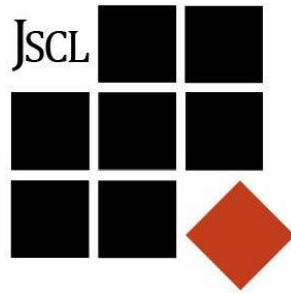


Jaipur Smart City Limited



INVITATION FOR BID (IFB)

Bid Reference No. JSCL/Smart City Works/05/2017-18

Bidding Document for

Pedestrianization of Krishna Circuit Phase 1

August - 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/05/2017

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,
Lal Kothi, Tonk Road, Jaipur – 302016
E-Mail ID: jscljaipur@gmail.com

NOTICE INVITING TENDER

Bid Reference No. JSCL/Smart City Works/05 /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	Pedestrianisation of Krishna Circuit Phase 1 at Jaipur	Rs.5.93 Crore (Rupees Five Crore and Ninety Three Lakh Only)	Rs. 11.86 Lakh (Rupees Eleven Lakh and Eighty Six Thousand Only)	Rs. 20,000 (Rupees Twenty Thousand Only)	Rs. 1000 (Rupees One Thousand Only)	9 (Nine) Months
2	Selection of System Integrator for Designing, Development, Implementation & Operation and Maintenance of Smart Digital Solutions for Integrated Solid Waste Management Systems in Jaipur	Rs.22.38 Crore (Rupees Twenty Two Crore and thirty eight Lakh Only)	Rs. 44.76 Lakh (Rupees Forty Four Lakh Seventy Six Thousand only)	Rs. 20,000 (Rupees ten thousands only)	Rs. 1000 (Rupee One Thousand Only)	9 Months for installation and 60 Months for O&M (including AMC)

Salient dates

(i)	Bid document Downloading and Submission Start Date and time	10 th August, 2017 at 11:00 am
(ii)	Bid document Downloading End Date and time	11 th September, 2017 at 5 :00 PM
(iii)	Pre bid Meeting	18 th August, 2017 at 11:00 AM
(iv)	Venue of Pre bid meeting	Jaipur Smart City Limited JMC Building, Pt Deendayal Upadhyay Bhawan, Lal Kothi, Tonk Road, Jaipur – 302016
(v)	Last date and time of Online submission of technical proposal and financial proposal	12 th September 2017 at 5:00 PM
(vi)	Last date and time of Physical submission of EMD, Bid document fee Bid processing fee & Power of Attorney	13 th September, 2017, Upto 5:00 PM
(vii)	Opening of bid online (Technical proposal only)	14 th September, 2017 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 procurement process; vii. disclose conflict of interest, if any; and 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.
		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	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: - 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.
		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 registered Contractor enlisted with any Govt. Department/ Organization equivalent to Class AA contractor of Govt. of Rajasthan. He shall furnish necessary proof for the same. PSU can participate in tender without registration.

		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 Section I. Instructions to Bidders (ITB) Section II. Bid Data Sheet (BDS) Section III. Evaluation and Qualification Criteria Section IV. Bidding Forms</p> <p>Part II: Requirements Section V. Procuring Entity's Requirements.</p> <p>Part III: Contract Section VI A. General Conditions of Contract [GCC] Section VI B. Special Conditions of Contract [SCC] Section VI C. Contract Forms</p>

		2.1.2	The Invitation for Bids (NIB) issued by the Procuring Entity is also part of the Bidding Document.
		2.1.3	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 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 Firms. Power of Attorney in favor of the partner signing/submitting the Bid, authorizing him to represent all partners of the firm. 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. iii .Address of residence and office, telephone numbers e-mail address in case of sole Proprietorship. iv. Certificate of Registration and Memorandum of Association issued by Registrar of Companies in

			<p>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> <ol 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	The Financial Bid/ Price Proposal shall contain the following: Financial Bid/ Price Proposal Submission Sheet and the applicable Price Schedules, in accordance with ITB Clauses 3.4, 3.5; Any other document required in the BDS.
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 Bill of Quantities. 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.
		3.5.2	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.
		3.5.3	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.

3.6	Currencies of Bid.	3.6.1	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.
3.7	Documents Establishing the Eligibility of the Bidder	3.7.1	To establish their eligibility in accordance with ITB Clause 1.4 [Eligible Bidders], Bidders shall: complete the eligibility declarations in the Bid Submission Sheet and Declaration Form included in Section IV [Bidding Forms]; 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 / 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 accordance with ITB Clause 6.3 [Signing of Contract] after issue of letter of acceptance/ placement of Work order within the specified time

			<p>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 be submitted.</p>
3.11	Format and Signing of Bid	3.11.1	<p>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</p>

			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	<p>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.</p> <p>Next, covers marked as "SUBSTITUTION Technical Bid" shall be opened, read out, recorded. The covers 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 Modificationis 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

			<p>of the Bidding Document and processing fee have been enclosed;</p> <p>iv. Any other details as the Bids opening committee may consider appropriate.</p> <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 and Bid Security.</p>
		4.4.9	<p>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.</p>
		4.4.10	<p>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.</p>
		4.4.11	<p>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.</p>
		4.4.12	<p>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.</p>

		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	<p>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.</p>
		5.1.4	<p>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.</p>

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	* 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.

			* [This ITB Sub-Clause should be kept only when considered necessary]
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	<p>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].</p>
		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> <ol 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	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.
5.8	Examination of Terms and Conditions of the Technical or Financial Bids	5.8.1	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.
		5.8.2	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.
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: <ol 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 lowest Bidder under the following circumstances- 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	(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. (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.

		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 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> <ul 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:-

- a) determination of need of procurement;
- b) provisions limiting participation of Bidders in the Bid process;
- c) the decision of whether or not to enter into negotiations;
- d) cancellation of a procurement process;
- e) applicability of the provisions of confidentiality.

3) **Form of Appeal.**-

- a) 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.
- b) 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.
- c) 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.**-

- a) 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.
- b) 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.**-

- a) 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 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

SECTION-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	The Number of the Invitation for Bids (NIT) is: JSCL/Smart City Works/05/2017-18 The Procuring Entity is: Jaipur Smart City limited, Rajasthan Name of Work: Pedestrianization of Krishna Circuit Phase 1 at Jaipur (Detailed Scope of work has been defined in Section V: Procurement Entity's Requirement)
1.1.2	Period of Completion: The Physical Works shall be completed in its entirety within 9 (nine) 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.
1.1.3	Estimated Cost of work is: Rs 5.93 Crore.
ITB 1.4.1	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.
ITB 1.4.2	"Bidders of Indian Nationality" are only permissible.
ITB 1.4.5	The Bidder / All partners of JV / Consortium must be registered Contractor enlisted with any Govt. Department/ Organization equivalent to Class AA contractor of Govt. of Rajasthan
ITB 1.4.8	The bidding process is open to bidders who fulfil the prescribed eligibility criteria.
ITB 1.4.9	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.

B. Bidding Documents

ITB 2.1.3	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 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
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	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 LalKothi, Tonk Road,Jaipur-302016 Phone No. 0414-2741346/2741347, E-Mail ID: jscljaipur@gmail.com
ITB 2.2.2	A Pre-bid Meeting will take place at the JMC Building, Pt Deendayal Upadhyay Bhawan, Lal Kothi, Tonk Road, Jaipur-302016.on: Date: 18thAugust, 2017 Time: 11 AM. No Site visit shall be organised by the procuring entity. 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 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 and based on BoQ.
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 11.86 lakh (Rupees Eleven lakh and Eighty-Six Thousands only), as indicated in NIT 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:</p> <p>OFFICE OF THE CHIEF EXECUTIVE OFFICER</p> <p>Jaipur Smart City Limited. JMC Building, Pt Deendayal Upadhyay Bhawan LalKothi, Tonk Road, Jaipur-302016 Phone No. 0414-2741346/2741347E-Mail ID: jscljaipur@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,
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	<p>Jaipur Smart City Limited, Jaipur payable at Jaipur, whereas the Processing fee 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 13th September, 2017 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: 12th September, 2017 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 Bhawan Lal Kothi, Tonk Road, Jaipur-302016 Phone No. 0414-2741346/2741347E-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) Contractor shall submit Performance Security @ 10% in advance at the time of signing of agreement in form of Bank Guarantee as per latest rules

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	<p>under RTPP act. The Bank Guarantee should be issued by any 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.</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 attachments
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 Requirement
	Single	Joint Venture /	

Requirement	Entity	Consortium(permitted)			s
		All Partners Combined	Lead Member	Each Member	
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 11.86 Cr)).	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</i>					

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.

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) of the requirement	Must meet 20% (percent) of requirement	Form FIN 3
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Bid Capacity = $(2xAxN)-B$

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),

N=Prescribed completion period of the work for which bids are invited in years,

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.

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

4. Experience:

Criteria	Compliance Requirements			Documents Submission Requirements
	Single Entity	Joint Venture / Consortium		
Requirement		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)	Must meet requirement	Not Applicable	Must meet requirement	Not Applicable	Form EXP 1
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and current year)					
<p><i>NOTE: Certificate of Chartered Accountant must be submitted, clearly indicating construction experience based on construction turnover of the firm.</i></p>					
<p>4.2 Specific Construction Experience</p> <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 substantially completed (as per definition given below) / completed and Commissioned one single similar work (which includes urban renewal project including area development, road redevelopment, development of pathways, landscaping) not less than the amount equal to Rs.4.5 Crore.	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2a
OR					
Should have substantially completed (as per definition given below) / completed and Commissioned two similar works (which includes providing cycle station, bus shelter) each amounting equal to Rs. 3.5 Crore.	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2a
<p>Note:</p> <p><i>(i) 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.</i></p> <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> 					
<p>4.3 Construction Experience in Key Activities in last 5 years</p>					
Bidder should have 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	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2b

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development, road redevelopment, development of pathways, landscaping) for a length of 1.0 km in last five years					
OR					
Bidder should have 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	Must meet requirement	Must meet requirement	Not Applicable	Not Applicable	Form EXP 2b
<p><i>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.</i></p>					
<p>Note: For 4.2 & 4.3</p> <p>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.</p> <p>ii) The works which have been completed during the period mentioned above, though may have commenced earlier, and shall be considered for experience purposes.</p> <p>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.</p> <p>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.</p>					

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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: _____

Volume-I Section-IV: Bidding Forms
Pedestrianization of Krishna Circuit Phase 1

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)	
Attached are self-attested copies of the following original documents: <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				
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.			
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 OR 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			
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: _____

Name:
Designation:

Signed by _____)
For and on behalf of _____)

in the presence of: _____)
_____)

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					
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6					

Procurement Entity's Requirement

SECTION-V: SCOPE OF WORK AND SPECIFICATIONS

1. Smart City Background

Presently 31% of India's population lives in cities; these cities also generate 63% of the nation's economic activity. These numbers are rapidly increasing, with almost half of India's population projected to live in its cities by 2030. The Honorable Prime Minister's vision to set up 100 smart cities across the country has led to a race among cities to be on the list that the ministry of urban development is compiling

Jaipur has been selected in the first list of Smart City announcement and stood second rank in the country.

M/s EPTISA India Pvt. Ltd was appointed as the Project Management Consultants (PMC) and shall be responsible for effectively leading and taking initiative to plan, manage, design, execute and implement the project including carrying out all necessary surveys and design the subproject plus ensuring proper construction supervision.

2. Jaipur Smart City Vision Document

The Jaipur Local Administration prepared a Bold Vision based on local context, its resources, and the priorities and aspirations of its citizens. The vision document covers the initiatives

(1)A Pan-City Initiative: Cities draws inspiration from smart solutions that incorporate the use of information technology and data management to improve services or results for the benefit of citizens. The "Pan-City" initiative has to touch the lives of many, or potentially all, of its citizens.

(2)An "Area-Based Development" Plan: This plan aimed to transform an existing place within the city, creating an example for other areas in the city, and across the country, to follow. Depending on local circumstances, cities chose one of three approaches: retrofitting, redevelopment, or green field development. Jaipur has chosen "retrofitting" within the heritage area of the Old City of Jaipur, as the "Area Based Development".

The "Krishna Circuit" in the Old City of Jaipur is envisaged as a connecting route between the several heritage temples, heritage and cultural assets linked to the legendary folklore and legend of Lord Krishna and one among the projects in the "Area Based Development" identified within the Old City of Jaipur, as a retrofit model to propose a 'Smart Pedestrian friendly environment' compliant with the spiritual status and heritage context, suited to the present and future needs of the area as a demonstration of heritage conservation, for Urban renewal and inner-city revitalization of public spaces with various interventions that will be discussed further in the report.

3. Jaipur- City Profile

3.1 Introduction

Jaipur is the capital and largest city of the state of Rajasthan in Northern India, with a population of 30.73 lac and a total area of 367km². Jaipur is known as the Pink City of India. It was founded on 18 November 1727 by Maharaja Sawai Jai Singh II, the ruler of Amer.

The city is surrounded by the Nahargarh hills in the North and Jhalana in the East, which is a part of Aravalli hills - ranges. The Southern end of the city is open to plain and stretches far and wide towards Sanganer and beyond. Jaipur forms a part of the west Golden Triangle tourist circuit along with Agra. Jaipur is a popular tourist destination in India and serves as a gateway to other tourist destinations in Rajasthan such as Jodhpur, Jaisalmer, Udaipur, and Mount Abu.



3.2 History

The construction of the city began in 1726 and took four years to complete the major roads, offices and palaces. The city was divided into nine blocks, two of which contained the state buildings and palaces, with the remaining seven allotted to the public. Huge ramparts were built, pierced by seven fortified gates.

3.3 Topography

The general slope of the Jaipur City and its surroundings is from North to South and then to South-East. Nearly all the ephemeral streams flow in this direction. Higher elevations in the north exist in the form of low, flat-topped hills of Nahargarh (587 meters). Jaigarh, Amber and Amargarh, which are deeply dissected and eroded. An isolated hillock called "Moti Dungari" upon which an old royal castle exists, is near the Rajasthan University. Further in the South, topographical levels of the plain areas varies between 280 meters along Bandi and Dhund rivers in the South to some 530 meters in the north east of Chomu near Samod hills. The overall trend is a decline of level from the areas bordering the hills in the north to plain in the south slopes of the plain areas are in general gentle.

3.4 Climate

The weather of Jaipur is semi-arid type. Temperatures remain high all around the year. The summer season begins from April and continues till July. The average temperature is at an average of 31oC. Jaipur is extremely warm during summers and cold during winters, though the nights are cooler throughout the year. The highest recorded temperature has been 48.5oC and the lowest at -2.2 oC.

Jaipur receives about 500 millimeters (196 inches) of rainfall annually but most rains occur in the monsoon months between June and September. Almost 70% of the annual rainfall is received during the months of July and August. With pleasant weather in the months of October; November to February, are the winter months for the City.

4. Project Objective

Krishna Circuit project is a part of the Government of India's 'Swadesh Darshan' scheme of re-discovering one's own country. Jaipur, has long-standing spiritual connections with Lord Shri Krishna and is identified as one of three places in Rajasthan to be taken up in this scheme and some proposal work. With that as the starting point, a wholesome proposal of a circuit or, route or, a *parikrama* by connecting important Krishna temples especially of Govindji and Gopinathji in the walled city and key heritage places like, Jantar Mantar, City Palace and Hawa Mahal, shall be prepared.

In recognition of the core objectives of the project being as follows:

- To showcase Cultural Assets
- To improve the Physical Environment for people
- To augment Physical Infrastructure
- To address Socio-economic needs of people within the precinct of this route.

5. Site Introduction

Total Length: 1100 m

Right of way: 6.5 m.

As an initiative towards this proposal, it is being proposed to develop the Phase-1 of the pedestrian route with an enhancement of urban character with the prime objective of revitalization of the urban spatial environment en-route; as places for people, with limited and defined carriageways for vehicular movement and very restricted and defined parking facility.

The Phase-1 of this pedestrian route is being proposed from Tadakeshwar Mandir up-to Govind Dev Ji Mandir, via Chandni Chowk, past the City Palace, Jantar Mantar, and through Jaleb Chowk.

The passage from Tadakeshwar Mandir to the gate adjacent to Tripolia Gate is covered under the pedestrian pathways under the "smart roads".

Section 1: From the Gate off Tripolia Bazar, past Aatish Market to Chandni Chowk.

This passage traverses through three narrow gates of the old city, the pedestrian pathways are defined and separated from carriageways. Car parking provisions are provided at Atish Market.

Section 2: The Chandni Chowk area.

This is a very prominent Urban Space, through which there is a passage for the Royal Palace from Tripolia Gate. The Brajnidhi Temple and the Anand Krishan Bihari Temple, also have their entrances from this area.

At present, the area is dotted with a few large and a few small trees, while the whole area is paved with end to end tarmac.

It is proposed to separate a 6.5-meter-wide carriageway from the remaining spaces by creating a pedestrian plaza for people, table top pedestrian crossing over road, provision stepped seating areas under trees, spray mist fountains and other landscape features and plants.

The intent is to create a pedestrian friendly arrival experience for the Lord Krishna devotees and tourists.

Section 3: From City Palace entry to Jantar Mantar entrance.

This is a narrow stretch with the City Palace wall on one side and the wall of the Jantar Mantar compound on the other. Here too, it is proposed to limit the carriageway to 6.5 meters, while increasing the pedestrian pathway on the (south-side) shaded Jantar Mantar side. Features like roadside planters and benches are provided in this stretch to make the environment more pedestrian friendly.

Section 4: From Jantar Mantar Entrance to Jaleb Chowk.

The open plaza on this stretch is proposed to be converted to a major halting and waiting point for visitors to Jantar Mantar, City Palace as well as the Temple devotees who traverse this path. A large amphitheatre like seating area with a fore-ground for small impromptu performers, and spray mist fountains are proposed.

A screened off area for car parking reserved for the City Palace staff is provided, apart from informal seating areas with benches, landscape plantation etc.

Section 5: Jaleb Chowk area.

The carriageway is restricted to 6.5 metres, while the pedestrian pathway sizes are proposed to be increased on both sides. Added plantation features like shrubs and shade giving trees are proposed to create an avenue like passage through the Jaleb Chowk. The broken railings are proposed to be repaired and new ones added to ensure the demarcation and segregation of pedestrian areas from the Jaleb Chowk garden lawns

Section 6: From Jaleb Chowk to Govind Dev Ji Temple.

The carriageway is maintained as 6.5 metres wide, while the remaining areas on both sides are proposed to be made as pedestrian friendly with paved plazas and pathways, provided with seating areas for resting, and landscape features. Opposite the Govind Dev Ji temple, it is also proposed to provide a number of shaded traditional chhatra like seating spaces, for devotees.

Section 7: Space adjoining the Pradip Rawat Hospital.

Organized Space for parking of 50 to 60 vehicles is proposed in this space, and the carriageway is restricted to 6.50 metres. Public amenities for drinking water and toilets are also provided for at the corner area.

6. Scope of Work:

For this initiative, the "Scope of Work" in the provision of pedestrian friendly environment along a 1.10 Kilometer stretch from Tadakeshwar Mandir, via Chandni Chowk, past Jantar Mantar, through Jaleb Chowk to Govind Dev Ji Mandir. This route would have; segregated paths for vehicular and paved pathways for pedestrian movement, amenities and conveniences for people, such as, benches, resting places, water ATM's, wi-fi facility, devotional music through public address systems, security surveillance cameras in "smart poles" and adequate street lighting, plantations and water bodies with spray fountains.

A few figures are attached hereinafter to have better understanding of the existing situation and Procurement Entity's idea of the overall development.

On award of the project, the contractor is required to mark out the segregation of pedestrian pathways from a limited vehicular carriageway restricted to a 6.50 meters width.

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The contractor, on award of the work will submit the detail drawing in one month's time. All detail drawings for the improvement shall be provided after carrying out necessary physical and instrumental surveys, for approval before execution at site.

The contractor will be liable to rectify all defects in Defect Liability period of one year upon completion of the project.

7. Technical Specifications

TECHNICAL SPECIFICATIONS FOR BUILDING WORKS for RUIDP/PWD

SPECIFICATIONS OF MATERIALS

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GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS

1. In the specifications, "as directed"/" Approved" shall be taken to mean "as directed"/"approved" by the Engineer-in-charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In "Mode of Measurement" in the specification wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on these particular points or aspects in the relevant Indian Standards shall be referred to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits:
 - (i) Length, width and depth (height) -----0.01 Meter.
 - (ii) Areas-----0.01 Mt.
 - (iii) Cubic Contents-----0.01 Cu. Mt.
5. The distance which constitutes lead shall be determined along the shortest practical route and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean "all leads".
7. Lift shall be measured from plinth level.
8. Up to "floor two level" means actual height of floor (Maxi. 4 M.) upto 3 Mt. Above plinth level.
9. Definite particulars covered in the items of work, though not mentioned or elucidated in it, specification shall be deemed to be included therein.
10. Reference to specifications of materials as made in the detailed specification of the items of work is in the form of a designation containing the number of the specification of the material and prefix 'M' e.g. 'M-5'.
11. Approval to the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
12. The contract rate of the item of work shall be for the work completed in all respects.
13. No collection of materials shall be made before it is got approved from the Engineer-in-charge.

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14. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
15. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.
16. No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage or overloading of the various components of the structure.
17. All works shall be carried out in a workmanlike manner as per the best techniques for the particular item.
18. All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of the work.
19. The mode, procedure and manner of execution shall be such that it does not cause damage or over loading of the various components of the structure during execution or after completion of the structure.
20. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work.
21. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the Contractor.
22. The contractor shall be responsible for observing the rules and regulations imposed under 'Minor Minerals Act' and such other laws and rules prescribed by Government from time to time.
23. All necessary safety measures and precaution [including those laid down in the various relevant Indian Standards shall be taken to ensure the safety of men, materials and machinery on the works as also of the work itself.
24. The testing charge of all materials shall be born by the Contractor unless recovery at one percent towards using charges is separately made.
25. Approval to any of the executed items for the work dose not in any way relieves the contractor of his responsibility for the correctness, soundness and strength of the structure as the drawings and specification.

General Technical Specification

M-1. Water:

1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalies, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in R.C.C Container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified I.S 456-1978.

1.2 If required by Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S.269-1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 per cent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.4 Hard and bitter water shall not be used for curing.

1.5 Potable water will be generally found suitable for curing mortar or concrete.

M-3. Cement

:

3.1 Cement shall be ordinary Portland slag cement as per I.S. 269-1976 or Portland slag cement as per I.S. 455-1976.

M-4. White Cement :

4.1 The white cement shall conform to I.S. 80412-E 1978.

M-6 Sand :

6.1 Sand shall be natural sand, clean, well graded, hard strong durable and gritty particle free from injurious amounts of dust clay, kankar nodules, soft or flaky particles shale, alkali, salts organic matter, loam, mica or other deleterious substance and shall be got approved from the Engineer-in-charge. The sand shall not contain more that 8 percent of silt as determined by field test. If necessary the sand shall be washed to make it clean.

6.2 Coarse Sand: The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0.

6.3 He sieve analysis or course shall be as under:

Percentage by weight I.S. Sieve Passing sieve Designation	I.S. Sieve Designation	Percentage by weight Passing sieve
4.75 mm.100	600 Micron	30-100
2.36 mm.90 to 100	300 Micron	5-70
1.18 mm.70-100	150 Micron	0-50

6.4 Fine Sand : The fineness modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under:

Percentage by weight I.S. Sieve Passing through Designation	I.S. Sieve Designation	Percentage by weight Passing through
4.75 mm.100	600 Micron	40-85
2.36 mm.100	300 Micron	5-50
1.18 mm.70-100	150 Micron	0-10

M-8 Stone Grit :

8.1 Grit shall consist of crushed or broken stone and be hard strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent adhesion of mortar Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1970. Unless special stone of particular quarries is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

8.2 The grit shall conform to the following gradation as per sieve analysis :

Percentage Passing I.S. Sieve through sieve Designation	I.S. Sieve Designation	Percentage Passing through sieve
12.50 mm.100 %	4.75 mm.	0-20%
10.00 mm.85-100%	2.36 mm.	0-25%

8.3 The crushing strength of grit will be such as to allow the concrete in which it is used to build up the specified strength of concrete.

8.4 The necessary tests for grit shall carried out as per the requirements of I.S.2386 (Parts I to VII) 1963, as per instructions of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-11. Cement Mortar:

11.1 Water shall conform to specification M-1.

Cement : Cement shall conform to specification M-3.

Sand : Sand shall conform to M-6.

11.2 Proportion of Mix:

11.2.1 Cement and sand shall be mixed to specified proportion, sand being measured by measuring boxes. The proportion of cement will be by volume on the basis of 50 Kg./Bag

as directed.

11.3 Preparation of Mortar: **11.3.1** In hand mixed mortar cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times or more till a homogenous mixture of uniform color is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform color so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

11.3.1 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 Stone Coarse Aggregate For Nominal Mix Concrete:

12.1 Coarse aggregate shall be machine-crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

12.2 The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below, However in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6 mm. less than the cover, whichever is smaller.

TABLE

I.S. Sieve Designation	Percentage passing for single sized aggregates of nominal size			I.S. Sieve Designation	Percentage passing for single sized aggregates of		
	40 mm.	20 mm.	16 mm.		40 mm.	20 mm.	16 mm.
80 mm.	--	--	--	12.5 mm.	--	--	--
63 mm.	100	--	--	10 mm.	0.5	0.02	0.30
40 mm.	85-100	100	--	4.75 mm.	--	0.5	0.5
20 mm.	0-20	85-100	100 mm.	2.35 mm.	--	--	

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16 mm.	--	--	85-100				
--------	----	----	--------	--	--	--	--

Note: This percentage may be varied some what by Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

12.3 The grading test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in I. S. 383-1970 and I.S. 456-1978 shall have to be carried out to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make them clean.

M-15 Bricks:

15.1 The bricks shall be hand or machine molded and made from suitable soils and klin- burnt. They shall be free from crack and nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform color. The bricks shall be molded with a frog of 100 mm. x 40 mm. and 10 mm. to 20 mm. deep on one of its flat sides. The bricks shall not break when thrown on the ground from a height of 600 mm.

15.2 The size of modular bricks shall be 190 mm. x 90 mm. x 90 mm.

15.3 The size of the conventional bricks shall be as under :
(9" x 4 3/8 "x 2 3/4 ") 225 x 110 x 75 mm.

15.4 Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work.
Length:
1.8(3.0 mm.) Width: 1/6" (1.51 mm.) Height: 1/6" (1.50 mm.)

15.5 The crushing strength of the bricks shall not be less than 35 Kg./Sq. Cm. The average water absorption shall not be more than 20 percent by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I. S. 3495 (Part-I to IV) 1976.

M-16 Stone:

16.1 The stone shall be of the specified variety such as Granite/Trap Stone/Quartzite or any other type of good hard stones. The Stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used. The percentage of water absorption shall not be more than 5% of dry weight, when tested in accordance with I.S. 1134-1974.

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The minimum crushing strength of the stone shall be 200 Kb/Sq. Cm. unless otherwise specified.

16.2 The samples of the stone to be used shall be got approved before the work is started.

16.3 The Khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.

M-17 Literate Stone :

17.1 Laterite stone shall be obtained from the approved quarry. It shall be compacted in texture, sound, durable and free from soft patches. It shall have a minimum crushing strength of 100 Kg./Sq. Cm. In its dry condition. It shall not absorb water more than 20% of its own weight, when immersed for 24 hours in water. After quarrying the stone shall be allowed to weather for some time before using in work.

17.2 The stone shall be dressed into regular rectangular blocks so that all faces are free waviness and unevenness, edges true and square.

17.3 Those types of stone in which white clay occurs, should not be used.

17.4 Special corner stones shall be provided where so directed.

M-18 Mild Steel Bars :

18.1 Mild steel bars reinforcement for R.C.C. work shall conform to I.S. 432 (Part-II) 1966 and shall be of tested quality. It shall also comply with relevant part of I.S. 456-1978.

18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.

18.3 For the purpose of payment, the bar shall be measured correct up to 100 mm. length and weight payable worked out at the rate specified below :

1. 6 mm. x 0.22 Kg./Rmt.	8.	20 mm.	2.47 Kg./Rmt.
2. 8 mm. x 0.39 Kg./Rmt.	9.	22 mm.	2.98 Kg./Rmt.
3. 10 mm. x 0.62 Kg./Rmt.	10.	25 mm.	3.85 Kg./Rmt.
4. 12 mm. x 0.89 Kg./Rmt.	11.	28 mm.	4.83 Kg./Rmt.
5. 14 mm. x 1.21 Kg./Rmt.	12.	32 mm.	6.31 Kg./Rmt.
6. 16 mm. x 1.58 Kg./Rmt.	13.	36 mm.	7.99 Kg./Rmt.
7. 18 mm. x 3.00 Kg./Rmt.	14.	40 mm.	9.86 Kg./Rmt.

M-19 High Yield Strength Steel Deformed Bars :

19.1 High yield strength steel deformed bars be either cold twisted or hot rolled, shall conform to I. S. 1739-1966 and I. S. 1139-1966 respectively.

19.2 Other provision and requirements shall conform to specification No. M-18 for mild steel bars.

M-24 Asbestos Cement Sheets :

24.1 Asbestos cement sheets plain, corrugated or semi corrugated shall conform to I. S. 459-1970.

M-26 Shuttering:

26.1 The shuttering shall be either of wooden planking of 30 mm. minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical bellies properly cross-braced together so as to make the centering rigid. In places of bulgie props, brick pillar of adequate section built in mud mortar may be used.

26.2 The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

26.3 If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete formwork shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

26.4 The props shall consist of bulgies having 100 mm. minimum diameters measured at mid length and 80 mm. at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area if 0-10 sq. m. laid on sufficiently hard base.

26.5 Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete. The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planed on the sides and surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

26.6 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.

26.7 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacturer may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.

26.8 The shuttering for beams and slabs shall have camber of 4 mm. per meter (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

M-30 Wooden flush door shutters (solid core):

30.1 The solid core type flush door shutters shall be decorative or non-decorative type as specified in the drawing. The size and thickness of the shutter shall be as specified in drawings or as directed. The timber species for core shall be used as per I.S. 2202 – (Part-I)

1980. The timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members in which they occur may be permitted. Pitch pockets, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross-bands shall conform to I.S. 303-1275.

30.2 The face panel of the shutters shall be formed by gluing by the hot press process on both faces of the core with either plywood or cross-bands and face veneers. The hopping rebating opening, ventilation etc. shall be provided if specified in the drawing.

30.3 All edges of the door shutters shall be square. The shutters shall be free from twist or warp in its plane. Both faces of the shutters shall be sand papered to smooth even texture.

30.4 The shutters shall be tested for

(1) End immersion test : The test shall be carried out as per I.S. 2202 (part-I) 1980. There shall be no delamination at the end of the test.

(2) Knife Test : The face panel when tested in accordance with I.S. 1659-1979 shall pass the test.

(3) Glue adhesion test : The flush door shall be tested for glue adhesive test in accordance with I. S. 2202 (Part-I) 1980. The shutters shall be considered to have passed the test if no de lamination occurs in the glue lines in the plywood and if no single de lamination more than 80 mm. in length and more than 3 mm. in depth has occurred in the assembly glue lines between the plywood face and the style and rail. De lamination at the corner shall be measured continuously around the corner. De lamination at the knots, knot holes and other permissible wood defects shall not be considered in assessing the sample.

30.5 The tolerance in size of solid core type flush door shall be as under :
In Normal thickness \pm 1.2 mm. In Normal height \pm 3 mm.

30.6 The thick of the shutters shall be uniform throughout with a permissible variation of not more than 0.8 mm. when measured at any two points.

M-43 Fixtures and fastenings:

43.1 General :

43.1.1 The fixtures and fastenings, that is butt, hinges, tee and strap hinges, sliding door bolts, tower bolts, door latch, bath room latch, handles, door stoppers, casement window fasteners, casement stays and ventilators catch shall be made of the metal as specified in the item or its specifications.

43.1.2 They shall be of iron, brass, aluminum, chromium plated iron, chromium plated brass, copper oxidized iron, copper oxidized brass or anodized aluminum as specified.

43.1.3 The fixtures shall be heavy, medium or light type. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operation.

43.1.4 The samples of fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.

43.1.5 Brass and anodized aluminum fixtures and fastenings shall be bright finished

43.2 Holdfasts:

43.2.1 Holdfasts shall be made from mild steel flat 30 cm. length and one of the hold fasts shall be bent at right angle and two nos. of 6 mm. diameter holes shall be made in it for fixing it to the frame with screws. At the other end, the holdfast shall be forked and bent at right angles in opposite directions.

43.3 Butt hinges :

43.3.1 Railway standard heavy type butt hinges shall be used when so specified.

43.3.2 Tee and strap hinges shall be manufactured from M. S. Sheet.

43.4 Siding door bolts (Aldrops) : **43.4.1** The aldrops as specified in the item shall be used and shall be got approved.

43.5 Tower bolts (Barrel Type): **43.5.1** Tower bolts as specified in the item shall be used and shall be got approved.

43.6 Door latch : **43.6.1** The size of door latch shall be taken as the length of latch.

43.7 Bathroom Latch: **43.7.1** Bathroom latch shall be similar to tower bolt.

43.8 Handle: The size of the handles shall be determined by the inside grip length of the handles. Handles shall have a base plate of length 50 mm. more than the size of the handle.

43.9 Door Stoppers: **43.9.1** Door stoppers shall be either floor door stopper type or door catch type. Floor stopper shall be of overall size as specified and shall have a rubber cushion.

43.10 Door Catch : **43.10.1** Door catch shall be fixed at a height of about 900 mm. from the floor level so that one part of the catch is fitted on the inside of the shutter and the other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixity. The catch shall be fixed 20 mm. inside the face of the door for easy operation of catch.

43.11 Wooden Door Stop with hinges: **43.11.1** Wooden door stop of size 100 mm x 60 mm x 40 mm shall be fixed on the door frame with a hinge of 75 mm size and at a height of 900 mm. from the floor level. The wooden door stop shall be provided with 3 coats of approved oil paints.

43.12 Casement window Fastener : Casement window fastener for single leaf window shutter shall be left or right handled as directed.

43.13 Casement stays (Straight Peg Stay) : **43.13.1** The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or practically as directed. Size of the stay shall be 250 mm. to 300 mm. as directed.

43.14 Ventilator Catch : **43.14.1** The pattern and shape of the catch shall be as approved.

43.15 Pivot : **43.15.1** The base and socket plate shall be made from minimum 3 mm. thick plate and projected pivot shall not be less than 12 mm. diameter and 12 mm. length and shall be firmly riveted to the base plate in case of iron pivot and in single piece base plate in the case of brass pivot.

M-44 Paints :

44.1 (A) Oil Paints :

44.1.1 Oil paints shall be of the specified color and shade, and as approved. The ready mixed paints shall only be used. However, if ready mixed paint or specific shade or tint is not available, white ready mixed paint with approved strainer will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform.

44.1.2 All the paints shall meet with following general requirements:

- (i) Paint shall not show excessive setting in a freshly opened full can and shall easily be redispersed with a paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or color separation and shall be free from lumps and skins.
- (ii) The paint as received shall brush easily, possess good leveling properties and show no running or sagging tendencies.

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(iii) The paint shall not skin within 48 hours in a three quarters filled closed container.

(iv) The paint shall dry to a smooth uniform finish free from roughness, grit, unevenness and other imperfections.

44.1.3 Ready mixed paint shall be used exactly as received from the manufactures and generally according to their instructions and without any admixtures whatsoever.

44.2 (B) Enamel Paints :

44.2.1 The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paint shall conform to I. S. 2933-1975.

M-48 Rough Kotah Stone :

48.1 The kotah stones shall be hard, even, sound, and regular in shape and generally uniform in color. The color of the stone shall generally be green. Brown color stones shall not be allowed for use. They shall be without any soft veins, cracks or flows.

48.2 The size of the stones to be used for flooring shall be of size 600 mm x 600 mm and / or size 600 mm x 450 mm as directed. However smaller sizes will be allowed to be used to the extent of maintaining required pattern. Thickness shall be as specified.

48.3 Tolerance of minus 30 mm. on account of chisel dressing of edges shall be permitted for length as well as breadth. Tolerance in thickness shall be + 3 mm.

48.4 The edges of stones shall be truly chiseled and table rubbed with coarse sand before paving. All angles and edges of the stone shall be true, square and free from chipping and the surface shall be true and plain.

48.5 When machine cut edges are specified, the exposed edges and the edges at joints shall be machine cut. The thickness of the exposed machine cut edges shall be uniform.

M-49 Polished Kotah Stones:

49.1 Polished kotah stone shall have the same specifications as per rough kotah stone except as mentioned below :

49.2 The stones shall have machine polished smooth surface. When brought on site, the stones shall be single polished or double polished depending upon its use. The stones for paving shall generally be single polished. The stones to be used for dedo, skirting, platforms, sink, veneering, sills, etc. where machine polishing after the stones are fixed in site is not possible, shall be double polished.

M-50 Dholapur Stone Slab :

50.1 Dholapur stone slab shall be of best quality as approved by the Engineer-in-charge. The stone slab shall be even, sound and durable, regular in shape and of uniform color.

50.2 The size of the stone shall be specified in the item or detailed drawings or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work with the permissible tolerance of plus or minus 2 mm. The provisions in respect of polishing as for polished Kotah stone shall apply to polished Dholpur stone also. All angles and edges of the face of the stone slab shall be fine chiseled or polished as specified in the item of work and all the four edges shall be machine cut. All angle and elges of the stone slab shall be true and plane.

50.3 The sample of stone shall be got approved from the Engineer-in-charge for shade and tint for a particular work. It shall be ensured that the stones to be used in a particular work shall not differ much in shade or tint from the approved sample.

M-51 Marble Slab :

51.1 Marble slab shall be white or of other color and of best quality as approved by the Engineer-in-charge.

51.2 Slabs shall be hard, uniform and homogeneous in texture. They shall have even crystalline grain and free from defects and cracks. The surface shall be machine polished to an even and perfectly plant surface and edges machine cut true and square. The rear face shall be rough to provide key for the mortar.

51.3 Marble slabs with natural veins, if selected shall have to be laid as per the pattern given by the Engineer-in-charge. Size of the slab shall be minimum 450 mm x 450 mm. and preferable 600 mm x 600 mm. However, smaller sizes will be allowed to be used to the extent of maintaining required pattern.

51.4 The slab shall not be thinner than the specified thickness at its thinnest part. A few specimen of finished slab to be used shall be deposited by the Contractor in the office for reference.

51.5 Except as above the marble slabs shall conform to I. S. 1130-1969.

M-52 Granite Stone Slab :

52.1 Granite shall be of approved color and quality. The stone shall be hard, even, sound regular in shape and generally uniform in color. It shall be without anby soft veins, cracks of flows.

52.2 The thickness of the stone shall be as specified in the items.

52.3 All exposed face shall be double polished to tender truly smooth and the even reflecting surface. The exposed edges and corners shall be rounded off as directed. The exposed edges shall be machine cut and shall have uniform thickness.

M-72 Wall Peg Rail :

72.1 The aluminum wall peg rail shall have three aluminum pegs of approved quality and size. It shall be fixed on teakwood plank of size 450 mm. x 75 mm. x 20 mm. The teakwood shall be French polished or oil painted as specified.

M-76 Bitumen Felt For Water Proofing And Damp Proofing :

76.1 Bitumen felt shall be on the fiber bases and shall be type 2, self finished grade-2 and shall conform to I. S. 1322-1970.

M-77 Selected Earth :

77.1 The selected earth shall be that obtained from excavated material or shall have to be brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.

77.2 The selected earth shall be good yellow soil and shall be got approved from the Engineer-in-charge. In no case black cotton soil or similar expansive and shrinkable soil shall be used. It shall be clean and free from all rubbish and perishable materials, stones or brick bats. The clods shall be broken to a size of 50 mm. or less, Contractor shall make his own arrangement at his own cost for land for borrowing selected earth. The stacking of material shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any constructional activities and in proper stacks.

77.3 When excavated materials is to be used, only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all the requirements of selected earth mentioned above :

DETAILED SPECIFICATIONS-EXCAVATION

4.0.0 (a) Excavation for foundation up to 1.5 M depth including sorting out and stacking useful materials disposing of the excavated stuff up to 50 meter lead in loose or soft soil.

1.0 General : 1.1 Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. fall under this category.

2.0 Clearing the site : 2.1 The site on which the structure is to be built shall be cleared and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed. The materials so obtained shall be properly of the Government and be conveyed and stacked as directed within 50 M. lead. The roots of the trees coming in the sides shall be cut and coated with hot asphalt.

2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0 Setting out : After clearing the site, the centerlines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the tractor shall assume full responsibility for alignment elevation and dimension of each and all parts of the work. Contractor shall supply laborers, materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0 Excavation : The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shutting or providing necessary slopes to a safe angle, at his own cost. The payment for such precautionary measures shall be paid separately if not specified. The bottom of the excavated area shall be levelled both longitudinally and transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason excavation is made deeper or wider than shown on the plan or directed. The extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor. The excavation up to 1.5 m. depth shall be measured under this item.

4.0.0 (B) Excavation for foundation up to 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50 meter lead in dense or hard soil.

1.0 Dense or Hard Soil : Any soil which generally require close application of picks or jumpers or scarifiers to loosen it stiff clay, gravel and rubble stone etc. fall under this category.

2.0 Workmanship : The relevant specification of item no. 4.0.0 (A) shall be followed except that the excavation work shall be carried out in dense or hard soil.

3.0 Mode of measurement and payment :

3.1 The relevant specification of item No. 4.0.0 (A) shall be followed.

3.2 The rate shall be for a unit of one cubic meter.

4.0.0 (C) : Excavation for foundation up to 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50 meter in lead-hard murrum.

1.0 Hard murrum : The hard murrum shall be clean of good binding quality and of approved quality obtained from approved quarries, of disintegrated rocks which contain siliceous material and natural of clay of calcareous origin. The size of hard murrum shall not be more than 20 mm.

2.0 Workmanship : The relevant specification of item No. 4.0.0 (A) shall be followed except that the excavation work shall be carried in hard murrum.

3.0 Mode of measurement and payment :

3.1 The relevant specification of item No. 4.0.0(A) shall be followed.

3.2 The rate shall be for a unit of one cubic meter.

1.8 Disposal of Excavated materials :

1.8.1 No materials excavated from foundation trenches of whatever kind they may be are to be placed even temporarily nearer than 1.5m. of distance prescribed by the Engineer from the outer edge of excavation. All materials excavated shall remain the property of Government. Rate for excavation includes sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable

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suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required for constructional purpose. The site shall be left clean of all debris on completion.

1.8.2 Disposal of excavated materials is subject to the following : Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead of 50 meters as directed. Useful materials obtained from clearing site and excavation shall be stacked within a lead of 50 M. beyond the building area as directed. Materials suitable for back filling shall be stacked at convenient places within a lead of 50 M. from the structure for reuse. Useful stones from rock excavation shall be stacked neatly within a lead of 50 M.

and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so laid down, at schedule of rates of the Division or at a mutually agreed rates if there are no such rates in the Schedule of rates.

1.8.3. If surplus materials are required to be conveyed beyond 50 M. conveyance will be paid for under a separate item.

2.0 Mode of measurement and payment :

2.1 The work shall be measured for the work limited to the dimensions shown on drawings or directed. Excavation to dimensions in excess of the above will not be measured or paid for and if so ordered by the Engineer the contractor shall have to fill up the excess depth with cement concrete specified for foundation without extra payment.

2.2 Driving of sounding bards, drill holes to explore the nature of substratum upto a total length of meter distributed in 2 or 3 places in each foundation if necessary, will be considered incidental work and will not be paid for separately.

2.3 Removal of slips and blows in the foundation trenches will not be measured or paid for.

2.4 If it is necessary in the opinion of the Engineer-in-charge to carry foundation below

the levels shown on the plants, the excavation for the first 1.5 M. of additional depth will be included in the quantity for the particular classification and will be paid for as extra work at rate to be decided under the general conditions of contract unless the contractor is willing to accept payment as tendered rates.

2.5 The rate shall be for a unit of one cubic meter.

4.001 (A) : Excavation for foundation for depth from 1.50 M to 3.0 M. including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 M. in lead-loose or soft soil.

1.0 Workmanship : 1.1 The relevant specification of item No. 4.0.0 (A) shall be followed except that the excavation work shall be carried out in loose or soft soil with lift 1.5 M. to 3.0 M.

2.0 Mode of measurement and payment :

2.1 The relevant specification of item No. 4.0.0 (A) shall be followed.

2.2 The excavation work from 1.5 to 3.0 M. shall be measured under this item.

2.3 The rate shall be for a unit of one cubic meter.

4.001 (C) : Excavation for foundation for depth from 1.5 M. to 3.0 M. including sorting out and stacking of useful materials and disposing of excavated stuff upto 50 M. lead in Hard murrum.

1.0 Workmanship : 1.1 The relevant specification of item No. 4.0.0 (C) shall be followed except that the excavation work shall be carried out from 1.5 M. to 3.0 M. lift in hard murrum.

2.0 Mode of measurement and payment:

2.1 The relevant specification of item No. 4.0.0 (A) shall be followed.

2.2 The excavation work from 1.5 M. to 3.0 M. shall be measured under this item.

2.3 The rate shall be for unit of one cubic meter.

4.001 (E) : Excavation foundation for depth 1.5 M. to 3.0 M. including sorting out and stacking of useful material and disposing of excavated stuff upto 50 M. lead in hard rock.

1.0 Workmanship : 1.1 The relevant specification of item No. 4.0.0 (E) shall be followed except that the excavation work shall be carried out from 1.5 m. to 3.0 M. lift in hard rock.

