

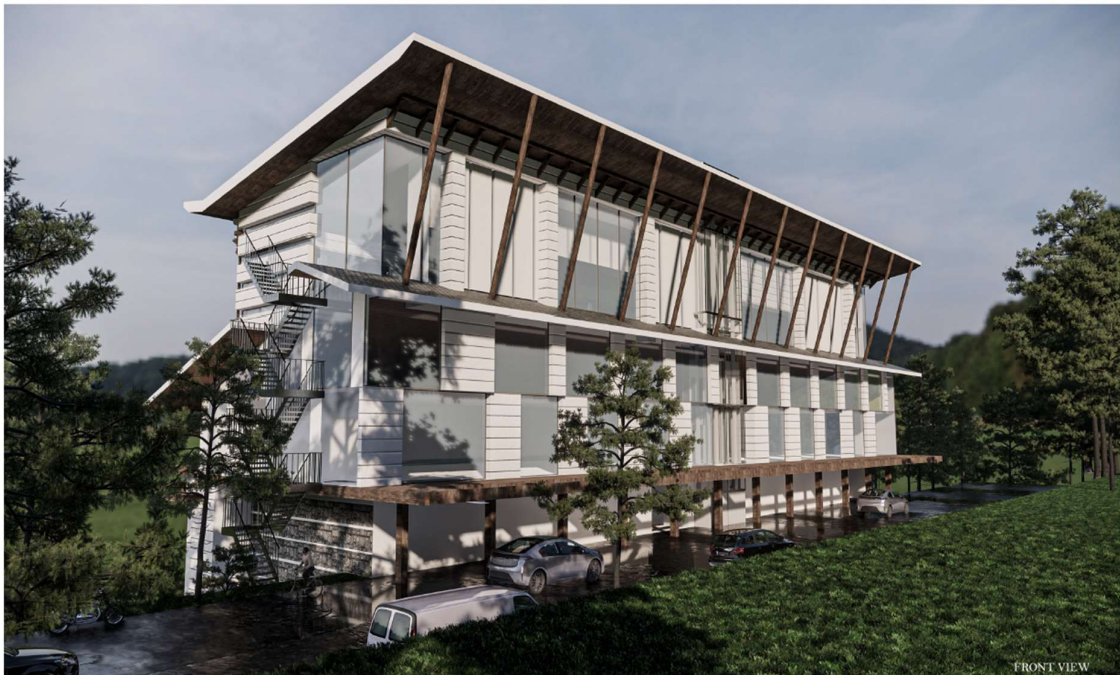
GANGTOK SMART CITY DEVELOPMENT LIMITED



REQUEST FOR PROPOSAL (RFP)

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Single-Stage, Two-Envelope



Single-Stage, Two-Envelope

Volume – I

Issued On : 25th February 2022

Invitation for Bids No : 019/SPV/GSCDL/2020; Dated: 25th February 2022

EMPLOYER : GANGTOK SMART CITY DEV. LTD.

BID VALUE : INR 16.15 Crore

BID SECURITY : INR 40,37,500.00

COST OF BID DOCUMENT: 1 LAKH

PERIOD OF COMPLETION : 24 MONTHS

Table of Contents

Part I- BIDDING PROCEDURES	1
Section I- Instruction to Bidders	2
A. General.....	2
1. SCOPE OF BIDS	2
2. SOURCE OF FUND.....	2
3. Fraud and Corruption.....	2
4. Eligible Bidders	3
5. Eligible Materials, Equipment and Services.....	4
B. Contents of Bidding Documents.....	5
6. Sections of Bidding Document.....	5
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting.....	5
8. Amendment of Bidding Document	6
C. Preparation of Bids	6
9. Cost of Bidding.....	6
10. Language of Bid.....	7
11. Documents Comprising the Bid	7
12. Letters of Bid, and Schedules.....	7
13. Alternative Bids	7
14. Bid Prices and Discounts.....	7
15. Currencies of Bid and Payment.....	8
16. Documents Comprising the Technical Proposal	8
17. Documents Establishing the Qualifications of the Bidder.....	9
18. Period of Validity of Bids.....	9
19. Bid Security.....	9
20. Format and Signing of Bid	10
D. Submission and Opening of Bids.....	10
21. Sealing and Marking of Bids	10
22. Deadline for Submission of Bids.....	11
23. Late Bids:	11
24. Withdrawal of Bids.....	11
25. Bid Opening	12
E. Evaluation and Comparison of Bids.....	13
26. Confidentiality	13

27.	Clarification of Bids	13
28.	Deviations, Reservations, and Omissions	14
29.	Preliminary Examination of Technical Bids	14
30.	Responsiveness of Technical Bid	14
31.	Nonconformities, Errors, and Omissions	15
32.	Qualification of the Bidder	15
33.	Subcontractors	15
34.	Correction of Arithmetical Errors	16
35.	Conversion to Single Currency	16
36.	Margin of Preference	16
37.	Preliminary Examination of Price Bids-	16
38.	Evaluation of Bids	16
39.	Comparison of Bids	17
40.	Employer’s Right to Accept Any Bid, and to Reject Any or All Bids	17
F.	Award of Contract	18
41.	Award Criteria	18
42.	Notification of Award	18
43.	Signing of Contract	18
44.	Performance Security	18
	Section II - BID DATA SHEET	20
	Section III- Evaluation & Qualification Criteria	23
	Section IV- Bidding Forms	29
	Letter of Technical Bid	29
	Appendix to Technical Part	31
	BID SECURITY	32
	TECHNICAL PROPOSAL	33
	Letter of Financial Price Bid	47
	Appendix to financial bid	49
	Section V- Deleted	54
	PART II- EMPLOYERS REQUIREMENT	55
	Section VI- Employers Requirement	56
	Section VI A-Standard Specifications	57
	PART III- CONDITIONS OF CONTRACT	60
	Section VII- General Conditions of Contract	61

A.	General.....	61
1.	Definitions.....	61
2.	Interpretation	63
3.	Language and Law	64
4.	Project Manager’s Decisions	64
5.	Delegation	64
6.	Communications	64
7.	Subcontracting	65
8.	Other Contractors	65
9.	Personnel and Equipment	65
10.	Employer’s and Contractor’s Risks	65
11.	Employer’s Risks	65
12.	Contractor’s Risks	66
13.	Insurance.....	66
14.	Site Investigation Reports.....	69
15.	Contractor to Construct the Works	70
16.	The Works to Be Completed by the Intended Completion Date	70
17.	Designs by Contractor and Approval by the Project Manager.....	70
18.	Safety.....	71
19.	Discoveries	71
20.	Possession of the Site.....	71
21.	Access to the Site	71
22.	Instructions, Inspections and Audits	71
23.	Appointment of the Adjudicator.....	72
24.	Procedure for Disputes Resolution by Arbitration	72
B.	Time Control.....	73
25.	Program	73
26.	Extension of the Intended Completion Date.....	73
27.	Acceleration	73
28.	Delays Ordered by the Project Manager.....	74
29.	Management Meetings	74
30.	Early Warning.....	74
C.	Quality Control	74
31.	Identifying Defects.....	74

32.	Tests	75
33.	Correction of Defects.....	75
34.	Uncorrected Defects	75
D.	Cost Control.....	75
35.	Contract Price	75
36.	Changes in the Contract Price	76
37.	Variations.....	76
38.	Cash Flow Forecasts.....	77
39.	Payment Certificates.....	77
40.	Compensation Events	77
41.	Payments	78
42.	Tax	79
43.	Currencies	79
44.	Price Adjustment.....	79
45.	Retention.....	81
46.	Liquidated Damages	81
47.	Bonus.....	81
48.	Advance Payment.....	81
49.	Securities.....	82
50.	Day works	82
51.	Cost of Repairs.....	82
E.	Finishing the Contract	82
52.	Completion.....	82
53.	Taking Over.....	82
54.	Final Account	82
55.	Operating and Maintenance Manuals.....	83
56.	Termination	83
57.	Fraud and Corruption.....	84
58.	Payment upon Termination.....	84
59.	Property	85
60.	Release from Performance.....	85
61.	Suspension of Loan or Credit.....	85
62.	Eligibility	86
63.	Indemnities.....	86

64.	Indemnities	87
65.	Royalties	87
66.	Third Party Inspection and Testing	87
67.	Licenses for Explosives:.....	88
68.	Indemnities	88
69.	Incomplete or unattended defective works or delays	88
70.	Contractor’s General Responsibilities	88
71.	Water for works and workforce.....	90
72.	Project Manager and Project Manager’s representative	90
73.	Alterations, Additions and Omissions	90
74.	Deleted.....	91
75.	Site Order Book	91
76.	Measurement Book:.....	91
77.	Safety, Security and Protection of the Environment.....	91
78.	Labour	93
79.	Compliance with Labour Regulations	93
80.	Fair Wage Clause:	96
81.	Recovery of compensation paid to workmen	97
82.	Ensuring Sikkim Labour Protection Act 2005:.....	97
Section VIII- Particular Conditions of Contract.....		98
Appendix-1 Environmental Management Plan (deleted).....		102
Section IX - CONTRACT FORMS		103
Letter of Acceptance.....		104
Contract Agreement		106
Unconditional Performance Security		108
Advance Payment Security (Unconditional).....		109
Unconditional Bank Guarantee in Lieu of Retention Money		110

Part I- BIDDING PROCEDURES

Section I- Instruction to Bidders

A. General

1. SCOPE OF BIDS

- 1.1 In connection with the Specific Procurement Notice – Request for Bids (RFB), specified in the Bid Data Sheet (BDS), the Employer, as specified in the BDS, issues this bidding document for the provision of Works as specified in Section VII, Works' Requirements. The name, identification, and number of lots (contracts) of this RFB are specified in the BDS.
- 1.2 Unless otherwise stated, throughout this Bidding document definitions and interpretations shall be as prescribed in the Section VII, General Direction & Conditions of Contract.
- 1.3 Throughout this Bidding Document:
 - (a) the term **—in writing** means communicated in written form (example by mail, email, fax) and delivered against receipt;
 - (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and
 - (c) —day means calendar day.

2. SOURCE OF FUND

- 2.1 The Borrower or Recipient (hereinafter called —GSCDL) indicated in the BDS has applied for or received financing (hereinafter called —funds) from the Smart City Mission (SCM) towards the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
- 2.2 Deleted

3. Fraud and Corruption

- 3.1 The Anticorruption Policy applicable in state of Sikkim requires bidders, suppliers, subcontractors and contractors under GSCDL-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, GSCDL.
 - (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^{ll} 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 harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

Part I- BIDDING PROCEDURES

- 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 reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract;
- (c) will sanction a firm or an individual, at any time, in accordance with the Anti-Corruption Policy and integrity Principles and guidelines (both as amended from time to time), including declaring in-eligible, either indefinitely or a stated period of time, to participate in GSCDL financed or GSCDL administered activities or to benefit from an GSCDL-finance or GSCDL-administered contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt fraudulent, collusive or coercive or other prohibited practices.
- (d) Will have the right to require that a provision be included in Bidding Documents and in contracts financed by GSCDL, requiring bidders, suppliers and contractors and consultants to permit the GSCDL to inspect their accounts and records and other documents relating to the Bid Submission and Contract Performance and to have them audited by auditors appointed by GSCDL.
- (e) Will cancel the portion of the financing allotted to contract if it determines at any time that representatives of the contractor or of a beneficiary or GSCDL financing engaged in corrupt, fraudulent, collusive or coercive or other prohibited practice during the procurement or the execution of the contract, without the borrower having taken timely and appropriate actions satisfactory to GSCDL to remedy the situation

3.2 Furthermore, Bidders shall be aware of the provisions of GCC 22.2 and 56.2 (h).

4. Eligible Bidders

- 4.1 A Bidder may be a natural person, private entity, government-owned entity—subject to ITB 4.5—under an existing agreement:
- 4.2 A Bidder, and all parties constituting the Bidder, shall have the Indian nationality. A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 4.3 GSCDL considers a conflict of interest 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, and that such conflict of interest may contribute to or constitute a prohibited practice under GSCDL's Anticorruption Policy. In pursuance of GSCDL's Anticorruption Policy's requirement that bidders, suppliers, subcontractors and contractors under GSCDL-financed contracts, observe the highest standard of ethics, GSCDL will take appropriate actions, which include not financing of the contract, if it determines that a conflict of interest has flawed the integrity of any procurement process. Consequently, all Bidders found to have a conflict of interest shall be

Part I- BIDDING PROCEDURES

disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to:

- a. they have controlling shareholders in common; or
 - b. they receive or have received any direct or indirect subsidy from any of them; or
 - c. they have the same legal representative for purposes of this bid; or
 - d. they 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 Employer regarding this bidding process; or
 - e. A 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 party is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid; not otherwise participating as a Bidder.
 - f. A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or
 - g. A Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Employer as Engineer for the contract.
- 4.4 A firm that is under a declaration of ineligibility by the GSCDL in accordance with ITB 3, at the date of the deadline for bid submission or thereafter, shall be disqualified. A bid from a sanctioned or cross debarred firm by any government agencies of Employers country will be rejected. It is the duty of the Contractor/Bidder to notify Employer if the Contractor/Bidder is being debarred by any agencies as mentioned above. The contractor bid will be summarily terminated even after contract has been awarded if it is found to in case of any such information comes to the notice of Employer in such an event the contractor will be liable for all losses and liabilities of Employers as well as of contractors firm.
- 4.5 Government-owned enterprises in the Employer's country shall be eligible only if they can establish that they are legally and financially autonomous and operate under commercial law, and that they are not a dependent agency of the Employer.
- 4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 4.7 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only for prequalified bidders.

5. Eligible Materials, Equipment and Services

- 5.1 The materials, equipment and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.
- 5.2 For purposes of ITB 5.1 above, —originl means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially

recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Documents

6. Sections of Bidding Document

6.1. The Bidding Document consist 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 8.

PART I Bidding Procedures

Section I - Instructions to Bidders (ITB)

Section II - Bid Data Sheet (BDS)

Section III - Evaluation and Qualification Criteria (EQC)

Section IV - Bidding Forms (BDF)

Section V –Deleted

PART II Requirements

Section VI – Employers Requirements (ERQ)

Section VIA – Standard Specifications (SS)

PART III Conditions of Contract and Contract Forms

Section VII - General Conditions (GCC)

Section VIII- Particular Conditions (PCC)

Section IX- Contract Forms (COF)

Part I and III are given in Volume I of the bidding document and Part II is given in the Volume II of the bidding document

6.2. The Invitation for Bids issued by the Employer is not part of the Bidding Document.

6.3. The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the Invitation for Bids.

6.4. The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

7.1. A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids, within a period given in the BDS. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.

Part I- BIDDING PROCEDURES

7.2. The Bidder is encouraged to visit and examine the Site of Works and its surroundings and obtain for itself on its own risk and responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

7.3. The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.4. The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5. The Bidder is requested, as far as possible, to submit any questions in writing, to reach the Employer not later than three days before the meeting.

7.6. Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

7 A Sufficiency of the Bid: The bidder shall be deemed to have satisfied himself before bidding as to the correctness and sufficiency of his tender for the Scope of Work.

8. Amendment of Bidding Document

8.1. At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.

8.2. Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document.

8.3. To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 22.2.

C. Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

- 10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in English. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents Comprising the Bid

- 11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid containing the documents listed in ITB 11.2 and the other the Price Bid containing the documents listed in ITB 11.3, both envelopes enclosed together in an outer single envelope.

- 11.2 The Technical Bid shall comprise the following:

- I. Letter of Technical Bid;
- II. Bid Security, in accordance with ITB 19;
- III. Bid Security, in accordance with ITB 19;
- IV. written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;
- V. documentary evidence in accordance with ITB 17 establishing the Bidder's Qualifications to perform the contract;
- VI. Technical Proposal in accordance with ITB 16; VI. Any other document required in the BDS.

- 11.3 The Price Bid shall comprise the following.

- (a) Letter of Price Bid;
- (b) completed Price Schedules, in accordance with ITB 12 and 14, or as stipulated in the BDS;
- (c) Any other document required in the BDS.

12. Letters of Bid, and Schedules

- 12.1 The Letters of Technical bid and Price bid, and all documents listed under Clause 11, i.e. Schedules, including the Bill of Quantities etc., shall be prepared using the relevant forms furnished in Section IV (Bidding Forms) if so provided. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

13. Alternative Bids

It will be the sole decision of the employer to accept or to reject any alternate bids so submitted by the bidders.

14. Bid Prices and Discounts

- 14.1 The prices and discounts quoted by the Bidder in the Letter of Price Bid and in the Bill of Quantities shall conform to the requirements specified below.

Part I- BIDDING PROCEDURES

- 14.2 The Bidder shall submit a bid for whole of the works described in ITB 1.1 by filling in prices for all items of Works, as identified in Section IV (Bidding forms). In case of admeasurements contracts, the bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.
- 14.3 The price to be quoted in the Letter of Price Bid, in accordance with ITB 12.1 shall be the total price of the Bid, excluding any discounts offered.
- 14.4 The Bidder shall quote Unconditional discounts, if any, and the methodology for their application in the Letter of Price Bid, in accordance with ITB 14.1.
- 14.5 If so indicated in ITB 1.1, bids are invited for individual contracts or for any combination of contracts (packages), Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.4, provided the bids for all contracts are submitted and opened at the same time.
- 14.6 Unless otherwise provided in the BDS and the Conditions of Contract, the prices quoted by the Bidder shall be fixed. If the prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data in Section IV (Bidding Forms) and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
- 14.8 Taxes, charges, Cess etc. including (but not limited to) Work Contract Tax (WCT), Seignorage/ Royalty / Labour Cess and any other charges as may be applicable from time to time at the prevailing rates shall be deducted from all payments made to the Contractor.
Contractor shall provide E-Way Bills, Form —38, or any other forms and comply with all the formalities that may be required by the Central/State Government for procurement of Owner supplied material.

15. Currencies of Bid and Payment

The currency(ies) of the bid and payment shall be as specified in the BDS.

16. Documents Comprising the Technical Proposal

The Bidder shall furnish, as a part of the Technical bid, a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.

17. Documents Establishing the Qualifications of the Bidder

- 17.1 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 in Section IV (Bidding Forms).
- 17.2 Domestic Bidders, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 35.

18. Period of Validity of Bids

- 18.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Employer. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.
- 18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid.

19. Bid Security

- 19.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its bid, in original form, either Bid Securing Declaration or a Bid Security as specified in the BDS. In case of Bid Security the amount shall be as specified in the BDS.
- 19.2 A Bid Securing Declaration shall use the form included in Section IV (Bidding Forms).
- 19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder's option, in any of the following forms:
 - a. an unconditional Bank Guarantee;
 - b. TDR/ FDR
 - c. Demand Draft

In the case of a Bank Guarantee, the Bid Security shall be submitted either using the Bid Security Form included in Section IV (Bidding Forms). The form must include the complete name of the Bidder. The Bid Security shall be valid for twenty-eight days (28) beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.
- 19.4 Any Bid not accompanied by to substantially compliant Bid Security, if required in accordance with ITB 19.3, or Bid Securing declaration in accordance with ITB 19.2, if required in accordance with ITB 19.1 shall be rejected by the Employer as non-responsive.
- 19.5 If a Bid Security is specified pursuant to ITB 19.1, the Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the Performance Security pursuant to ITB 43.1.

Part I- BIDDING PROCEDURES

- 19.6 If a Bid Security is specified pursuant to ITB 19.1, the Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security.
- 19.7 The Bid Security may be forfeited or the Bid Securing Declaration executed:
- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, except as provided in ITB 18.2 or
 - (b) if the successful Bidder fails to:
 - i. sign the Contract in accordance with ITB 42;
 - ii. furnish a Performance Security in accordance with ITB 43.1.
 - iii. accept the correction of its Bid price pursuant to ITB 33.2

20. Format and Signing of Bid

- 20.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it —ORIGINAL-TECHNICAL BID AND ORIGINAL-PRICE BID|. In addition, the Bidder shall submit copies of the bid, in the number specified in the BDS, and clearly mark each of them —COPY|. In the event of any discrepancy between the original and the copies, the original shall prevail.
- 20.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature.
- 20.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

- 21.1. Bidders may always submit their bids by mail or by hand. When so specified in the BDS, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows.
- (a) Bidder shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, in separate sealed envelopes, duly marking the envelopes as —ORIGINAL - TECHNICAL BID|, —ORIGINAL - PRICE BID| and —COPY NO... - TECHNICAL BID| and —COPY NO.... - PRICE BID|. These envelopes, the first containing the originals and the others containing copies, shall then be enclosed in one single envelope per set.
 - (b) Bidders submitting bids electronically shall follow the electronic bid submission procedures specified in the BDS.
- 21.2. The inner and outer envelopes shall:
- (a) bear the name and address of the Bidder;
 - (b) be addressed to the Employer as provided in BDS 22.1;

Part I- BIDDING PROCEDURES

- (c) bear the specific identification of this bidding process indicated in the BDS 1.1; and
- 21.3. The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB Sub-Clause 25.1.
- 21.4. The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB Sub-Clause 25.1.
- 21.5. Alternative Bids, if permissible in accordance with ITB Clause 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB Clauses 20 and 21, with the inner envelopes marked in addition —ALTERNATIVE NO.... as appropriate.
- 21.6. If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

22. Deadline for Submission of Bids

- 22.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.
- 22.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. Late Bids:

The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

Withdrawal of Bids

24. Withdrawal of Bids

- 24.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be:
 - (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked —WITHDRAWAL, —SUBSTITUTION, —MODIFICATION, and
 - (b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 22.
- 24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

Part I- BIDDING PROCEDURES

- 24.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

25. Bid Opening

- 25.1 The Employer shall open the Technical bids in public at the address, date and time specified in the BDS in the presence of Bidder's designated representative and anyone who chose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 21.1 shall be as specified in the BDS. The Price bids will remain unopened and will be held in the custody of the Employer until the specified time of their opening.
- 25.2 First, envelopes marked —WITHDRAWAL shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.
- 25.3 Second, outer envelopes marked —SUBSTITUTION shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bids shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the substitution Technical Bid, if any, shall be opened, read out and recorded. Substitution Price Bid will remain unopened in accordance with ITB Sub-Clause 25.1. No envelope 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.
- 25.4 Next, outer envelopes marked —MODIFICATION shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification is to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with ITB Sub-Clause 25.1.
- 25.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:
- a. the name of the Bidder;
 - b. Whether there is a modification or substitution
 - c. the presence of a Bid Security, if required; and
 - d. any other details as the Employer may consider appropriate.
- Only Technical Bids and alternative Technical bids read out and recorded at bid opening shall be considered for evaluation. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB Sub-Clause 23.
- 25.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is withdrawal, substitution or modification, alternative proposals and the presence or absence of a bid security, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

Part I- BIDDING PROCEDURES

- 25.7 At the end of the evaluation of the Technical Bids, the Employer will inform the bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice of the opening of Price Bids.
- 25.8 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and return their Price Bids unopened.
- 25.9 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders' representatives who choose to attend at the address, date and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.
- 25.10 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:
- (a) the name of the Bidder;
 - (b) Whether there is a modification or substitution,
 - (c) the Bid Prices, including any discounts; and
 - (d) any other details as the Employer may consider appropriate.
- Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. No Bid shall be rejected at the opening of Price Bids.
- 25.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

E. Evaluation and Comparison of Bids

26. Confidentiality

- 26.1. 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.
- 26.2. Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its Bid.
- 26.3. Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it may do so in writing.

