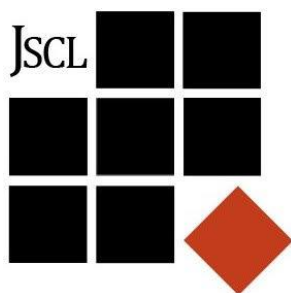


Jaipur Smart City Limited



INVITATION FOR BID (IFB)

Bid Reference No. JSCL/Smart City Works/22/2017-18

Bidding Document for

**Covering of Existing Nalla for An Approximate Length of 100
Meters in Each of Following Stretches**

- **Near Park Prime Hotel to Existing Mechanised MLCP at Krisna Marg**
- **From World Trade Park in JLN Marg along Park Avenue Road**

December - 2017

Jaipur Smart City Limited

JMC Building, Pt. Deendayal Upadhyay Bhawan, Lal Kothi, Tonk Road, Jaipur-302016
Phone No. 0141-2741346/2741347, E-Mail ID: jscljaipur@gmail.com

Bid Reference No. JSCL/Smart City

Works/22/2017

Bidding Document

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DISCLAIMER

This request for proposal (RFP) contains brief information about the Project, Qualification Requirements, Eligibility Criteria and the Selection process for the successful bidder. The purpose of this RFP documents is to provide bidders with information to assist in the formulation of their proposal ('proposal').

The information ('Information') contained in this RFP document or subsequently provided to interested parties (the bidder(s)), in writing by or on behalf of Jaipur Smart City Limited

(JSCL) is provided to Bidder(s) on the terms and conditions set out in this RFP documents and any other terms and conditions subject to which such information is provided. This RFP document does not purport to contain all their information each Bidder may require. This RFP document may not be appropriate for all persons, and it is not possible for JSCL, their employees or advisors to consider the investment objectives, financial situation and particular needs of each party who reads or uses this RFP document. Certain Bidders may have a better knowledge of the proposed Project than others. Each Bidder should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information in this RFP document and obtain independent advice from appropriate sources.

JSCL, their employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy; reliability or completeness of the RFP document and information provided hereunder is only to the best of the knowledge of JSCL.

Intimation of discrepancies in the RFP, if any, should be given to the office of the JSCL immediately by the Bidder. If JSCL receives no written communication, it shall be deemed that the Bidders are satisfied that the RFP document is complete in all respects.

This RFP, along with its Annexures, is not transferable and will be issued only to the interested Bidding Company or the Lead Member of the interested Bidding Consortium. The RFP and the information contained therein are to be used only by the person to whom it is issued. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient's professional advisors). In the event that the recipient does not continue with its involvement in the Project in accordance with this RFP, this RFP must be kept confidential.

This RFP document is not an agreement and is not an offer or invitation by JSCL to any other party. The terms on which the Project is to be developed and the right of the successful bidder shall be as set out in separate agreement contained herein. JSCL reserves the right to accept or reject any or all proposals without giving any reasons thereof. JSCL will not entertain any claim for expenses in relation to the preparation of RFP submissions.

Neither Jaipur Smart City Limited, nor its employees and advisors/consultants will have any liability to any Bidder or any other person under the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise from or be incurred or suffered in connection with anything contained in this RFP, any matter deemed to form part of this RFP, the award of the Project, the information supplied by or on behalf of JSCL or its employees, any advisors/consultants or otherwise arising in any way from the selection process for the said Project.

The purchaser of the RFP, which may be the Bidder or the lead Member of the Bidding Consortium and on behalf of each Member of such Consortium, shall be deemed to have confirmed that the Bidders are fully satisfied with the process of evaluation of the Responses and the JSCL's decision regarding the qualification or disqualification or

short listing of the Bidders. The Bidders hereby expressly waive any and all objections or claims in respect thereof.

This RFP may be withdrawn or cancelled by JSCL at any time without assigning any reasons thereof. JSCL further reserves the right, at its complete discretion to reject any or all of the Bids without assigning any reasons whatsoever.

Jaipur Smart City Limited

JMC Building, Pt Deendayal Upadhyay Bhawan,
LalKothi, Tonk Road, Jaipur – 302016, E-Mail ID: jscljaipur@gmail.com

SHORT NOTICE INVITING BID Bid Reference No. JSCL/Smart City Works/22/2017-18

Jaipur Smart City Limited (JSCL), Jaipur invites online e-bids from reputed contracting firms who have experience in multidisciplinary urban Infrastructure Projects for the following work.

Sl. No.	Name of Work	Estimated Project Cost	Earnest Money deposit(Rs.)	Tender document Fee	Bid processing fee	Period of Completion
1	Covering of Existing Nalla for An Approximate Length of 100 Meters in Each of Following Stretches <ul style="list-style-type: none">Near Park Prime Hotel to Existing Mechanised MLCP at Krisna MargFrom World Trade Park in JLN Marg along Park Avenue Road	Rs.792 lakh (Rupees Seven Crore and Ninety two Lakh Only)	Rs.15.84 Lakhs (Rupees Fifteen Lakh and Eighty four Thousands Only)	Rs. 20,000 (Rupees Twenty Thousand Only)	Rs. 1000 (Rupees One Thousand Only)	12 (Twelve) Months

Salient dates

(i)	Bid document Downloading and Submission Start Date and time	20 th December, 2017 at 5 :00 PM
(ii)	Bid document Downloading End Date and time	08 th January, 2018 at 5 :00 PM
(iii)	Last date and time of Online submission of technical proposal and financial proposal	08 th January, 2018 at 5:00 PM
(iv)	Last date and time of Physical submission of EMD, Bid document fee Bid processing fee and Power of Attorney	9 th January, 2018, Upto 5:00 PM
(v)	Opening of bid online (Technical proposal only)	10 th January, 2018, at 3:00 PM

Terms:

- Demand draft of EMD and Bid Cost are to be submitted in favour of Chief Executive Officer, Jaipur Smart City Limited, Jaipur & Bid Processing fee in favour of Managing Director, RISL,Jaipur.
- This notice and bid documents are available on following internet site address for e tender www.eproc.rajasthan.gov.in or <http://sppp.rajasthan.gov.in>
- A complete set of bid documents can be downloaded from above websites.
- Bids shall remain valid for 120 days (one hundred and twenty days) from the date of submission of the bid
- Any bid not accompanied by Bid document fee, Bid processing fee and Earnest Money as in the NIT will be rejected as nonresponsive.
- Complete e-Tender must be submitted on-line on www.eproc.rajasthan.gov.in
- Any addendum, clarification to the bidder's queries and corrigendum will be published on the www.eproc.rajasthan.gov.in or <http://sppp.rajasthan.gov.in> and will not be published in the Newspapers.

**Chief Executive Officer
Jaipur Smart City Limited**

SECTION-I: INSTRUCTION TO BIDDERS

Important Instruction:- The Law relating to procurement “The Rajasthan Transparency in Public Procurement Act, 2012” [hereinafter called the Act] and the “Rajasthan Public Procurement Rules, 2012” [hereinafter called the Rules] under the said Act have come into force which are available on the website of State Public Procurement Portal <http://sppp.raj.nic.in>. Therefore, the Bidders are advised to acquaint themselves with the provisions of the Act and the Rules before participating in the Bidding process. If there is any discrepancy between the provisions of the Act and the Rules and this Bidding Document, the provisions of the Law shall prevail.

1. General			
1.1	Scope of Bid	1.1.1	In support of the Invitation to Bid indicated in the Bid Data Sheet (BDS), the Procuring Entity as indicated in the BDS, issues this Bidding Document for the procurement of works as named in the BDS and as specified in Section V, Procuring Entity’s Requirements.
1.2	Interpretation	1.2.1	Throughout this Bidding Document: The term “in writing” means communicated in written form through letter, fax, e-mail etc. with proof of receipt. If the context so requires, singular means plural and vice versa; and “Day” means calendar day.
1.3	Code of Integrity	1.3.1	Any person participating in the procurement process shall, - i. not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process; ii. not misrepresent or omit that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation; iii. not indulge in any collusion, bid rigging or anti-competitive behavior to impair the transparency, fairness and progress of the procurement process; iv. not misuse any information shared between the Procuring Entity and the Bidders with an intent to gain unfair advantage in the procurement process; v. not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process; vi. not obstruct any investigation or audit of a

			<p>procurement process;</p> <p>vii. disclose conflict of interest, if any; and</p> <p>viii. Disclose any previous transgressions with any Entity in India or any other country during the last three years or any debarment by any other Procuring Entity.</p>
		1.3.2	<p>Conflict of Interest: A conflict of interest is considered to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations.</p> <p>A Bidder may be considered to be in conflict of interest with one or more parties in this bidding process if, including but not limited to:</p> <ul style="list-style-type: none"> i. have controlling partners/ shareholders in common; or ii. receive or have received any direct or in direct subsidy from any of them; or iii. have the same legal representative for purposes of this Bid; or iv. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Procuring Entity regarding this bidding process; or v. The Bidder 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 the Bidder is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one Bid; or vi. the Bidder 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 vii. The Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as Engineer-in-charge/ consultant for the Contract.

		1.3.3	The Bidder shall have to give a declaration regarding compliance of the Code of Integrity prescribed in the Act, the Rules and stated above in this Clause along with its Bid, in the format specified in Section IV, Bidding Forms.
		1.3.4	Breach of Code of Integrity by the Bidder: - Without prejudice to the provisions of Chapter IV of the Rajasthan Transparency in Public Procurement Act, in case of any breach of the Code of Integrity by a Bidder or prospective Bidder, as the case may be, the Procuring Entity may take appropriate action in accordance with the provisions of sub-section (3) of section 11 and section 46 of the Act.
1.4	Eligible Bidders	1.4.1	<p>A Bidder may be a natural person, private Entity, government-owned Entity or, where permitted in the Bidding documents, any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture [JV], Consortium or Association. In the case of a Joint Venture, Consortium or Association: -</p> <p>all parties to the Joint Venture, Consortium or Association shall sign the Bid and they shall be jointly and severally liable; and a Joint Venture, Consortium or Association shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the Joint Venture, Consortium or Association during the Bidding process. In the event the Bid of Joint Venture, Consortium or Association is accepted, either they shall form a registered Joint Venture, Consortium or Association as company/firm or otherwise all the parties to Joint Venture, Consortium or Association shall sign the Agreement.</p>
		1.4.2	A Bidder, and all parties constituting the Bidder, shall have the nationality of India. In case of International Competitive Bidding or Joint Venture, Consortium or Association [where permitted], the nationality of the Bidder and all parties constituting the Bidder shall be of India or an eligible country declared as such by Government of India. A Bidder shall be deemed to have nationality of a country if the Bidder is a citizen or 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 Sub-Contractors or suppliers for

			any part of the Contract including related services.
		1.4.3	A Bidder should not have a conflict of interest in the procurement in question as stated in the Rule 81 and this Bidding document.
		1.4.4	A Bidder debarred under section 46 of the Act shall not be eligible to participate in any procurement process undertaken by any Procuring Entity, if debarred by the State Government; and a Procuring Entity, if debarred by such Procuring Entity.
		1.4.5	The Bidder must be a enlisted contractor in appropriate class with the Department/ Organization. He shall furnish necessary proof of the same.
		1.4.6	<p>i Any change in the constitution of the firm, etc., shall be notified forth with by the Bidder in writing to the Procuring Entity and such change shall not relieve any former partner/ member of the firm, etc from any liability under the Contract.</p> <p>ii No new partner/partners shall be accepted in the firm by the Bidder in respect of the contract unless he/they agree to abide by all its terms, conditions and deposit with the Procuring Entity a written agreement to this effect. The Bidder's receipt for acknowledgement or that of any partners subsequently accepted as above shall bind all of them and will be sufficient discharge for any of the purpose of the Contract.</p> <p>iii The status of the lead partner/ representative of the Joint Venture, Consortium or Association as a major stake holder shall not change without the consent of the Procuring Entity. New major stake holder must agree to abide by all terms and conditions of the Contract.</p>
		1.4.7	Bidders shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, should the Procuring Entity request.
		1.4.8	In case a prequalification or empanelment or registration process has been conducted prior to the bidding process, this bidding shall be open only to the pre-qualified, empanelled or registered Bidders.
		1.4.9	Each Bidder shall submit only one Bid except in case of alternative bids, if permitted.

		1.4.10	<p>Bidder who is not registered under the Sales Tax Act prevalent in the State of Rajasthan can bid, however selected bidder shall have to be got registered with the Sales Tax department of the state government and submit the proof of registration before signing the Contract agreement.</p> <p>He is also required to provide proof of Permanent Account Number (PAN) given by Income Tax Department.</p>
2. Contents of Bidding Document			
2.1	Sections of the Bidding Document	2.1.1	<p>The Bidding Document consists of Parts I, II, and III, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB Clause 2.3 [Amendment of Bidding Document].</p> <p>Part I: Bidding Procedures</p> <p>Section I. Instructions to Bidders (ITB)</p> <p>Section II. Bid Data Sheet (BDS)</p> <p>Section III. Evaluation and Qualification Criteria</p> <p>Section IV. Bidding Forms</p> <p>Part II: Requirements</p> <p>Section V. Procuring Entity's Requirements.</p> <p>Part III: Contract</p> <p>Section VI A. General Conditions of Contract [GCC]</p> <p>Section VI B. Special Conditions of Contract [SCC]</p> <p>Section VI C. Contract Forms</p>
		2.1.2	<p>The Invitation for Bids (NIB) issued by the Procuring Entity is also part of the Bidding Document.</p>
		2.1.3	<p>i. The Bidding Document shall be uploaded on the e-procurement portal, eproc.raj.nic.in along with the Notice Inviting Bids. The complete Bidding Document shall also be placed on the State Public Procurement Portal, sppp.raj.nic.in. The prospective Bidders may download the bidding document from these portals. The price of the Bidding Document and processing fee of e-bid shall have to be paid to the Procuring Entity in the amount and manner as specified in Bid Data Sheet and</p>

			e-procurement portal.
		2.1.4	The Procuring Entity is not responsible for the completeness of the Bidding Document and its addenda, if they were not downloaded correctly from the e-procurement portal or the State Public Procurement Portal.
		2.1.5	The Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Document. Failure to furnish all information or authentic documentation required by the Bidding Document may result in the rejection of the Bid.
2.2	Clarification of Bidding Document and Pre-Bid Conference	2.2.1	The Bidder shall be deemed to have carefully examined the conditions, specifications, size, make and drawings, etc. of the Works and Related Services to be provided. If any Bidder has any doubts as to the meaning of any portion of the conditions or of the specifications, drawings etc., it shall, before submitting the Bid, refer the same to the Procuring Entity and get clarifications. A Bidder requiring any clarification of the Bidding Document shall contact the Procuring Entity in writing or e-mail at the Procuring Entity's address indicated in the BDS. The Procuring Entity will respond in writing or e-mail to any request for clarification, within seven days provided that such request is received no later than twenty-one (21) days prior to the deadline for submission of Bids as specified in ITB Sub-Clause 4.2.1[Deadline for Submission of Bids].The clarification issued, including a description of the inquiry but without identifying its source shall also be placed on the State Public Procurement Portal and should the Procuring Entity deem it necessary to amend the Bidding Document as a result of a clarification, it shall do so following the procedure under ITB Clause 2.3 [Amendment of Bidding Document] through an addendum which shall form part of the Bidding Document..
		2.2.2	The Bidder or his authorized representative is invited to attend the Pre- Bid Conference, if provided for in the BDS. The purpose of the Pre- Bid Conference will be to clarify issues and to answer questions on any matter related to this procurement that may be raised at that stage. If required, a conducted site visit may be

			arranged by the Procuring Entity.
		2.2.3	The Bidder is requested, to submit questions in writing, to reach the Procuring Entity not later than one week before the date of Pre-Bid Conference.
		2.2.4	Minutes of the Pre-Bid Conference, including the text of the questions raised, and the responses given, without identifying the source, will be transmitted promptly to all Bidders who attended the Pre-Bid Conference and shall also be placed on the State Public Procurement Portal and the e-procurement portal. Any modification to the Bidding Document that may become necessary as a result of the Pre-Bid Conference shall be made by the Procuring Entity exclusively through the issue of an addendum (part of Bid document) and not through the minutes of the Pre-Bid Conference.
		2.2.5	At any time prior to the deadline for submission of the Bids, the Procuring Entity, suo-moto, may also amend the Bidding Document, if required, by issuing an addenda which will form part of the Bidding Document.
		2.2.6	Non-attendance at the Pre-Bid Conference will not be a cause for disqualification of a Bidder.
2.3	Amendment of Bidding Document	2.3.1	Any addendum issued shall be part of the Bidding Document and shall be uploaded on the State Public Procurement Portal and the e-procurement portal.
		2.3.2	To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Procuring Entity may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB Sub-Clause 4.2 [Deadline for Submission of Bids], under due publication on the State Public Procurement Portal and the e-procurement portal and newspapers.
3. Preparation of Bids			
3.1	Cost of Bidding	3.1.1	The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
		3.1.2	The Bidder shall furnish the scanned attested copies of following documents with its Bid: - i. Partnership Deed and valid registration certificate with the Registrar of Firms in case of Partnership

			<p>Firms. Power of Attorney in favor of the partner signing/submitted the Bid, authorizing him to represent all partners of the firm.</p> <p>ii. VAT/ Sales Tax registration certificate and VAT/Sales Tax clearance certificate from the concerned Commercial Taxes Officer and Permanent Account Number (PAN) given by the Income Tax Department.</p> <p>iii .Address of residence and office, telephone numbers e-mail address in case of sole Proprietorship.</p> <p>iv. Certificate of Registration and Memorandum of Association issued by Registrar of Companies in case of a registered company and in case of any other statutory or registered body, certificate of incorporation or registration issued by concerned authorities. Power of attorney in favor of the person signing the Bid.</p> <p>v. Where permitted to bid as Joint Venture, Consortium or Association, letter of formal intent to enter in to an agreement or an existing agreement in the form of a Joint Venture, Consortium or Association.</p>
3.2	Language of Bid	3.2.1	<p>The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Procuring Entity, shall be written in English/ Hindi or a 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 duly accepted by the Bidder in English/ Hindi or the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.</p>
3.3	Documents Comprising the Bid	3.3.1	<p>The Bid shall comprise of two covers, one containing the Technical Bid/ Proposal and the other the Financial or Price Bid/ Proposal.</p> <p>One more cover containing scanned copies of proof of payment in form specified in Bid Data Sheet, of the price of Bidding Document, processing fee and Bid Security/ Bid Securing Declaration shall be enclosed separately.</p>
		3.3.2	<p>The Technical Bid/ Proposal shall contain the following:</p>

			<ul style="list-style-type: none"> i. Technical Bid/ Proposal Submission Sheet and Technical Bid containing the filled up Bidding Forms and Declarations related to Technical Bid and Code of Integrity given in Section IV [Bidding Forms]; ii. proof of payment of price of Bidding Document, processing fee, Bid Security, in accordance with ITB Clause 3.10; iii. written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB Clause 3.11; iv. documentary evidence in accordance with ITB Clause 3.7 establishing the Bidder's eligibility to bid; v. documentary evidence in accordance with ITB Clause 3.8 establishing the Bidder's qualifications to perform the contract if its Bid is accepted; vi. Drawings/ designs in support of the Works to be executed; vii. the Notice Inviting Bids; viii. any other document required in the BDS; and ix. Others considered necessary to strengthen the Bid submitted.
		3.3.3	<p>The Financial Bid/ Price Proposal shall contain the following:</p> <p>Financial Bid/ Price Proposal Submission Sheet and the applicable Price Schedules, in accordance with ITB Clauses 3.4, 3.5;</p> <p>Any other document required in the BDS.</p>
3.4	Bid Submission Sheets and Price Schedules	3.4.1	The Bidder shall submit the Technical Bid and Financial Bid using the Bid Submission Sheets provided in Section IV [Bidding Forms]. These forms must be completed without any alterations to their format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
		3.4.2	The Bidder shall submit as part of the Financial Bid, the Price Schedules for Works, using the forms provided in Section IV [Bidding Forms].
3.5	Bid Prices	3.5.1	<ul style="list-style-type: none"> i. In case of Item Rate 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 Procuring Entity but will have to be executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities. ii. In case of Percentage Rate Contracts, combined single percentage above or below must be quoted by the Bidder for all items of the

			<p>Bill of Quantities.</p> <p>iii. In case of Lump Sum Contracts, only Total Price which the Bidder wants to charge for the entire Works with all its contingencies in accordance with drawings and specifications shall be quoted by the Bidder. A Schedule of Rates shall be specified in the Bid Data Sheet in order to regulate the amount to be added to or deducted from the fixed sum on account of additions and alterations not covered by the Contract. Payments shall be linked to various stages of completion of the Works specified in Activity Schedule given in Bid Data Sheet.</p>
		3.5.2	<p>Prices quoted by the Bidder shall be fixed during the Bidder's Performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected, pursuant to ITB Clause 5.7 [Responsiveness of Bids]. However, if in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, a Bid submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero.</p>
		3.5.3	<p>All duties, taxes and other levies payable by the Bidder under the contract, or for any other cause, shall be included in the rates and prices, and the total Bid Price submitted by the Bidder.</p>
3.6	Currencies of Bid.	3.6.1	<p>The unit rates and the prices shall be quoted by the Bidder entirely in Indian Rupees unless otherwise specified in BDS. All payments shall be made in Indian Rupees only, unless otherwise specified in the BDS.</p>
3.7	Documents Establishing the Eligibility of the Bidder	3.7.1	<p>To establish their eligibility in accordance with ITB Clause 1.4 [Eligible Bidders], Bidders shall:</p> <p>complete the eligibility declarations in the Bid Submission Sheet and Declaration Form included in Section IV [Bidding Forms];</p> <p>if the Bidder is an existing or intended Joint Venture [JV], Consortium or Association in accordance with ITB Sub-Clause 1.4.1, shall submit a copy of the Agreement, or a letter of intent to enter into such Agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended JV, Consortium or Association as appropriate; and the existing or intended JV /</p>

			Consortium shall authorize an individual/ partner in one of the firms as lead partner of the JV / Consortium to act and commit all the partners of JV / Consortium for the Bid.
3.8	Documents Establishing the Qualifications of the Bidder	3.8.1	To establish its qualifications to perform the Contract, the Bidder shall submit as part of its Technical Proposal the documentary evidence indicated for each qualification criteria specified in Section III, [Evaluation and Qualification Criteria].
3.9	Period of Validity of Bids	3.9.1	Bids shall remain valid for 90 days or the period specified in the BDS after the Bid submission deadline date as specified by the Procuring Entity. A Bid valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.
		3.9.2	In exceptional circumstances, prior to the expiration of the Bid validity period, the Procuring Entity may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security or a Bid Securing Declaration in accordance with ITB Clause 3.10 [Bid Security] shall also be got extended for thirty days beyond the dead line of the extended validity period. A Bidder may refuse the request without forfeiting its Bid Security or a Bid Securing Declaration. A Bidder granting the request shall not be permitted to modify its Bid.
3.10	Bid Security	3.10.1	Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, a Bid Security for the amount specified in the BDS.
		3.10.2	Bid Security shall be 2% of the value of the Works indicated in the NIB. For bidders registered with the Procuring Entity, the bid security shall be 0.5% of the value of works indicated in the NIB. The bid security shall be in Indian Rupees, if not otherwise specified in the BDS.
		3.10.3	The Bid Security may be given in the form of a banker's cheque or demand draft or bank guarantee of a Scheduled Bank in India, in specified format, or deposited through eGRAS/ netbanking, if permitted.
		3.10.4	In lieu of Bid Security, a Bid Securing Declaration shall be taken from Government Departments and State Government Public Sector Enterprises, Autonomous bodies, Registered Societies, Cooperative Societies which are owned or controlled or managed by the State

			Government, Public Sector Enterprises of Central Government. For the Bid Securing Declaration the Bidder shall use the form included in Section IV [Bidding Forms].
		3.10.5	Scanned copy of Bid Security instrument or a Bid Securing Declaration shall necessarily accompany the sealed Bid. Any Bid not accompanied by Bid Security or Bid Securing Declaration, if not exempted, shall be liable to be rejected.
		3.10.6	Bid Security of a Bidder lying with the Procuring Entity in respect of other Bids awaiting decision shall not be adjusted towards Bid Security for this Bid. The Bid Security originally deposited may, however be taken into consideration in case Bids are re-invited.
		3.10.7	The issuer of the Bid Security and the confirmer, if any, of the Bid Security, as well as the form and terms of the Bid Security, must be acceptable to the Procuring Entity.
		3.10.8	Prior to submitting its Bid, a Bidder may request the Procuring Entity to confirm the acceptability of a proposed issuer of a Bid Security or of a proposed confirmer, if different than as specified in ITB Clause 3.10.3. The Procuring Entity shall respond promptly to such a request.
		3.10.9	The bank guarantee presented as Bid Security shall be got confirmed from the concerned issuing bank. However, the confirmation of the acceptability of a proposed issuer or of any proposed confirmer does not preclude the Procuring Entity from rejecting the Bid Security on the ground that the issuer or the confirmer, as the case may be, has become insolvent or is under liquidation or has otherwise ceased to be creditworthy.
		3.10.10	The Bid Security of unsuccessful Bidders shall be refunded soon after final acceptance of successful Bid and signing of Contract Agreement and submitting Performance Security by successful Bidder pursuant to ITB Clause 6.4 [Performance Security].
		3.10.11	The Bid Security taken from a Bidder shall be forfeited in the following cases, namely:- i. when the Bidder withdraws or modifies his Bid after opening of Bids; or ii. when the Bidder does not execute the agreement in

			<p>accordance with ITB Clause 6.3 [Signing of Contract] after issue of letter of acceptance/ placement of Work order within the specified time period; or</p> <p>iii. when the Bidder fails to commence the Works as per Work Order within the time specified; or</p> <p>iv. when the Bidder does not deposit the Performance Security in accordance with ITB Clause 6.4 [Performance Security]; in the prescribed time limit after the work order is placed;</p> <p>v. if the Bidder breaches any provision of the Code of Integrity prescribed for Bidders in the Act and Chapter VI of the Rules or as specified in ITB Clause 1.3 [Code of Integrity]; or</p> <p>vi. if the Bidder does not accept the correction of its Bid Price pursuant to ITB Sub-Clause 5.5 [Correction of Arithmetical Errors].</p>
		3.10.12	<p>In case of the successful bidder, the amount of Bid Security may be adjusted in arriving at the amount of the Performance Security, or refunded if the successful bidder furnishes the full amount of Performance Security. No interest will be paid by the Procuring Entity on the amount of Bid Security.</p>
		3.10.13	<p>The Procuring Entity shall promptly refund the Bid Security of the Bidders at the earliest of any of the following events, namely:-</p> <p>i. the expiry of validity of Bid Security;</p> <p>ii. the execution of agreement for procurement and Performance Security is furnished by the successful bidder;</p> <p>iii. the cancellation of the procurement process; or</p> <p>iv. the withdrawal of Bid prior to the deadline for presenting Bids, unless the Bidding Document stipulates that no such withdrawal is permitted.</p>
		3.10.14	<p>The Bid Security of a Joint Venture, Consortium or Association must be in the name of the Joint Venture, Consortium or Association that submits the Bid. If the Joint Venture, Consortium or Association has not been legally constituted at the time of Bidding, the members of the proposed consortium or JV shall enter in to an Agreement to form a legally constituted JV / Consortium after the issue of Letter of Acceptance / Letter of Intent to them and also declare a partner as the lead partner in whose name the Bid Security may</p>

			be submitted.
3.11	Format and Signing of Bid	3.11.1	All pages of the Technical and Financial Bid shall be digitally signed by the Bidder or authorized signatory 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. In case of a Joint Venture, Consortium or Association, if the Joint Venture, Consortium or Association has not been legally constituted at the time of Bidding, all the members of the proposed Joint Venture, Consortium or Association shall digitally sign the Bid.
4. Submission and Opening of Bids			
4.1	Sealing and Marking of Bids	4.1.1	Bidders shall submit their Bids to the Procuring Entity electronically only on the e-procurement portal, eproc.raj.nic.in. In submission of their Bids, the Bidders should follow the step by step instructions given on the e-procurement portal.
		4.1.2	The Bidder shall enclose the Technical Bid and the Financial Bid in separate covers. The proof of payment of price of Bidding Document, processing fee and Bid Security shall be enclosed in third cover. The price of Bidding Document and Bid Security shall be paid in the name of the Procuring Entity and the processing fee shall be paid in the name of RISL.
4.2	Deadline for Submission of Bids	4.2.1	Bids shall be submitted electronically only upto the time and date specified in the Notice Inviting Bids and BDS or an extension issued thereof.
4.3	Withdrawal, Substitution and Modification of Bids	4.3.1	A Bidder may withdraw, substitute or modify its Bid after it has been submitted by submitting electronically on the e-procurement portal a written Withdrawal/ Substitutions/ Modifications etc. Notice on the e-procurement portal, duly digitally signed by the Bidder or his authorized representative, and shall include a copy of the authorization in accordance with ITB Sub-Clause 3.11.1 [Format and Signing of Bid]. The corresponding Withdrawal, Substitution or Modification of the Bid must accompany the respective written Notice. All Notices must be received by the Procuring Entity on the e-procurement portal prior to the deadline specified for submission of Bids in accordance with ITB Sub-Clause 4.2. [Deadline for Submission of Bids].

		4.3.2	No Bid shall be withdrawn, substituted or modified in the interval between the deadline for submission of the Bid and the expiration of the period of Bid validity specified in ITB Clause 3.9.[Period of Validity of Bids] or any extension thereof.
4.4	Bid Opening	4.4.1	The electronic Technical Bids shall be opened by the Bids opening committee constituted by the Procuring Entity at the time, date and place specified in the Bid Data Sheet in the presence of the Bidders or their authorized representatives, who choose to be present.
		4.4.2	The Bids opening committee may co-opt experienced persons in the committee to conduct the process of Bid opening.
		4.4.3	The Bidders may choose to witness the electronic Bid opening procedure online.
		4.4.4	The Financial Bids shall be kept unopened until the time of opening of the Financial Bids. The date, time, and location of electronic opening of the Financial Bids shall be intimated to the bidders who are found qualified by the Procuring Entity in evaluation of their Technical Bids.
		4.4.5	The Bids opening committee shall prepare a list of the Bidders or their representatives attending the opening of Bids and obtain their signatures on the same. The list shall also contain the representative's name and telephone number and corresponding Bidders' names and addresses. The authority letters brought by the representatives shall be attached to the list. The list shall be signed by all the members of Bids opening committee with date and time of opening of the Bids.
		4.4.6	First, covers marked as "WITHDRAWAL" shall be opened, read out, and recorded and the covers containing the corresponding Technical Bids and Financial Bids shall not be opened. No Bid shall be permitted to be withdrawn unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is readout and recorded at Bid opening. If the withdrawal notice is not accompanied by the valid authorization, the withdrawal shall not be permitted and the corresponding Technical Bid shall be opened. Next, covers marked as "SUBSTITUTION Technical Bid" shall be opened, read out, recorded. The covers

			<p>containing the Substitution Technical Bids and/ or Substitution Financial Bids shall be exchanged for the corresponding covers being substituted. Only the Substitution Technical Bids shall be opened, read out, and recorded. Substitution Financial Bids will remain unopened in accordance with ITB Sub-Clause 4.4.4. No Bid shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at Bid opening.</p> <p>Covers marked as "MODIFICATION Technical Bid" shall be opened thereafter, read out and recorded with the corresponding Technical Bids. No Technical Bid and/ or Financial Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at opening of Technical Bids. Only the Technical Bids, both Original as well as Modifications to be opened, read out, and recorded at the opening. Financial Bids, both Original as well as Modification, will remain unopened in accordance with ITB Sub-Clause 4.4.4.</p>
		4.4.7	<p>All other covers containing the Technical Bids shall be opened one at a time and the following read out and recorded-</p> <ul style="list-style-type: none"> i. the name of the Bidder; ii. whether there is a modification or substitution; iii. whether proof of payment of Bid Security or Bid Securing Declaration, if required, payment of price of the Bidding Document and processing fee have been enclosed; iv. Any other details as the Bids opening committee may consider appropriate. <p>After all the Bids have been opened, their hard copies shall be printed and shall be initialed and dated on the first page and other important papers of each Bid by the members of the Bids opening committee.</p>
		4.4.8	<p>Only Technical Bids shall be read out and recorded at the bid opening and shall be considered for evaluation. No Bid shall be rejected at the time of opening of Technical Bids except Alternative Bids (if not permitted) and Bids not accompanied with the proof of payment of the required price of Bidding Document, processing fee</p>

			and Bid Security.
		4.4.9	The Bids opening committee shall prepare a record of opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer (if they were permitted), any conditions put by Bidder and the presence or absence of the price of Bidding Document, processing fee and Bid Security. The Bidders or their representatives, who are present, shall sign the record. The members of the Bids opening committee shall also sign the record with date.
		4.4.10	After completion of the evaluation of the Technical Bids, the Procuring Entity shall invite Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified to attend the electronic opening of the Financial Bids. The date, time, and location of the opening of Financial Bids will be intimated in writing by the Procuring Entity. Bidders shall be given reasonable notice of the opening of Financial Bids.
		4.4.11	The Procuring Entity shall notify Bidders in writing whose Technical Bids have been rejected on the grounds of being substantially non-responsive and not qualified in accordance with the requirements of the Bidding Document.
		4.4.12	The Bids opening committee shall conduct the electronic opening of Financial Bids of all Bidders who submitted substantially responsive Technical Bids and have qualified in evaluation of Technical Bids, in the presence of Bidders or their representatives who choose to be present at the address, date and time specified by the Procuring Entity.

		4.4.13	<p>All covers containing the Financial Bids shall be opened one at a time and the following read out and recorded-</p> <ul style="list-style-type: none"> i. the name of the Bidder; ii. whether there is a modification or substitution; iii. the Bid Prices; iv. any other details as the Bids opening committee may consider appropriate. <p>After all the Bids have been opened, their hard copies shall be printed and shall be initialed and dated on the first page of the each Bid by the members of the Bids opening committee. All the pages of the Price Schedule and letters, Bill of Quantities attached shall be initialed and dated by the members of the committee. Key information such as prices, completion period, etc. shall be encircled and unfilled spaces in the Bids shall be marked and signed with date by the members of the Bids opening committee.</p>
		4.4.14	<p>The Bids opening committee shall prepare a record of opening of Financial Bids that shall include as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification, the Bid Price, any conditions, any discounts and alternative offers (if they were permitted). The Bidders or their representatives, who are present, shall sign the record. The members of the Bids opening committee shall also sign the record with date.</p>
5.Evaluation and Comparison of Bids			
5.1	Confidentiality	5.1.1	<p>Information relating to the examination, evaluation, comparison, and post-qualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.</p>
		5.1.2	<p>Any attempt by a Bidder to influence the Procuring Entity in its examination of qualification, evaluation, comparison of the Bids or Contract award decisions may resulting in the rejection of its Bid, in addition to the legal action which may be taken by the Procuring Entity under the Act and the Rules.</p>

		5.1.3	Notwithstanding ITB Sub-Clause 5.1.2 [Confidentiality], from the time of opening the Bid to the time of Contract award, if any Bidder wishes to contact the Procuring Entity on any matter related to the Bidding process, it shall do so in writing.
		5.1.4	In addition to the restrictions specified in section 49 of the Act, the Procuring Entity, while procuring a subject matter of such nature which requires the procuring Entity to maintain confidentiality, may impose condition for protecting confidentiality of such information.
5.2	Clarification of Technical or Financial Bids	5.2.1	To assist in the examination, evaluation, comparison and qualification of the Technical or Financial Bids, the Bid evaluation committee may, at its discretion, ask any Bidder for a clarification regarding his Bid. The committee's request for clarification and the response of the Bidder shall be in writing.
		5.2.2	Any clarification submitted by a Bidder with regard to his Bid that is not in response to a request by the Bid evaluation committee shall not be considered.
		5.2.3	No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors discovered by the Bid evaluation committee in the evaluation of the financial Bids.
		5.2.4	No substantive change to qualification information or to a submission, including changes aimed at making an unqualified Bidder, qualified or an unresponsive submission, responsive shall be sought, offered or permitted.
5.3	Deviations, Reservations and Omissions in Technical or Financial Bids	5.3.1	During the evaluation of Technical or Financial Bids, the following definitions apply: i. "Deviation" is a departure from the requirements specified in the Bidding Document; ii. "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and iii. "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

5.4	Nonmaterial Non conformities in Technical or Financial Bids	5.4.1	Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity may waive any non-conformities (with recorded reasons) in the Bid that do not constitute a material deviation, reservation or omission.
		5.4.2	Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity may request the Bidder to submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Request for information or documentation on such nonconformities shall not be related to any aspect of the Financial Proposal of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
		5.4.3	<p>* Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity will rectify nonmaterial nonconformities or omissions (with recorded reasons). To this effect, the Bid Price shall be adjusted during evaluation of Financial Proposals for comparison purposes only, to reflect the price of the missing or non- conforming item or component. The adjustment shall be made using the method indicated in Section III, Evaluation and Qualification Criteria.</p> <p>* [This ITB Sub-Clause should be kept only when considered necessary]</p>
5.5	Correction of Arithmetical Errors in Financial Bid	5.5.1	<p>Provided that a Financial Bid is substantially responsive, the Bid evaluation committee shall correct arithmetical errors during evaluation of Financial Bid on the following basis:</p> <ul style="list-style-type: none"> i. 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 Procuring Entity 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; ii. 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 iii. if there is a discrepancy 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 (i) and (ii) above.
		5.5.2	If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its Bid Security shall be forfeited or its Bid Securing Declaration shall be executed.
5.6	Preliminary Examination of Technical or Financial Bids	5.6.1	The Procuring Entity shall examine the Technical or Financial Bids to confirm that all documents and technical documentation requested in ITB Sub-Clause 3.3 [Documents Comprising the Bid] have been provided, and to determine the completeness of each document submitted.
		5.6.2	<p>The Procuring Entity shall confirm, following the opening of the Technical or Financial Bids, that the following documents and information have been provided :</p> <ol style="list-style-type: none"> i. Bid is signed, as per the requirements listed in the Bidding documents; ii. Bid has been sealed as per instructions provided in the Bidding documents; iii. Bid is valid for the period, specified in the Bidding documents; iv. Bid is accompanied by Bid Security or Bid securing declaration; v. Bid is unconditional and the Bidder has agreed to give the required performance Security; vi. Price Schedules in the Financial Bids are in accordance with ITB Clause 3.4 [Bid Submission Sheets and Price Schedules]; vii. written confirmation of authorization to commit the Bidder; viii. Declaration by the Bidder in compliance of Section 7 and 11 of the Act; and ix. Other conditions, as specified in the Bidding Document are fulfilled.
5.7	Responsiveness of Technical or Financial Bids	5.7.1	The Procuring Entity's determination of the responsiveness of a Technical or Financial Bid is to be based on the contents of the Bid itself, as defined in ITB Sub-Clause 3.3 [Documents Comprising the Bid].

		5.7.2	<p>A substantially responsive Technical or Financial Bid is one that meets without material deviation, reservation, or omission to all the terms, conditions, and specifications of the Bidding Document. A material deviation, reservation, or omission is one that:</p> <p>(a) if accepted, would-</p> <ul style="list-style-type: none"> i. affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in Section V, Schedule of Supply; or ii. limits in any substantial way, inconsistent with the Bidding Document, the Procuring Entity's rights or the Bidder's obligations under the proposed Contract; or <p>(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.</p>
		5.7.3	<p>The Procuring Entity shall examine the technical aspects of the Bid in particular, to confirm that requirements of Section V, Procuring Entity's Requirements have been met without any material deviation, reservation, or omission.</p>
		5.7.4	<p>If a Technical or Financial Bid is not substantially responsive to the Bidding Document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.</p>
5.8	Examination of Terms and Conditions of the Technical or Financial Bids	5.8.1	<p>The Procuring Entity shall examine the Bids to confirm that all terms and conditions specified in the GCC and the SCC have been accepted by the Bidder without any material deviation or reservation.</p>
		5.8.2	<p>The Procuring Entity shall evaluate the technical aspects of the Bid submitted in accordance with ITB Clauses 3.3 [Documents Comprising the Bid] and to confirm that all requirements specified in Section V [Procuring Entity's Requirements] of the Bidding Document and all amendments or changes requested by the Procuring Entity in accordance with ITB Clause 2.3 [Amendment of Bidding Document] have been met without any material deviation or reservation.</p>

5.9	Evaluation of Qualification of Bidders in Technical Bids	5.9.1	The determination of qualification of a Bidder in evaluation of Technical Bids shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 3.8 [Documents Establishing the Qualifications of the Bidder] and in accordance with the qualification criteria indicated in Section III [Evaluation and Qualification Criteria]. Factors not included in Section III, shall not be used in the evaluation of the Bidder's qualification.
5.10	Evaluation of Financial Bids	5.10.1	The Procuring Entity shall evaluate each Financial Bid, the corresponding Technical Bid of which has been determined to be substantially responsive
		5.10.2	To evaluate a Financial Bid, the Procuring Entity shall only use all the criteria and methodologies defined in this Clause and in Section III, Evaluation and Qualification Criteria. No other criteria or methodology shall be permitted.
		5.10.3	To evaluate a Financial Bid, the Procuring Entity shall consider the following: <ul style="list-style-type: none"> i. the Bid Price quoted in the Financial Bid; ii. price adjustment for correction of arithmetical errors in accordance with ITB Clause 5.5 [Correction of Arithmetical Errors]; iii. Adjustment of bid prices due to rectification of nonmaterial nonconformities or omissions in accordance with ITB Sub Clause 5.4.3 [Nonmaterial Nonconformities in Bids], if applicable.
		5.10.4	If the Bid, which results in the lowest evaluated Bid Price, is considered to be seriously unbalanced, or front loaded, in the opinion of the Procuring Entity, the Procuring Entity may require the Bidder to produce detailed rate analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the construction methods and schedule proposed. After evaluation of the rate analysis, taking into consideration, the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the Performance security be increased at the cost of the Bidder to a level sufficient to protect the Procuring Entity against financial loss in the event of default of the successful Bidder under the Contract.