2.0 Mode of measurement and payment :

2.1 The relevant specification of item No. 4.0.0 (A) shall be followed.

2.2 The excavation work from 1.5 M. to 3.0 M. lift shall be measured under this item.

2.3 The rate shall be for a unit of one cubic meter.

1.0 Materials :

1.1 Sand shall conform to M.6.

2.0 Workmanship :

2.1 The relevant specifications of item No. 4.12 shall be followed except that sand shall be filled in under floors, including watering, ramming, consolidating and dressing etc. complete.

3.0 Mode of measurement and payment :

3.1 The relevant specifications of item No. 4.12 shall be followed.

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3.2 The rate includes cost of collecting carting sand with all lead and labor for filling the same in plinth under floors.

3.3 The rate shall be for a unit of one cubic meter.

4.004 : Filling in foundation and plinth with murrum or selected soil in layers of 20 cm. thickness including watering, ramming and consolidating etc. complete.

1.0 Materials :

1.1 Murrum shall be clean, of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicones materials and natural mixture of clay of calcarions origin. The size of murrum shall not be more than 20 mm.

2.0 Workmanship :

2.1 The relevant specifications of item No. 4.12 shall be followed except that the murrum or selected soil shall be filled in foundation and plinth in 20 cms. layers including consolidating, ramming, watering, dressing etc. complete.

3.0 Mode of measurement and payment :

3.1 The relevant specifications of item No. 4.12 shall be followed.

3.2 The rate includes cost of collecting carting sand with all lead and labor for filling the same in plinth under floors.

3.3 The rate shall be for a unit of one cubic meter.

SECTIONS – 5 DETAILED SPECIFICATIONS – PLAIN & RCC WORKS

5.3.2 (A) Providing and laying cement concrete 1:3:6 (1 cement:3 coarse sand : 6 graded stone aggregate 40 mm. nominal size) and curing complete excluding the cost of form work in foundations and plinth.

1.2 Materials : **1.1** Water shall conform to M-1. Sand shall conform to M-6. Cement shall conform to M-3. Stone aggregate 40 mm. nominal size shall conform to M-12.

2.0 Workmanship :

2.1 General : **2.1.1** before starting concrete bed of foundation teaches shall be cleared of all loose materials, leveled, watered and rammed as directed.

2.2 Proportion of Mix : **2.2.1** The Proportion of cement, sand and coarse aggregate shall be one part of cement, 3 parts of sand, 6 parts of stone aggregates and shall so measured by volume.

2.3 Mixing : **2.3.1** The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the

Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in color and consistency. However in such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 to 2 minutes. The quantity of water shall be sufficient to produce a dense concrete of required workability for the purpose.

2.4 Transporting & Placing the concrete :

2.4.1 The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

2.4.2 The concrete shall be laid in layers of 15 cms. to 20 cms.

2.5 Compacting : **2.5.1** The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction and to allow all the interstices to be filled with mortar.

2.6 Curing : **2.6.1** After the final set, the concrete shall be kept continuously wet, if required by pounding for a period of not less than 7 days from the date of placement.

2.7 Mode of measurement and Payment :

2.7.1 The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed

2.7.2 The rate shall be for a unit of one cubic meter.

5.3.3 (A) Providing and laying cement concrete 1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm. nominal size) and curing complete excluding cost of form work in foundations and plinth.

1.0 Materials : **1.1** Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm. nominal size shall conform to M-12.

2.0 Workmanship : **2.1** Relevant specifications of item No. 15.3.2 shall be followed except that cement concrete shall be mixed in the proportion of 1:4:8 instead of 1:3:6 by volume.

2.0 Mode of measurement and payment :

3.1 The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plans or directed.

3.2 The rate shall be for a unit of one cubic meter.

5.4.18 providing throating or plaster drip and moulding to R.C.C. Chhajjas.

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1.0 Materials : Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11.

2.0 Workmanship : **2.1** The work shall be carried out as directed. The proportion of mix for finishing touching shall be in CM 1:2 by volume. Curing shall be done for not less than 7 days. The work shall be carried out in best workman like manner. The throating or plaster drip and moulding shall be one centimeter in thickness.

5.7.5 Extra for providing and mixing water proofing or plaster drip and moulding shall be one centimeter in thickness.

2.0 Workmanship :

2.1 The proportions of materials for the cement concrete shall be mentioned with the specifications of that item. The quantity of water proofing materials to be added and the method of addition shall be as specified by manufactures.

2.3 Mixing

2.2.1 The mixing of the water proofing materials in cement, water or concrete shall be done according to the specifications of the manufacturer.

3.0 Mode of measurement and payment :

3.1 The payment is extra over and above the rate of concrete for mixing water proofing proper.

3.2 The rate shall be for a unit of one liter of Kg. per quintal of cement in which water proofing material is added.

5.7.1 Providing and laying damp proof course 25 mm. thick cement concrete 1 : 2 : 4 (1 cement, 2 coarse sand, 4 stone aggregate 10 mm. nominal size) and curing complete.

1.0 The specification of item No. 5.3.13(A) of ordinary concrete with or without reinforcement shall be followed except that the size of the stone aggregate shall be 10 mm. nominal size and the concrete work shall be carried out in 25 mm. thick damp proof course.

2.0 Mode of measurement and payment :

2.1 The rate includes cost of all materials and labor required to complete the item.

2.2 The rate shall be for a unit of one sq. meter.

5.3.13 Providing and laying cement concrete 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and curing complete excluding cost of form work in (A) foundation and plinth, (B) Independent piers, columns and pillars upto floor two level.

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1.0 Materials : Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20 mm. nominal size shall conform to M-12.

2.0 General :

2.1 The concrete mix is not required to be designed by preliminary tests. The proportion of the concrete mix shall be 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 10 mm. nominal size) by volume. Concrete work shall have exposed concrete surface or as specified in the item.

2.2 The designation ordinary M-100, M-150, M-200, M-250 specified as per I. S. Corresponding approximately to 1 : 3 : 6, 1 : 2 : 4, 1 ½ : 3 and 1 : 1 : 2 nominal mix of ordinary concrete by volume respectively.

2.3 The ingredients required for ordinary concrete containing one bag of cement of 50 Kg. by weight (0.0342 Cu. M.) for different proportions of mix shall be as under :

Grade of concrete	Total quantity of dry aggregate by volume per 50 kgs. Of cement to be taken as the sum of	Proportion of fine aggregate to coarse aggregate	Quantity of water per 50 Kgs. of cement maximum
1	2	3	4
M-100 (1 : 3 : 6)	300 Liters	Generally 1 : 2 for fine aggregate to coarse aggregate by volume but subject to and upper limit of 1:1 1/2 and lower limit 1 : 3	34 liters
M-150 (1 : 2 : 4)	220 "		32 "
M-200 (1 : 1 1/2 : 3)	160 "		30 "
M-250 (1 : 1 : 2)	100 "		27 "

2.4 The water cement ratio shall not more than those specified in the above table. The cement content of the mix specified in the Table shall be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction so that the water-cement-ratio specified in the Table is not exceeded.

2.5 Workability of the concrete shall be controlled by maintaining a water-cement-ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.

2.6 The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form.

2.7 For reinforced concrete work, coarse aggregates having a nominal size of 20 mm. are generally considered satisfactory.

2.8 For heavily reinforced concrete members as in the case of ribs of main beams, the nominal maximum size of coarse aggregate should usually be restricted to 5 mm. less than the minimum clear distance between the main bars, or 5 mm. less than the minimum cover to the reinforcement whichever is smaller.

2.9 Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be important and the nominal maximum size may sometimes be as great as or greater than the minimum cover.

2.10 Admixture may be used in concrete only with approval of Engineer-in-charge upon the evidence that with the passage of time, neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.

3.0 Workmanship :

3.1 Proportioning : proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 Kg. weight. The volume of one such bag being taken as 0.0342 Cu. Meter Boxes of suitable sizes shall be used for measuring sand aggregate. The size of the boxes (internal) shall be 35 cms. x 25 cms. and 40 cms. deep. While measuring the aggregate and sand, the box shall be filled without shaking ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for bulk age shall be made.

3.2 Mixing :

3.2.1 For all work. Concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand, cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing, measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and a half minute. Mixing shall be continued till materials are uniformly distributed and uniform color of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than 2 minutes after all ingredients have been put into the mixer.

3.2.2 When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign materials gets mixed with concrete nor does the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dru coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture to uniform color. Specified quantity of water shall then be added gradually through a rose-can and the mass turned over till a mix of

required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above that specified.

3.2.3 Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to by the Engineer-in-charge the first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement to another.

3.3 Consistency : **3.3.1** The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular

slumps tests in accordance with I. S. 1199-1959. The slumps of 10 mm. to 25 mm. shall be adopted when vibrators are used and 80 mm. when vibrators are not used.

3.4 Inspection :

3.4.1 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength, alignment, and general fitness but such inspection shall not relieve the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

3.4.2 Centering design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labor and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed for ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.5 Transporting and laying :

3.5.1 The method of transporting and placing concrete shall be as approved. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent material takes place.

All formwork shall be cleaned and made free from standing water, dust show or ice immediately before placing of concrete.

No concrete shall be placed in any part of the structure until the approval of the Engineer-in-charge has been obtained.

3.5.2 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joints is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer-in-charge concrete shall be deposited shall be deposited in horizontal layers to a compacted depth of not more than 0.45 meter when internal vibrators are used and not exceeding 0.30 meter in all other cases.

3.5.3 Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 meters. When trunking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be

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roughened, swept clean, thoroughly wetted and covered with a 13 mm. thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. This 13 mm. layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles of coarse aggregate. The surface shall then be thoroughly wetted all free water removed and then coated with neat cement grout. The first layer of concrete to be placed on his surface shall not exceed 150 mm. in thickness and shall be well rammed against old work, particular attention being given to corners and close spots.

3.5.4 All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise permitted by the Engineer-in-charge for exceptional cases, such as concreting under water, where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream up to form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to dry mixture. During compaction, it shall be observed that needle vibrators are not applied on reinforcement which is likely to destroy the bond between concrete and reinforcement.

3.6 Curing : Immediately after compaction, concrete shall be protected from weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, hassain or other similar absorbant material approved soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonary work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

3.7 Sampling and Testing of concrete :

3.7.1 Samples from fresh concrete shall be taken as per I. S. 1199-1959 and cubes shall be made, cured and tested at 7 days or 28 days as per requirements in accordance with I. S. 516-1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following :

Quantity of concrete in the work No. of samples	Quantity of concrete in the works	No. of samples
1-5 Cmt.1	16-30 Cmt.	3
6-15 Cmt.2	31-50	4

51 and above + one additional for each additional 50 M. or part thereof.

NOTE : At least one sample shall be taken from each shift. Ten test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary

by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.7.2 The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 kg/Cm² at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportions given for a particular grade, does not yield the specified strength, such concrete shall be classified as belonging to the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

3.8 Stripping :

3.8.1 The Engineer-in-charge shall be informed in advanced by the contractor of his intention to strike the form work. While fixing the time for removal of form work due consideration shall be given to local conditions, character of the structure the weather and other condition that influence the setting of concrete and of the materials used in the mix in normal circumstances (generally where temperatures are above 20°C) and where ordinary concrete is used forms may be struck after expiry of periods specified in item No. 9.1 (A) for respective item of form work.

3.8.2 All formwork shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit and struts are removed the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Centering shall be gradually and uniformly lowered in such manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to re-use the formwork, it shall be cleaned and made good to the satisfaction of the Engineer-in-charge. After removal of form work and shuttering the Executive Engineer shall inspect the work and satisfy by random checks that concrete produced is of good quality.

3.8.3 Immediately after the removal of forms all exposed bolts etc., passing through the cement concrete member and use for shuttering or any other purpose shall be cut inside the cement concrete members to a depth of at least 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fine caused by form joints, all cavities produced by the removal of forms ties and all other holes and depressions honeycomb spots broken edges or corners and other defects shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportion used in the grade of concrete that is being finished and of as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure through filling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours. If rock pockets honeycombs in the opinion of the Engineer-in-charge are of such an extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

4.0 Mode of measurement and payment :

- 4.1** The consolidated cubical contents of concrete work as specified in item shall be measured the concrete laid in excess of section shown on drawings or as directed shall not be measured. No deduction shall be made for
- (a) Ends of dis-similar materials such as joints, beams, posts, girders, rafters, purling trusses, corbels and steps etc. up to 500 Sq. Cm. in section.
(b) opening upto 0.1 Sq. m.
- 4.2** The rate includes cost of all materials, labor, tools and plant required for mixing, placing in position, vibrating and compacting, finishing as directed curing and all other incidental expenses for producing concrete of specified strength. The rate excludes the cost of form work.
- 4.3** The rate shall be for a unit of one cubic meter.
- 5.4.1** Providing and laying cement concrete 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and curing complete excluding cost of form work and reinforcement for reinforced concrete work in :
- (A) Foundations footing base of columns and mass (C) Slabs, landings, shelves, balconies, internals beams girders and cantilever upto floor two level (D) Columns, pillars, posts, and struts upto floor two level, (E) Staircase upto floor two level, (K) Vertical and horizontal first upto floor two level.

1.0 materials & Workmanship :

- 1.1** The relevant specification of item No. 5.3.13 shall be followed except that the work shall be carried out of reinforced concrete work for work as specified in item 1.2 in addition the following stipulations shall be followed for :
- (a) The bars shall be kept in position by the following methods :
- (i) In case of beam and slab construction sufficient number of precast cover blocks in cement mortar 1 : 2 (a cement : 2 coarse sand) about 4 cms. x 4 cms. section and of thickness equal to the specified cover shall be places between the bars and shuttering as to secure and maintain the requisite cover of concrete over the reinforcement.
In case of cantilevered or doubly reinforce beams of slabs the main reinforcing bars shall be held in position by introducing chain spacers or supports bars at 1.0 to 1.0 meters centers.
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- (ii) In case of columns and walls the vertical bars shall be kept in position by means of timber templates with slots accurately out in them. The tempts shall be removed after concreting has been done below it . The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.
- 1.2** All bars projecting from pillars, columns beams, slabs etc. to which other bars and concrete are to be attached or bounded to later on shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.

2.0 Mode of measurement and payment :

2.1 Relevant specifications of item no. 5.3.13 shall be followed.

2.2 The volume occupied by reinforcement shall be deducted from R.C.C. work.

2.3 The rate shall be for a unit of one cubic meter.

5.4.10 Providing Mild Steel reinforcement of R. C. C. work including bending binding and placing in position etc. complete upto floor two level.

1.0 Materials : 1.1 Mild steel bars shall conform to M-18. Mild steel binding wires shall conform to M-21.

2.0 Workmanship :

2.1 The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.

2.2 Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

2.3 Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed using a proper bar bender, operated by hand or power to attain proper radius of bends. Bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transport or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than twice the diameter of the round bar and the length of straight part of the bar beyond the end of the curve shall be at least four times the diameter of the round bar. In case of bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete.

2.4 All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size and by using stay blocks or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of concrete, except where shown on drawings. Placing bars on layers of freshly laid concrete as the work progress for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick and wooden blocks shall not be used. Layers of bars shall be separated by spacebars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars producing from concrete and to which other bars are to be

spliced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coat of neat cement grout.

- 2.5** Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm. in such manner that they do not slip over each other at the time of fixing and concreting.
- 2.6** As far as possible bars of full length shall be used. In case this is not possible, overlapping of bars shall be done as directed. When practicable, overlapping bars shall not touch each other but be kept apart by 25 mm. or 1.25 times the maximum size of the coarse aggregate whichever is greater by concrete between them. Where not feasible overlapping bars shall be bound with annealed wires not less than 1 mm. thick twisted tight. The overlaps shall be staggered for different bars and located at points along the span where neither movement is maximum.
- 2.7** Whenever indicated on the drawings or desired by the Engineer-in-charge bars shall be jointed by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are jointed by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than normal cross-section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I. S. 226.

When permitted or specified on the drawings joints of reinforcement bars shall be butt-welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subject to more than 75 per cent of the maximum permissible stresses and welds so staggered that at any one section not more than 20 percent of the rods 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 shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages previous surface shall be cleaned properly. Ends of the 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 M. S. electrodes used for welding shall conform to I. S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3.0 Mode of measurement and payment :

- 3.1** For the purpose of calculating consumption, wastage shall not be permitted beyond 3 percent. Excess consumption over 5% will be charged at penal rate.
- 3.2** Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to in place of lap joints such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured the weight of reinforcement shall be calculated in tones on the same basis of as per M-18 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for

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binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

3.3 The rate for reinforcement includes cost of steel binding wires its carting from Department a store to work site, cutting, bending, placing, binding and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position cost of joining as per approved method and all wastage and spacer bars.

3.4 The rate shall be for a unit of One kg.

5.4.11 High yield deform bars steel enforcement for R. C. C. work including bending, binding and placing in position complete upto floor two level.

1.0 Materials :

1.1 Cold twisted steel bars (high yield strength steel deformed bars) shall conform to M-19 mild steel binding wires shall conform to M-21.

2.0 Workmanship :

2.1 The specification of item No. 5.4.10 shall be followed except that the cold twisted steel bars shall be used with or without hooks at the ends. Deformed bars without hooks shall however, comply with relevant anchorage requirements.

3.0 Mode of measurement and payment :

3.1 The relevant specification of item No. 5.4.10 shall be followed.

3.2 The rate shall be for a unit of One kg.

5.4.13 Extra for additional lift of concrete for all R.C.C. work above floor two level excluding cost of reinforcement.

1.0 Materials & Workmanship : The relevant specifications of item No. 5.4.1 shall be followed for the work except that the R. C. C. work shall be done for ground floor i.e. above plinth level to first floor level.

2.0

2.0 Mode of measurement and payment :

2.1 The relevant specifications of item No. 5.4.1 shall be followed except that the rate shall be for extra lift above plinth to floor two levels, over and above the rate of concrete at floor two level.

2.2 The rate shall be for a unit of one cubic meter.

5.6.2 Providing upto floor two level precast cement concrete jail or grill 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm. nominal size) reinforced with 1 : 6 mm. dia. mild steel wire including roughening, cleaning, fixing and finishing in cement mortar 1 : 3 and curing complete.

(A) 50 mm. thick (B) 40 mm. thick (C) 25 mm. thick (D) 75 mm thick (E) 100 mm. thick

1.0 Materials : 1.1 Water shall conform to M-1 (2) Cement shall conform to M-3 (3) Sand shall conform to M-6 (4) Mortar shall conform to M-11 (5) Aggregates shall

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conform to M-12 (6) Mild steel wire shall conform to M-21 (7) Shuttering shall conform to M-26.

2.0 Workmanship :

It shall be of cement concrete 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm. nominal size) reinforced with 1.6 mm. dia mild steel wire unless otherwise specified. The thickness of jail shall be as specified in the item. The jail shall be set in position true to line and level before the jambs sills and soffits of the opening are plastered. It shall then be properly cemented with cement mortar 1:3 (1 cement: 3 sand) and rechecked for levels. Finally the jambs, sills and sophist shall be plastered gripping the Jali uniformly on all sides.

3.0 Mode of measurement and payment :

3.1 The item shall be measured in square meter.

3.2 The rate shall be for a unit of one square meter.

5.8.1 Providing and laying controlled concrete M-150 and curing complete excluding the cost of form work and reinforcement for reinforced concrete work in :

(A) Foundation, footing base of columns and mass concrete (B) Walls from top of foundations level upto floor two level. (C) Slabs, landing shelves, Balconies, lintels, beams, girders and cantilever upto floor two level, (D) Columns, pillars, posts and struts upto floor two level (E) Staircase upto floor two level (F) Vertical and horizontal fins upto floor two level.

1.0 Materials : **1.1** Water shall conform to M-1 Cement shall conform to M-3 Sand shall conform to M-6. Grit shall conform to M-8. Coarse aggregate shall conform M-12 B.

2.0 General

2.1 The relevant specifications of item No. 5.4.1 of ordinary concrete shall be followed except that the concrete mix shall be designed from preliminary tests, the proportioning of cement and aggregates shall be done by weight and necessary precautions shall be taken in the production to ensure that the required work cube strength is attained and maintained. The controlled concrete shall be in grades of M-100, M-150, M-200, M-250, M-300, M-350 & M-400 with prefix controlled added to it. The letter 'M' refers to mix and numbers specify 28 days works cube compressive strength of 150 mm. cubes of the mix expressed in Kg./Cmt.

2.2 The proportion of cement sand and coarse aggregates shall be determined by weight the weight the weight batch machine shall be used for maintaining proper control over the proportion of aggregates as per mix design.

The strength requirements of different grades of concrete shall be as under :

Grade of Concrete	Compressive strength of 15 cms. 28 days conducted in accordance Preliminary test Work test Min.	Cubes in Kg./Cmt. At with I. S. 516-1959. Min.
M-150		150

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M-200	200
M-250	250
M-300	300
M-350	350
M-400	400

In all cases the 28 days compressive strength specified in above table the criteria for acceptance or rejection of the concrete.

Where the strength of a concrete mix as indicated by tests, line in between the strength of any two grades specified in the above table, such concrete shall be classified in for all purpose as concrete belonging to the lower of the two grades between which its strength lies.

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- 2.3** The proportions for ingredients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with means available except where it can be shown to the satisfaction of the Engineer-in-charge that the supply of properly graded aggregate of uniform quality can be maintained till the completion of work. Grading of aggregate shall be controlled by obtaining the coarse aggregates in different sizes and benignity hem in the right proportions as required. Aggregate of different sizes shall be stocked in separate stockpiles. The required quantity of material shall be stock piled several hours, preferably a day before use. The grading of coarse and fine aggregate shall be checked as frequently as possible the frequency for a given job being determined by the Engineer-in-charge to ensure that the suppliers are maintaining the uniform grading as approved for samples used in the preliminary tests.
- 2.4** In proportioning concrete the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag a reasonable number of bags shall be weighted separately to check the net weight. Where cement is weighted from bulk stocks at site and not b y bags it shall be weighted separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipments shall be maintained in clean and serviceable condition. Their accuracy shall be periodically checked.
- 2.3** It is most important to keep the specified water cement ratio constant and at its correct value. To this end moisture content in both fine and coarse aggregates shall be determined by the Engineer-in-charge according to the weather conditions the amout of mixing water shall then be adjusted to compensate for variations in the moisture content. For the determination of moisture content in the aggregates I. S. 2389 (Part-III) shall be referred to suitable adjustments shall also be made in the weights of aggregates due to variation in their moisture content. Minimum quantity of cement to be used in concrete shall not be less than 220 Kg./M3 in plain concrete and not less than 250 Kg./M3 in reinforced concrete.

3.0 Mode of measurement and payment :

3.1 The relevant specifications item No. 5.4.1 shall be followed except that the controller concrete R.C.C. work for work as specified in item shall be measured under this item. The rate excludes cost of form work.

3.2 The rate shall be for a unit of one cubic meter.

5.8.2 Providing and laying controlled cement concrete M-200 and curing complete excluding the cost of form work and reinforcement for reinforced concrete work in : (A) Foundations, Footings base of columns and mass concrete (B) Walls from top of foundation upto floor two level, (C) Slabs, landings, shelves, balconies, lintels, beams, girders and cantilever upto floor two level. (D) Columns, pillars posts and struts upto floor two level, (E) Stair cases upto floor two level (K) Vertical and horizontal fins upto floor two level.

1.0 materials & Workmanship :

The relevant specification item No. 5.8.1 shall be followed except that the grading of concrete shall be controlled concrete M-200 sales for the works as specified in item.

2.0 Mode of measurement and payment :

2.1 The relevant specification of item No. 5.8.1 shall be followed.

2.2 The rate shall be for one cubic meter.

5.2 Providing and laying controlled cement concrete M-150 and finishing smooth with curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in :

(I) Slabs more than 10 cms. and upto 13 cms. (II) Slabs more than 13 cms. and upto 15 cms.

1.0 materials & Workmanship :

1.1 The relevant specifications of item No. 5.8.1 shall be followed for concrete work and item no. 9.1 shall be followed for form work and centering. The concrete surface shall be smooth finished with cement mortar 1:3 (1 cement, 3 fine sand) as per item No. 17.59(1). The thickness shall be as specified in the item.

2.1 Mode of measurement and payments :

2.1 The relevant specifications for item No. 5.8.1 shall be followed except that the item shall include the cost and form work and centering.

2.2 The rate shall be for a unit of one cubic meter.

5.3 Providing and laying ordinary cement concrete 1:2:4 (1 cement, 2 coarse sand, 4 graded stone aggregates 20 mm. nominal size) exposed work with curing etc. complete, including the cost of form work but excluding the cost of reinforcement for R.C.C. work in (I) Slab upto 8 cms. thickness (II) Slabs having more than 8 cms. and upto 10 cms. thickness (III) Slabs having more than 10 cms. and upto 13 cms. thickness (IV) Slabs having more than 13 cms. and upto 15 cms. thickness

1.0 Materials & Workmanship :

- 1.1 The relevant specifications of item No. 5.4.1 shall be followed for concrete work and that of form work and centering work shall be followed as per item No. 9.1 and 9.7 the thickness of the slab shall be as specified in the item.

2.0 Mode of measurements and payment :

- 2.1 The relevant specifications of item No. 5.4.1 shall be followed except that form work and centering work shall be included in the item.

2.2 The rate shall be for a unit of one cubic meter.

- 5.5 Providing and laying ordinary cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) for R.C.C. lintel including finishing smooth with curring etc. complete including the cost of form work but excluding the cost of reinforcement.

1.0 materials & Workmanship :

- 1.1 The relevant specifications of item No. 5.4.1 shall be followed for concrete work relevant specifications of item No. 17.59 (I) for finishing work and relevant specifications of item No. 9.1 shall be followed for form work and centering work. The concrete work shall be followed for the form work and centering work for exposed concrete work.

2.0 Mode of measurement and payment :

- 2.1 The relevant specifications of item No. 5.8.1 shall be followed except that the item includes the cost of form work and centering work for exposed concrete work.

2.2 The rate shall be for a unit of one cubic meter.

- 5.6 Providing and laying ordinary cement concrete 1:2:4(1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and finishing smooth with curing etc. complete including the cost of form work but excluding reinforcement for R.C.C. work in :

(A) **Beams** : (I) Having cross sectional area 0.05 to 0.08 Sq. meter (II) Having cross sectional area more than 0.08 Sq. mt. Upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 sq. mt. Upto 0.18 sq. mt.

(B) **Columns** : (I) Having cross sectional area 0.05 to 0.08 Sq. Mt. (II) Having cross sectional area more than 0.08 Sq. Mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. and upto 0.18 Sq. mt.

1.0 materials & Workmanship :

- 1.1 The relevant specifications of item No. 5.4.1 shall be done in cement mortar 1:3 (cement :3 fine sand) as per item No. 17.59(I). The cross sectional area of beam shall be specified in item.

2.0 Mode of measurements and payment :

- 2.1** The relevant specifications of item No. 5.4.1 shall be followed but the form work and centering work shall be included in the item.
- 2.2** The rate shall be for a unit of one cubic meter.

SECTION – 6 DETAILED SPECIFICATIONS – MASONRY WORK

6.12 (A) Brick work using common burnt clay building bricks having crushing strength not less than 75 Kg./Sq. Cm. in foundations and plinth in cement mortar 1 : 4 (1 cement : 5 fine sand) modular bricks.

1.0 Materials : Water shall conform to M-1. cement shall conform to M-3 sand shall conform to M-6. Brick shall conform to M-15. Cement mortar shall conform to M-11.

2.0 Workmanship :

2.1 Proportion :

2.1.1 The proportion of the cement mortar shall be 1 : 5 (1 cement : 5 fine sand) by volume.

2.2 Wetting of bricks :

2.2.1 The bricks required for masonry shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water is an indication of through wetting of bricks.

2.2 Laying :

2.3.1 Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except where necessary to complete the bond closers in such case shall be cut to required size and used near the ends of walls.

2.3.2 A layer of mortar shall be spread on full width for suitable length of the lower course, Each brick shall first be properly bedded and set home by gently tapping lapping with handle of trowel or wooden mallet. Its side face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

2.3.3 The walls shall be taken up truly in plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept uniform.

2.3.4 The brick shall be laid with frog upwards. A set of tools comprising of wooden straight edges, mason's spirit level, square half meter rule, and pins, string and plumb, shall be kept on the site of work for frequent checking during the progress of work.

2.3.5 Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one meter over the rest of the work. Where this is not possible the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

2.3.6 All fixtures, pipes, outlets of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

2.4 Joints :

2.4.1 Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exceed 12 mm. the face joints shall be raked out as directed by taking tools daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

2.4.2 The face of brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed.

2.5 Curing

2.5.1 Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.

2.6 Preparation of foundation bed :

2.6.1 If the foundation is to be laid directly on the excavated bed the bed shall be leveled, cleared of all loose materials, cleaned and wetted before starting masonry. If masonry is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When puccas flooring is to be provided flush with the top to plinth the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

3.0 Mode of measurements and payment :

3.1 The measurements of this item shall be taken for the brick masonry fully completed in foundation upto plinth. The limiting dimensions not exceeding those shown on the plans or as directed shall be final. Battered, tapered and curved portions shall be measured net.

3.2 No deduction shall be made from the quantity of brick work, nor any extra payment made for embedding in masonry or making holes in respect of following item :

(1) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbel steps etc. where cross sectional area does not exceed 500 Sq. Cm.

(2) Opening not exceeding 1000 Sq. Cm.

(3) Wall plates and bed plates, bearing of slabs, chhajjas and the like whose thickness does not exceed 10 Cms. and the bearing does not extend to the full thickness of wall.

(4) Drainage holes, and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.

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(5) Iron fixtures, pipes upto 300 mm. dia, hold fasts and doors and windows built into masonry and pipes etc. for concealed wiring.

(6) Forming chases of section not exceeding 350 Sq. Cm. in masonry.

3.3 Apertures for fireplaces shall not be deducted nor shall extra labor required to make splaying of jambs, threading and making Arches over the aperture be paid for separately.

3.4 The rate shall be for a unit of one cubic meter.

6.19(A) Bricks work using common burnt clay building bricks having crushing strength not less than 35 Kg./per Sq. Cm. for super structure above plinth level upto floor two level in cement mortar 1:5 (1 Cement : 5 fine sand) modular bricks.

1.0 Materials : Brick shall conform to M-15. Cement mortar shall conform M-11.

2.0 Workmanship :

2.1 The relevant specifications of item No.6.12 (A) shall be followed except that the masonry work shall be carried out above plinth level to floor two level i.e. for ground floor.

2.2 The frames of doors, windows, cupboards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embedded latter on in order to avoid damage to the frames.

2.3 Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal coarse only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding holes. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

2.4 For the face of brick work, where plastering is to be done, joints shall be racked out to a depth not less than thickness of joints. The face of brick work shall be cleansed and mortar dropping removed on very same day that brick work is laid.

3.0 Mode of measurement :

3.1 The masonry work of G.F. i.e. above plinth level to floor two level shall be measured and paid under this item.

3.2 Brick work in parapet shall be included in the corresponding masonry item of story immediately below the floor above which the parapet is built.

3.3 No deductions shall be made from quantity of brick work. No extra payment shall be made for embedding in masonry or making holes in respect of following items :

(1) Ends of joints, beams, posts, girders, rafters, purlins trusses corbel, steps etc. where cross sectional area does not exceed 500 Sq. Cm.

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- (2) Opening not exceeding 1000 Sq. Cm.
- (3) Wall plate, sand bed plates, bearing of slab, chhajjas and like whose thickness does not exceed 10 Cms. and the bearing does not extend the full thickness of wall.
- (4) Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
- (5) Iron fixtures, pipes upto 300 mm. dia. hold fasts of doors, and windows built into masonry and pipes etc. for concealed wiring.
 - (6) Forming charges of section not exceeding 350 Sq. Cm. in masonry.
- (7) Apertures for fire places, shall not be deducted nor shall extra labor required to make spaying of Jambs, threading and making trenches over the aperture be paid for separately.

3.4 The rate shall be for a unit of one cubic meter.

6.30I(A) Half brick masonry in common burnt clay building bricks having crushing strength not less than 75 Kg./Sq. cm. in cement mortar 1:4 (1 Cement : 4 Coarse sand) in super structure above plinth level upto floor two level with modular bricks.

- 1.0 Materials :** Bricks shall conform to M-15. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11.

2.0 Workmanship :

- 2.1** Relevant specifications of bricks, wetting and laying of bricks, joints, curing etc. shall conform to item No. 6.19(A) except the brick work of half bricks shall be carried out.

2.2 Cement mortar used in masonry work shall be in proportion of 1 part of cement and 4 parts of sand by volume.

- 2.3** All bricks shall be laid stretcher wise, braking joints with those in the upper and lower courses. The wall shall be taken truly plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. The bricks shall be laid with frogs upwards. A set of masons tools shall be maintained on work as required for frequent checking.

3.0 Mode of measurements and payment :

- 3.1** The half brick masonry work in foundation and plinth shall be measured under this item, the limiting dimensions shall not exceed those shown in the plan or as directed. Any work done extra over the specified dimensions shall be ignored.

- 3.2** The relevant specifications of item No. 6.12 shall be followed. The length shall be measured nearest to one Cm.

3.3 The rate shall be for a unit of Sq. meter.

6.30I(B) Half brick masonry in common burnt clay building bricks having crushing strength not less than 75 Kg./Sq. cm. in cement mortar 1:4 (1 Cement : 4 Coarse sand) in super structure above plinth level upto floor two level with conventional bricks.

1.0 Materials & Workmanship :

- 1.1 The relevant specifications of item No. 6.30 (A) shall be followed for bricks. Wasting of bricks, joint, curing, except that the bricks to be used shall be conventional bricks instead of Modular bricks.

2.0 Mode of measurements and payment :

- 2.1 The limiting dimensions shall no exceed those shown in the plan or as directed. Any work done extra over specified dimensions shall be ignored.

6.30IV(A) Half brick masonry in common burnt clay building bricks having crushing strength not less than 75 Kg./Sq. cm. in lime cement mortar 1:4 (1 Cement : 4 Coarse sand) with hoop iron 25 mm x 1.6 mm. or equivalent reinforcement at every third coarse embedded in cement mortar in foundation and plinth with modular bricks.

1.0 Materials : Bricks shall conform to M-15. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11. M. S. reinforcement shall conform to M-18.

2.0 Workmanship :

- 2.1 Relevant specification of bricks wetting and laying of bricks, joints, curing, scaffolding etc. shall conform to item No. 6.30 (I)-A except the following :-
- 2.2 Cement mortar used in masonry work shall be proportion to 1 part of cement and 5 parts of sand by volume and shall conform to M-11 and this work is for half brick thickness for partitions walls.
- 2.3 The hoop iron 25 mm. x 1.6 mm. or equivalent reinforcement shall be provided at every third course. The ends of reinforcement shall be fully embedded in mien walls on both sides as directed. Reinforcement shall be placed on the top of the bottom-most course. Laps shall be of 15 cms. of mild steel bars of hoop iron.
- 2.4 The joints in the course where reinforcement is placed shall admit of mortar cover to the reinforcement.

3.0 Mode of measurements and payment :

- 3.1 The rate shall be for half brick masonry work including providing specified reinforcement, the limiting dimensions not exceeding those in the plan or as directed. The length shall be measured nearest to one Cm.
- 3.2 Any work done extra over specified dimensions shall be ignored.
- 3.3 The rate shall be for a unit of one Sq. meter.

7 DETAILED SPECIFICATIONS – RUBBLE MASONRY WORKS

7.6(I) Uncoursed rubble masonry with hard stone approved quality in foundations plinth in cement mortar 1 : 6 (1 cement : 6 coarse sand) including leveling etc. complete.

1.0 Materials : The cement mortar shall conform to M-11 stones shall conform to M-16.

2.0 Workmanship :

2.1 Dressing of stones : Stones used of uncoursed rubble masonry work shall be hammer dressed on the sides and beds in such a way as to close up with the adjacent stone in the masonry work as strongly as possible. The face stones shall be dressed in such manner as to give a specified pattern such as Blygonal tucking etc. The face of the stones shall be so dressed that bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on the face to be plastered. It shall not projected by more than 19 mm. nor shall have depressions more than 10 mm. from the average wall surface.

2.2 Laying : All the stone shall be sufficiently wetted before laying to prevent absorption of water from mortar. The wall shall be built true to plumb (or true to required batter when so specified). All connected wall in a structures shall normally be raised up uniformly and regularly. However if for any specific reason one part of masonry is required to be left behind the wall shall be racked back at an angle not steeper than 45°. Vertical Toothed joints in masonry shall not be allowed. The work shall be carried out regularly and masonry of any day will not be raised by more than 1 meter in height.

2.3 The stone shall be laid in an uncoursed fashion or random facing etc. However the masonry is required to be brought to level at various stages viz. plinth level, window still level, roof level and any other level specifically shown in the drawings. This may be done by first by adjusting the laying or stones to one level and then by providing leveling coarse of cement concrete 1 : 6 : 12(1 cement : 6 sand : 12 graded stone aggregate 20 mm. nominal size) or as otherwise specified.

2.4 Proper bonding shall be achieved by closely filling in adjacent stones as well as by using bond stones or through stones as described herein below. Face stones shall extend back sufficiently and bond well with the masonry. The stone shall be carefully set so as to break joints and avoid formation of vertical joints. The depth of stone from the face of wall inwards shall not be less than weight or breadth at the face. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape. Neither the face stone nor the hearting stone shall be so small to pass through circular ring of 150 mm. internal diameter in any direction nor shall any of them shall have minimum thickness 100 mm.

2.5 All stone shall be carefully laid, hammered down by a wooden mallet into position and solidly embedded in mortar, chips and sprawls of stone may be used wherever necessary to avoid thick mortar beds or joints at the same time ensuring that no hollow space is left anywhere in the masonry. The chips used shall not be more than

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20% by volume of masonry. The hearting shall be laid nearly level with face stones except that at about one meter intervals vertical bond stone or plums projecting about 150 to 200 mm. shall be firmly embedded to form vertical bonding in masonry.

2.6 Bond stones : Bond stones or through stones running right across the thickness of the wall shall be provided in walls upto 600 mm. thick. In thicker walls two stones overlapping each other by at least 150 mm. shall be provided across the thickness of the wall to form bond stones. There shall be at least one bond stone for every 0.5 Sq. M. of wall surface. The bond stone shall be marked by a distinguishing letter during construction for subsequent verification and shall be laid staggered in subsequent layers.

2.7 Quoins : The quoins or corners stone shall be selected stone nearly dressed with hammer and or chisel to form the required corner angle and laid header and stretcher alternatively. The bed and top surface of quoins shall be chiseled dressed to give horizontal joints. The quoins shall have a uniform chisel draft of at least 25 mm. width at four edges exposed face, all the edges of the same face being in one plane. No quoins stone shall be smaller than 0.025 Cum. in volume.

2.8 Jamb Stones : The jamb stone shall be made with stone specified for quoins, except that the stone provided on the jambs shall have their length equal to thickness of wall upto 600 mm. and a line of headers shall be provided for walls thicker than 600 mm. as specified for bond.

2.9 Joints : All the joints shall be completely filled with mortar and their width shall not exceed 25 mm. When plastering or pointing is not required to be done, the joints shall be struck flush and finished simultaneously while laying the stone. Otherwise the joints shall be raked to a minimum depth of 20 mm. by a racking tools, during progress of laying while the mortar is still green.

2.10 Scaffolding : Single or double scaffolding shall be used. The scaffolding shall be strong and sound. The holes left in Masonry for supporting scaffolding shall be filled and made good before plastering.

2.11 Curing : Green work shall be projected from rains by suitably covering the same.

Masonry shall be kept constantly moist on all the faces for a period of at least 7 days. The top if masonry shall be flooded at the close of the day.

3.0 Mode of measurements & payment :

3.1 All work shall be measured on the basis of finished dimensions and measured net except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall be ignored. The masonry work in foundation and plinth shall be measured under this item. No deduction shall be made nor extra payment made for the following :

(a) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbels, etc. each upto 500 Sq. cm. in section.

- (b) Opening each upto 0.1 Sq. M.
- (c) Wall plates and bed plates bearings of chhaja and like upto 10 cm. depth (bearing of floor and roof slabs shall be deducted from masonry).
- (d) Drain holes and recesses for cement concrete blocks to embed hole fasts for doors windows.
- (e) Building in the masonry iron fixtures pipes upto 300 mm. dia hold fasts of doors and windows.
- (f) Forming cheses in masonry upto section of 350 Sq. Cm.

3.2 The rate shall be for a unit of one cubic meter.

7.6(II) Uncoarsed rubble masonry with hard stone of approved quality in foundation and plinth in cement mortar 1 : 5 (1 cement, 5 coarse sand) including leveling up etc. complete.

1.0 Materials & Workmanship : The relevant specifications of item No. 7.6(I) shall be followed except that the proportion of cement mortar shall be in C.M. 1 : 5 (1 cement : 5 coarse sand).

2.0 Mode of measurements and payment :

2.1 The relevant specifications of item No. 7.67(I) shall be followed.

2.1 The rate shall be for a unit of one cubic meter.

7.17(A) Coursed rubble masonry with hard stone of approved quality in foundation and plinth in cement mortar 1 : 6 (1 cement : 6 coarse sand) etc. complete.

1.0 Materials : Cement mortar shall conform to M-11. The stone shall conform to M-16.

2.0 Workmanship :

2.1 Dressing Stone : The face stone shall be hammer dressed so as to give approximately rectangular blocks. They shall be squared on bed and side joints. The bed joints shall be rough chisel dressed for a depth of at least 50 mm. back from the faces and the side joints shall be so dressed to a depth of at least 40 mm. back from the face such that no portion of the dressed surface is more than 10 mm. from a straight edge held against the surface. The remaining portions of surface shall not project above the chisel dressed bed and side joints. The bushing on the face shall not project by more than 40 mm. on an exposed face and 10 mm. on a face to be plastered. The hammer dressed stone shall also have a rough tooling for a minimum width of 25 mm. along the four edges of the face of the stone.

2.2 Laying :

2.2.1 all stones shall be wetted before laying. The wall shall be built up truly plumb (or to required batter where so specified).

All connected masonry in a structure shall normally be raised up uniformly and regularly. However if for any specific reasons one part of wall is required to be left

behind such wall shall be raked back at an angle not steeper than 45°. Vertical Toothed joints in masonry shall not be allowed. The work shall be carried up regularly and masonry on any day shall not be raised by more than meter in height.

2.2.2 All the course shall be laid truly horizontal. The height of course shall not be less than 150 mm. nor more than 300 mm. Face stone shall be laid in alternate header and stretcher fashion.

They shall be so arranged as to break joints by at least mm. Stones shall be laid with grains horizontal so that the load is transmitted along the direction of their maximum crushing strength. The depth of stone shall not be less than the height or breadth. The breadth of a face stone shall also be not less than 150 mm. Each face stone shall be of the same height in any given course. The course shall be built in perpendicular to the pressure which the masonry will bear. In case of battered walls (such as retaining walls) the beds of the stone and the plane of courses shall be laid with their bed perpendicular to the battered face.

9 DETAILED SPECIFICATIONS – CENTERING & FORM WORK

9.1.(A) Providing form work of ordinary timber planking so as to give a rough finish including centering shuttering strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 mm and removal of the same for in site reinforced concrete and plain concrete work in foundations, footing, bases of columns and mass concrete.

1.0 Materials :

- 1.1** The shuttering to be provided shall be of ordinary timber planks and shall conform to M-26.
- 1.2** The dimensions of scantlings and battens shall conform to the design. The strength of the wood shall not be less than that assumed in the design.

2.0 Workmanship :

2.1 The form work shall conform to the shape lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete. Adequate arrangements shall be made by the contractor to safe-guard against any settlement of the form work during the course of concreting and after concreting. The form work of shuttering, centering, scaffolding bracing etc. shall be as per design.

2.2 Cleaning & Treatment of forms :

2.2.1 All rubbish, particularly chippings shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treated. The surface shall be then coated with soap solution applied before concreting is done. Soap solution for the purpose shall be prepared by dissolving yellow soap in water to get consistency of paint. Alternatively a coat of raw linseed oil or form oil of approved manufacture may

be applied in case steel shuttering is used. Soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Care shall be taken that the coating does not get on construction joints surface and reinforcement bars.

2.3 Stripping time :

2.3.1 In normal circumstance and where ordinary cement is used forms may be struck after expiry of following periods :

(a) Sites of walls columns and vertical faces of beam 24 to 48 hours. (b)

Beam soffits. (Props left under) – 7 days.

(c) Removal of props slabs.

(i) Slabs spanning upto 4.5 m. – 7 days (ii) Spanning over 4.5 m. – 14 days. (d)

Removal of props to beams and Arches.

(i) Spanning upto 6 m. – 14 days. (ii) Spanning over 6 m. – 21 days.

2.4 Procedure when removing the form work : 2.4.1 All form work shall be removed without such shock or vibrations as would damage the reinforced concrete surface. Before the soffit formwork and struts are removed the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

2.5 Centering : 2.5.1 The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the formwork and concrete work before during and after pouring concrete. Watch should be kept to see that behavior of centering and formwork is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.5.2 The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads without any settlement.

2.5.3 The centering and formwork shall be inspected and approved by the Engineer-in-charge before concreting. But this will not relieve the contractor of his responsibility for strength, adequacy and safety of form work and centering. If there is a

failure of formwork or centering, contractor shall be responsible for the damages to the work, injury to life and damage to property.

2.6 Scaffolding :

2.6.1 All scaffolding, hoisting arrangements and ladders etc. required for the facilitating of concreting shall be provided and removed on completion work by contractor at his own expense. The scaffolding, hoisting arrangements and ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work and workman etc.

2.6.2 The scaffolding, hoisting arrangement and ladders shall allow easy approach to the work spot and afford easy inspection.