27. Clarification of Bids

- 27.1 To assist in the examination, evaluation, and comparison of the Technical and Price bids, and qualification of the Bidders, the Employer may at its discretion ask any

Part I- BIDDING PROCEDURES

Bidder for a clarification of its bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in substance of the Technical bid or prices in the price bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 33.

- 27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.

28. Deviations, Reservations, and Omissions

- 28.1 During the evaluation of bids, the following definitions apply:
- a. Deviation is a departure from the requirements specified in the Bidding Document;
 - b. Reservation is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
 - c. Omission is the failure to submit part or all of the information or documentation required in the Bidding Document.

29. Preliminary Examination of Technical Bids

- 29.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB Sub-Clause 11.2 have been provided, and to determine the completeness of each document submitted.
- 29.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid.
- (a) Letter of Technical Bid
 - (b) Written confirmation of authorization to commit the Bidder
 - (c) Bid Security, if applicable and
 - (d) Technical Proposal in accordance with ITB 16

30. Responsiveness of Technical Bid

- 30.1 The Employer's determination of a bid's responsiveness will be based on the contents of the bid itself, as defined in ITB 11.
- 30.2 A substantially responsive Technical bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,
- (a) if accepted, would:
 - i. Affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
 - ii. Limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or
 - (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.
- 30.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of

Section VI (Employers Requirements) have been met without any material deviation, reservation or omission.

- 30.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

31. Nonconformities, Errors, and Omissions

- 31.1 Provided that a bid is substantially responsive, the Employer may waive any nonconformity in the bid that does not constitute a material deviation, reservation or omission.
- 31.2 Provided that a Technical bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Technical bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.
- 31.3 Provided that a Technical bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price may be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the methods indicated in Section III (Evaluation and Qualification Criteria).

32. Qualification of the Bidder

- 32.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meet the qualifying criteria specified in Section III (Evaluation and Qualification Criteria).
- 32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1.
- 32.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.

33. Subcontractors

- 33.1 Unless otherwise stated in the BDS, the Employer does not intend to execute any specific elements of the Works Design and Build by sub-contractors selected in advance by the Employer (so-called —Nominated Subcontractors§).)
- 33.2 Subcontractors proposed by the Bidder shall be fully qualified for their parts of the contract. The subcontractor's qualifications shall not be used by the Bidder to qualify for the contract unless the Bidder designates them as Specialized Subcontractors, in which case, the qualifications of the Specialized Subcontractor proposed by the Bidder may be added to the qualifications of the Bidder for the purpose of the evaluation, if specified in BDS.

33.3 Bidders may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified in the BDS. Sub-contractors proposed by the Bidder shall be fully qualified for their parts of the Works.

34. Correction of Arithmetical Errors

34.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:

- a. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
- b. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- c. if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
- d. If there is a discrepancy in the ORIGINAL and COPY, the figures given in ORIGINAL shall prevail.

34.2 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 may be forfeited.

35. Conversion to Single Currency

35.1 For evaluation and comparison purposes, the currency(ies) of the bid shall be converted into a single currency as specified in the BDS.

36. Margin of Preference

36.1 Unless otherwise specified in the BDS, a margin of preference shall not apply.

37. Preliminary Examination of Price Bids-

Deleted

38. Evaluation of Bids

38.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.

38.2 To evaluate bid price, the Employer shall consider the following:

- a. The evaluation committee shall evaluate the Stage-I Qualification Criteria such as preliminary qualifications, financial eligibility and Technical eligibility. The bidder who satisfies these requirements will be made eligible for further evaluation of full technical proposals (Stage-II) on the basis of their responsiveness to the Terms of Reference, applying the evaluation criteria, sub-criteria, and point system specified

Part I- BIDDING PROCEDURES

- in **BDS**. Each responsive Proposal will be given a technical score (St). A Proposal shall be rejected at this stage if it does not respond to important aspects of the RFP.
- b. The bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurements contracts, or Schedule of Prices for lump sum contracts, but including Day work items, where priced competitively;
 - c. price adjustment for correction of arithmetic errors in accordance with ITB 33.1;
 - d. price adjustment due to discounts offered in accordance with ITB 14.4;
 - e. converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 34;
 - f. adjustment for nonconformities in accordance with ITB 31.3;
 - g. The price bid will then be given a financial score as specified in detail in Section III (Evaluation and Qualification Criteria);
 - h. application of all the evaluation factors indicated in Section III (Evaluation and Qualification Criteria);
 - i. Any other additional evaluation factors specified in the BDS and Section III, Evaluation and Qualification Criteria.
- 38.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 38.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Bid, is specified in Section III (Evaluation and Qualification Criteria).
- 38.5 If the Bid for an admeasurements contract, which results in the lowest Evaluated Bid Price is seriously unbalanced, front loaded or substantially below updated estimates in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items in the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

39. Comparison of Bids

- 39.1 The Employer shall compare all substantially responsive bids to determine the lowest evaluated bid in accordance with ITB 37.2.

40. Employer's Right to Accept Any Bid, and to Reject Any or All Bids

- 40.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby

incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

41. Award Criteria

- 41.1 The Employer shall award the Contract to the Bidder whose bid is declared the Most Advantageous Bid by the Tender Evaluation Committee which is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

42. Notification of Award

- 42.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted. The Notification letter (hereinafter and in the conditions of contract and contract forms called —The Letter of Acceptance), shall specify the sum that the Employer will pay the contractor in consideration of the execution and completion of the works. (Hereinafter and in the conditions of contract and contract forms called —The Contract Price).
- 42.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 42.3 At the same time, the Employer shall put up in the public domain information about the results of the bidding process which will include the following information (i) name of the winning Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful bidders may request in writing to the Employer a debriefing seeking explanations on the grounds on which their bids were not selected. The Employer shall respond in writing to any unsuccessful Bidder who, after publication of contract award, requests a debriefing after the evaluation process is complete.

43. Signing of Contract

- 43.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.
- 43.2 Within fifteen (15) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

44. Performance Security

- 44.1 Within fifteen (15) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the Conditions of Contract, subject to ITB 37.5, using for that purpose the Performance Security Form included in Section IX (Contract Forms), or another form acceptable to the Employer. If the institution issuing the Performance Security is located outside the country of the Employer, it shall have a correspondent financial institution located in the country of the Employer to make it enforceable.

Part I- BIDDING PROCEDURES

44.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

The above provision shall apply for furnishing of a domestic preference security if so required.

Section II - BID DATA SHEET

This Section Consists of Specific Data for the proposed work and shall complement, supplement or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail

A. General

ITB 1.1	The number of the Invitation for Bids is-1
ITB 1.1	The Employer is: Gangtok Smart City Development Limited
ITB 1.1	The name of the bidding process is: Request for Proposal (RFP) The name of the RFP is: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA Identification no. of this bidding process is- 019/GSCDL/2022
ITB 2.1	The Borrower is: GSCDL

B. Contents of Bidding Documents

ITB 7.1	For clarification purposes only, the Employer's address is: Attention : Chief Executive Officer Postal Address: Office of the CEO, Gangtok Smart City Dev. Ltd Office, Level 5, Kissan Bazaar, Gangtok. ZIP Code: 737101 Country: The Republic of India Telephone:- Facsimile number: - email : ceosmartcity.gangtok@gmail.com & gangtoksmartcity@gmail.com Website: - http://smartcitygangtok.com/
ITB 7.4	Interested eligible bidders may go through the bidding documents and obtain further information if any needed, from the Office of the undersigned from 21.03.2022 to 22.03.2022 between 1100 hrs to 1500 hrs.

C. Preparation of Bids

ITB 11.2(g)	Bidder shall submit with its Technical Bid the following additional documents: Safety Plan for execution of works
ITB 11.3(d)	Deleted
ITB 14	The Bidder shall be deemed to have been satisfied himself as to the correctness and sufficiency of the Bid and the rates and prices stated in the Bill of Quantities, all of which shall, except in so far as it is otherwise provided in the contract, cover all his obligations under the contract and all matters and things necessary for the proper execution and completion of the works and the remedying of any defects there in.
ITB 14.6	The price quoted by the bidder shall not be subjected to any price adjustment

Part I- BIDDING PROCEDURES

ITB 15	The prices shall be quoted by the bidder and shall be paid in: Indian Rupees
ITB 18.1	The bid validity period shall be 180 days after the bid submission deadline date.
ITB 19.1	The Bidder shall furnish a Bid Security for an amount of INR 40,37,500.00
ITB 19.3	The Bid Security shall be in the form of an unconditional and irrevocable Bank Guarantee/ TDR/ FDR only from a Nationalized /Scheduled bank in India. The validity of Bid Security shall be 28 days beyond the original validity period of 180 days or beyond any of extension if requested. FDR/ TDR certificate as security should be equivalent or higher value than the Bid Security fee are acceptable provided it is pledged in favour of Gangtok Smart City Development Limited and such pledging has been noted and suitably endorsed by the bank issuing the certificate.
ITB 20.1	In addition to the original of the bid, the number of copies is/ are: 1 (One)
ITB 20.2	The written confirmation of authorization to sign on behalf of the bidder shall consist of: a. Power of Attorney from the authorized persons to issue from the company. b. All the pages of the bid shall be signed or initialed by a person signing the bid along with the seal.

D. Submission and Opening of Bids

ITB 21.1 (a)	The Bidder should use the bid documents in original and duplicate issued to him by the Employer for filling and submitting the price bid along with supporting information, if any. He should prepare and submit the technical bid in the formats given in the bid document and submit it separately.
ITB 21.1(b)	Electronic Bid Submission shall be not applicable.

23

ITB 22.1	For <u>bid submission purposes</u> only, the Employer's address is: Attention: Chief Executing Officer, GSCDL. Office of the CEO, Kissan Bazaar, Gangtok- 737101, East Sikkim. Floor/Room number: Level 5 City: Gangtok ZIP Code: 737101 Country: India The deadline for bid submission is: Date: 24.03.2022 Time: 1500 hrs IST
-----------------	---

Part I- BIDDING PROCEDURES

<p align="center">ITB 25.1</p>	<p>The opening of the Technical Bid shall take place at:</p> <p>Office of the CEO, Level 5, Kissan Bazaar, Gangtok</p> <p>Postal Address: Office of the CEO, Kissan Bazaar, Gangtok- 737101, East Sikkim.</p> <p>Floor/Room number: Level 5</p> <p>City: Gangtok</p> <p>Country: India</p> <p>Date: 25.03.2022</p> <p>Time: 1100 hrs IST</p>
<p align="center">ITB 25.9</p>	<p>The opening of the Financial Bid shall take place at:</p> <p>Office of the CEO, Kissan Bazaar</p> <p>Postal Address: Office of the CEO, Kissan Bazaar, Gangtok- 737101, East Sikkim.</p> <p>Floor/Room number: Level 5</p> <p>City: Gangtok</p> <p>Country: India</p> <p>Date & Time: Shall be notified to the successful technical bidders</p>

E. Evaluation and Comparison of Bids

<p>ITB 32-A- 4</p>	<p>(a) Contractor's proposed subcontracting: sub-contracting: Not Allowed</p>
<p>ITB 34.1</p>	<p>The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: Indian Rupees</p>
<p>ITB 35</p>	<p>A margin of preference shall not apply</p>
<p>ITB 37.2 (h)</p>	<p>Additional requirements apply- These are detailed in the evaluation criteria in Section III, Evaluation and Qualification Criteria.</p>
<p>ITB 43.1</p>	<p>Performance Security shall be from a nationalized bank/scheduled bank situated in India and shall be valid for a period of 28 days beyond the completion date.</p>
<p>ITB 43.3</p>	<p>Not applicable</p>

Section III- Evaluation & Qualification Criteria

1. Evaluation

In addition to the criteria listed in ITB 37.2 (a) – (i) the following criteria shall apply:

Additional Evaluation Criteria

Not Applicable

1.1. Adequacy of Technical Proposal

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

1.2. Multiple Contracts

Not Applicable

1.3. Completion Time

Not Applicable

1.4. Alternative Technical Solutions

Not Applicable

1.5. Margin of Preference (Applicable for ICB only)

Not Applicable

1.6. Quantifiable Nonconformities, Errors and Omissions

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

"Pursuant to Sub-Clause 31.3 of Section I: Instructions to Bidders, the cost of all quantifiable nonconformities, errors, or omissions in a Bidder's Bid Proposal shall be evaluated. The Employer shall make its assessment of the cost of any quantifiable nonmaterial nonconformities, errors, or omissions for the purpose of ensuring fair comparison of Bids, and for this purpose, the Employer shall base its assessment on the highest price quoted for the same item(s) or component(s) by the other responsive Bidders."

2. Qualification Criteria

Eligibility and Qualification Criteria			Compliance Requirements	Documentation
Sl. No.	Subject	Requirements		Submission Requirements
1. Eligibility				
1.1	Nationality	Indian	Must meet requirement	Forms ELI – 1 with attachments
1.2	Conflict of Interest	No conflicts of interest	Must meet requirement	Letter of interest
1.3	GSCDL Eligibility	Not having been declared ineligible by the GSCDL& any other agencies.	Must meet requirement	Letter of interest
1.3A		Class IA Contractor/ Contracting Firm registered under registration system in SK PWD with a valid UIN or Equivalent Registration in any state Govt. Dept. Central Govt. Dept., other Govt. Dept./ undertaking of state/ Central Govt.	Must meet requirement	Forms ELI – 1 with attachments
1.4	Government owned enterprise or institution	Meets conditions.	Must meet requirement	Forms ELI – 1 and with attachments
2. Historical Contract Non-Performance				
2.1	History of Non-Performance	Non-performance of a contract ¹ did not occur as a result of contract or default since the last three years.	Must meet requirement	Form LIT – 1
2.2	Pending Litigation	Bidder's financial position and prospective long term Profitability sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Bidder.	Must meet requirement by itself	Form LIT – 1
3. Financial Situation and Performance				

¹Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution

Part I- BIDDING PROCEDURES

Eligibility and Qualification Criteria			Compliance Requirements	Documentation Submission Requirements												
Sl. No.	Subject	Requirements														
3.1	Financial Capabilities	i. Solvency certificate should be for an amount equal to 40% of the estimated cost of work.	Must meet requirement	Form FIN –3.1 with Attachments												
		ii. Profit/loss account papers should be as on 31st March of the previous financial year.	Must meet requirement													
3.2	Average Annual Turnover	Average annual financial turnover on construction works should be at least 30 percent of contract value, during the last three years ending 31st March of the previous financial year.	Must meet requirement	Form FIN –3.2												
<p>The turnover of the previous years’ value shall be updated to 2020-21 price level by giving weightage of 7% per year as follows:</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Financial Year</th> <th>Weight age</th> </tr> </thead> <tbody> <tr> <td>(i)</td> <td>2020-21</td> <td>1.00</td> </tr> <tr> <td>(ii)</td> <td>2019-20</td> <td>1.07</td> </tr> <tr> <td>(iii)</td> <td>2018-19</td> <td>1.14</td> </tr> </tbody> </table>					Sl. No.	Financial Year	Weight age	(i)	2020-21	1.00	(ii)	2019-20	1.07	(iii)	2018-19	1.14
Sl. No.	Financial Year	Weight age														
(i)	2020-21	1.00														
(ii)	2019-20	1.07														
(iii)	2018-19	1.14														
4. Experience																
4.1	Work Experience	<p>(a) Three similar works experience having successfully completed, costing not less than the amount equal to 40 percent of estimated cost put to tender.</p> <p>(b) Two similar works costing not less than the amount of 50% of the estimated cost put to tender.</p> <p>(c) One similar work of aggregate cost not less than 80 % of the estimated cost.</p>	Must meet requirement	Form EXP 4.1												

Personnel

mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

Part I- BIDDING PROCEDURES

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:

No.	Position	Total Work Experience [years]
1.	Civil Engineer-1 no.	B.E./ Diploma in Civil Engineering with 2 years' experience in relevant field
2.	Site supervisors-1no.	Diploma or B.E. Civil Engineering

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Information Forms PER-1 and PER-2 included in (Bidding Forms).

Equipment

The Bidder must demonstrate that it has the key equipment listed hereafter:

No.	Equipment Type and Characteristics	Min. Number Required
1	Crawler excavator Ex-200/300 or equivalent	1
2	Concrete mixer RM800 type or equivalent	1
3	Vibrator 5 hp / 2hp with nozzles 60 /40/20 / as required	4
4.	Plywood shuttering for casting of slab/ beam/ columns etc.	300 Sqm
5	Cup-lock staging and scaffolding for putting up formwork up to height of 4m for slab and for external façade and finishing works up to height of 15m	500 Sqm
6	Laboratory for testing fineness, consistency, setting time compressive & tensile strength of cement compressive & flexural strength of cement concrete and proof stress, elongation, tensile strength, bending & re-bending of reinforcement steel. Fully equipped field level laboratory for testing of general materials located at project site or at authority approved nearby place.	1

The Bidder shall provide further details of proposed items of equipment using the relevant FormEQ-1 and EQ-2 (Bidding Forms)

3. Bid Evaluation Process

The method of evaluation of the Most Advantageous Bid will be based on the —Least Cost Bidl and the following steps as given below will be followed.

The Employer shall constitute a Tender Evaluation Committee to evaluate the responses of the bidders. The Tender Evaluation Committee shall evaluate the responses to the RFP and all supporting documents/documentary evidence. Inability to submit requisite supporting documents/documentary evidence by bidders may lead to rejection of their bids.

The decision of the Tender Evaluation Committee in the evaluation of bids shall be final. No correspondence will be entertained outside the process of evaluation with the Committee. The Tender Evaluation Committee may ask for meetings or presentation with the Bidders to seek clarifications or conformations on their bids.

The tender Evaluation Committee reserves the right to reject any or all bids. Each of the responses shall be evaluated as per the criteria and requirements specified in this RFP. The steps for evaluation are as follows-

3.1 Stage 1:Pre-Qualification (document sufficiency)

The Technical Evaluation Committee shall validate the following documents as per RFP. Each of the Pre-Qualification condition mentioned in this RFP is MANDATORY. In case, the Bidder does not meet any one of the conditions, the bidder shall be disqualified.

- 3.1.1. Demand Draft towards the cost of bid from a Nationalized/ Scheduled / commercial Bank drawn in favor of CEO, GSCDL, Gangtok 737101, Sikkim.
- 3.1.2. Unconditional BG/ FDR/ TDR/ Demand Draft in respect of Bid Security from any nationalized/Scheduled /commercial Bank drawn in favor of CEO, GSCDL, Gangtok 737101, Sikkim.
- 3.1.3. Permanent Account No (PAN) of the Bidder/Firm/Company/ Society along with Contractor/ Company's Enlistment certificate.
- 3.1.4. Self-attested copy of Sales/ Service Tax/ GST registration and Sales/ Service Tax/ GST returns filed in last three years.
- 3.1.5. Self-attested documentary evidence of (a) the Proof of Residence of the Bidder (in case of Proprietor/Partnership Firm (b) Proof of Registered Office of the Company and Residential Address of the Director/Authorized Representative (in case of Bidder being a Company) (c) Proof of Registered office of the Society and Residence of President/Secretary (in case Bidder being a Society) as well as, Proof of the Address of the Office of the Bidder Firm/Company/Society.
- 3.1.6. Self-attested copy of bank statement indicating name of the Bank and Account No. of the Bidder Firm/Company/Society.
- 3.1.7. 3.1.8. Bidding forms ELI- 1, and LIT-1 establishing the eligibility of the bidder to bid the contract along with relevant certificates.

Part I- BIDDING PROCEDURES

- 3.1.9. Bidding forms EXP 4.1, establishing the experience of works done by the bidder along with completion certificate from the client agency certifying the successful completion of the similar work done by the bidder.
- 3.1.10. Bidding forms FIN- 3.1, 3.2 establishing the financial capacity of the bidder. The turnover/network/financial status of the bidder shall be ascertained from the following documents which the bidder is required to submit along with the tender document for the preceding three financial years FY 2018-19, 2019-20 and 2020-21 duly certified by a Chartered Accountant
- Audited Financial Statement of the Firm/Company/ Society
 - Audited Balance sheet of the Firm / Company /Society
 - Audited copies of profit and loss statements
 - Audited copies of Cash flow statements
 - Affidavit on List of Existing Commitment & Ongoing works
- 3.1.11. The bidder has to submit a Letter of Bid as per format given.
- 3.1.12. Technical bids along with the compliance sheet of technical specifications and with necessary documents should be filled in all respects and each paper should be signed by the authorized representative and submitted.
- 3.1.13. The bidder has to submit financial bid in separate sealed marked as —Financial Bid on the envelope and should contain Letter of Price Bid, Price Schedules.