5.11	Comparison of Bids	5.11.1	The Procuring Entity shall compare all substantially responsive Financial Bids to determine the lowest-evaluated Financial Bid in accordance with ITB Sub-Clause 5.10 [Evaluation of Financial Bids].
5.12	Negotiations	5.12.1	To the extent possible, no negotiations shall be conducted after the pre-Bid stage. All clarifications needed to be sought shall be sought in the pre-Bid stage itself.
		5.12.2	Negotiations may, however, be undertaken only with the lowestBidder under the following circumstances- <ul style="list-style-type: none"> i. when ring prices have been quoted by the Bidders for the subject matter of procurement;or ii. When the rates quoted vary considerably and considered much higher than the prevailing market rates.
		5.12.3	The Bid evaluation committee shall have full powers to undertake negotiations. Detailed reasons and results of negotiations shall be recorded in the proceedings.
		5.12.4	The lowest Bidder shall be informed about negotiations in writing either through messenger or by registered letter and e-mail (if available). A minimum time of seven days shall be given for calling negotiations. In case of urgency, the Bid evaluation committee, after recording reasons, may reduce the time, provided the lowest Bidder has received the intimation and consented to holding of negotiations.
		5.12.5	Negotiations shall not make the original offer made by the Bidder inoperative. The Bid evaluation committee shall have option to consider the original offer in case the Bidder decides to increase rates originally quoted or imposes any new terms or conditions.
		5.12.6	In case of non-satisfactory achievement of rates from lowest Bidder, the Bid evaluation committee may choose to make a written counter offer to the lowest Bidder and if this is not accepted by him, the committee may decide to reject and re-invite Bids or to make the same counter-offer first to the second lowest Bidder, then to the third lowest Bidder and so on in the order of their initial standing in the bid evaluation and work order be awarded to the Bidder who accepts the counter-offer.

		5.12.7	In case the rates even after the negotiations are considered very high, fresh Bids shall be invited.
5.13	Procuring Entity's Right to Accept Any Bid, and to Reject Any or All Bids	5.13.1	The Procuring Entity 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 assigning any reasons thereof and without there by incurring any liability to the Bidders.
6. Award of Contract			
6.1	Procuring Entity's Right to Vary Quantities	6.1.1	If the Procuring Entity does not procure any subject matter of procurement or procures less than the quantity specified in the Bidding Document due to change in circumstances, the Bidder shall not be entitled for any claim or compensation except otherwise provided in the Bidding Document.
		6.1.2	Order for additional quantity of an item of the Works upto 50 percent of the original quantity of that item in the Bill of Quantities and for extra items not provided for in the Bill of Quantities may be given but the amount of the additional quantities and extra items, taken together, shall not exceed 50 percent of the Contract Price.
6.2	Acceptance of the successful Bid and award of contract	6.2.1	The Procuring Entity after considering the recommendations of the Bid Evaluation Committee and the conditions of Bid, if any, financial implications, samples, test reports, etc., shall accept or reject the successful Bid.
		6.2.2	Before award of the Contract, the Procuring Entity shall ensure that the price of successful Bid is reasonable and consistent with the required specifications.
		6.2.3	A Bid shall be treated as successful only after the competent authority has approved the procurement in terms of that Bid.
		6.2.4	The Procuring Entity shall award the contract to the Bidder whose offer has been determined to be the lowest in accordance with the evaluation criteria set out in the Bidding Document if the Bidder has been determined to be qualified to perform the contract satisfactorily on the basis of qualification criteria fixed for the Bidders in the Bidding Document for the subject matter of procurement.
		6.2.5	Prior to the expiration of the period of validity of Bid, the Procuring Entity shall inform the successful Bidder in

			writing, by registered post or email, that its Bid has been accepted.
		6.2.6	If the issuance of formal letter of acceptance (LOA) is likely to take time, in the meanwhile a Letter of Intent (LOI) may be sent to the Bidder. The acceptance of an offer is complete as soon as the letter of acceptance or letter of intent is posted and/ or sent by email (if available) to the address of the Bidder given in the Bidding Document.
6.3	Signing of Contract	6.3.1	In the written intimation of acceptance of its Bid sent to the successful Bidder, it shall also be requested to execute an agreement in the format given in the Bidding Document on a non-judicial stamp of requisite value at his cost and deposit the Performance Security or a Performance Security Declaration, if applicable, within a period specified in the BDS or where the period is not specified in the BDS, then within fifteen days from the date on which the LOA or LOI is dispatched to the Bidder. In case the successful bidder is a JV / Consortium still to be legally constituted, all parties to the JV / Consortium shall sign the Agreement.
		6.3.2	If the Bidder, whose Bid has been accepted, fails to sign a written procurement contract or fails to furnish the required Performance Security or Performance Security Declaration within the specified time period, the Procuring Entity shall forfeit the Bid Security of the successful bidder / execute the Bid Securing Declaration and take required action against it as per the provisions of the Act and the Rules.
		6.3.3	The Bid Security, if any, of the Bidders whose Bids could not be accepted shall be refunded soon after the contract with the successful Bidder is signed and his Performance Security is obtained. Until a formal contract is executed, LOA or LOI shall constitute a binding contract.
6.4	Performance Security	6.4.1	Performance Security shall be solicited from the successful Bidder except State Govt. Departments and undertakings, corporations, autonomous bodies, registered societies, co-operative societies which are owned or controlled or managed by the State Government and undertakings of Central Government. However, a Performance Security Declaration shall be taken from them. The State Government may relax the provision of Performance Security in particular

			procurement.
		6.4.2	<p>(i) The amount of Performance Security shall be ten percent, or as specified in the BDS, of the amount of the Work Order. The currency of Performance Security shall be Indian Rupees, if otherwise not specified in BDS.</p> <p>(ii) If the Bid, which results in the lowest evaluated bid price, is seriously unbalanced or front loaded in the opinion of the Procuring Entity, the Procuring Entity may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, taking into consideration the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the performance security be increased (to a maximum of 20% of the bid value of such items) at the expense of the Bidder to a level sufficient to protect the Procuring Entity against financial loss in the event of default of the successful Bidder under the Contract.</p>
		6.4.3	<p>Performance Security shall be furnished in one of the following forms as applicable-</p> <p>(a) Deposit through eGRAS; or</p> <p>(b) Bank Draft or Banker's Cheque of a Scheduled Bank in India; or</p> <p>(c) National Savings Certificates and any other script/ instrument under National Savings Schemes for promotion of small savings issued by a Post Office in Rajasthan, if the same can be pledged under the relevant rules. They shall be accepted at their surrender value at the time of Bid and formally transferred in the name of the Procuring Entity with the approval of Head Post Master; or</p> <p>(d) Bank guarantee. It shall be got verified from the issuing bank. Other conditions regarding bank guarantee shall be same as specified in ITB Sub-Clause 3.10 [Bid Security]; or</p> <p>(e) Fixed Deposit Receipt (FDR) of a Scheduled Bank. It shall be in the name of the Procuring Entity on account</p>

			<p>of Bidder and discharged by the Bidder in advance. The Procuring Entity shall ensure before accepting the Fixed Deposit Receipt that the Bidder furnishes an undertaking from the bank to make payment/ premature payment of the Fixed Deposit Receipt on demand to the Procuring Entity without requirement of consent of the Bidder concerned. In the event of forfeiture of the Performance Security, the Fixed Deposit shall be forfeited along with interest earned on such Fixed Deposit.</p> <p>(f)The successful Bidder at the time of signing of the Contract agreement, may submit option for deduction of Performance Security from his each running and final bill @ 10% of the amount of the bill.</p>
		6.4.4	<p>Performance Security furnished in the form of a document mentioned at options (a) to (e) of Sub-Clause 6.4.3 above, shall remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the Bidder, including operation and / or maintenance and defect liability period, if any.</p>
		6.4.5	<p>Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Procuring Entity may either cancel the procurement process or if deemed appropriate, award the Contract at the rates of the lowest Bidder, to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Procuring Entity to be qualified to perform the Contract satisfactorily.</p>

		6.4.6	<p>Forfeiture of Performance Security: Amount of Performance Security in full or part may be forfeited in the following cases:-</p> <ol style="list-style-type: none"> i. when the Bidder does not execute the agreement in accordance with ITB Clause 6.3 [Signing of Contract] within the specified time; after issue of letter of acceptance; or ii. when the Bidder fails to commence the Works as per Work order within the time specified; or iii. when the Bidder fails to complete Contracted Works satisfactorily within the time specified; or iv. when any terms and conditions of the contract is breached; or v. to adjust any established dues against the Bidder from any other contract with the Procuring Entity; or vi. if the Bidder breaches any provision of the Code of Integrity prescribed for the Bidders specified in the Act, Chapter VI of the Rules and this Bidding Document. vii. Notice of reasonable time will be given in case of forfeiture of Performance Security. The decision of the Procuring Entity in this regard shall be final.
7. Redressal of Grievances during Procurement Process (Appeals)			
7	Grievance handling procedure during procurement process	7.1	Any grievance of a Bidder pertaining to the procurement process shall be by way of filing an appeal to the First or Second Appellate Authority, as the case may be, as specified in the BDS, in accordance with the provisions of chapter III of the Act and chapter VII of the Rules and as given in Appendix A to these ITB.

Appendix A:

Grievance Handling Procedure during Procurement Process (Appeals)

- 1) **Filing an appeal.**- If any Bidder or prospective Bidder is aggrieved that any decision, action or omission of the Procuring Entity is in contravention to the provisions of the Act or the Rules or the Guidelines issued there under, he may file an appeal to First or Second Appellate Authority, as the case may be, as may be designated for the purpose, within a period of ten days or such other period as may be specified in the pre-qualification documents, Bidder registration documents or Bidding documents, as the case may be, from the date of such decision or action, omission, as the case may be, clearly giving the specific ground or grounds on which he feels aggrieved:

Provided that after the declaration of a Bidder as successful in terms of section 27 of the Act, the appeal may be filed only by a Bidder who has participated in procurement proceedings:

Provided further that in case a Procuring Entity evaluates the technical Bid before the opening of the financial Bid, an appeal related to the matter of financial Bid may be filed only by a Bidder whose technical Bid is found to be acceptable.

- 2) **Appeal not to lie in certain cases.** -No appeal shall lie against any decision of the Procuring Entity relating to the following matters, namely:-
- determination of need of procurement;
 - provisions limiting participation of Bidders in the Bid process;
 - the decision of whether or not to enter into negotiations;
 - cancellation of a procurement process;
 - applicability of the provisions of confidentiality.
- 3) **Form of Appeal.**-
- An appeal under sub-section (1) or (4) of section 38 shall be in the annexed Form along with as many copies as there are respondents in the appeal.
 - Every appeal shall be accompanied by an order appealed against, if any affidavit verifying the facts stated in the appeal and proof of payment of fee.
 - Every appeal may be presented to First Appellate Authority or Second Appellate Authority, as the case may be, in person or through registered post or authorized representative.
- 4) **Fee for filing appeal.**-
- Fee for first appeal shall be rupees two thousand five hundred and for second appeal shall be rupees ten thousand, which shall be non-refundable.
 - The fee shall be paid in the form of bank demand draft or banker's Cheque of a Scheduled Bank payable in the name of Appellate Authority concerned.
- 5) **Procedure for disposal of appeals.**-
- The First Appellate Authority or Second Appellate Authority, as the case may be,

upon filing of appeal, shall issue notice accompanied by copy of appeal, affidavit and documents, if any, to the respondents and fix date of hearing.

- b) On the date fixed for hearing, the First Appellate Authority or Second Appellate Authority, as the case may be, shall,
 - (i) hear all the parties to appeal present before him; and
 - (ii) peruse or inspect documents, relevant records or copies thereof relating to the matter.

- c) After hearing the parties, perusal or inspection of documents and relevant records or copies thereof relating to the matter, the Appellate Authority concerned shall pass an order in writing and provide the copy of order to the parties to appeal free of cost.

- d) The order passed under sub-clause (c) above shall be placed on the State Public Procurement Portal.

Annexure

FORM No. 1

[See rule 83]

Memorandum of Appeal under the Rajasthan Transparency in Public Procurement Act, 2012

Appeal Noof

Before the (First / Second Appellate Authority)

1. Particulars of appellant:

- (a) Name of the appellant:
- (b) Official address, if any:
- (c) Residential address:

2. Name and address of the respondent(s):

- (a)
- (b)
- (c)

3. Number and date of the order appealed against and name and designation of the officer / authority who passed the order (enclose copy), or a statement of a decision, action or omission of the Procuring Entity in contravention to the provisions of the Act by which the appellant is aggrieved:

4. If the Appellant proposes to be represented by a representative, the name and postal address of the representative:

5. Number of affidavits and documents enclosed with the appeal:

6. Grounds of appeal:

.....
.....
.....

..... (Supported by an affidavit)

7. Prayer:

.....
.....
.....

Place

Date.....

Appellant's Signature

BSECTION-II: BIDDING DATA SHEET

The following specific data for the works shall complement, amend, or supplement the provisions in Instructions to Bidders – Section I. Whenever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

INSTRUCTIONS TO BIDDERS CLAUSE REFERENCE

A. Introduction

ITB. 1.1.1	<p>The Number of the Invitation for Bids (NIT) is: JSCL/Smart City Works/22/2017-18</p> <p>The Procuring Entity is: Jaipur Smart City limited, Rajasthan</p> <p>Name of Work: Covering of Existing Nalla for An Approximate Length of 100 Meters in Each of Following Stretches</p> <ul style="list-style-type: none"> • Near Park Prime Hotel to Existing Mechanised MLCP at Krishna Marg • From World Trade Park in JLN Marg along Park Avenue Road <p>(Detailed Scope of work has been defined in Section V: Procuring Entity's Requirement)</p>
1.1.2	<p>Period of Completion:</p> <p>The Physical Works shall be completed in its entirety within 12 (Twelve) months from the Start Date, which shall be the date of issue of the Notice to proceed or such other Start Date as may be specified in the Notice to proceed. The Defect Liability Period for the project is one year.</p>
1.1.3	<p>Estimated Cost of work is: Rs 792 Lakh. (Rupees Seven Crore and Ninety-Two Lakh Only)</p>
ITB 1.4.1	<p>Joint Ventures / Consortium are permitted comprising not more than 3 (three) firms/companies. The minimum equity under JV / Consortium of lead firm should be min 51% and other firm min 20% each.</p>
ITB 1.4.2	<p>“Bidders of Indian Nationality” are only permissible.</p>
ITB 1.4.5	<p>The Bidder must be a enlisted Contractor of Class AA with Rajasthan Public Works Department or equivalent with other Government / Organisation. He shall furnish necessary proof for the same.</p>
ITB 1.4.8	<p>The bidding process is open to bidders who fulfil the prescribed eligibility criteria.</p>
ITB 1.4.9	<p>Each bidder shall upload on-line / submit only one bid for one work. A bidder who submits or participates in more than one bid for the particular Works will be disqualified.</p>

B. Bidding Documents

ITB 2.1.3	<p>This is an “on-line tender”. Therefore, tender documents in physical form shall not be available for sale but can be downloaded from the website and pay cost (Rs 20,000/-) while submitting the filled-up Bidding document to the Procuring Entity along with the processing fee of Rs 1,000/- separately in favour of RISL, Jaipur</p>
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	The bidder should submit, by date & time specified in bid document, in original, hard copies of (i) cost of bid document as Rs. 20,000/- for each work in the form of DD/Banker's Cheque of a scheduled bank in India or eGRAS in the name of Chief Executive Officer, Jaipur Smart City Limited payable at Jaipur; (ii) Bid processing fee of Rs. 1,000/- for each work in the form of DD in the name of Managing Director, RISL, Jaipur payable at Jaipur; (iii) Bid Security as per RTPP; (iv) Letter of Technical Bid; (v) Power of Attorney; and (vi) Joint Venture Agreement, if applicable. The bidder should upload scanned copies of these documents on e-procurement web-site along with their technical bids.
ITB 2.2.1	For Clarification purposes only, the Procuring Entity's address is : OFFICE OF THE CHIEF EXECUTIVE OFFICER Jaipur Smart City Limited. JMC Building,Pt Deendayal Upadhyay Bhawan Lal Kothi,Tonk Road,Jaipur-302016 Phone No. 0141-2741346/2741347, E-Mail ID: jscljaipur@gmail.com
ITB 2.2.2	There will be no pre bid meeting. However, bidders are advised to visit the sites at their own expenses and if any support is required, shall be provided by the Executive Officer/Engineer.
ITB 2.2.3	The Bidders are requested, to submit questions in writing, to reach the Procuring Entity preferably not later than one week before the Pre-bid Meeting. However, Department may also consider questions / queries raised in writing only, during the Pre-bid Meeting.
ITB 2.3.1	Any addendum issued shall be part of the Bidding Document and shall be uploaded on the State Public Procurement Portals http://sppp.rajasthan.gov.in/ and http://eproc.rajasthan.gov.in
ITB 2.3.2	To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Procuring Entity may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB Sub-Clause 4.2 [Deadline for Submission of Bids], under due intimation to the Bidders by uploading it on the State Public Procurement Portal and its e-procurement portal.

C. Preparation of Bids

ITB 3.2.1	The language of the bid shall be: English
ITB 3.3.1	The online Bid shall comprise of two parts submitted simultaneously, one containing the Technical Bid/ Proposal and the other the Financial or Price Bid/ Proposal.
ITB 3.3.2	The Bidder shall submit the forms, declarations and documents, as specified in Section IV of Bid Document, with the Technical Bid:
ITB 3.3.3	The Bidder shall upload the following documents with its Financial Bid: a) Financial Proposal Submission Letter b) BoQ c) And other details as mentioned in Sec IV of Vol-01

ITB 3.5.1	Add following: a) The type of Contract will be Item Rate Contract..
ITB 3.5.2	The Prices quoted by the Bidder shall be fixed.
ITB 3.5.3	All variations in taxes and duties shall be borne as per relevant clause of the Section VI B: SCC
ITB 3.9.1	The Bid validity period shall be 120 (One hundred and twenty days) days from deadline for submission of bids.
ITB 3.10.2	Add following: Bid security shall be of the value Rs 15,84,000.00 (Rupees Rupees Fifteen Lakh and Eighty four Thousands Only), as indicated in Short NIB for all bidders.
ITB 3.10.3	A Bid Security shall be provided as a part of the bid in the form of a Banker's Cheque or Demand Draft or Bank Guarantee of a Scheduled Bank in India, in specified format which shall remain valid for a period of 45(forty-five) days beyond the validity of the bid.
ITB 3.11.1	Only Digital signed copy shall be submitted through e-procurement website.
ITB 3.11.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Power of Attorney

D. Submission and Opening of Bids

ITB 4.1.1	<p>For bid submission purposes only, the Procuring Entity's address is: OFFICE OF THE CHIEF EXECUTIVE OFFICER Jaipur Smart City Limited. JMC Building, Pt Deendayal Upadhyay Bhawan, LalKothi, Tonk Road, Jaipur-302016 Phone No. 0141-2741346/2741347 E-Mail ID: jscjjaipur@gmail.com</p> <p>Bidders shall submit their Bids electronically only.</p> <p>The Bidders shall submit the Bid online with all pages numbered serially and by giving an index of submissions. Each page of the submission shall be initialled by the Authorised Representative of the Bidder as per the terms of the tender. The Bidder shall be responsible for documents accuracy and correctness as per the version uploaded by the Procuring Entity and shall ensure that there are no changes caused in the content of the downloaded document. The bidder shall follow the following instructions for online submission:</p> <ul style="list-style-type: none"> • Bidder who wants to participate in bidding will have to procure digital certificate as per IT Act to sign their electronic bids. Offers which are not digitally signed will not be accepted. Bidder shall submit their offer in electronic format on above mentioned website after digitally signing the same. • Cost of bid document is Rs.20,000/- per tender should be deposited by Non Refundable Demand Draft drawn in favor of Chief Executive Officer, Jaipur Smart City Limited, Jaipur payable at Jaipur, whereas the
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	<p>Processing fee of Rs. 1,000/- should be deposited by Non-Refundable Demand Draft drawn in favour of MD, RISL, Jaipur payable at Jaipur. Original documents along with above mentioned fees and other documents as per bid conditions, has to be deposited up to 05.00 PM on 9th January, 2018 before opening of technical bid.</p> <ul style="list-style-type: none"> • The Procuring Entity will not be responsible for any mistake occurred at the time of uploading of bid or thereafter. • If holiday is declared on submission & opening date of tender the scheduled activity will take place on next working day.
ITB 4.1.2	Bids are required to be submitted in Electronic Format, it shall be submitted on the e-procurement portal: http://eproc.rajasthan.gov.in
ITB 4.2.1	The Deadline for electronic Bid submission is Date: 08th January, 2018 Time: 05:00 PM
ITB 4.4.1,4.4.5	The online Bid opening shall take place at: OFFICE OF THE CHIEF EXECUTIVE OFFICER Jaipur Smart City Limited. JMC Building,Pt Deendayal Upadhyay BhawanLalKothi,Tonk Road,Jaipur-302016 Phone No. 0141-2741346/2741347 E-Mail ID: jscljaipur@gmail.com The tendering process shall be conducted online only; DD/BC tender fee, processing fee and Bid Security shall be submitted physically up to deadline described in tender document.
ITB 4.4.13,4.4.15	The Procuring Entity will open the Financial proposal as per e-tendering procedure.

E. Award of Contract

ITB 6.3.1	The period within which the Performance Security is to be submitted by the successful Bidder and the Contract Agreement is to be signed by him from the date of issue of Letter of Acceptance is 30 Days.
ITB 6.3.3	The procuring entity shall promptly return the bid security after the earliest of the following events, namely: <ol style="list-style-type: none"> 1. The expiry of validity of bid security 2. The execution of agreement for procurement and performance security is furnished by the successful bidder; 3. The cancellation of the procurement process; or 4. The withdrawal of bid prior to the deadline for presenting bids, unless the bidding documents stipulate that no such withdrawal is permitted.
ITB 6.4.2, 6.4.3, 6.4.4 Replace with following	Performance Security amounting to total 10% of contract value and provisional sum) shall be submitted / deducted as follows: <ol style="list-style-type: none"> (i) Contractors shall submit Performance Security @ 10% in advance at the time of signing of agreement in form of Bank Guarantee as per latest rules under RTPP act. The Bank Guarantee should be issued by any

	<p>nationalized/ schedule bank and shall remain valid up to 60 days beyond defect liability period. Bank Guarantee submitted against the performance guarantee, shall be unconditional and en-cashable/ invokable at Town for which tenders are invited or at Jaipur.</p> <p>(ii) If there is no reason to retain the Performance Security, it shall be returned back to the contractor within 60 days after the satisfactory completion of the defect liability period, subject to submission of fresh performance security valid for 60 days beyond the O & M period of five (5) years, of an amount 10% of total contract value of Operation and Maintenance phase of five years.</p> <p>(iii) Refer Clause 49 of Special Conditions of Contract.</p>
7.1	<p>First Appellate Authority shall be: Dy. Secretary/Joint secretary, LSGD, Rajasthan</p> <p>Second Appellate Authority shall be: Secretary/Principal Secretary, LSGD, Rajasthan</p>

SECTION III: EVALUATION AND QUALIFICATION CRITERIA

A. Evaluation Criteria

1.1 The successful Bid will be the lowest evaluated responsive Bid, which qualifies technical evaluation.

1.2 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.

1.3 Quantifiable Nonconformities, Errors and Omissions.

The evaluated cost of quantifiable non conformities, errors and/or omissions is determined as follows:

"Pursuant to ITB Clause 5.4, the cost of all quantifiable nonmaterial nonconformities or omissions shall be evaluated. The Procuring Entity will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids."

[For guidance: The cost of minor omissions or missing items should be added to the Bid Price to allow for bid comparison on an equal basis. The price adjustment should be based on a reasonable estimate of the cost by the executing agency, engineer, consultant or bid evaluation committee, taking into consideration the corresponding quoted prices from other conforming bids. The price adjustment may be based on the price of the item quoted by the next lowest qualified bidder].

B. Qualification Criteria:**1. Eligibility:**

	Criteria	Compliance Requirements				Documents Submission Requirements
		Single Entity	Joint Venture / Consortium			
	Requirement		All Partners Combined	Each Partner	One partner	
i) Nationality	Nationality with accordance with ITB sub Clause 1.4.2	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	As per forms ELI 1, ELI 2 with attachment
ii) Conflict of Interest	No conflicts of interest in accordance with ITB Sub-clause 1.4.3	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	Letter of Bid
iii) Debarment/ Transgression by any Procuring Entity	Must declare	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	Declaration form given in the Bidding Document

2. Pending Litigation:

Pending Litigation	All pending litigation shall be treated as resolved against the Bidder and so shall in total not represent more than 50 percent of the Bidder's net worth.	Must meet requirement by itself or as partner to past or existing JV / Consortium	Not Applicable	Must meet requirement by itself or as partner to past or existing JV / Consortium	Not Applicable	Form LIT 1
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NOTE: CA certificate clearly mentioning with calculation that pending litigation in total not more than 50% of Bidder's net worth.

3. Financial Situation:

Criteria	Compliance Requirements				Documents Submission Requirements
	Single Entity	Joint Venture / Consortium(permitted)			
		All Partners Combined	Lead Member	Each Member	
Requirement					
3.1 Historical Financial Performance					

Net Worth					
Net Worth for the Financial Year 2016-17 (from latest audited balance sheet) should be positive. (Certificate of Chartered Accountant showing calculation of Net Worth must be enclosed)	Must meet requirement	Not Applicable	Must meet requirement	Must meet requirement	Form FIN 1 with attachments
Construction Turnover					
Average Annual Construction Turnover of last three years should be equal to or more than (1.5x cost of work/time period in years <i>i.e.</i> (Rs 11.88 crore).	Must meet requirement	Must meet requirement	Must meet 51% (percent) of the requirement	Must meet 20%(percent) of the requirement	Form FIN 2
<i>NOTE: Audited Balance Sheets of all the three financial years must be submitted in support, without which the bid may not be considered. The calculation sheet for annual average construction turnover shall be certified by a Chartered Accountant.</i>					
Working Capital					
Working Capital based on the current assets and current liabilities (including the short term loan repayments due in current years) should be minimum of 25% of the estimated cost of bid. (Available Working Capital shall be evaluated as Current Assets + Revolving Line of Credit – Current Liabilities (including loan repayment due within one year)	Must meet requirement	Must meet requirement	Must meet 51% (percent) of the requirement	Must meet 20% (percent) of requirement	
<i>NOTE: Certificate of CA must be submitted indicating clearly that the working capital is as per formula given in tender document and clearly stating the individual components. CA must also clearly mention that he has gone through the Revolving line of credit which is issued by scheduled Bank and Bank's commitment is project specific, assured and without any ambiguity and shall be available till final completion of project, otherwise bid shall not be considered. For revolving line of credit bank's letter should be attached. The bank issuing revolving line of credit has to be scheduled Bank as per format, otherwise it shall not be considered.</i>					
3.2 Bid Capacity (Financial Resources)					
Bid Capacity: The bid capacity of the bidder shall not be less than the estimated cost of the bid. The formula for calculating Bid capacity is given here	Must meet requirement	Must meet requirement	Lead member must meet 51% (percent	Must meet 20% (percent) of require	Form FIN 3

) of the requirement	ment	
<p>Bid Capacity = $(2 \times A \times N) - B$</p> <p>Where A= Maximum value of Annual Turnover from urban infrastructure works executed in any one year during the last four years (2013-14, 2014-15, 2015-16, 2016-17) (updated to present price level) taking in to account the completed as well as works in progress (including current year, if opted by the bidder),</p> <p>N=Prescribed completion period of the work for which bids are invited in years,</p> <p>B= Value at present price level (2016-17) of existing commitments and ongoing works to be completed during N period i.e., the period of completion of works for which bids are invited.</p>					
<p><i>NOTE: The certificate of CA regarding Bid Capacity must be submitted otherwise bid shall not be considered. The certificate should clearly show the calculation how the Bid Capacity is calculated as per formula given in tender. The contractor should submit an undertaking on stamp paper of Rs. 500 that he has mentioned all projects necessary for calculation of B value for the calculation of Bid Capacity</i></p>					

4. Experience:

Criteria		Compliance Requirements			Documents Submission Requirements
Requirement	Single Entity	Joint Venture / Consortium			
		All Partners Combined	Each Partner	One partner	
4.1 General Construction Experience:					
Experience of construction contracts - At least the last 5 Years prior to the Bid submission deadline. (2012-13 to 2016-17 and current year)	Must meet requirement	Not Applicable	Must meet requirement	Not Applicable	Form EXP 1
<p><i>NOTE: Certificate of Chartered Accountant must be submitted, clearly indicating construction experience based on construction turnover of the firm.</i></p>					
4.2 Specific Construction Experience					
<p><i>The bidder should have experience of the following in last five financial years (2012-13 to 2016-17); experience in current year shall also be counted up to deadline for submission of bid.</i></p>					
Should have successfully completed (as per definition given below) / completed and Commissioned one single similar work (which includes Construction of multistoried above ground/ underground RCC structures, or such similar RCC structures) of at least 40% of the estimated cost of	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2a

the bid for 3.17 Crores (Three Hundred Seventeen lakhs) only					
OR					
Should have successfully completed (as per definition given below) / completed and Commissioned two similar work (which includes Construction of multistoried above ground/ underground RCC structures or such similar RCC structures) of at least 30% of the estimated cost of the bid for 2.38 Crores (Two Hundred Thirty Eight lakhs) only	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2a
<p>Note:</p> <p><i>Successfully completed means</i></p> <p><i>The bidder should submit the following documents to substantiate his bid:</i></p> <ol style="list-style-type: none"> <i>The bidder shall submit copies of work order, completion and satisfactory performance certificates in support of their experience claims.</i> <i>The works which have been completed during the period mentioned above, though may have commenced earlier shall be considered for experience purpose.</i> <p><i>(ii) Clients certificate of experience must clearly indicate whether</i></p> <ul style="list-style-type: none"> <i>Completed and commissioned; or</i> <i>Substantially completed as per definition given above</i> 					
4.3 Construction Experience in Key Activities in last 5 years					
Should have successfully completed (as per definition given below) / completed and Commissioned one single similar work (which includes Construction of multistoried above ground/ underground RCC structures or similar RCC structures) and executed RCC work of minimum quantity of 2132 cum of concrete	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2b
OR					
Should have successfully completed (as per definition given below) / completed and Commissioned two similar work (which includes Construction of multistoried above ground/ underground RCC structures,	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2b

or such similar RCC structures) and executed RCC work of minimum quantity of 1600 cum of concrete.					
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Note: - Substantially completed means that the Contractor has completed and commissioned the work, at least of the amount required for qualification, out of a large size contract. The commissioning of the work is essentially required and any hindrance in commissioning whether within or beyond control of the contractor would not be acceptable.

Note: For 4.2 & 4.3

- i) The Bidder shall submit copies of Work Orders, Completion and satisfactory performance Certificates in support of their experience claims. Only works of Govt/PSU/Autonomous bodies under Govt. Sector of any country shall be considered.*
- ii) The works which have been completed during the period mentioned above, though may have commenced earlier, and shall be considered for experience purposes.*
- iii) For considering experience of the bidder, out of its experience as JV / Consortium, its own works in the JV / Consortium shall be considered with relevant evidence/certificates.*
- iv) JV / Consortium shall comprise of not more than three firms/companies. The minimum equity under JV / Consortium of lead firm should be min 51% and other firm min 20% each.*

NOTE:

The present price level for turnover and cost of completed work of similar nature, the previous years' value shall be given weight age of 10% per year as follows:

Sr. No	Financial Year	Weight age
(i)	2016-17	1.00
(ii)	2015-16	1.00
(iii)	2014-15	1.10
(iv)	2013-14	1.21
(v)	2012-13	1.33
(vi)	2011-12	1.46

Section IV: Bidding Forms

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4.1 TECHNICAL PROPOSAL [WITH REFERENCE TO SECTION III] CHECK LIST

In addition to the forms given in this section, a Technical Proposal must necessarily contain the following, otherwise the bid shall be considered incomplete and may lead to non-responsive.:

1. Notice Inviting Tender
2. CA's certificates
3. Bank's letter as required in Tender Document (if applicable).
4. Sales Tax Registration in State of Rajasthan (Optional),
5. VAT / Sales Tax Clearance Certificate
6. Service Tax Registration, if required as per law
7. Proof of payment of Bid Security
8. Proof of Cost of bidding document or receipt of such cost.
9. Proof of Bid processing fee as specified.
10. Bid capacity stipulations as required in Tender Document.
11. Completion Certificates of works which have been cited in support of fulfillment of eligibility criteria as specified in Tender Document.
12. Work orders of works which have been cited in support of fulfillment of eligibility criteria as specified in Tender Document.
13. Drawings / designs / technical documents (if required) in support of works to be executed
14. Any modifications or withdrawal.
15. Other documents considered necessary to strengthen the bid.
16. JV / Consortium agreement against which experience for eligibility is claimed to demonstrate clearly the JV / Consortium members work in that JV / Consortium.
17. Registration certificate of each bidder / JV / Consortium Partner in class AA or equivalent in any State / Central / PSU / in India.
18. Check Points and Self appraisal sheet

4.2 Letter of Technical Bid

Technical Bid Submission Sheet (In Bidder's Own Letterhead)

Date: _____ NIT No.: _____

To: _____

Sir,

We, the undersigned, declare that:

- a) We have examined and have no reservations to the Bidding Document, including Addenda No. _____
- b) We offer to execute in conformity with the Bidding Document the following Works:

- c) Our Bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of _____ percent of the Contract Price or Performance Security Declaration, as the case may be, for the due performance of the Contract;
- e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the eligible countries;
- f) We are not participating, as Bidder, in more than one Bid in this bidding process, other than alternative offers, if permitted, in the Bidding Document;
- g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers has not been debarred by the State Government or the Procuring Entity;
- h) 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;
- i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive;
- j) We agree to permit Government of Rajasthan or the Procuring Entity or their representatives to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the Procuring Entity;
- k) We have paid, or will pay the following commissions, gratuities, or fees, if any, with respect to the bidding process for execution of the Contract:

Name of Recipient	Address	Reason	Amount

- l) We declare that we have complied with and shall continue to comply with the provisions of the Code of Integrity including Conflict of Interest as specified for Bidders in the Rajasthan Transparency in Public Procurement Act, 2012, the Rajasthan Transparency in Public Procurement Rules, 2013 and this Bidding Document during this procurement process and execution of the Works as per the Contract;
- m) Other comments, if any:

Yours faithfully,

Signature:

Name/ address: _____

In the capacity of: _____

Signed: _____

Duly authorised to sign the Bid for and on behalf of: _____

Date: _____

Tel: _____ Fax: _____ E-mail: _____

4.3.1 Bid Security (Bank Guarantee Unconditional) *

Form of Bid Security
[insert Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: [Chief Executive Officer, JSCL, RAJSATHAN]

Date: [insert date]

BID GUARANTEE No.: [insert number]

We have been informed that **[insert name of the Bidder]** (hereinafter called "the Bidder") has submitted to you its bid dated **[insert date]** (hereinafter called "the Bid") for the execution of **[insert name of contract]** under Notice Inviting Tender No. **[Insert NIT number]** ("the NIT").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we **[insert name of Bank]** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ----- **[insert amount in figures] [insert amount in words]** upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letter of Technical Bid; or
- (b) having been notified of the acceptance of its Bid by the *Procuring Entity* during the period of bid validity,
 - (i) fails or refuses to execute the Contract Agreement,
 - (ii) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders (hereinafter "the ITB"),
- (c) has not accepted the correction of mathematical errors in accordance with the ITB, or
- (d) has breached a provision of the Code of Integrity specified in the ITB;

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of the Bidder's bid. Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

Signed: _____
[Insert signature of person whose name and capacity are shown]

NOTE: * - Scheduled Bank Only

Name: _____
[insert complete name of person signing the Bid Security]

In the capacity of: _____
[insert legal capacity of person signing the Bid Security]

Duly authorized to sign the Bid Security for and on behalf of _____
[insert name of the Bank]

Dated on day of ,
[insert date of signing]

Bank's Seal _____

[affix seal of the Bank]

[Note: In case of a Joint Venture, the Bid-Security must be in the name of all partners to the Joint Venture/Lead bidder that submits the bid.]

4.3.2 Bid Securing Declaration

Form of Bid Securing Declaration

Date: ***[insert date (as day, month and year)]***

Bid No.: ***[insert number of bidding process]***

Alternative No, if permitted: ***[insert identification No if this is a Bid for an alternative]***

To: ***[Chief Executive Officer, JSCL, RAJASTHAN]***

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with you, the Procuring Entity for the period of time of ***[insert number of months or years, as required by the Procuring Entity]*** starting on ***[insert date]***, if we are in breach of our obligation(s) under the bid conditions, because we:

- (a) withdraw our Bid during the period of bid validity specified in the Letter of Bid; or
- (b) do not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
- (c) having been notified of the acceptance of our Bid by you, the Procuring Entity, during the period of bid validity, (i) fail or refuse to sign the Contract, if required, or (ii) fail or refuse to furnish the Performance Security Declaration, in accordance with the ITB; or
- (d) breach any provisions of the Code of Integrity as specified in the ITB;

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) thirty days after the expiration of our Bid.

Signed: _____

[insert signature of person whose name and capacity are shown]

Name: _____

[insert complete name of person signing the Bid-Securing Declaration]

In the capacity of: _____

[insert legal capacity of person signing the Bid-Securing Declaration]

Duly authorized to sign the bid for and on behalf of: _____

[insert complete name of Bidder]

Dated on day of,

[insert date of signing]

Corporate Seal _____

[affix corporate seal of the bidder]

[Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all partners to the Joint Venture/ Lead bidder that submits the bid.]

4.4 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.

4.4.1 Form ELI - 1: Bidder's Information Sheet

BIDDER'S INFORMATION	
Bidder's legal name	
In case of JV/Consortium, legal name of each partner	
Bidder's /all JV/Consortium partners country of constitution.	
Bidder's /all JV/Consortium partners year of constitution	
Bidder's /all JV/Consortium partners legal address in country of constitution	
Bidder's /all JV/Consortium partners authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are self-attested copies of the following original documents:</p> <ol style="list-style-type: none"> 1. In case of single entity, certificate of registration/ incorporation and memorandum of association or constitution of the legal entity named above. 2. Authorization to represent the firm or JV / Consortium named in above. 3. In case of JV / Consortium, letter of intent to form JV / Consortium or JV / Consortium agreement. 4. In case of Consortium, letter of intent to form Consortium or JV Consortium. 	

4.4.2 Form ELI – 2: JV / Consortium Information Sheet

Attach the Letter of Intent to form JV / Consortium or certificate of registration/ incorporation and memorandum of association or constitution of the legal entity, if JV / Consortium is already in existence.

(Each member of a JV / Consortium / must fill in this form)

JV /Consortium/ SPECIALIST CONTRACTOR'S INFORMATION	
Bidder's legal name	
JV /Consortium Partner's or Subcontractor's legal name	
JV /Consortium Partner's financial share in the JV	
JV /Consortium Partner's or Subcontractor's country of constitution	
JV /Consortium Partner's or Subcontractor's year of constitution	
JV /Consortium Partner's or Subcontractor's legal address in country of constitution	
JV /Consortium Partner's or Subcontractor's authorized representative information(name, address, telephone numbers, fax numbers, e-mail address)	
Attached are attested copies of the following original documents: <ol style="list-style-type: none">1. Certificate of registration/ incorporation and memorandum of association or constitution of the legal entity named above.2. Authorization to represent the firm named above.	