2.6.3 The rate is applicable to all conditions of working and height upto 4 mts. The rate shall include the cost of materials and labor for various operations involved such as

(a) Splayed edges, notching, allowance for overlaps and passing at angles, battens centering, shuttering, strutting, propping bolting, nailing, wedging, easing, striking and removal.

(b) Filleting to form stop chamfered edges or played external angles not exceeding 20 mm. width to beams, columns and the like.

(c) Temporary openings in the forms for pouring concrete, if required, removing rubbish etc.

(d) Dressing with oil to prevent adhesion of concrete with shuttering and

(e) Raking or circular cutting.

2.7 Re-Use : 2.7.1 Before re-use all forms shall be inspected by Engineer-in-charge and their suitability ascertained. The forms shall be scarred, cleaned and joints gone over, repaired where required. Inside surface shall be retreated to prevent adhesion of concrete.

3.0 Mode of measurements & payment :

3.1 Form work shall be measured as the area in square meters of shuttering in contract with concrete except in the case of inclined member and portion of curved pro-file and upper side in which case only area of underside shall be measured for payment.

3.4 Form work to secondary beams shall be measured up to the sides of main beams but no deduction shall be made from the form work of the main beam at the inter section point. No deduction shall be made from the form work of a column at inter section of beams.

3.5 The rate is for the completed item.

3.6 The rate shall be for a unit of one Sq. meter.

9.1 (A) (I) Extra for providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling in between 4 m. to 5 m. and removal of the same of in site reinforced or plain concrete work in foundation, footings, bases of columns etc. and mass concrete.

1.0 Materials & Workmanship:

1.1 The relevant specifications of item No.9.1 (A) shall be followed except that the height of propping and centering below supporting floor to ceiling exceeding 4 m. but not exceeding 5 m.

2.0 Mode of measurements & payment :

2.1 The payment shall be made extra over and above the payment made upto 4mt. height. The relevant specifications of item 9.1 (A) shall be followed. The rate shall be for a unit of one Sq. meter.

9.1 (B) (I) Providing form work of ordinary timber planking so as to give a rough finish including centering shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in site reinforced and plain concrete work in flat surface such as soffits of slabs, landing and the like floors etc. upto 200 mm. in thickness.

1.0 Materials & Workmanship:

1.1 The relevant specifications of item No.9.1 (A) shall be followed except that the work is to be carried out for flat surface such as soffits of slabs, landing and the like for floors etc. upto 200 mm. in thickness.

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 9.1 (A) shall be followed.

2.2 The rate shall be for a unit of one Sq. meter.

9.1 (C) Providing form work of ordinary timber planking so as to give a rough finish including centering. shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in site reinforced and plain concrete work in vertical surface such as walls (any thickness) partitions.

1.0 Materials & Workmanship : The relevant specifications of item No.9.1 (A) shall be followed except that the form work shall be carried out for vertical surfaces such as walls of any thickness, partitions etc.

2.0

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 9.1 (A) shall be followed.

2.2 The rate shall be for a unit of one Sq. meter.

9.1 (G) (I) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in site reinforced and plain concrete work in columns, pillars and struts, square rectangular, polygonal in plan.

1.0 Materials & Workmanship :

1.1 The relevant specifications of item No.9.1 (A) shall be followed except that the work is for columns, pillars, posts and struts square, rectangular, polygonal in plan.

1.2

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 9.1 (A) shall be followed.

2.2 The rate shall be for a unit of one Sq. meter.

9.1 (H) (2) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in site reinforced and plain concrete work in side and soffits of beams, haunchings, cantilevers girders bressumers and lintels exceeding 1 M. in depth.

1.0 Materials & Workmanship : 1.1 The relevant specification of item No. 9.1(A) shall be followed except that the work is for side and soffits of beams, beams haunchings, cantilevers, girders, bressumers and lintels exceeding 1 M. in depth.

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 9.1(A) shall be followed except that the work is for side and soffits of beam, beam haunchings, cantilevers, girders, bressumers and lintels exceeding 1 M. in depth.

2.2 The rate shall be for a unit of one Sq. meter.

9.2 Extra for providing form of work with sheathing of steel sheets so as to give a fair finish in

(A) Foundation, footings, base of columns etc. and mass concrete.

(B) Flat surfaces such as soffits of slab, landing and the like.

(i) Floors etc. upto 200 mm. in thickness. (ii)

Floor etc. above 200 mm. in thickness.

(C) Vertical surfaces such as wall (Any thickness) partitions.

(D) Columns, pillars, posts and struts.

(1) Square, rectangular, breassumers and lintels not exceeding 1 mm. depth.

(2) Sides and soffits of beams, beam haunchings, cantilevers, girders, breassumers and lintels exceeding 1 mm. in depth.

(l) Edges of slabs and breaks in floors and walls.

(K) Small surface such as cantilever ends, brackets and ends of steps, caps and bases to pillars and columns including edges.

(L) Chollar woods whether sheds, chhajjas, corrodes etc. and the like.

(M) Stair cases with sloping or steeped soffits including risers, skingers, excluding landing.

(Q) Vertical fins and vertical sun breakers.

1.0 Materials & Workmanship :

1.1 The relevant specification of item No. 9.1(A) to (Q) shall be followed except that the extra rate shall be paid for using sheathing of steel sheets and plates of steel or plywood instead of ordinary timber plank, to obtain a desired smooth exposed finish of surface. The surface shall be presentable without further treatment.

2.0 Mode of measurements & payment :

2.1 The measurement of form work shall be taken for the form work done with steel sheathing, extra over and above the rate of form work of the respective item of form work done. The relevant specification of respective item No. 1 A to Q shall be followed.

2.2 The rate shall be for a unit of one Sq. meter.

SECTION – 10 DETAILED SPECIFICATIONS – MASONARY WORK

10.1(A) Providing wood work in frames of doors, windows clerestory windows and other similar work, wrought, framed and fixed in position, Indian Teak wood.

1.0 Materials : Wood in frames shall conform to M-29.

2.0 Workmanship :

2.1 The item covers the requirement of frames for doors, windows, clerestory windows their supply and fixing.

2.2 Frames

2.2.1 All members of the frames shall be exactly at right angles. The right angle shall be checked from inside surface of the respective members.

2.2.2 All members of frames shall straight without any warp or bow and shall have smooth surface well planed on the three sides exposed at right angles to each other. The surface touching the wall may not be planed unless it is required in order to straighten up the member or to obtain the overall size within the tolerances specified.

2.2.3 Frame shall have dovetail joints. When clerestory windows are included, it shall be provided by having full length one piece post for door or windows and clerestory window extending the frame on top at the head to the required extent. Horns shall not be provided in the head of the frame. When no sills are provided, the vertical posts of the frame in the ground floor shall be embedded in the sill masonry for 10 cm. on upper floors, the vertical posts shall be fixed in the floor or masonry by forming notches 10 mm. deep. Slight adjustment of spacing as necessary shall be done to have the hold fasts in the joints of masonry course. The frame shall be erected in position and held plumb with strong support from both sides and built in masonry as it is being built. The transom shall be through tenoned into the mortices of the jamb post to the full width of the jamb post and the thickness of the tenon shall be not less than 15 mm.

2.3 Tolerance : Unless specially mentioned otherwise tolerance of ± 1.5 mm. shall be allowed for each wrought face.

2.4 The tenons shall be closely fitting into the mortises and suitably pinned with wood dowels not less than 10 mm. dia. meter. The depth of rebates for housing the shutter shall be as shown in the detailed drawing or as directed.

2.5 The contact surface of tenon and mortise shall be treated before putting together with an adhesive of approved make.

2.6 Minimum number of three hold-fasts shall be fixed on each side of door and windows frames, one at the center point and the other two at 30 cm. from the top and the bottom of the frames. In case of windows and ventilators frames whose height is less 1 M. two hold-fats, on each side shall be fixed at quarter points of the frames. The size of each hold-fast shall be 300 x 25 x 6 mm. and of mild-steel with split end. The hold-fast shall be fixed with screws to frames.

2.7 Mild steel hold fasts shall be protected with a coating of coal asphalt tar. The surface of frame abutting the masonry or concrete faces shall be properly treated by applying a coat of approved coating.

3.0 Mode of measurements & payment :

3.1 The linear dimensions shall be measured correct up to 1 cm. The quantity shall be worked out correct to 2 places of decimals of a cu. m.

3.2 The rate shall be for a unit of 10 cu. diameter.

10.12(A)(I) Providing and fixing 35 mm. thick fully paneled shutters for doors, windows and clerestory windows including anodized aluminum butt hinges with necessary screws, Indian Teak Wood.

1.0 Materials :

1.0 Wood for shutter shall conform to M-29. (2) Glass shall conform to M-28. (3) Anodised aluminium but hinges shall conform to M-43.

2.0 Workmanship : The item covers the requirement of preparation of shutters for doors, windows, clerestory windows, their supply and fixing.

2.2 Shutters :

2.2.1 panelled shutters shall be constructed in the form of timber frame work of styles and rails with panel inserted of type as specified in the detailed drawings. Panel shall be fixed by providing grooves in the style and rails. The styles and rails shall be joined to each other by mortise and tenon joints at right angles.

2.2.2 All members of the shutters shall be straight without any warp or bow and shall have smooth, well planed faces at right

2.2.3 B. W. S. 9 angles to each other.

2.2.4 The size of styles and trails shall be as per drawing or as directed. Styles and rails of shutters shall be made of one piece only.

2.5 Fixtures & Fastenings :

2.5.1 The rate shall include anodized aluminium but hinges including fixing with iron screws. The size and number of hinges shall be as per table given in annexure – 1.

3.0 Mode of measurements & payment :

3.1 The rate for shutter includes cost of providing block and clear for keeping the shutter in open position as directed.

3.2 The dimensions of the shutter shall be measured clear size of the shutter in close position between the grooves of the frame.

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3.3 The rate shall be for a unit of one Sq. Meter.

10.30 Providing and fixing flush door shutters, solid core construction with frame of 1st class shard wood with cross band and face veneer or plywood face panels including anodized aluminium but hinges with necessary screws (A) Non-decorative type and block board core. (2) 35 mm. thick.

1.0 Materials : Flush door shall conform M-30. Plywood shall conform to M-37. Anodised aluminium but hinges shall conform to M-43.

2.0 Workmanship :

2.1 The relevant specifications of item No. 10.23 shall be followed except that the shutters be non-decorative type and block board core with face veneer or plywood with 35 mm. thickness.

2.2 Ready made shutters shall be correct size and shall fit into the door or other openings without excessive scraping of edges. Adding of battens etc. to make up to the size shall not be allowed.

3.0 Mode of measurements & payment :

3.1 The relevant specifications of item No. 10.12(A)(I) shall be followed.

3.2 The rate shall be for a unit of one Sq. meter.

10.100(B) Providing and fixing M. S. grill of required pattern to wooden frames of windows etc. with M. S. plates, at required spacing and frame around, square or round bars with round headed bolts and nuts or by screws and with ornamental grill.

1.0 Materials & Workmanship :

1.1 The relevant specifications of item No. 10.100(A) shall be followed except that the work is for ornamental grill.

2.0 Mode of measurements & payment :

2.1 The relevant Specifications of item No. 10-100(A) shall be followed.

2.2 The rate shall be for a unit of one Kg.

10.102 Providing and fixing hard drawn steel wire fabric 75 x 25 mm. mesh of weight not less than 7.75 Kg. per Sq. M to window frames etc. including 60 x 20 mm. beading of teak wood.

1.0 Materials : Hard drawn steel wire fabric of 75 x 25 mm. mesh shall conform to M-34. Teak wood beading shall conform to M-29.

2.0 Workmanship : The steel wire fabric 75 x 25 mm. mesh of weight not less than 7.75 kg. per Sq. M. to windows frames etc. shall be fabricated as per detail drawing. The

wire fabric shall be fixed to windows frame by teak wood beading of 60 x 20 mm. size by means of screws.

3.0 Mode of measurements & payment :

3.1 The wire mesh (Hard drawn) shall be measured net clear opening of frame windows in which mesh is fitted. Nothing shall be paid extra for fixing mesh in groove below teak wood beadings.

3.2 The rate shall be for unit of one sq. meter.

10.103 Providing and fixing fly proof galvanized M.S. Wire gauge of I.S. Gauge designation 85 G. with wire of dia 0.56 mm. to windows and clerestory windows including 60 x 20 mm. beading of Indian Teak Wood.

1.0 Materials : The fly proof galvanized M. S. wire gauge shall conform to M-36. Teak wood beading shall conform to M-29.

2.0 Workmanship : The relevant specification of item No. 10.102 shall be followed except that the proof galvanized M. S. wire gauge of I.S. gauge designation 85-G with wire of 0.56 mm. shall be provided.

3.0 Mode of measurements & payment :

3.1 The relevant specifications of item No. 10.102 shall be followed.

3.2 The rate shall be for unit of one sq. meter.

SECTION – 12

DETAILED SPECIFICATIONS – LABOUR FOR FIXING FIXTURES & FASTENING

12.4 Fixing metallic tower bolts of size with necessary screws etc. complete (tower bolts and screws to be paid under separate items) :

1.0 Workmanship :

1.1 This item provide for labor fixing metallic tower bolts of any size with screws, nuts etc.

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- 1.2 The tower bolts shall be fixed in proper position as shown in the drawings or as directed. There shall be fixed truly vertical or horizontal as the case may be.
- 1.3 The screws shall be driven home with screw driver. In not case the screws shall be hammered in
- 1.4 All recesses and seats shall be cut to the exact size for counter sinking etc. where so required.
- 1.5 Care shall be taken to see that no gaps are left between the fitting and the surface meant to receive the fittings.
- 1.6 The fittings shall be properly cleaned and left in original finish after fixing.

2.0 Mode of measurements & payment :

- (1) Cutting of holes, recesses and seats involved in process of fixing.
- (2) Cost of filling and Cushing materials where so required proper seating of new fittings.
- (3) Cost of nails etc. for temporary positioning of fitting.
- (4) Cost of cleaning materials like old washed dhoti, stain remover etc.
- (5) Cost of making good the over cut recesses or holes, if any.
- (6) Cost of making hole of required size on the wooden frame for housing the bolt for locking.

2.2 The rate including cost of labor involved in all operations required for proper completion of the items, including carriage, handling, fixing etc. complete.

2.3 The rate shall be for unit of one number.

12.5 Fixing metallic flush bolts of sizes with necessary screws etc. complete (flush bolts and screws shall be paid under separate item);

1.0 Workmanship :

- 1.1 The relevant specifications shall be followed as per item No. 12.4 except for fixing metallic flush bolts instead of tower bolts.

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 12.4 shall be followed.

2.2 The rate shall be for unit of one number.

12.8 Fixing metallic or plastic door handles of sizes with necessary screws etc. complete (door handles and screws to be paid under separate items) :

1.0 Workmanship :

1.1 The relevant specifications of item No. 12.4 shall be followed.

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 12.4 shall be followed.

2.2 The rate shall be for unit of one number.

SECTION – 14 DETAILED SPECIFICATIONS OF ITEMS – PAVING & FLOOR FINISHING AS PER

“SCHEDULE OR RATES”

14.43(A) Kotah stone slab (Polished, Green color) flooring over 20 mm. (average) thick base of cement mortar 1 : 6 (1 cement : 6 coarse sand) or lime mortar 1 : 1.5 laid over and jointed with gray cement slurry including rubbing and polishing complete 25 mm. thick.

1.0 Materials :

1.1 Water shall conform M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11 polished kotah stone shall conform to M-49.

2.0 Workmanship :

2.1 Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges.

The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab.

2.2 Bedding for the kotah stone slabs shall be cement mortar 1 : 6 (1 cement : 6 coarse sand) or L. M. 1 : 1.5 of average thickness 20 mm. as given in the description of the item. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall be then be spread on an area sufficient to receive one kotah stone slab. The slab

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shall be washed clean before laying. It shall be laid on top pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed.

2.3 The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly.

2.4 Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-charge wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polish machine fitted with bobs shall be run over it.

2.5 The holes required for Nahni traps, pipes any other fittings shall be made without any extra cost.

3.0 Mode of measurements & payment :

3.1 The rate shall include the cost of all materials and labor involved in all the operations described above. The kotah stone flooring shall be measured in square meters correct to two places of decimal, length and breadth shall be measured correct to a centimeter and between the finished face of skirting dado or wall plaster and no deduction shall be made nor extra paid for any opening in floor of areas upto
0.1 sq. mt.

3.2 The rate shall be for a unit of one sq. meter.

14.46(B) Rough chiseled dressed (Kotah stone green) stone flooring over 20 mm. thick base of cement mortar 1 : 6(1 cement : 6 coarse sand) or L. M. 1 : 1.5 including pointing with cement 1 : 2(1 cement : 2 stone dust) etc. complete 40 mm. thick.

1.0 1.1 The relevant specifications of item No. 14.46(A) shall be followed except that the thickness of stone slab shall be 40 mm. thick.

2.0 Mode of measurements & payment :

2.1 The relevant specifications of item No. 14.43(A) shall be followed.

2.2 The rate shall be for a unit of one sq. meter.

14.71(A) Cement concrete flooring for I.P.S. 1 : 2 : 4 (for Indian Patent Stones) (1 cement : 2 coarse : sand : 4 graded stone aggregate 20 mm. nominal size) laid in one layer finished with a floating coat of net cement 40 mm. thick.

1.0 Materials : Water shall conform to M-1 cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 20 mm. normal size shall conform to M-12.

Cement concrete 1 : 2 : 4 proportion measured by volume shall conform to relevant specification or ordinary grade 1 : 2 : 4 concrete.

2.0 Workmanship :

2.1 The relevant concrete flooring of 40 mm thick (Average) is to be laid as per the site condition. The concrete shall be mixed in a mechanical mixer at the work. Hand mixed may however be allowed for smaller quantities of work and in case of failure of machines or as permitted by the Engineer-in-charge. It shall be carried out on a water platform and care shall be taken to ensure that mixing is continued until the mass is uniform in color and consistency. However, in such cases 10 % more cement than otherwise required shall have to be used without any extra cost. The mechanical mixing shall be done for period of ½ to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose. Flooring of specified thickness shall be laid in accordance with approved pattern or as directed. Finishing operation shall start shortly after the cessation of beating and shall be spread over a period one to six hours depending upon the temperature and atmosphere conditions. The surface shall be left for some time till moisture disappears from it. Fresh quantity of cement shall be mixed with water to form a

thick slurry and spread over the surface while the concrete is still green. Use of dry cement or cement and mixture sprinkled on this surface to stiffen the concrete or absorb excessive moisture shall not be permitted. The cement slurry shall then be properly pressed twice by means of iron floats, once, when the slurry is applied and the second time when cement starts setting and finished smooth. The surface shall be marked with string or B.R.C. fabric nail to make the surface non-slippery as and when directed. The junction of floors with wall plaster, dado or skirting shall be rounded off where so required upto 25 mm. radius, flooring in lavatories and bath rooms shall be laid after fixing of water closet and squatting pans and floor traps which shall be plugged while laying the floors and opened after the floors are completed. Any damage, done to water supply or sanitary fittings during execution of work shall be made good.

2.2 After the final set, the concrete shall be kept continuously wet, if required by pounding for a period of not less than 7 days from the date of placement.

2.3 The formwork shall be provided if necessary as directed by the Engineer-in-charge. Concreting shall be done as per alternate bay method with necessary centering either by mastic or cement mortar as directed.

3.0 Mode of measurements & payment :

3.1 The rate shall include the cost of all materials and labor involved in all the operations described above. No deduction shall be made or extra paid for any opening upto

0.1 sq. mt. Ir. area in the floor, nothing extra shall be paid for laying the floor at different levels in the same room or the courtyard.

2.2 The rate shall be for unit of one sq. meter.

SECTION – 15

DETAILED SPECIFICATIONS OF ITEMS AS PER 'SCHEDULE OF RATES'

15.75 Providing and fixing five course water proofing treatment felt consisting of second and fourth course of blown bitumen or/and residual bitumen applied hot 1.20 Kg. / Sq. mt. of area for each course and first course with fiber base self finished felt type 2 Grade-I, fifth and final course of stone grit 6 mm. and down size or pea sized gravel spreaded at 0.008 cum/sq. mt. including preparation of surface, excluding grading complete.

1.0 Materials : The tar felt shall conform to M-76. The bitumen primer shall conform to I. S. 3388-1965. The bitumen shall conform to I. S. 702-1961. the grit or gravel shall conform to M-8.

2.0

2.0 Workmanship :

2.1 Preparation of surface :

2.1.1 Well-defined cracks other than hair cracks in the roof structure shall be cut to 'V' section cleaned and filled up flush with cement and slurry or with bitumen conforming to I.S. 702-1961. The surface to be treated shall have a minimum slope of 1 in 120. The grading shall be carried out prior to the application of water proofing treatment by cement mortar or line surkhi mortar or as specified in description of item.

2.1.2 The surface of room, part of parapet and gutters, drain mouths etc. over which the water proofing treatment is to be applied, shall be cleaned of all foreign matter such as fungus, moss and dust by wire brushing and dusting.

2.1.3 Drain outlet shall be suitably placed with respect to the roof gradient to ensure rapid drainage and prevent local accumulation of water on the roof, surface, masonry drain mouth, shall be widen sufficiently and rounded with cement mortar.

2.1.4 Form cast iron drain outlets, a groove shall be cut all round to touch the treatment.

2.1.5 When a pipe passes through a roof on which water proofing treatment is to be laid, a cement, concrete angle fillet shall be built round it and the water proofing treatment taken over the fillet.

2.1.6 In case of parapet wall over 450 mm. in height for tucking in the water proofing treatment, a horizontal groove 75 mm. wide and 65 mm. deep at minimum height of 150 mm. above roof level shall be left in the vertical face at the time of construction, the horizontal face of the groove shall be shaped with cement mortar 1 : 4.

2.1.7 In case of low parapet where the height does not exceed 450 mm. no groove shall be provided and the water proofing treatment shall be carried right over the top.

2.1.8 In case of existing R.C.C. and stone wall cutting the chase for tacking in the water proofing treatment is not recommended.

2.1.9 At the junction between the roof and vertical face of the parapet wall, a fillet 75 mm. in radius shall be constructed.

2.1.10 At the drain mouths the fillet shall be suitably cut back and rounded off for easy application of water proofing treatment and easy flow of water.

2.1.11 Outlet at every low dividing wall about less than 300 mm. in height shall be rounded smooth and corners rounded off for easy application of water proofing treatment.

2.2 Priming coat :

2.2.1 Bitumen primer shall conform to I.S. 3385-1965. A priming coat consisting of bituminous solution of low viscosity shall be applied with brush on the roof and wall surface at specified per unit area to assist adhesion of bonding materials as specified in the description of the item.

2.2.2 Where a floating treatment of water proofing with self finished bitumen felt is required i.e. where water proofing treatment is required to be isolated from the roof structure, layer of bitumen saturated felt (underlay) shall be spread over the roof surface and tucked into the flashing grooves. To keep the underlay free from the structure no bonding materials shall be used below underlay. Overlapping to the adjoining strip of underlay shall be minimum of 75 mm. at sides and 10 mm. at ends and shall be sealed with the same bonding materials as used for the self finished felt treatment. The underlay shall be of type-1 saturated felt conforming to I.S. 1322-1970.

2.3 Laying of Felt :

2.3.1 The self-finished tar felt shall be cut to the required lengths, brushed clean of dusting materials laid out flat on the roof to eliminate curls and subsequent stretching. The felt shall be laid in length running at right angles to the direction of run off gradient commencing at the lowest level and working up to crest, so that the lower laps of

the adjacent felt layer offer minimum obstruction to the flow of water. The felt shall not be laid in a single piece of very long lengths as it is likely to shrink 6 to 8 meters are suitable length. The roof shall be cleaned and dried before the felt treatment is begun. Each length shall be laid in position and rolled up for a distance of half its lengths. The hot bonding materials heated to correct working temperature as specified by manufacture shall be poured on to the roof across the full width of the felt as the later is steadily unrolled and pressed down. The excess of bonding materials which squeezes out at the ends shall be removed as the laying proceeds. The pouring shall be so regulated that correct weight of the bonding materials as per unit area is spread uniformly over the surface. When the first half of the tar felt has been bonded to the roof, the other half shall be rolled up and then unrolled on the hot bonding materials in the same way. Subsequent strips shall also be laid in the same manner. Each strip shall overlap the preceding one by at least 75 mm. at the longitudinal edges and 100 mm. at the ends. All overlaps shall be firmly bonded with hot bitumen. Streaks and trailing of bitumen near edges of laps shall be leveled by heating the overlaps with blow lamp and leveling down unevenness.

2.3.2 Third layer of bonding materials in four course treatment shall be carried out in similar manner after the flashing has been complete.

2.3.3 Water proofing treatment shall be carried out in the drain pipe or outlets by at least 100 mm. The water proofing treatment laid on the surface shall overlap the upper edge of water proofing treatment in the drain outlets by at least 10 mm. Flashing felts shall be laid as flashing. Wherever junction of vertical horizontal surface occurs longitudinal laps shall be 100 mm. The lower layer of flashing felt shall overlap the roofing felt by 100 mm. on vertical and sloping faces. Last course of flashing should not be of stone, grit or pea sized gravel but it shall be replaced by providing two coats of bitumen solution of approved quality.

2.3.4 The lower edge of flashing shall overlap the flat portion of the roof and the upper edge of the flashing shall be tucked into the horizontal groove 75 mm. thick wide, 65 mm. deep provided at minimum height of 150 mm. from top of the roof surface.

The flashing treatment shall be firmly held in place in the grooves with wooden wedges at intervals and the grooves shall be followed with cement mortar 1 : 4 (1 cement : 4 coarse sand) or cement concrete (1 : 2 : 4) (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm. nominal size) and surface finished smooth with the rest of wall. The cement work shall be cured for 7 days. When dry the exposed plaster joints of grooves shall be pointed with bitumen and two coats of bituminous solution shall be applied on the vertical and sloping surface of flashing.

2.3.5 After the top flashing felt layer has been laid, the penultimate layer of bonding materials shall be applied over the roofing felt and horizontal overlap and vertical and sloping surface of flashing shall be spread uniformly over the hot bonding materials on the horizontal roof surface and pressed into it with wooden roller.

2.3.6 The material for surface finish shall be spread as described in the item over top layer.

2.3.7 If ballooning occurs the defects may be rectified as under :

2.3.8 Remove the gravel on the ballooned surface. Then cut open and squeeze out the trapped vapor by firm pressure applied by hand, seal the bitumen felt so lifted back on the

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surface by applying additional bitumen, finally seal the cut with piece of bitumen felt with bitumen application.

3.0 Mode of measurements & payment :

3.1 The measurements for the item shall be taken as under :

(a) Water proofing of roof with bitumen shall be measured in sq. mt. length and breadth shall be measured correct to centimeter.

(b) Measurement shall be taken for the superficial area of roofing and flashing treatment including flashing over the parapet wall, low dividing walls and expansion joints and at the pipe projections etc. overlapping and tucking into flashing grooves shall not be measured.

(c) Sloping and vertical surface of water proofing treatment shall be measured under the four or five course treatment as the case may be irrespective of the fact that the final course of grit or gravel is replaced by bitumen primer.

(d) In measurements, no deduction shall be made for either openings or recesses for chimney stacks roof light etc. for area upto 0.40 sq. mt. nor anything extra shall be paid or extra labor and materials in forming such openings. For similar area exceeding 0.40 sq. mt. deduction shall be made in measurements for full opening but nothing extra shall be paid for extra labor and materials in forming such openings.

(e) The grading (coba bedding) shall be paid separately but cleaning of surface and treating the cracks shall not be paid Separately.

(f) Cutting of horizontal grooves in parapet walls for tucking in water proofing treatment shall not be measured or paid Separately.

3.2 The rate includes cost of all materials and labor.

3.3 The rate shall be for a unit of one sq. meter.

15.87(A) Providing and fixing on wall face C. I. rain water pipe including filling the joints with spun yarn socked in neat cement slurry and cement mortar 1 : 2 (1 cement : 2 fine sand) 75 mm. dia.

1.0 Materials : Water shall conform to M-1. The C.I. rain water pipes and fittings shall conform to M-68. Cement mortar shall conform to M-11.

2.0 Workmanship :

2.1 C. I. rain water pipes shall be of specified diameter and shall be in full lengths of 1.8 meters including socket ends of the pipes unless shorter lengths are required at junctions with fittings.

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2.2 Fixing : The pipe and fittings shall be fixed in vertical alignment unless otherwise specified and shall be secured to the walls at joints with M. S. clamps. The clamps shall be M. S. sheet 30 mm. bent to required shape and size so as to fit tightly on the socket of pipe when tightened with screw bolts. It shall be formed out of two semi-circular pieces. hinged with 6 mm. dia. M. S. pin on one side and provided flanged ends on the other side with holes to fit in the screw bolt and nut 40 mm. long. The clamps shall be provided with hook made out of 275 mm. long, 10 mm. dia. M. S. bar riveted to the ring at the center of one semicircular piece. The clamps shall be fixed to the walls. The clamps shall be kept above 25 mm. clear of finished face of wall so as to facilitate cleaning and painting the pipes.

2.3 The pipe shall be fixed vertically. The spigot of the upper pipe shall be properly fitted in the socket of the lower pipe such that there is uniform annular space for filling with the jointing materials. The annular space between the spigot and socket shall be filled with a few turns of spun yarn socked in cement slurry or blown bitumen 85/25 grade. These shall be pressed home by caulking tools. The joints shall then be filled with stiff cement mortar 1 : 2 (1 cement : 2 fine sand) well pressed with caulking tools and finished smooth at top at an angle of 45° sloping up. The joints shall be kept wet at least for 7 days by tying four founds of gunny bag to the pipe and keeping it moist constantly.

3.0 Mode of measurements & payment :

3.1 The relevant specifications of item No. 15.93(B) of A. C. rain water pipes shall be followed except that the C. I. rain water pipe shall be fixed.

3.2 The rate shall be for a unit of one running meter.

15.88(A) Providing and fixing M. S. Holder bat clamps of approved design to C. I. or S.C.I. pipes embedded and including cement concrete blocks (100 mm. x 100 mm. x 100 mm. size) in 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and cost of cutting holes and making good the walls etc. complete : 75 mm. dia.

1.0 Materials & Workmanship :

1.1 The relevant specifications of item No. 15.94(B) shall be followed except that the M. S. Holder bat clamps of approved design shall be for C. I. rain water pipe-75 mm. dia.

1.2 The bat clamps shall be fixed as directed with C.C. blocks of 100 mm. x 100 mm. x 100 mm. The relevant specification of item No. 5.4.1 shall be followed for concrete work.

2.0 Mode of measurements & payment :

2.1 The bat clamp of M. S. holders suitable for 75 mm. dia. shall be measured for finished item.

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2.2 The rate includes cost of all materials and labor etc. required for satisfactory completion of this item.

2.3 The rate shall be for a unit of one Number.

15.93(A) Providing and fixing and embedded sand C. I. rain water pipe in the mason surrounded with 12 mm. thick cement mortar of the same mix as that of masonry : 75 mm. dia pipe.

1.0 Materials : Water shall conform to M-1. Cement mortar shall conform to M-11. The C. I. pipe and fittings shall conform to M-68.

2.0 Workmanship :

2.1 The relevant specifications of item No. 15.87(A) shall be followed except that the C. I. pipe 75 mm. dia. shall be embedded in masonry surrounded with 12 mm. thick cement mortar.

2.2 The pipe shall be fixed in the masonry work as it proceeds. The pipe shall be kept vertical or to the line as directed. The pipe shall have minimum surroundings of 12 mm. thick cement mortar at every portion of external surface. The length shall be caulked with spun yarn and cement mortar as soon as the next length of pipe is placed in position. The socket end the pipe shall be kept closed till the next length of pipe is fitted and jointed to prevent any brick-bats or concrete or pieces of wood falling in and chocking the pipes.

3.0 Mode of measurements & payment :

3.1 The relevant specification of item No. 15.87(A) shall be followed.

3.2 The rate shall be for a unit of one running meter.

SECTION – 16 DETAILED SPECIFICATIONS FOR CEILING LINING AS PER “SCHEDULE OF RATES”

SECTION-17 DETAILED SPECIFICATIONS FOR PLASTERIN AND PAINTS AS PER “SCHEDULE OF RATES

17.58.(I) 10 mm. thick cement plaster in single coat on fair side of brick concrete walls for interior plastering upto floor two level and finished even and smooth in (i) C.M. 1:4.

1.0. Materials :

1.1. Water M-1. The cement mortar proportion 1:4 shall conform to M-13.

2.0. Workmanship :

2.1. Scaffolding : Wooden ballics, bamboos, planks, treatles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

2.2. Preparation of back-ground :

2.2.1. The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, afforescence and other foreign matter by water or by brushing. Smooth surface shall be roughened by wire brushing if it is not hard and by racking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Trimming of projections on brick/concrete surface where necessary shall be carried out to get an even surface.

2.2.2. Racking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before carrying out the plaster work.

2.2.3. The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry such area shall be moistened again.

2.2.4. For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started whenever the building frame and cladding work are ready and the temporary supporting ceiling

resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

2.3. Applications of plaster :

2.3.1. The plaster about 15 x 15 cms. Shall be first applied horizontally and vertically at not more than 2 metres intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly inplane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movement at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float shall be avoided. All corners, arrises, angles and junctions be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises junctions etc. shall be carried out with proper templates to the size required.

2.3.2. Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

2.3.3. In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the

adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. To any corners or arrises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

2.3.4. Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by handing mattings or gunny bags on the outside of the plaster and keeping them wet.

3.0. Mode of measurements & payment :

3.1. The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

3.2. All plastering shall be measured in square metres unless, otherwise specified, Length, breath or height shall be measured correct to a centimeter.

3.3. Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

3.4. This item includes plastering upto floor two level.

3.5. The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

3.6. Soffits of stairs shall be measured as plastering on ceilings. Flowing soffits shall be measured separately.

3.7. For jambs, soffits, sills etc. for openings not exceeding 0.5 sq.mt. each in area for ends of joints, beams, posts, girders, steps, etc. not exceeding 0.5 sq. mt. Each in area and for openings exceeding 0.5 sq. mt. And not exceeding 3.00 sq. mt. In each area deductions and additions shall be made in the following manner :

(a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq.mt. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these opening for finish to plaster around ends of joints, beams, posts etc.

(b) Deduction for openings exceeding 0.5 sq.mt. but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings.

(i) When both faces of all wall are plastered with same plaster, deduction shall be made for one face only.

(ii) When two faces of wall are plastered with different types of plaster or if one faces is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other side but no deductions shall be made on the outer side. Where width of

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reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case may be.

3.8. For openings having door frames equal to projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

3.9. In case of openings of area above 3 sq.mt. each, deduction shall be made for opening but jambs, soffits and sills shall be measured.

3.10. The rate shall be for unit of one sq. metre.

17.61. (II) 20 mm. thick cement plaster in single coat on rough side of single or half brick walls for interior plastering upto floor two level, finished even and smooth in cement mortar 1:4 (1 cement : 4 sand).

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.59 (I) shall be followed except that the thickness of item plastering shall be 20 mm. in C.M. 1:4.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item no. 17.59 (I) shall be followed.

2.2. The rate shall be for a unit of one sq.mt.

17.69. Extra over item 58 to 64 for finishing with a floating coat of net cement slurry.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.58 and 17.61 shall be followed for materials and workmanship except that this work is only of providing smooth cement finish with floating coat of neat cement slurry.

1.2. The coat of cement and fine sand mortar of proportion 1:1 (1.5 mm. thick about) shall be applied to the plastered surface with a trowel to provide uniform texture while the base coat is still plastic.

1.3. In any continuous face of wall the finishing treatment should be carried out continuously and day to day braked made to coincide with architectural breaks in order to avoid unsightly junctions.

1.4. Curing : All the plaster work shall be kept damp continuously for a period of 7 days.

2.0. Mode of measurements & payment :

2.1. The payment shall be made for a unit of 1.0 sq.mt. of work done over and above the finishing of work of base coat.

2.2. The relevant specifications of item of base coat shall be followed for measurements and payment.

2.3. The rate shall be for a unit of one sq. metre.

17.70. Extra over items 17.58 to 17.61 for providing and mixing water proofing materials in cement mortar in proportion recommended by the manufacturers.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.58 and 17.61 shall be followed except that the water proofing materials of approved make shall be added to the cement at the rate specified or as directed by the Engineer-in-charge. The proportion of water proofing materials to be mixed with 50 kg. Bags shall be as recommended by the manufactures of the water proofing material.

2.0. Mode of measurements & payment :

2.1. The payment shall be made extra for this work over and above the plaster work.

2.2. The rate shall be for a unit of 1 kg. Of water proofing materials used in 1 bag weighing 50 Kg. Cement used extra over the rate of plastering work.

17.91. Extra over items 17.59 to 17.61 for plastering on ceiling and soffits of stair upto floor two level instead of plastering on walls.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.59(I) shall be followed except that this work is for ceiling soffits of stairs upto two floor level instead of plaster in walls.

1.2. The smooth concrete surface shall be suitably roughened to provide necessary bond before plastering.

2.0. Mode of measurements & payment :

2.1. The payment shall be made for a unit of one sq.mt. of work done, extra over and above the payment plaster work on wall surfaces.

2.2. The rate shall be for a unit of one sq. metre.

SECTION - 18 DETAILED SPECIFICATIONS FOR WHITE WASHING & DISTEMPERING AS PER "SCHEDULE OF RATES"

18.11. While washing with undecorated wall surfaces (two coats) to given an even shade including through by brooming the surface to remove all dirt, dust, mortar drops and other foreign matter.

1.0. Materials :

1.1. The elcarolle shall be made from glue and boiling water by Mixing 1 kg. Mixture shall be suitably tinted where required for use under coloured distemper if directed. Glue shall conform to I.S. 852-1969 (Specifications for animal glue). 1.2. line used shall be freshly burnt class 'C' Lime (fat lime) and white in colour conforming to I.S. 712-1973/ Water shall conform to M-1 Best quality of gum shall be used in the preparation of white

wash. Ultramarine blue or Indigo : This shall conform to I.S. 55-1970 for points, and shall be used for preparation of white wash. Pigments : Mineral colours, not affected by lime shall be used in preparing colour wash.

2.0. Workmanship :

2.1. Preparation of white wash solution :

Surface already white or colour. The fat lime shall be slaked at site and shall be mixed and stirred with about five litres of water for 1 kg. Of unslaked lime to make a thin cream. This shall be allowed to stand for a period of 24 hours and then shall be screened through a clean coarse cloth, 4 kg. Of gum dissolved in hot water shall be added to each cubic metre of lime cream. Small quantity of ultramarine blut (Upto 3 gms. Per kg. Of lime) shall also be added to the last two coats of white wash solution and the whole solution shall be stirred thoroughly before use.

2.1. Preparation of surface :

2.2.1. The surface shall be thoroughly cleaned of all dust, dirt, mortar croppings and other foreign matter before white wash is to be applied.

2.2.2. The surface spoiled by smoke soot shall be scraped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brick bats. The surface shall be then broomed to remove all dust, dirt and shall be washed with clean water.

2.2.3. Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

2.2.4. All unsound portion of the surface plaster shall be removed to full depth of paster in rectangular patches and plastered again after raking the masonry joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one coat of white wash.

2.2.5. All unnecessary nails shall be removed, the holes cracks patches etc. shall be made good with materials similar in composition to the surface to be prepared.

2.3. Scaffolding : Wherever scaffolding is necessary it shall be erected in such a way that as far as possible on part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended platform (Zoola) may be used for white washing of ceilings proper stage scaffolding shall be erected where necessary.

2.4. Application of white wash :

2.4.1. On the surface so prepared the white wash shall be applied with "Moon" brush. The first stoke of the brush shall be from top downwards, another from bottom upwards over the first stroke and similarly one stoke from the right another from the left, over the first stroke brush before it dries. This will form one coat. Each coat shall be allowed to dry before next coat is applied. Number of coats as specified in item shall be applied. It shall present smooth and uniform finish free from brush marks and it should not come off easily when rubbed with finger.

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2.4.2. Splashing and dropping if any on the doors and windows, ventilators etc. shall be removed and the surface cleaned.

2.4.3. Priming and Alkali resistant treatments, scraping of surface washing etc. surface spoiled by smoke soot removed of oil and great spots treatment for infection with efflorescence moulds moss, funji algae and lichen and patch repairs to plaster. wherever done shall not be paid extra.

3.0. Mode of measurements & payment :

3.1. All the work shall be measured in the decimal system as under :

(a) Dimensions shall be measured to the nearest 0.01 M.

(b) Area in individual items shall be worked out to the nearest 0.01 Sq.mt.

All the work shall be measured in sq.mt. Deductions for jambs, soffits, sills etc. for opening not exceeding 0.5 sq.mt. each in area for ends of joints, posts, beams, girders, steps etc. not exceeding 0.5 sq.mt. each in area and for opening exceeding 0.3 sq.mt. and not exceeding 3.0 sq.mt. each in area deductions and additions shall be made as under :

3.2. No deductions shall be made for ends of joints beams, posts etc. and openings not exceeding 0.5 sq.mt. each. No addition shall be made for reveals, jambs, soffits, sills etc. of these openings :

(a) When both the faces or walls are provided with finish, deduction shall be made for one face only.

(b) When each face of walls are provided with different finish deduction shall be made for that side of frame for door, windows etc. on which width of reveals is less than that of the other side, where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if the width of reveal on the treated side is less than that on the untreated side, but if the width of the reveal is equal or more than on the untreated side neither deductions nor additions be made for reveals, jambs, soffits, sills etc.

3.4. In case of area of opening exceeding 3 sq.mt.each, deduction shall be made for openings but jambs, soffits, shall be measured.

3.5. No deduction shall be made for attachment such as casing, conducts, pipe, electric wiring and the like.

3.6. Corrugated surfaces shall be measured flat as fixed and not girth. The quantities so measured shall be increased by the following percentage and the resultant shall be included with the general areas.

(a) Corrugated steel sheets 14%

(b) Corrugated A.C. sheets 20%

(c) Semi Corrugated A.C. sheets 10%

(d) Nainital pattern roof (Plain sheeting with rolls) 10%

(e) Nainital pattern roof (with corrugated sheets) 25%

3.7. Cornices and other wall features, when they are not picked out in a different finish/colour shall be girthed and included in the general area.

3.8. The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above.

3.9. The rate shall be for a unit of one sq.mt.

18.12. White washing with lime on decorated wall surface (one coat) to give an even shade including thoroughly brooming the surface to remove dirt, dust mortar drops and loose scales of lime wash and other foreign matter.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No.18.11 shall be followed except that the white washing work shall be carried out on decorated wall surface in single coat.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.18.11 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.13. Extra over item 18.11 and 18.12 for every subsequent coat of white washing with lime on wall surfaces.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No.18.11 shall be followed except that the this work is for extra coat over and above two coats on wall surface.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.18.11 shall be followed except that the payment of subsequent coat shall be made extra over and above the item No.18.11 for every subsequent coat applied.

2.2. The rate shall be for a unit of one sq. metre.

18.18. Colour washing with lime on decorated wall surfaces (one coat) to give an even shade including thoroughly brooming the surface to remove all dirt dust, mortar drops and loose scales of lime wash and other foreign matter.

1.0. Materials & Workmanship :

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1.1. The relevant specifications of item No.18.17 shall be followed except that the colour washing shall be carried out on decorated wall surfaces in one coat.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.18.17 above shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.33. Removing dry or oil bound distemper by washing and scraping and sand papering the wall surface smooth including necessary repairs to scratches complete.

1.0. Materials & Workmanship :

1.1. All loose pieces and scales shall be removed by sand papering and surface shall be cleared of all greasy, dust, dirt, etc. on decorated wall surface : Where heavy scaling has taken place, the entire surface shall be scrapped by means of steel scrappers so as to remove all accumulated distemper, leaving clean surfaces. Necessary repairs to the scratches shall be made as directed.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.18.11 shall be followed

2.2. The rate shall be for a unit of one sq. metre.

18.34. Extra over item No.18.33 for removing dry oil bound distemper on ceiling and sloping roofs.

1.0. Workmanship :

1.1. The relevant specifications of item No.18.33 shall be followed except that removing dry oil bound distemper from sloping roof, ceiling is to be carried out.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.18.33 shall be followed except that the payment shall be made for removing dry/oil bound distemper from ceiling/sloping roof over and above the rate of item No.18.33.

2.2. The rate shall be for a unit of one sq. metre.

18.38. Distemping with dry (water bound) Distemper of approved brand and manufacturer (two coat) and of required shade on undecorated wall surfaces to give an even shade, over and including a priming coat of white washing after thoroughly brooming the surface free from mortar droppings and other foreign matter.

1.0. Materials :

1.1. The dry distemper and primer shall be of approved brand and manufacture. The dry distemper shall be required colour and shade and the same shall conform to I.S. 427-1965. Whiting shall conform to I.S. 63-1964.

2.0. Workmanship :

2.1. Scaffolding : Where scaffolding is required it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distempered.
A

properly secured strong and well tied suspended platform (jools) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

2.2. Preparation of Surface :

2.2.1. The undecorated surface to distempered shall be thoroughly brushed free from dust, dirt, grease, mortar, droppings and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry at least 2 months, before application of distemper.

2.2.2. All necessary nails shall be removed. Pitting in plaster shall be made good with plaster of Paris mixed with dry distemper of the colour to be used. The surface shall then be rubbed down again with a fine grades and paper and made smooth. The surface affected by moulds, moss, fungi, algee lichem, efflorescence etc. shall be treated in accordance with I.S. : 2395 (Part-I) – 1996 before applying distemper. Any unevenness shall be made good by applying putty made of plaster of Paris mixed with water on entire surface including filling up the undulations & then papering the same after it is dry.