3.2 Stage II Technical Evaluation

The Technical Evaluation Committee will review the technical bids of the bidders who have cleared the document sufficiency stage, to determine whether the technical bids are substantially responsive. Bids that are not substantially responsive are liable to be disqualified at Authority's discretion.

3.3 Stage III Financial Evaluation

All bidders who have been technically qualified will be notified to participate in Financial Bid opening process. The Financial bids of all the bidders shall then be opened on the notified date and time and reviewed to determine whether the commercial bids are substantially responsive. Bids that are not substantially responsive are liable to be disqualified at Authority's discretion.

Financial bids that are not as per the format provided shall be liable for rejection.

The Lowest price bid received will be declared as Most Advantageous Bid and the bidder will be awarded the Letter of Acceptance.

Bid Security of all other bidders shall be returned after Performance Security is submitted by successful bidder.

Section IV- Bidding Forms

Letter of Technical Bid

The Bidder must accomplish the Letter of Bid in its letterhead clearly showing the Bidder's complete name and address.

Date:

Bid No.:

Invitation for Bid No.:

To:

CEO

GSCDL, Level 5, Kissan Bazaar, Gangtok.

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda No _____;
- (b) We offer to execute in conformity with the Bidding Documents the following Works: **MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA**
- (c) Our bid shall be valid for a period as specified in the BDS ITB 18.1 (or as amended if applicable) _____ (fill the number of days as per ITB 18.1) from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of 2.5 percent of the contract Price for the due performance of Contract.
- (e) Our firm, including any subcontractors or suppliers for any part of the Contract, have Indian nationalities;
- (f) We, hereby certify that we including any subcontractors or suppliers for any part of the contract meet the eligibility criteria and do not have any conflict of interest in accordance with ITB 4⁶.
- (g) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 7,
- (h) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by the Employer & other agencies, under the Employer's country laws;
- (i) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption;

Part I- BIDDING PROCEDURES

- (j) 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 & executed.
- (k) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (l) We agree to permit GSCDL or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the GSCDL².

Name: _____

In the capacity of: _____

Signed; _____

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

Date: _____

² Use one of the two options as appropriate.

Appendix to Technical Part

(Technical Bid Forms)

BID SECURITY

Bank Guarantee

Bank's Name, and Address of Issuing Branch or Office

Beneficiary:

Date:

Bid Security No.:

We have been informed that *[name of the Bidder]*. (hereinafter called —the Bidder) has submitted to you its bid dated (Hereinafter called —the Bid) for the execution of name of Contract. under Invitation for Bids No. (—the IFB).

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

At the request of the Bidder, we *[name of Bank]*. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of amount in figures (. *[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 Form of Bid; or
- (b) does 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 its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the performance security, in accordance with the ITB.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement 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 your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration 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.

..... **Bank's seal and authorized signature(s)**

TECHNICAL PROPOSAL

Form PER – 1: Proposed Personnel

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

1	Title of position
	Name
2	Title of position*
	Name
3	Title of position*
	Name
4	Title of position*
	Name
5	Title of position*
	Name

*As listed in section III (Evaluation and Qualification criteria)

Part I- BIDDING PROCEDURES

Form PER – 2: Resume of Proposed Personnel

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

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

Part I- BIDDING PROCEDURES

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

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

Part I- BIDDING PROCEDURES

Form E Q-I: Information on Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III (Evaluation and Qualification Criteria). A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (*) shall be used for evaluation.

Type of Equipment*		
Equipment Information	Name of manufacturer	Model and power rating
	Capacity*	Year of manufactured
Current Status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Part I- BIDDING PROCEDURES

Form-EQ-2: Information on Equipment

The following information shall be provided only for equipment not owned by the Bidder.

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

Part I- BIDDING PROCEDURES

Form ELI – 1: Bidder’s Information Sheet

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

Bidder’s Information	
Bidder’s legal name	
Bidder’s country of constitution	
Bidder’s year of constitution	
Bidder’s legal address in country of constitution	
Bidder’s authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are copies of the following original documents.</p> <ol style="list-style-type: none"> 1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2. 2. In case of a government-owned entity, any additional documents not covered under 1 above required to comply with ITB 4.5. 3. Organization chart, and list of Board of Directors 	

Part I- BIDDING PROCEDURES

Form LIT – 1: Historical Contract Non-Performance and Pending Litigation

Non-Performed Contracts , Evaluation and Qualification Criteria			
<input type="checkbox"/> Contract non-performance did not occur since 1st January [insert year] specified in Section III, Evaluation and Qualification Criteria <input type="checkbox"/> Contract(s) not performed since 1 st January [insert year] specified, Evaluation and Qualification Criteria.			
Year	Non-performed Portion of contract	Contract Identification	Total Contract Amount (INR)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/city/country] Reason(s) for non-performance: [indicate main reason(s)]	[insert amount]
Pending Litigation, Evaluation and Qualification Criteria			
<input type="checkbox"/> No pending litigation, Evaluation and Qualification Criteria. <input type="checkbox"/> Pending litigation, Evaluation and Qualification criteria as indicated below.			
Year of Dispute	Amount in dispute (INR)	Contract Identification	Total Contract Amount (INR)
		Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: Party who initiated the dispute: ____ [indicate -Employer lor -Contractor] Status of dispute: _____ [Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary] Contract Identification: _____ Name of Employer:	

Part I- BIDDING PROCEDURES

		Address of Employer: Matter in dispute: [indicate-Employer or Contractor] Party who initiated the dispute: Status of dispute: Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]	
--	--	--	--

Form FIN – 3.1: Financial Situation and Performance

1. Financial data

Type of Financial information in (INR)	Historic information for previous 3 years		
	Year 1	Year 2	Year 3
Statement of Financial Position (Information from Balance Sheet)			
Total Assets (TA)			
Total Turnover			
Total Liabilities (TL)			
Total Equity/Net Worth (NW)			
Current Assets (CA)			
Current Assets + Loans & Advances			
Current Liabilities (CL)			
Current Liabilities & provision			
Working Capital (WC)			
Information from Income Statement			
Total Revenue (TR)			
Profits Before Taxes (PBT)			
Profits after Tax			
Cash Flow Information			
Cash Flow from Operating Activities			
Net cash accruals= Profit after Tax + depreciation			
<p>This information should be extracted from the Annual Financial Statements/ Balance sheets, which should be enclosed. Year 1 will be the latest year for which audited financial statements are available. Year 2 shall be the year immediately preceding year 1 and year 3 shall be the year immediately preceding Year 2.</p>			

Part I- BIDDING PROCEDURES

2. Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (INR)
1		
2		
3		

3. Financial documents

The Bidder and its parties shall provide copies of financial statements for last 3 years pursuant Section III, Evaluation and Qualifications Criteria, Sub-clause 3.2. The financial statements shall:

- (a) reflect the financial situation of the Bidder or as an affiliated entity (such as parent company or group member).
- (b) be independently audited or certified by a Chartered Accountant.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements³ for the _____ years required above; and complying with the requirements.

³ If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

Form FIN - 3.2: Average Annual Construction Turnover

Annual turnover data (construction only)	
Year	Amount in INR
[indicate year]	[insert amount]
Average Annual Construction Turnover *	

* See Section III, Evaluation and Qualification Criteria, Sub-clause 3.2. Annual construction turnover calculated as total certified payments received for work in progress or completed, for 3 years. This should be certified by a Chartered Accountant.

Part I- BIDDING PROCEDURES

Affidavit – 1 for Assessment of Bidders Bidding Capacity
 (To be typed on Rs.100/- non judicial stamp paper)

(for assessment of bidder’s bidding capacity)

I/ We..... Agedyears, son/ daughter of..... do hereby solemnly affirm and declare as follows for and on behalf of the firm:

List of Existing Commitment & Ongoing works

SN	Name of the Work	Client Name & address	Work order value (in Rs. Cr.)	Work executed until date (Rs. In Cr)	Balance amount of work to be completed	Balance period to complete the works (in months)	Work to be completed in 12 months (Rs in Cr)

Part I- BIDDING PROCEDURES

Form EXP - 4.1 General Experience

Similar works

Starting Year	Ending Year	Contract Identification	Role of Bidder	Status of Project ⁴
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ _____ _____ Amount of contract: _____ Name of Employer: _____ Address: _____		
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ _____ _____ Amount of contract: _____ Name of Employer: _____ Address: _____		
		(add more rows if required)		

⁴ Mention whether the project is Complete or under progress. If it is under progress mention % of work complete.
 All above statements should be backed by corresponding experience certificate from respective Employers.

Part I- BIDDING PROCEDURES

Bidder’s Declaration on Affidavit

Date:

Bid No.:.....

Invitation for Bid No.:.....

To:

CEO
GSCDL, Level 5, Kissan Bazaar, Gangtok.

We, the undersigned, declare that:

- 1. We have seen the Section VI A: Standard Specifications and we have studied and understood all the Clauses of this Section. We accordingly offer to design, execute and complete the said Works and remedy any defects therein, fit for purpose in conformity with the relevant Clauses of this Section.
- 2. We further undertake to accept that these form a part of our bid and we agree to sign these at the time when the contract agreement is executed.

Dated this _____ day of _____ 20 ____.

Signed and Sealed by: _____

In the Capacity of: _____

Name and Address of Bidder: _____

(Affix company seal)

Letter of Financial Price Bid

Date:

Bid No.:.....

Invitation for Bid No.:.....

To:

CEO

GSCDL, Level 5, Kissan Bazaar, Gangtok.

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8;
- (b) We offer to execute in conformity with the Bidding Documents the following Works:
MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA.
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:
.....
- (d) The detailed breakup of the Bid is given in the Price Schedule From of the Bid
- (e) The discounts offered and the methodology for their application are: INR
- (f) Our Bid shall be valid for a period of as specified in the BDS ITB 18.1 (or as amended if applicable) _____ (fill the number of days as per ITB 18.1) from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (g) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
- (h) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: **

Part I- BIDDING PROCEDURES

Name of Recipient	Address	Reason	Amount

- (i) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (j) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (k) We agree to permit GSCDL or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the GSCDL.
- (l) If awarded the contract, the person named below shall act as Contractor’s Representative.

Name.....

In the capacity of.....

Signed.....

Duly authorized to sign the Bid for and on behalf of.....

Date.....

****If none has been paid or is to be paid, indicate “none”**

Appendix to financial bid

Financial Bid Form

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Invitation for Bid No.: 019/GSCDL/2022 Page 1/2 of Price Bid

SN	Ref Section VI	Description of Work	No.	Quantity	Units	Rate (INR)	Rate in Words (INR)	Amount (INR)
						In Figures	In Words	
1		Dismantling of existing building including safely disposing off the debris	1	820 (approx.)	Sqm			
2		Designing and construction of Mechanical Multilevel Car Parking cum Community Centre cum Sporting Complex (civil structure) inclusive third party quality assurance.						
	i.	Design and construction of 3 - parking floors including raft foundation work, protective works. The structural design should be able to fully incorporate the mechanical car parking into the complex.	1	i. 418.00 ii. 544.60 iii. 652.40 Tot = 1615	Sqm			
	ii.	Design and construction of community hall along with kitchen cafeteria and toilets	1	652.40	Sqm			
	iii.	Design and construction of smart office, plug and play area, reading area server in-charge room, recreation room, kids play area, crèche room, yoga hall, gym, changing room with lockers, gym.	1	652.40	Sqm			

Name.....
 Signed.....
 In the capacity of.....
 Duly authorized to sign the Bid for and on behalf of.....
 Date.....

Part I- BIDDING PROCEDURES

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Invitation for Bid No.: 019/GSCDL/2022

Page 2/5 of Price Bid

SN	Ref Section VI	Description of Work	No.	Quantity	Units	Rate (INR)	Rate in Words (INR)	Amount (INR)
						In Figures	In Words	
	iv.	Design and construction of indoor sports arena with toilets for both male and female.	1	652.40	Sqm			
3		Internal & external service connections						
	i.	Internal water supply and sanitary installations	1	2919.80	sqm			
	ii.	External water supply connection	1	1	LS			
	iii.	Internal electrical installations along with lightening conductor	1	2919.80	sqm			
	iv.	External electrical service connections	1	1	LS			

Name.....
 Signed.....
 In the capacity of.....
 Duly authorized to sign the Bid for and on behalf of.....
 Date.....

Part I- BIDDING PROCEDURES

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Invitation for Bid No.: 019/GSCDL/2022

Page 3/5 of Price Bid

SN	Ref Section VI	Description of Work	No.	Quantity	Units	Rate (INR)	Rate in Words (INR)	Amount (INR)
						In Figures	In Words	
4.		Firefighting (wet riser and sprinkler system) and fire alarm (automatic alarm system)	1	2919.80	Sqm			
5.		Passenger lift (with enough space to allow for entry with wheel chair)	1	2	nos.			
6.		Renewable source of energy & rainwater harvesting						
	i.	Rainwater Harvesting System to use rainwater in toilets	1	587.16	sqm			
	ii.	Solar water heating system to be supplied to gym showers	1	2	1000 litre			

Name.....
 Signed.....
 In the capacity of.....
 Duly authorized to sign the Bid for and on behalf of.....
 Date.....

Part I- BIDDING PROCEDURES

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Invitation for Bid No.: 019/GSCDL/2022

Page 4/5 of Price Bid

SN	Ref Section VI	Description of Work	No.	Quantity	Units	Rate (INR)	Rate in Words (INR)	Amount (INR)
						In Figures	In Words	
6.		Electrical sub-station, DG & CCTV camera						
	i.	Sub-station equipment including transformer, LT/HT panel and all other required services all complete	1	315	kVA			
	ii.	Diesel Generating Set	1	189	kVA			
	iii.	CCTV System	1	2919.80	sqm			

Name.....
 Signed.....
 In the capacity of.....
 Duly authorized to sign the Bid for and on behalf of.....
 Date.....

Part I- BIDDING PROCEDURES

NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Invitation for Bid No.: 019/GSCDL/2022

Page 5/5 of Price Bid

SN	Ref Section VI	Description of Work	No.	Quantity	Units	Rate (INR)	Rate in Words (INR)	Amount (INR)
						In Figures	In Words	
7.		Mechanical Multilevel Car Parking						
		Supply, installation, erection, testing & commissioning & two Year Comprehensive Operation and maintenance contract of Parking System with Electro Mechanical technology to accommodate minimum 90 Nos. of four-wheeler with suitable steel structure frame work, Independent motorized pallet having up/down movement with electro-mechanical technology complete with PLC and electrical installation etc. as per specification and direction of Gangtok Smart City Dev. Ltd. The system shall be designed to accommodate 50% SUVs cars and 50% Sedan cars with average retrieval/parking time not more than 300 seconds.	1	90	Nos.			
8.		Furniture & fixture for community centre, along with equipment for the main building	1	1	LS			

Name.....
 Signed.....
 In the capacity of.....
 Duly authorized to sign the Bid for and on behalf of.....
 Date.....

Section V- Deleted

PART II- EMPLOYERS REQUIREMENT

Section VI- Employers Requirement

(Please refer Volume II for Employers Requirement)

Section VI A-Standard Specifications

List of Materials and Proposed schedule of finishes for the Construction of MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA, Contractor has to take prior approvals of all materials, fixtures and finishes to be used from the Project Manager/appropriate authority appointed by GSCDL before procurement.

Materials	Specifications
Cement	OPC 43,53 Grade
Sand	Tar Khola or its equivalent
Stone chips	Government approved quarry
Door Frames	Sal/Katus
Door Shutters	38mm TK blockboard with bothside with clamp/teak lipping
Windows	Wooden flung open / Aluminum / UPVC
Bricks	Cement Concrete (20x10x10)
Cement Plaster	1:4
GI Sheet	22 BWG TATA or equivalent (As per sample approved)
Flooring	
Corridor	Kota Stone
Toilet	Somany / Kajaria or equivalent
Steps	Green Marble
Reinforcement Fe415,500	TATA / SAIL or equivalent
Concrete RCC	M20, M25
Fixtures	
A Cock / L Cock / Shower head / Health Faucet	Esco / Jaguar or equivalent
Sanitary Hardware	Hindware / SImpolo / Cera or equivalent
G.I. Pipe	Medium with high quality fibre with ISI Mark.
Luminaries and Electrical Fitting (All concealed wiring)	

PART II- EMPLOYERS REQUIREMENT

Materials	Specifications
Wire	Fire Proof
Switches/Sockets	MK / Crabtree / Legrand or equivalent
Luminaires	Philips or equivalent
Transformer	100kVA with armored cable of appropriate design
Mechanical Car Parking	
Model Proposed	Mechanized Parking (Vertical rotary /Puzzle/Stack/etc.) – as per suitability at site
Minimum Number of 4-Wheeler Requirement	90 nos.
Clear Length of the System	As Per Design
Clear Width of the System	As Per Design
Allowable Car Dimensions (Length X Height X Width)	As per requirement & specification for SUV & Sedan vehicles
Total Allowable Clear Height of the System	As per design
Type of System	Electromechanical System
No. of Front Columns	As Per Design
No. of Rear Columns	As Per Design
Load on each Front Column	As Per Design
Load on each Rear Column	As Per Design
Power rating of the Lifting Motor	As per Design requirement
Power rating for Horizontal movement	As per Design requirement
Type of Motor	As per Design requirement
Type of Pallet	Galvanized Corrugated sheet
Type of System	As per Design requirement
Wheel Stopper	As per Design requirement

PART II- EMPLOYERS REQUIREMENT

Materials	Specifications
Type of Operation	As per Design requirement
Photo sensors	As per Design requirement
Antenna Type Limit Switch	As per Design requirement
Cam limit Switch	As per Design requirement
Geared Motor With Brake	As per Design requirement
Emergency Stop	As per Design requirement
Average Retrieval Time per operation	Approx. 300 Sec
Operating Panel	Touch screen type
Control Panel	PLC
Standby power arrangement	Generators
Life of system	25 years
Noise level	6-75 decibel
Structure	Industrial Grade MS
Guide rail for lifting unit	EN8
Gear boxes & drives	EN24
Delivery unit components	EN Grades
Nuts and Bolts	High tensile strength grade
Steel	Special Grade Industrial steel
Motors	German make, Reputed Indian make as per IS Specifications
Lifts	Automatic
Access control	Automatic

(The bidder is required to sign the declaration as given in section IV (Bidding forms) and submit along with the bid.)

In addition to above declaration, relevant national and international standard specifications are to be referred and taken into consideration for the bid.

PART III- CONDITIONS OF CONTRACT

Section VII- General Conditions of Contract

A. General

1. Definitions

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 Project Manager, 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 / Bidder/ Concessionaire/ Executing Agency/ Implementing Agency** 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.

PART III- CONDITIONS OF CONTRACT

- (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 Project Manager 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 Project Manager for the execution of the Contract.
- (q) The **Employer** is the party who employs the Contractor to carry out the Works, as specified in the **PCC**.
- (r) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.
- (s) **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.
- (t) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.
- (u) 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 **PCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.
- (v) **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.
- (w) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- (x) **Party** means the Employer or the Contractor/ Bidder/ Concessionaire/ Executing Agency/ Implementing Agency, as the context requires.
- (y) **PCC** means Particular Conditions of Contract
- (z) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
- (aa) The **Project Manager** is the person named in the **PCC** (or any other competent person appointed by the Employer and notified to the Contractor, to act in

PART III- CONDITIONS OF CONTRACT

replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

- (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 **PCC**.
- (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 Project Manager.
- (ff) The **Start Date** is given in the **PCC**. 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 Project Manager 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 **PCC**.
- (kk) The **Certificate of Completion** is the Certificate issued by the Project Manager to the Contractor, on successful completion of all the works specified in the Works Requirement (Section VI) and is —fit for purpose.
- (ll) —**Section** means part of the works specified in PCC as a section

2. Interpretation

- 2.1. In interpreting these GCC, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.
- 2.2. If sectional completion is specified in the PCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any

PART III- CONDITIONS OF CONTRACT

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) Particular Conditions of Contract,
- d) General Conditions of Contract,
- e) Specifications,
- f) Drawings,
- g) Bill of Quantities (or Schedules of Prices for lump sum contracts), and
- h) Contractor's Bid,
- i) any other document listed in the PCC as forming part of the Contract.

2.4. In the contract except where the context requires

- (a) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing;
- (b) "written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

3. Language and Law

3.1. The language of the Contract shall be English and the law governing the Contract are stated in the PCC.

4. Project Manager's Decisions

4.1. Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

4.2. The Project Manager shall have no authority to amend the Contract and has no authority to relieve either party of any duties, obligations or responsibilities under the contract.

5. Delegation

5.1. The Project Manager 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 as per GCC clause 72.

6. Communications

6.1. Wherever these Conditions provide for the giving or issuing of a Notice or other communication including approvals, certificates, consents,

PART III- CONDITIONS OF CONTRACT

determinations, instructions and requests, discharges such Notice or communication shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted by using any of the agreed systems of electronic transmission as **stated in the PCC**; and
- (b) delivered, sent or transmitted to the address for the recipient's communications as **stated in the PCC**.

7. Subcontracting

- 7.1. The Contractor may subcontract with the approval of the Project Manager but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.
- 7.2. The contractor shall be responsible for the acts or defaults of any subcontractor, his agents or employees, as if they were the acts or defaults of the contractor.

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 PCC. 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 Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
- 9.2. If the Project Manager 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 as per GCC clause 11 and 12.