4.4.3 Form LIT 1- Pending Litigation

(Each Bidder or member of a JV / Consortium / must fill in this form to be certified by the Statutory Auditors of the Bidder)

Pending Litigation			
<input type="radio"/> No pending litigation in accordance with Section III (Evaluation and Qualification Criteria).			
<input type="radio"/> Pending litigation in accordance with Section III (Evaluation and Qualification Criteria)			
Year	Matter in Dispute	Value of Pending Claim in INR	Value of Pending Claim as a Percentage of Net Worth

4.4.4 Form FIN 1 – Financial Situation

Each Bidder or member of a JV / Consortium must fill in this form

(To be certified by the statutory auditors of the Bidder)

Financial Data for past years in Rupees				
Years /Items	Year 1:	Year 2 :	Year 3:	Year 4:

Information from Balance Sheet in Rupees

(in case of bidders and JV / Consortium partners from outside India, data to be converted at the exchange rate prevailing 28 days prior to the deadline of submission of the bids)

Total Assets				
Total Liabilities				
Net Worth				
Current Assets				
Current Liabilities				
Others as required				

Information from Profit & Loss Account/ Income & Expenditure Statement

Total Operating Revenues/ Income				
Profit/ Excess of Income over Expenditure before Taxes				
Profit/ Excess of Income over Expenditure after Taxes				
Others as required				

Attached are attested copies of audited financial statements (balance sheets including all related notes, and Profit & Loss Account/ Income & Expenditure Statement) for the last years, as indicated above, complying with the following conditions:

- All such documents reflect the financial situation of the Bidder or partner to a JV / Consortium, and not sister or parent companies.
- Historic financial statements must be audited by a chartered accountant.
- Historic financial statements must be complete, including all notes to the financial statements.
- Historic financial statements must correspond to accounting periods already completed and audited. (No statements for partial periods shall be requested or

Signature of the statutory auditors Signature of Authorised Signatory

4.4.5 Form FIN 2 Average Annual Construction Turnover in Rupees

Each Bidder or member of a JV / Consortium must fill in this form

(To be certified by the statutory auditors of the Bidder)

Annual Turnover Data for the last.....years (<i>Construction works only</i>)	
Year	Amount-Rupees
Average Annual Construction Turnover	
The information supplied should be the Annual Turnover of the Bidder or each member of a JV / Consortium in terms of the amounts billed to clients for each year for work in progress or completed, at the end of the period reported. For JV / Consortium partners from other countries, the conversion to Rupees shall at the rates prevailing on the 31st.	
Signature of the statutory auditors	Signature of Authorised Signatory

NOTE:

[To bring the earlier year's amount to the last financial year's level the following multiplier may be applied.]

The present price level for turnover and cost of completed work of similar nature, the previous years' value shall be given weight age of 10% per year as follows:

Sr. No	Financial Year	Weight age
(i)	2016-17	1.00
(ii)	2015-16	1.00
(iii)	2014-15	1.10
(iv)	2013-14	1.21
(v)	2012-13	1.33
(vi)	2011-12	1.46

4.4.6 Form FIN 3 Financial Resources - Rupees

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract as indicated in Section III (Evaluation and Qualification Criteria).

FINANCIAL RESOURCES		
S.No	Source of Financing	Amount in Rupees

Signature of Authorised Signatory

4.4.7 Form FIN 4 Current Contract Commitments / Works in Progress

Bidders and each partner to a JV / Consortium should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

CURRENT CONTRACT COMMITMENTS					
S.No.	Name of Contract	Procuring Entity's Contact Address, Tel., Mobile, Fax, e-mail id	Value of Outstanding work in Rupees	Estimated Completion Date	Average Monthly Invoicing during Last 6 months (Rupees per month)

Signature of Authorised Signatory

4.5 Form EXP – 1: General Experience

Each Bidder or member of a JV / Consortium must fill in this form

GENERAL EXPERIENCE				
Starting Month Year	Ending Month Year	Years	Contract Identification and Name Name and Address of Procuring Entity Brief Description of the Works Executed by the Bidder	Role of Bidder

Bidder Must Enclose:

1. Certificate of CA mentioning the construction turnover as per relevant clause.

4.6 Form EXP – 2(a): Specific Experience

Note: Please fill up one sheet per contract

CONTRACT OF SIMILAR SIZE AND NATURE		
Contract No. of.	Contract	Identification
Award Date		Completion Date
Role in Contract	Contractor / Management Contractor / Subcontractor	
Total Contract Amount	INR	
If partner in a JV / Consortium or subcontractor, specify participation of total	Percent of Total	Amount
Procuring Entity's Name, Address, Telephone Number, Fax Number,		

Bidder Must Enclose:

1. Work order.
2. Experience certificate as per relevant clause from an officer not below the rank of executive Engineer or Equivalent.

4.7 Form EXP – 2(b): Experience in Key Activities

Fill up one (1) form per contract

CONTRACT WITH SIMILAR KEY ACTIVITIES			
Contract No. of.	Contract Identification		
Award Date		Completion Date	
Total Contract Amount	-----Equivalent INR -----		
If partner in a JV / Consortium or subcontractor, specify participation of total contract amount	Percent of Total	Amount	
Employer's Name Address Telephone Number Fax Number E-mail			
Description of the key activities in accordance with Criteria.			
<p>Experience (substantially completed as per definition given in tender document / completed and commissioned) in supply, installation and commissioning of one similar work (urban renewal project including area development, road redevelopment, development of pathways, landscaping) for a length of 1.0 km in last five years</p> <p>OR</p> <p>Experience (substantially completed as per definition given in tender document / completed and commissioned) in supply, installation and commissioning of two (2 nos.) similar works each comprising of minimum length of 800 meters in last five years</p>			
Reference page No., copy of work order and completion & commissioning certificate in support of above experience:			

4.8 Form: Assured Revolving Line of Credit Facility

(To be submitted by a Scheduled Bank on the Bank's Letter head)

Date: (Insert Date)

To: Chief Executive Officer

JMC Building, Pt Deendayal Upadhyay Bhawan
LalKothi, Tonk Road, Jaipur-302016

Subject: Letter of Assurance for Revolving line of credit facility for INR ----

Dear Sir,

WHEREAS _____ [name and address of Bidder] (hereinafter called the "Bidder") intends to submit a bid for-----
---- (name of contract package) -----" under the Jaipur Smart City Limited (JSCL) (hereinafter called the "Employer") in response to the Invitation for Bids issued by the JSCL through NIB no. -----; and

WHEREAS the Bidder has requested that an assured revolving line of credit be provided to it for executing the ----- (name of contract package) -----
-----In the event that the Contract is awarded to it; then

KNOW ALL THESE PEOPLE by these presents that We
_____ [name of Bank] of _____ [name of Country] having our registered office at _____ [address of registered office] are willing to provide to _____ (the Bidder) a sum of up to _____ [amount of guarantee in figures and words] as an assured revolving line of credit for executing the Works under ----- (name of contract package) -----should the Bidder be awarded the contract based on its tendered prices.

We understand that this assurance may be taken into consideration by the Employer during evaluation of the Bidder's financial capabilities, and further assure that we intend to maintain this revolving line of credit until such time as the Works are completed and taken over by the Employer.

SEALED with the Common Seal of the said Bank on the ____ day of _____, 2017

Date: _____ Signature of the Bank: _____

Witness: _____ Seal: _____

[Signature, name and address]

4.9 Declaration by the Bidder in compliance of Section 7 & 11 of the Act

Declaration by the Bidder/ JV / Consortium

(To be prepared and submitted in 100 rupees Non Judicial Stamp Paper)

In relation to our Bid submitted to *[enter designation and address of the procuring entity]* for procurement of *[insert name of the Works]* in response to their Notice Inviting Bids No..... Dated we hereby declare under Section 7 and 11 of the Rajasthan Transparency in Public Procurement Act, 2012, that;

1. We possess the necessary professional, technical, financial and managerial resources and competence required by the Bidding Document issued by the Procuring Entity;
2. We have fulfilled our obligation to pay such of the taxes payable to the Central Government or the State Government or any local authority, as specified in the Bidding Document;
3. We are not insolvent, in receivership, bankrupt or being wound up, not have my/our affairs administered by a court or a judicial officer, not have my/our business activities suspended and are not the subject of legal proceedings for any of the foregoing reasons;
4. We do not have, and our directors and officers not have, been convicted of any criminal offence related to our professional conduct or the making of false statements or misrepresentations as to our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment proceedings;
5. We do not have a conflict of interest as specified in the Rajasthan Transparency in Public Procurement Act, the Rajasthan Transparency in Public Procurement Rules and this Bidding Document, which materially affects fair competition;
6. We have complied and shall continue to comply with the Code of Integrity as specified in the Rajasthan Transparency in Public Procurement Act, the Rajasthan Transparency in Public Procurement Rules and this Bidding Document, till completion of all our obligations under the Contract.

Date:

Signature of Bidder

Place:

Name:

Designation:

Address:

4.10 Letter of Financial Bid

Financial Bid Submission Sheet

(To be submitted with financial bid under Vol 2: BoQ only)

Date: _____ NIT No.: _____

To: _____

Sir,

We, the undersigned, declare that:

- a) We have examined and have no reservations to the Bidding Document, including Addenda No.: _____
- b) We offer to execute in conformity with the Bidding Document the following Works:

- c) The total Price for our Bid, excluding any discounts offered, if permitted, in item (d) below is: _____
- d) The discounts offered, if permitted, and the methodologies for their application are:

- e) 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.
- f) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- g) Other comments, if any:

Yours faithfully,

Signature:

Name/ address: _____

In the capacity of: _____

Signed: _____

Duly authorised to sign the Bid for and on behalf of: _____

Date: _____

Tel: _____ Fax: _____

E-mail: _____

**4.11 POWER OF ATTORNEY (TO BE PREPARED AND SUBMITTED IN RS. 100.00
NON JUDICIAL STAMP PAPER)**

Power of Attorney for Authorized Representative

The firm M/s.....authorize the following Representative to sign and submit the tender document, negotiate terms and conditions for the contract, to sign the contract, to deal with the _____, to issue and receive correspondence related to all matters of the bid "-----". We / M/s _____ undertake the responsibility due to any act of the representative appointed hear by.

For Partnership Firm's

S. No.	Name of the All Partner	Signature of Partner with Seal
1.		
2.		
3.		
4.	Name and Designation of the person Authorized	
5.	Attested Signature of the Authorized Representative	

For Limited Firm's

Name and Designation of the person Authorized	
Firm	
Address	
Telephone No.	
Fax No.	
Telex No.	
Authority By which the Powers is delegated	
Attested Signature of the Authorized Representative	
Name and Designation of person attesting the signatures	

4.12 Joint Venture Agreement (Among Three Firms)

(On Rs 1000/- Non-judicial Stamp Paper)

Memorandum of Understanding for

JOINT VENTURE

This Memorandum of Understanding (hereinafter referred to as "MOU") is made and entered into this ----- ("Effective Date").

BETWEEN

M/s. _____, a company incorporated, and having its registered office at _____.
(Hereinafter referred to as the "**First Party**"/ "**One Partner**");

M/s. _____) a company incorporated, and having Registered office at _____.
(Hereinafter referred to as the "**Second Party**"/ "**Each Partner**");

Hereinafter jointly referred to as the "**Parties**" and individually as "**Each Party**" or "**a Party**" as the case may be.

WHEREAS,

A) **The Government of Rajasthan, JAIPUR SMART CITY LIMITED. Jaipur Rajasthan** (hereinafter referred to as the **JSCL** or procuring entity) invited bid for

_____.

(B) The **Parties** hereto formed a Joint Venture or will form a joint venture (hereinafter referred to as the "**JV**") to jointly execute the above project in all respect

NOW THEREFORE IT IS HERE BY AGREED as follows

ARTICLE 1: JOINT VENTURE:

1.1. The Parties hereto agree to form the Joint Venture with _____ designated as the **One Partner and First Partner**.

1.2. _____ shall be the **Second Member – or Second Partner**

1.3. _____ shall be the **Third Member – or Third Partner** (*insert more lines if more partners*)

ARTICLE 2: JOINT VENTURE NAME:

2. The JV shall do business in the name of “ _____ **Joint Venture**”.

ARTICLE 3: JOINT AND SEVERAL LIABILITY:

3. The **Parties** hereto shall, for the above-referred **Projects**, be jointly and severally liable to the **Employer** for the execution of the Projects in accordance with the **Contract** till the actual completion of Contract including defect liability period and operation & maintenance as per bid conditions.

ARTICLE 4: PROPORTIONATE SHARE:

4.1 Each member of the Joint Venture agrees to place at the disposal of the Joint Venture, the benefit of all its experience, technical knowledge and skill, and shall in all respects bear its share of responsibility and burden of completing the contract. The parties herein shall be responsible for physical and financial distribution of work as under.

Lead Partner: Financial responsibility: -----

Physical responsibility: -----

Other Partners: Financial responsibility: -----

Physical responsibility: -----

Other Partners: Financial responsibility: -----

Physical responsibility: -----

4.2 All rights, interests, liabilities, obligations, risks, costs, expenses and pecuniary obligations and all net profits or net losses arising out of the **Contract** shall be shared or borne by the **Parties** in the above **Proportions**.

4.3 The members in the proportion as mention in article 4.1, shall contribute sufficient Initial fixed capital for timely execution of the project including commissioning & operating period as per the contract.

ARTICLE 5: JOINT EFFORT AND MANAGEMENT:

5.1 The **Parties** shall participate as a **JV** in the submission of bids and further negotiations with the **Employer** and shall co-operate and contribute their respective expertise and resources to secure and execute the **Projects**.

5.2 On award of **Projects**, the **First Partner** in consultation with the other members of JV will decide on the final management structure for the successful execution of the **Projects** as per the terms of **Contract**.

5.3 All the **Parties** hereby agree to pool in their financial, administrative, managerial, technical and material resources for execution of the **Projects**, including commissioning & operation for the period as stipulated in the contract. The share of interest of the **JV** shall be as per the mutual understanding for the successful completion of the project.

ARTICLE 6: EXCLUSIVITY:

6.1 The co-operation between the **Parties** hereto shall be mutually exclusive i.e. none of them shall without the other **Party's** consent & prior approval of **JSCL**, approach or cooperate with any other parties in respect of the Project.

6.2 In the course of working as associates, the parties to the JV will be sharing information with each other which may be proprietary /confidential information /knowledge acquired by each other. It is hereby agreed that the parties will maintain complete secrecy regarding such information / knowledge and will not divulge to any party for any other purpose except for the success of the joint execution of the contract. All parties will also indemnify each other against any claim that may arise out of using information, which are being claimed proprietary.

ARTICLE 7: Memorandum of Understanding:

7.1 This **Memorandum of Understanding** shall be terminated:-

- a. if the **Parties** mutually confirm that the **JV's** bid proposal has not been finally accepted by **Employer** and all rights and obligations of the **Parties** under or in connection with this **Memorandum of Understanding** have ceased, or
- b. after successful completion of the project including commissioning & operation and defect liability period from the date of this **Memorandum of Understanding** unless extended for a further period on demand of **JSCL** & mutual consent of the Parties, or

7.2 The **Memorandum of Understanding** can be modified by mutual consent of the Parties to suit the efficient and expeditious execution of Projects including commissioning & operation of Plant or to make this agreement more meaningful to suit the requirements of Employer **after the consent of the Employer**.

ARTICLE 8: ARBITRATION:

8.1 Any dispute resulting from this Agreement shall be settled amicably by mutual Consultation by the Managing Directors/Chairman of _____ & _____. In the event that an amicable settlement is not reached within 60 days in any particular case, the dispute shall be referred to arbitration and shall be resolved in accordance with and subject to the provisions of the _____ and any statutory modifications and enactment hereof for the time being in force. The decision of the arbitrators shall be final and binding upon both parties. The venue of arbitration will be _____.

ARTICLE 9: GOVERNING LAWS:

9.1 This Agreement shall in all respects be governed by and interpreted in accordance with the _____ Laws.

ARTICLE 10: CONFIDENTIALITY:

10.1 No Party hereto shall disclose to any other party any information of a confidential nature including but not limited to trade secrets, know-how acquired from any Party in connection with the subject matter of this Agreement.

ARTICLE 11: ADDRESS OF Consortium:

Any and all correspondence from the Employer to the **JV** shall be addressed to **(name of JV)** at the address stated herein below—(any one of the partners). The address of the Consortium office of the partner companies will be deemed to be the address for the purpose of communication.

The notice, if any required to be served on the party by the other party, will be deemed to be served, if the said notice / communication is delivered by Registered Post at the respective address **(name of JV)**

ARTICLE 12: Authorized Representative:

The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.

Authorized Representative of JV: _____

ARTICLE 13: ASSIGN ABILITY:

13.1 The interests and rights of a Party in the Contract and as a Party of the Joint Venture shall not be transferable or assignable without the written consent of the Employer & other party.

ARTICLE 14: INTERPRETATION OF HEADINGS:

14. The headings of each of the Articles herein contained are inserted merely for convenience of reference and shall be ignored in the interpretation and construction of any of the provisions herein contained.

ARTICLE 15: OTHERS

15.1 Any other matters not contained in this Agreement shall be discussed and amicably agreed upon by the Parties in the spirit of mutual trust and cooperation for timely completion of project including commissioning & operation of project. Notwithstanding anything above all the Parties are severally and jointly responsible to the Employer for execution of the Contract:

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by each of the duly authorized representatives as appearing below:-

Signed by)
For and on behalf of)

_____)

in the presence of:)

_____)
Name:)

Designation:)

Signed by)

For and on behalf of)

_____)

in the presence of:)

_____)

Name:

Designation:

Name:

Designation:

Name :

Designation:

*Similar Consortium Agreement to be signed in case of a Consortium

4.13 STATEMENT FOR WORK IN HAND (for calculation of value of Bid Capacity)

This is to certify that the status of the present works in hand as on **date of publication of NIT** of order value more than Rs. 10.00 lacs for which either order are received or the work is under execution but which are still not completed is as under:

Amount in Lacs of Rupees.

Sl. No	Brief Description of Work	Stipulated Date of Start	Stipulated Date of Completion	Time left for execution after date of publication of NIT , in months	Cost of awarded work	Cost of work executed up to date of publication of NIT	Balance Cost of un-executed work as on date of publication of NIT in 30 month from and date of submission
1	2	3	4	5	6	7	8=6-7

1. If the value of Balance work goes beyond 30 months from the date of bid submission then client certificate mentioning the amount of work to be executed beyond 30 months, otherwise full balance work shall be accounted for calculation of 'B' value.

2. This is certified that this is true in all respect and can be used for calculation of the bidding capacity as per the formula given in ITB. This is also certified that other orders under execution by the firm shall not materially affect the bidding capacity of the firm as required in this tender. **(Format should be on Rs 500/= stamp paper)**

Signatures with Seal of Authorized Signatory for tender

4.14 Calculation of Available Bid Capacity

[Using the following formula the Bidder must calculate his available Bid Capacity:-]

Assessed Available Bid Capacity: $(A * N^2 - B)$

Where

A= Maximum value of works executed in any one year during the last five years (updated to the current price level) taking into account the completed as well as works in progress;

N = Number of years prescribed for completion of the works for which bids are invited, and

B = Value at current price level of the existing commitments and ongoing works to be completed during the next ----- years (period of completion of the work for which bids have been invited)

Signature of Authorised Signatory

4.15 Check Points

(Must be filled by Bidder)

S. No.	Page No. of Bidding Document	Requirements / Documents required to be submitted	Check Points	Yes / No	Enclosed at page no. of bid and any other detail as required
		GENERAL			

4.16 Self Appraisal Sheet

(To Be Filled by The Bidder for Determination of Responsiveness)

S. No.	Page No. of Bidding Document	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
1					
2					
3					
4					
5					
6					

SECTION-V: PROCURING ENTITY'S REQUIREMENTS

5.1 Project Background and Introduction

5.1.1 Introduction

Jaipur is known as one of the first planned cities of India. Jaipur City was not only planned but its execution was also coordinated in such a manner that a substantial part of the city developed up within seven years of its foundation. The municipality was reorganized in 1926 and a new Municipal Act was prepared in 1929. Post-independence, planned development of the city was taken up after the city became the capital of Rajasthan.

Jaipur is located at a strategic point on the National Highway (NH-8) that connects Delhi and Mumbai. NH-8 is one of the vertices of the Golden Quadrilateral Corridor of the National Highways Development Project. Jaipur with its exotic culture and tradition attracts domestic as well as foreign tourists. The city is currently the 11th largest city in the country and has one of the highest population growth rates. It is clearly one of the most thriving cities of North India. The city is therefore, bound to have increased spatial expansion in the coming decades in order to accommodate both economic as well as population growth. In this context, it is essential to introduce systematic planning measures for the future development of the city.

The Jaipur Region comprises two distinct constituents; the Jaipur Municipal Corporation (JMC) area and the rest of Jaipur Region. Jaipur Development Authority (JDA) is responsible for planning of the Jaipur region. Jaipur Region would henceforth be referred as the JDA area. The entire JDA area comprises Jaipur city (JMC) and the neighboring satellite towns namely, Chomu, Bagru, Bassi, Sheodaspura, Achrol and Jamwaramgarh. It covers a total area of 1464 sq. kms, out of which, the municipal area of Jaipur covers 288 sq. kms. The JMC area is further divided into the walled city and the rest of JMC area.

The area under Jaipur Municipal Corporation has grown from 200 sq. kms in 1981 to 218 sq. kms in 1991 and further to 288 sq. kms in 2001. The increase in area in 1991 was a result of addition of Sangner and Amber tehsils and in 2001 due to the addition of Bagru, Bassi and Chomu tehsils in the municipal area. The area under the jurisdiction of JDA has remained same since 1991.

The population of Jaipur region is 3.073 million as per 2011 census and has shown a consistent increase in the past 50 years. In a recent international survey, Jaipur was ranked the 7th best place to visit in Asia and in another poll, it was ranked third among twelve major Indian cities.

Modern infrastructural facilities are developing fast. The city is expanding very quickly and has become a hot spot for development in Rajasthan.

The existing nallahs have become a blot on Jaipur's world class city image and will soon have to be reclaimed for making the same useful for business spaces for small and medium enterpreneurs whose business is now scattered and randomly located. Presently, the works of covering the two stretches of existing nallahs will be taken up under this tender.

5.1.2 Project Background

The growing population and economic activity is straining the existing infrastructure in the old city of Jaipur. The poor drainage conditions at various location in Jaipur is mainly due to the open drains. The open nallahs are straining the cleanliness index of the city and needs to be rectified as soon as possible. The challenges that the citizen of Jaipur have to face because of these open drains/ nallahs include water borne diseases, air borne diseases, poor asthetic view and many more. These open drains not only affected the very location of them but also degrade the living conditions in the vicinity. Hence, it was decided by the Jaipur Smart City Limited to Cover these nallahs and then convert these areas into some recreational spaces at a later stage. This would develop the area as well as will improve the drainage conditions of the area.

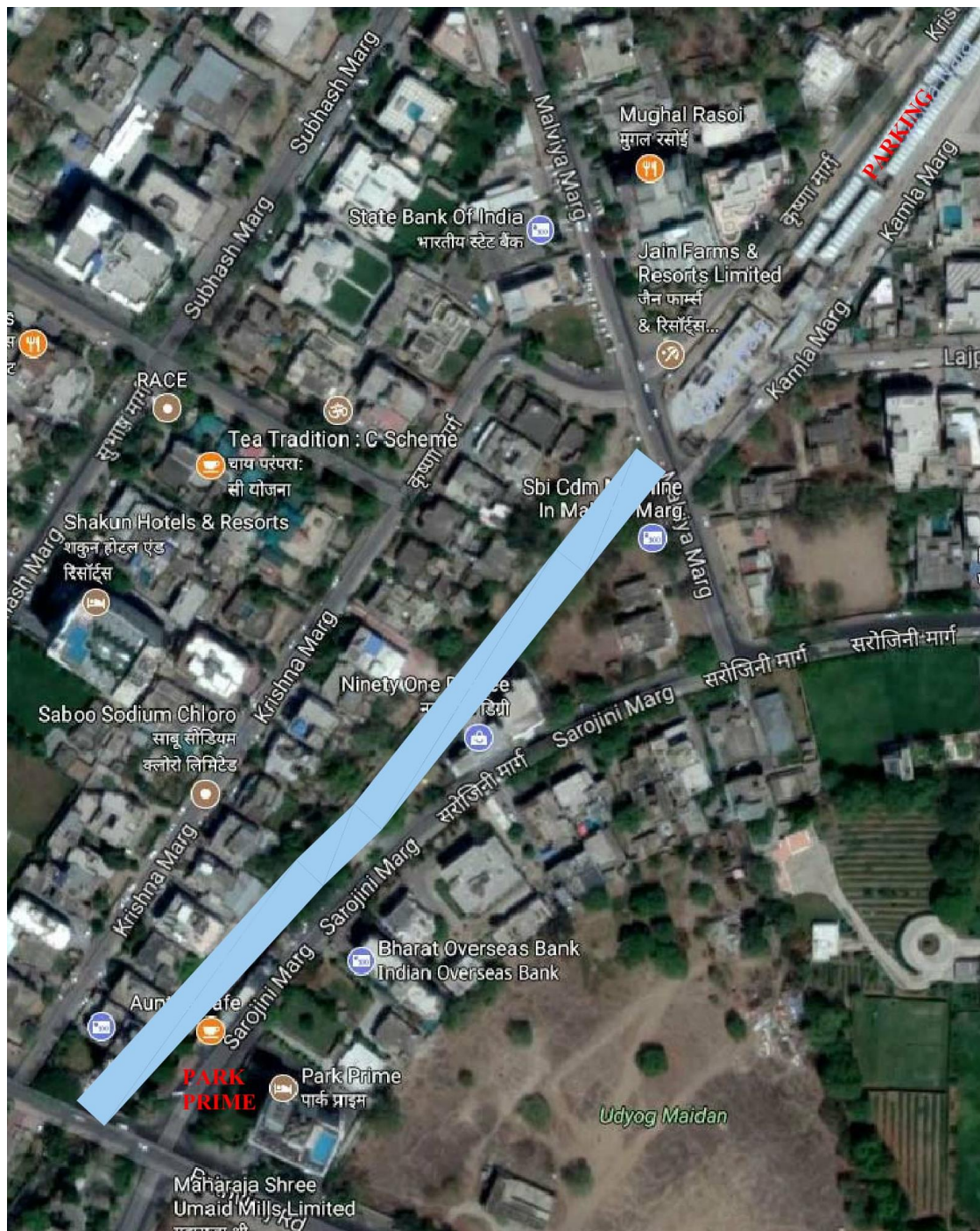


Figure 5.1: Location Map for nallah near Park Prime Hotel



Figure 5.2: Location Map for nallah from World Trade Park in JLN marg along Park Avenue road

5.1.3 Need for the Project

The nallahs in the city are prone to dumping which results in clogged drains and overflow during the monsoons. The overflowing drain water enters the shop premises and houses of slum dwellers residing close to the drains and cause damage to property during monsoon. Household waste, plastic, debris dumped by private developers choke the drains which makes it unable for the water to flow smoothly and then remains stagnant. This leads to foul smell and mosquito nuisance in the adjoining areas.

The proposal and benefits are:

- This project will strengthen and improve the natural drainage system, ecological and environmental conditions within and around.
- It will protect the city against flood
- It will also curb deterioration of the underground water quality due to percolation of untreated sewage.

Therefore, this project would positively impact the lives of near by residents of Jaipur city.

5.2 Objective of the Project

It is proposed to cover the following stretches of open nallah flowing through Jaipur City, to reclaim an area in thr following two prime locations:

- i. Near Park Prime Hotel to existing mechanized multi level car parking at Krishna Marg, C-Scheme.
- ii. From World Trade Park in JLN Marg along Park Avenue Road.

5.3 Area Details

This location of open nallah stretches is as below:

S. No.	Location	Length (in m)	Width (in m)
A.	Near Park Prime Hotel to existing mechanized multi level car parking at Krishna Marg, C-Scheme	423	12.50
B.	From World Trade Park in JLN Marg along Park Avenue Road	293	35

However, the proposal is to cover only 100m length of nallah in each stretch, in this tender.

5.4 Scope of Work

The Successful Bidder has to carry out the developments on the site as mentioned below, for 100m along the length of nallah. The survey of the site, prior to commencement of the works is under the scope of the contractor. The works of covering the nallah at two stretches under the Smart City Project in being undertaken to execute the following works:

I. Design Scope

- i. Conducting detailed topographic survey, geo technical investigation , determination of SBC , preparation and submission of layout and detailed design and good for construction drawings for piles, pile caps. Columns, main and secondary beam network, Cover slab and all other architechatural ,civil , structutal, electrical, landscaping and other finishing works, getting the same vet and approved by MNIT, Jaipur, PMC and JSCL.

II. Construction Scope:

- i. Bored RCC cast-in-situ piles and RCC pile caps below bed level of Nallah, and
- ii. RCC slab supported on grid of main and secondary RCC beams, with RCC columns above nallah bed level.
- iii. CC floor finishing work over RCC slab.

- iv. Raised platform with brickwork and finishing the same with red sand stone
- v. Supply and providing of temporary flexisheet cubicles of min. 3mx3m x3m size on the raised platform
- vi. Supply and providing of street lighting for the market with min 60 lux.
- vii. Development of footpath to integrate with the road with steps as shown in the drawing
- viii. Landscaping of the area.

Design of this project shall be using M30 grade concrete for all RCC works, M15 grade concrete for all PCC works, Fe-500D TMT bars for steel reinforcement unless otherwise specified, to ensure requisite structural strength, safety and durability.

For all concreting works OPC -43 grade conforming to IS 8112 latest revision shall only be used.

Steel reinforcement shall be conforming to IS 1786: latest revision and shall be from one of the following brands :

- a) SAIL
- b) RINL
- c) TATA
- d) JSW

Environmental Exposure Condition for design purpose shall be "Moderate" as per table 3 of IS 456

Design of structure shall be as per the relevant earthquake zone and following IS codes.

IS1893 (Part-1) – 2002, IS 13920-1993, IS 4326

The bidder shall refer to the attached detailed BOQ, Section V for the complete scope of work.

1. Technical Specifications:

General:

This section deals with specification of civil works only, for civil works which are not specified in this section and for electrical works which are relevant to the scope of works under the Contract, the work shall generally be carried out as per relevant CPWD/ RUIDP technical specifications/IS Codes as per latest revisions and as per instruction of the Engineer.

6.1 SURFACE AND SUB-SURFACE GEOTECHNICAL EXPLORATION

General

6.1.1 The objective of sub-surface exploration is to determine the suitability or otherwise of the soil or rock surrounding the foundation and soil parameters and rock characteristics for the design of foundation by in-situ testing or testing of samples/cores taken out of exploration. The subsurface exploration shall be planned in such a way that different types of soil up to the desired depth and their profile for the full proposed length of the bridge can be recorded and other information such as mechanical and physical properties like grain-size distribution, sensitivity, any existence of deleterious material in soil or ground water, etc., are determined along with soil parameters and rock characteristics. The sub-surface exploration shall also throw light on porosity of rock and subsidence due to mining, ground water level, artesian condition, if any, likely sinking and driving effort, likely constructional difficulties, etc.

6.1.2 FIELD INVESTIGATION

1. Reconnaissance
2. Preliminary Explorations
3. Detailed Explorations

1. Reconnaissance includes a review of available topographic and geological information, aerial photographs and data from previous investigations and site examination.
2. Preliminary investigation shall include the study of existing geological information, previous site reports, geological maps; air photos, etc., and surface geological examination. For large and important structures the information may be supplemented by geophysical methods. In some cases where no previous sub-strata data are available, exploratory geophysical investigation may need to be supplemented by resorting to a few bore-holes. These will help to narrow down the number of sites under consideration and also to locate the most desirable location for detailed sub-surface investigation like bore or drill holes, sounding probes, etc.
3. The scope of detailed investigation for bridges may be decided based on data obtained after preliminary investigations. Based on data obtained after preliminary investigations, the bridge site, type of structure with span arrangement and the location and type of foundations, shall be tentatively decided. Thereafter, the scope of detailed investigation including the extent

of exploration, number of bore-holes, type of soundings, type of tests, number of tests, etc., shall be decided, so that adequate data considered to be necessary for the detailed design and execution, are obtained.

4. The width of exploration: One purpose of detailed exploration for high embankments is to ascertain the compressibility of the clayey strata. It is, therefore, necessary that detailed and well illustrated description of the characteristics of stratification should be prepared. After the general shape and trend of the boundaries of the various soil deposits have been determined and rough assessment of their strength has been made by sub-surface sounding, with or without sampling in exploratory boring, the location of bore-hole(s) for undisturbed sampling shall be decided. At least one representative undisturbed sample should be collected from each strata. When homogeneous strata is very thick, one representative sample shall be collected for each 3 m thickness of the strata.

6.1.3 Soil investigation for foundations-

Soil investigation for foundations shall contain a programme for boring and retrieval of samples. The field work shall consist of excavation, drilling of bore-holes for the purposes of collection of undisturbed and disturbed samples, standard penetration tests, in-situ vane tests, static and dynamic cone penetration tests, other field tests, as specified by the Engineer and preparation of bore-logs. Collection and preservation for testing of disturbed and undisturbed samples from boreholes, borrow pits, etc., as specified by the Engineer shall form a part of the above, All in-situ tests shall be supplemented by laboratory investigations. Relevant Indian Standards such as IS: 1498, IS: 1888, IS: 1892, IS: 2131, IS: 2132, IS: 2720, IS: 4434 and IS: 4968 and Appendix I of IRC:78, etc., shall be followed for guidance.

The soundings by dynamic method shall be carried out in bore-holes using a standard sampler as specified in IS: 2131.

6.2 Preliminary Investigation

6.2.1 Foundations

1.2.1.1 Preliminary exploration shall be carried out to determine the soil profile showing the boundaries between the different soil types and between loose and dense parts in the same type of deposits. For guidance reference may be made to IRC: 75. For this purpose, as a first step, a suitable type of sub-surface sounding (e.g., static or dynamic cone penetration test) shall be carried out. As many soundings as necessary should be made, until the penetration data is complete enough to leave no doubt concerning the general shape and the trend of boundaries of the various soil deposits., Exploratory drill holes should then be made at one or two locations where average condition prevails and near those few points where the penetration diagrams indicate maximum deviations from the average.

1.2.1.2 The exploration shall cover the entire length of the bridge and also extend at either side for a distance about twice the depth below bed of the last main foundations. If there is any necessity for designing investigation for approaches particularly on soft soil or with high embankment or there is a possibility of considering alternatives between viaduct or earthen

embankment, the extended length and location of the borings beyond the proposed location of abutment should be determined and executed.

- 1.2.1.3 The depth of exploration should be at least 1 1/2 times the minimum width of foundation below the proposed foundation level. Where such investigation ends in any unsuitable or questionable foundation material the exploration shall be extended to a sufficient depth into firm and stable solid or rock but not less than four times the minimum depth of foundation below the earlier contemplated foundation level... In case of good sound rock the stipulation of minimum depth may be decreased based on difficulty to conduct core drilling and the minimum depth may be restricted to 3 metres.

Detailed Exploration

- 6.2.2 The exploration shall cover the entire length of the bridge and also extend at either end for a distance of about twice the depth below bed of the last main foundation to assess the effect of the approach embankment on the end foundations. Generally the sub-surface investigations (preliminary and detailed) for bridges shall extend to a depth below the anticipated foundation level equal to about one and a half times the width of the foundation. However, where such investigations end in any unsuitable or questionable foundation material, the exploration shall be extended to a sufficient depth into firm and stable soils or to rock.

- 6.2.3 The type and extent of exploration shall be divided into the following groups as per requirement of foundation design and likely method of data collection:

1. Foundation requiring shallow depth of exploration
2. Foundation requiring large depth of exploration
3. Fills behind abutments and protection works

6.2.4 Location Boring

Where the data made available by detailed exploration indicates appreciable variation or where variations in a particular foundation are likely to appreciably affect the construction (specially in case of bridge foundations resting on rock), it will be necessary to resort to additional bores/soundings to establish complete profile of the underlying strata. The additional borings/soundings shall be decided depending upon the extent of variation at a particular foundation location and should cover the entire area of the particular foundation.

6.2.5 Construction Stage Exploration

Whenever a change in the sub-soil strata/rock profile is encountered during construction, explorations shall be resorted to establish the correct data for further decisions.

- 6.2.6 Logging of bore-holes by radio-active methods shall be done for detailed investigations as specified in the contract or in special provisions.

- 6.2.7 For bridge works, the investigations shall be comprehensive enough to enable the designer to estimate or determine the following:

1. the engineering properties of the soil/rock,

2. the location and extent of soft layers and gas pockets, if any, under the hard founding strata,
3. the geological condition like type of rock, faults, fissures or subsidence due to mining, porosity etc.,
4. the ground water level,
5. artesian conditions, if any,
6. quality of water in contact with the foundation,
7. the depth and extent of scour,
8. suitable depth of foundation,
9. the bearing capacity of the foundation,
10. probable settlement and probable differential settlement of the foundations
11. likely sinking or driving effort, and
12. likely construction difficulties.

6.2.8 Basic Information Required from Explorations

1. Depth of rock strata and its variation over the site,
2. Whether isolated boulder or massive rock formation,
3. Extent and character of weathered zone,
4. Structure of rock - including bedding planes, faults, fissures, solution cavities etc.,
5. Properties of rock material - strength, geological formation, etc.,
6. Erodibility of rock to the extent possible,
7. Colour of water.

6.2.9 Exploration Programme

If preliminary investigations have revealed presence of rock within levels where the foundation is to rest, it is essential to take up detailed investigation to collect necessary information mentioned in Clause 6.4.3. The exploratory bore-hole shall be drilled into the rock to a depth of about 3 metres to distinguish a boulder from a continuous rock formation.

6.2.10 The extent of exploration shall be adequate enough to give a complete picture of the rock profile both in depth and across the channel width to assess the constructional difficulties in reaching the foundation levels.

6.2.11 The depth of boring in rock depends primarily on local geology, erodibility of the rock, extent of structural loads to be transferred to foundation etc. Normally, it shall pass through the upper weathered or otherwise weak zone, well into the sound rock. Minimum depth of boring in sound rock shall be 3 metres.

6.2.12 Detailed Investigation for Rock

1.2.12.1 This covers sounding, boring and drilling. An adequate investigation programme shall be planned to cover the whole area for general characteristics and in particular the foundation location, to obtain definite information regarding rock-depth and its variation over the foundation area. The detailed programme of exploration will depend on the type and depth of over-burden, the size and importance of the structure, etc. To decide this, geophysical methods adopted at the preliminary investigation stage will be helpful, this data being supplemental by sounding, bore-holes and drill holes.

1.2.12.2 Drilling through rock is a very specialised work and every care shall be taken to notice and record any small change during drilling. The time required to drill through a certain depth, amount of core recovery, physical condition, length of pieces of core, joints, colour of water residue, weathering and evidence of disturbance and other effects shall be carefully noticed and entered in the drilling log. for guidance, IS: 5313 may be referred to. The data shall be presented in accordance with IS: 4464.

1.2.12.3 The cores shall be stored properly in accordance with IS: 4078.

1.2.12.4 The rock cores obtained shall be subjected to following laboratory tests:

1.2.12.4.1 Visual identification for texture, structure, composition, colour and grain size.

1.2.12.4.2 Laboratory tests shall be done for specific gravity, porosity and moisture content.

1.2.12.5 In-situ tests shall be made in accordance with IS: 7292; IS: 7317; and IS: 7746. In addition, laboratory tests can also be made on samples.

1.2.12.6 Use of in-situ tests for measuring strength and deformation characteristics shall be made. Use of bore-hole photography will be desirable to evaluate the presence of faults, fissures or cavities, etc.

6.2.13 Special Cases

6.2.14 Caution

1.2.14.1 The interpretation of laboratory results on rock samples depends upon the relationship of the specimens tested to the overall rock characteristics, enumerated in Appendix I of IRC: 78. For this purpose, care shall be exercised in the choice of specimen size and its orientation in relation to the joint pattern.

1.2.14.2 In some cases, the foundation behaviour will be dominated by a possible mode of failure involving movement along some joint surface, fissures or weak layer within a generally strong rock system and also by possible weathering. In-situ shear tests may be conducted wherever feasible, as such tests are likely to give more representative data than the shear tests conducted on core samples.

6.2.15 Presentation of Data

The data shall be given in diagrammatic form in 3 sheets giving the following details:

1. Sheet 1: Plan showing the position of bore-holes clearly marked so as to fix the position at a future date.
2. Sheet 2: This shall contain the bore-log chart and test results of the samples separately for each bore-hole/pit etc.

3. Sheet 3: This shall contain pictorial representation of the borelog data to get an overall picture of the soil profile at the cross-section of the river.

Note: For guidance, refer to IRC: 78

6.3 Boring

Boring shall be done by any of the following methods depending on the soil type and types of samples required for the investigation:

1. Auger Boring
2. Shell and Auger Boring
3. Percussion Boring
4. Wash Boring
5. Rotary Boring

- 6.3.1 For preliminary and detailed sub-surface investigation only rotary drills shall be used. The casing shall also be invariably provided with diameters not less than 150 mm up to the level of rock, if any. However, use of percussion or wash boring equipment shall be permitted only to penetrate through bouldery or gravelly strata for progressing the boring but not for the collection of samples. While conduction detailed borings, the resistance to the speed of drilling i.e., rate of penetration, core loss, etc., as already specified in Appendix 3 of IRC: 78 shall be carefully recorded to evaluate the different types of strata and to distinguish specially sand from sandstone, clay from shale, etc.