2.3. Priming coat :

2.3.1. A priming coat of whitening shall be applied as per item No. 11. over the prepared surface in case of new work on undecorated surface. No coat of with lime shall be used as a priming coat for distemper.

2.3.2. Application of plaster shall be done as under :

The primer shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be Vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be Finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours before oil bound Distemper or paint is applied.

2.3.3. Distemper is not recommended to be applied within six month of the completion of wall plaster.

2.4. Proportion of Distemper: The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufactures only. Sufficient quantity of distemper required for one day's work shall be prepared.

2.5. Application of Distemper coat :

2.5.1. For undecorated surface, after the primer coat is dried for at least 48 hours, the surfaces shall be lightly sand papered to make them smooth for receiving the distemper, taking care not to rub cut the priming coat ; All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushed in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after time interval of at least 24 hours between consecutive coats to permit proper drying of the preceding coat. The finished

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surfaces shall be finished surfaces shall be even and uniform without patches, brush marks; distemper drops etc.

2.5.2. Sufficient quantity shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot to completed on the same day.

2.5.3. 15cm. Double bristled brush shall be used . After the days work, brushes shall be thoroughly washed in hot water with a soap solution and hang down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

2.6. Protective Measure :

2.6.1. The surface of door, windows, floors, articles of furniture etc. and such other parts of the building as are not to be distempered shall be protected from being aplashed upon. Such surfaces shall be cleaned of distemper aplashes if any.

3.0. Mode of measurements & payment :

3.1. Priming coat of distemper, primer scraping of surface spoiled by smoke soot, removal of oil and great spots, treatment for infection of effloresces, mouldmoss, fungi, algee and litoben and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

3.2. All the work shall be measured net in the decimal system as in places subject to the following limits unless otherwise stated hereinafter.

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out the nearest 0.01 sq.mt. all work shall be measured in sq.mt. No deductions shall be made for ends of joints beams, posts etc. and openings not exceeding 0.5 sq.mt. each and no addition shall be made reveals jambs, soffits, sills etc. of these openings nor finish around the ends of joints, beams, posts etc.

3.3. Deduction of openings exceeding 0.5 sq.mt. but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings :

(a) When both the faces of wall is provided with the same finish deductions shall be made for one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deductions shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50 % of area of opening on each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveals is equal or more than that of untreated side neither deductions nor additions to be made for reveals; jambs, soffits, sills etc.

3.4. In case of are exceeding 3 sq.mt. each, openings of deductions shall be made for openings, but jambs, sills and soffits shall be measured.

3.5. No deductions shall be made for attachments such as casing, conduits, pipes, electric wiring and the like.

3.6. Item includes removing nails, making good holes, cracks, patches with materials similar in composition to the distemper.

3.7. The rate includes cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handling, unloading storing etc.

3.8. The rate shall be for a unit of one sq. mt.

18.44. Distemping (two coats) with oil bound distemper of approved brand and manufacture and of required shade on undecorated wall surfaces to give an even shade, over and including a priming coat with distemper primer of approved brand and manufacture after thoroughly brushing the surface free from mortar dropping and other foreign matter also including preparing the surface even and sand papered smooth.

1.0. Materials :

1.1. Oil bound washable distemper and primer shall be of approved brand and manufacture. The distemper shall be of required colour and the same shall conform to I.S. 428-1969.

2.0. Workmanship :

2.1. Scaffolding : Where scaffolding is required, it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distemped. A properly secured strong and well tied suspended platform (Joola) may be used for distemping. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For distemping to ceilings, proper stage scaffolding shall be erected where necessary.

2.2. Preparation of surface :

2.2.1. The undecorated surface to be distemped shall be thoroughly brushed off from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for atleast 2 months before applications of distemper.

2.2.2. All unnecessary nails shall be removed. Pitting in plaster shall be made good with plaster of Paris mixed with dry distemper of colour to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected by moulds, moss, fungi algae lichens, efflorescence etc. shall be treated in accordance with I.S. 2395 (Part-I) 1966. Before applying distemping, any unevenness shall be made good by applying putty made of plaster of Paris mixed with water on entire surface including filling up the undulation and then sand papering the same after it is dry.

2.3. Priming coat :

2.3.1. A priming coat or distemper primer of approved manufacture and shade shall be applied over the papered surface in case of new work on decorated surface. If the distemper priming is done after the wall surface dries completely, the distemper primer shall be applied.

2.3.2. Application of primer shall be done as under :

The primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for atleast 48 hours before oil bound distemper or paint is applied.

2.3.2. Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.

2.4. Preparation of oil bound distemper : **2.4.1.** The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacture only. Sufficient quantity of distemper required for a day's work shall be prepared.

2.5. Application of Distemper coat :

2.5.1. For undecorated surfaces, after the primer coat is dried for atleast 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of atleast 24 hours between consecutive coats to permit proper drying of the proceeding coat. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.

2.5.2. Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

2.5.3. 15 cm. Double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

2.6. Protective measurements : The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected from being splashed upon. Such surfaces shall be cleaned off distemper splashes if any.

3.0. Mode of measurements & payment :

3.1. Priming coat of distemper primer, scraping of surface spoiled by stunk soots removal of oil & grease spots, treatment for infection of effloresces mould moss, fungi, algae and lichen and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

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3.2. All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter :

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq.m. All work shall be measured in sq.mt. No deductions shall be made for ends of joints, beams, posts etc. and openings, not exceeding 0.5 sq.mt. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams, posts etc.

3.3. Deductions of opening exceeding 0.5 sq.mt. but not exceeding 3 m. in each shall be made as follows and net addition shall be made for reveals, jambs, soffits, sills etc. of these openings

(a) When both the faces of walls are provided with same finish : deductions shall be made or one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deduction shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening of each face shall be made from area of finish.

(c) When only one face of wall is treated and the other is not treated, full deduction shall be made if the width of the reveal on treated side is less than that on untreated sides but if the width of the reveal is equal or more than that on untreated side neither deductions nor addition to be made for reveals, jambs, soffits, sills etc.

3.4. In case opening of area exceeding 3 sq.m. each, deduction shall be made for openings but jambs, soffits and sills shall be measured.

3.5. No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

3.6. Item includes removing nails, making good holes, cracks, patches with material similar in composition of distemper.

3.7. The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handling, unloading, storing work etc.

3.8. The rate shall be for a unit of one sq. metre.

18.45. Distemping (two coats) with oil bound washable distemper of approved brand and manufacture and of shade required on undecorated wall surfaces to give an even shade, over and including a priming coat with alkali resistance primer of approved brand and manufacture after thoroughly brushing the surface free from mortar droppings, and other foreign matter and also including preparing the surface even and sand-papered smooth.

1.0. Materials & workmanship :

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1.1. The relevant specifications of item No.18.44 shall be followed except that the primer of alkali resistance primer of approved brand manufacture shall be used instead of distemper primer.

2.0. Mode of measurements & payment :

2.1. The Mode of measurements & payment shall be same as for item No.18.44 above.

2.2. The rate shall be for a unit of one sq. metre.

18.51. Finishing wall with water proofing cement paint on an undecorated wall surfaces (two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials.

1.0. Materials : 1.1. The water shall conform to M-1. Cement water proofing shall conform to I.S. 5410-1969.

2.0. Workmanship :

2.1. Scaffolding : The relevant specifications of item No.18.11 shall be followed.

2.2. Preparation of surface : The relevant specifications of item No.18.11 shall be followed except that the word white wash colour wash shall be substituted with water proofing cement paint. The surface shall be thoroughly wetted with clean water before cement water proofing paint is applied.

2.3. Preparation of paint : Portland cement shall be prepared by adding paint powder to water and stirring to obtain a thick paste, which shall then be diluted to a brushable consistency. Generally, equal volumes of paint powder and water make a satisfactory paint. In all cases, the manufacturer's instructions shall be followed. The paint shall be mixed in such quantities as can be used up within an hour of mixing as otherwise the mixture will set and thicken, affecting flowing and finish. The lids of cement paint drums shall be kept tightly when not in use.

2.4. Application of Paint :

2.4.1. No painting shall be done when the paint is likely to be exposed to a temperature of below 7^o C within 48 hours after application.

2.4.2. When weather conditions are such as to cause damage the work shall be carried out "in the shadow" as far as possible. This helps the proper hardening of the paint film by keeping the surface moist for a longer period.

2.4.3. To maintain the uniform mixture and to prevent segregation, the paint shall be stirred frequently in the bucket.

2.4.4. For undecorated surfaces, the surfaces shall be treated with minimum two coats of water proof cement paint. Not less than 24 hours shall be allowed between two coats.

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Next coat shall not be started until the proceeding coat has become sufficiently hard to resist making by the brush being used. In hot dry weather, the proceeding coat shall be allowed between two coats. Next coat shall not be started until the proceeding coat shall be slightly moistened before applying the subsequent coat.

2.4.5. The finished surface shall be even and uniform in shade, without patches, brush marks, paint drops etc.

2.4.6. The cement paint shall be applied with a brush with relatively short stiff hog or fibre bristles. The paint shall be brushed in uniform thickness and shall be free from excessive heavy brush marks. The lamps shall be well brushed out.

2.4.7. Water proof cement paint shall be applied on surfaces already treated with white wash colour wash, distemper dry or oil bound varnishes, paint etc. It shall not be applied on gypsum, wood and metal surfaces.

2.5. Curing : Painted surfaces shall be sprinkled with water two or three times a day. This shall be done between coats and for atleast two days following the final coat. The curing shall be started as soon as the paint has hardened so as not to be damaged by the sprinkling of water say about 12 hours after the application.

2.6. Protection measures shall be taken as per item No.18.11 para 2.6.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No.18.11 shall be followed.

3.2. The rate shall be for a unit of one sq.mt.

SECTION - 19 DETAILED SPECIFICATIONS OF ITEMS-PAINTINGS & POLISHINGAS PER "SCHEDULE OF RATES"

19.7. Painting two coats (excluding priming coat) on new steel and other metal surfaces with enamel surfaces with enamel paint, brushing, interior to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials : The enamel paint shall conform to M-44 B.

2.0. Workmanship :

2.1. General :

2.1.1. The materials required for work of painting work shall be obtained directly from approved manufactures or approved dealer and brought to the site in maker's drums, kege etc. with seal unbroken.

2.1.2. All materials not in actual use shall be kept properly protected, lids of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become stale or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into small containers. While applying also the

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paint shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use, the containers shall be kept properly closed.

2.1.3. If for any seasons, thinning is necessary, the brand of thinner recommended by the manufacturer shall be used.

2.1.4. The surface to be painted shall be thoroughly cleaned and dusted. All rust, dirt and grease shall be thoroughly removed before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surfaces shall be thoroughly dry before painting work is started.

2.2. Application :

2.2.1. Brushing operations are to be adjusted to the spreading capacity advised by the manufacture of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush marks shall be after the laying off is finished. The full process of crossing and laying off will constitute one coat.

2.2.2. Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of sand paper and loose particles brushed off before the next coat is applied. Each coat shall vary slightly in shade and shall be got approved from Engineer-in-charge before next coat is started.

2.2.3. Each coat except the last coat shall be lightly rubbed down with sand-paper of fine pumic stone and cleaned of dust before the next coat is applied. No hair marks from the brush or clogging of paint puddles in the corners of panels angles of mouldings etc. shall be left on the work.

2.2.4. Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved best quality brushes shall be used.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No.19.12 shall be followed for mode of measurements and payment. The rate is excluding priming coat.

3.2. The rate shall be for a unit of one sq, metre.

19.15. Extra over item No.19.7 and 19.11 for every subsequent coat of paint.

1.0. Materials & Workmanship :

1.1. The relevant specification of item No.19.7 shall be followed except that the work of painting shall be carried out for subsequent coat.

2.0. Mode of measurement & payment :

2.1. The relevant specifications of item No. 19.7 shall be followed except that the extra rate shall be paid for every subsequent coat of paints applied over and above the rate of item No.19.7 and 19.11.

2.2. The rate shall be for a unit of one sq. metre.

19.19. Painting two coats (excluding priming coat) on new steel and other metal surface with synthetic enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials : Synthetic enamel paint shall conform to I.S. 1932-1964.

2.0 Workmanship:2.1. The relevant specifications of item No. 19.7 shall be followed except that the painting shall be carried out with synthetic enamel paint.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No. 19.7. shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

19.50(C) Painting two coats (excluding priming coat) on external surfaces of rain water, soil waste and vent pipe and fittings with ready mixed bituminous paint brushing, black anticorrosive to give shade including cleaning off all dirt dust and other foreign matter : 100 mm. dia.

1.0. Materials & Workmanship :

1.1 The relevant specifications of item No. 19.50 (B) shall be followed except that the pipes to be painted on is 100 mm. dia. metre.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.19.50(B) shall be followed. The rate is excluding the cost of priming coat but including cost of painting all fitting coming in line.

2.2. The rate shall be for a unit of one sq. metre.

19.59(B) Applying priming coat over new wood and based surfaces after and including preparing the surface by thoroughly cleaning of dirt grease, dust and other foreign matter, sand papering and knotting : Ready mixed paint, brushing wood primer pink.

1.0. Materials :

1.1. The ready mixed paint, brushing, wood primer pink shall conform to I.S. 3536-1966.

2.0. Workmanship :

2.1. Preparation of Surfaces :

2.1.1. All wood work shall be dry and free from any foreign matter incidental to building operations. Nails shall be punched well below the surface to provide a firm key for stopping. Mouldings shall be carefully smoothed with abrasive paper and projecting fibres shall be removed. Flat portion shall be smoothed off with abrasive paper used across the grain prior to painting and with the grain prior to staining or if the wood is to be left in its natural colour, wood work which is to be stained may be smoothed to scraping instead by glass papering if so required.

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2.1.2. Any knots, resinous or streaks or bleish sap wood that are not large enough to justify cutting out shall be treated with two coats of pure shellac knotting applied thinly and extended about 25 mm. beyond the actual area requiring treatment.

2.2. Application of primer :

2.2.1. The relevant specifications of item No.19.12(A) shall be followed for application of primer.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No.19.32 shall be followed except that work done on wood and wood based surfaces shall be paid under this item.

3.2. The rate shall be for a unit of one sq. metre.

19.59(D) Applying priming coat over new wood and wood based surfaces after and including preparing the surface by thoroughly cleaning of oil, dirt, grease, dust and other foreign matter, sand papering and knotting : Ready mixed paint brushing priming, for enamel.

1.0. Materials :

1.1. The ready mixed paint for brushing priming for enamel wood shall conform to I.S. 106-1962.

2.0. Workmanship :

2.1. The relevant specifications of item No.19.59(B) shall be followed except that ready mixed paint brushing priming for enamel shall be used instead of ready mixed paint brushing wood primer pink.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No.19.12 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

19.61(B) Extra over item 19.59(B) for every subsequent coat of priming coat. Ready mix paint brushing wood primer pink.

1.1 The relevant specifications of item No. 19.59 (B) shall be followed except that the painting work shall be carried out with ready mix paint, brushing wood primer pink for subsequent coat.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.19.59(B) shall be followed except that the extra rate shall be paid for every subsequent coat applied with Ready mix paint; brushing wood primer pink over and above the rate of item no.19.59 (B).

19.62 (D) Extra over item No. 19.59(D) for every subsequent coat of priming coat ready mix paint brushing priming for enamel.

1.0. Materials & Workmanship :

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1.1 The relevant specifications of item No. 19.59 (D) shall be followed except that the painting work shall be carried out with ready mix paint brushing priming for enamel.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No.19.59(D) shall be followed except that the extra rate shall be paid for every subsequent coat of priming coat with ready mixed paint, brushing priming for enamel.

2.2. The rate shall be for a unit of one sq. metre.

19.71. Painting two coats (excluding priming coat) on new wood and wood based surfaces with enamel paint interior to give an even shade including cleaning the surface off all dirt, dust and other foreign matter sand papering and slopping.

1.0. Materials :

1.1. The enamel paint shall conform to I.S. 133-1975.

2.0. Workmanship :

2.1. The relevant specifications of item No.19.7 shall be followed for general and applications of paint, except that the enamel paint shall be used for painting on new wood/wood based surfaces.

2.2. In painting doors and windows the putty, round the glass panes also be painted but care shall be taken to see that no paint, stain etc. are left on the glass. Top of shutters and surfaces in similar hidden locations shall not be left out in painting.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of item No.19.12 shall be followed, for mode of measurements and payments. The rate excludes cost of priming coat.

3.2. The rate shall be for a unit of one sq. metre.

SECTION - 20

DETAILED SPECIFICATIONS FOR DEMOLITION& DISMANTALING AS PER "SCHEDULE OF RATES"

20.1. (I) Demolition and disposal of unserviceable materials with all leads and lifts : Lime Concrete.

1.0. Workmanship :

1.1. The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant item as specified or shown in the drawings.

1.2. The demolition shall always be planned before hand and shall be done in reverse order

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of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

1.3. Necessary dropping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damages is caused to the adjoining property.

1.4. Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5. Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

1.6. All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.

1.7. Any serviceable material, obtained during dismantling or demolition shall be separated out and stacked properly as directed, with all lead and loft. All unserviceable materials, rubbish etc. shall be stacked as directed by the Engineer-in-charge.

1.8. On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

2.0. Mode of measurements & payment :

2.1. Measurements of all work except hidden work shall be taken before demolition or no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

2.2. All work shall be measured in decimal system as fixed in its place subject to the following limits, unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out to the nearest 0.01 sq. mt
(c) Cubical connection shall be worked out to the nearest 0.01 Cu. M.

2.3. The rate shall include cost of all labour involved and tools used in demolishing and dismantling in including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary storing for the safety of the portion not required to be pulled down or of adjoining properly and providing temporary enclosures or partitions where considered necessary.

2.4. The rate shall be for a unit of one cubic metre.

20.3. Demolition including stacking of serviceable materials and disposal or unserviceable materials with all leads and lifts : R.C.C. work.

1.0. Workmanship : 1.1. The relevant specifications of item No.20.1(I) shall be followed except that demolition of R.C.C. work is to be done.

2.0. Mode of measurements & payment :

2.1. The relevant specification of item No.20.1 shall be followed except that the demolition of reinforced concrete structure. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

2.2. The rate shall be for a unit of one cubic metre.

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20.23. Dismantling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lifts.

1.0. Workmanship : 1.1. The relevant specification of item No.20.1(I) shall be followed except that the dismantling of tiled or stone floors laid on mortar shall be done. Dismantling implies carefully, taking up or down or these are fixed by nail, screws, bolts etc. these shall be taken out with proper tools.

2.0. Mode of measurements & payment :

2.1. The supporting materials such as joints, beams if any etc. shall be measured separately, the relevant specification of item No.20.1 (I) shall be followed. The rate shall include stacking the unserviceable materials as directed will lead and lift.

2.2. The rate shall be for a unit of one sq. metre.

20.49. (I) Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats Architraves, hold fasts and other attachments etc. complete and stacking them within all lead & lifts, Not exceeding 3 sq. mt. in area.

1.0. Workmanship : 1.1. The relevant specification of item No.20.1(I) shall be followed that the doors, windows, ventilators etc. (wood or steel) shutters including chowkhats Architraves, hold fasts and other attachments etc. are to be dismantled.

2.0. Mode of measurements & payment :

2.1. The relevant specification of item No.20.1(I) shall be followed.

2.2. The doors, windows, ventilators etc. not exceeding 3 sq. mt. in area (each) including shutters and chowkhats Architraves, hold fasts and other attachments to frames etc. will be dismantled and measured under this item.

2.3. The rate includes stacking serviceable materials as and where directed with all leads and lifts.

2.4. The rate shall be for a unit of one number.

20.49. (II) Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats Architraves, hold fasts and other attachments etc. complete and stacking them within all leads & lifts exceeding 3 sq. mt. in area.

SECTION - 21

DETAILED SPECIFICATIONS FOR REPAIRS TO BUILDINGS AS PER "SCHEDULE OF RATES"

21.24. Cutting out cracks of roof terrace to V-section cleaning out, and fillings solidly with a hot mixtures of bitumen and clean dry sand (1:1 by weight).

1.0. Materials : (i) Bitumen shall be 85/25 penetration. (20 sand shall conform to M-6.)

2.0. Workmanship :

2.1. The relevant specification of item No.20.23 shall be followed for opening cracks and cleaning.

2.2. The cracks shall be absolutely dried and cleaned and filled solidly with a hot mixtures of 85/25 penetrating and sand in ratio of 1:1 by weight. The filler shall be well filled in to cracks with the edges of trowel and left flush with surface of roof. Repaired cracks shall cause no ridges across the direction of the slope of roof.

3.0. Mode of measurements & payment :

3.1. The relevant specification of item No.20.23 shall be followed.

3.2. The rate shall be for a unit of one running metre.

SECTION - 22

DETAILED SPECIFICATIONS FOR MIS. BUILDING ITEMS AS PER
"SCHEDULE OF RATES"

20.00.11. Treating the earth along the external perimeter of the building by making holes 15 cms. Apart upto a depth of 30 cms. With chemical emulsion at the rate of 7.5 liters/sq.mt. along the wall.

1.0. Materials : 1.1. The relevant specifications of the item No. 22.00.7. shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of the item No. 22.00.7. shall be followed except that the external perimeter of the building shall be treated with chemical emulsions. After building is complete, the earth along the external perimeter of the building should be robbed at intervals of 15 cms. And to a depth of 30 cms. The rods shall be moved backward and forward parallel to the wall to breakup the earth and chemical emulsion poured along the wall at the rate of 7.5 liters/sq.mt. of vertical surfaces. After the treatment, the earth shall be temped back into place, the earth out side of the building should be graded on completion of building. This treatment shall be carried out on the completion of such grading. In event of filling being more than 30 cms. the external perimeter and treatment shall be extended to the full depth of filling upto ground level so as to ensure continuity of the chemical barrier.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of the item No. 22.00.7. shall be followed.

3.2. The vertical surface area of sub-structure 30 cms. in depth from finished ground level in external periphery only shall be measured and paid under this item. The depth of wall treated under back filled shall not be included in this item.

3.3. The rate shall be for a unit of one sq. metre.

20.0012. Providing treatment along outside of foundation using chemical emulsion at 7.5 liters/sq.mt. of vertical surface (for each side) of sub-structure.

1.0. Materials : 1.1. The chemical used for the soil treatment shall be any one of the following with concentration shown against each in aqueous emulsion.

Chemicals	Concentration
1. Aldrin	0.50% (by weight)
2. Heptachlor	0.50% (")
3. Chlordane	1.00% (")

2.0. Workmanship : 2.1. The surface of consolidated earth around the existing shall be treated with chemical emulsion at the rate 7.5 liters/sq.mt. of vertical surface of the sub structure. The minimum height to sub-structure shall be considered 60 cms. for treatment. If the earth along the perimeter does not allow emulsion to seep through, holes up to 300 mm. depth at 150 mm. centers both way be made by 12 mm. dia. mild steel rod on the surface on facilitate saturation of the soil with chemical emulsion.

2.2. The chemical barrier shall be complete and continuous under hole of the structure to be protected.

2.3. The chemical treatment shall be carried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rain or sub soil water.

3.0. Mode of measurements & payment :

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3.1. The length shall be measured along the periphery of the sub-structure. The depth shall be taken 0.60 M.

3.2. No deduction shall be made nor extra paid for any opening for pipes etc. up to 0.1 sq.mt.

3.3. The rate includes cost of all labour and material required for the operations involved for satisfactory completion of this item.

3.4. The rate shall be for a unit of one sq. metre.

22.00.13. Providing treatment along external wall perimeter below concrete or masonry apron using chemical at 5 liters/sq.mt. linear including drilling and plugging etc.

1.0. Materials : 1.1. The relevant specifications of the item No. 22.00.12. shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of the item No. 22.00.12. shall be followed except that the termite control treatment shall be carried out in soil below existing floors.

2.2. The holes of 12 mm. dia. rod shall be drilled in floor up to 150 mm. depth at 300 mm. apart both ways. The chemicals shall be then injected with pressure at the rate 1 liters/hole of surface area.

3.0. Mode of measurements & payment :

3.1. The relevant specifications of the item No. 22.00.9. shall be followed.

3.2. The rate shall be includes cost of drilling holes and plugging.

3.3. The rate shall be for a unit of one sq. metre.

1.0. Materials : 1.1. The relevant specifications of the item No. 22.00.12. shall be followed.

2.0. Workmanship : 2.1. The walls effected by termite shall be cleaned off all live formy hiding inside sand holes or voids in masonry wall surface shall be treated by chemical

emulsion at rate 1 liters/hole. The holes in cracks in surface of wall shall be drilled at 300 mm. apart.

3.0. Mode of measurements & payment :

3.1. The rate shall be for a unit of one number of voids treated.

NOTE : PLEASE READ CAREFULLY :

- (1) Where detailed specification of an item provides for specific size of any fixture or fastening that shall prevail over the provisions in this schedule.
- (2) Fixtures and fastenings (except hold fasts which shall be of M.S. plate only) shall be of brass, copper oxidized brass, chromium plated brass, Iron, copper oxidized iron, or chromium plated iron as specified in the item of the work or detailed specifications.
- (3) External door and door falling in staircase excepting the door in balcony shall have sliding door bolt of size 300 mm. x 18 mm. in place of 250 mm. 16 mm. as shown in this schedule.

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- (4) The length of tower bolt shown is for a door having shutter height up to 2100 mm. only. For door having shutter height more than 2100 mm. the length of tower bolt is to be increased to the extent of increase door shutter height beyond 2100 mm.
- (5) 150 mm. x 150 mm. size glass vision panel shall be provided in the doors of Officer's chamber in addition to the scheduled provisions if so directed by the Engineer-in-charge.
- (6) Diamond shape chromium plated brass peeping plate of approved quality shall be provide in one entrance door in residential building in addition to the scheduled provisions.
- (7) Drawer in a wardrobe shall be provided with one furniture handle and one drawer lock (4 levers) in addition to its schedule provision.
- (8) For door and window with steel frame, 75 mm. size screws shall be provided both in top and bottom frame for fixity as shown below :
- | | |
|--|---------|
| (a) For width upto 1200 mm. | 2 No. |
| (b) For width above 1200 mm. and upto 1800 mm. | 3 No. 2 |
| (c) For every additional width of 500 mm. over and above 1800 mm | 1 Nos. |
- (9) When the mortice local (6 levers) and latch is specified to be provided to a door enter in the item of work itself or by a separate item, the requirement of providing sliding door bolt door latch and handles as per this schedule shall be dispensed with.
- (10) For door/window with ventilator at top, fixture and fastenings of door/window plus those of ventilator (excluding hold fasts) shall be used.
- (11) Where the item of work or its specification provides for anodized aluminium fixtures, all the fixtures except hinges and screws will be of anodized aluminium and chromium plated iron hinges and screws will be of anodized aluminium and chromium plated iron hings and screws shall be used.
- (12) For door, window or cupboard frame abutting concrete section, instead of hold fasts as shown in the schedule, coach screws of size as mentioned below shall be used :
- | | |
|---------------------|------------|
| (a) Teak wood frame | 00.125 mm. |
| (b) Steel frame | 00.75 mm. |
- (13) The locking etc. in the door latch shall be so positioned that the door can be properly locked even if part of the latch, when fully, slided, remains in the frame or masonry.

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- (14) Showcase cupboards having single shutter shall be provided with ball catcher instead of tower bolt (barrel type) as per schedule.
- (15) The size of the handle shown in the schedule indicates grip length.
- (16) Door stopper shall be either floor door stopper or door catches directed by the Engineer-in-charge.
- (17) Piano hinges shall be for the full height of the shutter.
- (18) Shutters with piano arrangements shall be provided with two pivots of approved size instead of hinges as per the schedule.
- (19) For butt hinges, only lengths are indicated in the schedule. The width of each flap being 5 mm. less than the thickness of the shutter to which they are to be fixed and the thickness of the flap shall be as specified in the relevant I.S.S. for heavy medium or light as specified in the detailed specification of the item of work.

Schedule for Testing for Materials

For ensuring quality control and workmanship, various test prescribe below corresponding to the material concerned shall be taken as periodic intervals as stipulated below be taken.

The Material shall be got tested Govt. recognized Laboratory (R & B) or field laboratory of GERI (R&B) **for which 1% of the estimated amount to tender shall be recovered from the contractor from the R.A. Bill and Final Bills as the testing charges** shall be paid by the Govt. to the GERI, However if the charged increase over 1% no excess recovery shall

be made from the contractor as per resolution of B&B department dated 10th May 1985,

vide TNC/1085 (4)
S.

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Item No. as per Sch. B	Brief Description of Materials to be tested	Qty. of Materi al	Prescription of test which shall be carried out	Frequency @ which test shall be carried out	Total No. of test to be taken
1.	Kapachi	-	-Gradation test - -Impact Value -Flakiness Index of aggregate	CMT 1 to 100 – 1 test 100 to 500 – 3 tests 500 to 1500 – 5 tests 1500 to 5000 – 7 tests	
2.	Grit	-	-Stripping Value		
3.	Sand		-Special Gravity -Water absorption -Fineness		
			Modulus -Silt – Content -Soundness		
4.	Tiles		-Dimension Test - Transverse strength -Water Absorption		
5.	Teakwood		-Anatomy Test -Density Test -Moisture content Test		

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6.	Bricks		-Water Absorption -Efflorence -Size -Comprehensive Strength	1 test @ 50,000 Bricks	
7.	Cement		-Consistency -Setting Time -Compressive Strength	1 test @ 10.0 M.T. As per manual of Quality Control	
8.	Steel		-Tensile strength -Yield Stress -Elongation -Size		
9.	C.C.Cube test 1:2:4		-Compressive Strength	1 to 5 Cum. 1 No. 6 to 15 Cum. 2 Nos. 16 to 20 Cum. 3	

The testing of various materials shall be carried out in GERI/ or approved GOVT. LAB and result received shall be binding to all. i.e. contractor and Govt.

TECHNICAL SPECIFICATION FOR ROAD WORKS

1.0 GENERAL

- 1.01 The specifications and mode of measurements for all the works mentioned in this tender shall be in accordance with RUIDP specifications 1996 volumes I to VI.

Unless otherwise specified in the nomenclature of individual item or in the specifications, the entire work shall be carried out as per the RUIDP specification with upto date correction slips upto the date of opening of tender.

- 1.02 For Items not covered under RUIDP specifications mentioned above, the work shall be executed as per "Specifications for Road & Bridge Work" published by Ministry of surface transport, "Hill Road Manual" (IRC:SP:48-1998) published by the Indian Road Congress, and as per relevant standards/codes published by BIS (formerly ISI) inclusive of all amendments issued thereto or revision thereof, if any, upto the date of opening Tender.
- 1.03 In case of BIS (formerly I.S.I) codes/specifications are not available, the decision of the Engineer based on acceptable sound engineering practice and local usage shall be final and binding on the contractor.
- 1.04 However, in the event of any discrepancy in the description of any item as given in the schedule of quantities or specifications appended with the tender and the specifications relating to the relevant item as per RUIDP specifications mentioned above or in drawings the former shall prevail.
- 1.05 The rates for different items of work shall be for all heights, lifts, leads and depths except where otherwise specified in the item of work or in additional conditions appended with the tender.
- 1.06 The work shall be carried out in accordance with the approved drawings. The drawings shall have to be properly co-related before executing the work. In case of any difference noticed between the drawings, final decision, in writing of the Engineer shall be obtained by the contractor. For items, where so required, samples shall be prepared before starting the particular items of work for prior approval of the Engineer and nothing extra shall be payable on this account.
- 1.07 Unless otherwise specified in the bill of quantities, the rates for the items of work shall be considered as inclusive of pumping out or bailing out water if required for which no extra payment will be made. This will include water encountered from any source such as rains, floods, sub-soil water table being high due to any other cause whatsoever.
- 1.08 Any cement slurry added over base surface (or) for continuation of concreting for bond is added its cost is deemed to have in built in the item unless otherwise/explicitly stated and nothing extra shall be payable or extra cement considered with consumption on this account.

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- 1.09 The rate for all items in which the use of cement is involved in inclusive of charges for curing.
- 1.10 The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the side to the satisfaction of the Engineer before the work is considered as complete.
- 1.11 The rate quoted for all brick /concrete work shall be deemed to include making openings and making good these with the same specifications as shown in drawings and / or as directed. No extra payment shall be made to the contractor on this account.
- 1.12 The drawing(s) attached with the tender documents are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed. The rates quoted by the tenderer shall be deemed to be for the execution of works taking into account the "Design Aspect" of the items and in accordance with the "Construction Drawings" to be supplied to the Contractor during execution of the works.
- 1.13 The quoted rate shall be for finished items and shall be complete in all respects including the cost of all materials, labour, tools & plants, machinery etc., all taxes, duties, levies, octroi, royalty charges, statutory levies, cess etc. applicable from time to time and any, other item required but not mentioned here involved in the operations described above. EPI shall not be supplying any materials, labour, plant etc. unless explicitly mentioned so.
- 1.14 Gradient of road shall be as per approved drawing and as per direction of Engineer – in-Charge.
- 1.15 Random Rubble Masonry retaining wall shall be constructed as per approved drawings based on different heights at different locations and payment for the same shall be made as per the rates of respective items available in the Bill of Quantities.
- 1.16 RCC culverts of larger sizes may be required to be constructed as per actual requirement at site. The contractor has to execute this work and payment shall be made as per the rates of respective items available in the Bill of Quantities.

2.0 MATERIALS

2.01 Stone Aggregate

For WBM construction stone metal grade – I & II of hard granite or equivalent as approved by Engineer-in-Charge shall be used. River borne or weathered stone metal shall not be used for the work. The stone metal and aggregates shall not be obtained from the rock which has been exposed to atmosphere for a long time. They shall be clean, hard, durable of fairly cubical shape and free from excess flat, elongated, soft & disintegrated particles, fracture, cleavage, dirt & other deleterious materials and organic impurities. The aggregates shall preferable be hydrophobic and low porosity. The aggregates shall satisfy the physical requirements as set forth in Table I.

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Table – I (Physical Requirement of Coarse Aggregate)				
Sl. No.	Type of Construction Requirement	Type of Construction Test	Test	Method
1.	Sub-Base (Maximum)	Los Angeles Abrasion Value	IS-2386 (Part-IV)	60%
		or Aggregate Impact Value	IS-2386 (Part-IV)	*50%
	(Maximum)		IS-5640***	
2.	Base (Maximum)	Los Angeles Abrasion Value	IS-2386 (Part-IV)	50%
		or Aggregate Impact Value	IS-2386 (Part-IV)	*40%
		Flakiness Index	IS-2386 (Part-I)	**15%
	(Maximum)		IS-5640***	
*	Aggregates may satisfy requirements of either of the two tests.			
**	The requirements of flakiness index shall be enforced only in case of crushed / broken stone ..			
***	Aggregates like brick metal, kankar and laterite which get softened in presence of water, shall be tested for impact value under wet conditions in accordance with IS:5640.			

2.02 Sand / Stone Dust

Sand/ Stone dust shall be clean, hard durable, uncoated, dry and free from injurious soft or flaky pieces and organic or deleterious substances. Quality of sand/ stone dust shall conform to IS: 383.

2.03 Supply and stacking of materials**Stone metal, boulder, sand, stone dust etc.**

Ground where stacks are proposed to be made shall be cleared, leveled or dressed to a uniform slope and all lumps, depressions etc. shall be removed. The stacked material shall be free from vegetation and other undesirable material. All rejected materials shall be immediately removed from site.

Stone metal and boulder shall be stacked in convenient units of one metre top width, 2.2 m bottom width, 60 cm height and of length in multiples of 3 meter. Template of wood or steel shall be used for making the stack and shall always be kept at site for check measurements.

Sand or stone dust shall be stacked in convenient units of one cum. The stack shall be made with wooden boxes open at both ends and of 2 m x 2 m x 0.25 m dimensions. These boxes shall always be kept at site for stacking and check measurements.

The stacks shall be uniformly distributed along the road side and shall be numbered serially. The number plate shall be planted on each stack which shall remain in position until the stack is used in the work.

Sample of materials shall be got approved from Engineer-in-Charge before the material in bulk is brought to the site.

2.03 Measurement for Payment

Length, breadth and height shall be measured correct to a cm and volume shall be calculated in cum correct to two places of decimal. The volume of stacks shall be reduced by percentage as shown below on account of voids to arrive at the net quantity for payment.

Earth

i)	In loose stacks such as cart loads, lorry etc.	-	20%
ii)	In consolidated fills	-	10%
iii)	In fills consolidated by heavy mechanical machinery but not under OMC	-	5%
iv)	In fills consolidated by heavy mechanical machinery at OMC	-	Nil
v)	Consolidated fills in confined situation such as under floors -	Nil	
vi)	Sand/ Stone dust	-	Nil
vii)	Moorum	-	Nil
viii)	Stone metal 40 mm nominal size and above	-	7.5%
ix)	Coarse Aggregate below 40 mm nominal size	-	Nil
x)	Soling Stone / Boulder – 100 mm nominal size and above	-	15%
xii)	Excavated Rock	-	50%

Unless otherwise directed, measurement shall not be taken until sufficient materials for use on the road (for a road length of minimum five hundred metre) have been collected and stacked. Immediately after measurement the stack shall be marked by white wash or other means as directed by Engineer-in-Charge.

3.0 ROLLING:

3.01 Rolling shall be done by 80 / 100 KN smooth wheeled power roller (3 wheel or tandem) or vibratory roller of 80 – 100 KN static weight. Rolling shall start as soon as possible after the materials have been spread, deploying a set of rollers as the rolling is to be completed in limited time frame. Rolling shall be done with care to avoid unduly roughening of the pavement surface. The roller shall move at a speed not more than 5 km / hour.

Rolling of longitudinal joints shall be done immediately behind the paving operation. After this the rolling shall commence at the edges and progress towards the centre longitudinally, except that on super elevated and uni-directional cambered portions, where the rolling shall proceed from inner edge to the outer parallel to the centre line of the

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pavement. First the edge / edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road, in successive passes uniformly lapping preceedings tracks by at least one-half width of WBM.

When the roller has passed over the whole area once, any high spots or depressions which become apparent shall be corrected by removing or adding mix material. The rolling shall be continued till the entire surface has been rolled to 95% of the Proctor's density, there is no crushing of aggregates and all roller marks have been eliminated. Roller shall not stand on newly laid material while there is a risk that surface will be deformed thereby.

3.02 Time Schedule for Rolling Operations

The minimum duration for rolling shall be governed by the guidelines set forth in Table-3. However, Engineer-in-Charge shall have the full authority to increase the duration to an extent as he may deem necessary, to satisfy himself that the compaction must comply with the specifications.

Table-3

Sl. No.	Items	Duration	Surface Area / Volume
1.	Preparation of Sub-grade	1 hour	200 sqm
2.	75 mm thick WBM with Stone Metal Grade – II	1 hour	50 sqm
3.	150 mm thick WBM with Stone Metal Grade – I	1 hour	100 sqm

3.03 Rates

The contract unit rate for the work shall be payment in full for carrying out the required operations including full compensation for

- (i) Making arrangements for traffic to Clause 112 of 'Specifications for Road & Bridge Works' published by Ministry of Surface Transport except for initial treatment to verge, shoulders and construction of diversion.
- (ii) Preparation of base except for laying of profile corrective course but including filling of pot holes.
- (iii) Providing all materials to be incorporated in the work including the arrangements for stockyard, all royalties, octroi, fees, cess, rents where necessary and all leads and lifts.
- (iv) All labour, tools, equipment, power supply units and all machines incidental to complete the work to the specifications.

4.06 Rectification / Reconstruction of Defective Macadam

Where the surface regularity of sub-grade and the various pavement courses fall outside the specified tolerances, the contractor shall be liable to rectify these at their own cost in the manner described below and to the satisfaction of the Engineer-in-Charge.

4.07 Sub-Grade

Where the surface is high, it shall be trimmed and suitably compacted. Where the surface is low, the deficiency shall be corrected by scarifying the lower layer and adding fresh material and re-compacting to the required density.

4.08 WBM (Sub-base / Base Course)

Where the surface is either high or low, the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material and re-compacted to the required density. In no case shall depressions be filled up with screenings or binding material.

5.0 **EARTH WORK**

5.01a EARTH WORK IN FILLING

Earth work in filling in banks shall be done in layers, each layer not exceeding 20 cm in thickness and should be properly watered to maintain the optimum moisture content. Consolidation of every 3rd layer (alternate layer) and the top-most layer should be done with power roller of minimum 80-100 KN capacity and got approved by Engineer-in-Charge before compacting the next layer. Required quantity of earth should be obtained from borrow-pits, the sites of which should necessarily be approved by Engineer-in-Charge. No borrow-pits should be dug within 4.5 m of toe of the final section of the embankment. Necessary witness should be left for the purpose of measurement of quantity of earth excavated and used in embankment. Proper profiles of embankment shall be maintained. Requisite allowance in height varying from 25 – 50 mm as directed by Engineer-in-Charge shall be left for settlement. Side slopes shall be maintained strictly as per drawings.

5.01b Earthwork in filling shall be measured in compacted volume of finished work in cubic metres.

5.02 EARTH WORK IN EXCAVATION

General

All excavation shall be carried out in conformity with the lines, grades, side slopes and levels shown on the drawings or as directed by the Engineer-in-Charge. The contractor shall not excavate outside the limits of excavation. After excavation, the sides of excavated area shall be trimmed and the area contoured to minimize erosion and ponding, allowing for natural drainage to take place.

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Rock, when encountered in road excavation, shall be removed upto the formation level. Rocks and large boulders which are likely to cause differential settlement and also local drainage problems should be removed to the extent of 500 mm below the formation level in full formation width.

5.03 Slope in cutting and filling at hill side and valley side shall be as per direction of Engineer-In-Charge.

5.04 Disposal of Excavated Materials

All the excavated materials shall be the property of the Employer. The materials obtained from excavation shall be used for filling in the adjacent embankments as directed by the Engineer-in-Charge. All hard rocks, not intended for use shall be stacked neatly on specified land as directed by the Engineer-in-Charge.

Unsuitable and surplus materials not intended for use shall be transported and disposed clear of the site as directed by the Engineer-in-Charge.

6.0 PREPARATION OF SUB-GRADE

The optimum moisture content should always be maintained by sprinkling requisite quantity of water in order to keep the sub-grade in established condition in accordance with the direction of Engineer-in-Charge. The sub-grade must not be allowed to become dry and break-up for want of cohesion. The final sectioning should be done to proper camber, gradient and super elevation with the help of template and strings. The rate of preparation and consolidation of sub-grade includes earth work in cutting and filling upto 22.5 cm thickness, if necessary, in order to achieve the desired profile. The dressed surface should be properly consolidated by rolling with power road roller of minimum 80-100 KN capacity.

7.0 **WATER BOUND MACADAM (SUB – BASE / BASE COURSE)**

7.01 SCOPE

This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bonding together with screening, binding material where necessary and water laid on a properly prepared sub grade and finished in accordance with the requirements of these specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by Engineer-in-Charge.

It is not desirable to lay Water Bound Macadam on an existing thin black topped surface without providing adequate drainage facility for water that would get accumulated at the interface of exiting bituminous surface and WBM.

7.02 MATERIALS

7.021 Coarse Aggregate

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Coarse Aggregates shall conform to the grading requirement as set forth in Table – 5

Table – 5

Size of Aggregate	IS Sieve Designation	% by Weight Passing IS Sieve
Grade – I (45 mm to 90 mm)	100 mm	100
	80 mm	65-85
	63 mm	25-60
	40 mm	0-15
	20 mm	0-05
Grade – II (45 mm to 63 mm)	80 mm	100
	63 mm	90-100
	50 mm	35-70
	40 mm	0-15
	20 mm	0-05

7.022 Stone Screenings

Screening to fill voids in the coarse aggregates shall generally consist of the same material as the coarse aggregate. Screening shall conform to the grading requirements as set forth in Table – 6.

Table – 6

Size of Screenings	IS Sieve Designation	% by Weight Passing IS Sieve
13.2 mm	13.2 mm	100
	11.2 mm	95-100
	5.6 mm	15-35
	180 micron	0-10

7.023 Proportioning of Materials

Approximate quantities of coarse aggregate and stone screenings required for Water Bound Macadam base / sub-base course shall be as mentioned in Table-7.

Table - 7
(Quantity for 10 Sqm Area)

Classifi-	Size /	Compact	Net	Stone Screening	Binding
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Category	Range	Thickness	Quantity	Grading Classification & Size	For WBM Sub-base / Base Course (Net Quantity)	Material
Grade – I	45 mm – 90 mm	100 mm	1.245 m ³	Type-A (13.2 mm)	0.285 m ³	0.10 m ³
Grade – II	45 mm – 63 mm	75 mm	0.935 m ³	Type-A (13.2 mm)	0.135 m ³	0.09 m ³

* Net quantity means – the quantity of metal measured in stacks and reduced by 7.5%.

7.03 CONSTRUCTION OPERATIONS**7.031 Preparation of Base**

The surface of the sub grade / sub-base base to receive the Water Bound Macadam course shall be prepared to the specified lines grades & camber and made free of dust and other extraneous material. Any soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained if necessary by sprinkling water. Any sub-base/base/surface irregularities, where predominant shall be made good by providing appropriate type of profile corrective course (leveling course)

7.032 Spreading Coarse Aggregates

The coarse aggregate shall be spread uniformly and evenly upon the prepared sub-grade to proper profile by using templates placed across the road about 6m apart in such quantities that the thickness of each compacted layer is not more than 100mm for Grade-I and 75 mm for Grade-II. Wherever possible, approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimize the need for manual rectification afterwards.

The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregates as may be required. The surface shall be checked frequently with a straight-edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The course aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.