11. Employer's Risks

- 11.1. The risk allocated to the Employer for which Employer is liable during the construction period are-

PART III- CONDITIONS OF CONTRACT

- (a) Employers commercial risk are-
 - i. Financial loss, delay or damage allocated to the Employer under the Contract for which the Employer is liable by the law unless otherwise modified under the contract
 - ii. use or occupation of the Site by the Works or any part thereof, or for the purpose of the Works, other than abusive and wrongful use by the contractor, or
 - iii. Negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted by the Employer except the Contractor. iv. The use or occupation by the Employer or any part of the permanent works except s specified in the contract

- (b) Employers risk of damage are-
 - i. damage due to any interference, whether temporary or permanent, with any right of way, light, air, water or other easement (other than that resulting from the Contractor's methods of operation and maintenance) which is the unavoidable result of operating and maintaining the Permanent Works in accordance with the Contract;
 - ii. fault, error, defect or omission in any element of the design of the Works by the Employer or which may be contained in the Employer's Requirements, other than design carried out by the Contractor pursuant to his obligations under the Contract;
 - iii. any operation of the forces of nature against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions

12. Contractor's Risks

- 12.1. The Contractor risk, 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 PCC 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;

PART III- CONDITIONS OF CONTRACT

- (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.
- 13.1.1. Insurance of work and contractor's equipment: The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause GCC 11, insure:
- (a) the Works, together with materials and Plant for incorporation therein to the full replacement cost
 - (b) additional sum as required by the employer, detailed out in the PCC.
 - (c) the Contractor's Equipment and other things brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.
- 13.1.2. Scope of cover: The insurance in paragraphs (a) and (b) of Sub-Clause 13.1.1 shall be in the joint names of the Contractor and the Employer and shall cover:
- (a) the Employer and the Contractor against all loss or damage from whatsoever cause arising, other than as provided Sub-Clause 13.1.4, from the first working day after the commencement date until the date of issue of the relevant Taking-Over Certificate in respect of the Works or any Section or part thereof as the case may be, and
 - (b) the Contractor for his liability;
 - i. during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of the Defects Liability Period, and
 - ii. for loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clause GCC 33.
- 13.1.3. Responsibility for Amount not Recovered: Any amounts not insured or not recovered from the insurers shall be borne by the Employer or the Contractor in accordance with their responsibilities Clause GCC 11 & 12.
- 13.1.4. Exclusions: There shall be no obligation for the insurance in Sub-Clause 13.1.1 to include loss or damage caused by
- a) war, hostilities, invasion, and act of foreign enemies.
 - b) Rebellion, revolution, insurrection or military or usurped power, or civil war.
- 13.1.5. Third Party Insurance: The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause GCC 63, insure, in the joint names of the Contractor and the Employer, against liabilities for death of or injury to any person (other than as provided in sub-clause 13.1.6 and 13.1.7) or loss or damage to any property (other than the Works) arising out of the performance of the Contract, other than the exception defined in paragraphs (a), (b) and(c) of clause GCC 63.3

PART III- CONDITIONS OF CONTRACT

Such insurance shall be for a certain minimum percentage of the contract amount as specified in the PCC.

The insurance policy shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Employer as separate insured.

13.1.6. Insurance for Employers Staff: The Contractor shall also, without limiting his or the employer's obligations insure in the Joint names of the contractor and the Employer, the Employer's staff to extent of 5 numbers and their staff engaged on the works at the site against liabilities for death or injury. The amount for the insurance cover for each of the employer's staff so engaged shall be limited to a minimum of Rs. 3,00,000/- per person or as per the laws governing in state whichever is more. The insurance shall continue until the taking over certificate for the whole of the works is issued. Notwithstanding the amount mentioned above, insurance obtained should satisfy the prevailing rules in this regard.

13.1.7. Accident or Injury to Workmen: The Employer or its representatives shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any subcontractor, other than death or injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

The Contractor shall insure against such liability and shall continue such insurance during the whole time that any person is employed by him on the Works. Provided that, in respect of any persons employed by any Subcontractor, the Contractor's obligations to insure as aforesaid under the Sub-Clause shall be satisfied if the Subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such Subcontractor to produce to the Employer, when required, such policy of insurance and the receipt for the payment of the current premium.

13.1.8. Personal Accident Insurance: In addition to any other insurance required to be taken out by statutory requirements (e.g. Workmen's Compensation Act 1923), the Contractor shall take out a Personal Accident Insurance in favour of each workman employed by him on the Works. Provided that, in respect of any persons employed by any Sub-Contractor, the Contractor's obligations to insure as aforesaid under this Sub-Clause shall be satisfied if the Sub Contractor shall have taken out Personal Accident Insurance in respect of his workmen employed on the works and the Contractor shall require such Sub Contractor to produce to the Employer, when required, such policy of Personal Accident Insurance and the receipt for the payment of the current premium.

PART III- CONDITIONS OF CONTRACT

- 13.1.9. Evidence and Terms of Insurances: The Contractor shall provide evidence to the Employer as soon as practicable after the respective insurance have been taken out but in any case prior to the start of work at the Site that the insurances required under the Contract have been effected and shall, within 84 days of the Commencement Date, provide the insurance policies to the Employer. When providing such evidence and such policies to the Employer, the Contractor shall notify the Project Manager of so doing. Such insurance policies shall be consistent with the general terms agreed prior to the issue of the Letter of Acceptance. The Contractor shall effect all insurances for which he is responsible with insurers and in terms approved by the Employer.
- 13.1.10. Adequacy of Insurance: The Contractor shall notify the insurers of changes in the nature, extent or programme for the execution of the Works and ensure the adequacy of the insurances at all times in accordance with the terms of the Contract and shall, when required, produce to the Employer the insurance policies in force and the receipts for payment of the current premium.
- 13.1.11. Remedy on Contractor's failure to Insure: If the Contractor fails to effect and to keep in force any of the insurances required under the Contract, or fails to provide the policies to the Employer within the period required by Clause 13.1.9, then and in any such case the Employer may effect and keep in force any such insurances and pay any premium as may be necessary for that purpose and from time to time and deduct premium amount so paid from any monies due or to become due to the Contractor, or recover the same as a debt due from the Contractor.
- 13.2. Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
- 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 Project Manager.
- 13.5. Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Reports

- 14.1. The Contractor, in preparation of the design and drawings is to carry out all necessary geo-technical investigations like soil investigations, hill stability, tests as necessary and required including any that are not mentioned in the document explicitly but is necessary to designing and execution of the structures to ensure stability and safety.

PART III- CONDITIONS OF CONTRACT

15. Contractor to Construct the Works

- 15.1. The Contractor shall construct and install the Works in accordance with the Specifications and Drawings as specified in Section VI.
- 15.2. The Contractor shall be deemed to:
 - (a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount; and
 - (b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters.

The Accepted Contract Amount covers all the Contractor's obligations under the Contract and all things necessary for the proper design, execution and completion of the Works, the remedying of any defects and the provision of the Operation Service.

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 Project Manager, and complete them by the Intended Completion Date.

17. Designs by Contractor and Approval by the Project Manager

- 17.1. The Contractor shall carry out design to the extent specified in the PCC. 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 Project Manager, who is to approve them if they comply with the Specifications and Drawings.
- 17.4. The Project Manager'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 Project Manager 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

Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

All old curiosities, relic coins, minerals etc., found in the excavation or pulling down shall be the property of the Government. Should any ancient masonry or other old work of interest be opened up, or any religious edifice or relic be involved in removal or destruction, in the execution of a work, a clear report on the matter should be sent to Government through the Employer and orders obtained before the demolition or removal of such works or relics. Similarly, regarding old curiosities etc., obtained during excavation, the Project Manager should consult the District Collector through appropriate channel regarding disposal of the same.

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 PCC, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event. The final authority on this matter shall lie with the GSCDL and decision in this matter taken by GSCDL will be binding on all parties to this contract.

21. Access to the Site

21.1. The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

22. Instructions, Inspections and Audits

22.1. The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

22.2. The Contractor shall permit the GSCDL 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 GSCDL. 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 GSCDL.

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 PCC, 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 Resolution by Arbitration

- 24.1. If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall submit a notice to the Project Manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance and within 42 days the contractor shall send to the Project Manager full detailed claim.
- 24.2. If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. The Contractor shall submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.
- 24.3. Within 42 days after receiving a claim the Project Manager shall respond with approval, or with disapproval with comments.
- 24.4. In the event that the Contractor does not agree on any matter relating to a claim, it may refer the matter to the Adjudicator pursuant to GCC 23 hereof.
- 24.5. Any disputes between the Employer and the Contractor arising out of or in connection with the Contract not settled amicably and in respect of Project Manager's / Adjudicator's decision, arbitration shall be settled in accordance with the Arbitration and Conciliation Act 1996 with relevant amendments.
- 24.6. The seat and place of the arbitration shall be Gangtok, Sikkim. Arbitration shall be held by a three-member Arbitration team. For the Panel, the Employer and the Contractor will suggest an Arbitrator each within 14 days of receipt of Arbitration Notice. The two Arbitrators will then mutually decide upon the Third Arbitrator who will act as Presiding Arbitrator.

B. Time Control

25. Program

- 25.1. The Contractor shall submit for approval a Program for the Works within 14 days from the date of the Letter of Acceptance. Within this, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.
- 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 Project Manager for approval an updated Program at intervals no longer than the period of 30 days. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the PCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.
- 25.4. The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

26. Extension of the Intended Completion Date

- 26.1. The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.
- 26.2. The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager 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 complete works before the Intended Completion Date, the Project Manager appointed by employer shall obtain priced proposals for achieving the necessary acceleration of works 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.

PART III- CONDITIONS OF CONTRACT

- 27.2. If the Contractor's priced proposals for acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

28. Delays Ordered by the Project Manager

- 28.1. The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

29. Management Meetings

- 29.1. The Project Manager or on the request of the Contractor may convene a management meeting and the Project Manager may require the Contractor to attend the 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 Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

30. Early Warning

- 30.1. The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the 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 Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

31. Identifying Defects

- 31.1. The Project Manager and PMC appointed by GSCDL 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 Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.
- 31.2. The contractor shall ensure that the raw materials, goods & related services procured/deployed under this contract/project should comply with the technical specifications and other provisions of Contract.

PART III- CONDITIONS OF CONTRACT

The contractor shall supply and use and will be held responsible for raw materials, goods & related services under this contract/project shall conform to the standards mentioned in the Sikkim SOR and when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the superior quality in reference to as mentioned in description in BoQ.

- 31.3. If the contractor finds any defects/ errors in the Good for Construction designs/ drawings submitted by the Project Manager, the Contractor shall promptly notify the same to the Project Manager and shall take corrective actions as specified in the PCC

32. Tests

- 32.1. If the Project Manager instructs the Contractor to carry out a test not specified in the Specifications 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 Project Manager 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 PCC. 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 Project Manager's notice.

34. Uncorrected Defects

- 34.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the 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 Project Manager shall adjust the rate to allow for the change.
 - (b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.
 - (c) If requested by the Project Manager, the Contractor shall provide the Project Manager 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, produced by the Contractor.
- 37.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.
- 37.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.
- 37.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.
- 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 with an item description in the Bill of Quantities and if, in the opinion of the Engineer, the quantity of work to be executed is an extra item and the rates in the bill of quantities shall be used for calculate the value of 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 item in the BOQ, the

PART III- CONDITIONS OF CONTRACT

procedure explained in the above Para i.e., 36.1 (i), the data rate based on schedule of rate of the year of execution or market rate (when Schedule of Rate is not available) shall be followed for arriving the rate for the new item.

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 Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

39. Payment Certificates

- 39.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously in the format approved by the Project Manager.
- 39.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor, subject to statutory deductions and any other deductions coming from Clause 48. The Project Manager shall within 28 days after receiving a statement and supporting documents from the Contractor, issue to the employer, an Interim Payment Certificate.
- 39.3 The value of work executed shall be determined by the Project Manager.
- 39.4 The value of work executed shall comprise:
- (d) In the case of an admeasurements contract, the value of the quantities of work in the Bill of Quantities that have been completed; or
 - (e) 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 Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

40. Compensation Events

- 40.1 The following shall be Compensation Events:
- (f) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 20.1.
 - (g) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
 - (h) The Project Manager orders a delay or does not issue Drawings, Specifications required for execution of the Works on time.

PART III- CONDITIONS OF CONTRACT

- (i) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
- (j) 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.
- (k) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
- (l) 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. (h) The advance payment is delayed.
- (m) The effects on the Contractor of any of the Employer's Risks.
- (n) The Project Manager unreasonably delays issuing a Certificate of Completion.

40.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

40.3 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 Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

40.4 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 Project Manager.

41. Payments

41.1 Payments shall be adjusted for deductions for advance payments & retention. The Employer shall pay the Contractor the amounts certified by the Project Manager according to each certificate.

41.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator same shall be paid to contractor.

41.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

PART III- CONDITIONS OF CONTRACT

- 41.4 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.

42. Tax

- 42.1 The rates quoted by the Contractor shall be deemed to be inclusive of all the taxes, levies, etc. including GST including their variations as notified by the concerned authority from time to time, and also of all the new taxes and levies that may be imposed that the Contractor will have to pay for the performance of this Contract. The Employer on behalf of the Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law.

- 42.2 The Contractor shall comply with the proper bye-laws and legal orders of the local body or public authority under the jurisdiction of which the work is executed and pay all fees and charges for which he may be liable. Nothing extra shall be payable on this account.

The rates quoted by the Contractor shall be deemed to be inclusive of all the prevailing taxes/octroi that the Contractor has to pay for performance of this contract. The Employer shall perform such duties in regard to the deduction of such taxes as per statutory deduction requirements at the source of payment as per applicable rules.

- 42.3 (i) Exemptions: The bidder shall refer such notifications/circulars/orders of the Government of India issued from time to time and shall quote his rates accordingly considering the exemptions available. The Employer will give the necessary certificates to the selected bidders to claim the exemption on specific requests made by the Contractor. Any conditional bids in this regard will not be accepted. The quoted rates should be based on the exemptions available and it will be responsibility of the Contractor to avail the exemptions, as per the contents of the notifications/circulars/orders, the Employers responsibility being limited to the issue of necessary certificates and will not take any responsibility of any kind in this regard.

(ii) It may also be noted that if the Government of India announces any exemptions on any statutory levies in future also during the tenure of the Contract, all the benefits accruing in view of such further exemptions of any kind on the taxes, shall be passed on to the Employer.

43. Currencies

- 43.1 Where payments are made in currencies other than Indian Rupees (INR), 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 PCC. If so provided, the amounts certified in each payment certificate,

PART III- CONDITIONS OF CONTRACT

before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. The following conditions shall apply:

- (a) No price increase will be allowed beyond the original completion date unless covered by an extension of time awarded by the Employer under the terms of the Contract. No price increase will be allowed for periods of delay for which the Contractor is responsible. The Employer will, however, be entitled to any price decrease occurring during such periods of delay.
- (b) Deleted.
- (c) No price adjustment shall be payable on the portion of the Contract price paid to the Contractor as an advance payment.

Base, Current and Provisional Indices: the base cost and indices or prices shall be those prevailing on the day 28 days prior to the latest date for submission of Bid. Current indices or prices shall be those prevailing on the quarter for which a particular interim Payment Certificate is related. If at any time the current indices are not available, no provisional escalation will be payable on the basis of indices of the previous quarter in absence of non-publication of indices for concerned quarter by the RBI. Escalation amount will be payable to the Contractor when the current indices become available.

Adjustable amount: The adjustable amount of each Interim Payment Certificate shall be the difference between (i) the amount which, in the opinion of the Employer's Representative, shall be due to the contractor including the amount at base rates and prices of the schedule works carried out but excluding provisional sums and the value of materials on the site, and (ii) the amount as calculated in (i) above and included in the last preceding interim payment certificate issued by the Employer's Representative. The adjustable amount shall exclude payments to nominated sub-contractors and any other amounts based upon actual cost or current prices.

Adjusted Amount: The adjusted amount of each payment certificate shall be determined by applying the price adjustment factor to the adjustable amount, and shall become payable to the contractor subject to any deductions there from for retention money, liquidated damages and any other monies due to the Employer from the Contractor including the recovery of advance mobilization, loan if any.

If the Contractor fails to complete the Works within the Time for Completion, adjustments of prices thereafter shall be made using either each index or price applicable on the date 49 days prior to the expiry of the Time for Completion, or the current index or price, whichever is more favorable to the Employer, provided that, if an extension of time is granted in accordance with the relevant Sub-Clause the above provision shall apply to the extended time for completion.

- 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 PCC until Completion of the whole of the Works.
- 45.2. Upon the issue of a Certificate of Completion of the Works by the Project Manager, 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 Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an unconditional bank guarantee.

46. Liquidated Damages

- 46.1 The Contractor shall pay liquidated damages to the Employer as compensation for delay at the rate per day stated in the PCC for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the PCC. The Employer may deduct liquidated damages from payments due to the 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 Project Manager 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 PCC 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 Project Manager 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 PCC**, against provision by the Contractor of an Unconditional Bank Guarantee in a form 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. Interest shall not be charged on the advance payment.
- 48.2 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.

PART III- CONDITIONS OF CONTRACT

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 PCC, by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 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 Project Manager 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 Project Manager. Each completed form shall be verified and signed by the Project Manager 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 Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.

53. Taking Over

- 53.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

54. Final Account

- 54.1 The Contractor shall supply the Project Manager 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 Project Manager 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 Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary.

PART III- CONDITIONS OF CONTRACT

If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

55. Operating and Maintenance Manuals

- 55.1 If—as built Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them within 14 days after completion of the component/ milestone.
- 55.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in GCC 55.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold 5% of the next interim payment 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 Project Manager;
 - (b) the Project Manager 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 Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate; at least 15 days before the expiry of 84 days' time period, the contractor should address a letter informing the same and requesting for early release of payment.
 - (e) the Project Manager 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 Project Manager;
 - (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 PCC.
 - (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 Project Manager for a cause other than those listed under GCC 56.2 above, the Project Manager shall decide whether the breach is fundamental or not.

PART III- CONDITIONS OF CONTRACT

- 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 GSCDL requires Contractors, Subcontractors, manufacturers & Suppliers, observe the highest standard of ethics during the procurement and execution of contract(s). In pursuit of this policy, the GSCDL:
- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) —corrupt practice~~l~~ means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
 - (ii) —fraudulent practice~~l~~ 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~~l~~ 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~~l~~ 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 allocated contract if GSCDL determines at any time that representatives of the Contractor or sub-contractors if permitted under this contract are found to be engaged in corrupt, fraudulent, collusive or coercive practices during the procurement or the execution of that contract, without the Contractor having taken timely and appropriate action satisfactory to the GSCDL and or competent authority to remedy the situation the said contract would be terminated; 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 GSCDL 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 GSCDL-financed contract.

58. Payment upon Termination

- 58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the PCC. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

PART III- CONDITIONS OF CONTRACT

The Contractor shall comply with all applicable national and local environmental laws and regulations.

The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all the monitoring and mitigating measures as set forth in Project's Environmental Management Plan (EMP), attached here to as Appendix 1 (the actual costs for the implementation of such measures shall be reimbursed by the Employer from provision sums). The contractor shall submit to the Employer quarterly report on the carrying out of such measures.

The Contractor Shall :(a) comply with all applicable labor laws, and (b) provide equal pay for men and women for work of equal value or type.

The Contractor shall not employ child labor, as defined in national legislation for construction and maintenance activities.

The Contractor shall give priority to the employment of local people, who meet the job and efficiency requirements, for the Contract works.

The Contractor shall not employ for the contract works (a) any person that has relationship with any of the officials of the Contractor (i.e., spouses or first blood relations), and (b) any person who retired, within the last two years, as a gazette officer from any department of the government of Sikkim.

- 58.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the 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 Project Manager 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.

61. Suspension of Loan or Credit

- 61.1 deleted

62. Eligibility

- 62.1 The Contractor shall have the Indian nationality. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 62.2 The materials, equipment and services to be supplied under the Contract shall have their origin in India and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment and services.
- 62.3 For purposes of GCC 62.2, —originl means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

63. Indemnities

- 63.1 Each party shall be liable for and indemnify the other Party against losses, expenses and claims for loss or damage to physical property, personal injury, and death caused by his own acts or omissions, subject to the exception defined in Clause 63.3.
- 63.2 Notwithstanding Clause 63.1 above, the Contractor shall be solely responsible for and shall indemnify and hold harmless the Employer from and against all claims, liabilities and costs of action in respect of injury to or both of any person in the employment of the Contractor or any of his Subcontractors subject to exceptions defined in clause 63.3.
- 63.3 The —exceptionsll referred to in Clause 63.2 are:
 - a. the permanent use or occupation of land by the Works, or any part thereof,
 - b. the right of the Employer to execute the Works, or any part thereof, on, over, under, in or through any land
 - c. damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any defects therein, in accordance with the Contract, and
 - d. death or injury to persons or loss of or damage to property resulting from any act or neglect of the Employer, or his agents, servants or other contractors, not being employed by the Contractor, or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or, whether the injury or damage was contributed to by the Contractor, his servants or agents, such part of the said injury or damage as may be just and equitable having regard to the extent of the responsibility of the Employer, his servants or agents or other contractors for the injury or damage.

64. Indemnities

Deleted

65. Royalties

- 65.1 Except otherwise stated, the Contractor shall pay all tonnage and other royalty charges and other payments or compensation, if any for getting stone, sand, gravel, clay or other materials required for the works.

66. Third Party Inspection and Testing

- 66.1 The representative of the concerned independent consultant appointed by the Employer will undertake independent third-party inspections and testing for supply and installation pipes and valves used for water supply and sewerage, pumps and motors and all works and any civil structure or material or work as may be applicable and as desired by the Project Manager. The Contractor shall be wholly responsible to make his own arrangements with the approved third party inspection agencies for carrying out the required tests. The Contractor shall be responsible to obtain permission for and provide all facilities to such agency for carrying out such inspections or testing as may be required. The Third Party Inspection charges of the agency only will be paid by the employer and all the other costs for such independent inspection and testing shall be borne by the contractor.
- 66.2 A mutually agreed quality assurance plan with minimum requirements as per Indian Standards will be developed which provides for inspection and certification by the third party inspection agency at specified times.
- 66.3 No material shall be delivered to the site without formal inspection or testing unless otherwise waived in writing by the Project Manager with a certificate issued by the contractor, which is endorsed by the Engineer that the item conforms to the requirement of contract in all respects.
- 66.4 The Employer or his authorized representative may make inspections at any of the manufacturing or shipping points at any time in addition to the schedule provided in this specification at the cost of Employer. However, during such inspection, if it is found that any of the items are not being supplied, manufactured or transported in accordance with the specifications, the contractor shall bear all expenses including fees incurred by the employer in respect of such inspection.
- 66.5 The contractor shall perform or make arrangements for all tests when requested by the Employer.
- 66.6 The Contractor shall agree with the Project Manager on the time and place for the inspection of any materials or plant. The Project Manager shall give the contractor not less than 24 hours' notice of his intention to carry out inspection or to attend the tests. If the Project Manager or his duly authorized representative does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Project Manager, proceed with the test reports.