Records of Borings and Trial Pits

- 6.3.2 The field records for the preliminary and detailed exploration shall contain the date when the boring was made, the location of the boring with reference to a permanent system of coordinates and the elevation of the ground surface with respect to a permanent bench mark. They shall include elevation at which the water table and the upper boundary of each of the successive soil strata were encountered, the investigator's clarification of the layer on the basis of general information obtained from field examination (refer to Appendix 2.1 of IRC:75) and the value of the resistance obtained by means of Standard Penetration Test. The type of tools used for borings shall be recorded. If the tools were changed, the depth at which the change was made and the reason thereof shall also be noted.
- Incomplete and abandoned

borings shall be described with no less care than successfully completed drill holes. The notes shall contain everything of significance observed on the job such as the elevation at which wash water was lost from the hole.

- 6.3.3 For all borings and trial pits, necessary information as detailed below shall be given. A site plan showing the disposition of the bore holes shall also be attached:

1. Agency
2. Location with reference map
3. Pit/Bore-hole number
4. reduced level (R.L.) of ground surface or other reference point
5. Dates of starting and completion

6. Name of supervisor
7. Scales of plans and sections
8. Dimensions, methods of advancing exploration such as by hand tools, blasting, boring, etc.
9. General description of strata met with and RLs at which they are met
10. Position and altitude of contacts, faults, strong joint, slacken sides, etc.
11. Inflow of water, methods of controlling the water, required capacity of pumps for dewatering
12. The level at which the sub-soil water is met with
13. Dip and strike of bedding and of cleavage.
14. Visual description of strata
15. Results of field tests e.g. SPT, in-situ vane shear test etc.
16. Any other information and remarks.

6.3.4 Upon removal of sampling tube, the length of the sample in the tube and the length between the top of the tube and the top of the sample in the tube shall be measured and recorded.

Methods of Sampling

There are two types of samples viz., (a) Disturbed sample (b) Undisturbed sample. The usual methods for sampling conforming to IS: 1892 and IS: 2132 are given ahead:

Name of Ground	Type of Sample	Method of Sampling
Soil	Disturbed Undisturbed	Hand Samples / Auger Samples / Shell Samples Hand Samples / Tube Samples
Rock	Disturbed Undisturbed	Wash Samples from percussion or rotary drilling Cores

Procedure for Taking Samples

6.3.5 For proper identification of sub-surface material, sample should be recovered containing all the constituents of the materials in their proper proportion. In clayey deposits such samples could be collected by split spoon samplers. In the case of sandy deposits, sampling spoons shall be fitted with suitable devices for retaining samples. All data required for soil identification (Appendix 2.1 of IRC: 75) should be collected from the samples so extracted when undisturbed samples, which are more desirable for collection of some of the data, are not available. Penetration test should be carried out with the standard split-spoon sampler or penetrometers if the soil is coarse grained. When it is known in advance that the soil profile is fairly regular, preliminary and detailed investigation may be combined. Tube samplers can be used in place of split spoon samplers for collecting samples in clayey strata.

6.3.6 Disturbed Soil Samples

6.3.7 Undisturbed Soil Samples

1.3.7.1 Disturbed samples of soil shall be obtained in the course of excavation and boring. For procuring samples from below the ground water level, where possible, special type of sampler shall be used. Where Standard Penetration Test is conducted, representative samples shall be obtained from the split spoon. While collecting disturbed samples from borrow areas it shall be ensured that the samples collected represented all types of borrow materials to be used in the construction of embankment and sub-grade.

1.3.7.2 The size of sample generally required shall be as given in Table 6-1.

Size of Soil Sample Required

Sr.	PURPOSE OF SAMPLE	SOIL TYPE	WEIGHT OF SAMPLE REQUIRED (kg)
1.	Soil identification, natural moisture content tests, mechanical analysis and index properties, chemical tests	Cohesive soils Sands and Gravel	1 3
2.	Compression tests	Cohesive soils and sand	12.5
3.	Comprehensive examination of construction material and borrow area soil including soil stabilisation	Cohesive soils and sands Gravelly soil	25 - 50 50 - 100

While taking out disturbed soil samples, Standard Penetration Test may also be conducted to find out the bearing capacity of the sub-soils at specified levels.

6.3.8 Undisturbed Soil Samples

1. The location of the bore-hole shall be as indicated on the Drawing or given by the Engineer. The depth of the bore-hole shall be as indicated on the Drawing or shall be governed by the criteria given therein or as directed by the Engineer.
2. Samples shall be obtained in such a manner that their moisture content and structure do not get altered. This may be ensured by careful protection and packing and by use of correctly designed sampler.
3. Standard Penetration Test may have to be conducted in each case to obtain additional data as directed by Engineer. In soft clay, in-situ vane shear test as per IS: 4434 may have to be conducted. Where all the three operations have to be carried out in one layer, the sequence shall be undistributed soil sampling followed by in-situ vane shear test, followed by Standard Penetration Test.

4. For compression test samples, core of 40 mm diameter and about 150 to 200 mm length may sufficient, but for other laboratory tests, a core of 100 mm diameter and 300 mm length shall be taken as far as possible, unless otherwise specified by the Engineer.
5. The upper few millimetres of both types of sample shall be rejected as the soil at the bottom of the bore hole usually gets disturbed by the boring tools.

6.3.9 Protection, labeling and handling of samples

- 1 Care shall be taken in handling and labeling of samples so that they are received in a fit state for examination and testing and can be correctly identified as coming from a specified trial pit or boring.
- 2 The disturbed material in the upper end of the tube shall be completely removed before applying wax for sealing. The length and type of sample so removed should be recorded.
- 3 The soil at the lower end of the tube shall be reamed to a distance of about 20 mm. After cleaning, both ends shall be sealed with wax applied in a way that will prevent wax from entering the sample. Wax used for sealing should not be heated to more than a few degrees above its melting temperature. The empty space in the samplers, if any, should be filled with moist soil, saw dust, etc., and the ends covered with tight fittings caps.
- 4 Labels giving the following information should be affixed to the tubes:
 - Tube number
 - Job designation
 - Sample location
 - Boring number
 - Sample number
 - Depth
 - Penetration
 - Gross recovery ratio
- 5 The tube and boring numbers should be marked in duplicate. Duplicate markings of the boring number and sample number on a sheet which will not be affected by moisture should be enclosed inside the tube.

6.4 RCC Cast- in-situ piles

CODES:

IS: 2911 with all latest revisions – Indian Standard Code of Practice for Design and Construction of pile foundations for Bored Cast-in-Situ Piles shall be referred to in conjunction with these specifications during the entire design, construction and installation work.

Reference to any code shall always mean reference to the latest revised edition of the code including all its amendments upto date, unless otherwise specified. In the event

of any conflict between the requirements of this specification and those of the referred codes, the former shall govern.

The grade of concrete shall be M-30 with a minimum cement content of 330 kg/m³.

6.4.1 Construction Operation for Structures

Setting out

After the site has been cleared according to Chapter 2, the limits of excavation shall be set out true to lines, curves and slopes to Clause 5.13.1 of RUIDP SOR.

Public Safety

All working areas shall be securely fenced, provided with proper caution signs and marked with red lights as night to avoid accidents. The Contractor shall take adequate protective measures to see that the excavation operations do not affect or damage adjoining structures. For safety precautions, guidance may be taken from IS: 3764.

Disposal of Surplus excavated materials shall be done by Contractor, to the place notified by Engineer- in -charge at no extra cost.

6.4.2 MATERIALS FOR STRUCTURES

Scope

1. Materials to be used in the work shall conform to the Specifications mentioned on the Drawings, the requirements laid down in this section and Specifications for relevant items of work covered under these Specifications.
2. If any material, not covered in these Specifications, is required to be used in the work, it shall conform to relevant Indian Standards, if there are any, or to the requirements specified by the Engineer.

6.4.3 Sources of Material

1. The Contractor shall notify the Engineer of his proposed sources of materials prior to delivery. If it is found after trial that sources of supply previously approved do not produce uniform and satisfactory products, or if the product from any other source proves unacceptable at any time, the Contractor shall furnish acceptable material from other sources at his own expense.

6.4.3.1 Cement

Cement to be used in the works shall be any of the following types with the prior approval of the Engineer:

1. Ordinary Portland Cement, 43 Grade, conforming to IS: 8112.

1. Cement conforming to IS: 8112 and IS: 12269 may be used provided the minimum cement content mentioned elsewhere from durability considerations is not reduced. From strength considerations, these cements shall be used with a certain caution as high early strengths of cement in the 1 to 28-day range can be achieved by finer grinding and higher constituent ratio of C₃S/C₂S, where C₃S is Tricalcium Silicate and C₂S is Dicalcium Silicate. In such cements, the further growth of strength beyond say 4 weeks may be much lower than that traditionally expected. Therefore, further strength tests shall be carried out for 56 and 90 days to fine tune the mix design from strength considerations.
2. Total chloride content in cement shall in no case exceed 0.05 percent by mass of cement also, total sulphur content calculated as sulphuric anhydride (SO₃) shall in no case exceed 2.5 percent and 3.0 percent when tri-calcium aluminate percent by mass is upto 5 or greater than 5 respectively.

6.4.3.2 Coarse Aggregates

1. For plain and reinforced cement concrete (PCC and RCC) or prestressed concrete (PSC) works, coarse aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone, crushed gravel, natural gravel or a suitable combination thereof or other approved inert material. They shall not consist pieces of disintegrated stones, soft, flaky, elongated particles, salt, alkali, vegetable matter or other deleterious materials in such quantities as to reduce the strength and durability of the concrete, or to attack the steel reinforcement. Coarse aggregate having positive alkali silica reaction shall not be used. All coarse aggregates shall conform to IS: 383 and tests for conformity shall be carried out as per IS: 2386 Parts I to VIII.
2. The Contractor shall submit for the approval of the Engineer, the entire information indicated in Appendix A of IS: 383.
3. Maximum nominal size of coarse aggregate for various structural components in PCC, RCC or PSC, shall conform to Chapter 9 of RUIDP Technical Specifications.
4. The maximum value for flakiness index for coarse aggregate shall not exceed 35 percent. The coarse aggregate shall satisfy the following requirements of grading:

IS Sieve Size	Percent by Weight Passing the Sieve		
	40 mm	20 mm	12.5 mm
63 mm	100	-	-
40 mm	95-100	100	-
20 mm	30-70	95-100	100
12.5 mm	-	-	90-100
10 mm	10-35	25-55	40-85
4.75 mm	0-5	0-10	0-10

6.4.3.3 Sand/Fine Aggregates

1. For masonry work, sand shall conform to the requirements of IS: 2116.
2. For plain and reinforced cement concrete (PCC and RCC) or prestressed concrete (PSC) works, fine aggregate shall consist of clean, hard, strong and durable pieces of crushed stone, crushed gravel, or a suitable combination of natural sand, crushed stone or gravel. They shall not contain dust, lumps, soft or flaky, materials, mica or other deleterious materials in such quantities as to reduce the strength and durability of the concrete, or to attack the embedded steel. Motorised sand washing machines should be used to remove impurities from sand. Fine aggregate having positive alkali-silica reaction shall not be used. All fine aggregate shall conform to IS: 383 and test for conformity shall be carried out as per IS: 2386 (Part I to VIII). The Contractor shall submit to the Engineer the entire information indicated in Appendix A of IS: 383. The fineness modulus of fine aggregate shall neither be less than 2.0 nor greater than 3.5.
3. Sand/fine aggregate for structural concrete shall conform to the following grading requirements:

IS Sieve Size	Percent by Weight Passing the Sieve		
	Zone I	Zone II	Zone III
10 mm	100	100	100
4.75 mm	90-100	90-100	90-100
2.36 mm	60-95	75-100	85-100
1.18 mm	30-70	55-90	75-100
600 micron	15-34	35-59	60-79
300 micron	5-20	8-10	12-40
150 micron	0-10	0-10	0-10

6.4.3.4 Steel

1. Reinforcement / Untensioned Steel

For plain and reinforced cement concrete (PCC and RCC) or prestressed concrete (PSC) works, the reinforcement / untensioned steel as the case may be shall consist of the following grades of reinforcing bars:

Grade Designation	Bar Type conforming to governing Specification IS	Characteristic Strength f_y MPa
Fe 500 D	IS:1786	500

All steel shall be procured from original producers, no re-rolled steel shall be incorporated in the work.

Only new steel shall be delivered to the site. Every bar shall be inspected before assembling on the work and defective, brittle or burnt bar shall be discarded. Cracked ends of bars shall be discarded.

- a. Chairs for supporting the reinforcement shall also be of Fe 500 D .
- b. The bars shall be cut by saw-cutting.
- c. While bending the bars, the pins of work benches shall be provided with PVC or plastic sleeves.
- d. Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete. Mixing and curing with sea water shall not be permitted. As a guide, the following concentrations represent the maximum permissible values:

To neutralise 200 ml sample of water, using phenolphthalein as an indicator, it should not require more than 2 ml of 0.1 normal NaOH.

To neutralise 200 ml sample of water, using methyl orange as an indicator, it should not require more than 10 ml of 0.1 normal HCl.

The permissible limits for solids shall be as follows when tested in accordance with IS: 3025:

1.	Organic	200 mg/lit
2.	Inorganic	3000 mg/lit
3.	Sulphates (SO ₄)	500 mg/lit
4.	Chlorides (Cl)	500 mg/lit *
5.	Suspended matter	2000 mg/lit

** In case of structures of lengths 30m and below, the permissible limit of chlorides may be increased upto 1000 mg/lit.*

All samples of water (including potable water) shall be tested and suitable measures may be where necessary to ensure conformity of the water to the requirements states herein.

The pH value shall not be less than 6.

2. Formwork requirements

- a. Forms shall conform to the shapes, lines, grades and dimensions including camber of the concrete as called for on the Drawings. Ample studs, walers, braces, ties, straps, shores, etc. shall be used to hold the forms in proper position without any distortion whatsoever until the concrete has set sufficiently to permit removal of the form. In special cases where form vibrators are to be used, the shuttering shall be close boarded. Timber shall be well seasoned, free from sap, shakes, loose knots, worm holes, warps or other surface defects in contact with concrete. Faces coming in contact with

the concrete shall be free from adhering grout, plaster, paint, projecting nails, splits or other defects. Joints shall be sufficiently tight to prevent loss of water and fine material from concrete.

- b. Plywood shall be used for Exposed Concrete surfaces; where called for. Sawn and wrought timber may be used for unexposed surfaces. Inside faces of forms for concrete surfaces which are to be rubbed finished shall be planned to remove irregularities or unevenness in the face. Formwork with linings will be permitted.
 - c. All new and used form lumber shall be maintained in a good condition with respect to shape, strength, rigidity, water tightness, smoothness and cleanliness of surfaces. Form lumber unsatisfactory in any respect shall not be used and; if rejected by Engineer, shall be removed from the site.
 - d. Shores supporting successive stories shall be placed directly over those below or be so designed and placed that the load will be transmitted directly on to them Truss supports shall be provided for shores that cannot be secured on adequate foundations.
 - e. Formwork, during any stage of construction showing signs of distortion or distorted to such a degree that the intended concrete work will not conform to the exact contours indicated on the Drawings, shall be repositioned and strengthened. Poured concrete affected by the faulty formwork, shall be removed in its entirety and the formwork corrected prior to placing new concrete.
 - f. Excessive construction camber to compensate for shrinkage settlement, etc. that may impair the structural strength of members will not be permitted.
 - g. Forms for substructure concrete may be omitted when, in the opinion of Engineer the open excavation is firm enough to act as the form. Such excavations shall be slightly larger than required by the Drawings to compensate for irregularities in excavation and to ensure the design requirements.
 - h. Forms shall be so designed and constructed that their removal will not damage the concrete. Face formwork shall provide true vertical and horizontal joints, conform to the architectural features of the structure as to location of joints and be as directed by Engineer.
 - i. Where Exposed smooth or rubbed concrete finishes are required, the forms shall be constructed with special care so that the resulting concrete surfaces require a minimum finish.
3. Bracing, struts and props

- i. Shuttering shall be braced, strutted, propped and so supported that it shall not deform under weight and pressure of the concrete and also due to the movement of men and other materials. Bamboo shall not be used as props or cross bearers.
 - ii. The shuttering for beams and slabs shall be so erected that the shuttering on the sides of the beams and under the soffit of slabs can be removed without disturbing the beam bottoms. Repropping of beams shall not be done except when props have to be reinstated to take care of construction loads anticipated to be in excess of the design load. Vertical props shall be supported on wedges or other measures shall be take whereby the props can be gently lowered vertically while striking the shuttering.
 - iii. If the shuttering for a column is erected for the full height of the column, one side shall be left open and built up in sections as placing of concrete proceeds, or windows may be left for pouring concrete from the sides to limit the drop of concrete to 1.0 M or as directed by Engineer.
4. Mould oil
 - i. Care shall be taken to see that the faces of form-work coming in contact with concrete are perfectly cleaned and two coats of mould oil or any other approved materials applied before fixing reinforcement and placing concrete. Such coating shall be insoluble in water, non-staining and not injurious to the concrete. It shall not become flaky or be removed by rain or wash water. Reinforcement and / or other items to be cast in the concrete shall not be placed until coating of the forms is complete. Adjoining concrete surfaces shall also be protected against contamination from the coating materials.
 - ii. Chamfers and fillets

All corners and angles exposed in the finished structure shall be formed with mouldings to form chamfers or fillets on the finished concrete. The standard dimensions of chamfers and fillets, unless otherwise specified, shall be 20 mm X 20 mm. Care shall be exercised to ensure accurate mouldings. The diagonal face of the moulding shall be planed or surfaced to the same texture as the forms to which it is attached.
 - iii. Vertical construction joint chamfers

Vertical construction joints on faces which will be exposed at the completion of the work shall be chamfered as above except where not permitted by Engineer for structural or hydraulic reasons.
 - iv. Wall ties

Wire ties passing through the walls shall not be allowed. In their place bolts passing through sleeves shall be used.

v. Reuse of forms

Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes that may leak suitably plugged and joints examined and when necessary, repaired and the inside retreated to prevent adhesion, to the satisfaction of Engineer. Warped lumber shall be resized. Contractor shall equip himself / herself with enough shuttering to complete the job in the stipulated time.

vi. Removal of forms

Contractor shall record on the Drawing or on a special register the date upon which the concrete is placed in each part of the work and the date on which the shuttering is removed therefrom.

In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the stress due to self weight and any construction / erection loading to which the concrete may be subjected at time of striking formwork.

- i. Informal circumstances (generally where temperatures are above 20°C) forms may be struck after expiry of the following periods:

Item	Ordinary Portland cement concrete	Rapid hardening Portland cement concrete
1. Walls, columns and vertical sides of beams	24 to 48 hours or as directed by the Engineer	24 hours
2. Slabs (props left under).	3 days	2 days
3. Beam soffits (Props left under)	7 days	4 days
4. Removal of props to slabs: • Spanning upto 4.5 m • Spanning over 4.5 m	7 days 14 days	4 days 8 days
5. Removal of props to beams & arches: • Spanning upto 6 m. • Spanning over 6 m.	14 days 21 days	8 days. 12 days.

- ii. Striking shall be done slowly with utmost care to avoid damage to arises and projections and without shock or vibration, by gently easing the wedges. If after removing the formwork, it is found that timber has been embedded in the concrete, it shall be removed and made good as specified earlier.
- iii. Reinforced temporary openings shall be provided, as directed by Engineer, to facilitate removal of formwork which otherwise may be inaccessible.

- iv. Tie rods, clamps, form bolts, etc. which must be entirely removed from walls or similar structures shall be loosened neither sooner than 24 hours nor later than 40 hours after the concrete has been deposited. Ties, except those required to hold forms in place, may be removed at the same time. Ties, withdrawn from walls and grade beams shall be pulled toward the inside face. Cutting ties back from the faces of walls and grade beams will not be permitted.
- v. For liquid retaining structures no sleeves for through bolts shall be used nor shall through bolts be removed as indicated in **Clause 9.11.13.6**. The bolts, in this case, shall be cut at 25 mm depth from the surface and then the hole shall be made good by sand cement mortar of the same proportions as the concrete just after striking the formwork.

Formwork

The formwork shall be properly designed, substantially built and maintained for all anticipated loads. The Contractor, if required, shall submit plans for approval to the Engineer. Approval of the plans, however, shall not relieve the Contractor of his responsibility.

6.4.4 STRUCTURAL CONCRETE

1.4.4.1 SCOPE

This Specification covers the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing and testing of concrete and also requirements in regard to the quality, storage, bending and fixing of reinforcement. This also covers the transportation of concrete from the mixer to the place of final deposit and the placing, curing, protecting, repairing and finishing of concrete.

1.4.4.2 Applicable Codes and Specifications

The following Specifications, standards and codes are made a part of this Specification. All Standards, Specifications, Codes of Practice referred to herein shall be the latest editions including all applicable official amendments and revisions. In case of discrepancy between this Specification and those referred to herein, this Specification shall govern.

1. Materials:

IS: 269	Specification for Ordinary, Rapid-Hardening and Low Heat Portland Cement.
IS: 455	Specification for Portland Blast Furnace Slag Cement.
IS: 1489	Specification for Portland-Pozzolana Cement.
IS: 4031	Methods of Physical Tests for Hydraulic Cement.
IS: 650	Specification for Standard Sand for Testing of Cement.

IS: 383	Specification for Coarse and Fine Aggregates From Natural Sources for Concrete.
IS: 2386	Methods of Test for Aggregates for Concrete. (Part I To VIII)
IS: 516	Method of Test for Strength of Concrete.
IS: 1199	Method of Sampling and Analysis of Concrete.
IS: 3025	Method of Sampling and Test (Physical and Chemical) Water Used In Industry.
IS: 432	Specification for Mild Steel and Medium Tensile Steel Bars and Hard Drawn Steel Wire for Concrete Reinforcement. (Part I & II)
IS: 1139	Specification for Hot Rolled Mild Steel and Medium Tensile Steel Deformed Bar for Concrete Reinforcement.
IS: 1566	Specification for Plain Hard Drawn Steel Wire Fabric for Concrete (Part I) Reinforcement.
IS: 1785	Specification for Plain Hard Drawn Steel Wire for Prestressed Concrete.
IS: 1786	Specification for Cold Twisted Steel Bars for Concrete Reinforcement.
IS: 2090	Specification for High Tensile Steel Bars Used In Prestressed Concrete.
IS: 4990	Specification for Plywood for Concrete Shuttering Work.
IS: 2645	Specification for Integral Cement Water-Proofing Compounds.
BS4461	Cold Worked Steel Bars for The Reinforcement of Concrete.
IS: 4098	Lime Pozzolana Mixture (1st Revision) (Amendment 2)

2. Equipment

IS: 1791	Specification for Batch Type Concrete Mixers.
IS: 2438	Specification for Roller Pan Mixer.
IS: 2505	Specification for Concrete Vibrators, Immersion Type.
IS: 2506	Specification for Screen Board Concrete Vibrators.
IS: 2514	Specification for Concrete Vibrating Tables.
IS: 3366	Specification for Pan Vibrators.
IS: 4656	Specification for Form Vibrators for Concrete.
IS: 2722	Specification for Portable Swing Weigh Batchers for Concrete (Single and Double Bucket Type).
IS: 2750	Specification for Steel Scaffoldings.
IS: 2438	Roller Fan Mixer (Reaffirmed 1990)

3. Codes of Practice

IS: 456	Code of Practice for Plain and Reinforced Concrete.
IS: 1343	Code of Practice for Prestressed Concrete.

IS: 457	Code of Practice for General Construction of Plain and Reinforced Concrete for Dams and Other Massive Structures.
IS: 3370	Code of Practice for Concrete Structures for Storage of Liquids (Part I to IV)
IS: 3955	Code of Practice for Composite Construction.
IS: 3201	Criteria for Design and Construction of Precast Concrete Trusses.
IS: 2204	Code of Practice for Construction of Reinforced Concrete Shell Roof.
IS: 2210	Criteria for The Design of R.C. Shell Structures and Folded Plates.
IS: 2751	Code of Practice for Welding of Mild Steel Bars Used for Reinforced Concrete Construction.
IS: 2502	Code of Practice for Bending and Fixing Vibrators for Consolidating Concrete.
IS: 3558	Code of Practice for Use of Immersion Vibrators for Consolidating Concrete.
IS: 3414	Code of Practice for Design and Installation of Joints In Buildings.
IS: 4014	Code of Practice for Steel Tubular Scaffolding. (Part I & II)
IS: 2571	Code of Practice for Laying Insitu Cement Concrete Flooring.
IS: 2250	Code of Practice for Preparation and Use of Masonry Mortar (1st Revision)

4. Construction Safety

IS: 3696	Safety Code for Scaffolds and Ladders. (Part I & II)
IS: 3385	Code of Practice for Measurement of Civil Engineering Works.

5. Measurement

IS: 1200	Method of Measurement of Building Works.
IS: 3385	Code of Practice for Measurement of Civil Engineering Works.

In the event that state, city or other governmental bodies have requirements more stringent than those set forth in this Specification, such requirement shall be considered part of this Specification and shall supersede this Specification where applicable.

i General

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix, whether reinforced or otherwise, shall conform to the applicable portions of this Specification.

Engineer shall have the right to inspect the source(s) of material(s), the layout and operation of procurement and storage of materials, the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged and Engineer's approval obtained, prior to starting of concrete work.

1.4.4.3 Materials

All materials shall conform to the requirements laid in Chapter 7 of RUIDP specifications.

i. Steel Reinforcement

Laps

Laps and splices for reinforcement shall be as shown on the Drawings. Splices in adjacent bars shall be staggered and the locations of all splices, except those specified on the Drawings, shall be approved by Engineer. The bars shall not be lapped unless the length required exceeds the maximum available length of bars at site.

Bending

Reinforcing bars supplied bent or in coils, shall be straightened before they are cut to size. Straightening of bars shall be done in cold and without damaging the bars. This is considered as a part of reinforcement bending fabrication work.

All bars shall be accurately bent according to the sizes and shapes shown on the detailed working Drawings / bar bending schedules. They shall be bent gradually by machine or other approved means. Reinforcing bars shall not be straightened and rebent in a manner that will injure the material and bars containing cracks or splits shall be rejected. They shall be bent cold, except bars of over 25 mm in diameter which may be bent hot if specifically approved by Engineer. Bars which depend for their strength on cold working, shall not be bent hot. Bars bent hot shall not be heated beyond cherry red colour (nor exceeding 845°C) and after bending, shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be used only if the means used for straightening and rebending be such as shall not, in the opinion of Engineer, injure the material. No reinforcement shall be bent when in position in the work without approval, whether or not it is partially embedded in hardened concrete. Bars having kinks or bends other than those required by design shall not be used.

Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the Drawings by the use of blocks, spacers and chairs as per IS: 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing points shall be securely bound together at all such points with number 16 gauge annealed soft iron wire. The vertical distances required between successive layers of bar in beams or similar members shall be maintained by the provision of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between spacer bars.

Welding of Bars

When permitted or specified on the Drawings, joints of reinforcement bars shall be butt welded so as to transmit their full strength. Welded joints shall preferably be located at points where the reinforcement steel will not be subject to more than 75 % of the maximum

permissible stresses and the welded joints should be staggered such that, at any one section, not more than 33% of bars are welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work will be accepted. Suitable means shall be provided for holding the bars securely in position during welding. It must be ensured that no voids are left in welding and when welding is done two or three stages, the previous surfaces shall be cleaned properly. Ends of bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The MS electrodes used for welding shall conform to IS: 814. Welded pieces of reinforcement shall be tested. Specimens shall be taken from the actual site and their number and frequency of test shall be as directed by the Engineer.

Cover

Unless indicated otherwise on the Drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:

1. At each end of reinforcing bar, not less than 25 mm nor less than twice the diameter of the bar.
2. For a longitudinal reinforcing bar in a column, not less than 40 mm, nor less than the diameter of the bar. In case of columns of minimum dimension of 20 cm. or under, with reinforcing bars of 12 mm and less in diameter, a cover of 25 mm may be used.
3. For longitudinal reinforcing bars in a beam, not less than 25 mm nor less than the diameter of the bar.
4. For tensile, compressive, shear, or other reinforcement in a slab or wall, not less than 13 mm, nor less than the diameter of such reinforcement.
5. For any other reinforcement, not less than 13 mm, nor less than the diameter of such reinforcement.
6. For footings and other principal structural members in which the concrete is deposited directly against the ground, cover to the bottom reinforcement shall be 75 mm. If concrete is poured on a layer of lean concrete the bottom cover may be reduced to 50 mm.
7. For concrete surfaces exposed to the weather or the ground after removal of forms, such as retaining walls, grade beams, footing sides and top, etc., not less than 50 mm for bars larger than 16 mm diameter and not less than 40 mm for bars 16 mm diameter or smaller.
8. Increased cover thickness shall be provided, as indicated on the Drawings, for surfaces exposed to the action of harmful chemicals (or exposed to earth contaminated by such chemical), acid, alkali, saline atmosphere, sulphurous smoke, etc.
9. For reinforced concrete members, totally or periodically immersed in sea water or subject to sea water spray, the cover of concrete shall be 50 mm more than those specified in (1) to (5) above.
10. For liquid retaining structures, the minimum cover to all steel shall be 40 mm or the diameter of the main bar, whichever is greater. In the presence of sea water and soils and waters of a corrosive character the cover shall be increased by 10 mm.
11. Protection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective

coatings, as specified on the Drawings. In such a case the extra cover mentioned in (8) and (9) above, may be reduced by Engineer to those shown on the Drawings.

12. The correct cover shall be maintained by cement mortar cubes or other approved means. Reinforcement for footings, grade beams and slabs on subgrade shall be supported on precast concrete blocks as approved by Engineer. The use of pebbles or stones shall not be permitted.
13. The 28 day crushing strength of cement mortar cubes / precast concrete cover blocks shall be atleast equal to the specified strength of concrete in which these cubes / blocks are embedded.
14. The minimum clear distance between reinforcing / bars shall be in accordance with IS: 456 or as shown in Drawings.

Inspection

Erected and secured reinforcement shall be inspected and approved by Engineer prior to placement of concrete.

Payment

For payment of work done under this item, the actual quantity of steel embedded in concrete as calculated and approved by Engineer, irrespective of the level or the height at which the work is done, shall be taken. The unit rate for reinforcement shall include all wastage, binding wire, etc. for which no separate payment shall be made. Laps as shown in Drawings or as approved by Engineer and minimum number of chairs and spacer bars shall be measured and paid for.

ii Mix Design

1. This is to investigate the grading of aggregates, water cement ratio, workability and the quantity of cement required to give preliminary and works cubes of the minimum strength specified. The proportions of the mix shall be determined by weight. Adjustment of aggregate proportions due to moisture present in the aggregate shall be made. Mix proportioning shall be based on the principles given in IS: 456-2000 and SP: 23-1982 "Handbook for Design Mix Concrete."
2. Whenever there is a change either in required strength of concrete, or water-cement ratio or workability or the source of aggregates and / or cement, preliminary tests shall be repeated to determine the revised proportions of the mix to suit the altered conditions. While designing mix proportions, over-wet mixes shall always be avoided.
3. While fixing the value for water / cement ratio for preliminary mixes, assistance may be derived from the graph (Appendix A IS: 456) showing the relationship between the 28-day compressive strengths of concrete mixes with different water / cement ratios and the 7 day compressive strength of cement tested in accordance with IS: 269.

Preliminary tests

- i. Tests specimens shall be prepared with at least two different water / cement ratios for each class of concrete, consistent with workability required for the nature of the work. The materials and proportions used in making preliminary tests shall be similar in all respects to those, to be actually employed in the works as the object of these tests is to determine the proportions of cement, aggregates and water necessary to produce concrete of required consistency and to give the specified strength. It will be Contractor's sole responsibility to carry out statement of proportions proposed to be used for the various concrete mixes. For preliminary tests, the following procedure shall be followed:
- ii. Materials shall be brought to the room temperature and all materials shall be in a dry condition. The quantities of water, cement and aggregates for each batch shall be determined by weight to an accuracy of 1 part in 1000 parts.

Mixing Concrete

For all works, concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained through out the construction. Mixing shall be continued till materials are uniformly distributed and a uniform colour of entire mass is obtained and each individual particle of the coarse aggregate shows a complete coating of mortar containing its proportionate amount of cement. In no case, the mixing be done for a period of not less than two minutes after all ingredients have been put into the mixer. In case of hand mixing, quantity of cement shall be increased by 10% above that specified in **Clause 9.6.1**, the cost of increased cement quantity being borne by the Contractor. Hand mixing shall be permitted only under exceptional conditions and the Contractor must take the permission of the Engineer in advance. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting a new batch. Unless otherwise agreed by the Engineer, the first batch of concrete from the mixer shall contain only two thirds of the normal quantity of coarse aggregate. The mixing plant shall be thoroughly cleaned before changing from one type of cement to another.

Consistency

The consistency of each batch of concrete shall be measured immediately after mixing, by the slump test, care should be taken to ensure that no water or other material is lost, the material used for the slump test may be remixed with the remainder of the concrete for making the specimen test cubes. the period of re-mixing shall be as short as possible yet sufficient to produce a homogeneous mass.

Size of Test Cubes

Compression tests of concrete cubes shall be made as per IS: 516 on 15 cm cubes. Each mould shall be provided with a metal base plate having no leakage. The base plate shall be preferably attached to the mould when assembled and shall be positively and rigidly held together. Before placing concrete, the mould and base plate shall be cleaned and oiled. The dimensions and internal faces of the mould shall be accurate within the following limits:

Height and distance between the opposite faces of the mould shall be of specified size + 0.2 mm. The angle between the adjacent internal faces and between internal faces and top and

bottom planes of mould shall be $90^{\circ} + 0.5^{\circ}$. The interior faces of the mould shall be plane surfaces with a permissible variation of 0.03 mm.

Compacting

Concrete tests cubes shall be moulded by placing fresh concrete in the mould and compacted as specified in IS: 516.

Curing

Curing shall be as specified in IS: 516. The cubes shall be kept in moist air of at least 90% relative humidity at a temperature of $27^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 2 hours \pm 1/2 hr. from the time of adding water to the dry ingredients. Thereafter in clean, fresh water and kept at $27^{\circ} \pm 2^{\circ}\text{C}$ temperature until seven days. A record of maximum and minimum temperatures at the places of storage of the cubes shall be maintained during the period they remain in storage.

Testing of Specimens

The strength shall be determined based on not less than five cube test specimens for each age and each water cement ratio. All these laboratory test results shall be tabulated and furnished to Engineer. The test results shall be accepted by Engineer if the average compressive strengths of the specimens tested is not less than the compressive strength specified for the age at which specimens are tested, subject to the condition that only one out of the five consecutive tests may give a value less than the specified strength for that age. Engineer may direct Contractor to repeat the tests if the results are not satisfactory and also to make such changes as he considers necessary to meet the requirements specified. All these preliminary tests shall be conducted by Contractor at his own cost in an approved laboratory.

iii Proportioning, Consistency, batching and mixing of concrete

Proportioning

Aggregate

The proportions which shall be decided by conducting preliminary tests shall be by weight. These proportions of cement, fine and coarse aggregates shall be maintained during subsequent concrete batching by means of weigh batchers conforming to IS: 2722 capable of controlling the weights within one percent of the desired value. Except where it can be shown to the satisfaction of Engineer that supply of properly graded aggregate of uniform quality can be maintained over the period of work, the grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions. The different sizes shall be stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible, as determined by Engineer, to ensure maintaining of grading in accordance with the sample used in preliminary mix design. The material shall be stock piled well in advance of use.

Cement

The cement shall be measured by weight.

Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete, specified surface finish, satisfactory workability, consistent with the strength stipulated for each class of concrete. The water added to the mix shall be such as not to cause segregation of material or the collection of excessive free water on the surface of the concrete.

Definition of Water / Cement Ratio.

The water cement (W/C) ratio is defined as the weight of water in the mix (including the surface moisture of the aggregates) divided by the weight of cement in the mix.

Water / Cement Ratio

The actual water cement ratio to be adopted shall be determined in each instance by Contractor and approved by Engineer.

Proportioning by Water / Cement Ratio

The W/C ratio specified for use by Engineer shall be maintained. Contractor shall determine the water content of the aggregates as frequently as directed by Engineer In- Charge as the work progresses and as specified in IS: 2386 (part III) and the amount of mixing water added at the mixer shall be adjusted as directed by Engineer so as to maintain the specified by W/C ratio. To allow for the variation in weight of aggregates due to variation in their moisture content, suitable adjustments in the weights of aggregates shall also be made.

Consistency and slump

- i. Concrete shall be of a consistency and workability suitable for the condition of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts. Compacting factor tests, in accordance with IS: 1199, shall be conducted from time to time to ensure the maintenance of such consistency.
- ii. The following table gives a range of slumps which shall generally be used for various types of construction unless otherwise instructed by the Engineer.

Types of Construction	Slump in mm	
	Maximum	Minimum
Reinforced foundation walls and footings	75	25
Plain footings, caissons and substructure walls	75	25

T.G. and massive compressor foundations	50	25
Slabs, Beams and reinforced walls	100	25
Pumps & miscellaneous Equipment	75	25
Building columns	100	25
Pavements	50	25
Heavy mass construction	50	25

Batching and mixing of concrete

- i. The materials and proportions of concrete materials as established by the preliminary tests for the mix design shall be rigidly followed for all concrete on the project and shall not be changed except when specifically permitted by Engineer.
- ii. Concrete shall be produced only by weigh batching the ingredients. The mixer and weigh batchers shall be maintained in clean, serviceable condition. The accuracy of weigh batchers shall be periodically checked. They shall be set up level on a firm base and the hopper shall be loaded evenly. The needle shall be adjusted to zero when the hopper is empty. Fine and coarse aggregates shall be weighed separately. Volume batching will not be permitted. However, Engineer In- Charge may permit volume batching by subsequent conversion of the weights of important pours involving concrete of not more than 0.25 cubic metres, on days when other pours involving weigh batching are not likely to be taken up. Concrete shall be of strength stipulated in the respective items. All concrete shall be mixed in mechanically operated batch mixers complying with IS: 1791 and of approved make with suitable provision for correctly controlling the water delivered to the drum.
- iii. The quantity of water actually entering the drum shall be checked with the reading of the gauge or valve setting, when starting a job. The test should be made while the mixer is running. The volume of the mixed material shall not exceed the manufacturer's rated mixer capacity. The batch shall be charged into the mixer so that some water will enter the drum in advance of cement and aggregates. All water shall be in the drum by the end of the first 15 seconds of the specified mixing time. Each batch shall be mixed until the concrete is uniform in colour, for a minimum period of two minutes after all the materials and water are in the drum. The entire contents of the drum shall be discharged in one operation before the raw materials for the succeeding batches are fed into the drum.
- iv. Each time the work stops, the mixer shall be cleaned out and when next commencing the mixing, the first batch shall have 10% additional cement to allow for sticking in the drum.

iv Sampling and testing concrete in the field

Facilities required for sampling materials & concrete in the field, if Engineer so desires, shall be provided by Contractor at no extra cost. The following equipment with operator shall be made available at Engineer's request (all must be in serviceable condition)

Sr.	EQUIPMENT	QUANTITY
1	Concrete cube testing machine suitable for 15 cm cubes of 100 Tonnes capacity with proving calibration ring	1 No.
2	Cast Iron cube moulds 15 cm size.	12 Nos.(min.)
3	Slump cone complete with tamping rod	2 set s
4	Laboratory balance to weigh upto 5 Kg, with sensitivity of 10 gm.	1 No.
5	IS Sieves for coarse and fine aggregates.	1 set
6	Electric oven with thermostat upto 120°C.	1 No.
7	Flakiness gauge.	1 No.
8	Elongation index gauge.	1 No.
9	Sedimentation pipette.	1 No.
10	Pycnometer.	1 No.
11	Calibrated glass jar 1 litre capacity.	2 Nos.
12	Glass flasks & metal containers.	As required
13	Chemical reagents like sodium hydroxide, tannic acid, litmus papers etc.	As required
14	Laboratory balance of 2 Kg capacity and of sensitivity of 1 gm.	1 No.

Note: Arrangement can be made by Contractor to have the cubes tested in an approved laboratory in lieu of a testing machine at site at his expense, with the prior consent of the Engineer.

Sampling for strength of concrete:

Sampling shall be done as per provisions of IS:456.

At least 6 test cubes of each class of concrete shall be taken for every 150 cum. concrete or part thereof. Such samples shall be drawn on each day for each type of concrete. of each set of 6 cubes, three shall be tested at 7 days age and three at 28 days age. The laboratory test results shall be tabulated and furnished to Engineer. Engineer will pass the concrete if average strength of the specimens tested is not less than the strength specified, subject to the condition that only one out of three consecutive tests may give a value less than the specified strength but this shall not be less than 90% of the specified strength.

Consistency:

Slump tests shall be carried out as often as demanded by Engineer and invariably from the same of concrete from which the test cubes are made. Slump tests shall be done immediately after sampling.

v. Admixtures:

Admixtures may be used in concrete only with the approval of Engineer based upon evidence that, with the passage of time, neither the compressive strength nor its durability will reduce. Calcium chloride shall not be used for accelerating set of the cement for any concrete containing

reinforcement, or embedded steel parts. When calcium chloride is permitted to be used, such as in mass concrete works, it shall be dissolved in water and added to the mixing water in an amount not to exceed 1½ percent of the weight of the cement in each batch of concrete. When admixtures are used, the designed concrete mix shall be corrected accordingly. Admixtures shall be used as per manufacturer's instructions and in the manner and with the control specified by Engineer. However, the specific requirements as given in **Chapter 7** shall be adhered to.