7.033 Rolling

Immediately following the spreading of the coarse aggregates, rolling shall be started with three wheeled Power Roller of 80-100 KN capacity or Vibratory Rollers of 80-100 KN static weight. The type of roller to be used shall be

approved by the Engineer-in-Charge based on trial run Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit the application of stone screenings.

The rolled surface shall be checked transversely and longitudinally, with templates and any irregularities corrected by loosening the surface, adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired grade and camber. In no case shall be use of screenings be permitted to make up depressions. Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates.

7.034 Application of Screenings

After the coarse aggregate has been rolled completely, screenings to completely fill the interstices shall be applied gradually over the surface. These shall not be damp or wet at the time of application. Dry rolling shall be done while the screenings are being spread so that vibrations of the roller cause them to settle into the voids of the coarse aggregates. The screenings shall not be dumped in piles but be spread uniformly in successive thin layers either by the spreading motions of hand shovels or by mechanical spreaders.

The screenings shall be applied at a slope and uniform rate (in three or more applications) so as to ensure filling of all voids. This shall be accompanied by dry rolling and brooming with mechanical or hand brooms.

7.035 Sprinkling of Water and Grouting

After the screenings have been applied the surface shall be copiously sprinkled with water swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operations shall be continued, with additional screenings applied as necessary until the coarse aggregate has been thoroughly keyed, well bonded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or sub-grade does not get damaged due to the addition of excessive quantity of water during construction.

7.036 Application of binder Material (Moorum / Stone Dust)

After the application of stone screening in accordance with Clauses 8.034 and 8.035 the binding material where it is required to be used shall be applied successively in two or more thin layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly and rolled during which water shall be applied to the wheels of the roller if necessary to wash down the binding material sticking to them. These operations shall continue until the resulting slurry after filling of voids forms a wave ahead of the wheels of the moving roller.

7.037 Setting and Drying

After the final compaction of Water Bound Macadam course the pavement shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or bedding materials as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set.

7.038 Measurement for Payment

Water Bound Macadam shall be measured as finished work in cubic meters.

LIST OF APPROVED MAKES

1. Ordinary Portland Cement: JK Birla, Vikram,,Ultratech, Lafarge conforming to IS for 43/ 53 grade as applicable for design and drawing.
2. Reinforcement Steel MS & TMT: M.S. bar shall conform to IS: 2062. TMT bar shall be as per IS: 1786 of grade Fe-415/ 500. Approved manufacturer for MS/ TMT bar are SAIL/ TISCO/ ISPAT/ BISCON/ KAMDHENU or other reputed manufacturer with prior approval of the competent authority.
3. PVC pipe for weepholes: Jindal, Supreme, Prince.

Note : The materials other than approved list shall also bear IS mark and/ or to be approved by the Engineer-in-charge before the use. Required tests are to be conducted by the contractor before use at works.

Table 900-1, Tolerances in Surface Levels.

1.	Sub-Grade	+ 20mm - 25mm
2.	Sub-base + 10mm	
	a) Flexible pavement	- 20mm
	b) Concrete Pavement	+ 6mm
	(Dry lean concrete or rolled concrete)	- 10mm

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3.	Base Course for flexible pavement. a) Bituminous Course b) Other than bituminous. i) Machine laid ii) Manually laid.	+ 6mm - 6mm + 10mm - 10mm + 15mm - 15mm
4.	Wearing course for flexible pavement. i) Machine laid ii) Manually laid.	+ 6mm - 6mm + 10mm - 10mm
5.	Cement Concrete Pavement.	+ 5mm - 6mm*

* *This may not exceed - 8mm at 0-30 cm from the edge.***QUALITY CONTROL FOR ROAD WORKS****Table 900-2, Maximum Permitted Number of Surface Irregularities.**

Irregularity	Surface of carriageways and paved shoulders				Surface of laybys, service areas and all bituminous base course			
	4 mm		7 mm		4 mm		7 mm	
Length (m)	300	75	300	75	300	75	300	75
National Highways/ Expressway*	20	9	2	1	40	18	4	2
Roads of Lower category*	40	18	4	2	60	27	6	3

* *Category of each section of road as described in the contract.*

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The maximum allowable difference between the rod surface and underside of a 3m straight edge when placed parallel with, or at right angles to the center line of the road at points decided by the Engineer shall be for :

- | | | |
|-------|---|------|
| (i) | Pavement surface (bituminous and cement concrete) | 3mm |
| (ii) | Bituminous base courses. | 6mm |
| (iii) | Granular sub-base/base courses. | 8mm |
| (iv) | Sub-base under concrete pavements. | 10mm |

Table 900-3,

S. No.	Type of Construction	Test	Frequency (Min.)
1.	Granular	(i) Gradation (ii) Atterberg Limits (iii) Moisture content prior to compaction (iv) Density of compacted layer (v) Deleterious constituents (vi) CBR	One test per 200 m ³ One test per 200 m ³ One test per 250 m ²
2.	Lime/Cement Stabilised Soil Subbase.	(i) Quality of Lime/Cement (ii) Lime/Cement Content (iii) Degree of pulverisation (iv) CBR or unconfined compressive strength test on a set of three specimens. (v) Moisture content prior to compaction (vi) Density of compacted layer (vii) Deleterious constituents.	One test for each consignment subject to a minimum of one test per 5 tonnes. Regularly through procedural checks. Periodically as considered necessary As required. One test per 250 m ² One test per 500 m ² As required.
3.	Water Bound Macadam.	(i) Aggregate impact value (ii) Grading (iii) Flakiness index and Elongation index.	One test per 200 m ³ of aggregate. One test per 100 m ³ One test per 200 m ³ of aggregate.

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4.	Wet Mix Macadam.	(iv) Atterberg limits of binding material	One test per 25 m ³ of binding material.
		(v) Atterberg limits of portion of aggregate passing 425 micron sieve.	One test per 100 m ³ of aggregate.
		(i) Aggregate impact value	One test per 200 m ³
		(ii) Grading	One test per 100 m ³
		(iii) Flakiness index and Elongation index	One test per 200 m ³
		(iv) Atterberg limits of portion of aggregate passing 425 micron sieve	One test per 100 m ³
		(v) Density of compacted layer	One test per 500 m ²

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Table 900-4, Control tests and their Minimum Frequency for Sub-Bases and Bases (Excluding bitumen Bound Bases)

S. No.	Type of Construction	Test	Frequency (Min.)
1.	Primer Coat/ Tack Coat/For spray	(i) Quality of binder.	No. of samples per lot to be and tests as per IS:73, IS:217 and IS:8887 as applicable. At regular close intervals.
		(ii) Binder temperature for application.	
		(iii) Rate of spread of binder	
2.	Seal coat/surface dressing.	(i) Quality of binder	Same as mentioned under serial No.1 One test per 50 m ³ of aggregate. One test per 50 m ³ of aggregate.
		(ii) Aggregate Impact value	
		(iii) Flakiness Index or Elongation Index	

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		(iv) Stripping value of aggregate	Initially one set of 3 representative specimens for each source of supply. Subsequently when warranted by changes in the quality of aggregate.
		(v) Water absorption of aggregate.	----- do -----
		(vi) Grading aggregates.	One test per 25 m ³ aggregate.
		(vii) Stone Polishing Value	As required.
		(viii) Temperature of binder at application.	At regular close intervals.
		(ix) Rate of spread of materials.	One test per 500m ² of work.

S. No.	Type of Construction	Test	Frequency (Min.)
3.	Open-graded premix carpet/ Mix seal surfacing.	(i) Quality of binder (ii) Aggregate Impact value (iii) Flakiness Index or Elongation Index (iv) Stripping value (v) Water absorption of aggregate. (vi) Grading aggregates. (vii) Stone Polishing Value (viii) Temperature of binder at application. (ix) Binder content (x) Rate of spread of materials.	Same as mentioned under serial No.1 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 As required. At regular close intervals. One test per 500m ³ and not less than two tests per day. One test per 500m ³ of work.
4.	Bituminous Macadam	(i) Quality of binder (ii) Aggregate Impact value (iii) Flakiness Index or Elongation Index (iv) Stripping value (v) Grading of aggregate (vi) Water absorption of aggregates (vii) Binder content (viii) Control of temperature of binder and aggregate for mixing and of the mix at the time of laying and rolling (ix) Rate of spread of mixed material (x) Density of compacted layer.	Same as mentioned under serial No.1 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Two test per day per plant both on the individual constituents and mixed aggregates from the dryer. Same as mentioned under serial No.2 Periodic, subject to minimum of two tests per day per plant At regular close intervals. Regular control through checks of layer thickness. One test per 250m ² of area.

Table 900-4, Control tests and their Minimum Frequency for Sub-Bases and Bases (Excluding bitumen Bound Bases)

S. No.	Type of Construction	Test	Frequency (Min.)
5.	Bituminous Penetration Macadam/Built-up Spray Grout.	(i) Quality of binder (ii) Aggregate Impact Value (iii) Flakiness Index or Elongation Index (iv) Stripping value (v) Water absorption aggregate (vi) Aggregate grading (vii) Temperature of binder at application. (viii) Rate of spread of binder.	Same as mentioned under serial No.1 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as S.No.2 One test per 100m ³ of aggregate At regular close intervals. Same as mentioned under serial No.2
6.	Dense Bituminous Macadam/Semi Dense Bituminous Concrete/ Bituminous Concrete.	(i) Quality of binder (ii) Aggregate Impact Value (iii) Flakiness Index and Elongation Index (iv) Stripping value (v) Water absorption of aggregate (vi) Sand equivalent test (vii) Plasticity Index (viii) Stone Polishing value (ix) Mix Grading (x) Stability of Mix	Same as mentioned under serial No.1 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 Same as mentioned under serial No.2 As required. As required. As required, for Semi Dense bituminous Concrete/ Bituminous Concrete. One set of tests on individual constituents and mixed aggregate from the dryer for each 400 tonnes of mix subject to a minimum of two tests per plant per day. For each 400 tonnes of mix produced, a set of 3 Marshall specimens to be prepared and tested for stability, flow value, density and void content subject to a minimum of two sets being tested per plant per day.

S. No.	Type of Construction	Test	Frequency (Min.)
7.	Mastic Asphalt	<p>(xi) Water sensitivity of mix Retention of Marshal Stability.</p> <p>(xii) Swell test on the mix</p> <p>(xiii) Control of temperature of binder in boiler, aggregate in the dryer and mix at the time of laying and rolling</p> <p>(xiv) Control of binder content and grading of the mix.</p> <p>(xv) Rate of spread of mixed material.</p> <p>(xvi) Density of compacted layer.</p> <p>(i) Quality of binder</p> <p>(ii) Aggregate impact value</p> <p>(iii) Flakiness Index and Elongation Index</p> <p>(iv) Stripping value</p> <p>(v) Water sensitivity of mix</p> <p>(vi) Grading of aggregates</p> <p>(vii) Water absorption of aggregates.</p> <p>(viii) Binder content and aggregate grading.</p> <p>(ix) Control of temperature of binder and aggregate for mixing and of the mix at the time of laying and rolling.</p> <p>(x) Rate of spread of mixed material.</p> <p>(xi) Hardness number.</p>	<p>As required for the bituminous concrete.</p> <p>As required for the bituminous concrete.</p> <p>At regular close intervals.</p> <p>One test for each 400 tonnes of mix subject to a minimum of two tests per day per plant.</p> <p>Regular control through checks on the weight material and layer thickness.</p> <p>One test per 250m² area</p> <p>Same as mentioned under Serial No.1</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Two tests per day per plant both of the individual constituents and mixed aggregates from the dryer</p> <p>Same as mentioned under Serial No.2</p> <p>Period, subject to minimum of two tests per day per plant.</p> <p>At regular close intervals.</p> <p>Regular control through checks of layer thickness.</p> <p>One test for each 400 tonnes of mix subject to a minimum of two tests per day.</p>

S. No.	Type of Construction	Test	Frequency (Min.)
8.	Slurry seal	(i) Quality of binder (ii) Film Stripping test	Same as mentioned under Serial No.1 Initially one set of 3 representative specimens for each source of supply, then as warranted by changes in the quality of aggregates.
9.	Sand Asphalt base course.	(i) Quality of binder (ii) Loss Angeles Abrasion Value. (iii) Sand equivalent test (iv) Plasticity Index (v) Mix grading. (vi) Stability of Mix. (vii) Control of temperature of binder in boiler, aggregate in the dryer and mix at the time of laying and rolling. (viii) Control of binder content and grading of the mix. (ix) rate of spread of mixed material. (x) Density of compacted layer	Same as mentioned under Serial No.1 Same as mentioned under Serial No.2 As required As required One set of tests on individual constituents and mixed aggregate from the dryer for each 400 tonnes of mix subject to a minimum of two tests per plant per day. For each 400 tonnes of mix produced, a set of 3 Marshal specimens to be prepared and tested for stability, flow value, density and void content subject to a minimum of two sets being tested per plant per day. At regular close intervals. One test for each 400 tonnes of mix subject to a minimum of two tests per day per plant. Regular control and through checks on the weight of mixed material and layer thickness One test per 250 m ² area.

S. No.	Type of Construction	Test	Frequency (Min.)
10.	Modified binder	(i) Softening Point (ii) Penetration at 25°C and 4°C (iii) Elastic Recovery (iv) Ductility (v) Flash Point (vi) Fraass Breaking (vii) Viscosity at 150°C (viii) Thin film oven test, penetration, softening point, elastic recovery of residue, loss on heating.	Initially one submission thereafter daily if site blended, weekly if pre-blended. ----- do ----- ----- do ----- ----- do ----- ----- do ----- Initially on submission. Initially on submission. Initially on submission.

Table 900-1, Tolerances in Surface Levels.

1.	Sub-Grade	+ 20mm - 25mm
2.	Sub-base + 10mm c) Flexible pavement d) Concrete Pavement (Dry lean concrete or rolled concrete)	- 20mm + 6mm - 10mm
3.	Base Course for flexible pavement. c) Bituminous Course d) Other than bituminous. i) Machine laid ii) Manually laid.	+ 6mm - 6mm + 10mm - 10mm + 15mm - 15mm
4.	Wearing course for flexible pavement. iii) Machine laid iv) Manually laid.	+ 6mm - 6mm + 10mm - 10mm

5.	Cement Concrete Pavement.	+ 5mm - 6mm*
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* This may not exceed - 8mm at 0-30 cm from the edge.

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Table 900-2, Maximum Permitted Number of Surface Irregularities.

Irregularity	Surface of carriageways and paved shoulders				Surface of laybys, service areas and all bituminous base course			
	4 mm		7 mm		4 mm		7 mm	
Length (m)	300	75	300	75	300	75	300	75
National Highways/ Expressway*	20	9	2	1	40	18	4	2
Roads of Lower category*	40	18	4	2	60	27	6	3

* Category of each section of road as described in the contract.

The maximum allowable difference between the rod surface and underside of a 3m straight edge when placed parallel with, or at right angles to the center line of the road at points decided by the Engineer shall be for:

- | | | |
|--------|---|------|
| (v) | Pavement surface (bituminous and cement concrete) | 3mm |
| (vi) | Bituminous base courses. | 6mm |
| (vii) | Granular sub-base/base courses. | 8mm |
| (viii) | Sub-base under concrete pavements. | 10mm |

Table 900-3,

S. No.	Type of Construction	Test	Frequency (Min.)
1.	Granular	(i) Gradation (ii) Atterberg Limits (iii) Moisture content prior to compaction (iv) Density of compacted layer (v) Deleterious constituents (vi) CBR	One test per 200 m ³ One test per 200 m ³ One test per 250 m ² One test per 500 m ³ As required As required

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2.	Lime/Cement Stabilised Soil Subbase.	(i) Quality of Lime/Cement (ii) Lime/Cement Content (iii) Degree of pulverisation (iv) CBR or unconfined compressive strength test on a set of three specimens. (v) Moisture content prior to compaction (vi) Density of compacted layer (vii) Deleterious constituents.	One test for each consignment subject to a minimum of one test per 5 tonnes. Regularly through procedural checks. Periodically as considered necessary As required. One test per 250 m ² One test per 500 m ² As required.
3.	Water Bound Macadam.	(i) Aggregate impact value (ii) Grading (iii) Flakiness index and Elongation index. (iv) Atterberg limits of binding material (v) Atterberg limits of portion of aggregate passing 425 micron sieve.	One test per 200 m ³ of aggregate. One test per 100 m ³ One test per 200 m ³ of aggregate. One test per 25 m ³ of binding material. One test per 100 m ³ of aggregate.
4.	Wet Mix Macadam.	(i) Aggregate impact value (ii) Grading (iii) Flakiness index and Elongation index (iv) Atterberg limits of portion of aggregate passing 425 micron sieve (v) Density of compacted layer	One test per 200 m ³ One test per 100 m ³ One test per 200 m ³ One test per 100 m ³ One test per 500 m ²

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Table 900-4, Control tests and their Minimum Frequency for Sub-Bases and Bases (Excluding bitumen Bound Bases)

S. No.	Type of Construction	Test	Frequency (Min.)
1.	Primer Coat/ Tack Coat/For spray	(i) Quality of binder.	No. of samples per lot to be and tests as per IS:73, IS:217 and IS:8887 as applicable.

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2.	Seal coat/surface dressing.	(ii) Binder temperature for application.	At regular close intervals.
		(iii) Rate of spread of binder	One test per 500m ² and not less than two test per day.
		(i) Quality of binder	Same as mentioned under serial No.1
		(ii) Aggregate Impact value	One test per 50 m ³ of aggregate.
		(iii) Flakiness Index or Elongation Index	One test per 50 m ³ of aggregate.
		(iv) Stripping value of aggregate	Initially one set of 3 representative specimens for each source of supply. Subsequently when warranted by changes in the quality of aggregate. ----- do -----
		(v) Water absorption of aggregate.	
		(vi) Grading aggregates.	One test per 25 m ³ aggregate.
		(vii) Stone Polishing Value	As required.
		(viii) Temperature of binder at application.	At regular close intervals.
		(ix) Rate of spread of materials.	One test per 500m ² of work.

S. No.	Type of Construction	Test	Frequency (Min.)
3.	Open-graded premix carpet/ Mix seal surfacing.	(i) Quality of binder	Same as mentioned under serial No.1
		(ii) Aggregate Impact value	Same as mentioned under serial No.2
		(iii) Flakiness Index or Elongation Index	Same as mentioned under serial No.2
		(iv) Stripping value	Same as mentioned under serial No.2
		(v) Water absorption of aggregate.	Same as mentioned under serial No.2
		(vi) Grading aggregates.	Same as mentioned under serial No.2
		(vii) Stone Polishing Value	As required.
		(viii) Temperature of binder at application.	At regular close intervals.

4.	Bituminous Macadam	<ul style="list-style-type: none"> (ix) Binder content (x) Rate of spread of materials. (i) Quality of binder (ii) Aggregate Impact value (iii) Flakiness Index or Elongation Index (iv) Stripping value (v) Grading of aggregate (vi) Water absorption of aggregates (vii) Binder content (viii) Control of temperature of binder and aggregate for mixing and of the mix at the time of laying and rolling (ix) Rate of spread of mixed material (x) Density of compacted layer. 	<p>One test per 500m³ and not less than two tests per day.</p> <p>One test per 500m³ of work.</p> <p>Same as mentioned under serial No.1</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Two test per day per plant both on the individual constituents and mixed aggregates from the dryer.</p> <p>Same as mentioned under serial No.2</p> <p>Periodic, subject to minimum of two tests per day per plant</p> <p>At regular close intervals.</p> <p>Regular control through checks of layer thickness.</p> <p>One test per 250m² of area.</p>
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Table 900-4, Control tests and their Minimum Frequency for Sub-Bases and Bases (Excluding bitumen Bound Bases)

S. No.	Type of Construction	Test	Frequency (Min.)
5.	Bituminous Penetration Macadam/Built-up Spray Grout.	<ul style="list-style-type: none"> (iii) Quality of binder (iv) Aggregate Impact Value (iii) Flakiness Index or Elongation Index (iv) Stripping value (v) Water absorption aggregate (vi) Aggregate grading (vii) Temperature of binder at application. 	<p>Same as mentioned under serial No.1</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as S.No.2</p> <p>One test per 100m³ of aggregate</p> <p>At regular close intervals.</p>

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6.	Dense Bituminous Macadam/Semi Dense Bituminous Concrete/ Bituminous Concrete.	<p>(viii) Rate of spread of binder.</p> <p>(iv) Quality of binder</p> <p>(v) Aggregate Impact Value</p> <p>(vi) Flakiness Index and Elongation Index</p> <p>(iv) Stripping value</p> <p>(v) Water absorption of aggregate</p> <p>(vi) Sand equivalent test</p> <p>(vii) Plasticity Index</p> <p>(viii) Stone Polishing value</p> <p>(ix) Mix Grading</p> <p>(x) Stability of Mix</p>	<p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.1</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>Same as mentioned under serial No.2</p> <p>As required.</p> <p>As required.</p> <p>As required, for Semi Dense bituminous Concrete/ Bituminous Concrete.</p> <p>One set of tests on individual constituents and mixed aggregate from the dryer for each 400 tonnes of mix subject to a minimum of two tests per plant per day.</p> <p>For each 400 tonnes of mix produced, a set of 3 Marshall specimens to be prepared and tested for stability, flow value, density and void content subject to a minimum of two sets being tested per plant per day.</p>
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S. No.	Type of Construction	Test	Frequency (Min.)
		<p>(xi) Water sensitivity of mix Retention of Marshal Stability.</p> <p>(xii) Swell test on the mix</p> <p>(xiii) Control of temperature of binder in boiler, aggregate in the dryer and mix at the time of laying and rolling</p> <p>(xiv) Control of binder content and grading of the mix.</p>	<p>As required for the bituminous concrete.</p> <p>As required for the bituminous concrete.</p> <p>At regular close intervals.</p> <p>One test for each 400 tonnes of mix subject to a minimum of two tests per day per plant.</p>

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7.	Mastic Asphalt	<p>(xv) Rate of spread of mixed material.</p> <p>(xvi) Density of compacted layer.</p> <p>(i) Quality of binder</p> <p>(ii) Aggregate impact value</p> <p>(iii) Flakiness Index and Elongation Index</p> <p>(iv) Stripping value</p> <p>(v) Water sensitivity of mix</p> <p>(vi) Grading of aggregates</p> <p>(vii) Water absorption of aggregates.</p> <p>(viii) Binder content and aggregate grading.</p> <p>(ix) Control of temperature of binder and aggregate for mixing and of the mix at the time of laying and rolling.</p> <p>(x) Rate of spread of mixed material.</p> <p>(xi) Hardness number.</p>	<p>Regular control through checks on the weight material and layer thickness.</p> <p>One test per 250m² area</p> <p>Same as mentioned under Serial No.1</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Same as mentioned under Serial No.2</p> <p>Two tests per day per plant both of the individual constituents and mixed aggregates from the dryer</p> <p>Same as mentioned under Serial No.2</p> <p>Period, subject to minimum of two tests per day per plant.</p> <p>At regular close intervals.</p> <p>Regular control through checks of layer thickness.</p> <p>One test for each 400 tonnes of mix subject to a minimum of two tests per day.</p>
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S. No.	Type of Construction	Test	Frequency (Min.)
8.	Slurry seal	<p>(i) Quality of binder</p> <p>(ii) Film Stripping test</p>	<p>Same as mentioned under Serial No.1</p> <p>Initially one set of 3 representative specimens for each source of supply, then as warranted by changes in the quality of aggregates.</p>
9.	Sand Asphalt base course.	<p>(i) Quality of binder</p>	<p>Same as mentioned under Serial No.1</p>

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		<p>(ii) Loss Angeles Abrasion Value.</p> <p>(iii) Sand equivalent test</p> <p>(iv) Plasticity Index</p> <p>(v) Mix grading.</p> <p>(vi) Stability of Mix.</p> <p>(vii) Control of temperature of binder in boiler, aggregate in the dryer and mix at the time of laying and rolling.</p> <p>(viii) Control of binder content and grading of the mix.</p> <p>(ix) rate of spread of mixed material.</p> <p>(x) Density of compacted layer</p>	<p>Same as mentioned under Serial No.2</p> <p>As required</p> <p>As required</p> <p>One set of tests on individual constituents and mixed aggregate from the dryer for each 400 tonnes of mix subject to a minimum of two tests per plant per day.</p> <p>For each 400 tonnes of mix produced, a set of 3 Marshal specimens to be prepared and tested for stability, flow value, density and void content subject to a minimum of two sets being tested per plant per day.</p> <p>At regular close intervals.</p> <p>One test for each 400 tonnes of mix subject to a minimum of two tests per day per plant.</p> <p>Regular control and through checks on the weight of mixed material and layer thickness</p> <p>One test per 250 m² area.</p>
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S. No.	Type of Construction	Test	Frequency (Min.)
10.	Modified binder	<p>(i) Softening Point</p> <p>(ii) Penetration at 25°C and 4°C</p> <p>(iii) Elastic Recovery</p> <p>(iv) Ductility</p> <p>(v) Flash Point</p> <p>(vi) Fraass Breaking</p> <p>(vii) Viscosity at 150°C</p> <p>(viii) Thin film oven test, penetration, softening point, elastic recovery of residue, loss on heating.</p>	<p>Initially one submission thereafter daily if site blended, weekly if pre-blended.</p> <p>----- do -----</p> <p>----- do -----</p> <p>----- do -----</p> <p>----- do -----</p> <p>Initially on submission.</p> <p>Initially on submission.</p> <p>Initially on submission.</p>

5.1 Site Investigation Reports

No Site Investigation Reports are attached herewith and the Contractor may carry out his own site investigation, as he requires.

5.2 Tests and Quality Assurance & Quality Control

All tests as mentioned in the RUIDP publications, stipulated in the codes, as directed by the Engineer all tests for materials and works shall have to be carried out by the Contractor and test reports will be submitted regularly to the Engineer for his perusal. The Contractor is to notify the Engineer the program of such tests well in advance, so that such tests, either conducted in his own laboratory, laboratory established at the site or any accredited laboratory or at Manufacturer's place can be witnessed by him / his representative or Third Party, if appointed by the Procuring Entity.

The Contractor is to abide by the stipulations/ clauses appearing in the QA & QC Manual published by the RUIDP.

5.3 Laboratory at Site

The Contractor may not set up his own laboratory at site, if such requirement is not warranted for and agreed by the Engineer. In such an event the Contractor will provide the name and details of the accredited laboratory or Government laboratory for Engineer's approval. However, the Contractor will maintain small equipment and appurtenances such as for cube testing for concrete works, slump test, etc. at site to carry out the quick tests.

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 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.

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

8.1 There is no parallel contract going on.

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
Site Supervisor		1	Diploma in Civil Engineering	5 years	2 years

The Contractor may appoint reputed Consultant for the planning and design of the parking facilities upon approval with Engineer. The contractor shall submit prior proposal (along with all details of consultants) Engineer sufficiently in advance.

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 9 (nine) **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.

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 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

35.2 Provisional Sum

"Provisional Sum" means a sum included in the contract and so designated in the bill of quantities for the execution of any part of the works or for the supply of goods, materials, plants or services or for contingencies, which sum may be used, in whole or parts, or not at all, on the instructions of the Engineer. The contractor shall be entitled to get reimburse only such amounts in respect of the work, supply of contingencies to which such provisional sums relate as the Engineer shall determine in accordance with this clause. The Engineer shall notify the contractor of any determination made under this sub clause, with a copy to the Employer.

35.2.1 Use of Provisional Sum

In respect of every provisional sum the Engineer shall have authority to issue instructions for the execution of work or for supply of goods, materials, plant or services by

(a) the contractor, in which case the contractor shall be entitled to an amount equal to the value thereof determined in accordance with Clause 39,

35.2.2 A handling fee of 5% (Five percent) of provisional sum (Paid) shall be payable to the Contractor on the actual cost of any approved expenditures under as Provisional Sum items.

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 25 percent, or
 - ii. 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 for the excess quantities, 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 Schedule of Rates (SOR) of month Sept, 2013 RUIDP 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.
- 37.4 The effect of excise/ custom duty exemption, for which Project Authority Certificate will be issued, will be compensated in the rate of variation items.
- 37.5 For Clause 37.3(c), 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.
- 37.6 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.
- 37.7 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 or 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.
- 37.8 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.

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

Clause 40: Payments

Delete Clause 40 in its entirety and add the following:

40.1 The Employer shall make payments to the Contractor for the Works on the basis of the lump sum price accepted by the Employer in consideration of the obligations specified in this Agreement for an amount of Rs. (Rs.) (the “Contract Price”), which shall be subject to adjustments in accordance with the provisions of this Agreement. For the avoidance of doubt, the Parties expressly agree that the Contract Price shall include all expenses incurred by the Contractor during 1year Defect Liability period. The Parties further agree that save and except as provided in this Agreement, the Contract Price shall be valid and effective until issue of Completion Certificate.

40.1.1 The Contract Price includes all duties, taxes, royalty, and fees that may be levied in accordance with the laws and regulations in force as on the Base Date on the Contractor's equipment, Plant, Materials and supplies acquired for the purpose of this Agreement and on the services performed under this Agreement. Nothing in this Agreement shall relieve the Contractor from its responsibility to pay any tax including any tax that may be levied in India on profits made by it in respect of this Agreement.

40.1.2 The Contract Price shall not be adjusted for any change in costs except as stated in **Clause 42**, or in Price adjustment.

40.1.3 The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs, unless otherwise provided for in this Agreement.

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

40. 1.5 All payments under this Agreement shall be made in Indian Rupees.

40.2 **Procedure** for estimating the payment for the Works

40.2.1 The Employer shall make interim payments to the Contractor as certified by the Engineer on completion of at least 10% of the Contract value on submission of monthly invoice/bill.

40.2.2 Any reduction in the Contract Price arising out of Change of Scope or the works

shall not affect the amounts payable for the items or stage payments there of which are not affected by such Change of Scope or withdrawal. For avoidance of doubt and by way of illustration, the Parties agree that if the amount assigned to Major Bridges is reduced from Rs. 100 Crore to Rs. 80 Crore owing to Change of Scope or withdrawal of work, the reduction in payment shall be restricted to relevant payments for Major Bridges only and the payment due in respect of all other stage payments under the item Major Bridges shall not be affected in any manner. The Parties further agree that the adjustments arising out of the aforesaid modifications shall be carried out in a manner that the impact of such modifications is restricted to the said Change of Scope or withdrawal, as the case may be, and does not alter the payments due for and in respect of items or stage payments which do not form part of such Change of Scope or withdrawal.

40.3 Stage **Payment** Statement for Works

The Contractor shall submit a statement (the "Stage Payment Statement"), in 3 copies, by the 7th (seventh) day of the month to the Engineer in the form set forth, showing the amount calculated to which the Contractor considers himself entitled for completed stage(s) of the Works. The Stage Payment Statement shall be accompanied with the progress reports and any other supporting documents. The Contractor shall not submit any claim for payment of incomplete stages of work.

40.4 Stage Payment for Works

40.4.1 Within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor, the Engineer shall broadly determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment against the Stage Payment Statement, pending issue of the Interim Payment Certificate by the Engineer. Within 10 (ten) days of the receipt of recommendation of the Engineer, the Employer shall make electronic payment directly to the Contractor's bank account.

40.4.2 Within 15 (fifteen) days of the receipt of the Stage Payment Statement the Engineer shall determine and shall deliver to the Employer and the Contractor an IPC certifying the amount due and payable to the Contractor, after adjusting the payments already released to the Contractor against the said statement. For the avoidance of doubt, the Parties agree that the IPC shall specify all the amounts that have been deducted from the Stage Payment Statement and the reasons therefor.

40.4.3 In cases where there is a difference of opinion as to the value of any stage, the Engineer's view shall prevail and interim payments shall be made to the Contractor on this basis; provided that the foregoing shall be without prejudice to the Contractor's right to raise a Dispute.

40.4.4 The Engineer may, for reasons to be recorded, withhold from payment:

- (a) the estimated value of work or obligation that the Contractor has failed to perform in accordance with this Agreement and the Engineer had notified the Contractor; and
- (b) the estimated cost of rectification of work done being not in accordance with

this Agreement.

40.4.5 Payment by the Employer shall not be deemed to indicate the Employer's acceptance, approval, consent or satisfaction with the work done.

40.5 Time of payment and interest.

40.5.1 The Employer shall pay to the Contractor any amount due under any payment certificate issued by the Engineer in accordance with the provisions or in accordance with any clause of this Agreement as follows:

- (a) payment shall be made no later than 30 (thirty) days from the date of submission of the Stage Payment Statement by the Contractor to the Engineer for certification for an IPC; provided that, in the event the IPC is not issued by the Engineer within the aforesaid period of 30 (thirty) days, the Employer shall pay the amount shown in the Contractor's Stage Payment Statement and any discrepancy therein shall be added to, or deducted from, the next payment certificate issued to the Contractor; and
- (b) payment shall be made no later than 30 (thirty) days from the date of submission of the Final Payment Certificate for Works along with the discharge submitted to the Engineer for certification.

40.5.2 In the event of the failure of the Employer to make payment to the Contractor within the time period, the Employer shall be liable to pay to the Contractor interest at the Base Rate plus 2% (two percent), calculated at quarterly rests, on all sums remaining unpaid from the date on which the same should have been paid.

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.

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 minimise 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 manufactures' 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 Vs-à-Vs the Government of Rajasthan 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. The QAQC document of JSCL is an integral part of the document and it will be provided with the bid document. A copy of the same shall be made available at the site by the contractor.

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

87.1The 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

88.1The 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.

91.5 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.

91.6 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 Visa(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	
2. Contract Agreement	
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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

Signed by

Chief Executive Officer
Jaipur Smart City Limited
for and on behalf of the Employer

for and on behalf the Contractor

Witness, Name, Signature, Address
Signed by

Witness, Name, Signature, Address
Signed by

Drawings

Pedestrianization of Krishna Circuit- Phase I

Concept Plan For Krishna Circuit

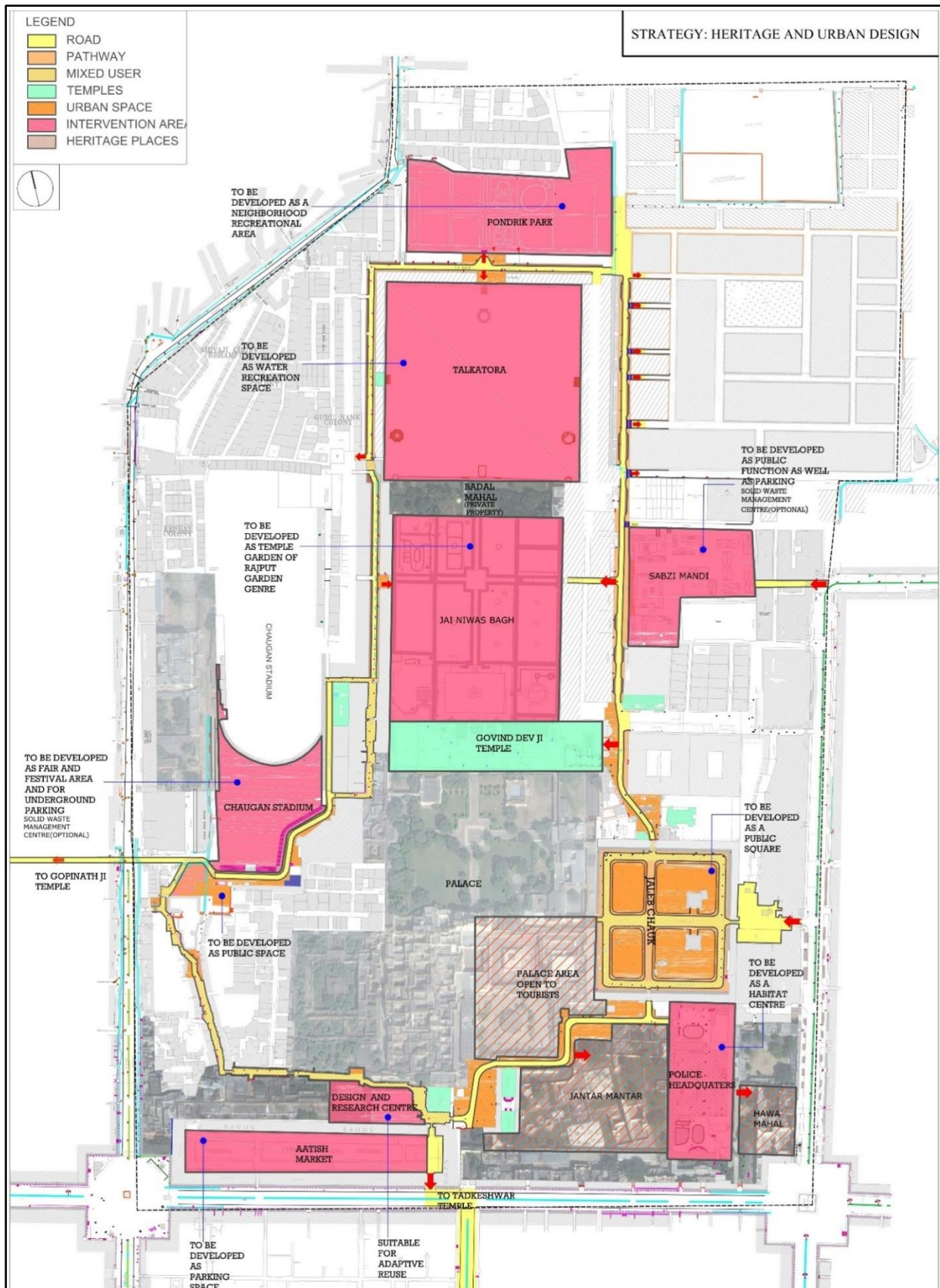


Figure 1: Overall plan of development

Key PlanPhase-1

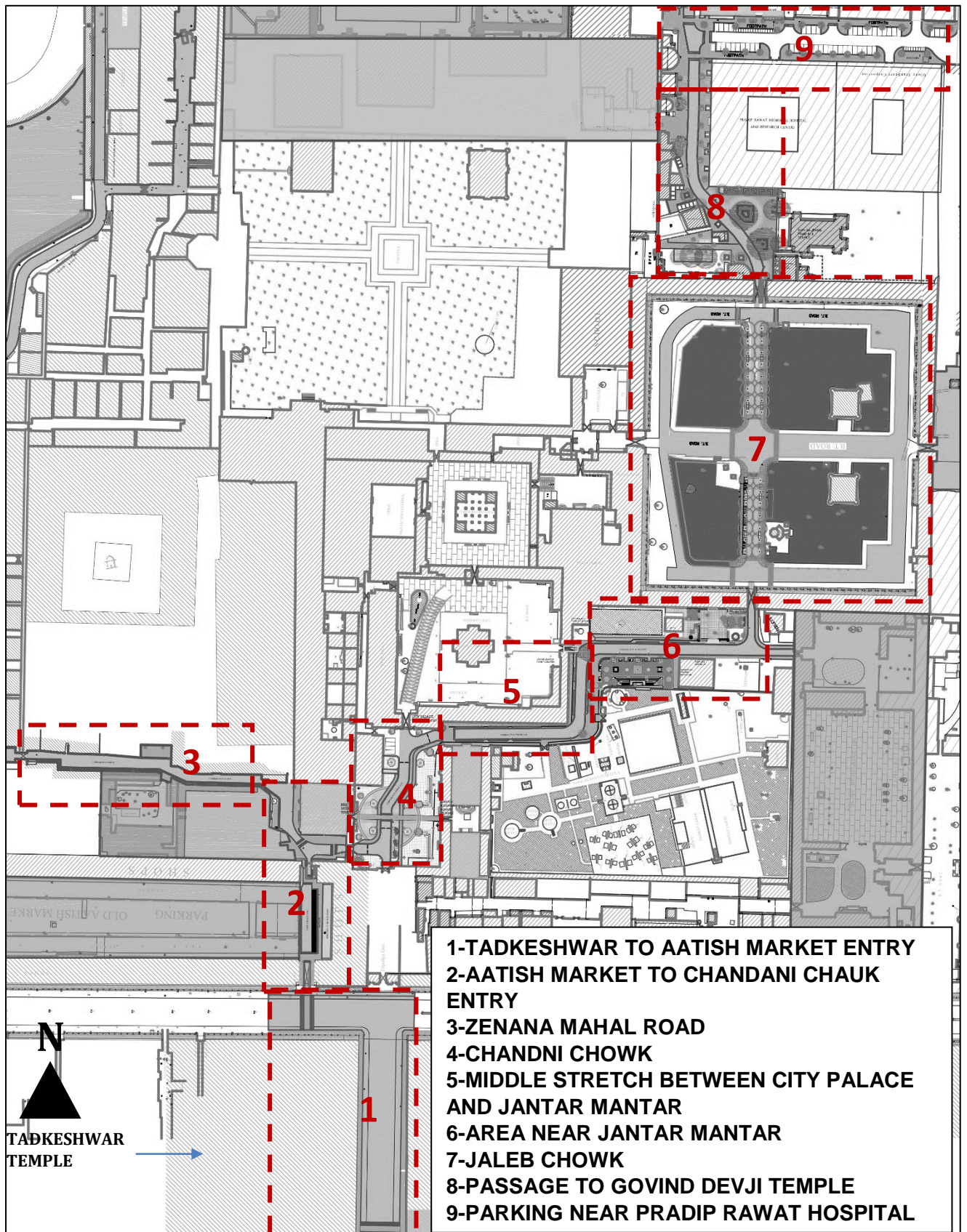


Figure 2: Key plan

Drawings

Pedestrianization of Krishna Circuit- Phase I

Area-1: Tadkeshwar Temple To Aatish Market Entry

The stretch from tadkeshwar mandir to aatish market entry has pedestrian path on both sides of the road which reaches Tripolia gate crossing , with proposed table top crossings for pedestrians. Tripolia gate is not accessible as it is private property of the city palace, hence the entry to the krishna circuit is provided through the Aatish market entry gate. This section is a part of the “Smart Road” project in the ABD area.