PART III- CONDITIONS OF CONTRACT

- 66.7 If at the time and place agreed in accordance with as mentioned in the clause 66.4 and 66.6, the materials or Plant if, as a result of the inspection or testing referred to in this Clause, the Project Manger determines that the materials or plant are defective or otherwise not in accordance with the contract, he may reject the materials or plant and shall notify the contractor there of immediately. The notice shall state the Project Manager's observations with reasons. The Contractor shall then promptly make good the defect or replace the same. It the Project Manager so requests, the tests of such material or plant shall be made or repeated under the same terms and conditions. All costs incurred by the Project Manager or the Third Party inspection agency for the inspection of the tests shall be determined by the Project Manager and shall be recoverable from the contractor and may be deducted from any money's due that the Contractor and the Project Manager shall notify the Contractor accordingly.
- 66.8 Any inspection carried out by the Project Manager shall not relieve the contractor of his obligations under the contract.

67. Licenses for Explosives:

The Contractor should take necessary licenses under the current explosive rules to enable him to manufacture and process the quantity of gunpowder / explosive and perform the blasting as necessary according to prevailing rules.

68. Indemnities

Deleted

69. Incomplete or unattended defective works or delays

The Employer has the right to get the uncompleted works done by other competent contractors at the risk and cost of the contractor in the following circumstances:

- a) If the contract is terminated for the reasons attributable to the contractor
- b) If the Contractor has delayed the work as per the schedule with no justifiable reasons.
- c) If the Contractor fails to correct any defects in the work within the period stated in the defects notice sent by the Project Manager to the Contractor.
- d) If the Contractor does not meet any of its obligations within the time frame of the contract specified in section VII GCC or section VIII PCC

70. Contractor's General Responsibilities

- 70.1 The Contractor shall, with due care and diligence, execute and complete the Works and remedy any defects therein accordance with the provisions of the Contract. The Contractor shall provide all superintendence, labour, materials, Plant, Contractor's Equipment and all other things, whether of a temporary or permanent nature, execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

PART III- CONDITIONS OF CONTRACT

- 70.2 The Contractor shall promptly notify the Employer, of any error, omission, fault or other defect in the design of or Specification for the Works which he discovers when reviewing the Contract or executing the Works.
- 70.3 The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of construction. Provided that the Contractor shall not be responsible (except as stated hereunder or as may be otherwise agreed) for the design or specification of Permanent Works, not prepared by the Contractor. Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall be fully responsible for that part of such Works, notwithstanding any approval by the Employer.
- 70.4 The Contractor shall provide all necessary superintendence during the execution of the Works and as long as thereafter as the Project Manager may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorized representative approved of by the Project Manager, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the Works. Such authorized representative shall receive, on behalf of the Contractor, instructions from the Engineer. If the approval of the representative is withdrawn by the Project Manager, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving notice of such withdrawal, remove the representative from the Works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another representative approved by the Project Manager.
- 70.5 The Contractor shall be responsible for:
- a. the accurate setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing,
 - b. the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the Works, and
 - c. The provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.
 - d. Security of the site

If, any time during the execution of the Works, any error appears in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required so to do by the Project Manager, shall, at his own cost, rectify such error to the satisfaction of the Project Manager, unless such error is based on incorrect data supplied in writing by the Project Manager, in which case the Project Manager shall determine an addition to the Contract Price as per the relevant provisions of the contract and shall notify the Contractor accordingly.

The checking of any setting-out or of any line by the Project Manager shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting-out the Works.

71. Water for works and workforce

- 71.1 The contractor at his own expenses should provide water from municipal mains or other sources for the use of work and workmen.

72. Project Manager and Project Manager's representative

- 72.1 The Project Manager is the representative of the Employer and the contractor is bound to take all his instructions as that of the employer. The Project Manager shall represent the employer in all dealings with the Contractor concerning the work, including administering contract, certifying payments due to the contractor, issuing and valuing variations, awarding extension of times and valuing compensation events as per the powers delegated to him by the employer and after taking necessary approvals.
- 72.2 The Project Manager's representative who would be appointed to assist the Project Manager would be notified to the Contractor. The Employer / Project Manager may employ any other additional representative for managing this contract.
- 72.3 The Project Manager may from time to time delegate any of his duties and authorities, to his representative, and he may at any time revoke such delegation. Any such delegation or revocation shall be in writing and shall not take effect until copy thereof has been delivered to the Employer and the Contractor.
- 72.4 Any approval, check, certificate, consent, examination, inspection, instruction, Notice, proposal, request, test or similar act by the Project Managers representative, in accordance with the delegation, shall have the same effect as though the act had been an act of the Project Manager. However:
- a. any failure to disapprove any work, Plant, Materials or any part of the constructed work shall not constitute approval, and shall therefore not prejudice the right of the Employer's Representative to reject the work, Plant, Materials or any part of the Operation Service; and
 - b. if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Project Manager, who shall promptly confirm, reverse or vary the determination or instruction.
- 72.5 The Project Manger's representative may appoint any number of persons to assist the Project Manager's representative in carrying out his duties. He shall notify to the Contractor the names, duties and scope of authority of such persons.

73. Alterations, Additions and Omissions

- 73.1 The Project Manager shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any reason it shall, in his opinion appropriate he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:
- (a) increase or decrease the quantity of any work included in the Contract,
 - (b) omit any such work
 - (c) change the character or quality or kind of any such work,
 - (d) change the levels, lines, position and dimensions of any part of the Works,

PART III- CONDITIONS OF CONTRACT

- (e) execute additional work of any kind necessary for the completion of the Works, or
- (f) change any specified sequence or timing of construction of any part of the Works. No such variation shall in any way vitiate or invalidate the Contract, but the effect, if any, of all such variations shall be valued in accordance with relevant provisions of the Contract. Provided that where the issue of an instruction to vary the Works is necessitated by some default of or breach of contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor.

74. Deleted

75. Site Order Book

- 75.1 A site order book is to be maintained at site by the contractor for issue of necessary instructions during the site visits. It is binding on the contractor to enforce such instructions and if the compliance of such instructions would have financial implications, the contractor need to inform the Project Manager on the financial implications on executing the instruction, obtain his permission, and sanction before executing such works. No additional payment would be made on the basis of the instructions of the site order alone. The site in charge of the Employer and the Contractor should sign both while issuing the order and after compliance. The site order book needs to be serially numbered. The site order should be maintained by the contractor throughout the work and submitted to the Project Manager before the payment of the final bill.

76. Measurement Book:

- 76.1 All measurements should be recorded directly in the Measurement Book as per the instructions printed in the Measurement Book.

77. Safety, Security and Protection of the Environment

- 78.1 Accidents – Hoarding – Lighting – Observations – Watchmen:

The contractor shall be responsible for the safety of the labour employed by him and he shall be liable for payment of necessary compensation in the case of accidents as per workers compensation act.

- a) When excavations have been made or obstacles have been put in public thoroughfares or in places where there is likelihood of accidents, the contractor shall comply with any requirement of law on the subject and shall provide suitable Hoarding-Lighting, watchmen when and where necessary or required by the Project Manager or by any duly constituted authority, for protection of works and safety and convenience of the public or others. In case of excavations on roads, a traffic diversion plan should be made and got approved by the concerned authorities.
- b) It shall be the contractor's sole responsibility to protect the public and its employees against the accident from any cause and he shall indemnify the Government against any claims for damages for injury to person or property, resulting from any such

PART III- CONDITIONS OF CONTRACT

accidents and he shall, where the provisions of the Workmen's Compensation Act apply, take steps to properly insure against any claims thereafter.

- c) On the occurrence of an accident which results in the death of any of the workmen employed by the contractor or which is so serious as to be likely to result in the death of any such workmen, the contractor shall within 24 hours of the happening of such accidents, intimate the employer in writing, the fact of such accident. The contractor shall indemnify Government against all loss or damage sustained by the Government resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or fines if any payable by the Government as a consequence of Government's failure to give notice under the Workmen's Compensation Act or otherwise confirm to said Act in regard to such accident.
- d) In the event of an accident in respect of which compensation may become payable under the workmen's Compensation Act VIII of 1923 whether by the Contractor or by the Government as principal it shall be lawful for the Project Manger to retain out of moneys due and payable to the contractor such sum or sums of money as may, the opinion of the Project Manager shall be final in regard or all matters arising under this clause.

78.2 Noise, Disturbance and Pollution:

Works shall be carried out without unreasonable noise and disturbance. The Contractor shall indemnify the Employer from and against any liability for damages on account of noise or other disturbances created while executing the Works and from against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in regard or in relation to such liability. Necessary permissions as may be required from Pollution Control Board or any other regulatory authority shall have to be obtained by the Contractor for erecting and operating any plant or machinery and for other operations required for the execution of the Works in the Contract.

78.3 Site Sanitation:

The contractor should provide and erect prior to commencement of the work sufficient latrines for the use of workmen, both males and females and should keep the same disinfected and clean all times during the progress of the work and remove the same and restore to original ground on completion of the works.

78.4 HIV/AIDS awareness and prevention program:

It is obligatory as a part of the Contractor to carryout HIV / AIDS awareness and prevention program, and dissemination of information on worksites on risks of sexually transmitted diseases and HIV/AIDS as a part of health and safety measures for those employed under the Contract.

78.5 The Contractor shall comply with all applicable environmental laws and regulations and the Contractor shall

- a) establish an operational system for managing environmental impacts,

PART III- CONDITIONS OF CONTRACT

b) carry out all of the monitoring and mitigation measures set forth in the Initial Environmental

Assessment (IEE) or Environmental Impact Assessment (EIA) and Environment Management Plan (EMP) attached hereto as Appendix 1 (c) allocate the budget required to ensure that such measures are carried out, and the actual costs for the implementation of such measures shall be reimbursed by the Employer to the Contractor from Provisional Sum. The Contractor shall submit to the Employer quarterly reports of the carrying out of such measures.

78. Labour

- 79.1 The contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.
- 79.2 It is mandatory to the contractor to register all the labours he is engaging at site with the concerned authorities.
- 79.3 The Contractor shall, if required by the Project Manager, deliver to the Project Manager a return in detail, in such form and at such intervals as the Project Manager may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Project Manager may require
- 79.4 Except otherwise stated in the contract, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the contractors personnel. Further the Contractor shall at all times during the contract period take all reasonable precautions to maintain the health and safety of the contractor's personnel.
- 79.5 The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.
- 79.6 The Contractor may bring in to India any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in India of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.
- 79.7 The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers

79. Compliance with Labour Regulations

- 80.1 During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour law that are applicable to construction

PART III- CONDITIONS OF CONTRACT

industry are given below. The contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or Rules made there under, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/ bye laws/ Acts/ Rules/ Regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

- 80.2 The employees of the Contractor and the Sub Contractor in no case shall be treated as the Employees of the Employer at any point of time.
- 80.3 Salient features of some major labor laws applicable to establishments engaged in building and other construction work:
- a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
 - b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death the rate of 15 days wages for every completed year of service The Act is applicable to all establishments employing 10 or more employees.
 - c) Employees P.F and Miscellaneous Provision Act 1952: The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:
 - Pension or family pension on retirement or death, as the case maybe
 - Deposit linked insurance on the death in harness of the worker.
 - Payment of P.F accumulation on retirement/death etc.
 - d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
 - e) Contract labour (Regulation and Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. the Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.
 - f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment as per the act.
 - g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

PART III- CONDITIONS OF CONTRACT

- h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to male and Female workers and for not making discrimination against Female Employees in the matters of transfers, training and promotions etc.
- i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/ per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
- j) Industrial Disputes Act 1947: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock – out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50) The Act provided for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.
- m) Child Labour (Prohibition and Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.
- n) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto establishment and back, etc.
- o) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the Establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First Aid facilities, Ambulance, housing accommodations for workers near the work

PART III- CONDITIONS OF CONTRACT

place etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

- p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

80.4 Notwithstanding what is given in the above the acts as amended latest shall apply from time to time

80. Fair Wage Clause:

81.1 The following should be followed in respect of payment of wages to the labour.

- a) The contractor shall pay not less than fair wages to labourers engaged by him on the work.
— Fair Wages means wage whether for time or piece work notified at the time of inviting Bids for the work and where such wages have not been so notified the wage prescribed by the Central PWD for the District in which the work is done.
- b) The contractors shall notwithstanding the provisions of any contract to the contrary cause to be paid a fair wage to labourers indirectly engaged on the work including any labour engaged by his subcontractor in connection with the said work as if he labourers had been immediately employed by him.
- c) In respect of all labour directly or indirectly employed in the works for the performance of the Contractor's part of this agreement, the contractor shall comply with or cause to be complied with (the Central P W D Contractor's labour) regulations made by Government in regard to payment of wages, wage period deduction from wages, recovery of wages not paid and deductions unauthorized made, maintenance of wages register, other terms of employment, inspection and submission of periodical returns and all wages cards, publication of scale of wages and returns and all other matters of a like nature.
- d) The Deputy Programme Director or Subdivision Officer concerned shall have the right to deduct from the moneys due to the contractor and any sum required or estimated to be required for making good the loss suffered by a worker or workers by reasons of non-fulfilment of the conditions of the contract for the benefit of works, non-payment of wages or deductions made from his or their wages which are not justified by their terms of contract or non-observance of the regulations.
- e) Vis – a Vis the Central Government the Contractor shall be primary liable for all payment to be made under the observance of the regulations aforesaid without prejudice to his right to claim from this subcontractors.
- f) The regulation aforesaid shall be deemed to be a part of this contract and breach there shall, be a breach of this contract.

81. Recovery of compensation paid to workmen

In every case in which by virtue of the provisions sub section(1) of section 12, of the workmen's compensation act 1923, Employer is obliged to pay compensation to a workman employed by the contractor, in execution of the works Employer will recover from the contractor, the amount of compensation so paid ; and without prejudice to the right of the Employer under sub section 2 of section 12 , of the said act Employer shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or any sum due to the Employer to the contract whether under this contract or otherwise. Employer shall not be bound to contest any claim made against it under sub section (1) Section 12 of the said act except on the written request of the contractor and upon his giving to Employer full security for all costs for which Employer become liable in consequence of contesting such claim.

82. Ensuring Sikkim Labour Protection Act 2005:

In every case in which by virtue of the provisions of Sikkim Labour Protection Act Employer shall be at liberty or to recover such amount or any part thereof by deducting it from the Security Deposit or any sum due by Employer to the contractor under this contract or otherwise.

1. The contractor must employ local people whose nationality is not in doubt for execution of works in Sikkim.
2. The labourers employed by the contractor should be of Indian origin only.
3. The Contractor shall obtain a valid certificate of Registration under Sikkim Labour Protection Act 2005 (20 to 2005) and the rules made there under and contractor should abide by all provisions of the act and Rules aforesaid as may be required from time to time regarding wages and other working conditions.
4. No labour below the age of 14 years shall be employed on the work and the contractor shall pay not less than fair wages to labourer engaged by him on the work.
5. The contractor shall comply with the provisions of the payment of wages act 1936 Minimum Wages Act 1948 Employees Labour (Regulation and Abolition) Act 1970 or the modifications thereof or any other laws relating thereto and the rules made there under from time to time by the state Government.

PART III- CONDITIONS OF CONTRACT

Section VIII- Particular Conditions of Contract

The following Particular Conditions of Contract shall supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

A. General	
GCC 1.1 (q)	The Employer is CEO , GSCDL, Level 5, Kissan Bazaar-737101, Gangtok.
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be 24 months.
GCCs 1.1 (aa) & 4.1	The Project Manager is the Chief Technical Officer , GSCDL, Level 5, Kissan Bazaar.
GCC 1.1(cc)	The Site is located at old UDD Engineering Cell building at Development Area in Gangtok, Sikkim, India.
GCC 1.1 (ff)	The Start Date shall be 7 days from the date of signing the Agreement.
GCC 1.1 (jj)	The Works consist of MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA
GCC 1.1 (ll)	Not applicable
GCC 2.2	Sectional Completions are: Not Allowed
GCC 2.3	Any other written agreement reached between the Employer and contractor further to the award of contract shall be in line with the original bidding document only, there will be no contradiction with respect to the clauses, terms and conditions of the original conditions of the contract. The Environment Plan attached hereto as Appendix I shall also form part of the agreement The following documents also form part of the Contract: Environmental Management Plan, attached hereto as Appendix 1.
GCC 3.1	The law that applies to the Contract is the law of Union of India and State of Sikkim. Where there is a conflict between the two, the laws of the Union of India shall prevail.
GCC 6.1	Agreed methods of electronic transmission are as given in the address of communications given below: Address of Employer for Communication [add the address] [add the email address of communication] NA

PART III- CONDITIONS OF CONTRACT

	Address of Project Manager for Communications [add the address] [add the email address of communication] NA
	Address of Contractor for Communications [add the address] [add the email address of communication] NA
GCC 8.1	Schedule of other contractors: Nil.
GCC 13.1.1 (b)	Insurance for an additional sum of 15 per cent of replacement cost, to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature —it being understood that such insurance shall provide for compensation to be payable to rectify the loss or damage incurred
GCC 13.1.5	Third Party Insurance: Insurance shall be for at least 1 % (one percent of the contract amount) subject to a minimum of Rs. 25,00,000/- (Rs. 25 Lakhs) per occurrence with number of occurrences unlimited
GCC 15.1	The Contractor has to submit all the detailed designs and drawings pertaining to Architectural, Structural, Mechanical, Electrical, Plumbing, transportation, highways, Roads, Bridges etc. to the Project Manager for approval in accordance to the Employers Requirement for the works as given in more detail in Section VI, Part II in accordance with codal provisions and sound engineering practice. The Project Manager approved designs and drawings are to be used for construction.
GCC 16.1	Intended completion date is 24 months from the date of start as per GCC 1.1 (ff)
GCC 20.1	The Site Possession Date(s) shall be: the site shall be handed over to the contractor within 30 days from the date of start of work
GCC 23.1	Appointing Authority for the Adjudicator: President, Institution of Engineers Sikkim chapter. India.
GCC 24	Arbitrators will be selected from the Panel of Arbitrators from Construction Industry Arbitration Council/ Indian Institute of Engineers.
B. Time Control	
GCC 25.3	The amount to be withheld for late submission of an updated Program is an amount equal to 5 % of the next interim payments
C. Quality Control	
GCC 31.3	The Contractor shall notify the defects/ errors in the design/ drawings within 21 days of issue by the Project Manager
GCC 33.1	The Defects Liability Period is: 1 year from the date of issue of Certificate of Completion.

PART III- CONDITIONS OF CONTRACT

GCC 39	All payments will be paid as per the Terms of Payment given in Part II Employers Requirement
D. Cost Control	
GCC 44.1	<p>Price Adjustment Clause is Not Applicable for the first 18 months. After 18 months, the price adjustment is applicable and payable to the Contractor Prices payable to the Contractor, in accordance with the Contract, subject to adjustment during performance of the Contract to reflect changes in the cost of labor and material components, in accordance with the following formula:</p> $P_1 = P_0 \times \left(a + b \frac{L_1}{L_0} + c \frac{M_1}{M_0} \right) - P_0$ <p>in which: P1 = adjustment amount payable to the Contractor P0 = Contract price (base price) a = percentage of fixed element in Contract price (a =25 %) b = percentage of labor component in Contract price (b = % as given table below) c = percentage of material and equipment component in Contract price (c = % as given in table below) L0, L1 = labor indices applicable i.e. consumer price index for industrial workers provided by Guwahati Centre of Labour Bureau Of Government of India on the base date and the date for adjustment, respectively M0, M1= For material and equipment index will be wholesale price index of all commodities published by RBI on the base date and the date for adjustment, respectively. Table showing percentage of material and labour component For General Civil Works Labor PL = 22.5% and Materials PM = 52.5%</p>
GCC 45	<p>The proportion of payments retained from each payment shall be 5% (Five percent) of the payment amount, as Retention Money. No interest will be paid for the retention money 50% of retention money will be paid upon issue of Certificate of Completion and remaining 50% upon completion of defect liability period. The Contractor may substitute retention money with an —unconditional bank guarantee.</p>
GCC 46.1	<p>In the event that the contractor fails to comply with the Intended Time of completion for the whole of the Works, or, if applicable, any section within the relevant time, then the Contractor shall pay liquidated damage to the Employer at the rate of 0.1% (one percent) per day. The maximum amount of liquidated damages for the whole of the works is 10% (ten percent) of the final contract price. Whether the asset is put to use or not the Liquidated Damages will be levied for any delay in completion of works as a part of commitment on the part of the contractor.</p>

PART III- CONDITIONS OF CONTRACT

GCC 47	Bonus: Rs. 1000.00 per day
GCC 48.1	The Advance Payments shall be: 15% of the Contract Amount and shall be paid to the Contractor no later than 21 days after the submission of the required Bank Guarantee issued by a Nationalized Bank/Scheduled Bank. The mobilization advance cannot be claimed after the expiry of 4 months from the date of agreement of this contract.
GCC 48.3	The advance payment shall be recovered at a rate of minimum of 15 % (fifteen percent) of the amount of advance payment from the first and every subsequent bills until the full advance paid has been recovered.
GCC 49.1	The Performance Security in the form unconditional and irrevocable bank guarantee issued by a Nationalized Bank/Scheduled Bank located in India for an amount of 5 % of the Contract price. The performance security shall be valid up to 28 days beyond completion date. The Performance Security shall be released after issue of Completion Certificate by the Project Manager.
E. Finishing the Contract	
GCC 56.2(b)	The contractor has to approach the Project Manager at least 5 days before the expiry of time period of 28 days to get the revised instructions.
GCC 56.2(g)	The maximum number of days is: 100 days.
GCC 58.1	The percentage to apply to the value of the work not completed, representing the Employer's additional cost for completing the Works, is 20%.