Air entraining agents:

Where specified and approved by Engineer, neutralized vinsol resin or any other approved air entraining agent may be used to produce the specified amount of air in the concrete mix and these agents shall conform to the requirements of ASTM standard 6-260; Air Entraining Admixtures for Concrete. The recommended total air content of the concrete is 4% ± 1%. The method of measuring air content shall be as per IS: 1199.

Water reducing admixtures:

Where specified and approved by Engineer water reducing lignosulfonate mixture shall be added in quantities specified by Engineer. The admixtures shall be added in the form of a solution.

Retarding admixtures:

Where specified and approval by Engineer, retarding agents shall be added to the concrete mix in quantities specified by Engineer.

Water proofing agent:

Where specified and approved by Engineer, water proofing agent conforming to IS: 2645, shall be added in quantities specified by Engineer.

Other admixtures:

Engineer may at his discretion instruct Contractor to use any other admixture in the concrete.

vi. Optional Tests

Engineer, if he so desires, may order tests to be carried out on cement, sand, coarse aggregate, water in accordance with the relevant Indian Standards.

Tests on cement shall include:

1. Fineness test
2. Test for normal consistency
3. Test for setting time
4. Test for soundness
5. Test for tensile strength

6. Test for compressive strength
7. Test for heat of hydration (by experiment and by calculations) in accordance with IS: 269.

Tests on sand shall include:

1. Sieve test
2. Test for organic impurities
3. Decantation test for determining clay and silt content
4. Specific gravity test
5. Test for unit weight and bulkage factor
6. Test for sieve analysis and fineness modulus.

Tests on coarse aggregate shall include:

1. Sieve analysis
2. Specific gravity and unit weight of dry, loose and rodded aggregate
3. Soundness and alkali aggregate reactivity
4. Petrographic examination
5. Deleterious materials and organic impurities
6. Test for aggregate crushing value.

Any or all these tests would normally be ordered to be carried out only if Engineer In- Charge feels the materials are not in accordance with the Specifications or if the specified concrete strengths are not obtained and shall be performed by Contractor at an approved test laboratory. If the tests are successful, owner shall pay for all such optional tests otherwise Contractor shall have to pay for them.

If the works cubes do not give the stipulated strengths, Engineer reserves the right to ask Contractor to dismantle such portions of the work, which in his opinion are unacceptable and re-do the work to the standard stipulated, at Contractor's cost. The unit rate for concrete shall be all inclusive, including making preliminary mix design and test cubes, works, cubes, testing them as per Specification, slump tests, optional tests, etc. complete.

Load test on members or any other tests:

In the event of any work being suspected of faulty material or workmanship or both, Engineer requiring its removal and reconstruction may order, or Contractor may request that it should be load tested in accordance with the following provisions:

1. The test load shall be 125 percent of the maximum super- imposed load for which the structure was designed. Such test load shall not be applied before 56 days after the effective hardening of concrete. During the test, struts strong enough to take the whole load shall be placed in position leaving a gap under the members. The test load shall be maintained for 2 hours before removal.
2. If within 24 hours of the removal of the load, the structure does not show a recovery of at least 75 percent of the maximum deflection shown during the 24 hours under load, the

test loading shall be repeated after a lapse of at least 72 hours. The structure shall be considered to have failed to pass the test if the recovery after the second test is not at least 75 percent of the maximum deflection shown during the second test. If the structure is certified as failed by the Engineer, the cost of the load test shall be borne by the Contractor.

3. Any other tests, e.g. taking out in an approved manner concrete cores, examination and tests on such cores removed from such parts of the structure as directed by Engineer In-Charge, sonic testing etc. shall be carried out by Contractor if so directed.

Unsatisfactory tests:

1. Should the results of any test prove unsatisfactory, or the structure shows signs of weakness, undue deflection or faulty construction Contractor shall remove and rebuild the member or members involved or carry out such other remedial measures as may be required by Engineer / Owner. Contractor shall bear the cost of so doing, unless the failure of the member or members to fulfill the test conditions is proved to be solely due to faulty design. The cost of load and other tests shall be borne by Contractor if the tests show unsatisfactory results; otherwise such costs will be borne by Owner.

Preparation prior to concrete placement, final inspection and approval

- i. Before the concrete is actually placed in position, the insides of the formwork shall be inspected to see that they have been cleaned and oiled. Temporary openings shall be provided to facilitate inspection, especially at bottom of columns and wall forms, to permit removal of saw dust, wood shavings, binding wire, rubbish, dirt etc. Openings shall be placed or holes drilled so that these materials and water can be removed easily. Such openings / holes shall be later suitably plugged.
- ii. The various trades shall be permitted ample time to install drainage and plumbing lines, floor and trench drains, conduits, hangers, anchors, inserts, sleeves, bolts, frames and other miscellaneous embedments to be cast in the concrete as indicated on the Drawings or as is necessary for the proper execution of the work. Contractor shall cooperate fully with all such agencies, and shall permit the use of scaffolding, formwork etc. by other trades at no extra cost.
- iii. All embedded parts, inserts etc. supplied by Owner or Contractor shall be correctly positioned and securely held in the forms to prevent displacement during depositing and vibrating of concrete.
- iv. All anchor bolts shall be positioned and kept in place with the help of properly manufactured templates unless specifically waived in writing by Engineer. The use of all such templates, fixtures etc. shall be deemed to be included in the rates. Slots, openings, holes, pockets etc. shall be provided in the concrete work in the positions indicated in the Drawings or as directed by Engineer.
- v. Reinforcement and other items to be cast in concrete shall have clean surfaces that will not impair bond.

- vi. Prior to concrete placement all work shall be inspected and approved by Engineer and if found unsatisfactory, concrete shall not be poured until after all defects have been corrected at Contractor's cost.
- vii. Approval by Engineer of any and all materials and work as required herein shall not relieve Contractor from his obligation to produce finished concrete in accordance with the Drawings and Specifications.

Rain or wash water:

No concrete shall be placed in wet weather or on a water covered surface. Any concrete that has been washed by heavy rains shall be entirely removed, if there is any sign of cement and sand having been washed away from the concrete mixture. To guard against damage which may be caused by rains, the works shall be covered with tarpaulins immediately after the concrete has been placed and compacted before leaving the work unattended. Any water accumulating on the surface of the newly placed concrete shall be removed by approved means and no further concrete shall be placed thereon until such water is removed. To avoid flow of water over / around freshly placed concrete, suitable drains & sumps shall be provided.

Bonding mortar:

Immediately before concrete placement begins, prepared surfaces except formwork, which will come in contact with the concrete to be placed, shall be covered with a bonding mortar as specified in paragraph 24.7 of this section.

Transportation:

All buckets, containers or conveyers used for transporting concrete shall be mortar-tight. Irrespective of the method of transportation adopted, concrete shall be delivered with the required consistency and plasticity without segregation or loss of slump. However, chutes shall not be used for transport of concrete without the written permission of Engineer and concrete shall not be rehandled before placing.

Retempered or contaminated concrete:

Concrete must be placed in its final position before it becomes too stiff to work. On no account, water shall be added after the initial mixing. Concrete which has become stiff or has been contaminated with foreign materials shall be rejected and disposed off as directed by Engineer.

Cleaning of equipment:

All equipment used for mixing, transporting and placing of concrete shall be maintained in clean condition. All pans, buckets, hoppers, chutes, pipelines and other equipment shall be thoroughly cleaned after each period of placement.

1.4.4.4 Procedure for Placing of Concrete

Engineer's approval of equipment & methods:

Before any concrete is placed, the entire placing programme, consisting of equipment, layout, proposed procedures and methods shall be submitted to Engineer for approval if so demanded by Engineer and no concrete shall be placed until Engineer's approval has been received. Equipment for conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete during depositing, without segregation of materials, considering the size of the job and placement location.

Time interval between mixing and placing

Concrete shall be placed in its final position before the cement reaches its initial set and concrete shall normally be compacted in its final position within thirty minutes of leaving the mixer, and once compacted it shall not be disturbed.

Avoiding segregation

Concrete shall, in all cases, be deposited as nearly as practicable directly in its final position, and shall not be rehandled or caused to flow in a manner which will cause segregation, loss of materials, displacement of reinforcement, shuttering or embedded inserts or impair its strength. For locations where direct placement is not possible, and in narrow forms, Contractor shall provide suitable drop and "Elephant Trunks" to confine the movement of concrete.

Special care shall be taken when concrete is dropped from a height, especially if reinforcement is in the way, particularly in columns and thin walls.

Placing by manual labour

Except when otherwise approved by Engineer, concrete shall be placed in the shuttering by shovels or other approved implements and shall not be dropped from a height more than 1.0 M or handled in a manner which will cause segregation.

Placing by mechanical equipment

The following Specification shall apply when placing of concrete by use of mechanical equipment is specifically called for while inviting bids or is warranted considering the nature of work involved.

The control of placing shall begin at the mixer discharge by a vertical drop into the middle of the bucket or hopper and this principle of a vertical discharge of concrete shall be adhered to throughout all stages of delivery until the concrete comes to rest in its final position.

Type of Buckets.

Central-bottom-dump buckets of a type that provides for positive regulation of the amount and rate of deposition of concrete in all dumping position shall be employed.

Operation of Bucket

Placing concrete in large open areas, the bucket shall be spotted directly over the position designated and then lowering for dumping. The open bucket shall clear the concrete already in place and the height of drop shall not exceed 1.00 M. The bucket shall be opened slowly to avoid high vertical bounce. Dumping of buckets on the swing or in any manner which results in separation of ingredients or disturbance of previously placed concrete will not be permitted.

Placement in restricted forms

Concrete placed in restricted forms by barrows, buggies, short chutes hand shoveling shall be subject to the requirement for vertical delivery of limited height to avoid segregation and shall be deposited as nearly as practicable in its final position.

Chuting

Where it is necessary to use transfer chutes, specific, approval of Engineer must be obtained to type, length, slopes, baffles, vertical terminals and timing of operations. These shall be so arranged that an almost continuous flow of concrete is obtained at the discharge and without segregation. To allow for the loss of mortar against the sides of the chutes, the first mixes shall have less coarse aggregate. During cleaning of chutes, the waste water shall be kept clear of the forms. Concrete shall not be permitted to fall from the end of the chutes by more than 1.0 M. Chutes, when approved for use, shall have slopes not flatter than 1 vertical: 3 horizontal and not steeper than 1 vertical: 2 horizontal. Chutes shall be of metal or metal lined and of rounded cross section. The slopes of all chute sections shall be approximately the same. The discharge end of the chutes shall be maintained above the surface of the concrete in the forms.

Placing by pumping / pneumatic placers

- i. Concrete may be conveyed and placed by mechanically operated equipment e.g. pumps or pneumatic placers, only with the written permission necessary for conveying concrete by this method.
- ii. When pumping is adopted, before pumping of concrete is started, the pipeline shall be lubricated with one or two batches of mortar composed of one part cement and two parts sand. The concrete mix shall be specially designed to suit pumping. Care shall be taken to avoid stoppages in work once pumping has started.
- iii. When pneumatic placer is used, the manufacturer's advice on layout of pipeline shall be followed to avoid blockages and excessive wear. Restraint shall be provided at the discharge box to take care for the reaction at this end.
- iv. Manufacturer's advice shall be followed regarding concrete quality and all other related matters when pumping / pneumatic placing equipment are used.

Concrete in layers

Concrete, once started, shall be continuous until the pour is completed. Concrete shall be placed in successive horizontal layers of uniform thickness ranging from 15 to 90 cm or as directed by Engineer. These shall be placed as rapidly as practicable to prevent the formation of cold joints or planes of weakness between each succeeding layer within the pour. The thickness of each layer shall be such that it can be deposited before the previous layer has stiffened. The bucket loads or other units of deposit, shall be spotted progressively along the face of the layer with such overlap as will facilitate spreading the layer to uniform depth and texture with a minimum of shoveling. Any tendency to segregation shall be corrected by shoveling stones. Such a condition shall be corrected by redesign of mix or other means, as directed by Engineer.

Bedding of layers

The top surface of each pour and Bedding planes shall be approximately horizontal unless otherwise instructed.

Compaction

Concrete shall be compacted during placing, with approved vibrating equipment until the concrete has been consolidated to the maximum practicable density, is free of pockets of coarse aggregate fits tightly against all form surfaces, reinforcement and embedded fixtures. Particular care shall be taken to ensure that all concrete placed against the form faces and into corners of forms or against hardened concrete at joints is free from voids or cavities. The use of vibrators shall be consistent with the concrete mix and caution exercised not to over vibrate the concrete to the point that segregation results.

Type of Vibrators

1. Vibrators shall conform to IS Specifications. Type of vibrator to be used shall depend on the structure where concrete is to be placed. Shutter vibrators to be effective, shall be firmly secured to the formwork which must be sufficiently rigid to transmit the vibration and strong enough not to be damaged by it. Immersion vibrators shall have "no load" frequency, on the size of the vibrator.
2. Immersion vibrators in sufficient numbers and each of adequate size shall be used to properly consolidate all concrete. Tapping or external vibrating of forms by hand tools or immersion vibrators will not be permitted.

3. Use of Vibrators

The exact manner of application and the most suitable machines for the purpose must be carefully considered and operated by experienced men. Immersion vibrators shall be inserted vertically at points not more than 450 mm apart and withdrawn when air bubbles cease to come to the surface. Immersion vibrators shall be withdrawn very slowly. In no case shall immersion vibrators be used to transport concrete inside the forms. Particular attention shall be paid to vibration at the top of lift e.g. in a column or wall.

Melding Successive Batches

When placing concrete in layers, which are advancing horizontally as the work progresses, great care shall be exercised to ensure adequate vibration, blending and melding of the concrete between the succeeding layers.

Penetration of Vibrator

The immersion vibrator shall penetrate the layer being placed and also penetrate the layer below while the underlayer is still plastic to ensure good bond and homogeneity between the two layers and prevent the formation of cold joints.

Vibrating Against Reinforcement

Care shall be taken to prevent contact of immersion vibrators against reinforcement steel. Immersion vibrators shall not be allowed to come in contact with reinforcement steel after start of initial set. They shall also not be allowed to come in contact with forms or finished surfaces.

Use of Form Attached Vibrators

Form attached vibrators shall be used only with specific authorization of Engineer.

Use of Surface Vibrators

The use of surface vibrators will not be permitted under normal conditions. However, for thin slabs, such as highways, runways and similar constructions, surface vibration by specially designed vibrators may be permitted, upon approval of Engineer.

Stone pockets and Mortar Pondages

The formation of stone pockets or mortar pondages in corners and against faces of forms shall not be permitted. Should these occur, they shall be dug out, reformed and refilled to sufficient depth and shape for through bonding, as directed by Engineer.

Placement interval

Except when placing with slip forms, each placement of concrete in multiple lift work, shall be allowed to set for atleast 24 hours after the final set of concrete and before the start of a subsequent placement.

Special provision in placing

When placing concrete in walls with openings, in floors of integral slabs and beam construction and other similar conditions, the placing shall stop when the concrete reaches the top of the opening in walls or bottom horizontal surface of the slab, as the case may be

Placing shall be resumed before the concrete in place takes initial set, but not until it has had time to settle as determined by Engineer In- Charge.

Placing concrete through reinforcing steel

When placing concrete through reinforcing steel, care shall be taken to prevent segregation of the coarse aggregate. Where the congestion of steel makes placing difficult, it may be necessary to temporarily move the top aside to get proper placement and restore reinforcing steel to design position.

Bleeding

Bleeding or free water on top of concrete being deposited into the forms, shall be a cause to stop the concrete pour and the conditions causing this defect corrected before any further concreting is resumed.

Mass Foundations

Mass Foundations shall be poured in lifts not exceeding 1.5m. in height unless otherwise indicated on the Drawings or approved by Engineer.

Slump of Concrete Slump of concrete shall range between 100 to 180 mm depending on the manner of concreting. The table below gives the general guidance.

6.5 Piling work

6.5.1 Piling Slump (in mm) typical conditions of use

Minimum slump of 100 mm and Max. slump of 180mm -Pouring into water-free unlined bore having widely spaced reinforcement. Where reinforcement is not spaced widely enough, cut-off level of pile is within the casting and diameter of pile less than or equal to 600mm, higher order of slump within this range may be used.

Minimum slump of 150mm and max. slump of 180mm- Where concrete is to be placed under water or drilling mud by tremie or by placer.

Structural Design: The piles shall have necessary structural strength to transmit the load imposed on it, to soil. Relevant part of IS: 2911 (Part I/ Sec.2) and specific requirements shall be considered to apply for assessing the structural capacity of piles.

Reinforcement - The minimum longitudinal reinforcement shall be 0.4% of the cross sectional area of the pile.

Clear cover to the main reinforcement shall be 50 mm. This shall be increased to 75 mm in case of aggressive soils and ground water conditions.

The vertical reinforcement shall project 50 times its diameter above the cut-off level.

The minimum clear distance between the two adjacent main reinforcement bars should normally be 100 mm for the full depth of cage. The bars shall be so placed as not to impede

the placing of concrete. The lateral ties in the reinforcing cage shall be preferably spaced not closer than 150 mm centre to centre. The minimum diameter of the lateral ties shall be 6 mm.

6.5.2 Equipment and accessories

The equipment and accessories for installation of bored case-in-situ piles shall be selected giving due consideration to the subsoil conditions and the method of installation, etc. These shall be of standard type and shall have the approval of the Engineer-in-Charge. The capacity of the rig shall be adequate so as to reach the desired depth. Provision shall be kept for chiseling within the borehole in case of any underground obstruction/hard strata. However, chiseling shall be carried out only with the approval of Engineer-in-Charge.

6.5.3 Piling Installation

Control of Alignment The piles shall be installed as accurately as possible as per the designs and drawings. The permissible positional deviations shall be governed by IS: 2911 (Part I /Sec.2). In case of piles deviating beyond such permissible limits, the piles shall be replaced or supplemented by additional piles, as directed by Engineer-in-Charge.

Boring : The boring shall be done by one of the following methods: (a) Direct mud circulation (b) Reverse mud circulation (c) Bailer bentonite. The actual method of construction to be followed shall be as per specific requirements. In very soft soil a permanent liner shall be installed to ensure stability of borehole. A liner shall be used to protect the green concrete where a high hydrostatic pressure exists in the subsoil or where an underground flow of water exists and which is likely to damage the concrete on withdrawal of casing. Use of temporary liner only in lieu of bentonite to stabilize sides of boreholes shall not be permitted. Properties of bentonite used and quality control shall be as per IS: 2911 (Part I /Sec.2).

6.5.4 Concreting of Piles

The reinforcements shall be made into cages sufficiently rigid to withstand handling without damage. In case the reinforcement cage is made up more than one segment, the same shall be assembled by providing necessary laps preferably by welding. Stirrups to the main bars shall be tack welded. Care shall be taken to ensure that the reinforcement bars do not come closer while the cage is lowered down the hole. Proper cover and central placement of the reinforcement shall be ensured by use of suitable concrete spacers or rollers, case specifically for the purpose. Concreting shall not be commenced until the Engineer-in-Charge satisfies himself that at final borehole depth the soil is not weaker than that taken as the basis for pile design. If necessary, SPT or similar test shall be conducted to ensure the above. Borehole bottom shall be thoroughly cleaned to make it free from sludge or any foreign matter before lowering the reinforcement cage. The full length of reinforcement cage shall be in position before start of concreting. Concreting shall be done by tremie method. The operation of tremie concreting shall be governed by IS: 2911 (Part I / Sec.2).

The concrete placing shall not proceed if specific gravity of fluid near about the bottom of borehole exceeds 1.2. Determination of the specific gravity of the drilling mud from the base of the borehole shall be carried out by taking samples of fluid by suitable slurry sampler approved by the Engineer-in-Charge, in first few piles and at a suitable interval of piles thereafter and the results recorded. Control of consistency of drilling mud shall be carried out throughout boring as well as concreting operations. Care shall be exercised to preserve

correct cover and alignment of reinforcement and avoid any damage to it throughout the complete operation of placing the concrete. The top of the pile shall be brought up above the cut off level minimum by 0.75 m so as to permit removal of all laitance and weak concrete before capping and to ensure good and sound concrete at the cut off level for proper embedment into the pile cap. Any defective concrete in the head of the completed piles shall be cut-away and made good with new concrete.

6.5.5 Defective Piles

Defective piles shall be removed or left in place, as judged convenient by the Architect/Engineer-inCharge, without affecting the performance of adjacent piles of capping above and additional piles shall be provided to replace them.

6.5.6 Recording of Data

A competent supervisor shall be present to record the necessary information during the installation of piles. The data to be recorded shall include: a) The dimensions of the piles, including the reinforcement detail and the mark of the pile. b) The boring method employed. c) The type of soil in which pile is terminated. d) The depth bored. e) The depth of water table. f) When drilling mud is used, the specific gravity of the fresh supply and contaminated mud in the borehole before concreting is taken up, in case of first few piles and subsequently at suitable interval of piles. g) The time taken for concreting. h) The cut-off level/working level, and i) The consumption of cement. j) Any other important observations.

Tests on Pile- Tests shall be carried out as per directions of engineer incharge and as per IS- 2911

6.5.7 Pile Caps

The size of the pile cap is fixed in such way that it has clear overhang beyond the outermost pile not less than 100mm, but preferably 150mm.

It should be deep enough to allow the necessary overlap of reinforcements from column and piles.

The clear cover to the main reinforcement should not be less than 40mm.

The span to thickness ratio of the cap should not be more than 5 so that pile cap is rigid enough to distribute the load uniformly to the piles.

Generally, its thickness should not be less than 1000mm .

The piles should at least 50mm into the pile cap. A leveling course of not less 75mm thick concrete should be provided under the pile cap.

The thickness of the Pile Cap is fixed such that it is adequate to resist shear without shear reinforcement and the bars projecting from the piles and the dowel bars for the column can be provided adequate bond length. As per IS 456- 2000, the minimum thickness on top of piles should not be less than 300 mm. Pile cap depth should be kept on the high side to effect economy in the consumption of steel and also to provide adequate rigidity to pile cap. Generally, pile cap thickness should not be less than 500 mm which may be reduced to 300 mm at the free edges. For pile caps to be rigid, pile cap has to be quite deep with 600 mm as the minimum depth.

As a guide line the formula given by Reynolds may be followed for thickness of pilecap.
For Pile dia > 550 mm, Pile cap depth (h) = (2xDia. Of pile+ 100)mm .

The main reinforcement is usually bend (full bend) and extended for full depth of pile cap to fulfill the check for development length. The minimum reinforcement shall be 0.15 % BD for main reinforcement and 0.12 % BD for secondary reinforcement may be provided. For bursting (horizontal binders) it is suggested that 25 % of the main reinforcement (usually 12 Φ RTS at 150 mm c/c) shall be used. Cover :- A cover of 75 mm is usually provided for the pile cap surfaces in contact with earth and 60 mm against blinding concrete of 75 to 100 mm thick.

This section details the structural design specifications for nallah covering system. This shall form integral part of the development obligations of the contractor shall have to comply with these specifications as bare minimum.

6.6 Back Filling

Trenches shall be backfilled with approved selected excavated material only after the successful testing of the pipe line. The tamping around the pipe shall be done by hand or other hand operated mechanical means. The water content of the soil shall be as near to the optimum moisture content as possible. Filling of the trench shall be carried out simultaneously on both sides of the pipe in such a manner that unequal pressure does not occur. Back filling shall be consolidated by watering, ramming, care being taken to avoid damage to the pipe line. In case of mild steel pipes / specials, the spiders provided during assembly and welding shall be retained until the trench is refilled and consolidated. Where timbers are placed under the pipe line to aid alignment, these timbers shall be removed before backfilling.

6.7 Cement Concrete Flooring

6.7.1 Cement Concrete

Cement concrete of specified mix shall be used and it shall generally conform to the Specifications described Chapter 9 of RUIDP Technical Specifications.

6.7.2 Base Concrete

Flooring shall be laid on base concrete where so provided. The base concrete shall be provided with the slopes required for the flooring. Flooring in verandah Courtyard kitchens & baths shall have slope ranging from 1:48 to 1:60 depending upon location and as decided by the Engineer. Floors in water closet portion shall have slope of 1:30 or as decided by the Engineer to drain off washing water. Plinth masonry off set shall be depressed so as to allow the base concrete to rest on it.

If the base consists of lime concrete, it shall be allowed to set for seven days and the flooring shall be laid within the next three days.

If the base is of lean cement concrete, the flooring shall be commenced preferably within 48 hours of the laying of base concrete. The surface of the base shall be roughened with steel

wire brushes without disturbing the concrete. Immediately before laying the flooring, the base shall be wetted and a coat of cement slurry at 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

If the cement concrete flooring is to be laid directly on the RCC slab, the top surface of RCC slab shall be cleaned and the laitance shall be removed and a coat of cement slurry at 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

Thickness

The thickness of floor shall be as specified in the description of the item.

6.7.3 Laying Panels

Flooring specified thickness shall be laid in the pattern including the border/or as given in the Drawings or as directed by the Engineer. The border panels shall not exceed 450 mm in width and the joints in the border in line with panel joints. The panels shall be of uniform size and no dimension of a panel shall exceed 2 m and the area of a panel shall not be more than 2 sqm.

Laying of flooring without Strips

Laying of cement concrete flooring in alternate panels may be allowed by the Engineer in case strips are not to be provided.

1. Shuttering

The panels shall be bounded by angle iron or flats. The angle iron/flat shall have the same depth as the concrete flooring. These shall be fixed in position, with their top at proper level giving required slopes. The surface of the angle iron or flats, to come in contact with concrete shall be smeared with soap solution or non-sticking oil (Form oil or raw linseed oil) before concreting. The flooring shall butt against the unplastered masonry wall.

2. Concreting

The concreting shall be done in the manner described under Clause 22.5.4.2. The angle iron/flats used for shuttering, shall be removed on the next day of the laying of cement concrete. The ends thus exposed shall be repaired, if damaged with cement mortar 1:2 (1 cement: 2 coarse sand) and allowed to set for minimum period of 24 hours. The alternate panels shall then be cleaned of dust, mortar, droppings etc. and concrete laid. While laying concrete, care shall be taken to see that the edges of the previously laid panels are not damaged and fresh mortar is not splashed over them. The joints between the panels should come out as fine straight lines.

3. Finishing

1. The finishing of the surface shall follow immediately after the cessation of beating. The surface shall be left for some time, till moisture disappears from it or surplus water can

be mopped up. Use of dry cement or cement and sand mixture sprinkled on the surface to stiffen the concrete or absorb excessive moisture shall not be permitted. Excessive trowelling shall be avoided.

2. Fresh cement shall be mixed with water to form a thick slurry and spread at the rate of 2 kg of cement over an area of one sqm of flooring while the flooring concrete is still green. The cement slurry shall then be properly processed and finished smooth.
3. The edges of sunk floors shall be finished and rounded with cement with a floating coat of neat cement
4. The junctions of floor with wall plaster, dado or skirting shall be rounded off where so specified.
5. The men engaged on finishing operations shall be provided with raised wooden platform to sit on so as to prevent damage to new work.

4. **Curing**

The curing shall be done for a minimum period of ten days. Curing shall not be commenced until the top layer has hardened. Covering with empty gunnies shall be avoided as the colour of the flooring is likely to be bleached due to the remnants of cement dust from the bags.

Precautions

Flooring in lavatories and bath room shall be laid only after fixing of water closet and squatting pans and floor traps. Traps shall be plugged while laying the floors and opened after the floors are cured and cleaned. Any damage done to W.C.'s squatting pans and floor traps during the execution of work shall be made good.

During cold weather, concreting shall not be done when the temperature falls below 4 degree Centigrade. The concrete placed shall be protected against frost by suitable covering. Concrete damaged by frost shall be removed and work redone. During hot weather, precautions shall be taken to see that the temperature of wet concrete does not exceed 38 degree Centigrade. No concreting shall be laid within half a hour of the closing time of the day, unless permitted by the Engineer. To facilitate rounding of junction of skirting, dado and floor, the skirting/dado shall be laid along with the border or adjacent panels of floor.

6.8 Paver Block Flooring

6.8.1 Paver Blocks

Paver Blocks Manufacturing Facilities
Concrete Block making Machines

The block-making machine should ensure the following:

- i. High degree of dimensional accuracy (+ 3mm)
- ii. Precast blocks with spacer nibs (2mm to ensure uniform joints)
- iii. High compaction energy (to produce blocks with high compressive strength)

The above can be generally achieved by machine with following features

Block making machine should have simultaneous application of high intensity vibration to moulds

3000 V.P.M. and hydraulic pressure of 800 psi.

6.8.2 Concrete Batching and Mixing Plant

The concrete Mix Design should be followed for each batch of materials. The concrete ingredient should be mixed in concrete Batching & Mixing plant with suitable capacity.

The plant should be equipped with automatic control panel for maintaining water cement ratio from batch to batch to obtain concrete of uniform quality and strength. The plant should be equipped with adequate mechanism for mechanized loading of raw materials into mixer and conveyor belt for transportation of concrete from mixer to concrete block making machine.

6.8.3 Raw materials

1. Cement

The cement used in the manufacture of high quality precast concrete paving block shall be conforming to IS 12269 (53 grade) ordinary Portland Cement or IS 8112 (43 grade ordinary Portland cement). The minimum cement content in concrete used for making paver blocks should be 350 kg/Cu.M.

2. Aggregates

The fine and coarse aggregates shall consist of naturally occurring crushed or uncrushed materials, which, apart from the grading requirements comply with IS 383-1970. The fine aggregates used shall contain a minimum of 25% natural silica sand. Lime stone aggregates shall not be used. Aggregates shall contain no more than 3% by weight of clay and shall be free from deleterious salts and contaminants.

3. Water

The water shall be clean and free from any deleterious matter. It shall meet the requirements stipulated in IS: 456-2000.

4. Other materials

Any other material/ingredients used in the concrete shall conform to latest IS specifications.

6.8.4 Paver Block Characteristics

- The concrete pavers should have perpendicularities after release from the mould and the same should be retained until the laying.
- The surface should be of anti-skid and anti-glare type.
- The paver should have uniform chamfers to facilitate easy drainage of surface run off.
- The pavers should have spacer ribs, for uniform interlocking space of 2 mm to 3 mm to ensure compacted sand filling after vibration on the paver surface.
- The concrete mix design should be monitored for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality. The pavers shall be manufactured in single layer only.
- Skilled labour should be employed for laying blocks to ensure line and level for laying, desired shape of the surface and adequate compaction of the sand in the joints.
- The pavers are to be skirted all round with kerbing using solid concrete blocks of size 100 mm x 200 mm x 400 mm or as directed by the Engineer. The kerbing should be embedded for 100 mm depth. The concrete used for kerbing shall be cured properly for 7 days minimum.

Construction Aspects

6.8.5 Sequencing of Operations

The sequencing of operations for construction ICBP should be as follows –

- Installation of sub-surface drainage structures Levelling and compaction of sub-grade.
 - Provision and compaction of sub-base course (where needed)
 - Provision and compaction of base course and checking for correct profile
 - Installation of edge restraints
 - Provision and compaction of coarse bedding sand
 - Paving of blocks and compaction
 - Application of joint sealing sand and compaction
 - Cleaning of surface
 - Filling any remaining empty portions in the block layer with in-situ concrete.
 - Paving Job Planning
Proper job planning, use of proper techniques any coordination of materials handling, paving and compaction teams can greatly enhance efficiency and economy of paving job. The following are some of the key factors in job planning and cost control.
- Ensure that edge restraints are properly located to minimize cutting of blocks.
 - Use cut blocks and end blocks, wherever needed.
 - Spread bedding sand mechanically, when possible.
 - Locate pavement start lines and subsequent development of the laying face to ensure that a laying face continues in one general direction.
 - Use guidelines to control regularity of bond.
 - Anticipate and plan detailing of the pavement at perimeters and obstructions and aprons of manholes, drainage pits etc.
 - Position bedding sand, joint sealing sand and paver block deliveries so as to minimize rehandling.
 - Use suitable trollies or buggies to ease transport of blocks from delivery points to the laying face.
 - Locate and phase paving and compaction teams to facilitate orderly progress of work.
 - Do not allow traffic or pedestrian movement on block paved surface until compaction is completed.

6.8.6 Provisions of Bedding Sand Layer

The bedding sand shall consist of a clean well graded sand passing through 4.75 mm sieve and suitable for concrete. The bedding sand should be from either a single source or blended to achieve the following grading.

In sieve size	% passed
10 mm	100
4.75 mm	95-100
In sieve size	% passed
2.36 mm	80-100
1.18 mm	60-100
600 microns	25-60
300 microns	10-30
150 microns	5 15
75 microns	0 10

Contractor shall be responsible to ensure that single-sized, gap graded sands or sands containing an excessive number of fines or plastic fines are not used. The sand particles should preferably be sharp not rounded as sharp sand possess higher strength and resist the migration of sand from under the block to less frequently used areas even though sharp sands are relatively more difficult to compact than rounded sands, the use of sharp sands is preferred for the more heavily trafficked driveways. The sand used for bedding shall be free of any deleterious soluble salts or other contaminants likely to cause efflorescence.

The sand shall be of uniform moisture content and within 4% - 8% when spread and shall be protected against rain when stock piled prior to spreading. Saturated sand shall not be used. The bedding sand shall be spread loose in a uniform layer as per drawing.

The compacted uniform thickness shall be of 45 mm and within +/- 5 mm. Thickness variation shall not be used to correct irregularities in the base course surface. The spread sand shall be carefully maintained in a loose dry condition and protected against pre-compaction both prior to and following screeding. Any precompacted sand or screeded sand left overnight shall be loosened before further laying of paving blocks take place.

Sand shall be lightly screeded in a loose condition to the predetermined depth only slightly ahead of the laying of paving unit.

Any depressions in the screeded sand exceeding 5 mm shall be loosened, raked and rescreeded before laying of paving blocks.

Bedding sand should be unloaded in small piles regularly placed over the base course. Bedding sand should preferably have moisture content of about 6 percent, which will facilitate its spreading and compaction. Bedding sand should be screeded in a uniform layer over the base course. The screed can be guided to level by tensioned string lines set above the base course. At the time of screeding, the thickness of sand must allow for the amount by which it will be subsequently compacted. The sand should be distributed evenly with a small surcharge maintained in front of the screed. Screeding should not proceed beyond about 1m ahead of the planned end of block paving for the day. Sand should be compacted with a manual, fabricated plate compactor or other suitable devices and the level should be readjusted using the screed. The surface profile of the screeded bedding sand should match that for the completed pavement.

6.8.7 Provisions of Paver Block layer

The pattern in which blocks are to be paved should be decided from the choices available, as per Figure 5. for paving in trafficked areas, herringbone pattern should be adopted for ensuring better performance. Paving should commence and progress from one starting line only. Wherever possible, paving should commence adjacent to or against edge restraint.

Blocks should be placed at the correct angle to the start line to achieve the final orientation of the laying pattern. For curved or unfavorably oriented edge restraints, a string line should be established to permit fast, easy laying such that it is never necessary to force a block between blocks already paved. Maintenance of control over alignment, laying pattern and joint width can be assisted by the use of chalked string lines set at about 5m intervals. Nominal joint width of 2 to 4 mm should be maintained by holding the paving unit lightly against the face of the adjacent block and allowing it to slide into position. Cutting paving units for filling the paving gaps occurring against edge restraints etc. should be deferred until sufficient work has progressed to allow reasonably continuous operation. When space does not permit the use of cut pieces of blocks, the use of premixed or dry packed concrete is recommended.

6.8.8 Laying of Paver Blocks

Priming

It will be responsibilities of the Contractors to ensure that the manhole/pipeline cable trenches/circular drainage system etc. raised to driveway level using the requisite materials as per instruction of Engg. The areas of potholes/deep depressions at the isolated locations also have to be filled up before laying the paver blocks. No extra pavements will be made for this purpose.

It will be the responsibility of the Contractors to ensure that undulations on the paver blocks are eliminated after the traffic is allowed on it. Proper slope for drainage of water needs to be ensured

6.8.9 Laying of interlocking Paver Blocks

Paver blocks shall be laid in herringbone laying pattern throughout the pavement. Once the laying pattern has been established, it shall continue without interruption over the entire pavement surface. Cutting of blocks, the use of infill concrete or discontinuities in laying pattern is not be permitted in other than approved locations.

Paver blocks shall be placed on the uncompacted screeded sand bed to the nominated laying pattern, care being taken to maintain the specified bond throughout the job. The first row shall be located next to an edge restraint. Specially manufactured edge paving blocks are permitted or edge blocks may be cut using a power saw, a mechanical or hydraulic guillotine, bolster or other approved cutting machine.

Paver blocks shall be placed to achieve gaps nominally 2 to 3 mm wide between adjacent paving joints. No joint shall be less than 1.5 mm and not more than 4 mm.

Frequent use of string lines shall be used to check alignment. In this regard, the "laying face" shall be checked at least every two meters as the face proceeds. Should the face become out of alignment, it must be corrected prior to initial compaction and before further laying job is proceeded with.

In each row, all full blocks shall be laid first. Closure blocks shall be cut and fitted subsequently. To infill spaces between 25 mm and 50 mm wide concrete having screened sand, coarse aggregate mix and strength of 45 N/sqmm shall be used. Within such mix the nominal aggregate size shall not exceed one third the smallest dimension of the infill space. For smaller spaces dry packed mortar shall be used.

Except where it is necessary to correct any minor variations occurring in the laying bond, the paver blocks shall not be hammered into position. Where adjustment of paver blocks necessary care shall be taken to avoid premature compaction of the sand bedding.

1. Initial Compaction

After laying the paver blocks, they shall be compacted to achieve consolidation of the sand bedding and brought to design levels and profiles by not less than Two (2) passes of a suitable plate compactor.

Vibrate the blocks with 3 passes of the plate vibrator of adequate capacity.

Spread a thin layer of fine joint filling sand on top of the paved blocks and sweep it into the joints using suitable brooms.

1. Vibrate the sand into the joints by making 3 passes of the compactor.
2. Sweep of the excess sand on top.

The compactor shall be a high frequency, low amplitude mechanical flat plate vibrator having plate area sufficient to cover a minimum of twelve paving blocks. Prior to compaction all debris shall be removed from the surface.

Compaction shall proceed as closely as possible following laying and prior to any traffic. Compaction shall not, however, be attempted within one metre of the lying face. Compaction shall continue until lipping has been eliminated between adjoining blocks. Joints shall then be

filled and recompacted as described in Cl. 5.6.3.5. All work further than one metre from the lying face shall be left fully compacted at the completion of each day's laying.

Any blocks that are structurally damaged prior to us during compaction shall be immediately removed and replaced. Sufficient plate compactors shall be maintained at the paving site for both bedding compaction and joint filling.

As a guide to the characteristics of typical vibrating plate compactors, standard compactors have a weight of 90 kg, a plate area of 0.3m² and apply a centrifugal force of 1500 kg. Heavy duty compactors weigh between 300 to 600 kg, have a plate area of about 0.5 to 0.6m² and apply a centrifugal force in the range of 2000 to 3000 kg. Use of heavy duty compactors is desirable for trafficked pavements. In the absence of the same.

The number of passes by the light compactor may be suitably increased.

2. Joint filling and final compaction

As soon as possible after compaction and in any case prior to the termination of work on that day and prior to the acceptance of vehicular traffic, sand for joint filling shall be spread over the pavement.

Joint sand shall pass a 2.36 mm (No.8) sieve and shall be free of soluble salts or contaminants likely to cause efflorescence. The same shall comply with the following grading limits.

In sieve size	% passed
2.36 mm	100
1.18 mm	90-100
600 microns	60-90
300 microns	30-60
150 microns	15-30
75 microns	10-20

The Contractor shall supply a sample of the jointing sand to be used in the contract prior to delivering any such materials to site for incorporation into the works. Certificates of test results issued by a recognized testing laboratory confirming that the samples conform to the requirements of this specifications shall accompany the sample.

The jointing sand shall be broomed to fill the joints. Excess sand shall then be removed from the pavement surface and the jointing sand shall be compacted with not less than one (1) Pass by the plate vibrator and joints refilled with sand to full depth. This procedure shall be repeated until all joints are completely filled with sand. No traffic shall be permitted to use the pavement until all joints have been completely filled with sand and compacted.

Both the sand and paver block shall be dry when sand is spread and broomed into the joints to prevent premature setting of sand. The difference in level (lipping) between adjacent blocks shall not exceed 3 mm with not more than 1% in any 3 m x 3 m area exceeding 2 mm. Pavement which is deformed beyond above limits after final compaction shall be taken out and reconstructed to the satisfaction of the Engineer.

3. Edge Restraint

Edge restraints need to be sufficiently robust to withstand override by the anticipated traffic, to withstand thermal expansion and to prevent loss of the laying course material from beneath the surface course. The edge restraint should present a vertical face down to the level of the

underside of the laying course. The surface course should not be vibrated until the edge restraint, together with any bedding or concrete haunching, has gained sufficient strength. It is essential that edge restraints are adequately secured.

The quantities of the work for providing edge restrains will be paid separately under respective items of work.

6.8.10 Sampling and testing procedure for Paver Blocks

Sample Size

Internal Average of minimum 3 samples per 5000 blocks for paver block manufacturers. External Minimum 2 blocks per 10000 blocks. Average of minimum 8 blocks per site for captioned contractors.