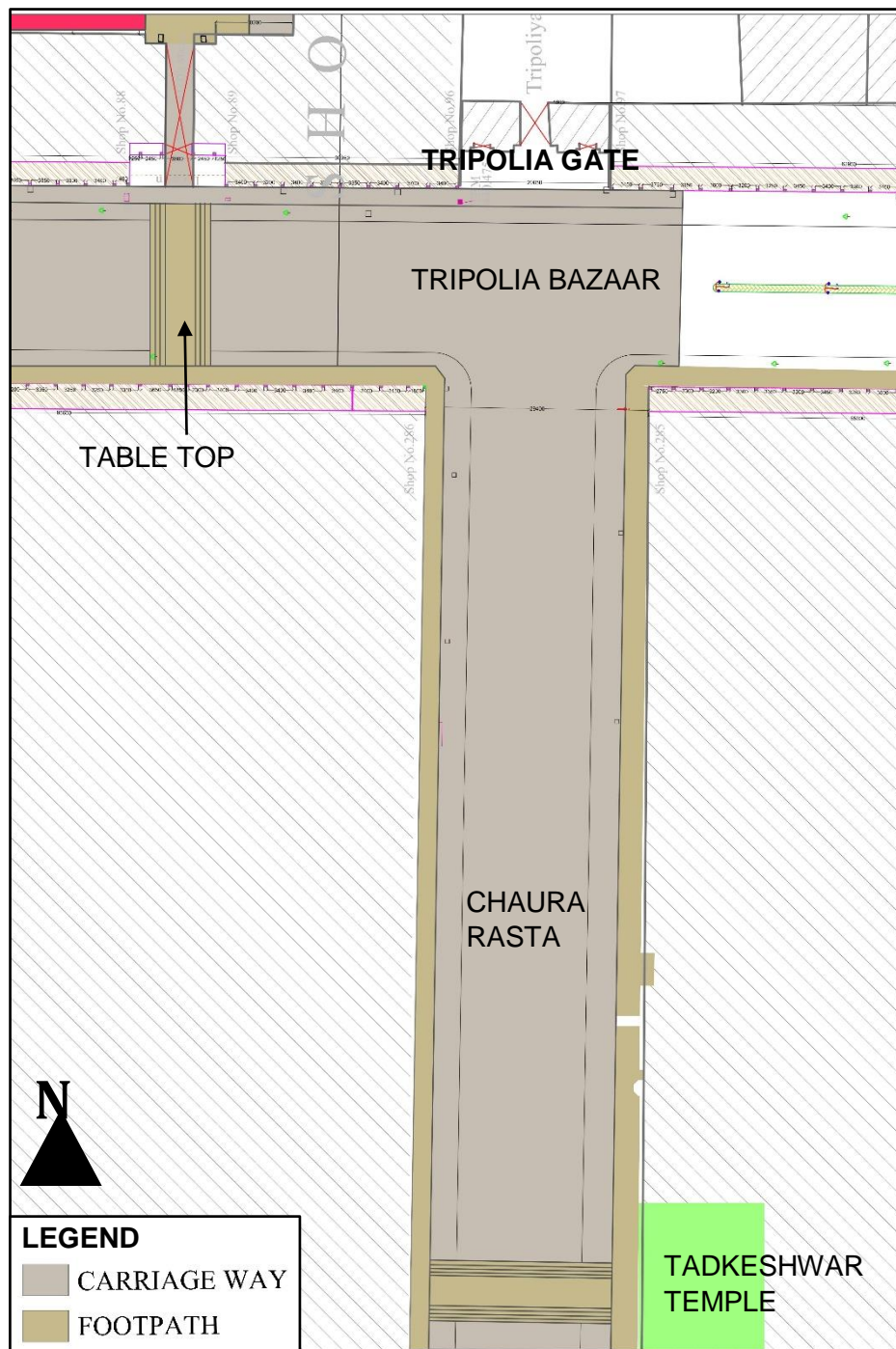


Figure 3:Tadkeshwar temple to Aatish market entry

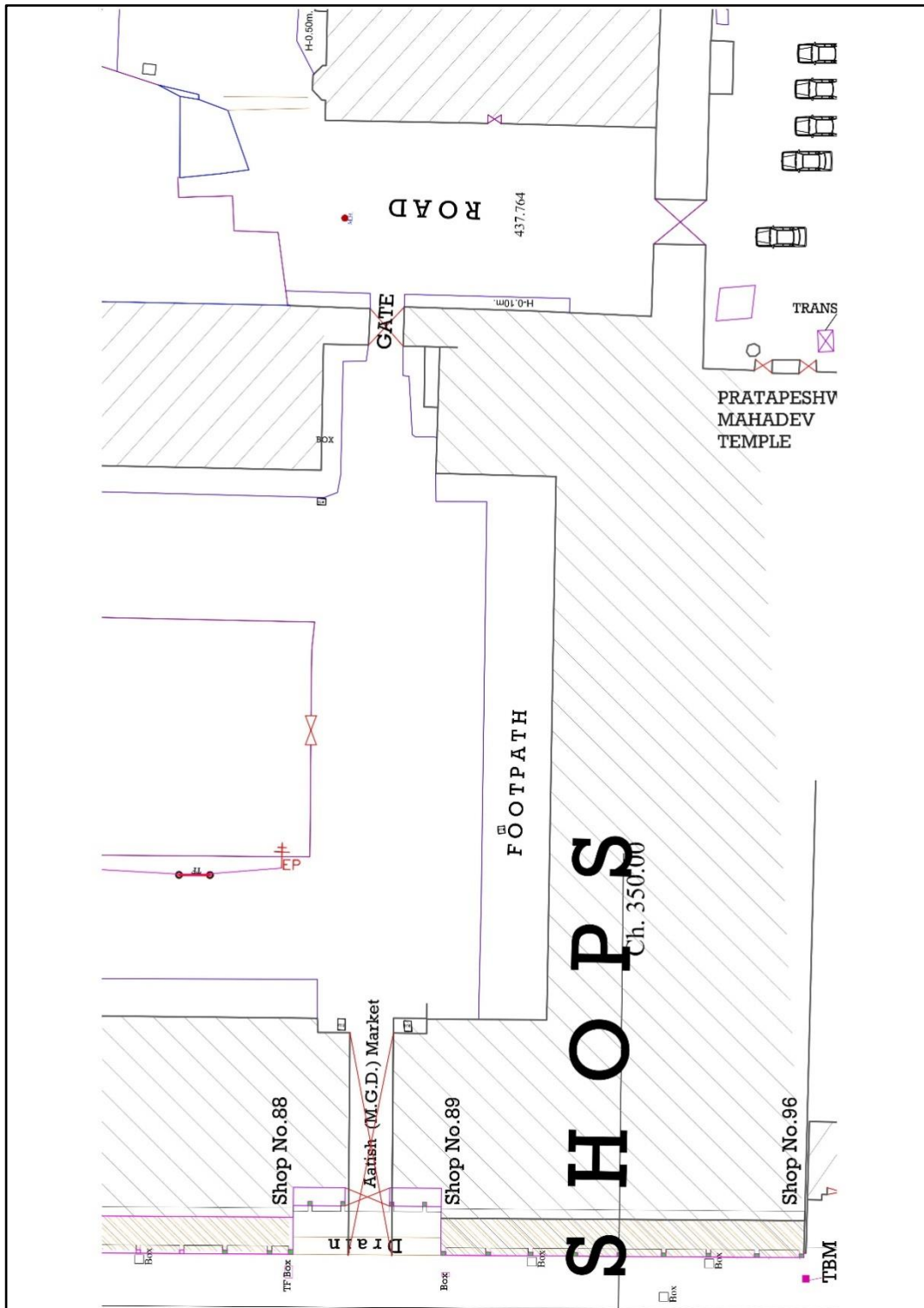
Drawings

Pedestrianization of Krishna Circuit- Phase I

9. Area-2: Aatish Market

A. EXISTING SITUATION

The Aatish market entry from Tripolia gate is common for both the vehicles and the pedestrians and haphazard parking is done on the road in front of the shops and no separate footpath is provided for the people which creates unsafe conditions for them.



Drawings

Pedestrianization of Krishna Circuit- Phase I

Figure 4: Existing Aatish market area



Drawings

Pedestrianization of Krishna Circuit- Phase I

B. The proposal

This passage traverses through three narrow gates of the old city, the pedestrian pathways are defined and separated from carriageways. Separate pedestrian gate are proposed through the Aatish market entry from Tripolia Bazaar side.

Parking at Aatish market

To enhance pedestrian convenience, comforts, and an overall ambience befitting of the context, in order to attract more tourists and devotees, it is also proposed to provide well organized parking at Aatish Market .

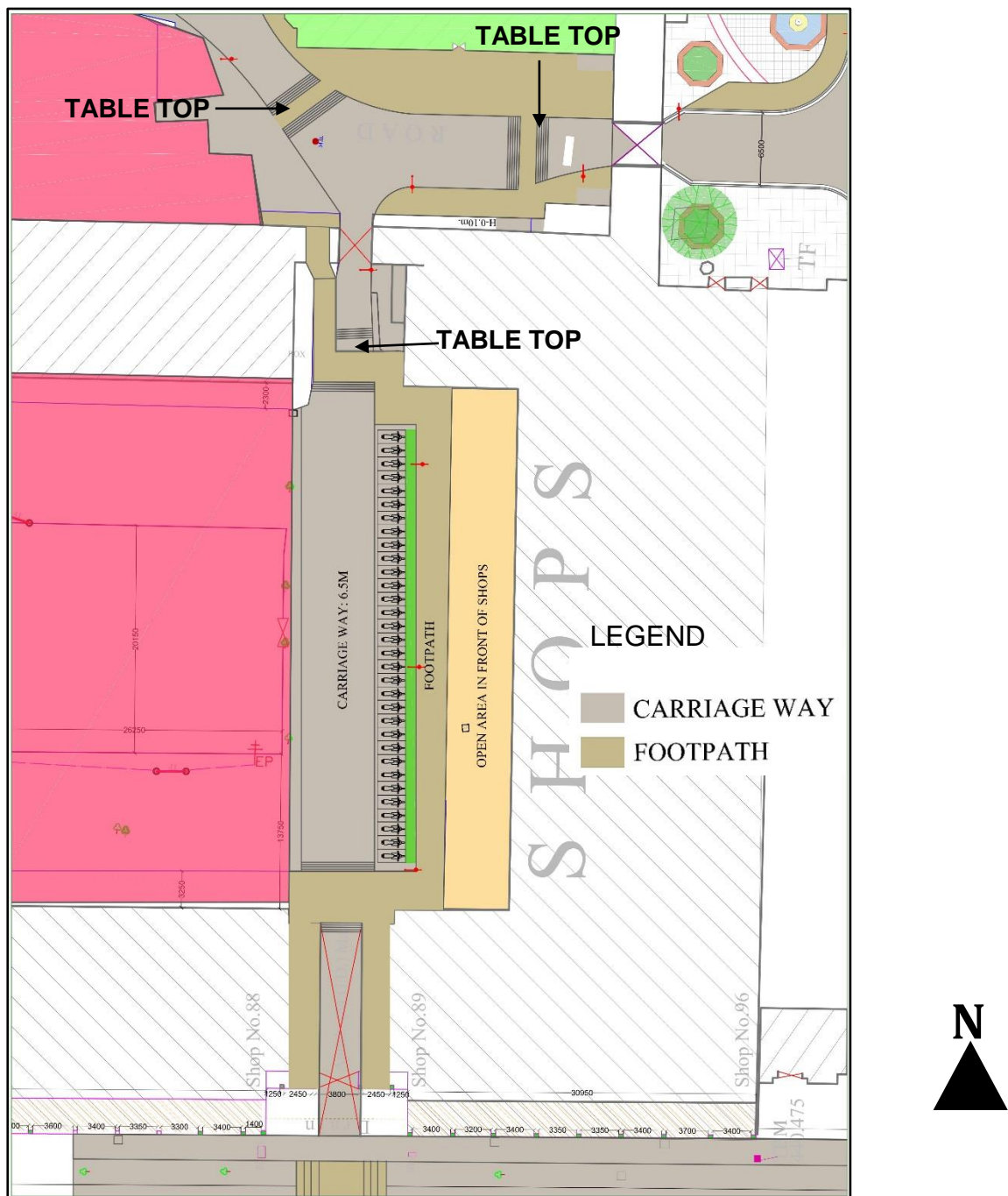


Figure 5: Proposed Aatish market area

Drawings

Pedestrianization of Krishna Circuit- Phase I

10. Area-3: Stretch near Zenana Mahal

A. EXISTING SITUATION

The stretch near Zenana mahal has heritage walls on both the sides and the right of way changes constantly. There is separate footpath for pedestrians and the carriage way is common for both pedestrian as well as vehicular traffic.



Figure 6: Existing Zenana mahal stretch

B. The proposal

As the right of way is narrow in this stretch, the carriage way is variable according to the right of way available, and footpath of 1.5 m is provided on one side for walkway. Storm-water drain would be only on one side and below the walkway.

Wall bracket street lights also on one side and Plain renovation and painting of the walls is also included.

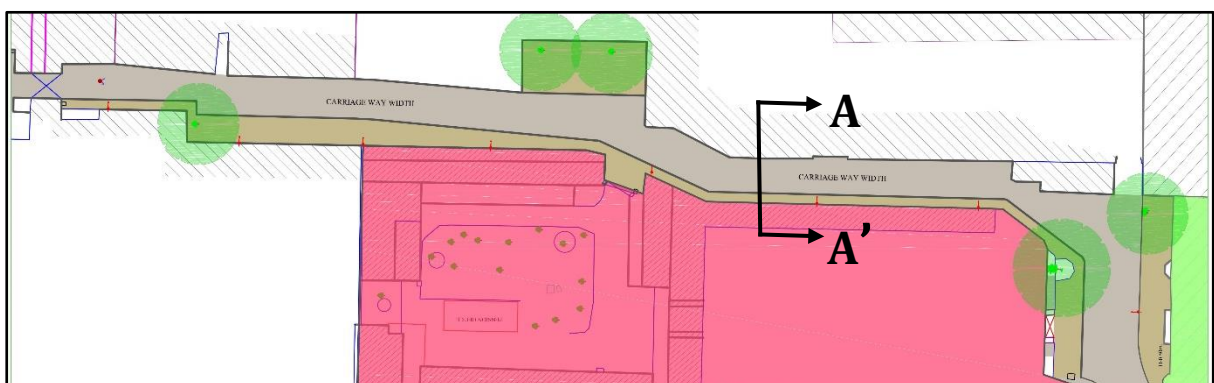


Figure 7: Proposed Zenana mahal stretch

Drawings

Pedestrianization of Krishna Circuit- Phase I

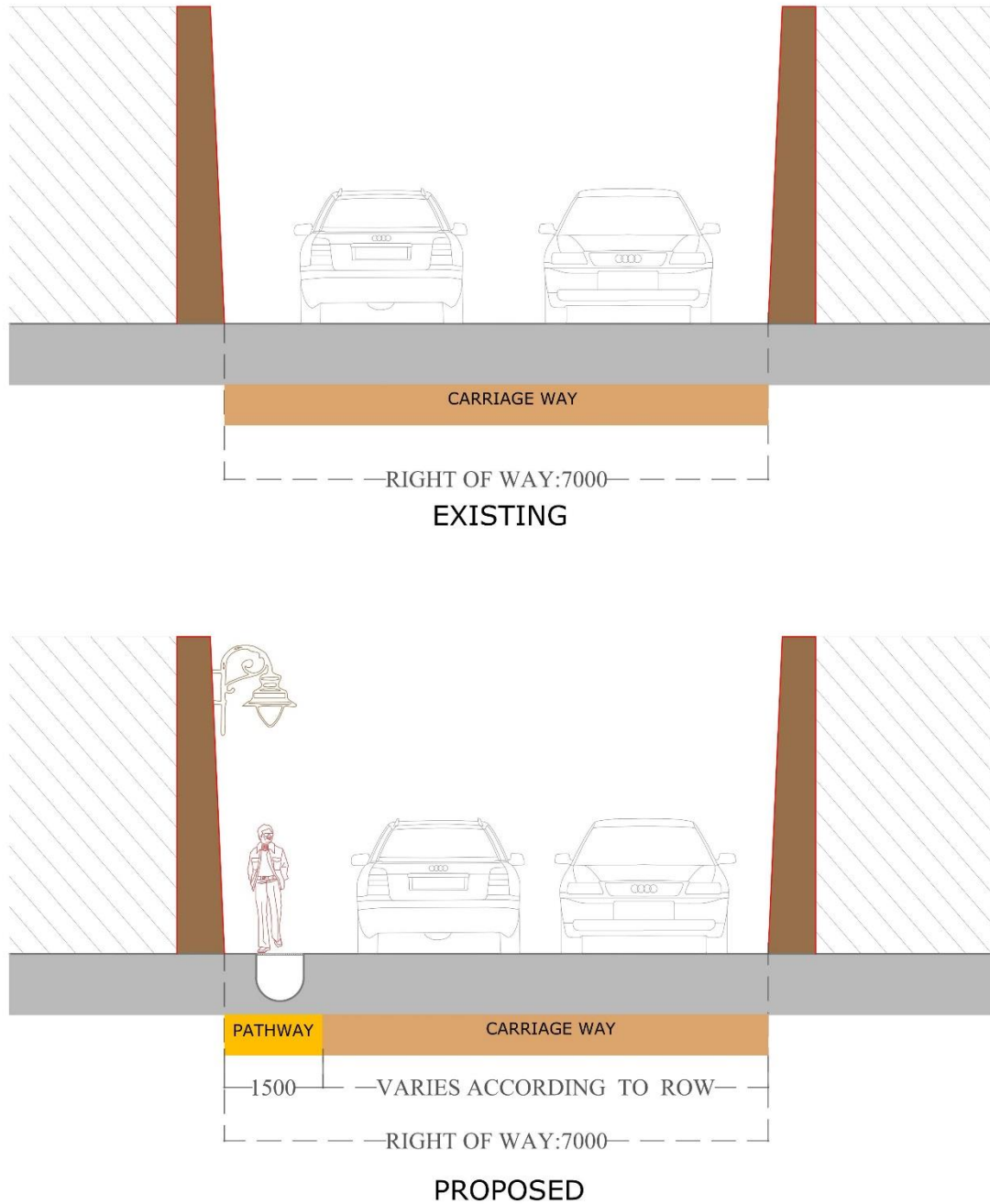


Figure 8: Existing and proposed section AA of Zenana mahal stretch

Drawings

Pedestrianization of Krishna Circuit- Phase I

11. Area-4: Chandani Chowk

A. EXISTING SITUATION

The first of the public spaces encountered on this journey is the Chandni Chowk, inside Tripolia Gate, as a forecourt to the City Palace entry, flanked by the Brajnidhi Temple on the left and Anand Krishan Temple on the right.

At present, the entire surface area has end to end tarmac, dotted with a few large shady trees. Random car parking is prevalent, and flow of un-managed traffic, during peak hours, especially during week ends and religious festivals.

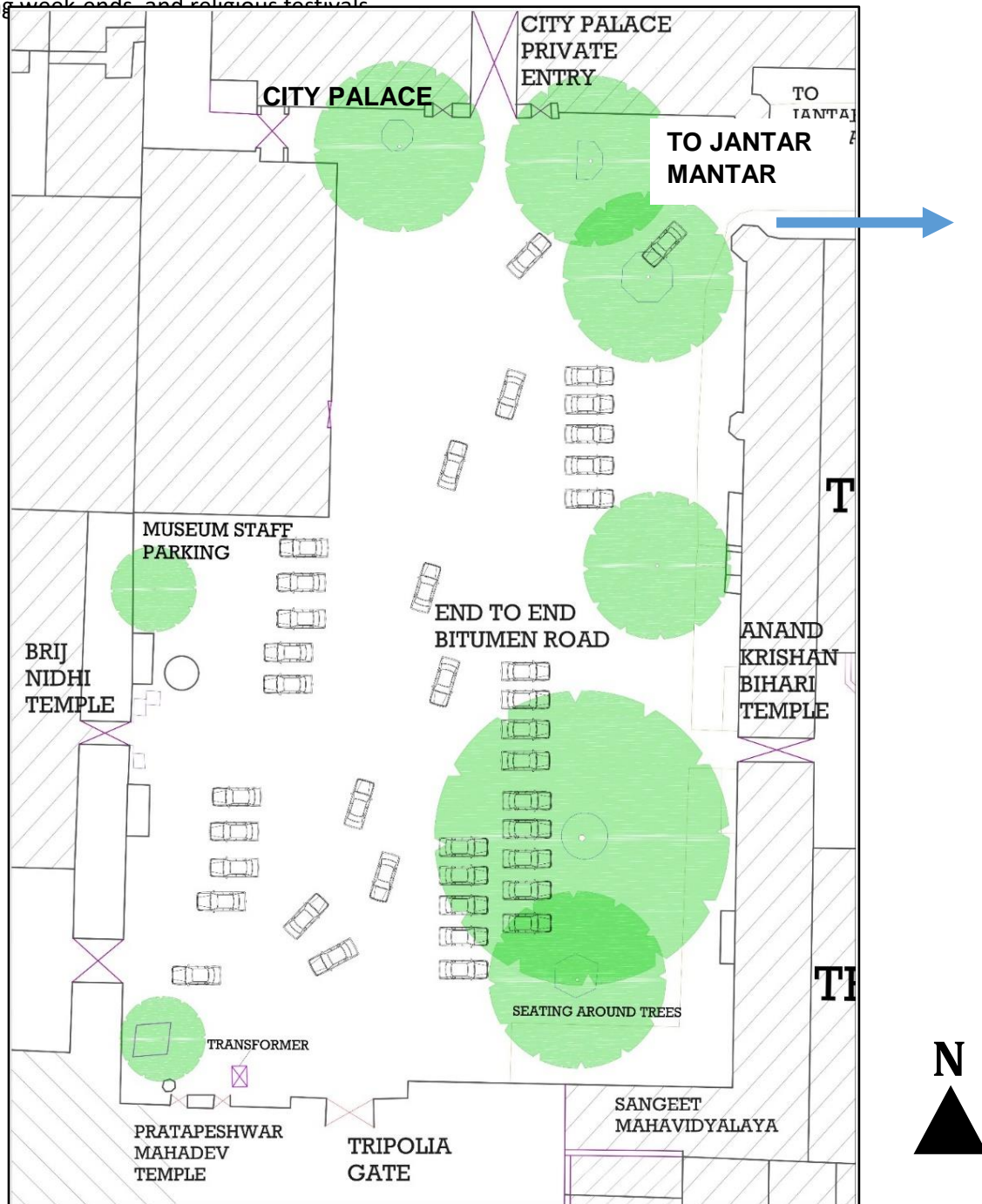


Figure 9 Existing part plan- Chandni Chowk

Drawings

Pedestrianization of Krishna Circuit- Phase I

B. THE PROPOSAL

It is proposed to allow, very restricted traffic flow, within the area along a 6.5 M carriageway, while the remaining area is designed to be a public space, for people with paved plaza, steps for seating, planters and water fountains, with Spray Mist fountains, for passive cooling, and aesthetic appeal. A clearly defined path for free flow of pedestrian movement is also integrated in the plaza design.

The entry gate to Chandani Chalk is common for both: vehicles and pedestrians.

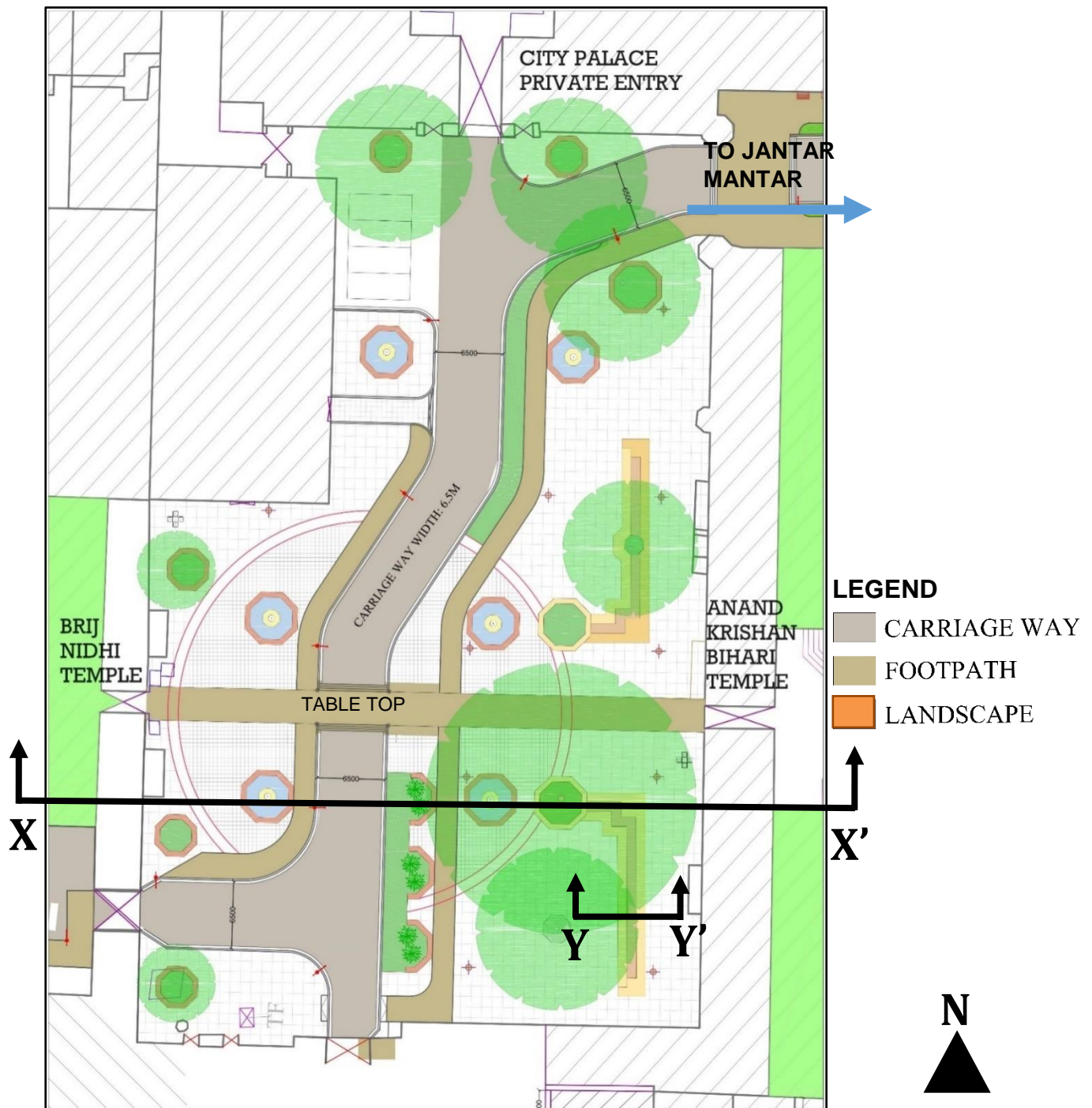


Figure 10 Proposed part plan- Chandni Chowk







Drawings

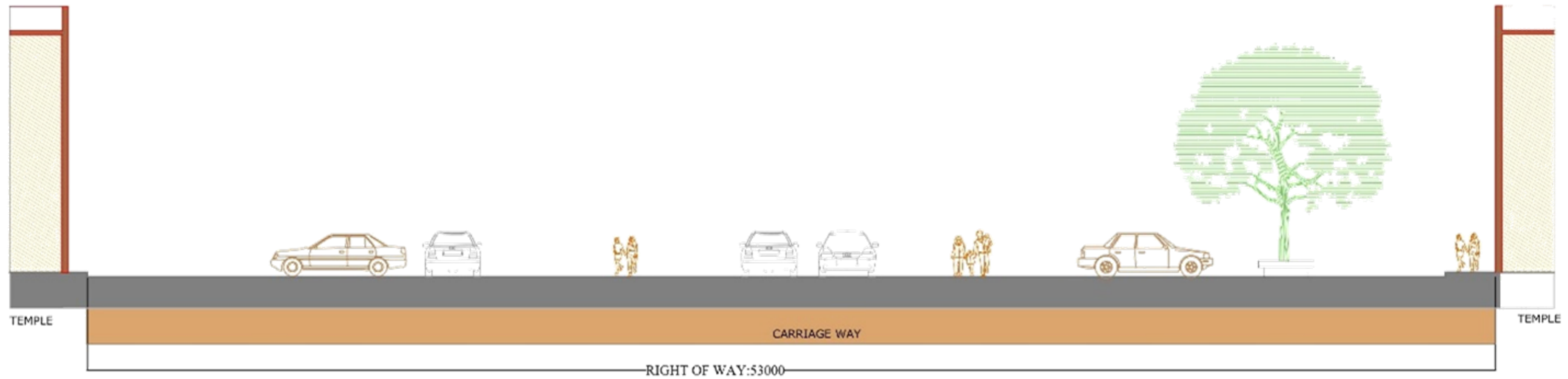
Pedestrianization of Krishna Circuit- Phase I



Drawings

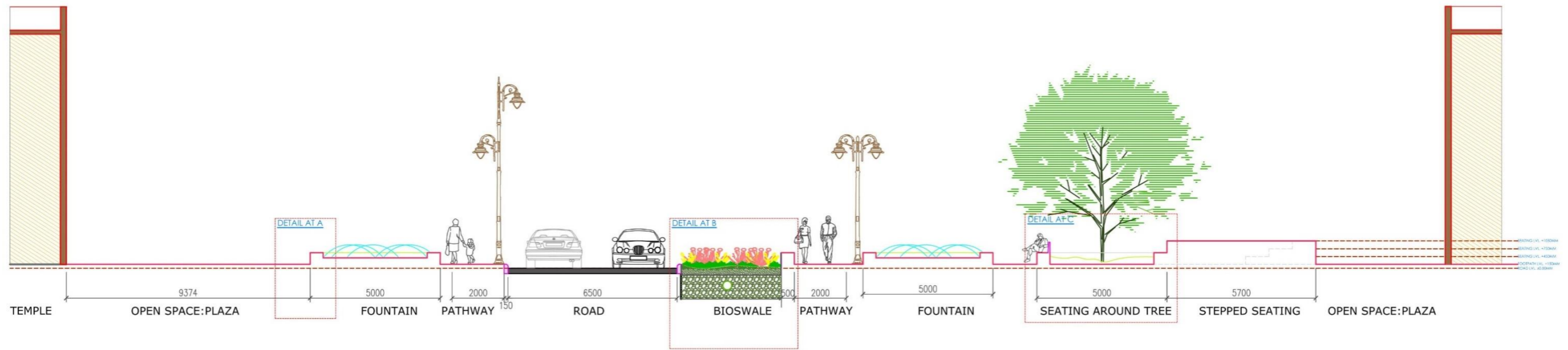
Pedestrianization of Krishna Circuit- Phase I

Existing Condition	Proposed Design
 <p>29/03/2017 15:17</p>	
 <p>Figure 11: 3D views of chandani chawk</p>	
	



EXISTING

Figure 13. Existing section-Chandni Chowk



PROPOSED

Figure 12: Proposed Section

Drawings

Pedestrianization of Krishna Circuit- Phase I

DETAIL AT A SCALE 1:50



Figure 14: Details from Figure 10

DETAIL AT B SCALE 1:50

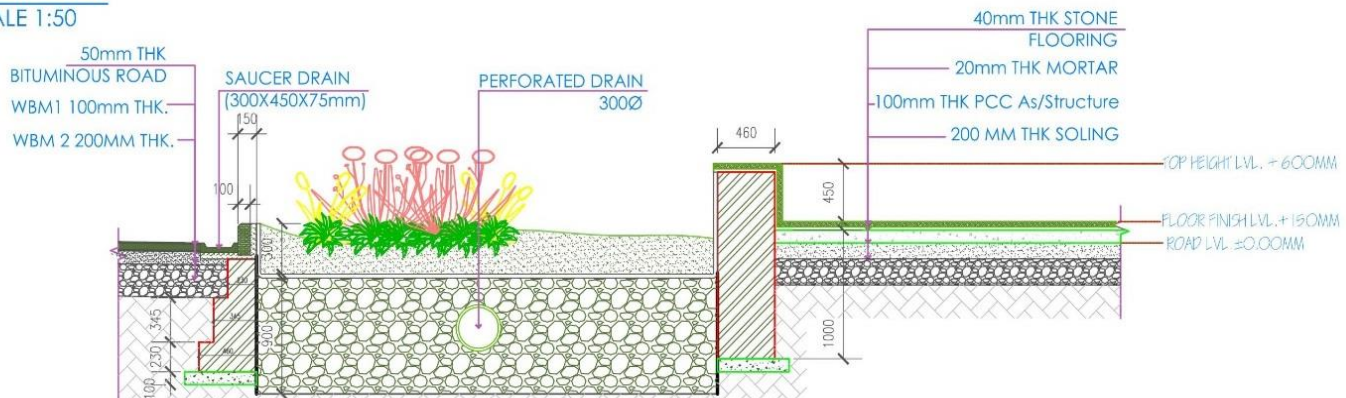


Figure 15: Details from Figure 10

Drawings

Pedestrianization of Krishna Circuit- Phase I

DETAIL AT C

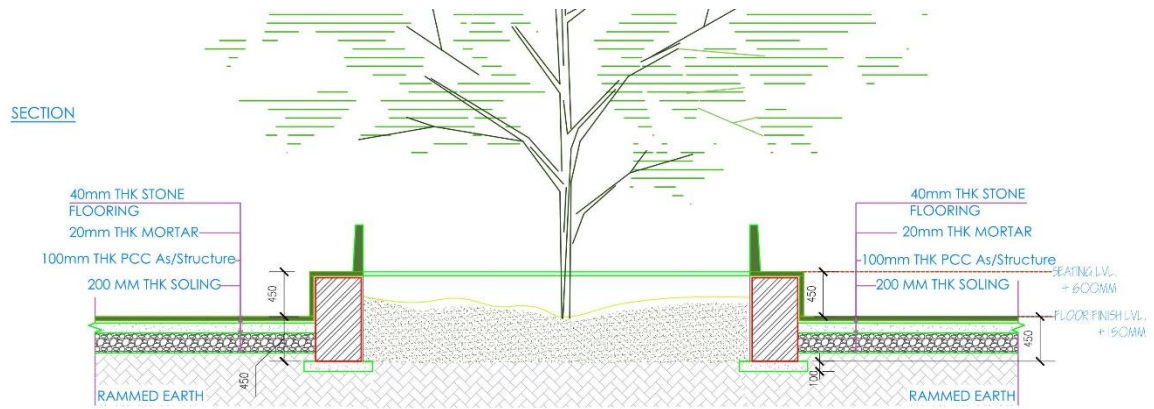


Figure 16:Details from Figure 10

DETAIL AT D

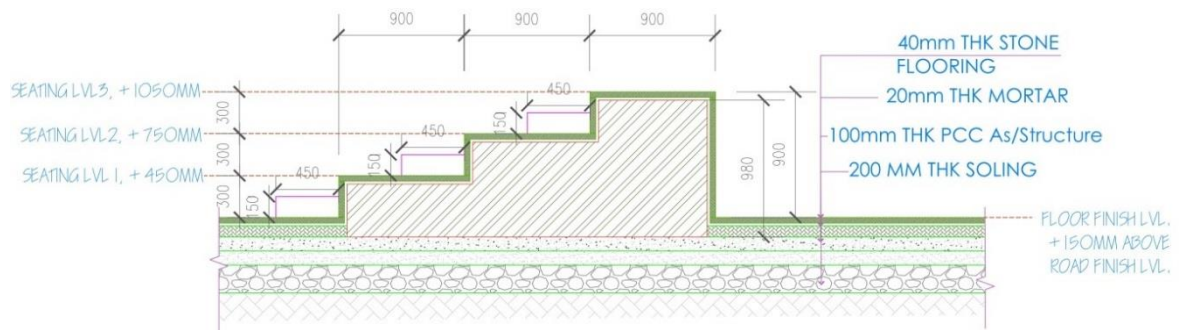


Figure 17:Details from Figure 10

12. Area-5: Middle Stretch Between Chandni Chowk And Jantar Mantar

A. EXISTING SITUATION

This stretch of road [ROW] has a wide carriageway, and limited pedestrian path width, without any suitable street furniture or quality enhancing features.

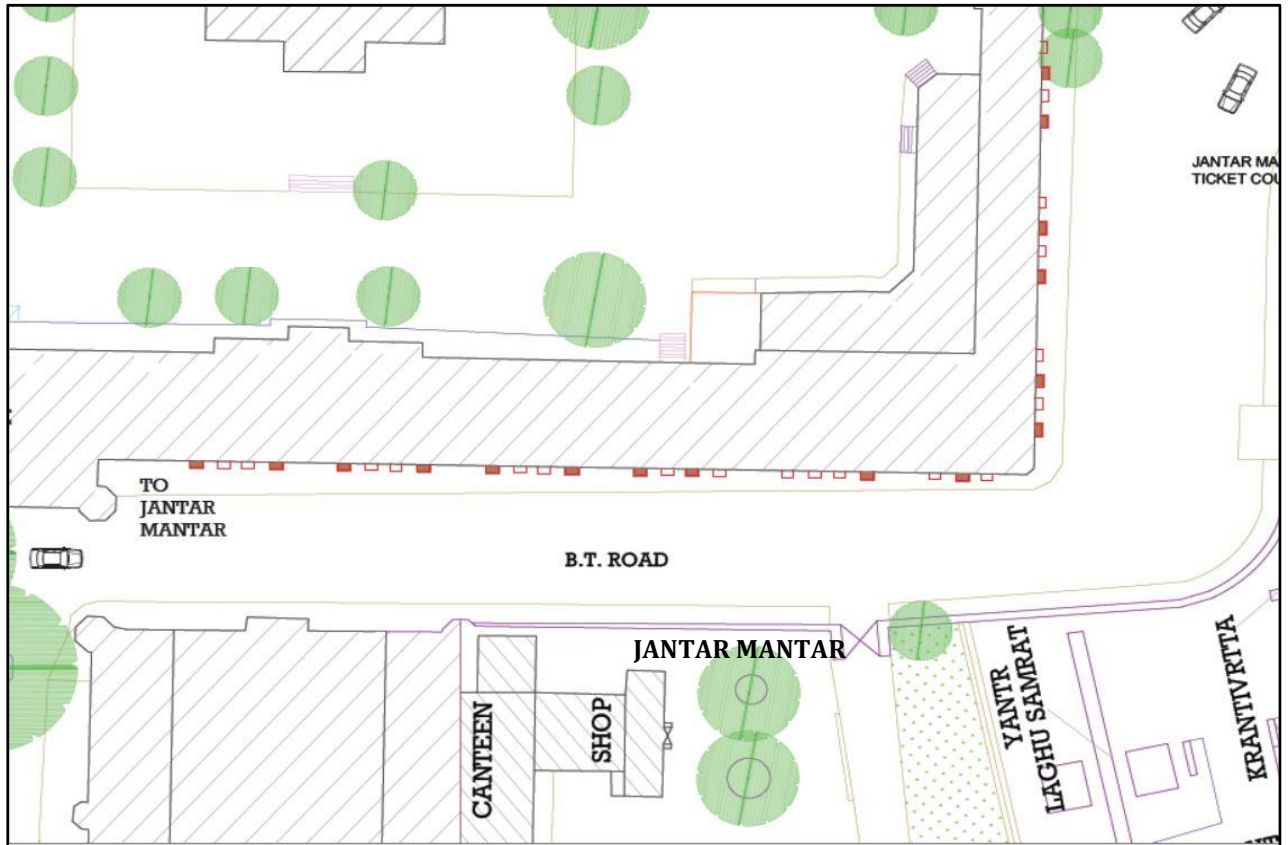


Figure 18 Existing part plan Middle Stretch Between Chandni Chowk and Jantar Mantar



N

Drawings

Pedestrianization of Krishna Circuit- Phase I

Figure 19 Existing Condition



B. THE PROPOSAL

It is thus proposed to limit the carriageway to 6.5 M and increase the widths of pedestrian paths on both sides, and improve the pedestrian experience with stone benches for seating, planters with shrubs as well as water fountains with spray mist facility.

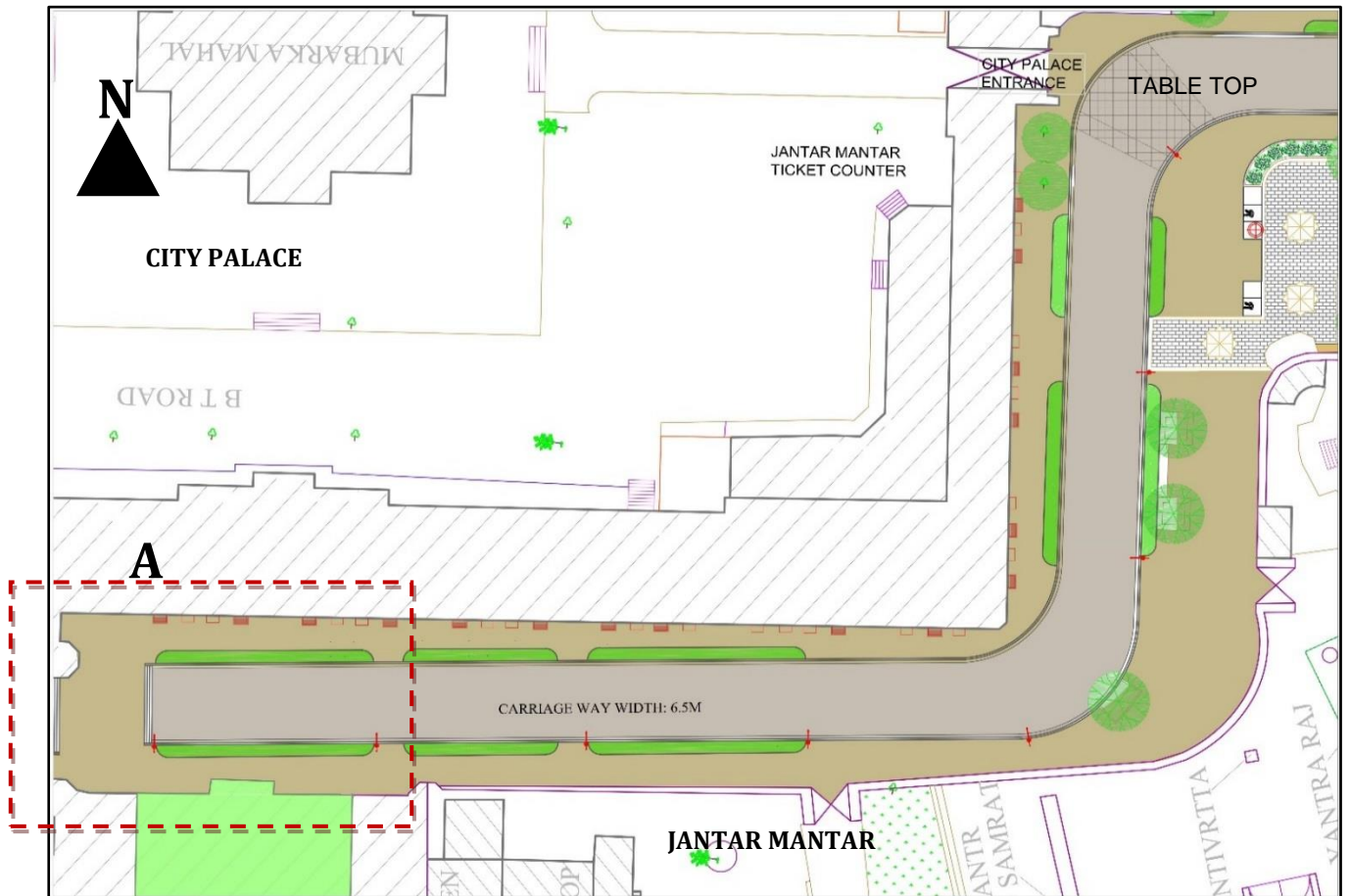


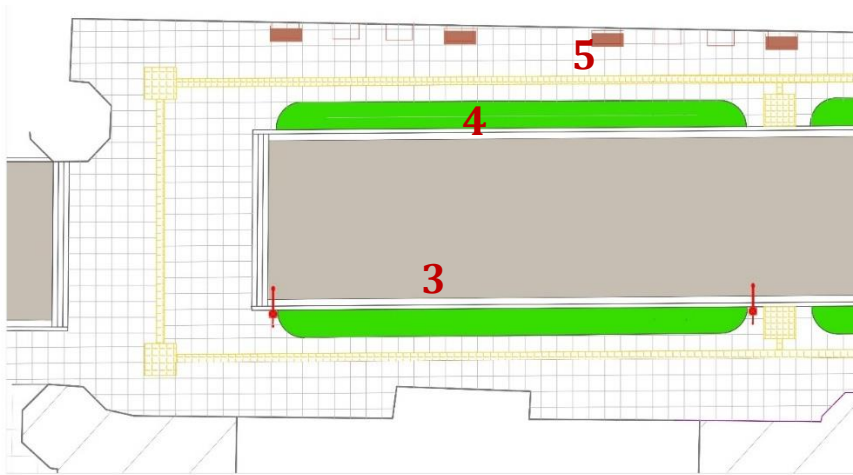
Figure 20 Proposed part plan Middle Stretch Between Chandni Chowk and Jantar Mantar

1

2

Drawings

Pedestrianization of Krishna Circuit- Phase I



- 1-SANDSTONE
- MANDANA STONE
- 2-TACTILE FLOORING-COBBLE
- 3-CARRIAGE WAY
- 4-PLANTERS
- 5-STREET FURNITURE

LEGEND




-  CARRIAGE WAY
-  FOOTPATH
-  LANDSCAPE

Figure 21 Proposed Flooring Pattern at A from Figure 8

Drawings

Pedestrianization of Krishna Circuit- Phase I

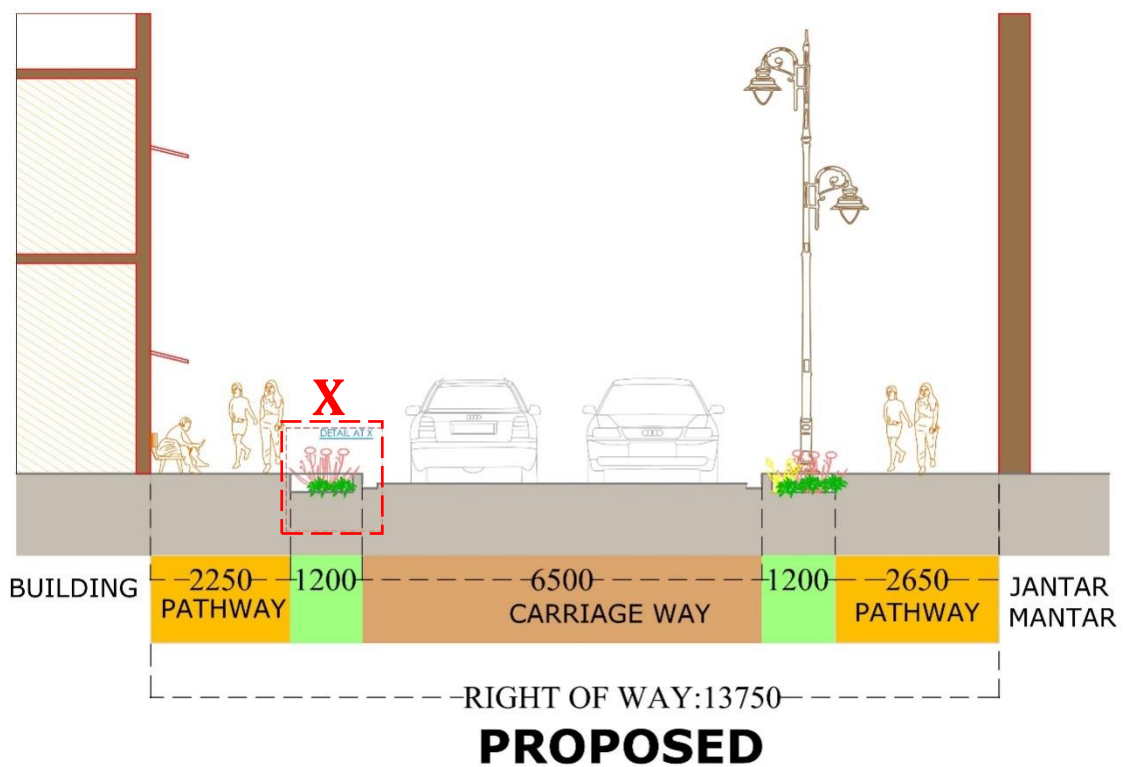
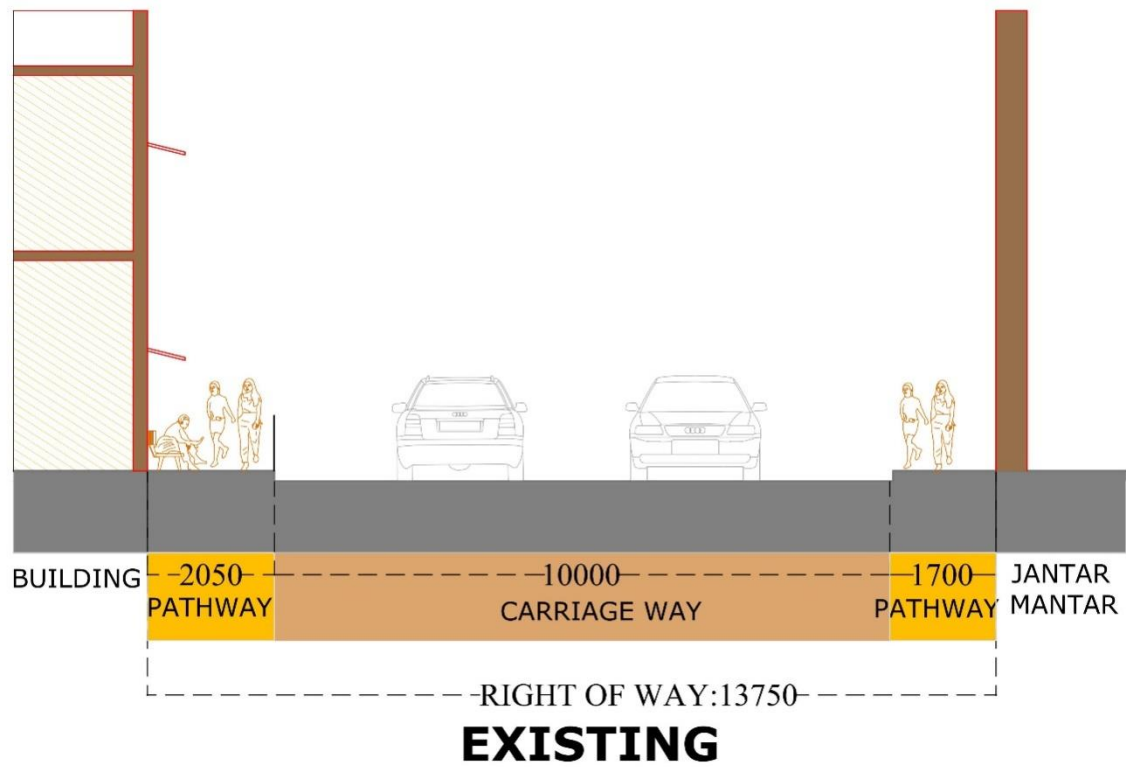


Figure 22 Existing and Proposed sections Middle Stretch Between Chandni Chowk and Jantar Mantar

Drawings

Pedestrianization of Krishna Circuit- Phase I

DETAIL AT X

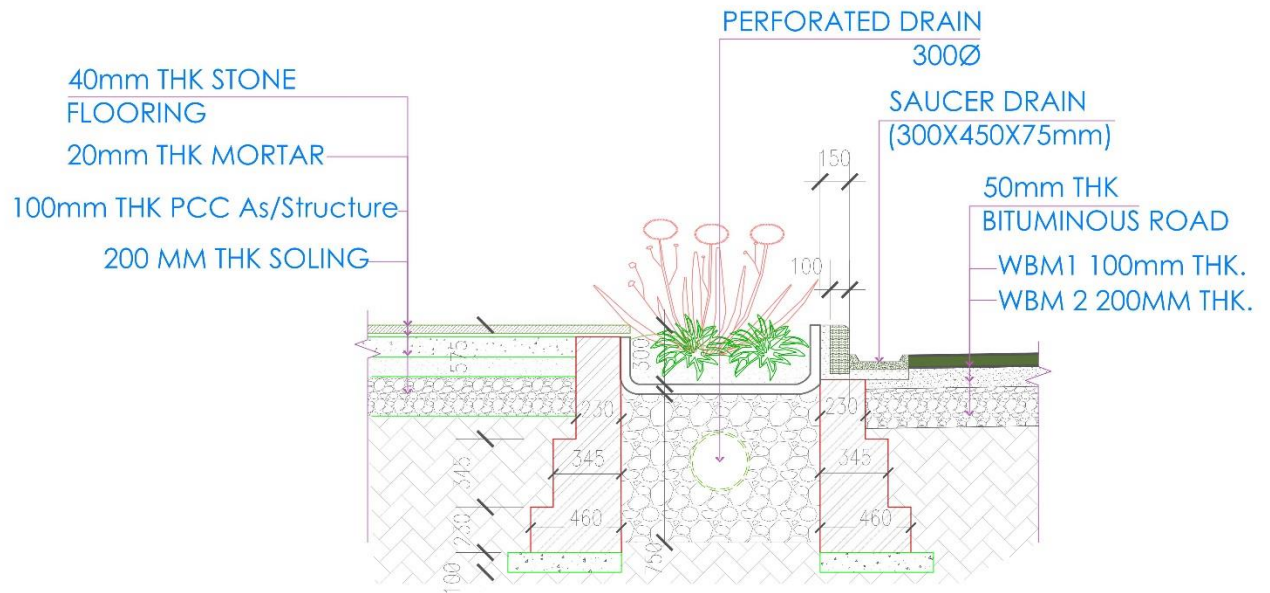


Figure 23: Detail from figure18

Drawings

Pedestrianization of Krishna Circuit- Phase I

13. Area-6: Area Near Jantar Mantar

A. EXISTING SITUATION

At present, random parking for cars on the right and for scooters on the left, the spaces have no clear definition or design.