Appendix-1 Environmental Management Plan (deleted)

PART III- CONDITIONS OF CONTRACT

Section IX - CONTRACT FORMS

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

PART III- CONDITIONS OF CONTRACT

Letter of Acceptance

---- on letterhead paper of the Employer ----

..... *date.*

To: *name and address of the Contractor*

Subject: *Notification of Award Contract No.*

Dear Sirs

This is to notify you that your Bid dated *date* for

.....
..... Gangtok, Sikkim or the Contract Price of Rupees
.....

..... ,*amounting numbers and words* as corrected and modified in accordance with the Instructions to Bidders* is hereby accepted by our Agency.

We accept/ do not accept that be appointed as the Adjudicator **.

We note that as per bid, you do not intend to subcontract any component of work.

OR

We note that as per bid, you propose to employ M/s as subcontractor for executing

[delete whichever is not applicable]

You are hereby requested to furnish the Performance Security, plus additional security for unbalance bids in terms of ITB clause 43.1, in the form detailed in Para 37.5 of ITB for an amount of INR. within 15 days of the receipt of this letter of acceptance valid up to 28 days from the date of expiry of Defects Liability

PART III- CONDITIONS OF CONTRACT

Period i.e.: unto and sign the contract, failing which action as stated in Para 43.2 of ITB will be taken.

We have reviewed the construction methodology submitted by you along with the bid in response to section IV and our comments are given in the attachment. You are requested to submit a revised Program including environmental management plan as per Clause 25 of General Conditions of Contract within 14 days of receipt of this letter.

Yours Faithfully

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

* - delete —corrected and| or —and modified| if only one of these actions applies. Delete —as corrected and modified in accordance with the Instructions to Bidders| if corrections or modifications have not been effected.

** - to be used only if the Contractor disagrees in his Bid with the Adjudicator proposed by the Employer|.

PART III- CONDITIONS OF CONTRACT

Contract Agreement

THIS AGREEMENT made theday of,, between Chief Executing Officer, GSCDL, Level 5, Kissan Bazaar, Gangtok-737101, Sikkim (India) (here in after —the Employer), of the one part, and name of the Contractor. (hereinafter —the Contractor), of the other part:

WHEREAS the Employer desires that the Works known as **MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA**, 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,

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) the Letter of Acceptance
 - b) Letters of Technical Bid and Price Bid
 - c) The Addenda Nos *insert addenda numbers if any.*
 - d) the Particular Conditions
 - e) the General Conditions
 - f) the Specification
 - g) the Drawings; and
 - h) the completed Schedules,
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 Sikkimon the day, month and year indicated above.

PART III- CONDITIONS OF CONTRACT

Signed by

Signed by

for and on behalf of the Employer

for and on behalf the Contractor

in the presence of:

in the presence of:

Witness, Name, Signature, Address, Date

Witness, Name, Signature, Address, Date

Unconditional Performance Security

Bank's Name, and Address of Issuing Branch or Office

Beneficiary:

Name of the Employer: Gangtok Smart City Development Limited represented by the Chief Executing Officer, Level 5, Kissan Bazaar, Gangtok-737101, Sikkim (India)

Date:

Performance Guarantee No.:

We have been informed that name of the Contractor. . . . (here in after called —the Contractor) has entered into Contract No. reference number of the Contract. . . . datedwith you, for the **MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA**, (hereinafter called —the Contract).

Furthermore, we understand that, according to the conditions of the Contract, an irrevocable and unconditional performance guarantee is required.

At the request of the Contractor, we *name of the Bank*. . . . hereby unconditionally and irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *name of the currency and amount in figures*. (*amount in words*.) such sum being payable in the types and proportions of currencies in which the Contract Price is 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, and without cavil & arguments without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of *Insert the date twenty-eight days after the defect liability period*. . . . , , and any demand for payment under it must be received by us at this office on or before that date.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [one year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee

.....
Seal of Bank and Signature(s)

PART III- CONDITIONS OF CONTRACT

Advance Payment Security (Unconditional)

Bank's Name, and Address of Issuing Branch or Office

Beneficiary:

Name of the Employer: Gangtok Smart City Development Limited represented by the Chief Executing Officer, Level 5, Kissan Bazaar, Gangtok-737101, Sikkim (India)

Date:

Advance Payment 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 **MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA**, (hereinafter called —the Contract).

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum *name of the currency and amount in figures. . . . (. . . . amount in words. . . .)* is to be made against an advance payment guarantee.

At the request of the Contractor, we *name of the Bank. . . .* hereby unconditionally and irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *name of the currency and amount in figures*. . . . (. . . . amount in words. . . .)* 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 under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number
. *Contractor's account number. . . . at name and address of the Bank.*

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire upon our receipt of a copy of the payment certificate indicating that hundred (100) percent mobilization advance has been recovered. This guarantee will not be subjected to any cavil or arguments.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [one year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee

. Seal of Bank and Signature(s).

PART III- CONDITIONS OF CONTRACT

Unconditional Bank Guarantee in Lieu of Retention Money

To: Gangtok Smart City Development Limited represented by the Chief Executing Officer, Level 5, Kissan Bazaar, Gangtok-737101, Sikkim (India)

WHEREAS _____ [name and address of contractor] (hereinafter called the —Contractor) has undertaken, in pursuance of Contract No. _____ dated _____ to

MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA,

(herein after called the —Contractl.);

AND WHEREAS IT HAS BEEN AGREED BY YOU IN THE SAID contract that the Contractor has option to replace the Retention Money with an irrevocable and unconditional Bank Guarantee, in instalments of _____ (*indicate the value*) from a Bank acceptable to you as security for compliance with contractor's obligations in accordance with the contract (Sub-clause 45.2 of Particular Conditions of Contract).

AND WHEREAS the Contractor has opted to replace the retention money with an irrevocable and unconditional Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ [*amount of Guarantee in figures*],

_____ [*amount in words*],#such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents

PART III- CONDITIONS OF CONTRACT

which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid till the _Project Manager‘ certifies repayment of retention money in accordance with Sub-clause 45.2 of Particular Conditions of Contract i.e., upto

SIGNATURE AND SEAL OF THE GUARANTOR

Name of the Bank: _____

Address: _____

Date: _____

An amount is to be inserted by the Guarantor, representing the amount specified in the Contract, and denominated either in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Employer.

GANGTOK SMART CITY DEVELOPMENT LIMITED



REQUEST FOR PROPOSAL (RFP)



NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE & SPORTING COMPLEX AND DISMANTLING OF EXISTING UDD ENGINEER CELL OFFICE BUILDING AT DEVELOPMENT AREA

Single-Stage, Two-Envelope

Volume - II

Issued on : 25.02.2022

Invitation for Bids No. : 019/GSCDL/2022

Date: 25.02.2022

Employer : GSCDL, Level 5, Kissan Bazaar, Gangtok

Table of Contents

Brief Background of the project	2
WORKS REQUIREMENTS	4
1. Scope of work	4
1.1 Demolition of Existing Buildings	5
1.2 Designing & Construction of MLCP Complex building	5
1.2.1 Parking Floors	7
1.2.2 Retirement club/Kids play area/Yoga spaces/Cafe	8
1.2.3 Community Hall	8
1.2.4 Sporting Complex	8
1.2.5 Rainwater Harvesting & Solar Power	9
1.2.6 Transformer, Diesel Generator (DG Set) & Surveillance system	9
1.2.7 Mechanical Car Parking	10
2. Specifications	12
2.1. Structural Requirement	13
2.2. Mechanical Car Parking	13
2.2. Parking Floor Requirement	17
2.3. Material Specifications- Civil/ Building works	20
2.4. Specifications of Work	41
2.5. Technical Specifications – Public Health and Fire Fighting Works	53
2.6. Technical Specifications - Sanitary Fixtures	57
2.7. Technical Specifications – Soil, Waste & Vent Pipes	61
2.8. Technical Specifications – Water Supply	72
2.9. Technical Specifications – Sewerage/Drainage System	79
2.10. Technical Specifications – Fire Hydrant System	89
2.11. Technical Specifications – Pumps and Ancillary Equipment	93
2.12. Technical Specifications – Commissioning for Fire-fighting System	98
2.13. Technical Specifications – Installation of Tube well	101
2.14. Electrical Installation Works	103
3. Drawings	131
4. Terms of Payment	132
5. Supplementary Information	137

Part II- Employers Requirement

Brief Background of the project

- a) Gangtok, the capital of Sikkim is the 3rd city to be selected under the INDIA SMART CITY MISSION. Gangtok Smart City Development Limited (GSCDL) is the nodal agency with a mandate to development of the smart city. Gangtok is one of the most beautiful hill cities and a preferred tourist destination of the country. The city apart from tourist hub is also a base for adventure seekers trekking to the Himalayan Mountain range. Nearly 14.25 lakhs tourist have visited the city in 2017 and is expected to grow in coming years.
- b) The project is located at existing building of Urban Development. Department. opposite the official residence of the Accounts General of Sikkim at Development Area.
- c) The current building was earlier functioning as a shopping complex, which had been constructed by Urban Development Department (UDD). The most recent use of the building was housing the Engineering Cell of Urban Development Department (UDD). The building being an old structure and also being crossed by a Jhora had begun to develop minor cracks. However, during the monsoon of 2021 major cracks were development and it was ordered to be vacated by the District Collector – cum – Magistrate (East).
- d) Development Area has a dearth of parking spaces. The three floors of 1800 sqm parking space can come as a great relief to the public of the area. Even the nearby taxi stand can be shifted there, which can increase the effective width of the road that can help in decongestion. In addition, the parking can be used by GMC after completion of the project to generate revenue as well.
- e) Further, during social events such as marriage, funeral or public gathering the community hall can be very useful. As stated above it will limit the people of Development area from looking into community halls of other areas and will also potentially generate revenue for GMC through hall bookings.
- f) In addition, the sports complex shall engage the youths of the area into healthy habits and keep them above from antisocial activities. This will further help in talent development and scouting. Also, the retirement club for the elderly with kids playing area will ensure that our older generation can relax and rejuvenate themselves through the innocence and youthful energy of the children and the children can also be guided and molded by the profound knowledge and wisdom of the elderly. As in the above cases, this too can act as a revenue-generating model for GMC.
- g) This project shall make use of the building that has been rendered useless and convert the same into a structure that is the need of the hour of the region which will also help in generate revenue for the Government.

PART II- EMPLOYERS REQUIREMENT

- h) The Contractor will be responsible for all Clearance from Town Planning / Municipal Corporation & any other competent authority needs to be obtained for constructing the MLCP Development Area at UDD Engineering Cell and use of Building for the same including all necessary Environmental clearance from concerned authority.
- i) The Contractor shall also obtain No objection Certificate from Fire Department shall be obtained after taking care of disaster management measures as per NBC-2016 pre/ post construction as the case may be.
- j) All clearances from relevant competent Authorities for start of work, during work, final commissioning of work done or any item or any part of work or any other necessary item clearances are contractor's responsibility with no extra costs/payments on this account from employer. The following are applicable permits (the list is indicative but not exhaustive)
- GSCDL
 - Fire Department
 - Power Department Government of Sikkim
 - Public Health Engineering Department of Gangtok Sikkim
 - Environmental Clearances
 - State Pollution Board
 - Services Agencies / Road Owning Agencies
 - Traffic Police (for traffic management schemes during and after the construction)
 - Land/Drain owning agencies
 - Any other applicable permits
- k) Prior to the commencement of any construction activity, the Contractor shall comply conditions mentioned below:
- Finalize and furnish detailed drawings for project implementation plan for the Project (Construction Plan) in consultation with the Project Manager. The Construction Plan shall, include detailed schedule which shall specify all major milestones and should cover all stages and aspects of the project implementation including design and engineering, procurement of materials and equipment, installation, construction, testing, etc.
 - Manpower deployment plan, including the designation of Key Personnel for the management and supervision of all Project Activities. This would include the designation of suitably qualified and experienced personnel for areas such as Contract Administration and Supervision, Construction Management, Traffic & Safety, Environmental Management, Plant & Equipment Maintenance, Procurement, Materials Management, Quality Control & Assurance, etc.
 - A broad method statement for key items setting out methodology of construction, materials and construction equipment mobilization, utilization

PART II- EMPLOYERS REQUIREMENT

plans, broad output calculations and details of the quality assurance and quality control procedures.

- Advise to GSCDL on the details of the utilities that are necessary to be shifted, including suggestions on the alternate routing, and the estimates of the costs associated with such shifting.
- l) All detailed designs must be submitted to the Project Manager for approvals and works are to be taken up after the receipt of respective approvals and “Good for Construction” stamps from the Project Manager.

WORKS REQUIREMENTS

Following sections give the detailed scope of work to be taken up under the bid.

1. Scope of work

The “Multilevel Mechanical Car Parking cum Community Centre & Sporting Complex at Development Area” is to be developed in an available area of over 700.00 sqm that is proposed to be used in steps to reduce cutting of soil. The project shall comprise of 6 storey building having a buildup area of 2919.80 sqm. The main component of the project is as follows:

- Dismantling of existing structures including throwing of unserviceable debris.
- Soil investigation, survey and preparation of Detailed Project Report as per Engineer-in-charge.
- Car parking at road level and two floors below of total 1615 sqm, to be constructed in such a way that the Mechanical Car Parking can be seamlessly integrated inside the RCC structure.
- Mechanical Car parking having at least 90 number of LMV capacity at the three floors given above.
- The floor above road level shall house kids play area and retirement club with total area of 652.4 sqm.
- The floor above that shall have community hall with total area of 652.4 sqm.
- The topmost floor shall have sporting complex with total area of 652.4 sqm.
- The top floor shall be covered with steel truss and roof with provision for rainwater harvesting and solar water heater of 5000 litre capacity.
- The plumbing work shall be carried out in such a manner that the water collected from rainwater after filtration shall be used for the purpose of flushing in toilets.
- In addition, if the rainwater is not sufficient then the fittings will have to be done in such a manner than beyond a certain capacity normal PHE water will have to be supplied at the rainwater harvesting tanks.
- Internal and external water supply and sanitary installation.

PART II- EMPLOYERS REQUIREMENT

- Internal and external electrification with dedicated transformer and DG set.
- Construction of sewer line, effluent drain.
- Security and surveillance.
- Firefighting with sprinkler system and automatic fire alarm.
- The building should be earthquake resistant including the construction of shear wall.

1.1 Demolition of Existing Buildings

Currently at the proposed location there is an existing building which needs to be demolished prior to the construction of the building

The Contractor shall demolish the complete building including the foundation, plinth protection, flooring in and around the building and other structures including RCC slabs, beams, columns, masonry walls, doors, windows, ventilators, internal plumbing and sanitary lines, electrical lines, fixtures etc. complete except the outer compound wall, as per the instruction of the Project Manager and dispose off the debris & other unserviceable material to the designated dumping ground, with due permission of the local authorities as per the norms/ rules and regulations of Central Pollution Control Board/ National Green Tribunal.

The bidder may quote for this item of work after accounting for the cost of demolition, disposal of debris & unserviceable materials as above.

The demolition plan of the existing buildings has to be submitted to the Project Manager for approval.

1.2 Designing & Construction of MLCP Complex building

The building is coming up in a proposed site area of over 700 Sqm. (approx.) of land. The proposed structure will capitalize on the elevation difference available at the land and the road. The building will be like a (Level 1/Ground Level, Level 2, Level 3/Road Level, Level 4, Level 5, Level 6) 6 Levels building.

The area statement and levels of the proposed structure are given below-

Table 1: Area statement and levels of proposed structure

SN	Floor	Level (m)	Total Area (Sqm)	Any special feature/ specification
1	Sporting Complex (Level 6)	10.8	652.4	<ul style="list-style-type: none">• Futsal play area with green turf Badminton Court

PART II- EMPLOYERS REQUIREMENT

SN	Floor	Level (m)	Total Area (Sqm)	Any special feature/ specification
				<ul style="list-style-type: none"> Washroom/ toilet facilities along with shower and changing room for players.
2	Community Hall (Level 5)	7.2	652.4	<ul style="list-style-type: none"> Community hall along with kitchen and dining area Washroom/ toilet facilities
3	Kids play area, yoga centre, retirement club (Level 4)	3.6	652.4	<ul style="list-style-type: none"> Play area for kids along with adjacent retirement club for the elderly. Yoga centre along with small café cum working area with space to play chess.
4	Parking (Level 3/ Road Level)	0	652.4	<ul style="list-style-type: none"> car parking Washroom/ toilet facilities
5	Parking (Level 2)	-3.6	544.6	<ul style="list-style-type: none"> car parking Washroom/ toilet facilities
6	Parking (Level 1/ Ground Level)	-7.2	418	<ul style="list-style-type: none"> car parking space and housing of transformer and DG set Washroom/ toilet facilities
	Total		3571.9 (3572.2)	

Detailed descriptions of the above and conceptual drawings are available in this section. The work would involve-

- a) Undertaking all geo technical investigations at the proposed site, which includes but not limited to soil investigations, slope/ hill stability investigations etc. as the case may be.
- b) The foundation should be designed as per the soil investigation report as conducted at the site by the contractor. The building should be design for resisting earthquake forces as per the relevant IS Code.
- c) Undertaking of Architectural, Structural, and Mechanical- Electrical- Plumbing for the entire structure including hill stability / soil stability measures to be taken up (if required).
- d) Submission of the above designs for approval of the Project Manager.
- e) Providing and construction of the MLCP Development Area at UDD Engineering Cell based on the approved designs as per the Sikkim PWD/ CPWD specifications.

PART II- EMPLOYERS REQUIREMENT

Provision for water collection from the surface for rain harvesting and recycle for the use in Landscape and Toilets as per the standards may be made.

The plumbing fixtures shall be of reputed brands like Hindware, Jaguar or Cera or equivalent. The building shall also have adequate provision for safe and sanitary disposal of grey water and other wastewater through connection with the existing sewer network or through municipal sewer line. Fire-fighting systems need to be provided as per standards.

The building shall have provisions for adequate water supply by being connected to the main source or other source of water supply and shall have provisions for both hot and cold water. The plumbing shall be concealed with adequate points of supply wherever required and as approved by the Project Manager. The plumbing fixtures shall be of reputed brands like M/s. Hindware, M/s Simpolo, M/s. Cera or equivalent. The building shall also have adequate provision for safe and sanitary disposal of grey water and other wastewater through connection with the existing sewer network or through onsite sanitation systems like septic tank, etc. The electrical work shall be done by providing adequate switches for lighting, heating, cooling and charging requirements of the residents. All electrical wiring and fixtures should be of reputed brands like M/s. MK, M/s. Crabtree M/s. Legrand or equivalent as approved by the Project Manager

The building can be a RCC structure and or composite with Prefabricated Steel and RCC. Sufficient capacity power/electricity generators should be installed for use of all basic parking functions in case of power failure with proper chimney arrangements to disperse off smoke. The buildings and other components below should be fit for the designated purpose of use.

1.2.1 Parking Floors

A Parking floor covering an area of 1615 sqm (Ground floor, Basement Level 1, Basement Level 2 as in concept drawings) of parking area spread over 3 floors.

The RCC framed structure must be designed in accordance with standard of "Specifications" as mentioned in this document. All designs must be submitted to the Project Manager for approval before work is taken up and work to be started after required approvals.

The parking area entry and exit will be secured with security cabin and security boom barrier and provided with ticket collection points. Also, all entries be provided with necessary vehicle height restrictions bars for maximum height clearance for respective parking spaces. Fire alarm and fighting system with CCTV and other security system as per standards must be provided. Construction of ramp for the vehicle entry and exit to be finished in anti-skid flooring material. Only Light Motor Vehicles are to allowed entry into the parking area and hence, the design may be done accordingly.

PART II- EMPLOYERS REQUIREMENT

1.2.2 Retirement club/Kids play area/Yoga spaces/Cafe

Retirement clubs for the elderly people and shall comprise of necessary seating arrangements it shall also house area for Yoga centre for health benefits among the youths and adults.

Recreation plays a key role in the well-being of older adults and in enhancing their quality of life.

For seniors, as for people of all ages, involvement in recreation activities can satisfy a variety of needs. Among the important benefits of recreation for the senior population is increased health and fitness, as well as opportunities for socializing, for using skills and talents developed throughout their lifetime, and for learning new skills. The senior population is quite varied, with a diversity of interests, strengths, and abilities and can find appropriate activities to suit their changing physical abilities and interests.

The level above the road level shall comprise of kids play area with equipment's for kids play with the flooring material being such that the accidental risks would be minimized in accordance with relevant standard of "Specifications" as mentioned in this document.

Further, a café with working area for people along the lines of remote working concept so that tourists who are visiting with such provisions can also easily use the same and locals can also make use of the facility. Further, a space to play chess or other board games to promote social interactions.

1.2.3 Community Hall

Open community hall along with adjacent dining and kitchen space. The design shall have to be in such a way that it can incorporate social functions such as marriages, funeral, and house sufficient number of guests. The shape of community hall should be such that it accommodates maximum people efficiently using space available to facilitate needs of dining, kitchen and its staff space, toilets, etc. as directed by project manager. Adequate reverberation is important to lend blending and fullness of music without echo of sounds.

1.2.4 Sporting Complex

The topmost floor in the building shall comprise of a sporting complex with futsal arena, badminton court the dimension of the complex shall be standardized. The flooring shall be of green turf grass.

Badminton Court Standards

The court has two halves measuring 6.7m (22 feet) each and separated by a **badminton net** that stands at a height of 1.55m (5 feet 1in) at the ends and dips to 1.52m (5 feet) in the middle.

PART II- EMPLOYERS REQUIREMENT

The two playing areas on either side of the net are further vertically divided down the middle demarking the service areas. This means a badminton court has four service courts each of which is 3.96m (13 feet) long and 2.59m (8.5 feet) wide.

With laws of badminton dictating specific rules for service in badminton, the court has two service lines, the short service line, which is 1.98m (6.5 feet) from the net, and long service line 0.76m (2.5 feet) in from the baseline, specifically marked for this purpose.