Sampling for Testing

Sampling for testing of paver blocks shall be done in accordance with Appendix-A.

Compressive Strength

Testing for compressive strength shall be undertaken in accordance with Appendix- B. The average compressive strength of the 80 mm thick paver block tested shall be 50 N/Sq mm and average compressive strength of the 60 mm thick paver blocks tested shall be 45 N/Sq mm

Water Absorption

Testing for water absorption shall be in accordance with IS 2185: 1979:Part I (Specifications for concrete masonry blocks) Appendix C

Sampling of Paver Blocks

Method of Sampling

Before laying paver blocks, each designated section comprising not more than 50000 blocks, shall be divided into ten approximately equal groups. Three blocks shall be drawn from each group.

Marking and Identification

All samples shall be clearly marked at the time of sampling in such a way that the designated section of Part thereof and the consignment represented by the sample, are clearly defined.

The sample shall be dispatched to the approved test laboratory taking precaution to avoid damage to the paving in transit. Protect the paving from damage and contamination until they have been tested. The samples shall be stored in water at 20°C + 5°C for 24 hours prior to testing.

Procedure for Testing of Compressive Strength for Paver Blocks

Reference: BS 6717 Part I (1993) Specification for Paver Blocks

B-1 Testing Machine

The testing machines shall be of suitable capacity for the test and capable of applying the load at the rate specified. It shall comply, as regards repeatability and accuracy with the requirements of relevant IS specification.

B-2 Procedure

The sample specimens shall be tested in wet condition after being stored at least 24 hours, in water maintained at a temperature of 20°C + 5°C before the specimens are submerged in water, the necessary area shall be determined.

The plates of the testing machine shall be wiped clean and any loose grit or other material removed from the contact faces of the specimen. Plywood nominally 4 mm thick, shall be used as packing between the upper and lower faces of the specimen and the machine plates, and these boards shall be larger than the specimen by a margin of at least 5 mm at all points. Fresh packing shall be used for each specimen tested. The specimen shall be placed in the machine with the wearing surface in a horizontal plane and in such a way that the axes of the

specimen are aligned with those of the machines plates. The load shall be applied without shock and increased continuously at the rate of approximately 15 N/sqmm per minute until no greater load can be sustained. The maximum load applied to the specimen shall be recorded.

B-3 Calculation of Corrected Strength

The compressive strength of each block specimen shall be calculated by dividing the maximum load by full cross section area and multiplying by an appropriate factor.

Table 5.6.8 Thickness and Chamfer Correction Factors for Compressive Strength

Work Size Thickness (in mm)	Correction Factors	
	Plain Block	Chamfered Block
60	1	1.06
80	1.12	1.18
100	1.18	1.24

B-4 Compressive Strength Calculation

The average corrected compressive strength for the designed block section shall be calculated.

Method for the Determination of Water Absorption

- The test specimens shall be completely immersed in water at room temperature for 24 hours.
- The specimens shall then be weighed, while suspended by a metal wire and completely submerged in water.
- They shall be removed from the water and allowed to drain for one minute.
- Visible surfaces water being removed with a damp cloth and immediately weighed. Subsequent to saturation, all specimens shall be dried in a ventilated oven at 100 to 115oC for not less than 24 hours and until two successive weightings at intervals of 2 hours show an increment of loss not greater, than 0.2 percent of the last previously determined mass of the specimen.

Calculate the absorption as follows:

$$\text{Absorption, kg/m}^3 = \frac{A - B}{C} \times 1000$$

$$\text{Absorption percent} = \frac{A - B}{B} \times 100$$

Where,

= wet mass of unit in kg

= dry mass of unit in kg. and

= suspended immersed mass of unit in kg.

Sr. No.	Traffic Category	Grade of Concrete Block *	for	Block Thickness*	Coarsed Bedding Sand Thickness*	Min Cement Content in Concrete*
1	Light (for footpaths etc.)	M 35		60 mm	40 mm	380
2	Heavy (for carriageways)	M 45		80 mm	40 mm	400

3	Very heavy (for heavy traffic of commercial vehicles)	M 50	100 mm	40 mm	400
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*or as specified in the BOQ item.

MASONRY WORKS

Scope

This specification covers furnishing, installation, repairing, finishing, curing protection, maintenance and handling of masonry and allied works for use in structures and locations covered under the scope of the Contract.

Applicable Codes

The latest revision of the Indian Standards and Codes, unless otherwise specified, shall be applicable to all brickwork and block work.

IS:1077	Specification for Common Burnt Clay Building Bricks
IS:2180	Specification for Burnt Clay Building Bricks, heavy duty
IS:2116	Specification for Sand Masonry Mortar
IS:2212	Code of Practice for Brickwork
IS:3495	Method of sampling and testing Clay Building Bricks
IS:2250	Code of Practice for Preparation and Use of Masonry Mortar
SP:27	Handbook of Method of Measurement of Building works
IS:432	Specifications for Mild Steel and Medium Tensile Bars
IS:2185	Specification for Cement Concrete Block
IS:2572	Code of Practice for construction of Concrete Walls
IS:9103	Specification for Admixture of Concrete

Rubble Masonry:

IS:1129 (1972)	Stone, Dressing
IS:8348 (1977)	Stone, slabs, stacking and packing for transportation
IS:1805 (1973)	Glossary of terms: quarrying and dressing
IS:1121 (1957)	Compressive, transverse and sheer strength determination.
IS:8759 (1977)	Maintenance and preservation of stone
IS:4348 (1973)	Permeability determination
IS:1122 (1957)	Specific gravity and porosity determination.
IS:4121 (1967)	Water transmission rate through natural building stone
IS:1706 (1972)	Wear resistance, determination by abrasion method.

6.9 HORTICULTURE WORKS AND LANDSCAPING

6.9.1 Horticulture work

Horticultural operations shall be started on ground previously levelled and dressed to required formation levels and slopes.

In case where unsuitable soil is met with, it shall be either removed or, replaced or it shall be covered over to a thickness decided by the Engineer-in-charge with good earth. In the course of excavation or trenching during horticultural operations, any walls, foundations, etc. met with shall not be dismantled without pre-measurement and prior to the written permission of the Engineer-in-charge.

6.9.2 Trenching in ordinary soil

Trenching is done in order to loosen the soil, turn over the top layer containing weeds etc. and to bring up the lower layer of good earth to form a proper medium for grassing, regressing, hedging and shrubbery.

Trenching shall be done to the depth ordered by the Engineer-in-charge. The depth is generally 30cm for grassing and 60 cm for regressing in good soil.

The trenched ground shall, after rough dress, be flooded with water by making small kiaries to enable the soil to settle down. Any local depression unevenness etc. shall be made good by dressing and/or filling with good soil.

Weeds or other vegetation which appear on the ground are then uprooted and removed and disposed off and paid.

6.9.3 Trenching

Trenching shall consist of the following operations:

1. The whole plot shall be divided into narrow rectangular strips of about 1.5 m width or as directed by the Engineer-in-Charge.
2. These strips shall be sub-divided lengthwise into about 1 m long sections. Such sections shall be excavated serially and excavated soil deposited in the adjacent section preceding it.
3. In excavating and depositing care shall be taken that the top soil with all previous plant growth including roots, get buried in the bottom layer of trenched area, the dead plants so buried incidentally being formed into humus.
4. The excavated soil shall be straight away dumped into the adjoining sections so that double handling otherwise involved in dumping the excavated stuff outside and in back filling in the trenches with leads is practically eliminated.

The earth shall be stacked at site in stacks not less than 50 cm high and of volume not less than 3.0 cum.

6.9.4 Neem/ Castor

The cake shall be free from grit and any other foreign matter. It should be un-decorticated and pulverized. The material shall be packed in old serviceable gunny bags of 50 kgs capacity approximately. The weight of gunny bag shall be deducted @1 kg per bag and payment shall be made for net quantity. The quality of cake should be got approved by the Engineer-in-charge before supply.

6.9.5 Farmacyard Manure

It shall be transported to the site in lorries with efficient arrangement to prevent spilling enroot. It shall be stacked at site. Each stack shall not be less than 50 cm height and volume not less than 3 cum.

Rough Dressing of The Trenched Ground

Rough dressing of the area shall include making kiaries for flooding. The trenched ground shall be levelled and rough dressed and if there are any hollows and depressions resulting from subsidence which cannot be so levelled, these shall be filled properly with earth brought from outside to bring the depressed surface to the level of the adjoining land and to remove discontinuity of slope and then rough dressed again.

The supply and spreading of soil in such depressions is payable separately. In rough dressing, the soil at the surface and for 75 mm depth below shall be broken down to particle size not more than 10 mm in any direction.

Uprooting Weeds from Trenched Areas

After 10 days and within 15 days of flooding the rough dressed trenched ground with water, the weeds appearing on the ground shall be rooted out carefully and the rubbish disposed off as directed by the Engineer-in-charge.

6.9.6 Fine dressing the ground

Slight unevenness, ups, and downs and shallow depressions resulting from the settlement of the flooded ground, in drying and from the subsequent weeding operations, shall be removed by fine dressing the surface to the formation levels of the adjoining land as directed by the Engineer-in-charge, and by adding suitable quantities of good earth brought from outside, if necessary.

6.9.7 Spreading Good Earth

Good earth shall be removed from stacks by head load and spread evenly over the surface to the thickness ordered by the Engineer-in-charge. It shall be spread with a twisting motion to avoid segregation and to ensure that spreading is uniform over the entire area.

Spreading Sludge/Manure

Good earth shall be thoroughly mixed with sludge or manure in specified proportion as described in the item or as directed by the Engineer-in-Charge. The mixing shall be spread as described in 23.9.1 to the thickness ordered by the Engineer-in-Charge.

Mixing of Good Earth and Sludge/Manure

The stacked earth shall, before mixing be broken down top particle of sizes not exceeding 6 mm in any direction. Good earth shall be thoroughly mixed with sludge or manure in specified proportion as described in the item or as directed by the Engineer-in-charge.

The area from where the grass roots are to be obtained shall be specified by the Engineer-in-charge at the time of execution of the work and no royalty shall be charged on this account from the contractor. Grass is to be arranged by contractor (cost of grass to be paid separately). The soil shall be suitably moistened and then the operation of planting grass shall be commenced. The grass shall be dibbled at 10 cm, 7.5 cm, 5 cm apart in any direction or other spacing as described in the item. Dead grass and weeded shall not be planted. The contractor shall be responsible for watering and maintenance of levels and the lawn for 30 days or till the grass forms a thick lawn free from weeded and fit for moving whichever is later. Generally planting in other direction at 15 cm, 10 cm, spacing is done in the case of large open spaces, at 7.5 cm spacing in residential lawn and at 5cm spacing for Tennis Court and sports ground lawn. Rates are including cost of labour and material (grass shall be paid separately.)

During the maintenance period, any irregularities arising in ground levels due to watering or due to trampling by labour, or due to cattle straying thereon, shall be constantly made up to the proper levels with earth as available or brought from outside as necessary, Constant watch shall be maintained to ensure that dead patches are replanted and weeds are removed.

The area shall be first weeded out of all undesirable growth. The entire grass shall be scrapped (cheeled) without damaging roots and level of the grounds. Slight irregularities in surface shall be levelled off and the area shall then be forked so as to aerate the roots of the grass without, however uprooting them.

Specified quantity of sludge or manure shall than be spread uniformly with wooden straight edge (phatti) as directed by the Engineer-in-charge. The area shall then be slightly sprinkled with water so as to facilitate proper integration of the manure or sludge with the soil and later flooded. The contractor shall be responsible for watering, proper maintenance and tending of the lawn for 30 days or till the grass forms a lawn fit for mowing, whichever is later.

During the above operations, all undesirable growths shall be constantly weeded out and all rubbish removed and disposed off as directed by the Engineer-in-Charge.

Initially the area shall be dug up to a depth of 30 cm. and weeds and rank vegetation with roots removed thereon by repeated forking. The whole area then shall be retrenched to a depth of 60 cm in the same manner as described in 5.6.23.1. Clods of excavated earth shall then be broken up to the size not more than 75 mm in any direction. The area shall then be flooded with water and after 10 days and within 15 days of flooding, weeds shall be uprooted carefully. The rubbish arising from the above operations shall be removed and disposed off in a manner directed by the Engineer-in-charge, away from the site. The earth shall then be rough dressed and fine dressed as described in 5.6.23.6 & 5.6. 23.8 in RUIDP Technical Specifications.

Excavation and Trenching for Preparation of Beds for Hedge and Shrubbery

Beds for hedges and shrubbery are generally prepared to width of 60 cm. to 125 cm. and 2 to 4 meters respectively.

Beds for hedges and shrubbery shall be prepared in the following manner. The beds shall first be excavated to a depth of 60 cm. and the excavated soil shall be stacked on the sides of the beds. The surface of the excavated bed shall then be trenched to a further depth of 30 cm, in order to loosen the soil, in the manner described in 23.1. No flooding will be done at this stage but the top surface shall be rough dressed and levelled. The excavated soil from the top 60 cm depth of the bed stacked at the site shall then be thoroughly mixed with sludge over manure in the proportion 8:1 by ratio or other proportion described in the item. The mixed earth and manure shall be refilled over the trenched bed, leveled neatly and profusely flooded so that the water reaches even the bottom most layers of the trenched depth of the bed. The surface after full subsidence shall again be refilled with the earth and manure mixture, watered and allowed to settle and finally fine dressed to the level of 50 mm to 75 mm below the adjoining ground or as directed by the Engineer-in-Charge. Surplus earth if any, shall be disposed off as directed by the Engineer-in-charge. Any surplus earth if removed beyond initial lead shall be paid separately. Stones, bricks bats and other foreign matter if met with during excavation or trenching shall be removed and stacked within initial lead & lift, such material as is declared unserviceable by the Engineer-in-charge shall be disposed by spreading and levelling at places ordered by him. If disposed outside the initial lead & lift, then the transport for the extra leads will be paid for separately. If a large proportion of material unsuitable for the hedging and shrubbery operations is met with and earth from outside is required to be brought in for mixing with manure and filling, the supply and stacking of such earth will be paid for separately.

6.9.8 Digging holes for Planting trees

In ordinary soil, including refilling earth after mixing with oil cake, manure and watering. Holes of circular shape in ordinary soil shall be excavated to the dimensions described in the items and excavated soil broken to clods of size not exceeding 75 mm in any direction, shall be stacked outside the hole, stones, brick bats, unsuitable earth and other rubbish, all roots and other undesirable growth met with during excavation shall be separated out and unserviceable material removed from the site as directed. Useful material, if any, shall be stacked properly and separately. Good earth in quantities as required to replace such discarded stuff shall be brought and stacked at site by the contractor which shall be paid for separately.

The tree holes shall be manured with powdered Neem/castor oil cake at the specified rate along with farm yard manure over sludge shall be uniformly mixed with the excavated soil after the manure has been broken down to powder, (size of particle not to be exceeded 6 mm in any direction) in the specified proportion, the mixture shall be filled in to the hole up to the level of adjoining ground and then profusely watered and enable the soil to subside the refilled soil shall then be dressed evenly with its surface about 50 to 75 mm below the adjoining ground level or as directed by the Engineer-in-charge.

6.9.9 M.S. iron Riveted tree Guard

The tree guard shall be 600 mm in diameter and 2 meter high above ground level and 25 cm in below ground level. The tree guard shall be framed of 4 nos. 25 x 6 mm M.S. flat 2 meter long

excluding displayed outward at lower and upto an extent 10 cm and 8 nos. 25 x 3 mm vertical M.S. Flat Rivetted to 3 Nos. 25 x 6 mm Flat iron rings in two halves, bolted together 8 mm dia and 30 mm long M.S. bolts and nuts.

The entire tree guard shall be given two coats of synthetic enamel paint of approved brand and manufacturer of required shade over a priming coat of ready mixed steel primer of approved brand and manufacturer. The design of tree guards shall be shown in the drawing.

6.9.10 M.S. Flat iron Welded tree Guard

The tree guard shall be 600 mm in diameter and 2-meter-high above ground level and 25 cm in below ground level. The tree guard shall be framed of 4 nos. 25 x 6 mm MS. Flat 2 metres long excluding displayed outward at lower and up mto an extent 10 cm and 8 Nos. 25 x 3 mm vertical M.S. Flat Riveted to 3 nos. 25 x 6 mm flat iron rings in two halves, bolted together 8 mm dia and 30 mm long M.S. Bolts & nuts. The entire tree guard shall be given two coats of synthetic enamel paint of approved brand and manufacturer of required shade brand and manufacturer of required shade over a priming coat of ready mixed steel primer of approved brand and manufacturer. The design of tree guards shall be shown in the drawing.

The separately specified earth and sludge shall be broken down to particles of size not exceeding 6 mm in any directions before mixing. Good earth shall be thoroughly mixed with sludge over manure in specified proportions as directed by Officer-in-Charge. During the process of preparing the mixture as above, trenches shall be flooded with water and levelled.

6.10 Contractor's Obligations

- a. All Safety, Quality Assurance, Quality Control, Environmental Management and Protection works related aspects shall be responsibility of contractor. Compliance to all Statutory and Regulatory requirements of Cental and State Government, Local Administration shall be responsibility of contractor
- b. While undertaking design and construction works of the Project, the Successful Bidder shall adhere to the latest amended National Building Code of India, IRC, RUIDP/PWD, MORTH, other relevant IS codes as per latest revisions, for all disciplines like civil structural, statutory requirements, laws of land, the principles of good construction practices and any other norms as applicable from time to time.
- c. All required plant and machinery for execution are in scope.
- d. Curing to RCC work, finishing works, is in scope and shall be done as per standard practices.
- e. Cube testing for RCC works needs to be done at approved laboratories and results to be submitted to JSCL.
- f. Stacking of all serviceable materials shall be handed-over to Government. Unserviceable usable materials to be disposed by mechanical transport including loading, unloading etc for all leads and lifts. Removal of debris/ vegetation by manual means and its disposal for all lead and lifts shall also be done.
- g. The detailed design drawings (GFCs) for all works including design calculations (wherever applicable), shall be submitted to the JSCL. The detailed design shall be get approved by MNIT Jaipur and construction activity will only start after such review and approval of MNIT, PMC and JSCL.
- h. All necessary shuttering, centering and scaffolding for construction of various works is in scope.
- i. On completion of the work, the contractor will be responsible for maintaining the asset for 1 year of Defect Liability Period, during which, the contractor will be liable to rectify or amend the defect, if any, including those for civil and structural works promptly and

without any additional cost, within max. of 7 days of notifying such defect by PMC/
Engineer-in-charge.

Section VIA

General Conditions of Contract

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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 Contractor to resolve disputes in the first instance, as provided for in GCC 23.1 hereunder.
 - (d) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.
 - (e) **Compensation Events** are those defined in GCC 41.1 hereunder.
 - (f) The **Completion Date** is the date of completion of the Works as certified by the Engineer, in accordance with GCC 52.1.
 - (g) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below.
 - (h) The **Contractor** is the party whose Bid to carry out the Works has been accepted by the Employer.
 - (i) The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer.
 - (j) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.
 - (k) **Days** are calendar days; months are calendar months.
 - (l) **Day works** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.
 - (m) A **Defect** is any part of the Works not completed in accordance with the Contract.
 - (n) The **Defects Liability Certificate** is the certificate issued by Engineer upon correction of defects by the Contractor.

- (o) The **Defects Liability Period** is the period calculated from the Completion Date where the Contractor remains responsible for remedying defects.
- (p) **Drawings** include calculations and other information provided or approved by the Engineer for the execution of the Contract.
- (q) The **Employer or Procurement Entity** is the party who employs the Contractor to carry out the Works, as specified in the **SCC**.
- (r) The **Engineer** is the person named in the **SCC** (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Engineer) who is responsible for supervising the execution of the Works and administering the Contract.
- (s) **Equipment** is the Contractor'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) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.
- (v) The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the **SCC**. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time or an acceleration order.
- (w) **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.
- (x) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- (y) "**Party**" means the Employer or the Contractor, as the context requires.
- (z) **SCC** means Special Conditions of Contract
- (aa) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
- (bb) **Retention Money** means the aggregate of all monies retained by the Employer pursuant to GCC 45.1.
- (cc) The **Site** is the area defined as such in the **SCC**.
- (dd) **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.

- (ee) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Engineer.
- (ff) The **Start Date** is given in the **SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.
- (gg) A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.
- (hh) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.
- (ii) A **Variation** is an instruction given by the Engineer which varies the Works.
- (jj) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the **SCC**.

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 Engineer shall provide instructions clarifying queries about these GCC.
- 2.2 If sectional completion is specified in the **SCC**, 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) Agreement,
 - (b) Letter of Acceptance,
 - (c) Contractor's Bid,
 - (d) Special Conditions of Contract,
 - (e) General Conditions of Contract,
 - (f) Specifications,
 - (g) Drawings,
 - (h) Bill of Quantities (or Schedules of Prices for lump sum contracts), and
 - (i) any other document listed in the **SCC** 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 **SCC**.

4. **Engineer's Decisions** 4.1 Except where otherwise specifically stated, the Engineer shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.
5. **Delegation** 5.1 The Engineer may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.
6. **Communications** 6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.
7. **Subcontracting** 7.1 The Contractor may subcontract with the approval of the Engineer, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.
8. **Other Contractors** 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as **referred to in the SCC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.
9. **Personnel and Equipment** 9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid to carry out the Works, or other personnel and equipment approved by the Engineer. The Engineer 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.
- 9.2 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.
10. **Employer's and Contractor's Risks** 10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
11. **Employer's Risks** 11.1 From the Start Date until the Defects Liability 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 Contractor.

- (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.

11.2 From the Completion Date until the Defects Liability 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 Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Starting Date until the Defects Liability 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 Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the **SCC** for the following events which are due to the Contractor's risks:

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

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

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

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

- the approval of the Engineer.
- 13.5 Both parties shall comply with any conditions of the insurance policies.
- 14. Site Investigation Reports** 14.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **SCC**, supplemented by any information available to the Bidder.
- 15. Contractor to Construct the Works** 15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.
- 16. The Works to Be Completed by the Intended Completion Date** 16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion Date.
- 17. Designs by Contractor and Approval by the Engineer** 17.1 The Contractor shall carry out design to the extent specified in the **SCC**. The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt, the Employer shall notify any comments. The Contractor 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 Contractor shall resubmit all designs commented on taking these comments into account as necessary.
- 17.2 The Contractor shall be responsible for design of Temporary Works.
- 17.3 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them if they comply with the Specifications and Drawings.
- 17.4 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
- 17.5 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
- 17.6 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before this use.
- 18. Safety** 18.1 The Contractor shall be responsible for the safety of all activities on the Site.
- 19. Discoveries** 19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Engineer of such

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

- 20. Possession of the Site** 20.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the **SCC**, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
- 21. Access to the Site** 21.1 The Contractor shall allow the Engineer and any person authorized by the Engineer 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.
- 22. Instructions, Inspections and Audits** 22.1 The Contractor shall carry out all instructions of the Engineer, which comply with the applicable laws where the Site is located.
- 22.2 The Contractor shall permit the Employer to inspect the Contractor's accounts, records and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by the Employer. The Contractor shall maintain all documents and records related to the Contract for a period of three (3) years after completion of the Works. The Contractor 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 the Employer.
- 23. Appointment of the Adjudicator** 23.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, 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 SCC**, to appoint the Adjudicator within 14 days of receipt of such request.
- 23.2 Should the Adjudicator resign or die, or should the Employer and the Contractor 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 Contractor. In case of disagreement between the Employer and the Contractor, 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.
- 24. Procedure for Disputes** 24.1 If the Contractor believes that a decision taken by the Engineer was either outside the authority given to the Engineer 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 Engineer's decision.
- 24.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

- 24.3 The Adjudicator shall be paid by the hour at the rate specified in the **SCC**, together with reimbursable expenses of the types specified in the Contract Data, and the cost shall be divided equally between the Employer and the Contractor, 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.
- 24.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the **SCC**.

B. Time Control

25. Program

- 25.1 Within the time stated in the **SCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Engineer 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.
- 25.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
- 25.3 The Contractor shall submit to the Engineer for approval an updated Program at intervals no longer than the period stated in the **SCC**. If the Contractor does not submit an updated Program within this period, the Engineer may withhold the amount stated in the **SCC** 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 Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Engineer.
- 25.4 The Engineer's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Engineer again at any time. A revised Program shall show the effect of Variations and Compensation Events.

26. Extension of the Intended Completion Date

- 26.1 The Engineer 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 Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.
- 26.2 The Engineer shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Engineer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting

information. If the Contractor has failed to 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.

- 27. Acceleration**
- 27.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Engineer shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.
- 27.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
- 28. Delays Ordered by the Engineer**
- 28.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the Works.
- 29. Management Meetings**
- 29.1 Either the Engineer or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
- 29.2 The Engineer 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 Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
- 30. Early Warning**
- 30.1 The Contractor shall warn the Engineer 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 Engineer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
- 30.2 The Contractor shall cooperate with the Engineer 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 Engineer.

C. Quality Control

- 31. Identifying Defects**
- 31.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and

test any work that the Engineer considers may have a Defect.

- 32. Tests** 32.1 If the Engineer instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
- 33. Correction of Defects** 33.1 The Engineer shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the **SCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
- 33.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.
- 34. Uncorrected Defects** 34.1 If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

D. Cost Control

- 35. Contract Price** 35.1 In the case of an admeasurements contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.
- 35.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.
- 36. Changes in the Contract Price** 36.1 In the case of an admeasurements 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 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Engineer shall adjust the rate to allow for the change.
- (b) The Engineer shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

(c) If requested by the Engineer, the Contractor shall provide the Engineer with a detailed cost breakdown of any rate in the Bill of Quantities.

36.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

37. Variations

37.1 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 Contractor.

37.2 The Contractor shall provide the Engineer with a quotation for carrying out the Variation when requested to do so by the Engineer. The Engineer shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Engineer and before the Variation is ordered.

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

37.4 If the Engineer 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.

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

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

38. Cash Flow Forecasts

38.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Engineer 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.

**39. Payment
Certificates**

- 39.1 The Contractor shall submit to the Engineer monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
- 39.2 The Engineer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 39.3 The value of work executed shall be determined by the Engineer.
- 39.4 The value of work executed shall comprise:
- (a) In the case of an admeasurements 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.
- 39.5 The value of work executed shall include the valuation of Variations and Compensation Events.
- 39.6 The Engineer may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

40. Payments

- 40.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Engineer within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor 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.
- 40.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 40.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
- 40.4 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.

41. Compensation Events

41.1 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 20.1.
- (b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
- (c) The Engineer orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.
- (d) The Engineer instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
- (e) The Engineer 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 Engineer gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
- (h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- (i) The advance payment is delayed.
- (j) The effects on the Contractor of any of the Employer's Risks.
- (k) The Engineer unreasonably delays issuing a Certificate of Completion.

41.2 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 Engineer 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.

41.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Engineer, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Engineer shall adjust the Contract Price based on his own

forecast. The Engineer shall assume that the Contractor shall react competently and promptly to the event.

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

42. Tax

42.1 The Engineer 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 Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 44.1.

43. Currencies

43.1 Where payments are made in currencies other than the currency of the Employer's country specified in the **SCC**, the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.

44. Price Adjustment

44.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **SCC**. 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:

$$P_c = A_c + B_c \text{ Imc/loc}$$

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 specified in the **SCC**, 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 loc is the same consolidated index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."

44.2 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.

45. Retention

45.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the **SCC** until Completion of the whole of the Works.

45.2 Upon the issue of a Certificate of Completion of the Works by

the Engineer, in accordance with GCC 52.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Engineer has certified that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" bank guarantee.

46. Liquidated Damages

46.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the **SCC** 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 **SCC**. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

46.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC 40.1.

47. Bonus

47.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the SCC for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Engineer shall certify that the Works are complete, although they may not be due to be complete.

48. Advance Payment

48.1 The Employer shall make advance payment to the Contractor of the amounts stated in the **SCC** by the date stated in the **SCC**, against provision by the Contractor of an unconditional bank guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal 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 Contractor. Interest shall not be charged on the advance payment.

48.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Engineer.

48.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, 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.

- 49. Securities** 49.1 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 **SCC**, 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 28 days from the date of issue of the Certificate of Completion in the case of a bank guarantee.
- 50. Day works** 50.1 If applicable, the Day works rates in the Contractor's Bid shall be used for small additional amounts of work only when the Engineer has given written instructions in advance for additional work to be paid for in that way.
- 50.2 All work to be paid for as Day works shall be recorded by the Contractor on forms approved by the Engineer. Each completed form shall be verified and signed by the Engineer within two days of the work being done.
- 50.3 The Contractor shall be paid for Day works subject to obtaining signed Day works forms.
- 51. Cost of Repairs** 51.1 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 Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.
- E. Finishing the Contract**
- 52. Completion** 52.1 The Contractor shall request the Engineer to issue a certificate of Completion of the Works, and the Engineer shall do so upon deciding that the work is completed.
- 53. Taking Over** 53.1 The Employer shall take over the Site and the Works within seven days of the Engineer's issuing a certificate of Completion.
- 54. Final Account** 54.1 The Contractor shall supply the Engineer with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Engineer shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Engineer shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate.
- 55. Operating and Maintenance** 55.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the

Manuals dates stated in the **SCC**.

55.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the SCC** pursuant to GCC 55.1, or they do not receive the Engineer's approval, the Engineer shall withhold the amount **stated in the SCC** from payments due to the Contractor.

56. Termination

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

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

- (a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Engineer;
- (b) the Engineer instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;
- (c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
- (d) a payment certified by the Engineer is not paid by the Employer to the Contractor within 84 days of the date of the Engineer's certificate;
- (e) the Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer;
- (f) the Contractor does not maintain a Security, which is required; and
- (g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the **SCC**.
- (h) if the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC 57.1.

56.3 When either party to the Contract gives notice of a breach of Contract to the Engineer for a cause other than those listed under GCC 56.2 above, the Engineer shall decide whether the breach is fundamental or not.

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

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

57. Fraud and Corruption

57.1 Employer requires that Contractors, Subcontractors, manufacturers, and Consultants under Employer-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy, the Employer:

- (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.
- (b) will cancel the portion of the allocated to a contract if it determines at any time of the engaged in corrupt, fraudulent, collusive or coercive practices during the procurement or the execution of that contract, without having taken timely and appropriate action satisfactory to the Employer to remedy the situation; and
- (c) will sanction a firm or individual, including declaring them ineligible, either indefinitely or for a stated period of time, to be awarded a Employer-financed contract if it at any time determines that they have, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for, or in executing, a Employer-financed contract.

58. Payment upon Termination

58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done 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 **SCC**. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

58.2 If the Contract is terminated for the Employer’s convenience or because of a fundamental breach of Contract by the Employer,

the Engineer shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

59. Property

59.1 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 Contractor's default.

60. Release from Performance

60.1 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 Contractor, the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

SECTION VIB: SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract shall complement, amend, supplement the GCC and the Clause Numbers provided herein refer to the same Clause Numbers provided in the Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. This Section shall therefore be read in conjunction with Section VI A of the Bid Documents.

Clause 1: Definitions

Clause **1.1 (q)**; the **Employer** (or Procuring Entity) is the Executing Agency, Jaipur smart City Limited represented by the Chief Executive Officer, Jaipur Smart City Limited.

Clause **1.1(aa)**; the Engineer is the Executive Engineer, Jaipur smart City Limited (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Engineer) who is responsible for supervising the execution of the Works and administering the Contract.

Add Clause **1.1(kk)**; the **Notice to Proceed** is the notice issued by the Engineer to the Contractor to proceed with the Works. Whenever possible the Notice to Proceed will be issued by the Engineer immediately upon signing of the Contract, or as soon thereafter as is feasible considering the availability of the Site and other relevant factors.

Replace Clause **1.1(ff)**; the **Start Date** is the date as specified in the Notice to Proceed. This is the date when the Contractor can commence work on the Contract, but does not necessarily coincide with Possession Date of all the locations of Site.

Clause 1.1(jj) The work is described in Section V Procurement Entity's Requirement.

Clause 2: Interpretation

2.2 Sectional Completion will be not allowed.

2.3 Delete the sub clause in its entirety and replace by the following.

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

- (a) Agreement,
- (b) Letter of Acceptance,
- (c) Contractor's Bid,
- (d) Special Conditions of Contract,
- (e) General Conditions of Contract,
- (f) Procuring Entity's Requirement,
- (g) Drawings,
- (h) Bill of Quantities (or Schedules of Prices for lump sum contracts), and any other document listed in the **SCC** as forming part of the Contract.

If any ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction, which will be final and binding to both the parties.

Clause 3: Language and Law

3.1 The law which shall govern the conduct of the Contract and according to which the Contract shall be construed is that in force in the State of Rajasthan, India. The language of the contract shall be in English.

Clause 6: Communications

Add Sub Clause 6.2 as below: -

6.2 Any notification under this Contract shall be served on the party concerned when received by fax, hand delivery, courier delivery, or registered letter at the addresses listed

in the Contract Data Any notification under this Contract shall be served at the addresses provided below:

Address of the Contractor:

Name: _____

Address: _____

Address of the Engineer:

Executive Engineer,
Jaipur Smart City limited
Jaipur.

Clause 7: Sub-Contracting

Add the following Paragraphs to Sub-clause 7.1:

"The Contractor shall not sub-contract more than 50% of the awarded work, other than related to supply of equipment and machinery under the contract. Sub-contracting shall not alter the Contractor's obligation. The Contractor shall submit a list of sub-contractors along with their credentials about (a) Technical capacity, (b) Financial capability and (c) the Experience of similar work, which is proposed to be sub-contracted. The Engineer shall scrutinize the offers submitted by the Contractor, and shall approve the sub-contractors based on their overall capability to execute the proposed sub-contracted work. The agreement between the Contractor and each sub-contractor shall be submitted by the Contractor to the Engineer and would require approval of the Engineer. Such agreement between the Contractor and sub-contractor should be reasonable, workable and justified.

If at any stage during execution, a sub-contractor is found working at Site without prior approval of the Engineer, then the work being done by such Contractor shall be stopped at Site and payment to the Contractor for that particular work shall not be made by the Engineer.

It shall be responsibility of the Contractor to ensure that no unauthorized sub-contractor works on any work Site."

Provided that the Contractor shall not be required to obtain such consent for:

- a) The provision of labors,
- b) The purchase of materials which are in accordance with the standards specified in the Contract, or
- c) The subcontracting of any part of the works for which subcontractor is named in the Contract.

Clause 8: Other Contractors: None

Clause 9: Personnel & Equipment

9.1 Add the following:

The Contractor shall provide details of the following Schedule of Key Personnel which summarizes their qualifications and experience.

Schedule of Key Personnel

Position	Name	Nos.	Qualification	Total Years of Experience	Years of Relevant Experience
Project In charge		1	B.E.(Civil)	5 years	3 year
Site Engineer		1	Diploma in Civil Engineering	5 years	2 years

Clause 11: Employer's Risks

Replace Clause 11.1 with the following:

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

Clause 13: Insurance

Add 13.1.1

13.1 The minimum amount of Third Party Liability insurance cover shall be *Rs 10,00,000 (Rupees ten Lakhs only)* per occurrence or event, with the number of occurrences not less than four. The Contractor shall promptly notify the Engineer of each claim made under the Third Party Liability coverage, and shall renew the Third Party Insurance after each such occurrence in order to maintain the number of covered occurrences at not less than four.

The minimum coverage against damage to the Works and materials during construction shall be *Rs. 5,00,000 (Rupees Five Lakhs only)*.

Clause 14: Site Investigation Reports

14.1 Site Investigation Reports are as detailed in Section V, Procurement Entity's Requirement.

Clause 16: The Works to Be Completed by the Intended Completion: -

In continuation to paragraph 16.1, add the following: -

The successful bidder will be expected to complete the works within **12 (Twelve) months**, as mentioned in Section II: Bidding Data Sheet, from the Start Date, which shall be the date of issue of the Notice to Proceed or such other Start Date as may be specified in the Notice to Proceed.

Clause 17: Designs by Contractor and Approval by the Engineer

In continuation to paragraph 17.1, add the following:-

17.1 The scope to carry out designs & drawings, if any, are as specified in Section V, Procurement Entity's Requirement.

Clause 19: Discoveries

Add clause 19.2:

19.2: All materials, including stone, bricks, steel, wood and any other material, obtainable in the work by dismantling, etc. will be the property of the Employer/ Procuring Entity and will be disposed off as directed by the Engineer. The contract price is deemed to have been

included for collection, loading/unloading, carriage and disposal within a distance of 5 km radius and no additional payment will be allowed.

Clause 20: Possession of Site

Replace clause as per following:-

The employer will give possession of the sites as elaborated in the Notice to Proceed on the Date of Start as mentioned in NTP. The remaining sites shall be made available in accordance to the agreed "Program of Work" and in general, sites shall be kept available with the contractor for the works proposed to be carried out during the next three months. The contractor will not be entitled to any delay or compensation event unless his work as per the agreed "Program of Work" is actually held up because of delay in the Employer's hand over of the site to the contractor. Refer Section V - Procurement Entity's Requirements for further details.

Clause 23.1 & 23.2: Appointment of the Adjudicator

Delete clause 23.1 & 23.2 in its entirety.

Clause 24: Procedure for Disputes

Delete Clause 24 in its entirety and replace it with the following:

24.1 Engineer's Decision: If any dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the Contract or the execution of the Works, whether during the execution of Works or after their completion, and before or after repudiation or other termination of the Contract, including any dispute as to:

- a) the meaning of the specifications, designs, drawings and instructions herein before mentioned,
- b) the quality of the workman ship or materials,
- c) any opinion, instruction, determination, certificate or valuation of the Engineer, or
- d) any other question, claim, right matter or anything whatsoever in any way arising out of or relating to the contract, design, drawings, specifications, estimates, instructions, conditions, orders or the failure to execute the same,

The dispute shall, in the first place, be referred in writing to the Engineer who has jurisdiction over the Works specified in the Contract, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. Not later than 28 (twenty eight) day after the day on which he received such reference the Engineer shall give written notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.

Subject to the other forms of settlement hereinafter provided, the Engineer's decision in respect of every dispute or difference so referred shall be final and binding upon the Contractor and the Employer. Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer until or unless the same shall be revised in an amicable settlement or as hereinafter provided.

24.2 Remedy When the Engineer's Decision is Not Accepted: If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before 28 (twenty eight) days after the day on which he received the reference, then either the Employer or the Contractor may, on or before the twenty eighth day after the day on which he received the notice of such decision, or on or before the twenty eighth day after the day on which the said period of 28 days expired, as

the case may be, give notice to the other party, with a copy to the Engineer, of his intention to commence arbitration for settlement of the dispute.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no written notice to commence arbitration has been given by either the Employer or the Contractor on or before the twenty eight day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

24.3 Amicable Settlement: Where notice of intention to commence arbitration has been given in accordance with Sub-Clause 24.2, arbitration shall not be commenced unless an attempt has first been made by the parties to settle the dispute amicably. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which the notice of intention to commence arbitration was given, whether or not any attempt at amicable settlement thereof has been made.

24.4 Arbitration: Any dispute in respect of which:

a) the decision, if any, of the Engineer has not become final and binding pursuant to Sub-Clause 24.3, and

b) Amicable settlement has not been reached within the period stated in Sub-Clause 24.3, shall be finally resolved by arbitration. The arbitration will take place in accordance with The Arbitration and Conciliation Act 1996 of India (as amended to date) and the arbitration will take place at Jaipur. Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Works.

c) In case of dispute arising out of the Arbitration Award, the courts in Jaipur shall have the exclusive jurisdiction.

24.5 Contractor to Execute Work Pending Settlement: Whether the dispute is referred to the Engineer, to Arbitrator, to amicable settlement, or to the law courts, as the case may be, the Contractor shall, unless the Contract has been repudiated or terminated, proceed to execute and complete the Works with all due diligence pending settlement of the said dispute or differences.

25: Program:

Replace the following sub-clauses

25.1 The contractor is required to submit his own Program as per Section V (Scope of Work) within 28 days of the issue of the Letter of Acceptance showing the general methods, arrangements, order and timing for all the activities in the Works. The Work program given by Contractor should give output more than or equal to the output if indicated in Indicative Work Plan. In case of lump sum contract, the activities in the Program shall be consistent with those, as may be given in the Activity Schedule. In case the contractor fails to submit an acceptable program, a program given by the Engineer will be applicable for further control of progress of work. The Contractor shall submit the detailed method statement defining Contractor's methodology for construction backed with his proposal for construction equipment planning & deployment duly supported with broad output calculation & details of quality control procedure proposed to be adopted. The Drawings for any particular activity shall be issued to the contractor at least 30 days in advance of the schedule date of the start of the activity as per the approved program.

Clause 25.3

The Contractor shall provide an updated Work Program by the last day of each Month, which shall clearly demonstrate the actual progress achieved on each activity, the effect of the

progress achieved on the timing of the remaining work, and the proposed changes in activities that will enable the Contractor to complete the Works within the Intended Completion Date. In case the Contractor fails to submit an updated Work Program within this time limit, the Engineer will be entitled to withhold an amount of Rs. 1,00,000/- (Rupees One lakh only) Or 1% of the Contract Value (Whichever is more) 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.