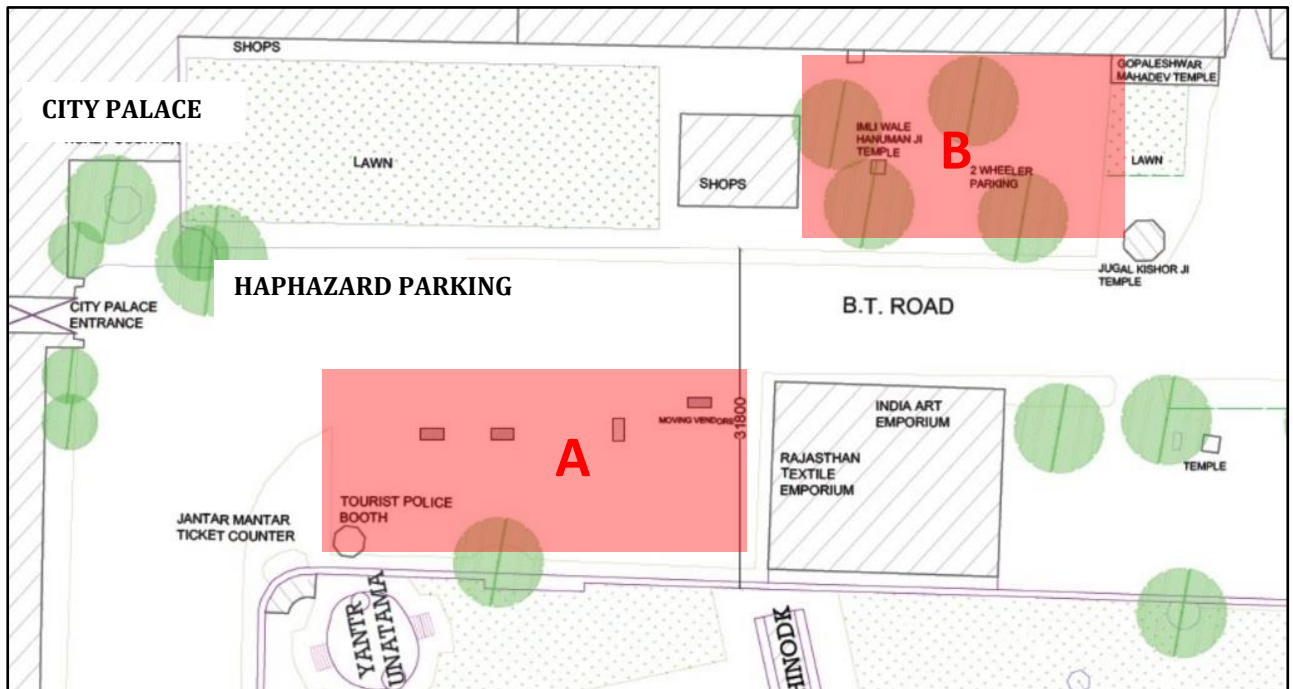


Figure 24 Existing part plan showing Middle Stretch between City Palace Entry and Jantar-Mantar Ticket Counter to Jaleb Chowk



Area A: Haphazard parking and vendors



Haphazard two wheelers parked

Drawings

Pedestrianization of Krishna Circuit- Phase I

B. THE PROPOSAL

It is now proposed to provide a landscape design with stepped seating, water fountains and planters on the right(A), while on the left(B), a jali wall screen separates a limited parking area for the City Palace Museum staff. The unpaved areas are proposed to be suitably planted with grass and ground cover.

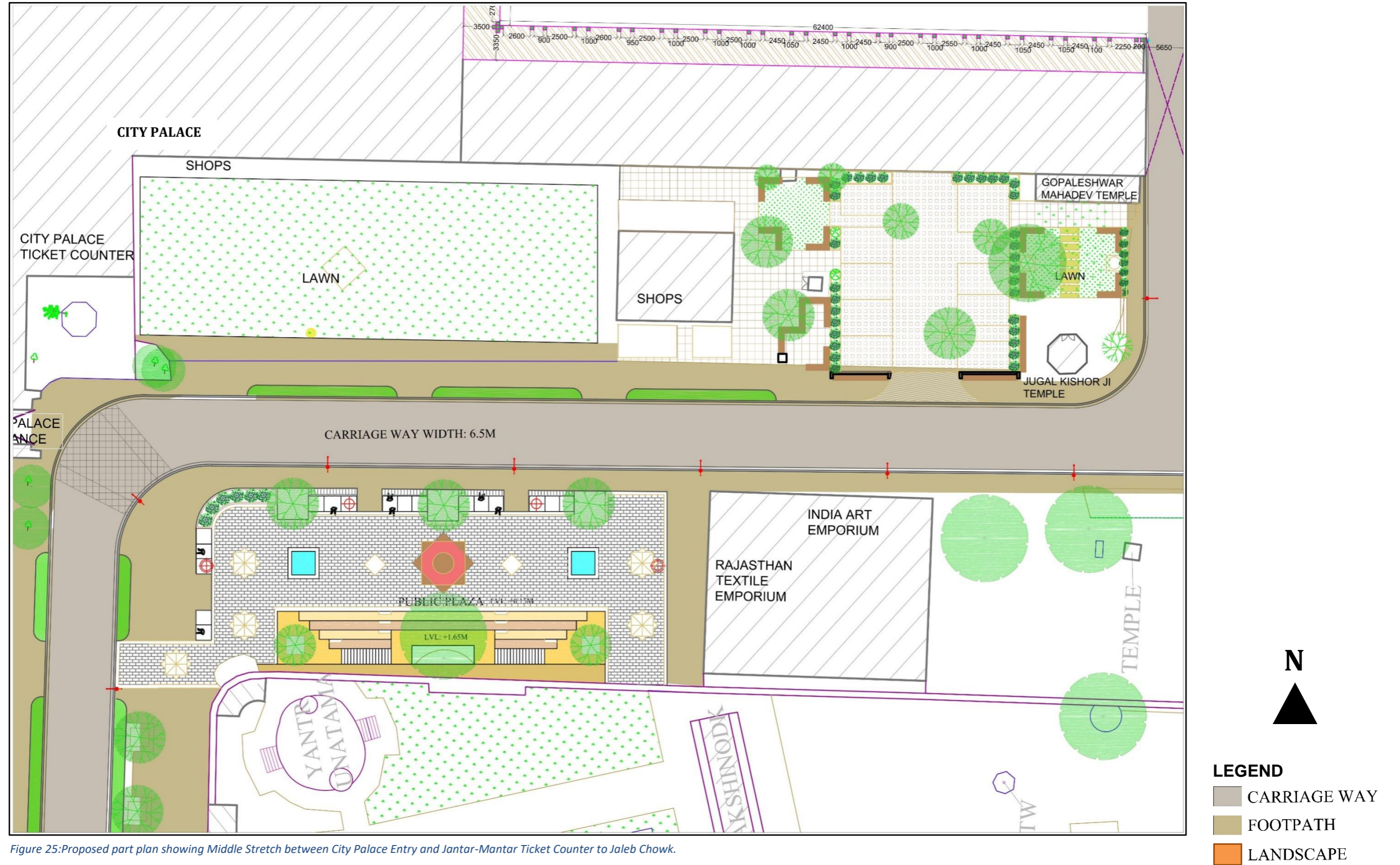


Figure 25: Proposed part plan showing Middle Stretch between City Palace Entry and Jantar-Mantar Ticket Counter to Jaleb Chowk.

Drawings

Pedestrianization of Krishna Circuit- Phase I

i) PROPOSED DRAWING - PLAZA A

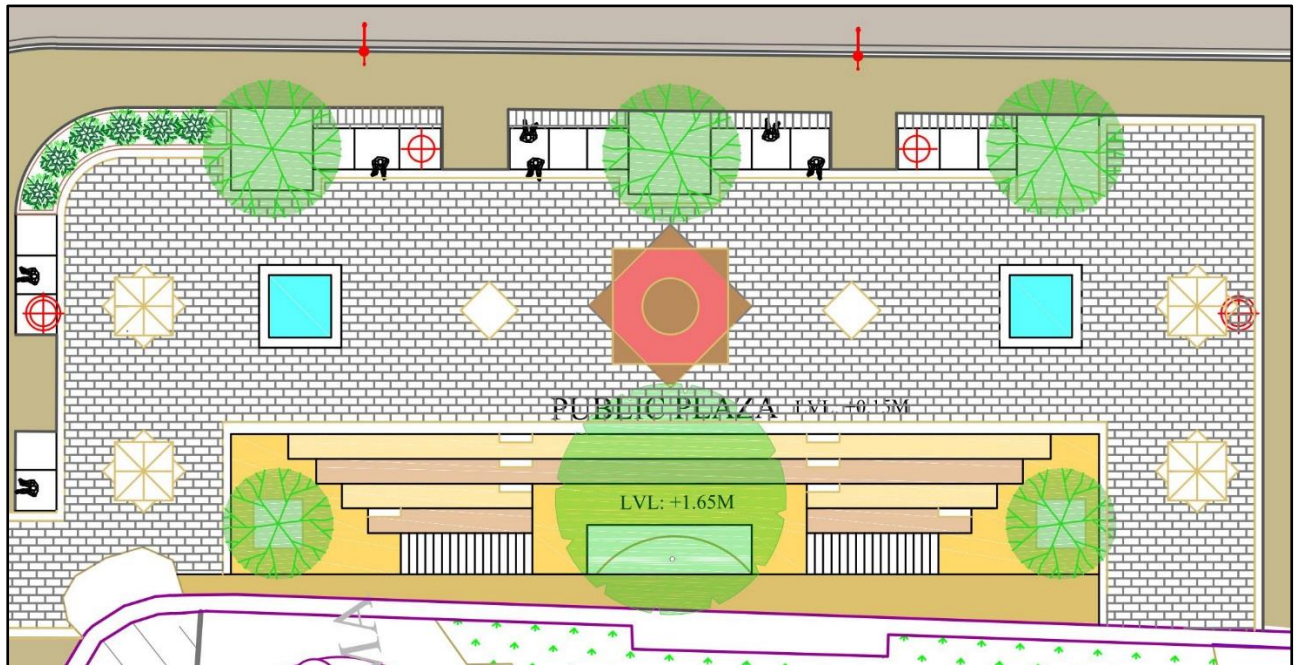


Figure 26 Proposed part plan for Plaza-A in Middle Stretch between City Palace Entry and Jantar-Mantar Ticket Counter to Jaleb Chowk.

Drawings

Pedestrianization of Krishna Circuit- Phase I



Figure 27 Proposed View of Plaza-A in Middle stretch between City Palace entry and Jantar-Mantar Ticket Counter to Jaleb Chowk.

Drawings

Pedestrianization of Krishna Circuit- Phase I

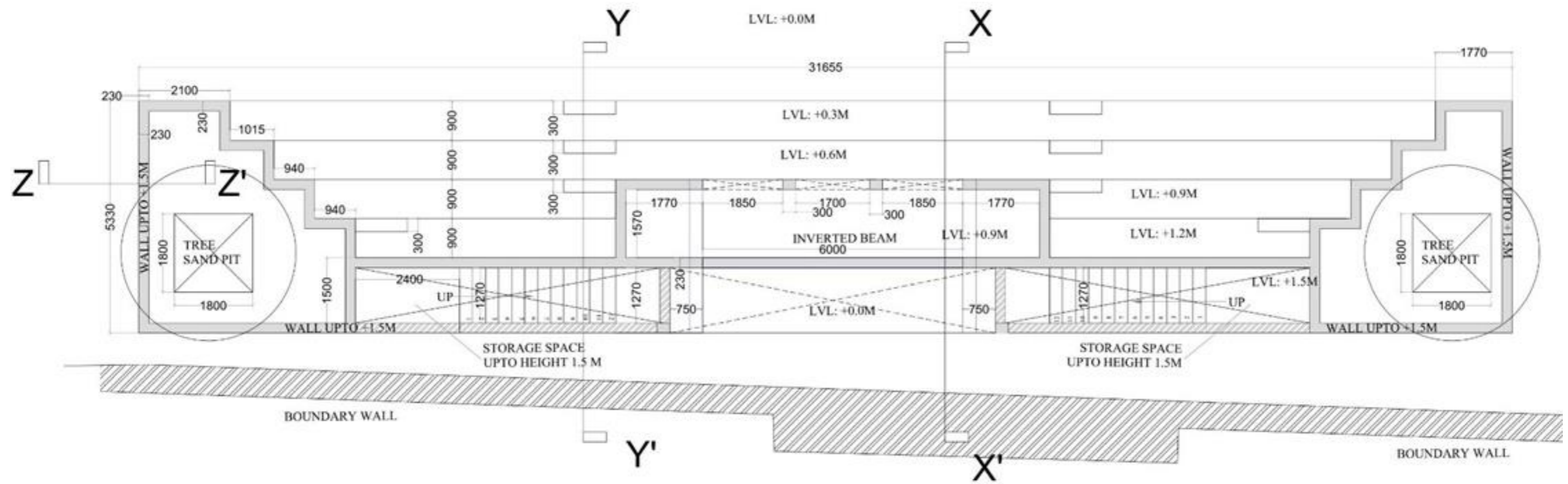


Figure 28: Plan detail

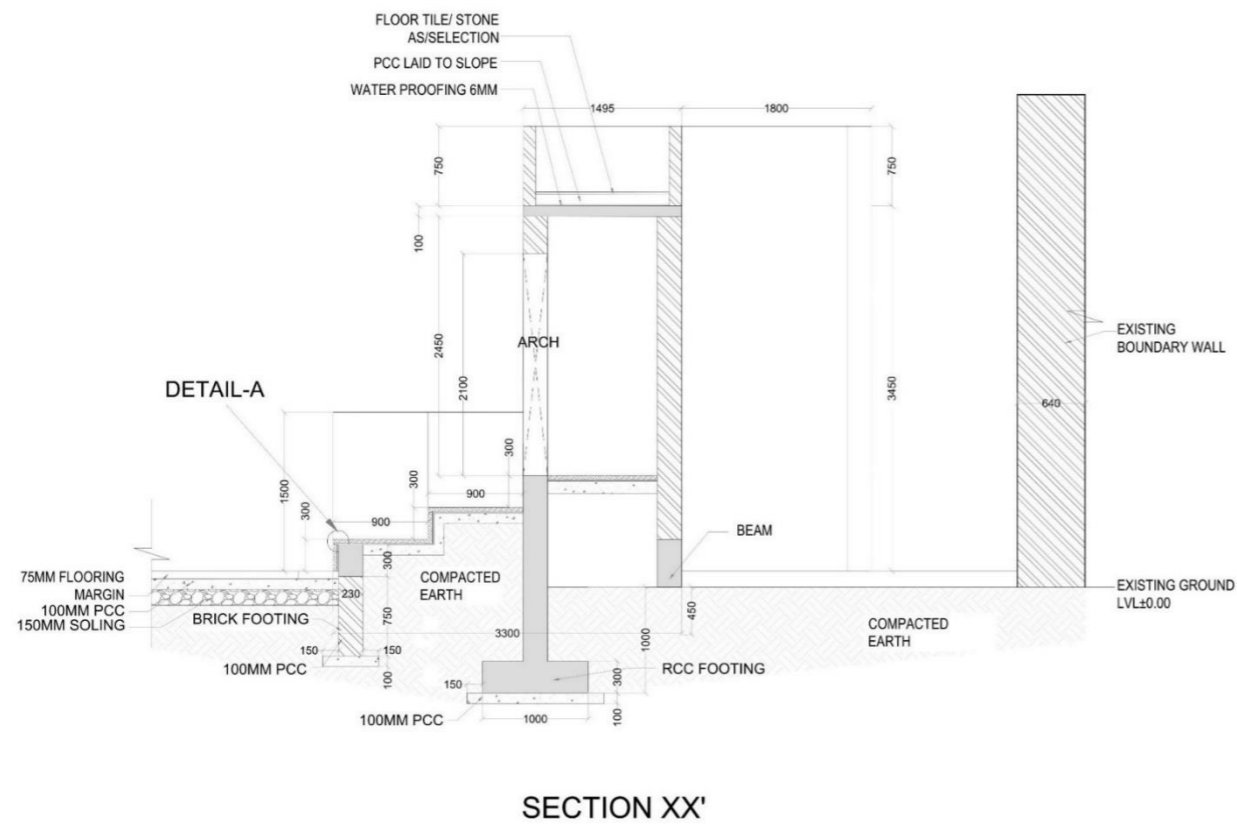


Figure 30:Section XX' from Figure 15

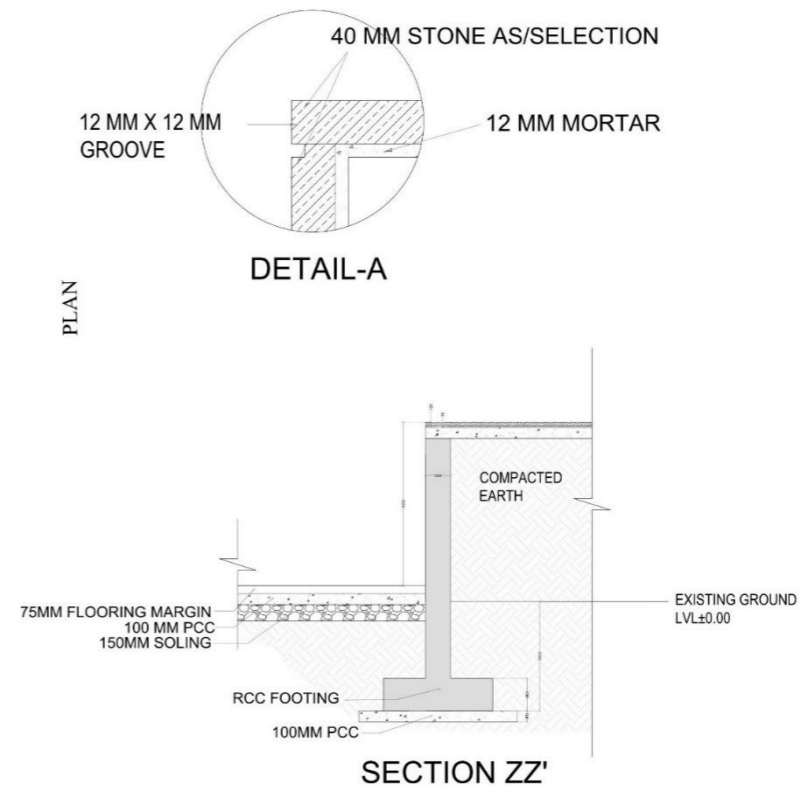


Figure 29:Section-zz' and Detail-A

Drawings

Pedestrianization of Krishna Circuit- Phase I

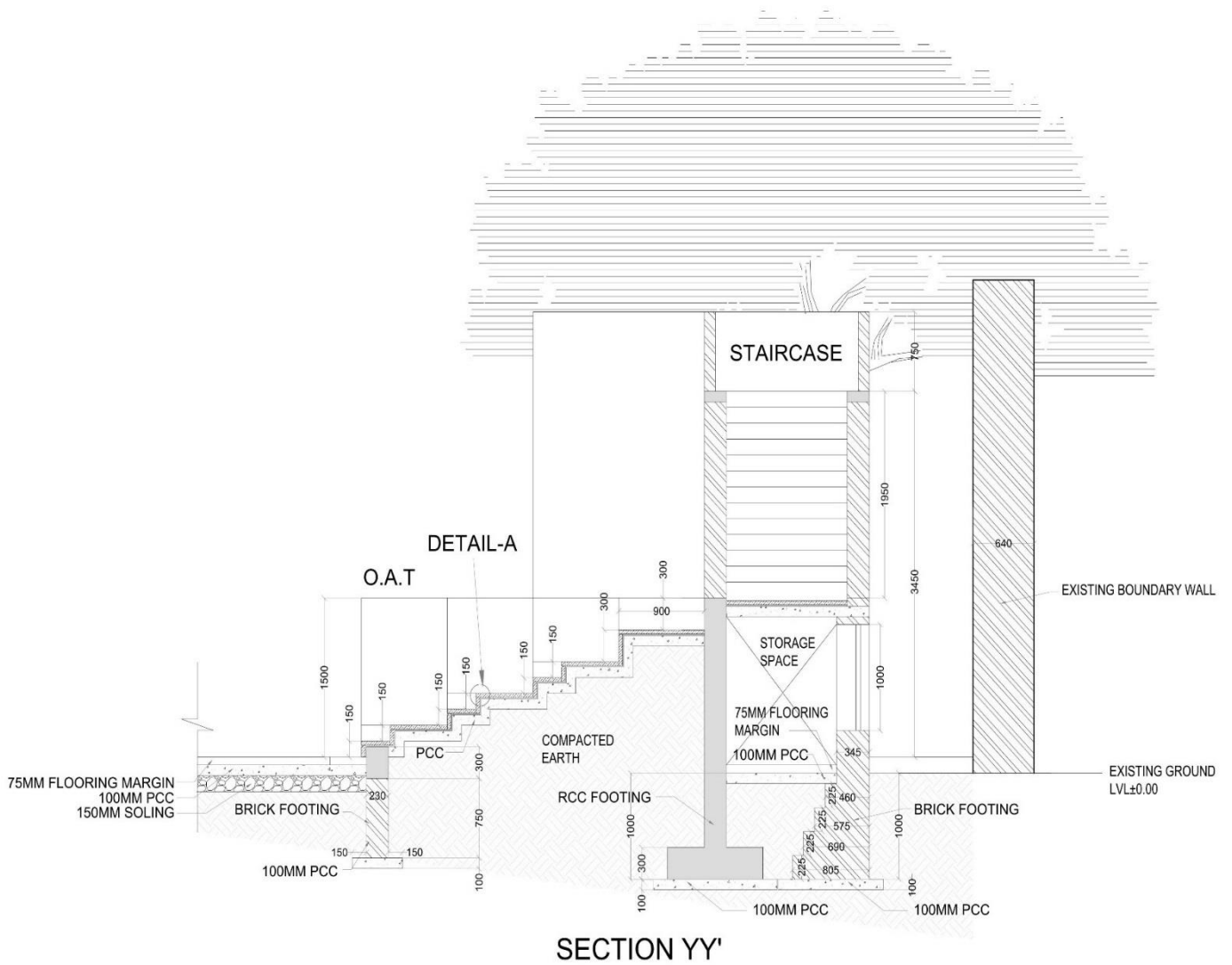


Figure 31: Section YY' from Figure 15

Drawings

Pedestrianization of Krishna Circuit- Phase I

ii) PROPOSED DRAWING- PLAZA B

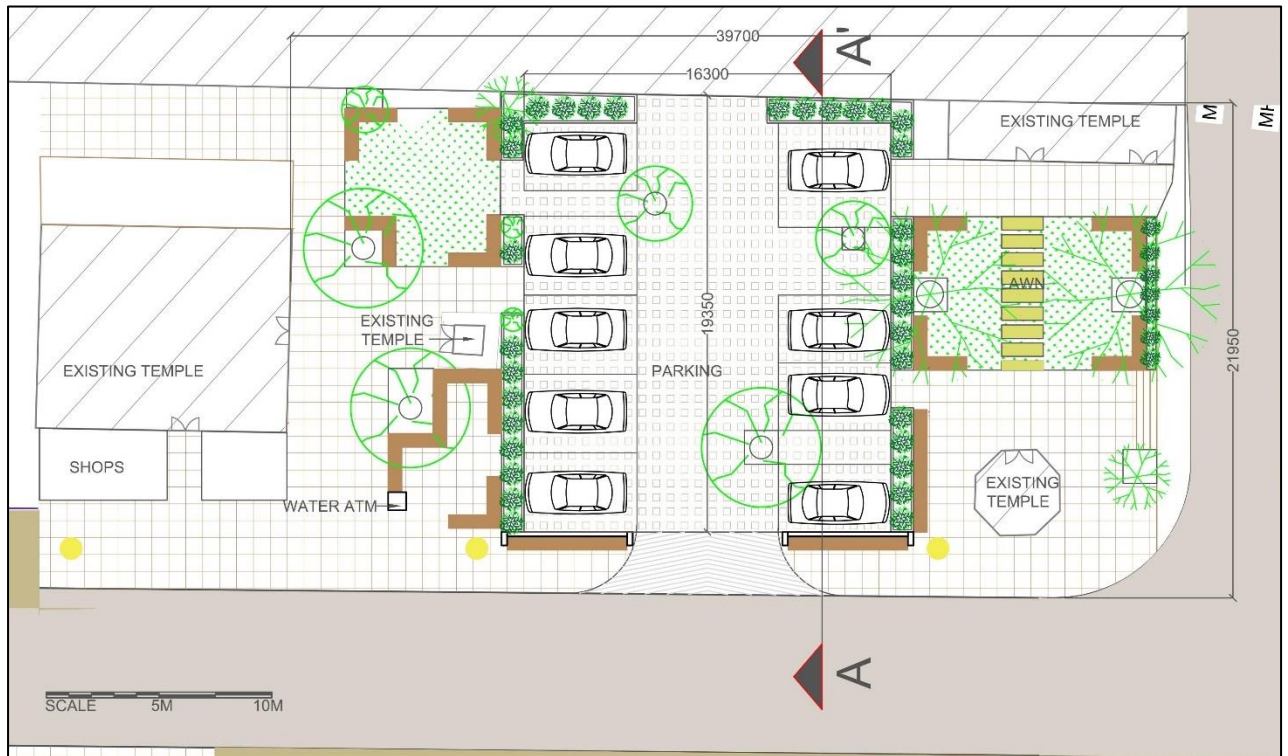


Figure 32 Proposed part plan for Plaza-B in Middle Stretch between City Palace Entry and Jantar-Mantar Ticket Counter to Jaleb Chowk.



Figure 33 Proposed view for Plaza-B in Middle Stretch between City Palace Entry and Jantar-Mantar Ticket Counter to Jaleb Chowk.

Drawings

Pedestrianization of Krishna Circuit- Phase I

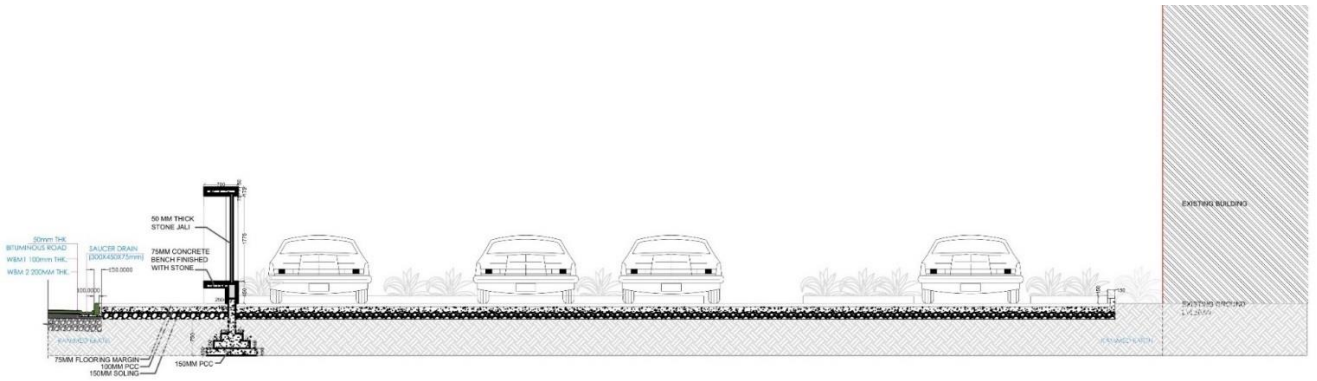


Figure 34 Section

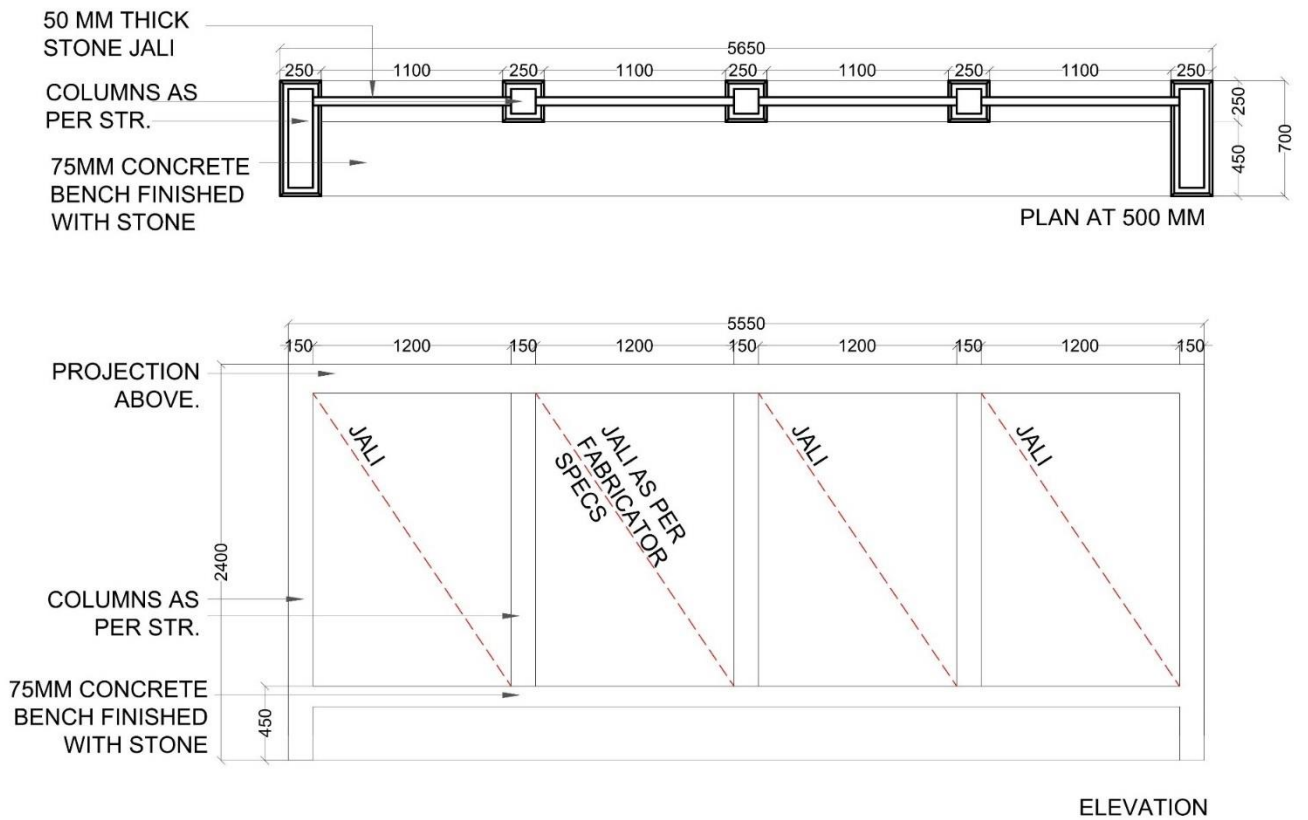


Figure 35 Jaali Details

Drawings

Pedestrianization of Krishna Circuit- Phase I

Proposed Design Views for public space 1 on right of road



Figure 36: 3D views for area Aneer Jantar Mantar

Drawings

Pedestrianization of Krishna Circuit- Phase I

Proposed Design Views for public space 2 on left of road



Figure 37: 3D views of area B near jantar mantar

Drawings

Pedestrianization of Krishna Circuit- Phase I

14. Area-7: Passage Through Jaleb Chowk

A) EXISTING SITUATION

At present the passage through Jaleb Chowk has a total width of about 15.0 M, where the carriageway is 9 to 10 M wide, while the paved pedestrian paths on each side are about 2.5 M wide. The railings on either side of the walkways are broken and in poor condition at several places.

B) THE PROPOSAL

Carriageway Width: 6.5M, Pedestrian Pathways : 3.0 M

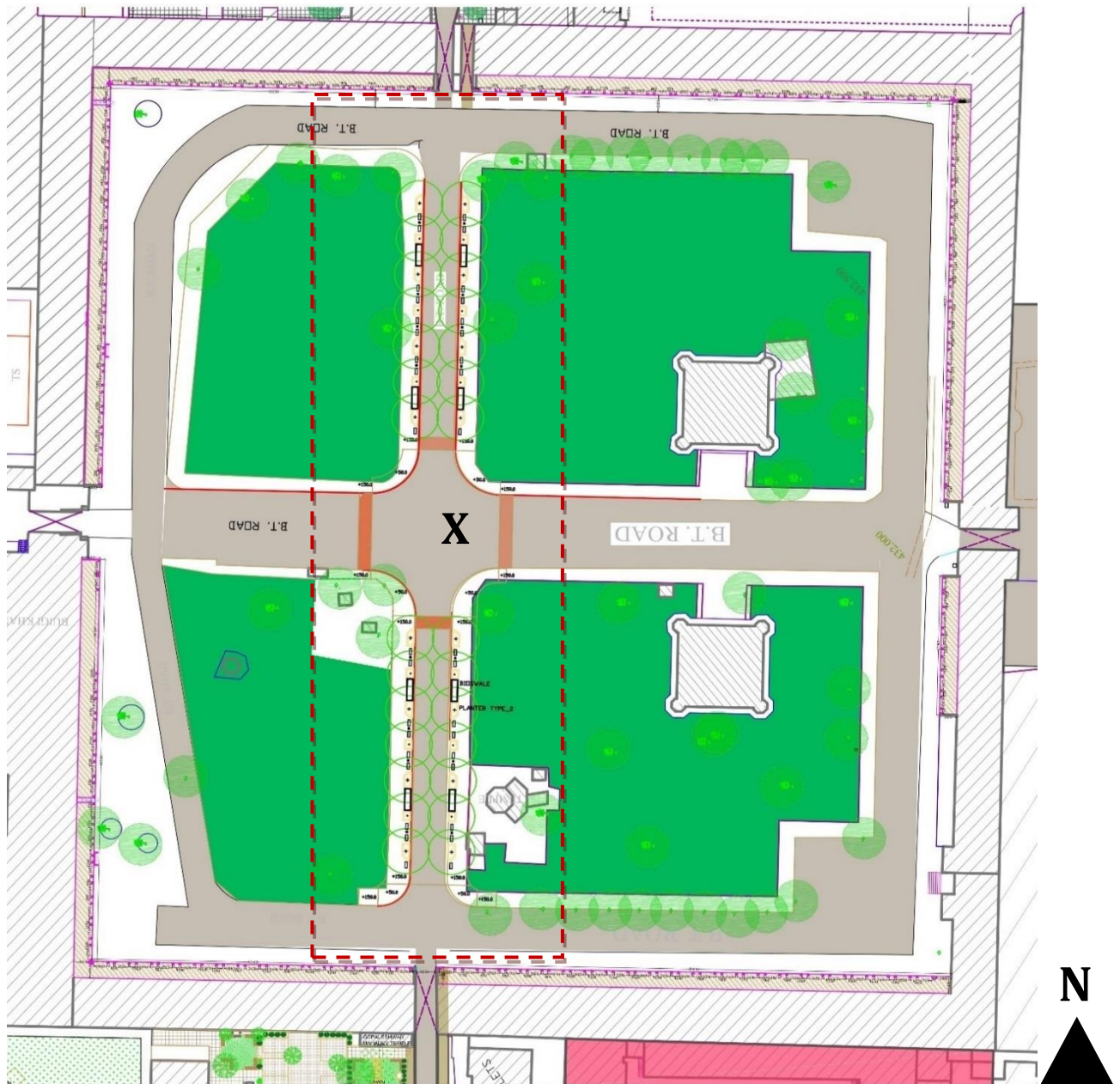


Figure 38 Proposed part plan showing Jaleb Chowk

Drawings

Pedestrianization of Krishna Circuit- Phase I

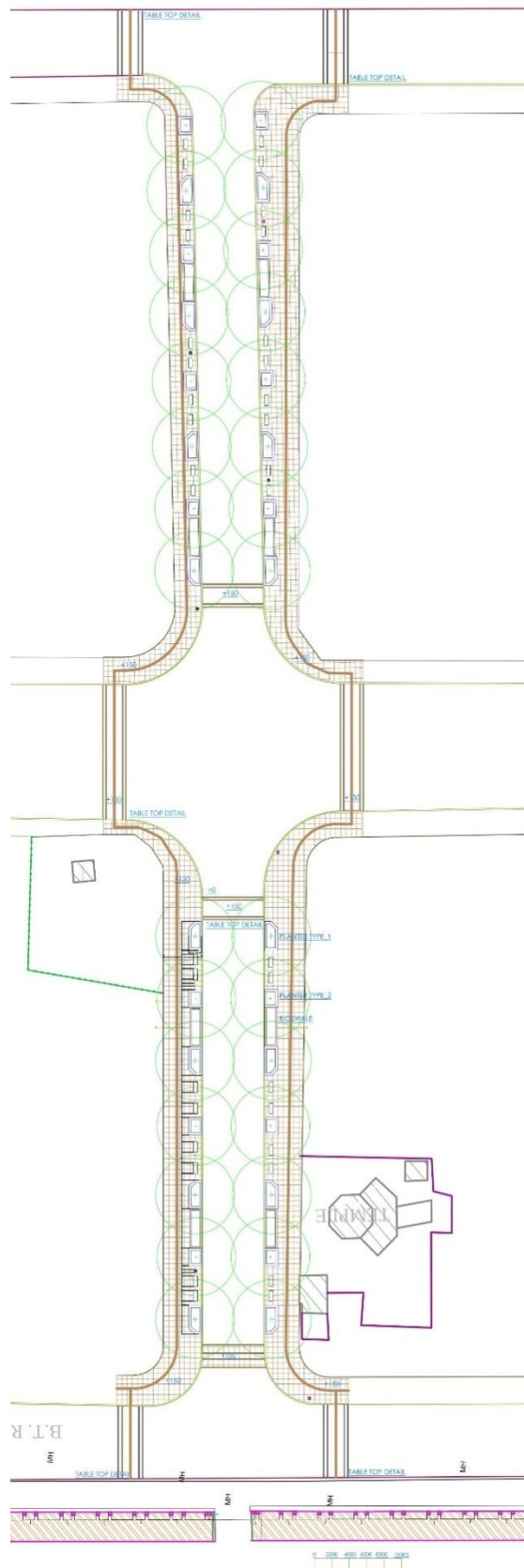
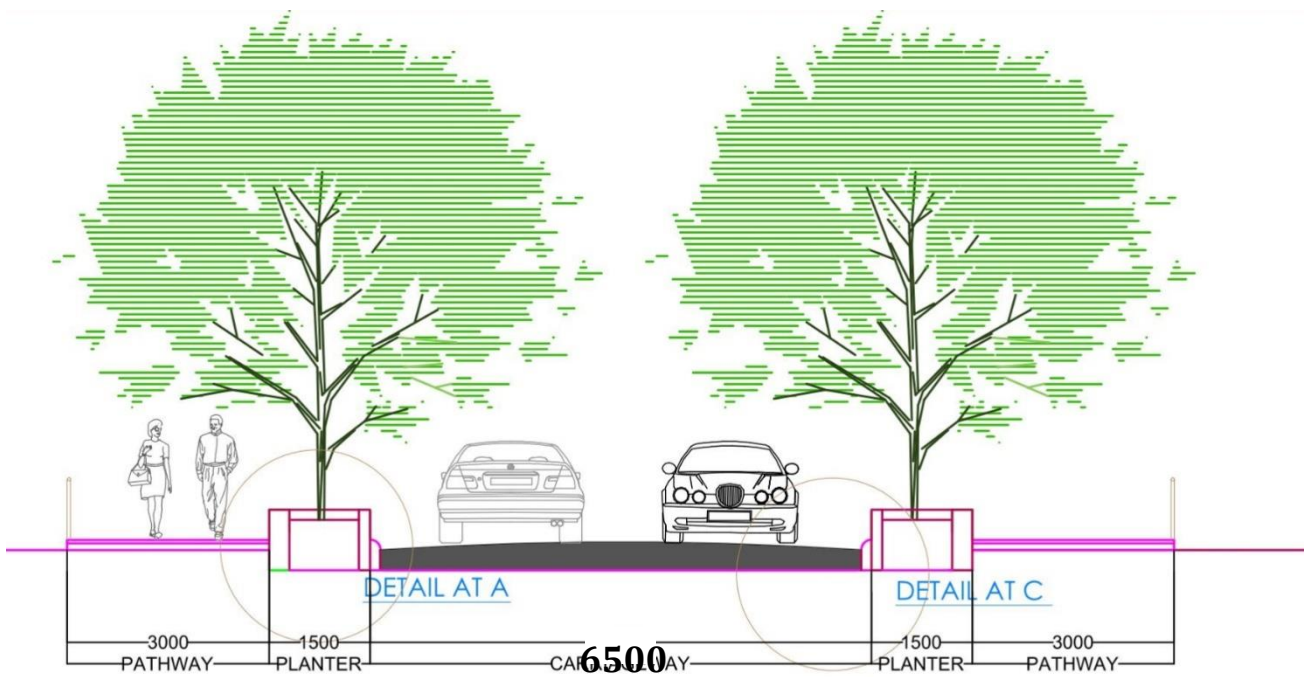


Figure 39: Detail at X

It is proposed to again limit the carriageway to a width of 6.5.0 M, and increase the pedestrian pathways to 3.0 M wide and introduce a 1.0 M wide plantation bed for flowering shrubs and shading trees in between the carriageway and pedestrian paths.