In singles, the service needs to be beyond the short service line and within the boundary lines while in the doubles game, the service should be beyond the short service line but it's the long service line that acts as the marker on the backcourt. This means, in doubles the serve length is shorter than in singles.

Proper washroom and toilet facilities along with bathroom along with shower facilities shall be provided for health and hygiene of the users. The shower will have provision of hot water coming from the solar water heating system.

1.2.5 Rainwater Harvesting & Solar Power

A 5000-litre capacity solar power heater shall be installed by providing solar planes at the roof of the structure.

Also, rainwater harvesting shall be done to use for the purpose of flushing after filtration.

1.2.6 Transformer, Diesel Generator (DG Set) & Surveillance system

A transformer of capacity 250 kVA shall be provided along with DG of 150 kVA capacity. The same shall be housed at the lower most parking floor. In addition, CCTV system shall be installed on all floors along with cameras facing the outer portion of buildings covering. Security systems should be enough for covering whole MLCP Development Area at UDD Engineering Cell compounds, different areas and all secluded areas where security is inaccessible by guard physically.

Providing standby Power by installation of D.G. set of suitable capacity as per pre-approvals by the Project Manager. A detailed explanatory note giving the details of operational sequence, time period and safety aspects etc. on changeover from Power Department (Government of Sikkim) supply source to stand by D.G. power.

Installation of Security systems, which would include perimeter protection, alarm systems, security lighting, closed circuit TV at the site. The Security systems installed should be of high standards and of reputed brands like M/s Zicom, M/s Godrej or equivalent. Also, components like camera PTZ Optical Zoom 4MP, IP Bullet or Dome 4mm upto 4K, NVR 4 Sata 4MP upto 4K, Hard Disk of Minimum 4TB Storage, POE Switch 8 way Giga, CAT 6 D-link, LED FHD 32 X 2, Camera Stand, Bose 251 or equivalent outdoor speakers, Bose F1 812 or equivalent flexible array loudspeaker, Pioneer channel Amplifier class D3 Network or equivalent with all accessories with providing and fixing charges all including should be as per pre-approvals by the Project Manager.

PART II- EMPLOYERS REQUIREMENT

1.2.7 Mechanical Car Parking

1. Supply, installation, erection, testing & commissioning & two Year Comprehensive Operation and maintenance contract of Parking System with Electro Mechanical technology to accommodate minimum 90 Nos. of four-wheeler with suitable steel structure frame work, Independent motorized pallet having up/down movement with electro-mechanical technology complete with PLC and electrical installation etc. as per specification and direction of Gangtok Smart City Development Ltd.
2. The system shall be designed to accommodate 50% SUVs Four-Wheeler and 50% Sedan cars with average retrieval/parking time not more than 300 seconds.
3. Provide required electrical, mechanical and automation for MLCP.
4. Provide all software and hardware required for automation and commissioning the MLCP.
5. The bidder shall install brand new equipment and the same shall be free from all defects and faults in material, workmanship, and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for materials of the type ordered and shall perform in full conformity with the specifications and drawings.
6. The Contractor shall be responsible for execution of work without any defects that may develop under the conditions provided by the Contractor and under use, arising from faulty materials, design or workmanship such as corrosion of the equipment, inadequate contact protection, deficiencies in circuit design and or otherwise and shall rectify if any defects occur at his own cost when called upon to do so by the GSCDL.
7. Further GSCDL reserves the right to collect the revenue from MLCP during operations maintenance period.
8. Contractor shall submit Structure stability certificate for 10 years for all the components of electro Mechanized Parking (Vertical Rotary /Puzzle/Stack) system from any Government Engineering Institution / College recommended by GSCDL.
9. Third party inspection: The GSCDL may appoint any approved government agency/Authority or any person for third party inspection of the work, on contractor's cost.
10. All labour, materials, tools plants, machinery, equipment, and any other things required for execution for work shall be arranged by the CONTRACTOR at his own cost.
11. All arrangements for establishment, watch & ward of stores and security of sites, appropriate vehicles for transportation etc. shall have to be made by the CONTRACTOR at his own cost and nothing extra on this account shall be paid.
12. Testing and Commissioning shall include furnishing all labour, materials, instruments etc. and incidentals necessary for complete testing of each component as per the IS / NBC specifications and manufacturer's recommendations.
13. On the completion of the work, the CONTRACTOR shall clear away and remove from the site all construction plants, temporary works, surplus material and rubbish of every kind and leave the site and works clean to the satisfaction of the Engineer-in-charge.

PART II- EMPLOYERS REQUIREMENT

14. In view of the site location and their prevailing condition, it is mandatory on the Contractor to visit the site and make himself thoroughly familiar with the site conditions, access and account for all possible difficulties and other requirements mentioned elsewhere in his bid prior to submission. When a contractor submits his bid for this work, it will be considered that he has quoted for this work with full and complete knowledge of the site and prevailing conditions, and no claim for additional compensation shall be entertained on this account.

15. It is clarified that bidder should read carefully understand design features as mentioned in "Design Feature" in the para below so that the Bidder is familiarized with the scope of work while submitting a Bid.

16. The contractor shall submit the as built drawing, other specifications & additional maintenance, and Operation standard other than mentioned in the RFP.

17. Comprehensive Operation and Maintenance: The successful bidder/ CONTRACTOR will be required to undertake Operation & maintenance of the Parking System as per the following terms:

a) The CONTRACTOR shall at all times maintain, keep in good operating condition, repair, and renew, replace and upgrade to the extent reasonably necessary, the equipment, systems, and facilities. All maintenance and repair works shall be carried out in such a way as to minimize inconvenience to users of the Parking Systems.

b) Maintenance shall generally be allowed at nonpeak hours only.

c) The complete Mechanized system shall have the provision of emergency evacuation of vehicles manually also.

d) Contractor should maintain all the necessary INVENTORY of electro-mechanical parts of the system during Comprehensive Operation and maintenance period and also provide a list parts prone to wear and tear during regular operation to GSCDL authorities at the time of handing over after two-year Comprehensive Operation and maintenance.

e) During the Operation and Maintenance period, the successful bidder shall replace the damaged/defective/worn out parts at his own cost to ensure smooth functioning of MLCP.

f) The CONTRACTOR shall maintain a complaint register, duly paged, at site and shall make it available to the users of the parking to note down the complaints. "GANGTOK SMART CITY DEVELOPMENT LIMITED will have the right to check the complaint book as and when required. The complaint register will be kept properly, and it shall be mentioned on the display signboard about its availability.

g) Transfer of facility to "GANGTOK SMART CITY DEVELOPMENT LIMITED. The CONTRACTOR shall transfer the parking facility to GANGTOK SMART CITY DEVELOPMENT LIMITED, free and clear of any encumbrances on completion of or termination of contract, whichever is earlier.

h) During the Comprehensive Operation and maintenance period prior to anticipate transfer of the Facility the CONTRACTOR shall provide such training services to the representatives and employees of Engineer In Charge GANGTOK SMART CITY DEVELOPMENT LIMITED, or its nominated agency to operate and maintain the Facilities efficiently and safely following such transfer.

2. Specifications

The structure has to be designed in accordance with standard of specification of Sikkim PWD duly conforming to relevant IS Codes. Each item like furniture, sanitary wares, plumbing, fire systems, etc. to be provided inside this structure shall be according to relevant available codes and if any item or part of the item is not covered in these specifications best quality item available in market shall be installed with relevant pre-approvals for rates and standards from authority (Project Manager/appropriate government authority appointed by GSCDL for approval). All designs have to be submitted to the Project Manager/appropriate government authority appointed by GSCDL for approval. Any item or part of the item not covered in Sikkim PWD Specifications shall be executed as per relevant IS Codes or CPWD Specifications or as per the directions of Authority. The following codes and standards will be applicable

- Sikkim PWD Specifications
- Central PWD Specifications (CPWD)
- Bureau of Indian Standards (BIS)
- Indian Standards in Civil Engineering (IS Codes)
- National Building Codes (NBC)
- Local Building Bye Laws and DCR
- Indian Road Congress (IRC Codes)
- The Sikkim Allotment Of house sites and Construction of Building (Regulation and Control) Act, 1985
- Sikkim Building Construction Regulation amendment
- The SIKKIM FIRE SERVICE ACT, 1981
- Gangtok Stability Map

The design of facilities for the handicapped and the disabled people, like the toilets, bathrooms, ramps shall be designed as per the respective IS Codes and guidelines issued by Government of India or Government of Sikkim. These codes and specifications shall deem to be bound in this document. The technical specifications for Civil, Mechanical and Electrical installations works are detailed in the subsequent sections. Should there be any conflict between the codes and specifications or if any specifications aren't present, following order is to be followed for reference:

- Sikkim PWD
- CPWD
- BIS CODE

PART II- EMPLOYERS REQUIREMENT

2.1. *Structural Requirement*

The building shall be designed in accordance with the latest Indian Standard Codes and shall be designed to resist wind and seismic forces

- RCC Structures shall be designed as per IS 456:2000
- Steel Structures shall be designed in accordance with the provision of IS 531-1984 and IS 800:1984.
- Structural steel shall conform to IS 2062.
- Tubular section shall conform to IS 4923
- Architectural design norms as per NBC (National Building Code – 2016)
- Structural Design norms as per NBC and BIS (Bureau of Indian Standards).

Contractor is advised to carry out its own tests and investigations related to soil condition, strata, bearing capacity and other characteristics.

2.2. *Mechanical Car Parking*

I. The structure shall be designed in accordance with the latest Indian Standard Codes and

- Shall be designed to resist wind and seismic forces.
- Steel Structures shall be designed in accordance with the provision of IS 800-1984.
- Structural steel shall conform to IS 842. Tubular section shall conform to IS 4923.
- Architectural design norms as per NBC (National Building Code – 2005).
- Structural Design norms as per NBC and BIS (Bureau of Indian Standards)

CONTRACTOR shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural drawings. The CONTRACTOR shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the CONTRACTOR for the test,

The work shall be carried out in accordance with the Architectural drawings and structural drawings. Before commencement of any item of work, the CONTRACTOR shall correlate all the relevant architectural and structural drawing issued for the work, nomenclature of items, specifications etc. and satisfy himself that the information available there from is complete and unambiguous. The figures & the written dimensions of the drawing shall supersede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in-charge for immediate decision before execution of the work. The CONTRACTOR alone shall be responsible for any loss or damage occurring by the commencement of work on

PART II- EMPLOYERS REQUIREMENT

the basis of any erroneous and or incomplete information and no claim, whatsoever shall be entertained on this account. The CONTRACTOR shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other CONTRACTOR's) or by the Engineer-in-charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed so as not to interfere with the operations of other CONTRACTOR or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

The rates of different items of work shall apply to all heights & depths unless otherwise specified.

Site Electricians / Other Electrical Personnel: The CONTRACTOR shall engage qualified and competent electricians and other electrical personnel while working for safe execution of contract. The electricians and other electrical personnel must possess requisite certificate issued from competent authority. Using exposed naked loose joints, inserting of bare wire into socket, improper grounding for appliances, exposed circuits on work place etc. shall not be permitted. Rating of fuses and circuit breakers used for protection of circuit should be coordinated. Flexible cords with the conductor cross sectional area smaller than 1.5 mm should not be used. Socket outlets, plugs and cable coupler should be of the water splash proof type, so minimum IP44 panel boards are required in construction sites. Overhead cabling should provide for a minimum ground clearance of at least 3.0 meters. The CONTRACTOR shall employ qualified, full time Electricians / Electrical Supervisors to maintain his temporary electrical installation. Use approved perimeter markings to isolate restricted areas from designated work areas and entryways. Erect them before work begins and maintain them for the duration of work. Approved perimeter marking must be Install red barrier tape printed with the words 'DANGER-HIGH VOLTAGE' approximately 1 to 1.5 meter above the floor or work surface or Install a barrier of yellow or orange synthetic rope 1 to 1.5 meter from the floor with standard danger signs. Any steps suggested by Engineer-in-charge should be- complied with by the CONTRACTOR.

Welding and Cutting Gas cylinders in use should be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap should be kept in place to protect the valve when the cylinder is not connected for use. Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch Domestic LPG cylinders shall not be used for Gas welding and cutting purpose. DCP or CO2 type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire Extinguisher should confirm to IS 2190: 1992. Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable will not be attached to equipment or existing installations or apparatus.

a) Steel

PART II- EMPLOYERS REQUIREMENT

All finished steel shall be well and cleanly rolled to the dimensions and weight specified by BIS subject to permissible to tolerances as per IS: 1852. The finished materials shall be reasonable free from cracks, surface flaws laminations, rough and imperfect edges and all other harmful defects and shall be painted with anti-corrosive paint Steel Sections, shall be free from excessive rust, scaling and pitting and shall be well protected. The decision of the Engineer-in-Charge regarding rejecting any steel section on account of any of the above defects shall be final and binding and shall be painted with anti-corrosive paint.

b) Fabrication

Fabrication shall generally be done as specified in IS: 800. In major works or where so specified, drawings giving complete information for the fabrication of the component parts of the structure including the location, type, size, length and details or fivers, bolts or welds, shall be prepared in advance of the actual fabrication and approved by the Engineer-in-Charge. The drawings shall indicate the shop and field rivets, bolts and welds. The steel members shall be distinctly marked or stenciled with paint with the identification marks as given in the shop drawings.

Great accuracy shall be observed in the fabrication of various members, so that these can be assembled without being unduly packed, strained or forced into position and when built up, shall be true and free from twist, kinks, buckles or open joints.

Wooden or metal sheet templates shall be made to correspond to each member, and position of rivet holes shall be marked accurately on them and holes drilled. The templates shall then be laid on the steel members, and holes for riveting and bolting marked on them. The ends of the steel members shall also be marked for cutting as per required dimensions. The base of steel columns and the positions of anchor bolts shall be carefully set out at the required location.

c) Erection

Steel work shall be hoisted and erected in position carefully, without any damage to itself other structures and equipment and injury to workmen. The method of hoisting and erection proposed to be adopted by the CONTRACTOR shall be got approved form the Engineer-in-charge in advance. The CONTRACTOR however shall be fully responsible for the work being carried out in a safe and proper manner without unduly stressing the various members and proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.

d) Overall Design Parameters

i) The codes and standards applicable for the design of the Project / Project facilities are given below:

Building Works and Electrical
System

Road / Pedestrian Path Works

PART II- EMPLOYERS REQUIREMENT

<p>I. Central public works (CPWD)</p> <p>II. Bureau of Indian Standards (BIS)</p> <p>III. National Building Codes (NBC); and</p> <p>iv. MPPWD Standards</p> <p>IS 456-2000</p> <p>IS 875</p> <p>Part 1: 1987</p> <p>Part 2: 1987</p> <p>Part 3: 1987</p> <p>IS 1893: 2002</p> <p>IS 13920: 1993</p> <p>IS 800:1984 & 2007</p> <p>IS 3370 Part 1 TO 4</p> <p>IS 2911 Part 1 TO 4</p> <p>SP-24-2000</p> <p>BS 8110: 1997</p> <p>SP-16-2000(Design Aids for Reinforced Concrete)</p> <p>SP-34-1987</p> <p>IS 1343:2012</p>	<p>I. Indian Road Congress (IRC) codes and standards</p> <p>II. Relevant Building Byelaws (on Parking Space)</p> <p>Plain and reinforced concrete-code of practice</p> <p>Code Of practice for design loads for buildings and structures</p> <p>dead loads- unit weights of building material and stored material</p> <p>Imposed loads</p> <p>Wind loads</p> <p>Criteria for earthquake resistant design of structures</p> <p>Code of practice for ductile detailing of reinforced concrete structures subjected to seismic forces</p> <p>Code of practice for general construction in steel</p> <p>Code of practice for liquid retaining structures</p> <p>Design & Construction of Pile Foundation</p> <p>Explanatory Hand Book on Indian Standard</p> <p>Code of Practice for Plain and Reinforced Concrete</p> <p>Plain and reinforced concrete-code of practice (British standard)</p> <p>Design Aids for Reinforced Concrete to IS 456.</p> <p>Hand Book on Concrete Reinforcement and Detailing.</p> <p>Code of practice for pre-stressed concrete (First Revision)</p>
---	--

II)Electrical system shall be provided as per the following applicable codes:

Sl No.	Code No.	Application Details
1	IS-10118 (Part I), 1982	Code of practice for selection, installation and maintenance of switch gear & control gear.
2	IS-732, 1989 Rev.3	Electrical wiring system
3	IS-3043, 1987	Code of practice for ear thing
4	IS-13032, 1992(Rev.2)	MCB distribution boards for voltage up to and including 1000V AC
5	IS-12640, 1988	Residual current operated circuit breakers
6	IS-649, 1990 (Rev.-3)	PVC insulated cabled for working voltage upto and including 1100 V AC
7	IS- 9537 (Part-I), 1980	Conduits for electrical installations general requirements
8	IS-13118, 1991	Circuit breakers- general requirements
9	IS-13947 (Part-III), 1993	Air break switches for voltage not exceeding 1000V AC or 1800 V DC

PART II- EMPLOYERS REQUIREMENT

10	IS-1248 (All parts), 1983, 1984, 1993	Electrical direct acting instruments
11	IS-2147, 1962	Degree of protection provided by enclosures for LV switches gear and control gear.
12	National Electrical Code Part-4 Appendix	Recommended values of illumination and limiting values of glare index-Industrial Building (parking space Indoor and outdoor)

Where the aforesaid are silent on any aspect, the following standards in order of preference shall be adopted in consultation with the Engineer-in-charge, unless otherwise specified in this schedule:

- i) Euro norm standards En: 14010: 2003 for parking structure safety.
- ii) American National Standard Institute (ANSI)
- iii) International standards organization (ISO)
- iv) British Standards (BS)
- v) National Fire Protection Association of America (NFPAA)
- vi) Safety code of Mechanized Parking (Vertical rotary/Puzzle) garage equipment of America (ASA.A113.1)

- vii) American Society of testing materials (ASTM)
 - viii) International Society for Measurement and Control (ISA)
 - ix) ISO 9000
 - x) Kis & Jis Standards
 - xi) Americans with Disability Act Accessibility Guidelines
 - xii) American Association of State Highway and Transport officials (AASHTO)
 - xiii) American Society of Mechanical Engineers code on storage retrieval (S/R) machines and associated Equipment (ASME B30.13)
 - xiv) National Mechanical code of America (NMC)
1. Any other standard proposed by the Bidder and approved by the Owner /Architect.
 2. The BIDDER shall provide illuminated signage in accordance with NBC/ IRC/ Norms at suitable locations within the parking facility. The scheme for signage shall be finalized in consultation with the independent Engineer.
 3. The Bidder shall provide the fire safety arrangement as per National Building Codes/ DIS codes or any widely accepted international codes.

The above-mentioned specification / codes are indicative only; any other code / specification required for development for parking facility will be applicable even though not mentioned above.

2.2. Parking Floor Requirement

- a) A modern state of the art parking charge collection system with Ticket Issuing Machine shall be designed. The parking charges shall be collected from the vehicles at the exit point.

PART II- EMPLOYERS REQUIREMENT

- b) A mechanized barrier gate/ Boom barrier shall be designed and synchronized with the ticketing system for regulating entry/exit of vehicles into and out of the parking area.
- c) The Entry areas shall be equipped with sensors to ensure the right positioning of the vehicle to be transported as well as determine the presence of oversized vehicles, protruding mirrors or racks, which exceed the size limitations of the system.
- d) CCTV Cameras shall be installed at entry/ exit points and all floors of the building facility for Security purpose and to record digital photos of the cars entering and exiting the premises. The images are also helpful to locate cars for drivers with a lost ticket and to validate damage claims.
- e) All Entry and Exit Areas must comply with disability requirements
- f) Safety barriers, at appropriate locations, shall be provided to effectively manage pedestrian and vehicular traffic.
- g) Illuminated signage in accordance with National Building Code (NBC)/ Indian Road Congress (IRC) Norms shall be provided at suitable locations within the Parking Facility. Some of the key parameters are tabulated below:

Table 3: Key Parameters for illuminated signage

SN	Items	Requirement
1	System Dimension	As per the system, to accommodate the car dimensions given.
2	Retrieval Time	40 - 60 seconds per car.
3	Driveways	Aisle for vehicle Circulations with 6m (max.) & 5m (Min.) width.
4	Setback	As per DCR
5	Ground Coverage	50%; confirming to DCR
6	Basement Coverage	75%; Confirming to DCR
7	Parking bay Dimension	2.5 x 5.5. m (manual)
8	Ramps	As per DCR; with a minimum 5.5.m for one-way and 7 m for two way and shall conform to structure and fire safety norms.
9	Slope of Ramps	1:10
10	Vehicle Queuing	Not more than 5 vehicles
11	Power Backup	100%
12	Security System	To be provided, should include CCTVs.
13	Gas and Smoke detection system	To be provided

PART II- EMPLOYERS REQUIREMENT

The design should be conforming to the above specifications for cars and SUVs, development control norms and other covenants for the parking given above.

2.2.1 Information Technology applications for MLCP Development Area at UDD Engineering Cell

- a) The facility shall have a parking tracking system based on sensors at Entry/ Exit Boom barriers to keep track of parking occupancy count
- b) There shall be an LED Display board at entrance of parking lot to display number of available parking spaces
- c) The MLCP Development Area at UDD Engineering Cell shall have a CCTV camera-based Vehicle and License Plate Image Capture with capability to automatically capture details of vehicle license plates at every entry. Image of the license plate should be linked to the details of the corresponding ticket issued in real-time and stored in the database for one month for security purpose
- d) The Control Room shall be furnished with a Graphical User Interface (hereafter referred as "GUI"), which shall show the geometry of the entire System with parking occupancy and all installed machines in real time.