Add the following sub-Clauses

25.5 If in the opinion of the Engineer, the work on site is not progressing satisfactorily in accordance with the mutually agreed "Work Programme" and the delay is likely to effect the overall completion of the work within the intended date of completion, he may by a written notice to the Contractor ask him to expedite the works within 15 days suitably to make for deficiencies.

25.6 If the contractor fails to take appropriate action in time in pursuance of 25.5, the Engineer may by another notice inform him the components of work that will be carried out by him through another agency in parallel to the other activities being carried out by the contractor at his cost with a view of expediting the works and reducing delays. The value of the work so carried out will be credited to the contractor's account, but he will not be responsible for the quality of the said work. The Engineer will recover the cost spent plus 5% for supervision charges from the next bill or

If the contractor fails to take appropriate action in time in pursuance of 25.5, the Engineer may withheld 25% amount of the delayed part of the work from the next running bills, till the contractor achieves the progress as per the agreed Work Plan.

25.7 In addition to the Updated Program, Monthly updated progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies in the first week of every calendar month. Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works. Each report shall include:

- (a) photographs and detailed descriptions of progress.
- (b) charts showing the status of Construction Documents, purchase orders, manufacture and construction;
- (c) records of Contractor's personnel and Equipment on Site;
- (d) copies of Contractor's quality assurance documents, test results and certificates of Materials;
- (e) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and

Comparisons of actual and planned progress, with details of any aspects which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome such aspects.

Clause 31: Identifying Defects:

Add the following Sub-Clauses 31.2

Unless otherwise indicated elsewhere in the contract, the Quality Assurance and Quality Control (QA/QC) document, as issued by the RUIDP, shall be followed. The Contractor, prior to commencement of permanent works at site shall set up his own laboratory, with prior notification to the Engineer as defined in Section V.

Clause 33: Correction of Defects:

Replace Clause 33.1 by -

33.1 The Engineer shall give notice to the Contractor of any Defects including damages caused to Third Party property by the Contractor by his work force or by his machinery/ equipment or by his negligence during the continuance of the Contract, before the end of the Defects Liability Period, which begins from the physical completion date specified in the completion certificate/ taking over certificate and will end up to 1 year thereafter. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

Add clause 33.3

33.3 The Engineer shall certify that all Defects have been corrected. If the Engineer considers that correction of a Defect is not essential, he can request the Contractor to submit a quotation for the corresponding reduction in the Contract Price. If the Engineer accepts the quotation, the corresponding change in the Contract Price is a Variation. The Defects Correction Period is 14 (fourteen) Days from the date of receipt by the Contractor of the Employer's notice to correct any Defects in the Works.

Clause 34 Uncorrected defects

Replace the clause with the following: -

If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer may have the defect corrected by other contractor(s) and recover the cost paid for the same plus 5% for supervision charges from any amount due to the contractor.

Clause 35: Contract Price

Replace Clause 35.2 in its entirety and add the following sub clauses

36. Changes in the Contract Price

Replace clause 36.1(a) with the following:-

In the case of an ad measurement contract:

(a) If the final quantity of the work done exceeds from the quantity in the Bill of Quantities for the particular item by (higher of (i) & (ii) resultant) -

i. Up to 50 percent, or

!! The individual item total cost up to 2 lakh or 1 percent of the Initial Contract Price, on the basis of BOQ (whichever is lesser) irrespective of the percentage excess in the quantity, then rates will be as per BOQ.

In case the final quantities exceed the above limits, then the rates for the excess quantities more than the above limits shall be adjusted to allow for the changes as described in Clause 37. There shall be no adjustment to allow for the change in case of lesser quantities executed than the BOQ.

Delete Clause 36.2 in its entirety.

37: Variations

Delete Clause 37 in its entirety and replace with following

37.1 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 Contractor.

- 37.2 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
- 37.3 The Integrated Schedule of Rates (SOR) 2017 of RUIDP and in absence of such item in SOR of RUIDP, any other SOR applicable for Jaipur District, shall be followed for excess BOQ items, for quantities other than mentioned in Clause 36, the basis of approval of variation will be as per following:
- a. On the rates of SOR mentioned as above, with effect of overall bid premium for the BOQ and Non-BOQ SOR items in the Contract which are in the SOR. These items will be treated like item included in original BOQ and will be eligible for any price escalation in accordance with the contract provisions.
 - b. In the case of composite items consisting of non-SOR and/or SOR; the items contained in the SOR will be analyzed on the basis of SOR rates with tender premium and escalation effect in accordance with the RBI price index and the non-SOR on the rate analysis on the basis of market rates as approved by the Engineer plus 10% overhead charges against the fulfillment requirement of contract and 10% contractors profit on the above cost.
- For any additional item of works, other than the items appearing in the BOQ, the same procedure as mentioned above will be followed
- 37.4 For Clause 37.3 (b), the Contractor shall provide the Engineer with a quotation for carrying out the Variation when requested to do so by the Engineer. The Engineer shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Engineer and before the Variation is ordered.
- 37.5 If the Contractor's quotation is unreasonable, the Engineer may order the Variation and make a change to the Contract Price, which shall be based on the Engineer's own forecast of the effects of the Variation on the Contractor's costs.
- 37.6 The Engineer may require any variation of the form, quality or quantity of the Works of any part thereof that may in his opinion be necessary to satisfactorily complete the work or for any other reason in his opinion, be appropriate, He shall have the authority to instruct the Contractor to carry out the work accordingly. The variations can be:
- a) Increase of decrease the quantity of any work included in the Contract.
 - b) Omit any such work (but not if the omitted work is to be carried out by the Employer or by another contractor)
 - c) Change the character or quality or kind of any such work
 - d) Change of levels, lines, position and dimensions of any part of the works
 - e) Execute additional work of any kind necessary for the completion of the works,
 - f) Change of any specified sequence or timing of construction of any part of the works.
- 37.7 The contractor will be obliged to carry out the work and no such variation shall in any way vitiate or invalidate the Contract.

Clause 38: Cash Flow Forecast

Delete the last sentence of Sub-Clause 38.1 and replace it with the following:

"All cash flow forecasts shall be denominated in Indian Rupees."

Clause 39: Payment Certificates

Delete Clause 39.4 (b) in its entirety

Add the following Sub-Clauses

39.7 Deductions from the Payment Certificates will be made towards Income Tax, Turnover Tax, and Royalties, as per provisions of the statutory authorities, in force from time to time in the State of Rajasthan.

39.8 All interim payments for admeasurements contract shall be certified within 30 days from the date of submission of the invoice by the contractor, provided that there is no major objection from the Engineer to any of the items claimed by the contractor. Such payments for the Final invoice shall be certified within 60 days.

Clause 40: Payments

Delete Clause 40 in its entirety.

Clause 41: Compensation Events

41.3 Delete the second last sentence in Sub-Clause 41.3 and replace it with the following:

“In case agreement on Contract Price adjustment or extension of the Intended Completion Date cannot be reached, the Contractor shall complete the Work on the basis of the Engineer’s estimate and the dispute can be settled in accordance with the provisions of Clause 24.

Clause 42: Tax

Replace Clause 42 in its entirety with the following: -

The Engineer shall adjust the Contract Price if Works Contract tax or any similar tax, levied on the contract as a whole and not on to the cost of any particular item or ingredient of contract being executed under the contract, 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 Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 44.1. Also no such adjustment will be applicable for the GST, as the Contractor is not to include GST in their quoted rates, and GST will be paid to the Contractor as applicable.

Clause 43: Currencies

Replace Clause 43.1 by the following:

43.1 All payments will be made in Indian Rupees

Clause 44: Price Adjustment

Delete Clause 44 in its entirety and replace with following sub clauses

44.1 No price adjustment is allowed under this contract

Clause 45: Retention

Replace Clause 45.1 with as per following:

45.1 The proportion of payment retained from each payment shall be 10% (Ten percent) of the payment amount, up to a maximum of 5% of the contract price. The Retention money shall not be deducted from the running bills if the bidder gives bank guarantee in lieu of the Retention Money for the amount equal to 5% of the Contract value at the time of issue of NTP. If such unconditional Bank Guarantee is submitted during execution of the contract wherein some Retention Money has already been deducted, then such amount may be refunded if such Bank Guarantee is of the amount considered satisfactory by the Engineer. The format of the Bank Guarantee shall be as per Annexure in Forms. The Bank Guarantee shall be in name of Chief Executive officer; Jaipur Smart city limited issued by any Nationalized/ scheduled Bank payable at Jaipur. Such Bank Guarantee if invoked shall be en-cashable when presented in the specified branch office located in Jaipur.

Clause 46: Liquidated Damages

Delete Sub-Clause 46.1 in its entirety and replace it with the following:

46.1 In the event that the Contractor fails to comply with the Intended Time for Completion for the whole of the Works, or, if applicable, any Section within the relevant time, then the Contractor shall pay liquidated damages to the Employer. The rate of L.D. per day for each day that the Completion Date is later than the Intended Completion Date will be (10% of Contract Price/ D), where D is 100 Days or 25% of the Original Contract Period whichever is more. The Employer may deduct liquidated damages from payments due to the Contractor, but payment of liquidated damages does not affect the Contractor's responsibilities under the Contract.

Add the following new Clause 46.2:

46.2 If at any time during implementation of the Contract, before the Intended Completion Date has been reached, the Contractor's progress falls more than 20% (twenty percent) behind the scheduled progress as per the agreed Work Program between Contractor and Engineer at the time of NTP and it becomes apparent that the forecast completion date is likely to be later than the Intended Completion Date, then the Contractor shall pay liquidated damages to the Employer at the rate stated in Clause 46.1 for each day that the forecast completion date is later than the Intended Completion Date, and the Employer will be entitled to deduct such liquidated damages from the running account bill payments due to the Contractor. The final decision of LD will be at the discretion of JSCL.

Renumber Sub-Clauses 46.2 as 46.3.

Add the following new Clause 46.4:

46.4 Notwithstanding the above, the amount of liquidated damage paid by the Contractor to the Employer shall not exceed 10 per cent of the Contract Price.

Clause 47: Bonus

Delete Clauses 47

Clause 48: Advance Payment

Delete the clause in its entirety and add the following:

48.1 No advance payment will be made

Clause 49 Securities

Delete clause 49 in its entirety and replace with the following:-

49.1 A performance security shall be provided to the Employer in accordance with the Instructions to Bidders and shall be issued in a form acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable.

49.2 If there is no reason to withhold the performance security, the performance security shall be returned to the Contractor within 28 days of the last Defects Correction Period.

49.3 The Employer shall notify the Contractor of any claim made against the institution issuing the performance security.

49.4 The Employer may claim against the surety if any of the following occurs for 14 days or more:

(a) the Contractor is in breach of the Contract and the Employer has notified him that he is; and

(b) the Contractor has not paid an amount due to the Employer.

Clause 52 Completion

Replace the Sub-Clause 52.1 with the following:

“When whole of the work has been substantially completed and have satisfactory passed any Tests on Completion prescribed by the contractor, the Contractor may give a notice to that effect to the Engineer, with a copy to the Employer, accompanied by a written undertaking to finish with due expedition any outstanding work during the Defects Notice Period. The Engineer shall issue a certificate complying completion of the works to the contractor.”

Add the following Sub-Clause 52.2:

52.2 “If any part of the permanent work has been substantially completed and has satisfactorily passed any Tests on Completion prescribed by the Contract, the Engineer may issue a Completion Certificate in respect of the part of the Permanent Work before completion of the whole of the Works and, upon the issue of such Certificate, the Contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in the part of the Permanent Work during the Defects Notice Period.” Hence the defect liability period starts on the date on which part/ substantial completion certificate is issued, for that particular part of the permanent work has been substantially completed.

Clause 53: Taking Over

Replace the Sub-Clause 53.1:

53.1 “The Employer shall take over the whole works or section of works within Seven (7) days of issuance of Completion Certificate, as per Clause no 52.1 and 52.2.”

Add the following Sub-Clause 53.2:

53.2 Similarly in accordance with the procedure set out in sub clause 53.1, the Employer may issue a taking – over certificate in respect of:

Any substantial part of the Permanent Work which has been both completed to the satisfaction of the Engineer and, otherwise than as provided for in the Contract, occupied or used by the Employer, or any part of the Permanent Works which the Employer has elected to occupy or use prior to completion (where such prior occupation or use is not provided for in the Contract or has not been agreed by the Contractor as a temporary measure.

53.3 Interference with Tests on Completion

If the Contractor is prevented from carrying out the Tests on Completion by a cause for which the Employer (or another contractor employed by the Employer) is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion, as defined in the Specification, would otherwise have been completed. The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry of the Contract Period. The Engineer shall require the Tests on Completion to be carried out by 14 days' notice and in accordance with the relevant provisions of the Contract. If the Contractor incurs additional Cost as a result of this delay in carrying out the Tests on Completion, such Cost plus reasonable profit shall be determined by the Engineer in accordance with the provisions of Sub-Clause 3.5 and shall be added to the Contract Price.

Replace Clause 55.2 as per following:-

As-Built Drawings

The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact "as-built" locations, sizes and details of the work as executed, with cross references to relevant specifications and data sheets. These records shall be kept on the Site and shall be used exclusively for the purposes of this Sub-Clause. Two copies shall be submitted to the Engineer prior to the commencement of the Tests on Completion.

In addition, the Contractor shall prepare and submit to the Engineer "as-built drawings" of the Works, showing all Works as executed. The drawings shall be prepared as the Works proceed, and shall be submitted to the Engineer for his inspection. The Contractor shall obtain the consent of the Engineer as to their size, the referencing system, and other pertinent details.

Prior to the issue of any Taking-Over Certificate, the Contractor shall submit to the Engineer one softcopy in CD, one full-size original copy and six printed copies of the relevant "as-built drawings" duly signed and sealed, and any further Construction Documents specified in the Contract. The Works shall not be considered to be completed for the purposes of taking-over under Sub-Clause 52 until such documents have been submitted to the Engineer.

Clause 58: Payment upon Termination

58.1 If the Contract is terminated because of a breach of Contract by the Contractor, the deduction to be made by the Employer which represents the Employer's additional cost for completing the Works shall be 50% (fifty percent) of the value of the Works not completed.

Add the following Clauses;

61. Site Environmental Plan (SEP)

61.1 The Contractor should prepare a detailed Site Environmental Plan (SEP) as per the Environmental and Social Management Framework and EMP format attached for location/s identified to be potentially impacted such as but not limited to the work site, base camp. The SEP should include arrangement for disposal of sites for excavated materials, sanitary and other waste, storage location for fuel, oil and lubricants, facilities for equipment, labour and housing, among others. The SEP should be reviewed and approved prior to construction activities by the Engineer.

62. Safety, Security and Protection of the Environment

62.1 General

- i. This section of the Specification sets out limitations on the Contractor's activities specifically intended to protect the environment.
- ii. The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the works and all associated operations on site or off-site are carried out in conformity with statutory and regulatory environmental requirements including those prescribed elsewhere in this document.
- iii. The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated.
- iv. In the event of any spoil, debris, waste or any deleterious substance from the Site being deposited on any adjacent land, the Contractor shall immediately remove all such material and restore the affected area to its original state to the satisfaction of the Engineer. This should be monitored regularly in accordance with the Environmental Management Plan.
- v. Consent for establishment (CFE) and consent for operation (CFO) for WTP and STP- need to be identify with the consultation with Local authorities and contractor shall be responsible for annual renewal of CFE and CFO.
- vi. During construction, the area should be to avoid trespassing of animals and people. Unauthorized persons should not be allowed within the construction area.

- vii. During construction, there should be signs to inform public of on-going work, warning on dangers due to trenches along roads, excavations on different sites.
- viii. Contact town authorities to arrange for the use of excavated material where possible, such as in construction projects, to raise the level of land prior to construction of roads or buildings, or to fill previously excavated areas.
- ix. Especially for cleaning, desilting, and dredging of drainages: Contact town authorities to arrange for testing and analysis of sludge/excavated materials for hazardous components. If material are hazardous, coordinate with authorities for approve disposal sites;
- x. Prevent generation of dust by removing excavated materials as soon as it is excavated, by loading directly onto trucks and covering with tarpaulins to prevent dust during transportation.
- xi. All excavation should be done in the dry seasons to avoid any impacts on surface water drainage if water collects in any quantity, it will need to be pumped out, and it should be then be donated to neighboring farmers to provide a beneficial use to the communities most affected by this aspect of the work.
- xii. Plant three (3) trees for every tree to be cut.
- xiii. Consult town authorities to identify any buildings at risk from vibration damage and avoiding use of pneumatic drills or heavy vehicles in the vicinity.
- xiv. Providing wooden bridges for pedestrians and metal sheets for vehicles to allow access across open trenches where required (including access to houses).
- xv. Carefully planning of transportation routes with the municipal authorities to avoid sensitive areas as far as possible, including narrow streets, congested roads, important or fragile buildings and key sites of religious, cultural or tourism importance.
- xvi. Consulting historical and archaeological authorities at both national and state level to obtain an expert assessment of the archaeological potential of the site. Alternate location should be considered if the area is medium or high risk.
- xvii. Developing a protocol in conducting any excavation work to ensure that any chance finds are recognized and measured are take to ensure they are protected and conserved this should involve having excavation observed by a person with archaeological field training, stopping work immediately to allow further investigation if any finds are suspected; and calling the state archaeological authority if a find is expected and taking any action they acquire ensuring its removal or protection in situ.
- xviii. Living spaces for access between mounds of excavated soil and providing footbridges so that pedestrians can cross open trenches;
- xix. Increasing the workforce in these areas to ensure that work is completed quickly;

62.2. Water Quality

- i. The Contractor shall prevent any interference with the supply to or abstraction from, and prevent any pollution of, water resources (including underground percolating water) as a result of the execution of the Works.
- ii. Areas where water is regularly or repetitively used for dust suppression purposes shall be laid to fall to specially constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing.
- iii. All water and other liquid waste products arising on the Site shall be collected and disposed of at a location on or off the Site and in a manner that shall not cause either nuisance or pollution.
- iv. The Contractor shall not discharge or deposit any matter arising from the execution of the Works into any waters except with the permission of the Engineer and the regulatory authorities concerned.
- v. The Contractor shall at all times ensure that all existing stream courses and drains within, and adjacent to, the Site are kept safe and free from any debris and any materials arising from the Works.
- vi. The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes

and the like from pollution as a result of the execution of the Works.

62.3. Air Quality

- i. The Contractor shall devise and arrange methods of working to minimize dust, gaseous or other air-borne emissions and carry out the Works in such a manner as to minimize adverse impacts on air quality.
- ii. The Contractor shall utilize effective water sprays during delivery, manufacture, processing and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather. Stockpiles of friable materials shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.
- iii. Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.
- iv. In the event that the Contractor is permitted to use gravel or earth roads for haulage, he shall provide suitable measures for dust palliation, if these are, in the opinion of the Engineer, necessary. Such measures may include spraying the road surface with water at regular intervals.

62.4 Noise

- i. The Contractor shall consider noise as an environmental constraint in his planning and execution of the Works.
- ii. The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environmental requirements. The Contractor shall use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.
- iii. Using modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions and ensuring they are maintained to manufacturers' specifications.

62.5. Control of Wastes

- i. The Contractor shall control the disposal of all forms of waste generated by the construction operations and in all associated activities. No uncontrolled deposition or dumping shall be permitted. Wastes to be controlled shall include, but shall not be limited to, all forms of fuel and engine oils, all types of bitumen, cement, surplus aggregates, gravels, bituminous mixtures, etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Engineer.

62.6. Emergency Response

- i. The Contractor shall plan and provide for remedial measures to be implemented in the event of occurrence of emergencies such as spillages of oil or bitumen or chemicals.
- ii. The Contractor shall provide the Engineer with a statement of the measures he intends to implement in the event of such an emergency which shall include a statement of how he intends to provide personnel adequately trained to implement such measures.
- iii. Should any pollution arise from the Contractor's activities he shall clean up the affected area immediately at his own cost and to the satisfaction of the Engineer, and shall pay full compensation to any affected party.

63 Protection of Trees and Vegetation

63.1 The Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except for those required to be cleared for execution of the Works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer. No tree shall be removed without the prior approval of the Engineer and any competent authorities. Should the Contractor become aware during the period of the Contract that any tree or trees designated for clearance have cultural or religious significance he shall immediately inform the Engineer and await his instructions before proceeding with clearance. In the event that trees or other vegetation not designated for clearance are damaged or destroyed, they shall be repaired or replaced to the satisfaction of the Engineer, who shall also impose a penalty to twice the commercial value of any timber affected, as assessed by the Engineer.

64. Use of Wood as Fuel

64.1 The Contractor shall not use wood as a fuel for the execution of any part of the Works, including but not limited to the heating of bitumen and bitumen mixtures and the manufacture of bricks for use in the Works, and to the extent practicable shall ensure that fuels other than wood are used for cooking, and water heating in all his camps and living accommodations.

65. Water Supply and Electric Power

65.1 The Contractor shall make his own arrangements at his own expense for water supply and electric power supply for construction, testing and other purposes. Only clean water free from deleterious materials and of appropriate quality for its intended use shall be used.

66. Hot Mix Plants

66.1 The Contractor shall not locate any hot-mix or similar potentially polluting plant closer than 500 m to any settlement. Any such plant shall be fitted with dust suppression equipment and shall be operated and maintained at all times in conformity with the manufacturer's specifications, instructions and manuals.

67. Relations with Local Communities and Authorities

67.1 In sitting and operating his plant and facilities and in executing the Works the Contractor shall at all times bear in mind and to the extent practicable minimise the impact of his activities on existing communities. Where communities are likely to be affected by major activities such as road widening or the establishment of a camp, large borrow pit or haul road, he shall liaise closely with the concerned communities and their representatives and if so directed, shall attend meetings arranged by the Engineer or Employer to resolve issues and minimise impacts on local communities.

68. Fire Prevention

68.1 The Contractor shall take all precautions necessary to ensure that no vegetation along the line of the road outside the area of the permanent works is affected by fires arising from the execution of the Works. The Contractor shall obtain and follow any instructions of the competent authorities with respect to fire hazard when working in the vicinity of gas installations. Should a fire occur in the natural vegetation or plantations adjacent to the road for any reason the Contractor shall immediately suppress it. In the event of any other fire emergency in the vicinity of the Works the Contractor shall render assistance to the civil authorities to the best of his ability. Areas of forest, scrub or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or labour shall be replanted and otherwise restored to the satisfaction of the Engineer at the Contractor's expense.

69. Fossils

69.1 The Contractor shall make his staff available for briefing on archaeological matters as directed by the Engineer.

70. Interference with Traffic and Adjoining Properties

70.1 In case any operation connected with the works necessitates diversion, obstruction or closure of any road, railway, waterway or any other right of way, the approval of the Engineer or the Engineer's Representative and the respective competent authorities shall be obtained well in advance by the Contractor. In case the Contractor's operations obstruct access to adjacent properties, the Contractor shall be responsible to provide reasonable temporary access to the affected parties. In case the Contractor fails to provide adequate temporary facilities, this shall be deemed to be an uncorrected Defect under the terms of Clause 31 and the Employer shall have the right to engage a third party to correct the Defect and the cost of such correction will be deducted from the Contract Price.

71. Transport of Contractor's Equipment or Temporary Works

71.1 Where the Contractor intends to use a particular route for the haulage of large quantities of materials he shall consult well in advance with any affected communities and submit in advance for the Engineer's approval a plan including but not limited to the proposed route, the existing condition of the pavement and bridges, the estimated number and type of vehicle movements per day, a programme for monitoring the condition of the pavement and structures, and measures for limiting vehicle speeds and dust nuisance in built-up areas. The Engineer reserves the right to disallow certain haul routes should these in his opinion cause or be likely to cause unreasonable nuisance or hazards to the public. The Engineer's approval will not remove the Contractor's obligations under this Sub-Clause to prevent and repair damage to roads or his liability for compensation for any accidents caused by his vehicles.

72. Clearance of Contractor's Facilities

72.1 On or before expiry of the Defects Notice Period the Contractor shall clear away all his temporary facilities including but not limited to offices, camps, storage and holding yards, workshops, crushing and mixing plant, diversion and haul roads so that the land is returned to at least its previous condition and, in the case of agricultural land, potential productivity. Clearance shall include but not be limited to tasks such as the removal of unwanted structures, removal of metallic and concrete debris, removal and disposal of any soil contaminated by diesel, bitumen or other polluting material, ripping to relieve compaction, grading, replacement of topsoil, and turfing and grassing, as appropriate. Where improvements have been made such as land filling or installation of boreholes or construction of boat landings these may be retained subject to the agreement of the landowner. The Employer reserves the right to inspect the site of any facilities established or used by the Contractor in connection with the Works and to undertake any corrective measures necessary to restore the land, and to recover the cost from monies due or to become due to the Contractor.

73. Fair Wages

73.1 The Contractor shall pay not less than fair wage/minimum wages to labourers engaged by him on the work as revised from time to time by the Government of Rajasthan, but the Government shall not be liable to pay anything extra for it except as stipulated in price adjustment clause (Clause 41) of the Contract.

(Explanation: "Fair wage" means minimum wages for time or piece work, fixed or revised, as established by the State Government under the Minimum Wages Act, 1948.)

73.2 The Contractor shall, notwithstanding the provisions of any Contract to the contrary, cause to be paid fair wages to laborers indirectly engaged on the work, including any labour engaged by his sub-Contractors in connection with the said work, as if the laborers have been immediately or directly employed by him.

73.3 In respect of all laborers, immediately or directly employed on the work, for the purpose of the Contractor's part of this agreement, the Contractor shall comply with or

cause to be complied with, the Public Works Department Contract Labour Regulations' made, or that may be made, by the Government, from time to time, in regard to payment of wages, wage period, deductions from wages, recovery of wages not paid, and unauthorized deductions, maintenance of wages register, wage card, publication of scale of wages and other terms of employment, inspection and submission of periodical returns, and all other matters of a like nature.

73.4 The Engineer shall have the right to deduct, from the money due to the Contractor, any sum required or estimated to be required for making good the loss suffered by a worker or workers by reasons of non-fulfillment of the conditions of the Contract for the benefit of the worker or workers, non-payment of wages or of deductions made there from, which are not justified by the terms of the Contract or as a result of non-observance of the aforesaid regulations.

73.5 The Contractor shall be primarily liable for all payments to be made and for the observance of the regulations aforesaid, without prejudice to his right to claim indemnity from his sub-Contractors.

73.6 The regulations, aforesaid, shall be deemed to be part of this Contract and any breach thereof, shall be deemed to be breach of the Contract.

74. Housing for Labour

74.1 The Contractor at his own expense shall provide and maintain, in a clean and sanitary condition, living accommodations for those employed by him on the project. Each building for living accommodation shall be provided with lights, water supply, and sanitary facilities and be properly furnished.

75. Safety and Accident Prevention Officer

75.1 Due precautions shall be taken by the Contractor, at his own cost, to ensure the safety and protection against accidents of all staff and labour engaged on the Works, local residents in the vicinity of the Works, and the public travelling through the Works. The Contractor shall have on his staff on Site a designated officer qualified to promote and maintain safe working practices. This officer shall have authority to issue instructions and shall take protective measures to prevent accidents, including but not limited to the establishment of safe working practices and the training of staff and labour in their implementation.

76. Protective Clothing and Footwear

76.1 The Contractor shall, at his own expense, provide protective clothing and equipment to all staff and labour engaged on the Works to the satisfaction of the Engineer, and on his failure to do so the Employer shall be entitled to provide the same and recover the cost from the Contractor. Such clothing and equipment shall include, at a minimum, protective footwear for workmen undertaking concrete mixing work, protective footwear and gloves for any workmen performing bituminous paving works, protective footwear, clothing, cream, gauntlet-type gloves, hats, safety glasses or goggles and filter masks for workmen undertaking lime stabilisation works, hard hats for workmen engaged on bridge construction, and otherwise as appropriate to the job in hand and to the Engineer's satisfaction.

76.2 Ensuring that all workers are provided with and use appropriate Personal Protective Equipment (PPE), Health and safety training should be conducted for all site personnel; availability of documented procedures to be followed for all site activities; and documentation of work-related accidents;

77. First-Aid Services

77.1 The Contractor shall, at his own expense, provide first aid equipment at all camps and work sites to the satisfaction of the Engineer, and shall ensure that at all work sites where 40 or more persons are engaged on the Works there shall at all times be a person qualified in first-aid with access to appropriate first-aid equipment. A first-aid post shall be established at

each base camp comprising a suitable room with two beds, washing and examination facilities, appropriate medical supplies, and staffed on a full-time basis by a qualified paramedical attendant.

78. Health and Pests

78.1 The Contractor shall at his own expense and throughout the period of the Contract ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements for his staff and labour, and shall comply with all the regulations and requirements of the local health authorities with respect to disease prevention and control. He shall warn his staff and labour of the dangers of communicable diseases including those transmitted by insects, water, faecal/oral contact and sexual activity. The Contractor shall take the precautions necessary to protect all staff and labour employed on the Site from insect nuisance, rats and other pests and minimise the dangers to health and the general nuisance caused by the same. Should malaria or other insect-borne diseases be prevalent in the area, he shall provide his staff and labour with suitable prophylactics, equip living accommodation with screens and bed-nets, and carry out spraying with approved insecticides, as appropriate and to the Engineer's satisfaction.

79. Supply of Drinking Water, Sanitation

79.1 The Contractor shall so far as is reasonable, having regard to local conditions, provide on the Site and at his expense an adequate supply of drinking water for the use of Contractor's staff and work people, together with sanitary facilities (portable toilets or latrines), to the satisfaction of the Engineer.

80. Festivals and Religious Customs

80.1 The Contractor shall in all dealings with labour in his employment have due regard to all recognised festivals, days of rest and religious or other customs.

81. Disorderly Conduct

81.1 The Contractor shall at all times take reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same. "Disorderly conduct" shall include but not be limited to harvesting of natural resources such as firewood or fish by the Contractor's labour when this is done to the detriment of pre-existing local interests.

82. Records of Labour and Accidents

82.1 The Contractor shall maintain full records of numbers, working hours and wages of labour, safety, health and welfare of persons, accidents, and damage to property and make such reports on these matters to the Engineer as he may from time to time prescribe.

83. General

83.1 Unless otherwise indicated elsewhere in the Contract, The General Specification for civil works and the Quality Assurance and Quality Control (QAQC) document, as issued by the PMU of RUIDP, shall be followed.

84. Site Office for Engineer and Other Supervisory Staff

84.1 The Contractor shall arrange to provide office of minimum 100 sq. ft. size as per specification with two tables, four chairs, one steel almirah, sufficient number of display board, telephone etc. fully furnished office accommodation within 15 days from the date of commencement of same and shall become property of the Contractor at the completion of the work. The electrical charges / water charges and all other charges shall be arranged within the area of the work. Approval shall be taken from Engineer prior to making arrangement of the office. The construction of site office and its or maintenance are incidental to the work. The office shall be functional until work is completed. If Engineer found that office

arranged by the contractor is not being maintained properly then Engineer has right to deduct a reasonable amount from that payment. In case adequate space is not available for setting up of such office, the Engineer may waive such requirement on being requested by the Contractor, in writing.

85. Field Laboratory

85.1 Within 15 (Fifteen) days from the date of commencement of the work, the Contractor shall arrange to provide a 250 sqft. fully furnished and adequately equipped field laboratory as per Specifications and directions of the Engineer, including maintenance of the same. This shall be removed at the completion of the work. All dismantled items of field laboratory and all equipment shall be property of the Contractor at the completion of the work. The Laboratory shall be functional till the work is completed. If Engineer found that Laboratory arranged by the Contractor is not being maintained properly then Engineer has right to deduct a reasonable amount from payment. The construction of Field Laboratory & its maintenance are incidental to the work. Notwithstanding the above, the Engineer may agree to the Contractor's proposal to use facilities of accredited/ Government laboratories, upon scrutinising the details of such laboratories, submitted by the Contractor. Even in that case also, the Contractor will keep and maintain certain basic equipment at site as mentioned under Section V: Procuring Entity's Requirement.

85.2 The calibration of the laboratory equipments and instruments shall at the initial stage to be certified by agencies approved by the Engineer. Laboratory equipments shall be properly maintained and calibrated throughout the period of the Contract by the Contractor at his own expense. The Contractor shall notify the Engineer in sufficient advance prior to conducting any tests for the materials and work. The Engineer will also inspect the laboratory and the contractor shall provide adequate facilities to the Engineers for his independent verification of the accuracy and adequacy of the facilities.

86. Pre-Construction Inspection, Testing & Review of Data for Materials, Plant & Equipment

86.1 The contractor shall place order for the material and the equipment only after the approval of the Engineer. The Contractor shall submit the detailed drawings for the approved manufacturer and the procedure of submission, review and revision shall be specified herein below.

86.2 The Contractor shall inform the Engineer about the likely dates of manufacturing, testing and dispatching. The Contractor shall notify the Engineer for Inspection and Testing, at least twenty eight days prior to packing and shipping and shall supply the manufacturer's test results and quality control certificates. The Engineer will decide whether he or his representative will inspect and test the material/ equipment or whether he will approve it on the basis of manufacturer's certificate.

86.3 The inspection and test categories shall be applied prior to delivery of the equipment, of various categories as indicated in the technical specifications for each type of the equipment.

Category A: - The Drawing has to be approved by the Engineer before manufacturing and Testing. The material has to be inspected by the Engineer or by an Inspecting agency approved by the Engineer at the manufacturer's premise before packing and dispatching. The Inspection charges of the agency will be borne by the Employer but the contractor has to pay the inspection charges. The Contractor shall include in their next bill the inspection charges and the same will be reimbursed by the Employer from the provisional Sum. The Contractor shall provide the necessary equipment and facilities for tests and the cost, thereof, shall be borne by the Contractor. In case of failure of any item during third party inspection no charges shall be reimbursed to the contractor for the same.

Category B:- The drawings of the Equipment have to be submitted and to be approved by the Engineer prior to manufacture. The material has to be tested by the manufacturer and the manufacturer's test certificates are to be submitted and approved by the Engineer before dispatching of the Equipment. Notwithstanding the above, the Engineer, after examination of the test certificates, reserves the right to instruct the Contractor for retesting, if required, in the presence of Contractor's representative.

Category C: The material may be manufactured as per standard and delivered to the site.

For material / Equipment under category "A" and "B", the Engineer will provide an authorization for packing and shipping after inspection.

The testing, approval for dispatching shall not absolve of the Contractor's obligation for satisfactory performance of the plant."

Indicative list of Inspection Items with Category

Sr. No.	Item	Category of inspection
1	Retaining wall	Category A
2	Electric Cable , Conductors	Category A
3	Electric poles	Category A
4	Expansion Joint	Category A
5	Underground pipes	Category A
6	Others as directed by Engineer & as mentioned in QAQC manual	

87. Supply of Colored Record Photographs

87.1 The Contractor shall, at his own cost, arrange to take colour photographs at various stages / facets of the work including interesting and novel features of the work as directed by the Engineer and supply two copies of colour record photographs mounted in the albums including negatives with specification and these shall be kept by Employer.

88. Public Awareness / Information Display

88.1 The Contractor shall, at his own cost, arrange to provide, erect and maintain necessary display boards/ banners etc. at selection points of project site giving such information as considered necessary for public awareness/ information/ safety as directed by the Engineer.

89. Contractor's Responsibilities

89.1 The contractor shall promptly inform the Employer and the Engineer of any error, omission, fault, or any other defect in the design or drawings or specification for the works, which he discovers when reviewing the contract documents, or in the process of execution of the works. The Engineer will resolve the ambiguity or correct the error and will notify the contractor of the interpretation to be adopted.

90. Services

90.1 Underground and overhead services are likely to be met with during construction. These are to be protected against damage by the Contractor at his own cost.

90.2 The contractor shall be required to carry out removal / shifting of existing utilities as itemized in the BOQ. The contractor work program shall include this activity. The work shall be carried out under supervision of concerned department. The supervision charges of the line agencies shall be paid by the contractor and shall be reimbursed on actual on submission of receipt.

90.3 Shifting of underground and overhead services other than itemized in the BOQ, but falling in the alignment of pipe line will have to be done by Contractor. The employer would

provide full support to contractor in coordinating with line agencies; however, no claim on account of delay in shifting of utilities by line department will be admissible.

91. Setting Out

91.1 The Contractor(s) shall set out the whole of the work in conjunction with an officer to be deputed by the Engineer and during the progress of the work to amend on the requisition of the Engineer any errors which may arise therein and provide all the necessary labour materials and equipments for so doing. The contractor(s) is/are to provide all tools, plant, machinery, labour and materials (with the exceptions noted in the relevant clauses for issue of departmental materials as per schedule attached) which may be necessary and required for the work. All materials and workmanship shall conform to the relevant specifications mentioned in the tender documents.

91.2 During execution of pile foundation, if there is any variation in soil strata which was not anticipated earlier, the matter shall be referred to Engineer – in – charge for review and modification of design by the competent authority, if considered necessary. Time taken in this process is consider in the original completion period, however no claim on account of delay in getting the sanction from competent authority will be admissible.

91.3 The contractor shall carryout the detailed topographic survey at site and prepare the pre-commencement survey map for approval of the Engineer's representatives. Based on the approved Pre-commencement survey map, the contractor will prepare the necessary working drawings for the purpose of execution.

91.4 Contractor shall be responsible for taking all traffic block and shutdowns etc. from west central railway authority for execution in railway land / spans. Contractor will get all designs and drawings approved from west central railway authority for all temporary and permanent works of railway land / spans. This will be all incidental to the work. No separate claim on this account shall be payable.

91.5 Defect liability period shall be 1 year. Contractor shall furnish an affidavit from the manufacture / supplier firms before actual date of completion.

92. Labor

92.1 Engagement of Staff and Labor

- a) Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport.
- b) The contractor shall pay equal wages for men and women for work of equal value or type.
- c) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.
- d) The Contractor shall be responsible for obtaining all necessary permit(s) and/or Vsa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel.
- e) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

- f) Be required to employ atleast 50% of the labour force from communities within a radius of 2kms from the site, if sufficient people are available.

92.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.

92.3 Labor Laws

- (a) The Contractor shall comply with all the relevant labor Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.
- (b) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.
- (c) The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

92.4 Rates of Wages and Conditions of Labour

- (a) The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.
- (b) The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

92.5 Working Hours

- (a) No work shall be carried out on the Site on locally recognized days of rest, or outside the Normal working hours, which shall be 9.00 AM to 5.00 PM on all days of the week., unless:
 - (i) otherwise stated in the Contract,
 - (ii) the Engineer gives consent, or
 - (iii) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer.
- (b) If and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Engineer's consent thereto, the Engineer shall not unreasonably withhold such consent.
- (c) This Sub-Clause shall not apply to any work, which is customarily carried out by rotary or double-shifts.

92.6 Facilities for Staff and Labor

- (a) Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

- (b) The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

92.7 Health and Safety

- (a) The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.
- (b) The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.
- (c) The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.
- (d) The Contractor shall throughout the contract (including the Defect Liability Period):
 - (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Sub-Contractors and Employer's and Engineer's' employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular;
 - (ii) provide male or female condoms for all Site staff and labor as appropriate; and
 - (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor.

The Contractor shall include in the program to be submitted for the execution of the Facilities under Sub-Clause 18.2 an alleviation program for Site staff and labor and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation of this program shall not exceed the Provisional Sum dedicated for this purpose

92.8 Funeral Arrangements

In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial, unless otherwise specified in the SCC.

92.9 Records of Contractor's Personnel

The Contractor shall keep accurate records of the Contractor's personnel, including the number of each class of Contractor's Personnel on the Site and the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis in a form approved by the Engineer and shall be available for inspection by the Engineer. Until the Contractor has completed all work.

92.10 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

92.11 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

92.12 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

92.13 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift barter or disposal by Contractor's Personnel.

92.14 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

92.15 Prohibition of All Forms of Forced or Compulsory Labour

The contractor shall not employ "forced or compulsory labor" in any form. "Forced or compulsory labor" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

92.16 Prohibition of Harmful Child Labor

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, 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. "Child" means a child below the statutory minimum age of 14 years.

93 MONITORING

Provision for regular monitoring will be made as per the Environmental Management Plan and actions will be taken in case of non-compliance.

Section VI C: Contract Forms

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1. Letter of Acceptance

Letter of Acceptance

[on letter head paper of the Procuring Entity]

No. *Dated*

To: ***[name and address of the Contractor]***

Subject: ***[Notification of Award for the Works]***

This is to notify you that your Bid dated ***[date]*** for execution of the
... ***[name of the contract and identification number, as given in the Contract Data]*** for the Accepted Contract Amount of the equivalent of
[amount in numbers and words and name of currency], as corrected and modified in negotiations and in accordance with the Instructions to Bidders has been accepted by ***[designation of the Procuring Entity]*** The date of commencement and completion of the Works shall be:
.....

You are requested to furnish the Performance Security/ Performance Security Declaration within Days in the form given in the Contract Forms for the same for an amount equivalent to Rupees within days of notification of the award valid up to 60 days after the date of expiry of Defects Liability Period and maintenance period, if applicable, and sign the Contract, failing which action as stated in sub-section 2 of section 42 of the Rajasthan Transparency in Public Procurement Act, 2012 and Instructions to Bidders shall be taken.