A new railing of stone jail design is proposed to segregate the pathways from the Jaleb Chowk's gardens and lawns.



SECTION 1



SECTION 2

Figure 40: Sections at Jaleb chauk

Drawings

Pedestrianization of Krishna Circuit- Phase I

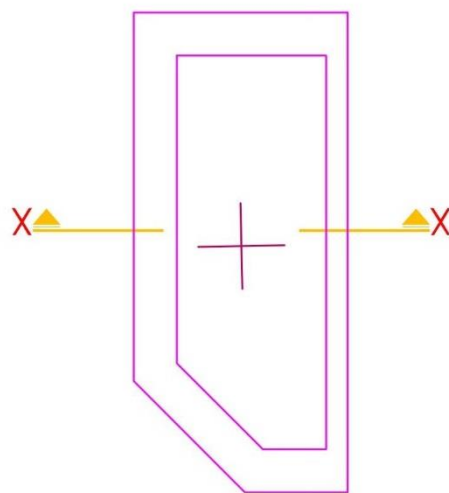
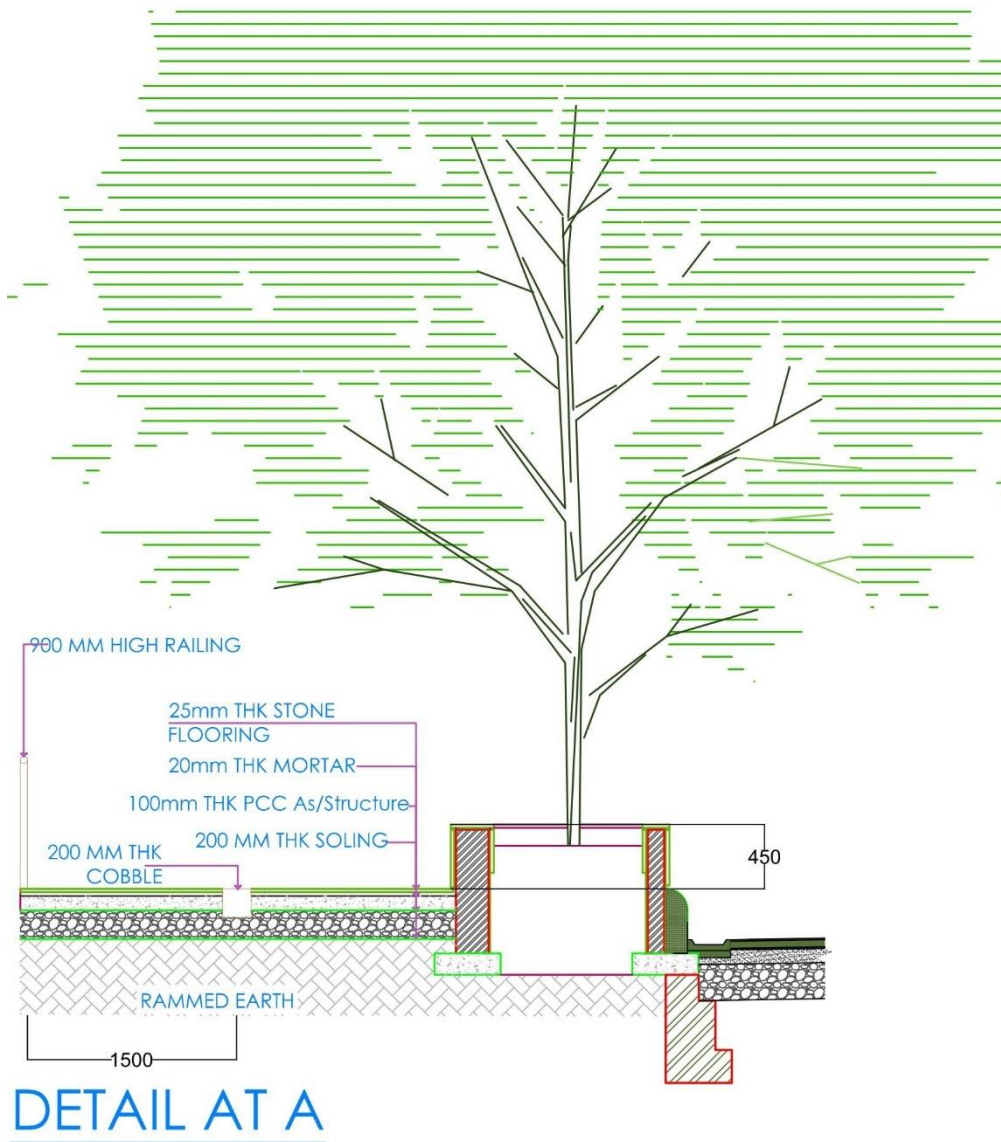


Figure 41:Details at Jaleb Chowk

Drawings

Pedestrianization of Krishna Circuit- Phase I

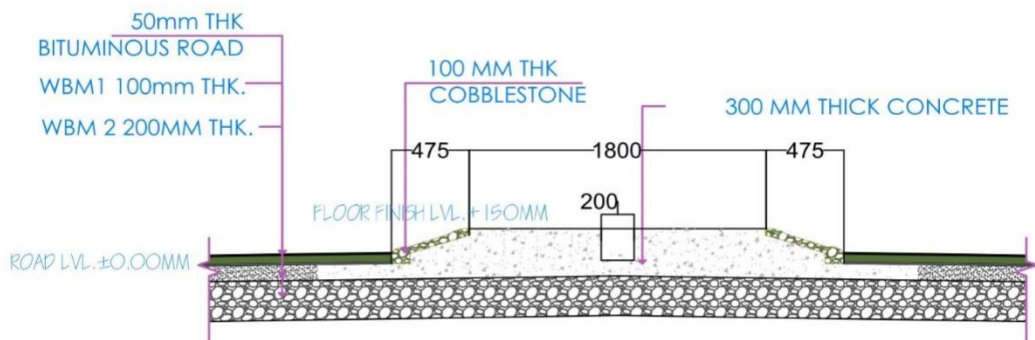
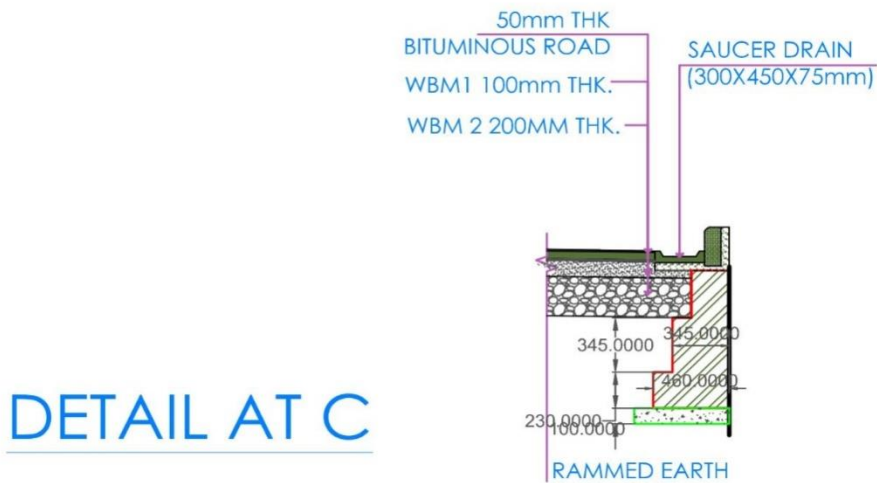
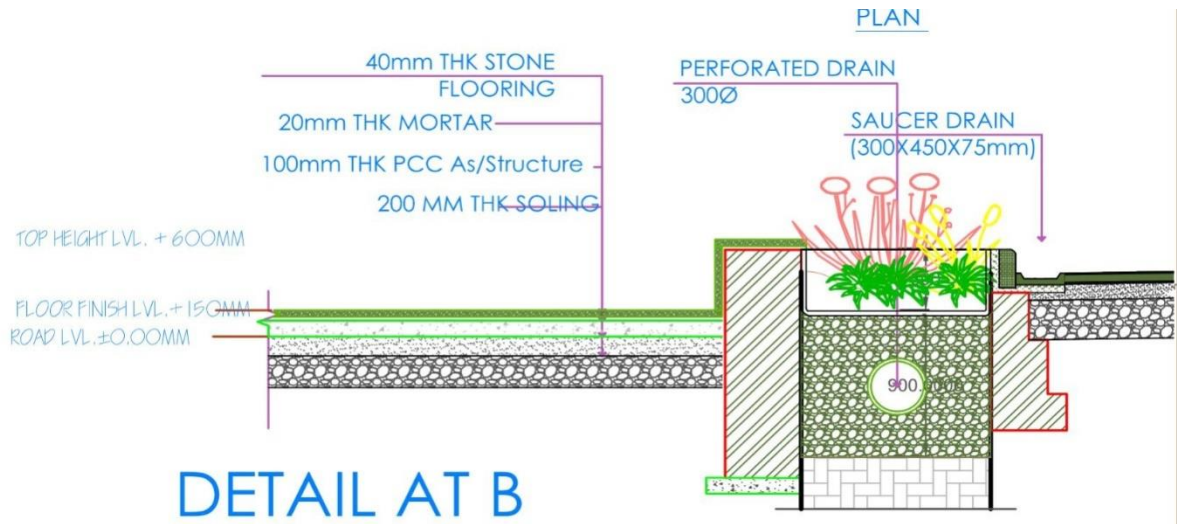


Figure 42 Details at Jaleb Chowk

Drawings

Pedestrianization of Krishna Circuit- Phase I

15. Area-8: Passage Beyond Jaleb Chowk To Govind Dev Ji Temple.

A. EXISTING SITUATION:

The area here is presently in very poor shape and order. On the left is the un-maintained area of the irrigation department, on the right is the entrance to the Gaurang Prabhu Ji Temple. These are all unplanned areas, and a double row of small shops were built to accommodate the small kiosks and vendors that have sprouted to cater to the needs of the increasing numbers of temple goers.

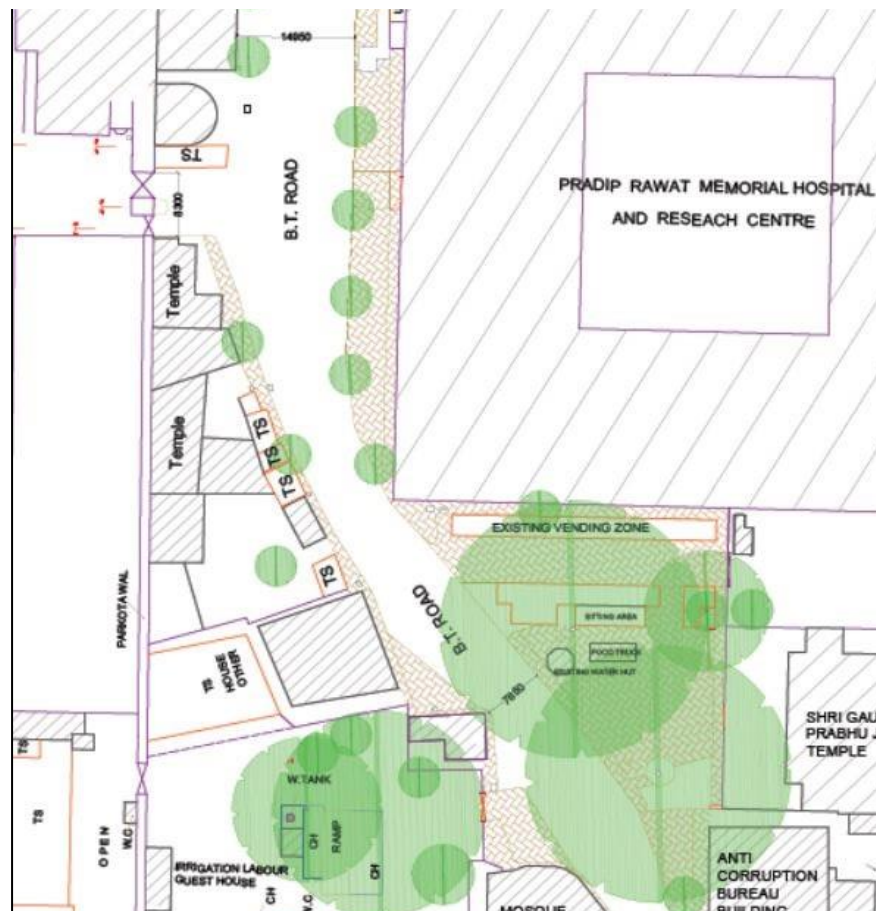


Figure 43 Existing part plan showing passage beyond Jaleb Chowk to Govind Devji Temple

B. THE PROPOSAL

The proposal is made to suitably landscape the visible and accessible portions of the Irrigation department's land, and to pave the frontage of the Gaurang Prabhu Ji Temple, and provide stone benches under the shade of trees. The shops are redesigned with frontages suitable opened up to be visible and easily accessible. The carriageway for vehicles is again restricted to 6.5 M width.

The urban character of this entire space is proposed to be enhanced with landscape plantation, paved areas, benches for seating under shade trees, kiosks for vendors, water

ATM and also replicas of traditional Chhatris with seating at the front of Govind Devji Temple.

Drawings

Pedestrianization of Krishna Circuit- Phase I

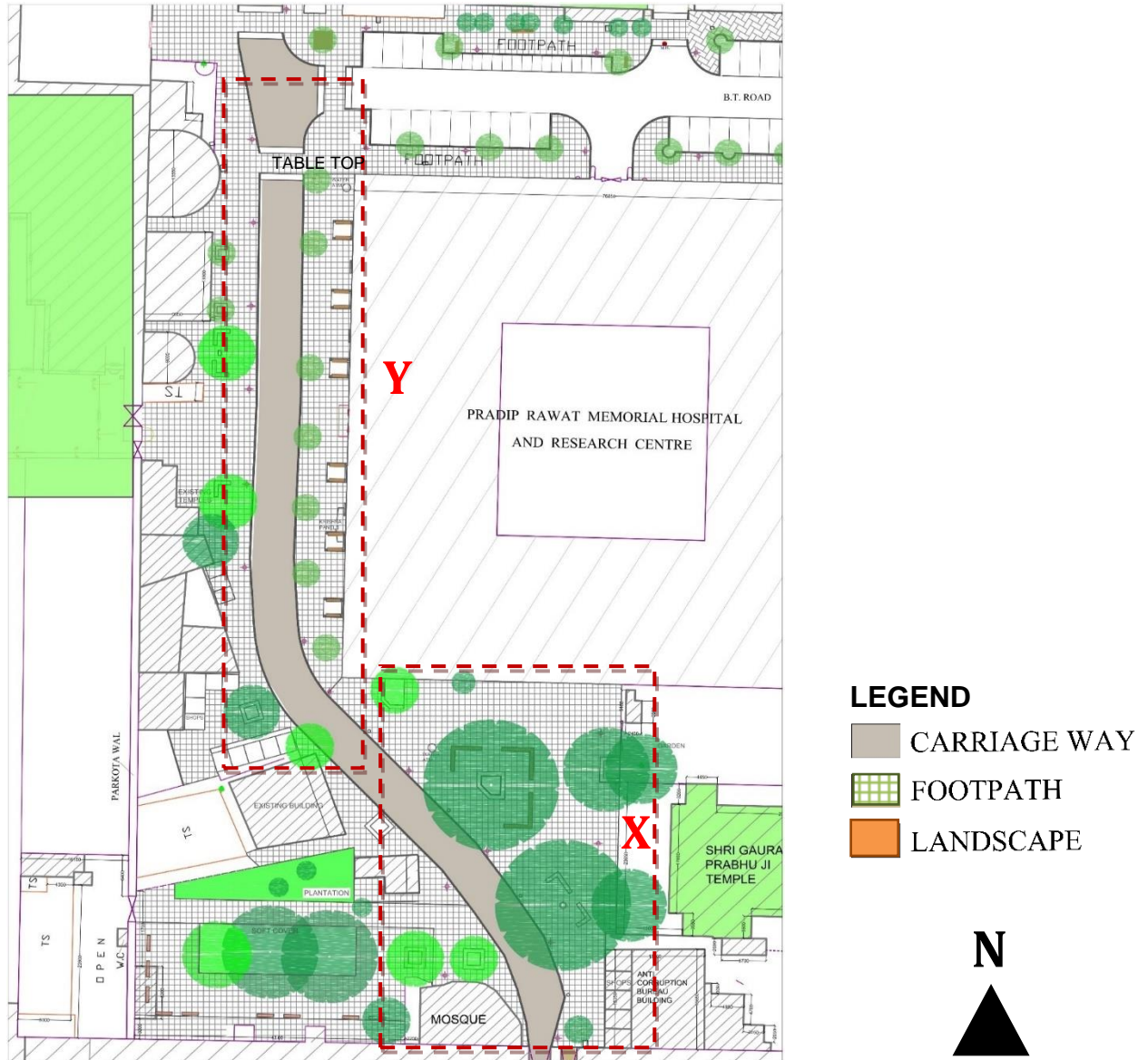


Figure 44. Proposed part plan showing passage beyond Jaleb Chowk to Govind Devji Temple

Drawings

Pedestrianization of Krishna Circuit- Phase I

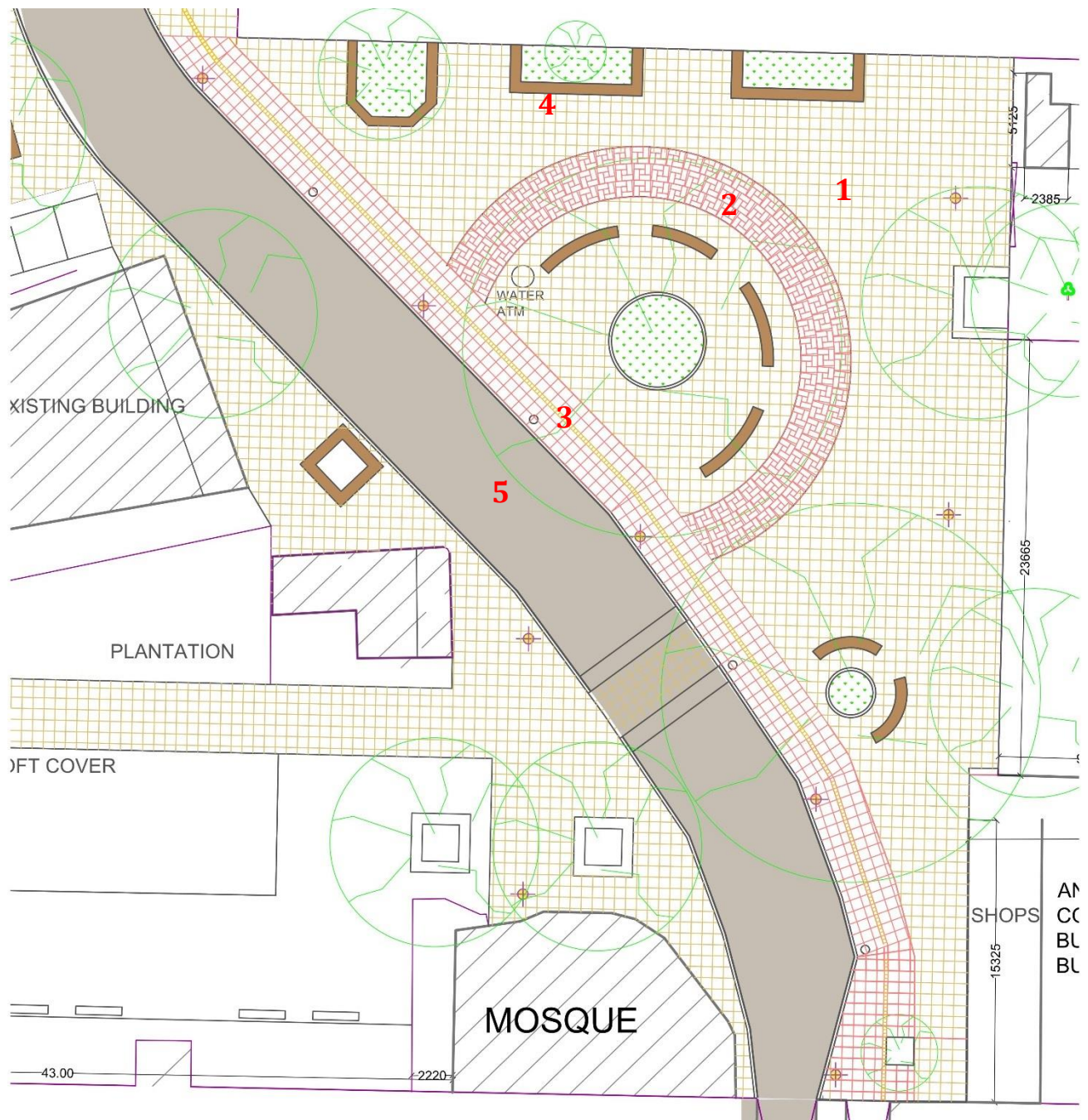


Figure 45: Flooring pattern at X from fig. 31

- 1-SANDSTONE (colour 1)
- 2-SANDSTONE (colour 2)
- 3-COBBLE STONE
- 4-SEATING
- 5-CARRIAGE WAY

Drawings

Pedestrianization of Krishna Circuit- Phase I

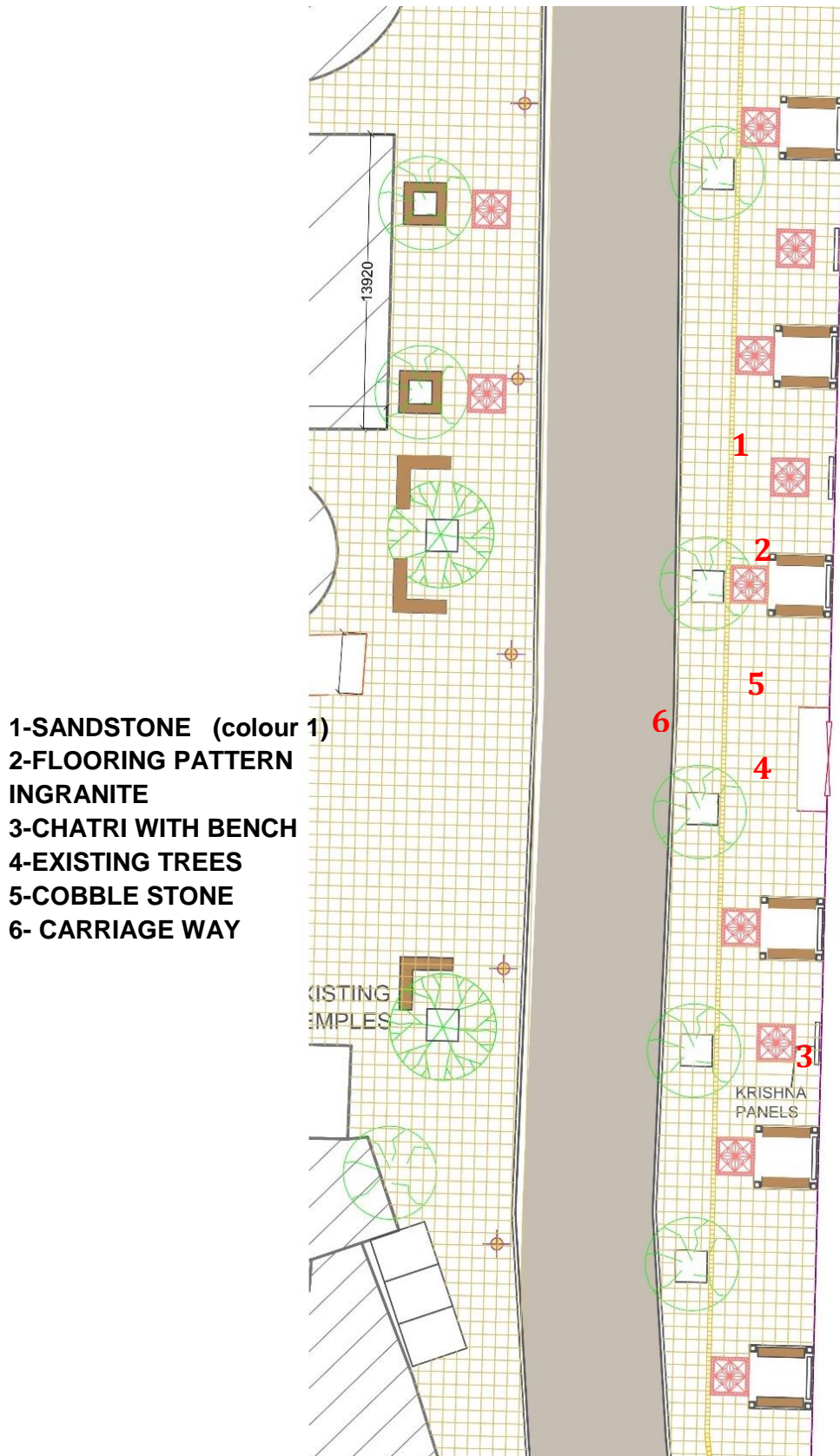


Figure 46: Flooring pattern at Y from fig 31

Drawings

Pedestrianization of Krishna Circuit- Phase I

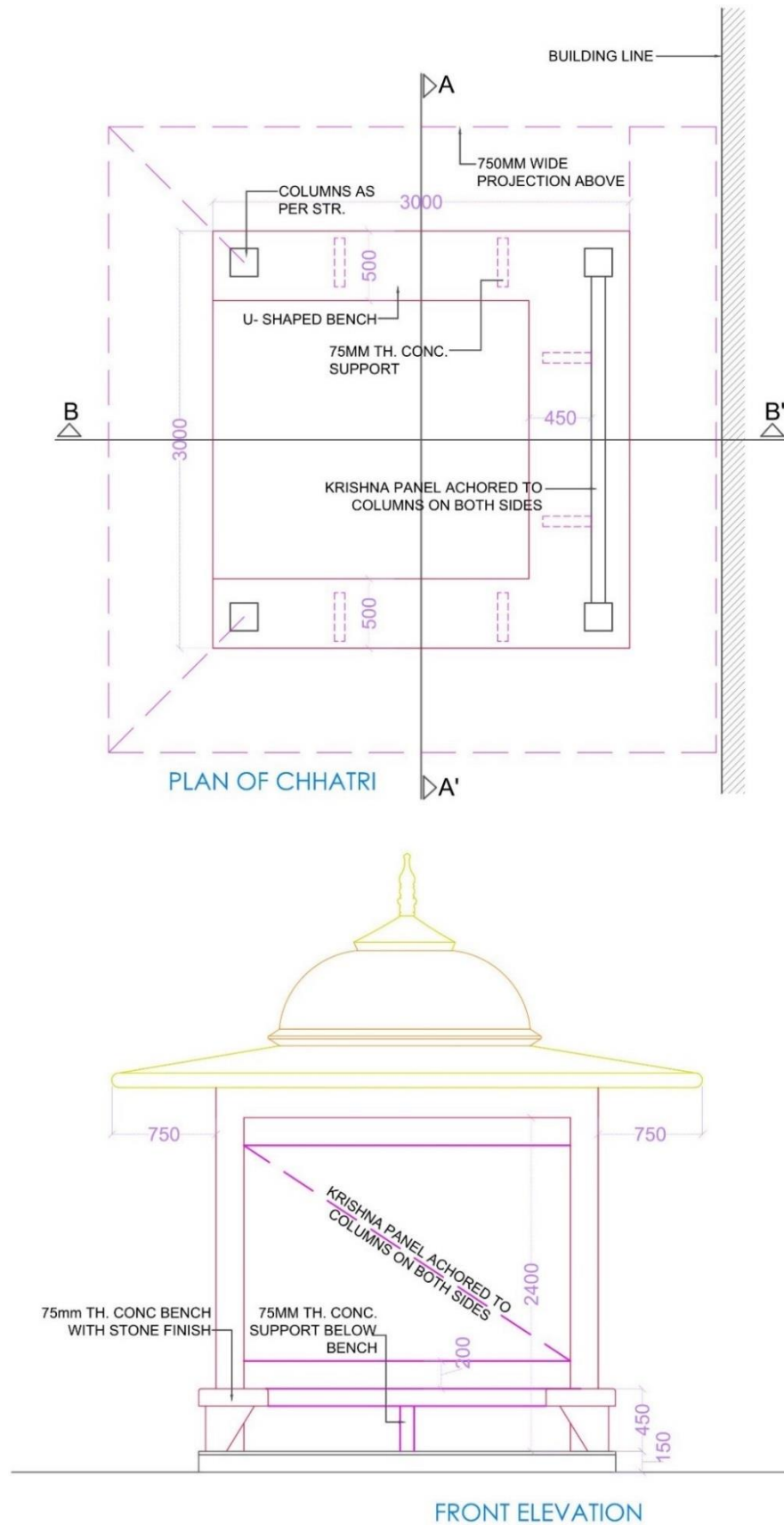


Figure 47: Chatri Details

Drawings

Pedestrianization of Krishna Circuit- Phase I

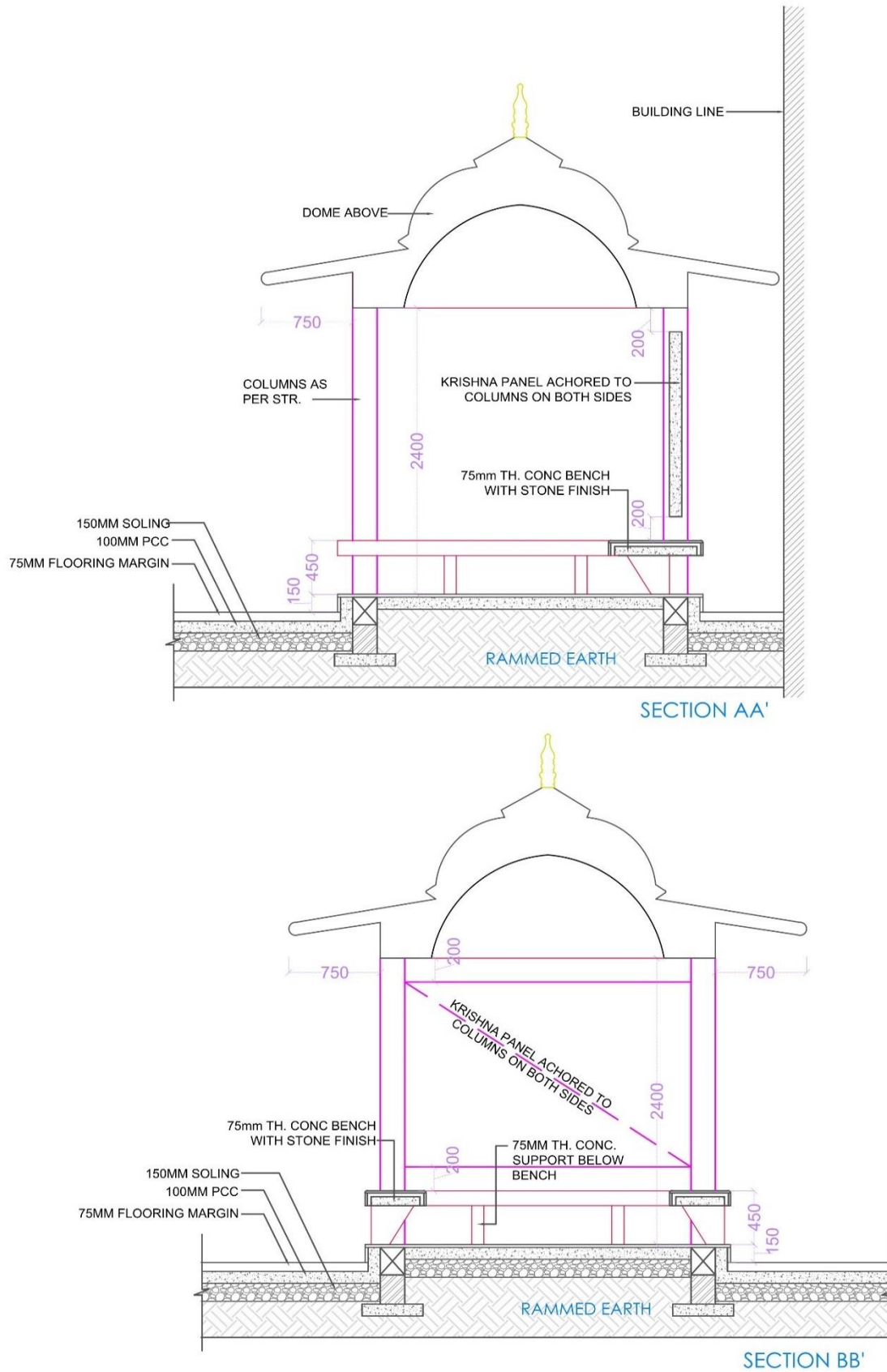


Figure 48 Chatri Details

Drawings

Pedestrianization of Krishna Circuit- Phase I

16. Area-9 : Parking Near Pradip Rawat Memorial Hospital

A. EXISTING CONDITION

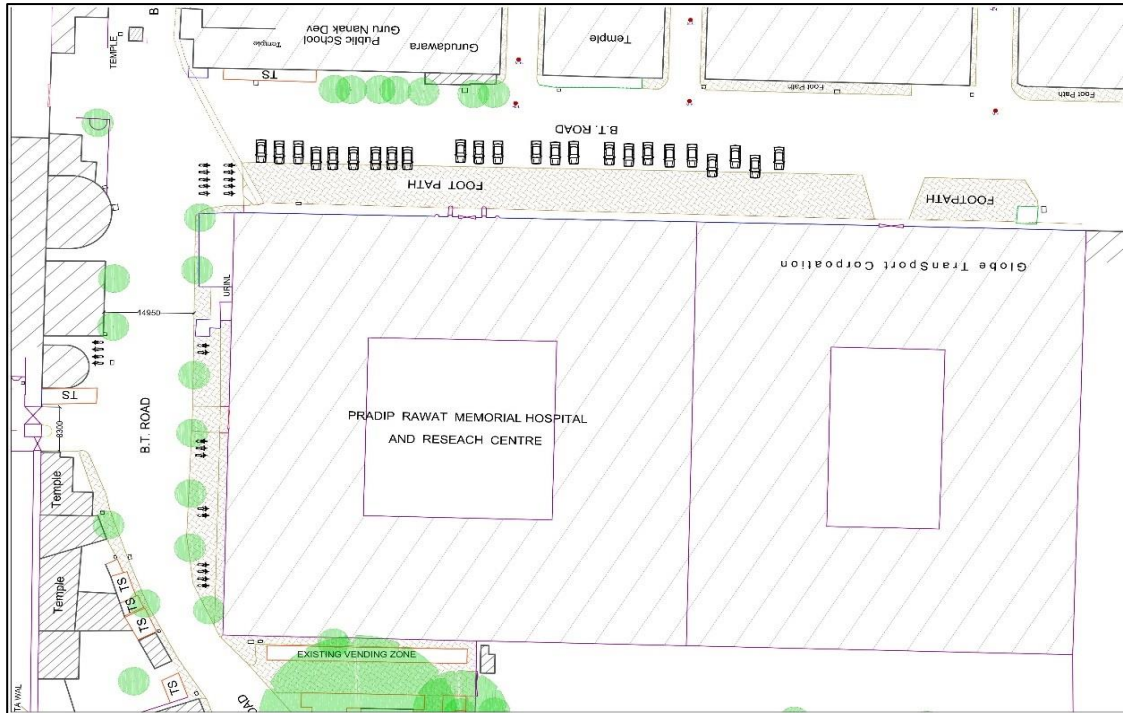


Figure 49 Existing part plan of parking near Pradip Rawat Memorial Hospital

B. THE PROPOSAL



Figure 50 Proposed part plan of parking near Pradip Rawat Memorial Hospital

17. Typical Flooring Design Pattern

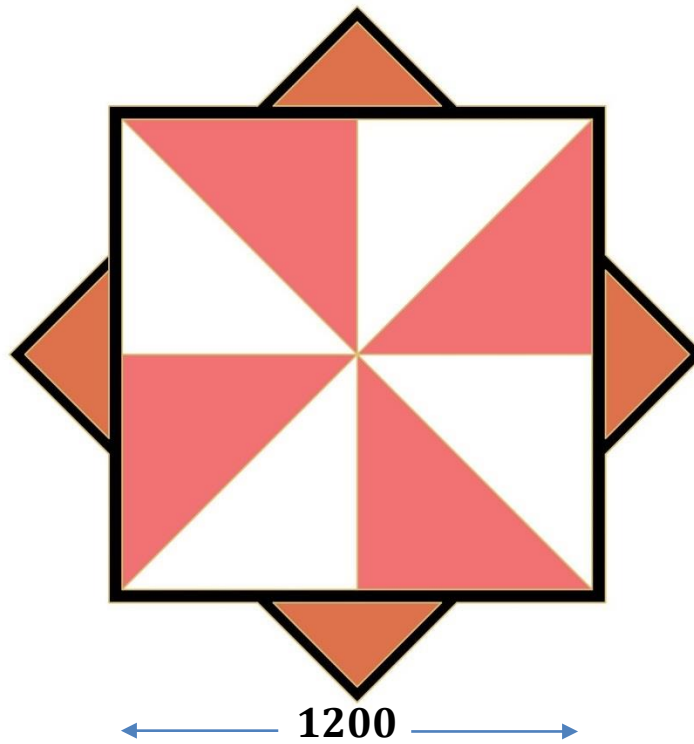


Figure 51: Flooring pattern in Granite repeated throughout the stretch of phase 1

18. Typical Table Top Crossing Section

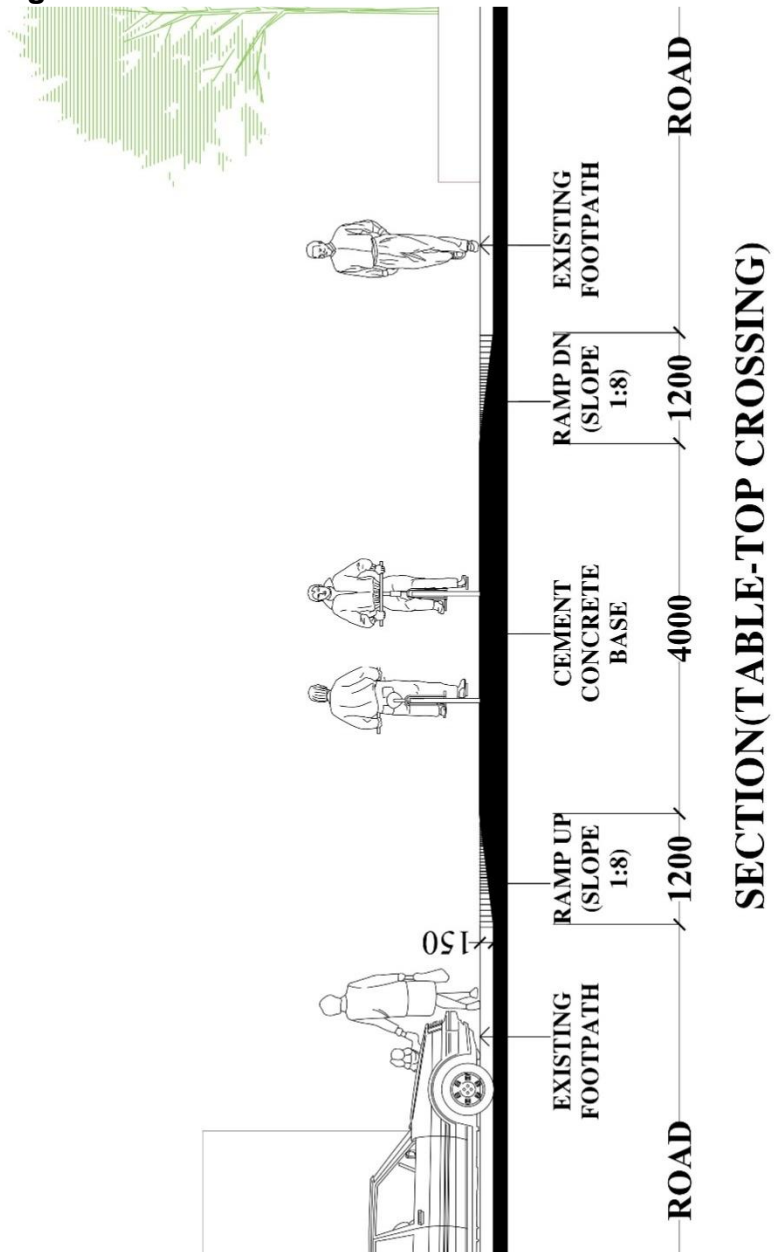


Figure 52: Table top section

19. Road markings

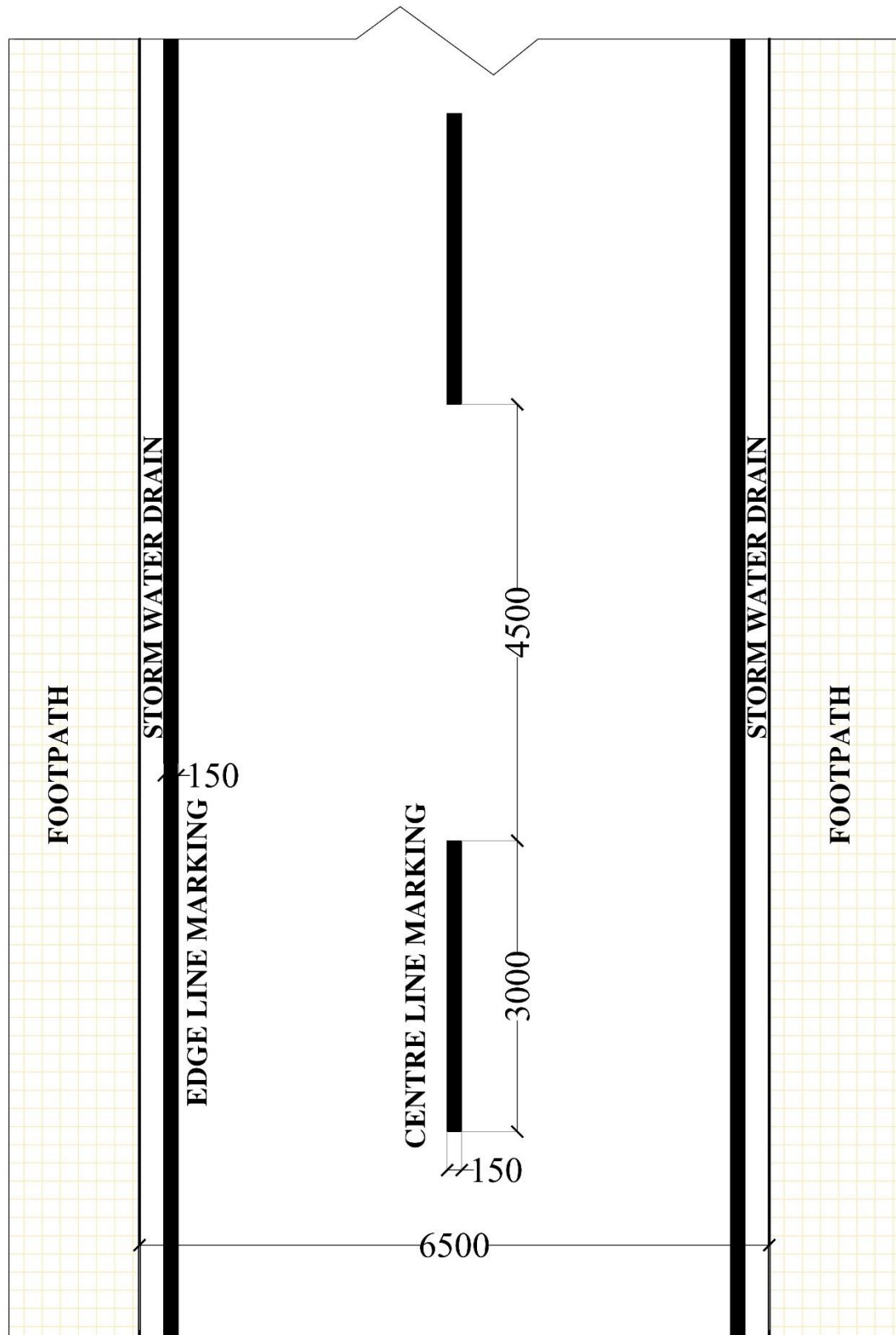


Figure 53: Road marking

12 Tender Drawing

Pedestrianisation of Krishna Circuit Phase 1

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.

Environment and Social Management Framework

Pedestrianization of Krishna Circuit Phase 1

			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.

Environment and Social Management Framework

Pedestrianization of Krishna Circuit Phase 1

			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.

Environment and Social Management Framework

Pedestrianization of Krishna Circuit Phase 1

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				

Environment and Social Management Framework

Pedestrianization of Krishna Circuit Phase 1

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.

Environment and Social Management Framework
Pedestrianization of Krishna Circuit Phase 1

			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).

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	<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	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.	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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	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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	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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	<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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	<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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	<p>roads. The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation.</p> <ul style="list-style-type: none"> •Transportation links are to be inspected daily to clear accidental spillage, if any. <p>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.</p> <ul style="list-style-type: none"> • 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 	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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	<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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	<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. 					
Equipment/ vehicles deployed for Construction works.	<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. 	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
Hot Mix Plants and Laying of bitumen.	<ul style="list-style-type: none"> • Hot mix plants shall be at least 500 m away from human settlements and preferably 	As determined by contractor	Construction Phase.	To be included in contractor's	All facilities are to be planned and	SC

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	<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 plants 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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	<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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	<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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	<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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	<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. 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 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. 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. 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>					
<p>Personal Safety Measures for Labour</p>	<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 	<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>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