Authorized Signature:

Name and Title of Signatory: Chief Executive Officer, JSCL, Jaipur.

Designation:

2. Contract Agreement.

Contract Agreement

THIS AGREEMENT made theday of,, between the Governor of Rajasthan/ **[Jaipur Smart City Limited]** (hereinafter “the Procuring Entity”) which expression shall, where the context so admits, be deemed to include his successors in office and assigns, of the one part, and **[name of the Contractor]**(hereinafter “the Contractor”), which expression shall, where the context so admits, be deemed to include his heirs, successors, executors and administrators, of the other part:

WHEREAS the *Procuring Entity* desires that the Works known as **[name of the Contract]**should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein, and for which the Contractor has submitted Performance Security for Rupees ----- in the form of -----(For Jaipur Smart City Limited)

The Procuring Entity and the Contractor 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.
 - a) the Letter of Acceptance;
 - b) the Bid of the Contractor as accepted alongwith the correspondence done on it, if any;
 - c) the Special Conditions of Contract/ Contract Data;
 - d) the General Conditions of Contract;
 - e) the Specifications;
 - f) the Drawings; and
 - g) the Instructions to Bidders and Notice Inviting Bids.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Procuring Entity to execute the Works and to remedy defects therein (and, if applicable, maintain the Works for a period of -----) in conformity in all respects with the provisions of the Contract.
4. The Procuring Entity hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein (and,if applicable, maintain the Works for a period of -----), 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 India and Rajasthan on the day, month and year indicated above.

Signed by

Signed by.....

for and on behalf of the Governor/ Palika Entity

for and on behalf the Contractor

(Chief Executive Officer, JSCL)

in the presence of

in the presence of

Witness, Name, Signature, Address, Date

Witness, Name, Signature, Address,
Date

3. Performance Security

Performance Security

..... *[Bank's Name, and Address of Issuing Branch or Office]*

Beneficiary: *[Name and Address of Procuring Entity (Chief Executive Officer, Jaipur Smart City Limited)*

Date:

Performance Guarantee No.:.....

We have been informed that **[name of the Contractor]** (hereinafter called "the Contractor") has entered into Contract No. **[reference number of the Contract]**. dated with you, for the execution of **[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 security is required.

At the request of the Contractor, we **[name of the Bank]** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Rupees* **[amount in figures]** (.Rupees..... **[amount in words]**) such sum being payable upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

The Guarantor agrees to extend this guarantee for a specified period in response to the Procuring Entity's written request for such extension for that specified period, provided that such request is presented to the Guarantor before the expiry of the guarantee.

This guarantee shall expire, no later than the Day of , **, and any demand for payment under it must be received by us at this office on or before that date.

.....
Seal of Bank and Authorised Signature(s)

*** The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract**

**** Insert the date sixty days after the expected completion date, including defect liability period and maintenance period, if any.**

Notes: 1. All italicized text is for guidance on how to prepare this advance payment guarantee and shall be deleted from the final document.

2. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity 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.

4. Performance Security Declaration

Form of Performance Security Declaration

Date: _____ ***[insert date (as day, month and year)]***

Contract Name and No.: _____ ***[insert name and number of Contract]***

To: _____ ***[insert Designation and complete address of Procuring Entity]***

We, the undersigned, declare that:

We understand that, according to your conditions, the Contract must be supported by a Performance Security Declaration as a guarantee to ensure fulfillment of our all

performance obligations under the Contract for _____ ***[insert name of subject matter of procurement]***.

We accept that we will automatically be suspended from being eligible for bidding in any contract with you for the period of time of _____ ***[Procuring Entity to indicate here the period of time for which the Procuring Entity will declare a Bidder ineligible to be awarded a Contract if the performance Security Declaration is to be executed]*** starting on the date that we receive a notification from you, the _____ ***[Designation of the Procuring Entity]*** that our Performance Security Declaration is executed, if we are in breach of any of our performance obligation under the conditions of the Contract,

We understand this Performance Security Declaration shall expire after 60 days of completion of our all obligations under the Contract including Defect Liability, warranty/ Guarantee, operation, maintenance, etc. in accordance with the conditions of the Contract.

Signed: _____

[insert signature of person whose name and capacity are shown]

In the capacity of: _____

[insert legal capacity of person signing the Performance Security Declaration]

Name: _____

[insert complete name of person signing the Declaration]

Duly authorized to sign the Contract for and on behalf of: _____

[insert complete name and address of the Bidder]

Dated on _____ day of _____, _____ ***[insert date of signing]***

Corporate Seal _____

Contract Agreement Works

THIS AGREEMENT made this.....day of.....2017., between Government of Rajasthan, represented by the Chief Executive Officer, JSCL (Jaipur Smart City Limited) JMC Building,Pt Deendayal Upadhyay Bhawan LalKothi,Tonk Road,Jaipur-302016 Phone No. 0414-2741346/2741347 ,E-Mail ID: jscljaipur@gmail.com (hereinafter “the Employer”), of the one part and M/S (hereinafter “the Contractor”), of the other part:

WHEREAS the *Employer* desires that the Works known as Work 1: Development of Smart Roads (Package 1: Civil Works) in ABD Area of Jaipur should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein for three years in conformity with the provisions of the contract in all respect.

The Employer and the Contractor 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.
 - a) Notice to Proceed
 - b) the Letter of Acceptance;
 - c) the Bid
 - d) the Addenda and Corrigendum
 - e) the Special Conditions
 - f) the General Conditions
 - g) the Specifications;
 - h) the Drawings;
 - i) Instructions to Bidders and Notice Inviting Bids
 - j) the Priced Bill of Quantities and
 - k) The Schedule of Supplementary information,
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor 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 Contractor 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 India on the day, month and year indicated above.

Signed by

Chief Executive Officer
Jaipur Smart City Limited
for and on behalf of the Employer

Witness, Name, Signature, Address
Signed by

Signed by

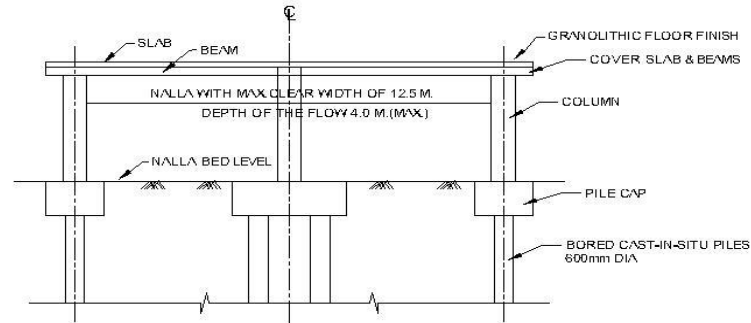
for and on behalf the Contractor

Witness, Name, Signature, Address
Signed by

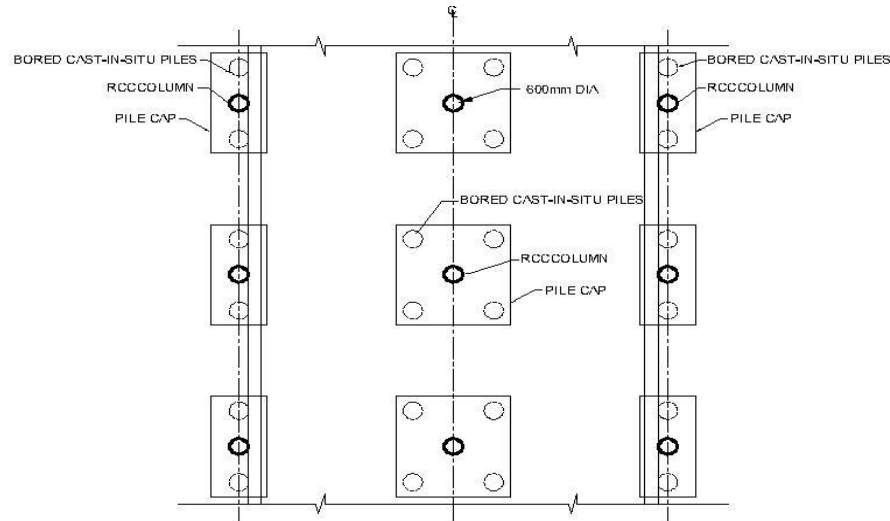
12 Tender Drawing

Construction of Nalla covering

TENDER DRAWING FOR COVERING OF NEAR PRIME HOTEL TO EXISTING MECHANIZED MLCP AT KRISHNA MARG C SCHEME (MAX. NALLA WIDTH 12.5M.)
(FOR REFERENCE PURPOSE ONLY)



SECTION



TYPICAL LAYOUT OF PILE FOUNDATIONS & PILE CAPS AT NALLA BED LEVEL



Jaipur Smart City Limited
JSCCL, M.C.C. Corporation,
Plot No. 1, Durgam Chauraha, Jaipur,
Rajasthan, India - 302016

DECLARATION
I hereby declare that the contents of this drawing are true and correct and I have not made any alteration or modification in the same without the written consent of the client.
NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
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BANSHI LAL	C.D.PRASAD
APPROVED BY	
K.MURALI KRISHNA	

SECTOR
PAN CITY SOLUTIONS- SMART MOBILITY

PROJECT
CAR PARKING NEAR KRISHNA MARG
DRAWING TITLE: PROJECT CAR PARKING ON NALLA
DRAWING No. JSCUPCS-SHIPBS-S-001

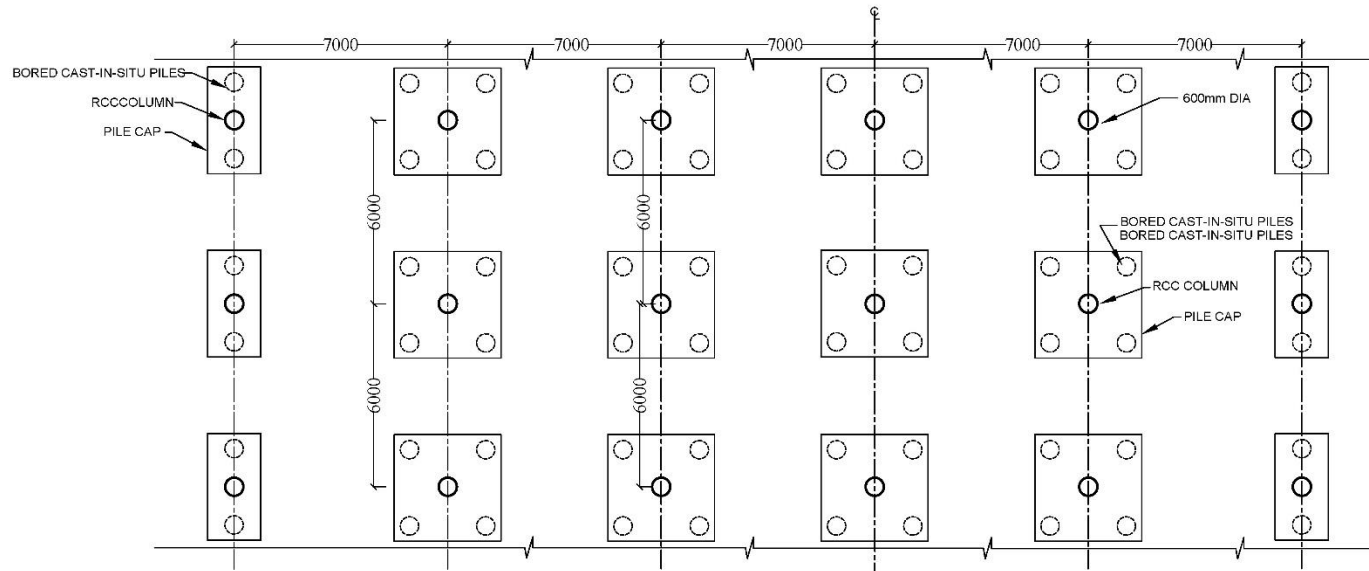
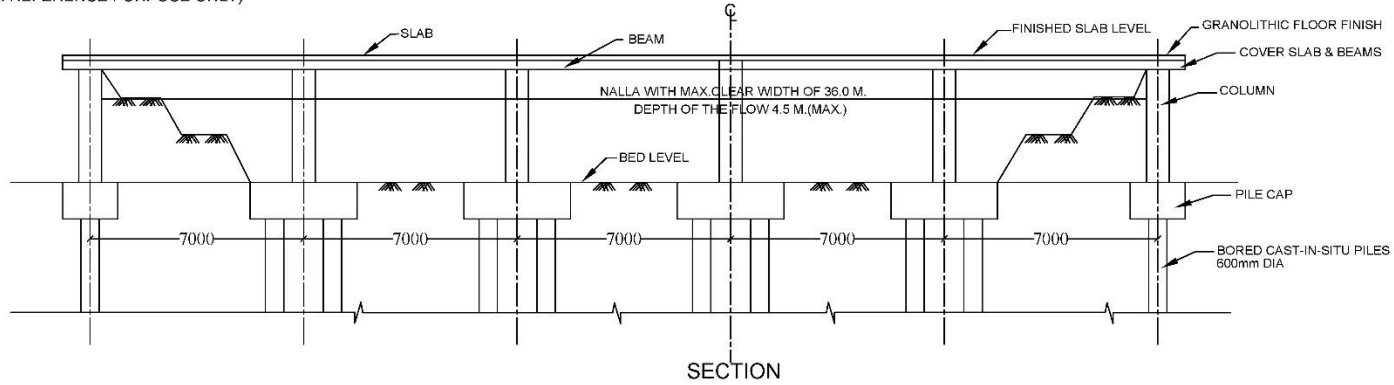
SCALE
NTS
NORTH



12 Tender Drawing

Construction of Nalla covering

TENDER DRAWING FOR COVERING OF NALLA NEAR WORLD TRADE PARK IN JLN MARG ALONG AVENUE ROAD (MAX. NALLA WIDTH 35M.)
(FOR REFERENCE PURPOSE ONLY)



TYPICAL LAYOUT OF PILE FOUNDATIONS & PILE CAPS AT NALLA BED LEVEL

epitisa
Jaipur Smart City Limited
Jaipur Municipal Corporation,
Pt. Deen Dayal Upadhyay Bhawan,
Lalcothi, Tonk Road, Jaipur - 302016

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20/12/2017	JSCCL	EPTISA	01	0			BANSHI LAL	G. D. PRASAD	PAN CITY SOLUTIONS- SMART MOBILITY	CAR PARKING ON NALLA	NTS
							APPROVED BY				
							K. MURALI KRISHNA				

PROJECT	SCALE
CAR PARKING ON NALLA	NTS
DRAWING TITLE: PROJECT CAR PARKING ON NALLA	NORTH
DRAWING No. JSCCLPCS-SM/PBS-S-001	

Environmental and Social Management Framework for Smart City Sub-Projects

As per the Government of India and Government of Rajasthan, the project and its subprojects also must be prepared and implemented in full compliance with the national legislation, regulations and standards governing protection and management of the cultural and natural heritage of the country, social development, and environmental management. Specific state and local level standards and regulations also apply based on the project location and nature of its proposed investments and activities (subprojects). The key legislation and Policy applied to this project are further discussed below in Table-1. The contractor is responsible for the implementation of Environmental and Social Framework during work execution.

Table-1

Act/Policy	Year	Objective	Main Stipulations	Applicability to Project	Monitoring Agency
Cultural Heritage Government of India					
Ancient Monuments and Archaeological Sites and Remains Act Amended	1958 2010	Declares certain monuments/sites as being of “national importance”. Stipulates conservation of cultural and historical remains found in India.	Monuments are “protected” area. 100m radius is “prohibited” area – no construction or reconstruction. Repairs allowed. 200m radius is “regulated” area (structures can be constructed by archaeological officers with due sanctions from competent authority). Protection, maintenance and	Yes, as appropriate. Approximately 46 monuments/sites are protected in Jaipur.	Ministry of Culture; with ASI/ Supervision Consultant.

			conservation managed by Archaeological Survey of India (ASI)		
Ancient Monuments Protection Act	1904	Gives central government the authority to protect and conserve monuments, particularly those privately owned, through acquisition of rights.	Specifies agreements to be made between Gol and monument/site owner for transfer of rights for protection. Gives Gol right to intervene in potentially harmful activities near site (e.g. mining, quarrying).	Possibly, if any subproject supports privately owned monument.	Ministry of Culture/ Supervision Consultant.
The Antiquities and Art Treasures Act.	1972	To ensure registration of antiquarian remains in personal possession of individuals and institutions.	Registration of antiquities/remains/art is mandatory.	Possibly, if any subproject involves chance find.	Directorate of Culture. Govt. of Rajasthan// Supervision Consultant.
Social					
Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act.	2013	To ensure rights of displaced populations in the case of land acquisition.	Fair compensation for acquisition of immovable assets; Resettlement of displaced population due to land acquisition and economic rehabilitation of all those who are	Yes. In case of acquisition of land and /or resettlement.	Revenue Department. Govt. of Rajasthan/ Supervision Consultant.

			affected due to private land acquisition		
Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act	2014	To regulate street vending while ensuring rights and stating obligations of street vendors.	Local agencies must regulate vending through a Plan, including relocation/eviction rules, vendor rights (e.g. certificate of vending) and vendor obligations (e.g. maintain cleanliness of area).	Yes. In case vending areas are close to or at the location of subprojects.	Town vending Committee/ Supervision Consultant.
Child Labour (Prohibition and Regulation) Amendment Bill,	2016	To completely ban on child labour.	The act has completely banned employment of children below 14 in all occupations and enterprises, except those run by his or her own family, provided that education does not hampered.	Yes, In case some contractor employs Child labour.	Labour Department/ Supervision Consultant.
Labour Act, Contract Labour (Regulation & Abolition) Act	1970	Act to regulate the employment of contract labor in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith.	To protect labour right.	To every establishment in which twenty or more workmen are employed or were employed on any day of the preceding twelve months as contract labour;	Labour Department/ Supervision Consultant.

Rajasthan Minimum Wages Act	2016	To regulate the wages.	To provide minimum wages.	To every Establishment.	Labour Department/ Supervision Consultant.
Payment of Wages Rule of Rajasthan.	1961	To regulate the time for wages distribution	To provide wages timely.	To every Establishment.	Labour Department/ Supervision Consultant.
Safety					
Manufacture, Storage and Import of Hazardous Chemical Rules and amendments	1989	Manufacture, Storage and Handling of Fuels and Explosive (Hazardous Chemical)	To regulate the manufacturing, storage, import and usage of explosives and hazardous chemicals.	Permission for use / storage;	SPCB, District Administration and Supervision Consultant
Environment					
Environment Protection Act	1989	To protect and improve the overall environment.	Prevention, control, and abatement of environmental pollution. Gives central government rights to monitor and test for environmental pollution, and if necessary penalize for infringements.	Yes, some specific permissions/ clearances may be required under the Act, e.g. permission for extraction of ground water for use in construction activities, from State Ground Water board.	Ministry of Environment and Forests; SEIAA/ Supervision Consultant
The Forest Conservation Act	1927	To check deforestation by restricting conversion of forested areas into non-forested areas.	If any forest land is proposed to be used for non-forest purposes, the user agency needs to get the clearances under the Forest (Conservation) Rules, 1981.	Yes, in case subprojects include pristine forest	State Forest Department. MoEFCC/ Supervision Consultant.
The Forest (Conservation) Act	1980				
The Forest (Conservation) Rules	1981				

The Forest (Conservation) Rules	2003				
Wild Life (Protection) Act.	1972	To protect wildlife through certain of National Parks and Sanctuaries.	The Act provides for protection of wild animals, birds and plants and related matters. The Act contains specific provisions and chapters on protection of specified plants, sanctuaries and national parks, etc.	Yes, in case there may be any activity against the wild animals.	Chief Conservator of Wildlife, Wildlife Wing, Forest Department, Govt. of Rajasthan, National Board For Wildlife, Govt. of India and Supervision consultant.
Water (Prevention and Control of Pollution) Act.	1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards.	Provides for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water; creates Boards and assigns functions and powers for the prevention and control of water pollution.	Yes, for any subproject involving water bodies, e.g.kunds revitalization	Rajasthan State Pollution Control Board/ Supervision Consultant.
Air (Prevention and Control of Pollution) Act.	1981	To control air pollution by controlling emission of air pollutants as per the prescribed standards.	Act provides for prevention, control and abatement of air pollution and establishment of Boards for planning a comprehensive	Yes, for any subproject involving impact of air pollution during construction/ rehabilitation phases.	Rajasthan State Pollution Control Board/ Supervision Consultant.

			program for this task. Collect and disseminate information relating to air pollution, lay down standards for emission of air pollutants into the atmosphere from industrial plants, automobiles or other sources.		
Central Motor Vehicle Act	1988	To check vehicular air and noise pollution	Vehicles to be used for construction and other purposes need to meet the standards and certificates prescribed as per the Rules, 1989 to control noise, pollution, etc.	Yes. The impact of vehicular pollution during construction/ rehabilitation phases.	Motor Vehicle Department/Supervision Consultant
Central Motor Vehicle Rules and (Amendment) Rules	1989 2013 2014				
Municipal Solid Waste (Management and Handling) Rule.	2016	To Manage Municipal Solid waste.	These rules shall apply to every urban local body, outgrowths in urban agglomerations, census towns as declared by the Registrar General and Census Commissioner of India.	Yes	Municipal Corporation of Jaipur/ Supervision Consultant
Noise Pollution (Regulation and Control) Act.	2000	To Control Noise Pollution.	Four Noise Zone specified by the Central Pollution Control Board.	Yes	Rajasthan State Pollution Control Board/ Supervision Consultant.

Standard EMP for Sub-Projects of Smart City

The Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors and subcontractors, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. EMP also ensures the project implementation is carried out in accordance with the design by taking appropriate mitigative actions to reduce or avoid adverse environmental impacts during its life cycle.

The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required. Also, the plan outlines roles and responsibility of project proponent, supervision consultant and contractors who are charged with the responsibility to manage the smart city project of Jaipur. The EMP is proactive in nature and shall be upgraded if new facilities or modifications of existing facilities, with environment concerns, come up at a later stage.

The EMP is generally:

- Prepared in accordance with rules and requirements of the MoEFCC and the State Pollution Control Board;
- To ensure that the component of facility are operated in accordance with the design;
- Process that confirms proper operation through supervision and monitoring;
- System that addresses public inconvenience during construction and operation of the facility; and

Plan that ensure remedial measures are implemented immediately.

EMP includes four major elements:

Commitment & Policy: Jaipur Smart City Limited will strive to provide and implement the Environmental Management Plan that incorporates all social and environmental issues related to project.

Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives.

Implementation: This comprises of resources available to the developers, accountability of contractor, and training of operational staff associated with environmental control facilities and documentation of measures to be taken.

Measurement & Evaluation: This includes monitoring, corrective actions and record keeping.

The Environmental Management Plan (EMP) needs to be implemented right from the conception and should continue till the end. The Plan can be divided into three phases - (a) Design or pre-construction phase (b) Construction phase and (c) Operational phase.

The Environment Management Plan of Pre Construction, Construction and Operation phase is given in **Table -1**.

Table-1

Attributes	Mitigation Measures	Location	Time Frame	Cost	Agency Responsible for Implementation	Agency Responsible for Monitoring
A: Pre Construction Phase						
Finalisation of sub project	<ul style="list-style-type: none"> • Consult with local people to finalize the sub-project especially to avoid any social obligation related to project. • Avoid excessive cut and fill and sub-project should follow natural topography of the area. • In flood prone areas, refer to hydrological data to finalize the provision for culvert drainage structures. • Avoid the requirement of forestland for sub-project. In case unavoidable, minimize it to extent possible by exploring alternative options. • In case, requirement of forestland is unavoidable, determine the legal status of forestland and initiate actions to seek permits for diversion of forestland for non-forest uses. • Forest clearance is to be obtained in accordance with the provisions of State Forest Act and MoEFCC, and all conditions related with the clearance has to 	Throughout project area.	Prior to commencing any construction works.	Part of Project Cost.	Project Implementing Unit (PIU).	Supervision Consultant (SC).

Environment Management Plan – Standard Format

Construction of Nalla Covering

	<p>be implemented.</p> <ul style="list-style-type: none"> • In case sub-project has trees, which are known to be nesting/breeding places for migratory birds, contact the wildlife division of Department of Forest for seeking permits and details about non-breeding seasons. In any case, no tree shall be cut in such location and construction works are to be strictly scheduled for non-breeding/nesting season and all permit conditions are to be complied. • Avoid or minimize tree felling, acquisition of agricultural land, shifting of shrines/temples, disturbance to community ponds, community resources, burial grounds, etc. to the extent possible through evolving alternate location options. 					
Land Acquisition	<p>Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed in Social Impacts and Resettlement & Rehabilitation report if land is acquired for the sub-project.</p>	Throughout project area.	Pre-Construction phase.	Encumbrance-free land to be made available by State Government.	State Government/PIU	SC
B: Construction Phase						
Land Clearing	• The sub-project area requiring	Throughout	Pre-	Encumbrance-	State	SC

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<p>Operation</p>	<p>clearing shall be clearly demarcated on ground.</p> <ul style="list-style-type: none"> • During land clearing operations, topsoil shall be collected, preserved, and reused as a base for the development of unused/ barren areas near sub-project. • Trees falling within sub-project area and other vegetative cover are to be removed. • Small temples, shrines if any is within the sub-project, the same may be shifted to adjacent areas in consultation with local community leaders. • During clearing operations, any treasure trove, slabs with epigraphical evidence or edicts, sculptural or any material found and appear to have historical importance, it should be brought to the notice of Department of Archaeology, and instructions of this Department must be followed. • All public utilities like power transmission cables, telephone cables, water/sewerage lines, drains, tube wells etc. falling within sub-project area shall be inventoried, and arrange for relocation /shifting to adjacent areas in consultation with the respective agencies/authorities. • Establish and maintain 	<p>project area.</p>	<p>Construction Phase.</p>	<p>free land to be made available by State Government. Relocation of utilities are to be undertaken by respective departments and costs are to be reimbursed</p>	<p>Government/PIU</p>	
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	interaction with local community to ensure that no social resentment sets in due to operations.					
Establishment of temporary office and storage area	<ul style="list-style-type: none"> • The temporary office and storage area for construction works shall be located away from human settlement areas (minimum 500 m) and forest areas (minimum 1 km). • The office and storage areas shall preferably be located on barren/waste lands and conversion of agricultural/cultivable lands for office and storage areas shall not be allowed under any circumstances. • All fuel oil/lubricants loading, unloading and storage areas shall be paved (impermeable), and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge. • The temporary office and storage area shall be provided with adequate water supply, sanitation, septic tank/soak pit of adequate capacity so that it functions properly for the entire duration of its use. • After completion of construction works, the site shall be restored to its previous state 	As determined by contractor under approval of PIU and SC	Pre-construction and Construction Phase	To be included in contractor's cost.	All facilities are to be planned and implemented by contractor under approval by PIU.	SC

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Construction of Nalla Covering

	by undertaking clean up operations.					
Construction Camp Sites.	<ul style="list-style-type: none"> • The construction campsites shall be located away from any local human settlement areas and preferably located on lands, which are barren/waste lands. • The camps shall be located, at a minimum, 5 km from forest areas to deter trespassing of construction labour. • The campsites shall be provided with adequate water supply, sanitation and all requisite infrastructure facilities. This would minimize dependence on outside resources, presently being used by local populace and minimize undesirable social friction thereof. • The camps shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. • Construction camps shall be provided with kerosene/LPG to avoid dependence on firewood for cooking to the extent possible. • After completion of construction works, location of campsites shall be restored to its previous state by undertaking 	As determined by contractor under approval of PIU and SC	Pre-construction and Construction Phase	To be included in contractor's cost.	All facilities are to be planned and implemented by contractor under approval by PIU / PIC	SC

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Construction of Nalla Covering

	cleanup operations.					
Mobilization of construction materials.	<ul style="list-style-type: none"> • Stone aggregates shall be sourced only from licensed existing quarries. • A list of such existing quarries is available from responsible department/ authority for mining related works in each state. In case new quarries are to be opened, quarry license/permits are to be obtained from this department/authority. • In case, only stone crushing plants are to be installed near work sites, required permits are to be obtained and all conditions of permits are to be complied. • Ensure stone quarries and crushing units have pollution control system; occupational safety procedures/practices in place and regular inspection shall be carried to ensure compliance. This shall be a pre-condition for sourcing of materials from quarries/crushing plants. • Earth borrow areas identified during DPR stage shall be revisited to assess its environmental sensitivity and ensure it is not an ecologically sensitive areas. Permits are to be obtained from authorities and all permit conditions are 	As determined by contractor under approval of PIU.	Pre-construction and Construction Phase.	To be included in contractor's cost.	All facilities are to be planned and implemented by contractor under approval by PIU / SC	SC

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Construction of Nalla Covering

	<p>complied.</p> <ul style="list-style-type: none">• The borrow areas are to be demarcated with signboards and operational areas are to be access controlled.• Topsoil from borrow areas (first 30cm) are to be preserved and used for redevelopment of borrow areas.• The borrow areas as an option may be converted into ponds wherever possible, which can be used for storage of rainwater.• Conversion of agricultural lands for borrowing earth is to be discouraged to the use possible unless warranted by local conditions. In such cases, written consent shall be obtained from the landowners.• Water for construction works shall NOT be drawn from sources, which serve routine needs of local people.• In case water is sourced from existing private tube wells, well owner shall be informed about the quantity and duration for which water draws will be carried out and possible implications. Written consent for use of groundwater shall be obtained. <p>In case new tube wells are to be constructed, required permits are to be obtained from the</p>					
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Construction of Nalla Covering

	<p>State Ground Water Department and permit conditions, if any are to be complied.</p> <ul style="list-style-type: none"> • In any case, care shall be taken not to source all requirements from one single source and no two sources (in case of tube wells) shall be less than 500 m from each other. 					
<p>Transportation of construction materials.</p>	<ul style="list-style-type: none"> • Existing tracks/roads are to be used for hauling of materials to extent possible. • The alignment of haul roads (in case of new ones) shall be finalized to avoid agricultural lands to the extent possible. In unavoidable circumstances, suitable compensation shall be paid to people, whose land will be temporarily acquired for the duration of operations. The compensation shall cover for loss of income for the duration of acquisition and land restoration. • Prior to alignment of new haul roads, topsoil shall be preserved or at least shall be used for any other useful purposes. • Dust suppression along transportation links is to be ensured by deploying water tankers with sprinkling system are to be deployed along haul 	<p>As determined by contractor under approval of PIU.</p>	<p>Pre-construction and Construction Phase.</p>	<p>To be included in contractor's cost.</p>	<p>All facilities are to be planned and implemented by contractor under approval by PIU / SC</p>	<p>SC</p>

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Construction of Nalla Covering

	<p>roads. The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. •Transportation links are to be inspected daily to clear accidental spillage, if any. Precaution shall be taken to avoid inconvenience to the local community due to movement of materials.</p>					
Diversion of traffic.	<ul style="list-style-type: none"> • Frame appropriate traffic diversion schemes wherever required during construction. • The traffic diversion signs should be bold and clearly visible particularly at night. • Diversion schemes are required to ensure smooth traffic flow, minimize accidents to road users during construction works. 	As determined by contractor under approval of PIU.	Pre-construction and Construction Phase.	To be included in contractor's cost.	All facilities are to be planned and implemented by contractor under approval by PIU / SC	SC
Drainage Structures	<p>In case of road construction will also require construction of several cross drainage structures, across streams/rivers flowing across the road. • Refer to hydrological studies to ensure that construction of drainage structures is not likely to alter drainage pattern, and discharge capacities of drainage structures are designed to</p>	At all locations of CD structures along the rural roads	Construction Phase.	To be included in contractor's cost.	The planning, and construction/ upgradation of existing/new cross drainage structures roads are responsibilities of contractor under approval	SC

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Construction of Nalla Covering

	<p>facilitate smooth passage of water and heading up or flooding is avoided even in flood season.</p> <ul style="list-style-type: none"> • Schedule the construction works to dry season so that impacts on water quality of stream/river is minimise or avoided. • Precaution shall be exercised to prevent oil/lubricant/hydrocarbon contamination of channel bed during construction works. Spillage, if any, shall be immediately cleared with utmost caution to leave no traces. • Ensure all construction wastes are removed from work site and stream /river beds are to be cleaned up (at least 50 m on both upstream and downstream sides of water courses) after completion of construction but prior to onset of monsoon. 				by PIU.	
Tree Planting	<ul style="list-style-type: none"> • Tree planting operations shall be commenced immediately after the construction work. • The tree plantation shall be undertaken as per permit conditions issued by the Department of Forests, prior to tree felling. • The species shall be suitable for local climate and available. The concerned DFO can be 	The area allocated for tree plantation and or land provided by forest department.	Construction Phase.	To be included in contractor's cost.	The tree plantation work can be entrusted to forest department under the supervision of PIU.	SC

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Construction of Nalla Covering

	<p>consulted for selection of species and technical guidance, if required.</p> <ul style="list-style-type: none"> • Proper care shall be taken to increase survival rate of saplings like regular watering, pruning, provision of tree guards, manure for better nourishment, etc. including timely replacement of perished saplings. 					
<p>Equipment/ vehicles deployed for Construction works.</p>	<ul style="list-style-type: none"> • All diesels run equipment/vehicles/ deployed for construction activities shall be regularly maintained for smooth operation, a measure contributing to air quality and noise. • Vehicles/equipment shall be periodically subjected for emission tests and shall have valid POLLUTION UNDER CONTROL certificates. Revalidation of certificates shall be done in every 3 months. • All vehicles deployed for material movement shall be spill proof to the extent possible. In any case, all material movement routes shall be inspected daily twice to clear off any accidental spills. 	<p>As determined by contractor.</p>	<p>Construction Phase.</p>	<p>To be included in contractor's cost.</p>	<p>All facilities are to be planned and implemented by contractor under approval by PIU.</p>	<p>SC</p>
<p>Hot Mix Plants and Laying of bitumen.</p>	<ul style="list-style-type: none"> • Hot mix plants shall be at least 500 m away from human settlements and preferably 	<p>As determined by contractor</p>	<p>Construction Phase.</p>	<p>To be included in contractor's</p>	<p>All facilities are to be planned and</p>	<p>SC</p>

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Construction of Nalla Covering

	<p>located on leeward side of most dominant wind direction.</p> <ul style="list-style-type: none"> • Consent/permits to establish and operate are to be obtained from State Pollution Control Board and all permit conditions are to be implemented/complied. • The hot mix plants shall be set up on barren/waste lands and conversion of agricultural/cultivable lands for this purpose shall not be allowed under any circumstances. • All operational areas like storage, handling, loading, unloading areas shall be paved, and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge. • The storm water from storage area shall not be directly discharged into any, nearby water courses/drains. • The hot mix pants shall be provided with adequate water supply, sanitation, septic tank/soak pit of adequate capacity so that it functions properly for the entire duration of its use. • After completion of construction works, the site shall be restored to its previous state by undertaking cleanup operations. 	<p>under approval of PIU.</p>		<p>cost.</p>	<p>implemented by contractor under approval by PIU.</p>	
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Construction of Nalla Covering

	<ul style="list-style-type: none"> Hot mix plants shall have required measures for control of dust, air, and noise pollution as per regulatory limits of State Pollution Control Board measures. 					
Clean up of construction work Sites and Disposal of waste.	<ul style="list-style-type: none"> All operational areas under road construction works like work sites, office/storage area, and work force camps shall be cleaned up and restored to its previous state soon after operations are complete. All construction waste shall be disposed in approved areas. Local district authorities shall be consulted to determine disposal site and implement any conditions imposed while issuing permits. 	Throughout project area.	Prior claiming the final payment	To be included in contractor's cost.	Contractor with the approve plan from PIU.	SC
Occupational Safety and Health Hazards at Work and camp sites.	<ul style="list-style-type: none"> All personnel at work sites shall be provided with protective gears like helmets, boots, etc. so that injuries to personnel are avoided or minimized. Children (less than 18 years) and pregnant women shall not be allowed to work under any circumstances. No personnel shall be allowed to work at site for more than 10 hours per day (8-hour makes one work shift). The operational areas shall be 	As determined by contractor.	Construction Phase.	To be included in contractor's cost.	All facilities are to be planned and implemented by contractor under approval by PIU.	SC

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Construction of Nalla Covering

	<p>access controlled and entry shall be allowed only under authorization.</p> <p>Workforce, likely to be exposed to noise levels beyond regulatory stipulated limits, shall be provided with protective gears like hear plugs etc. and regularly rotated.</p> <ul style="list-style-type: none">• Dust suppression measures like sprinkling of water shall be ensured at all operations areas.• The construction camps shall have health care facilities for adults, pregnant women and children.• All construction personnel shall be subjected to routine vaccinations and other preventive/healthcare measures.• The work and campsites shall have suitable facilities for handling any emergency situation like fire, explosion, etc.• All areas intended for storage of hazardous materials shall be quarantined and provided with adequate facilities to combat emergency situations. All required permits for storage of inflammable/hazardous materials are to be obtained.• The personnel in charge of such areas shall be properly trained, licensed and with sufficient experience.					
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Construction of Nalla Covering

	<ul style="list-style-type: none"> The construction camps shall have in-house community/common entertainment facilities. Dependence of local entertainment outlets by construction camps should be discouraged/prohibited to the extent possible. 					
Water Pollution from Construction Wastes.	<p>Take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. Avoid construction works close to the streams or water bodies during monsoon. All waste arising from the project is to be disposed off in the manner that is acceptable to the State Pollution Control Board or as directed by Environmental Expert of SC. The Environmental Expert of SC will certify that all liquid wastes disposed off from the sites meet the discharge standards.</p>	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC
Water Pollution from Fuel and Lubricants.	<p>Ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refuelling sites will be located at least 500 m from rivers and</p>	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC

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Construction of Nalla Covering

	<p>irrigation canal/ponds. All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the Environmental Expert of SC.</p> <p>Also ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refuelling areas as per the design provided</p> <p>In all, fuel storage and refuelling areas, if located on agricultural land or areas supporting vegetation, the top soil will be stripped, stockpiled and returned after cessation of such storage.</p> <p>Make necessary arrangements for collection, storing and disposal of oily wastes to the pre-identified approved vendors (list to be submitted to SC). All spills and collected petroleum products will be disposed off in accordance with MoEFCC and state SPCB guidelines.</p> <p>Environmental Expert of SC will certify that all arrangements comply with the guidelines of</p>					
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	PCB/ CPCB/ MoEF or any other relevant laws.					
Dust Pollution.	<p>Take every precaution to reduce the level of dust from crushers/hot mix plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source and by erection of screen/barriers.</p> <p>All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement.</p> <p>Provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation. The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 g/m³. The pollution monitoring is to be conducted as per the monitoring plan.</p> <p>Alternatively, only crushers licensed by the SPCB shall be used. Required certificates and consents shall be submitted by the Contractor in such a case.</p>	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC
Emission from Construction Vehicles, Equipment and Machineries	Ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC

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	<p>SPCB. The Contractor will submit PUC certificates for all vehicles/equipment/machinery used for the project.</p>					
<p>Noise Pollution: Noise from Vehicles, Plants and Equipments</p>	<ul style="list-style-type: none"> • All plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards. • All vehicles and equipment used in construction will be fitted with exhaust silencers. • Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. • Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. • Maintenance of vehicles, equipment and machinery shall be regular and up to the satisfaction of the Environmental Expert of JP Greens to keep noise levels at the minimum. 	<p>Throughout the project area.</p>	<p>Construction phase.</p>	<p>To be included in contractor's cost.</p>	<p>Contractor.</p>	<p>SC</p>

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	<p>At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, concrete mixing, batching will be stopped during the night time between 10.00 pm to 6.00 am.</p> <p>No noisy construction activities will be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 9.00 am to 6.0 pm.</p>					
Personal Safety Measures for Labour	<ul style="list-style-type: none"> • Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement batching plant, cement, lime mortars, concrete etc. • Welder's protective eye-shields to workers who are engaged in welding works • Protective goggles and clothing to workers engaged in Factories Act, 1948 stone breaking activities and workers will be seated at sufficiently safe intervals • Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation. • Adequate safety measures for 	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC

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	<p>workers during handling of materials at site are taken up.</p> <ul style="list-style-type: none">• The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. <p>The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>Make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.</p> <p>Not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.</p> <p>Also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.</p> <p>Provide facemasks for use to the workers when paint is</p>					
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	<p>applied in the form of spray or a surface having lead paint dry is rubbed and scrapped.</p> <p>Mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce non-compliance of use of PPE with zero tolerance.</p>					
Risk from Electrical Equipment(s)	<p>Take all required precautions to prevent danger from electrical equipment and ensure that -</p> <ul style="list-style-type: none"> • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights will be provided to protect the public in construction zones. <p>All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert.</p>	Throughout the project area.	Construction phase.	To be included in contractor's cost.	Contractor.	SC
First Aid	<ul style="list-style-type: none"> • Readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone • Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital • Equipment and trained nursing 	Workers Camp and construction camps.	Construction phase.	To be included in contractor's cost.	Contractor.	SC

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	staff at construction camp.					
Waste Disposal	Provide garbage bins in the camps and ensure that these are regularly emptied and disposed off / treated in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert. Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert.	Workers Camp and construction camps.	Construction phase.	To be included in contractor's cost.	Contractor.	SC