2.2.2 Other Facilities and considerations

- a) Lighting: The Contractor shall provide adequate lighting system along with the Parking facility area.
- b) Signages: Proper illuminated Sign in accordance with the codes and standards to be provided with the parking facility. The codes may be referred are NBC, IRC and local DCR. The scheme for signals shall be finalized in consultation with the Project Officer.
- c) Drainage: The parking floors shall have proper and adequate drainage provisions. No stagnation of water shall take place within the parking facility Area. Preferably, the drain shall lie in the parking driveway.
- d) Employee Amenities: Adequate Worker Amenities area and facilities to be provided by the Contractor.
- e) Safety Structures: Proper and adequate Safety gears with instructions to be provided On Site for staff.
- f) Fire Fighting: Proper and Industry Standard Firefighting equipment to be provided by the Contractor.
- g) Sounds: The surrounding walls of the Parking Facility shall cover any sound emission of more than 40 dba emanating outside the structure, measured at the boundaries of the Project Site.

PART II- EMPLOYERS REQUIREMENT

- h) Vibrations: Not only sound but also vibrations resulting from the machinery need to be considered for potential negative impact to the rest of the building and their influence shall be kept to a very minimum.
- i) Evacuation Plan: Emergency Evacuation Plan and Safety procedures Manuals to be developed and made available.

2.3. *Material Specifications- Civil/ Building works*

The Tenderer are expected to possess and be well conversant with the following Sikkim PWD Specifications. Any item or part of the item not covered in Sikkim PWD Specifications shall be executed on relevant BIS specification, IS standard and code of practice.

All items of works shall be executed as per Sikkim PWD Specifications. Any item or part of the item not covered in Sikkim PWD Specifications shall be executed on relevant BIS specification and CPWD Specification and relevant IS CODES for best quality of items referred or as per directions of Project Manager/appropriate government authority appointed by GSCDL. The brief specification of main materials involved and items to be executed are given below:

2.3.1 *Termite Treatment*

Providing and injecting chemical emulsion for pre - constructional ant termite treatment as per I.S.6313. (Part – I & Part – II) specification and creating a chemical barrier in bottom and sides of foundation trenches, top- surface of plinth filling junction of walls and floors along with external perimeter of the building expansion joints surrounding the pipes and cables etc. complete using approved quality of chemical emulsion of requisite quantity prescribed by the manufacturer as directed by the Project Manager/appropriate government authority appointed by GSCDL including cost of all materials and labour taxes etc. complete. (Indemnity bond for warranty for 10 years to be furnished)

2.3.2 *Structural Glazing*

Scope: Designing the Curtain wall / Semi unitized structural glazing system as per design intent and as per approved drawings, preparation of shop drawings, supply, fabricate the panel with the specified glass on the child frame at factory, erect the system on erected extruded main frame & Transom fixed on supporting system at site as per approved shop drawings at all floor levels and for all heights. Designing, providing and fixing frame supporting system, the framing system (i.e. Main & Child frame) to support Spandrel panels either with Monolithic Glass or Laminated sandwiched composite panel (ACP),/openable Top hung window panels/ punched strip windows/ decorative capping to any shape & profile, smoke seal, flashing including gaskets, sealants necessary accessories, as part of the system on a

PART II- EMPLOYERS REQUIREMENT

continuous framing supported between floors as detailed below and as per the specification for external facade system.

Design the split framing semi unitized glazing system in case of Punched windows with vision panel proposed with either Monolithic Glass, as specified maintaining groove width shall not be more than 12 mm both in horizontal and vertical. Conducting the test for the materials involved in the system, field test on the erected system at site as per the test criteria set out in the specification of External Facade system. Submission of methodology for the Materials and assembly (Mock-up & field test) supported by the copy of relevant codes & Standards and the same shall be got approved by the Project Manager/appropriate government authority appointed by GSCDL prior to testing. Protection of the System and Materials till handing over to the Project Manager/appropriate government authority appointed by GSCDL, removal of the unwanted materials, broken glass, Screws, bolts, Nuts, Packing Materials, debris etc. regularly and keeping the premises neat and clean at all times.

Coordinate the details of the façade cleaning system during the preparation of shop drawing and incorporate such details in the shop drawing submitted for approval of Project Manager/appropriate government authority appointed by GSCDL. Maintaining the system by means of periodical inspection at site (bi-monthly) and checking the system and Materials involved in the system during Defects liability period (this will not relieve the contractor from the condition laid down in the contract under defects liability period) to ensure that the system and all materials are free from any defects during this period. Providing the Guarantee for the entire External Façade system to the specified period in an approved format supported with Back to back guarantee from the specialized Material supplier like Glass, Aluminum composite panel, Gasket, Sealant, Hardware etc. complete as directed by Project Manager/appropriate government authority appointed by GSCDL.

2.3.2.1 Design: Design pre-assembled aluminum Semi unitized Structurally glazed Panel with continuous framed panels / Strip window / Punched window system with split mullion to any shape and profiles shall be designed to with stand the design wind pressure as per relevant IS code (Test pressure shall be 1.5 times of the design wind pressure) and fixed at horizontally / vertically / sloped / curved position etc. as shown in the approved drawings by using Aluminum extrusions, Glass, Spacer tape, Gasket, Sealant etc. as specified.

Contractor shall be responsible to determine the maximum design wind pressure and lateral forces, moments, stresses, etc. applicable for the system. Negative/suction pressures if determined as per IS875 and Lateral forces as per code IS 1893 shall make allowances as described in the code for corner effects on the system. System shall be designed with Air pressureequalizationchamberandconcealedcontinuousgutterverticallyandhorizontallyatalllevels

PART II- EMPLOYERS REQUIREMENT

asselfdrainagebarriertoachievetightnessbesidesprovidingEPDMGasketso
ntheframeandEPDM Gasket/Sealant on the external groove as air and water
barrier.

2.3.2.2 **System:** System shall be designed to satisfy the structural design criteria specified in the technical specification with self-bearing modular elements supported between floors (Supporting span of minimum 3.50 meter) in the case of structural glazing and split mullion supported between sill & lintel/beam in the case of punched windows, EPDM Gaskets on the frame and Gasket/sealant on the groove to prevent the system from Air & water penetration ,double adhesive spacer tape, backer rod, sealant, supporting brackets (Resistance to design wind pressure), Separator Gaskets for Bi-Metallic Corrosion, Pressure equalization chamber in the system, built-in continuous internal drainage gutter for collection and facility at lowest floor level to drain out penetrated water, in built adjustability to accommodate thermal expansion, thermal movement and movement due to any other forces etc.

System shall be designed with Gasket/Sealant on the external groove with colour anodized aluminum holder around the panel to the required width and thickness as per design as Dead load support to the Glass panel. Non-Staining sealant between glass &aluminum holder around the panel shall be provided. Glazing the panel with child frame shall be done only at factory at the controlled atmosphere to erect the panel on erected extruded aluminum main member and transom with supporting system at site fixed on the RC surface. The Mullion and sill / head Transom flush on inside of the facade. Intermediate transoms shall be provided keeping 2 to 3mm recessed from the inner face of the mullion. Joints between mullion and transom shall be filled with weather sealant on the inside. All transoms shall have uniform in depth on the inner face of the system. Vertical in-situ glazing shall not be carried out during construction/erection stage. System shall be designed in such a way that the outer surface of insulated glass unit, monolithic glass unit and Aluminum Composite Panel shall be in the same plane or as per approved drawing. Aluminum shim shall be used for level adjustment of bracket, but more than 20 mm is not acceptable. If more than 20 mm bracket shall be designed according to site condition.

2.3.2.3 **Movement:** System shall be designed to accommodate movement due to any force including lateral/dynamic pressure movement, horizontal & vertical building movement panels and on the framing system with support brackets, gaskets and fastening devices. System shall be designed to accommodate the size and shape of the glass panel as per the approved drawings including approved modifications as may be required during execution as well as all other incidental forces and stresses likely to be experienced under service conditions, i.e. Lateral force, Dead weight and Thermal expansion due to building movement both vertical and horizontal etc.

The supporting system shall consist of Brackets / Clamps, fastening straps, nuts, bolts, rivets, washers and other fastening materials etc. Extruded sections

PART II- EMPLOYERS REQUIREMENT

shall be designed to accommodate Monolithic (Single) Glass and Aluminum composite panel as per the approved shop drawings. Extruded aluminum sections shall be 63400 (H9) grade conforming to IS 8147, finished with AC25 grade Architectural quality electrolytic colour anodic coating of approved colour conforming to IS 1868.

2.3.2.4 **Glass:** Fixing the Monolithic (single) Glass as per specification for both vision and spandrel panel conforming to the minimum spectral parameters as specified.

2.3.2.5 **Gaskets:** Providing and fixing weather barrier to ensure the air & water tightness at minimum three stages and to ensure that the system is thermally broken systems. The first barrier exposed to weather condition shall be Elastomer silicon synthetic rubber manufacture by oven process at different stages conforming to BS or equivalent IS. The properties of Elastomer silicon synthetic rubber such as hardness, tensile strength elongation compression test & ozone resistance shall be in accordance with BS 903 & BS 903A minimum hardness (shore A) of Elastomer silicon synthetic rubber shall be 65 to 75 Degrees and the weather strip within the system for unexposed shall be Elastomer EPDM (Ethylene Propylene Diene Monomer) synthetic rubber and its properties like hardness, expanded density (Specific gravity) compressive set, water absorption, skin surface, cell structure, ozone resistance, low temperature includes work shall be in accordance with ASTM D – 1056 and minimum hardness (Shore A) shall be 61/71 Grade.

In general, EPDM gaskets / silicon synthetic rubber shall be as per pre-approved make.

Contractor shall submit the Manufacturer test certificate conforming that the properties of the Gasket supplied is meeting the specification, codes & standards and copy of such codes shall be produced by the Contractor for verification of Employer/PMC/Architect. Contractor shall arrange to carry out the test to check the properties of EPDM / silicon rubber gasket on the random sample selected by Employer/PMC/Architect (Min. 3 Nos of each type to a required length) and the contractor shall make sure that the properties are meeting the codes and standards and specifications.

2.3.2.6 **Sealing:** Design bite and thickness of structural sealant to withstand 3 times of the stress caused by the design wind pressure specified above and to ensure the same, the design calculation of sealant manufacturer shall be submitted along with shop drawing. Necessary materials as proposed in the shop drawing such as Extruded member with finish, glass and any other material required by the Sealant manufacturer shall be supplied to them to carry out the test as per relevant codes standards in order to validate the bite and thickness designed by them. Contractor shall obtain the test certificate from Sealant manufacturer and submit the same along with shop drawing and supported by the copy of relevant codes and standards. Contractor shall ensure that the bite and thickness of

PART II- EMPLOYERS REQUIREMENT

sealant as designed & determined by calculation, verified and tested by Manufacture's is followed in the shop drawing and the same shall be adopted for the glazing at factory after the approval of shop drawing. Field test shall be conducted for adhesion of sealant with in the quoted rate.

Supplying and fixing the Sealant as per specification and Double Adhesive spacer tapes for glazing the panel at factory. Spacer tape shall be open cell polyethylene of reputed brand approved or equivalent, Jointing / Sealing of the glazed panel at factory shall be done with Nonstructural (weather) sealant / Non staining sealant of DC 991 HP of reputed brand or approved equivalent with Polyurethane baker rods of reputed brand or approved equivalent. Acetoxy sealant shall not be used for Structural Glazing application. In general, providing and fixing the Structural and non-Structural (weather) sealant shall be as follows:

- i. Shop/ Factory Sealants:
 - a. Structural sealant shall be of reputed brand or approved equivalent.
 - b. Non-Structural (weather) sealant shall be of reputed brand or approved equivalent.
- ii. Field Sealants:
 - a. Structural sealant shall be of reputed brand or approved equivalent.
 - b. Non-Structural (weather) sealant shall be of reputed brand or approved equivalent.
- g) **System Supports:** Providing and fixing the supporting system with Brackets / Clamps including fastening straps, nuts, bolts, rivets, washers etc. as per design requirement and as per approved shop drawing. Brackets / Clamps shall be of hot dip galvanized steel and fastening materials shall be Non - magnetic Stainless steel 300 series - 316 grade of reputed brand or approved equivalent. Galvanizing thickness shall be in accordance with IS 2629 and 4759. Providing and fixing serrated plates or serrated washer wherever required as per the system requirement and as shown in the approved shop drawing. Shim thickness beyond 20mm is not permitted. Shims shall be similar material, preferably with aluminum, not more than 20mm thick and if the variation is beyond 20 mm, the bracket shall be designed accordingly with fastener.
- h) **Smoke seal:** Providing and fixing Smoke seal / Fire stop using extruded aluminum channel with cap for continuous structurally glazed framing system with required thickness as per site and in general the thickness of channel and cap shall be 2 mm and to a width as required between transom and sill finish material and it shall be 63400 (H9) grade conforming to IS 8147, finished with AC25 grade Architectural quality electrolytic colour anodic coating conforming to IS 1868 of approved colour. Aluminum colour anodized extruded Channel

PART II- EMPLOYERS REQUIREMENT

shall be supported with the help of Aluminum bracket as designed and this bracket to be fixed on the wall / RCC surface with necessary SS anchor bolt and fastener of reputed brand or approved equivalent. This channel with cap shall be provided between Sill finish Material (Civil scope)) and Curtain wall / structural glazing member at sill level and between RCC member face and structural glazing member at soffit level / false ceiling and etc. complete. All the Joints between the capping channel and any other finish material at both sill and soffit level shall be sealed with intumescent sealant of reputed brand or approved equivalent.

The channel with cap shall be provided between Sill finish Material (Sill finish material shall be paid separately) and Curtain wall / structural glazing member at sill level and between RCC member face and structural glazing member at soffit level / false ceiling and etc. complete. All the Joints between the capped channel and any other finish material at both sill and soffit level shall be sealed with Intumescent sealant of reputed brand or approved equivalent. Also, close the gap on the vertical surface between the face of column/wall/partition and structural glazed frame/glass by using extruded aluminum channel with cap with anodized finish aluminum bracket supported on the column/wall/partition and in general the thickness of channel and cap shall be 2 mm and to a width as per drawing and it shall be 63400 (H9) grade conforming to IS 8147, finished with AC25 grade Architectural quality electrolytic colour anodic coating conforming to IS 1868 of approved matching colour to the Mullion & transom.

- i) **Flashing:** In addition to the Channel specified above, providing and fixing flashing at all floor levels as part of the system (applicable only for continuous Curtain wall / structural glazing portion) made to profile as shown in the approved drawings and the profile shall be made out of hot dip galvanized sheet 1.2 mm thick and galvanizing coating thickness shall be in accordance with IS 2629 & 4759. In general, the flashing shall be provided to the entire length of Curtain wall / structural glazing portion horizontally at all floor levels and at terrace level with an overlap of 100 to 125 mm in plan and the joints shall be sealed with weather silicon sealant and with recessing anchoring system soaked and SS fastening devices in sealant of reputed brand or approved equivalent. Also, the flashing shall be provided at parapet top below the coping to drain the water during any seepage through the sealant joints with overlap of 100 to 125 mm in plan with sealant at joints to make sure that no water leakage through coping / flashing joints.
- j) **Top hung Openable Window Hardware:** Providing and fixing the hardware for the shutter with heavy duty self-balancing stainless steel friction hinges, corner transmission, detachable restrictor stay assembly and Multi point locking with heavy duty mechanism (minimum 6 points including corner locking point), handle with key at centre of the transom having a ceremony. Handle / cremone shall be made out of aluminum die cast with powder coat finish - 65 microns, matching to the transom profile colour. Rate shall include the shutter frame as

PART II- EMPLOYERS REQUIREMENT

designed to accommodate the Hinge, stay arm and multi point lock, EPDM gaskets, fastening materials including all other necessary materials etc. Hinge shall have thermoplastic asymmetric end cap to ensure weather tight sealing at the ends.

Rate shall exclude cost of Glass and main frame, but include cost of sub frame for shutter and the frame to be designed to fix all the hardware specified like heavy duty self-balancing stainless steel friction hinges of reputed brand or pre-approved equivalent make and Multi point lock (minimum 9 point) and handle / cremone size of 110 x 27mm with key of reputed brand or pre-approved equivalent make. Shutter will have a provision for hold open option and to restrict the opening not more than 200 mm and to keep the vent weather tight while closing the shutter. Gaskets shall be designed to ensure the air and water tight including noise control while the shutter is closed in position and the gasket shall be silicon synthetic rubber of required strength. Rate shall include for providing master key - 3 sets (floor wise) & Grand master key - 3 sets (building wise) for openable with necessary coding engraved on the keys etc., complete.

- k) **Visual mock up:** Providing and fixing full scale visual mock-up with minimum 3 bays with openable window, ACP cladding, smoke seal and other special architectural features etc., to establish the actual system design prior to proceeding with full scale production of the materials involved in the system. Conduct a water test on the installed visual mock up system, (only water using hose real to the specified pressure in the technical specification) and submit the test result of the system for review. Rate shall include for any improvements required on the system based on the test result by the Glazing contractor.
- l) **Field Test:** Conduct Field test at site on the installed glazing system as per the criteria set out in the specification of the external facade system and as per the Methodology described in ASTM 501-2. Test shall be carried out in the presence of Project Manager/appropriate government authority appointed by GSCDL. Methodology for carrying out the test shall be submitted to Architect for approval prior to testing. The results shall be recorded and the reports shall be submitted to the Engineer in charge for approval. If Field test fails, contractor shall submit the rectification methodology to correct the defects as per the performance data set out in the Specification of external facade system and as per the methodology described in the relevant code for the approval of Project Manager/appropriate government authority appointed by GSCDL. Defects, if any noticed shall be rectified to the satisfaction of Project Manager/appropriate government authority appointed by GSCDL.
- m) **General:** System design in total, including Aluminum extruded frames, type & thickness of Glass pane, Aluminum sleeves at connections, inserts, EPDM Gaskets / Silicon rubber, Adhesive tapes, Sealant, Supporting system / bracket including fastening and anchoring system & Materials specified in the schedule and the system details as shown in the tender drawing are only tentative and is

PART II- EMPLOYERS REQUIREMENT

meant to set out a general outline of the Proprietary system and minimum requirements/ properties of the system and component parts.

The general guidelines governing the system design and performance parameters as set out in the Specification relating to External Façade System and the contents therein. Since the External Façade system in terms of Design, materials, all fixing details, methodology of execution are proprietary in nature, the onus of the design and Performance requirements, shop drawing, execution etc. satisfying the design intent and specification of external facade system including conducting the site survey prior to and after preparation of shop drawing and accommodating the site conditions in the system at appropriate levels etc. lies solely with the Contractor.

- n) **Mode of Measurement:** Length and breadth of the superficial area of the finished work shall be measured centre to centre of the grooves on the external surface viewed externally correct to a centimeter under the respective items. Areas shall be calculated in a square meter correct to two places of decimal.
- o) **Rate.** Quoted rate shall include the cost of all materials and labour involved in all the operations as specified above, specified in the external facade system, to execute the work as per approved drawings / shop drawings including, scaffolding, infrastructure facility, tools and plants etc. necessary for execution of the respective item for all height and for all floor levels, Item measurable in sqm. Rate shall exclude cost of Insulation on spandrel, but includes the field test, visual mock up, supplying and fixing of glass & fixing of window hardware. Supply of hardware for top hung window. Supplying and fixing of Insulation with tray on spandrel shall be measured separately and paid under respective item given in the tender.

Designing, providing and fixing of Aluminum Grille / Louvers of Faneline make shall be fixed on the system by using aluminum box section 50mm X100mm with minimum 2.20mm thick as a main frame. Grille / Louver panel shall be fixed on the aluminum main framing system with suitable size and thick brackets shall be fixed on the RC / MS surface with vertically to the spacing not more than 1500mm and horizontally not more than 1500mm by using SS 316 grade anchors and bolts and the complete system shall be designed to with stand the design wind pressure as per IS code or relevant international code (Test pressure shall be 1.5 times of the design wind pressure)

In addition to the aluminum main frame, aluminum clip on vertical support of 2.0mm thick & covering profile of 0.7mm thick to fix the aluminum Grille shall be fixed at every vertical aluminum main frame as per manufacturer specification with specified product code in the bills of quantities with not less than 0.80 mm thick shall be fixed as per drawing with pitch as specified in the BOQ using SS 316 grade bolt and nut arrangement. The aluminum grille and all aluminum frames shall be finished with PVDF coating with approved colour. All aluminum sections shall be 6063-T6 Conforming to BS 1474 / 63400 (H9) grade conforming to IS 8147. Rate shall include the supplying and fixing of aluminum

PART II- EMPLOYERS REQUIREMENT

main frame, sub frames to receive the grille, aluminum brackets / clamps with necessary SS 316 grade anchor fastener, nuts, bolts, rivets, aluminum end caps on the terminations and washers of approved make and all materials involved in the work.

Mode of Measurement: Length and breadth of the superficial area of the finished Louver area shall be measured on the external surface viewed externally correct to a centimeter under the respective items. Areas shall be calculated in a square meter correct to two places of decimal. Exterior glazing work with high-pressure laminate glass for exterior cladding, fitted with spider fittings of reputed brands make 316 grade, Chrome polished with 12 mm tuff front glass and 19 mm thickness fin Plate glass fixing with router support, fastener and silicon, tape etc. complete. Providing & Fixing Semi unitized type Structural Glazing System in fixed panels with frame work including mullions, double glazed hermetically sealed insulating glass with 12 mm thick Heat reflective transoms & sub frame (No aluminum section to be exposed to outside and only glass panels with silicon joint to be visible from outside) made of specially designed extruded aluminum section of Jindal / Hindalco/ OEL(Alom) or equivalent make conforming to 6063 T5 or T6 as per B.S.1474, duly anodized/ powder coated in approved colour& shade with mullions fixed to RCC beams/columns through adequately designed MS back up materials and Anchor fasteners of Hilti / Fischer or equivalent make, having toughened glass on outer face plus 12mm air gap with perforated aluminum spacer bar and 6 mm clear float toughened glass on inner face (DGU) of Saint Gobain / AIS or equivalent make including providing EPDM gasket, silicon sealants etc. Glass to be fixed with structural silicone of Dow Corning/GE /JL/Alstone or equivalent make & Norton tape or equivalent, with weather sealant in silicone of Dow Corning/GE /JL/Alstone or equivalent make & Norton tape or equivalent, with weather sealant in between the joint to make leak proof glazing, etc. complete as per the approved drawing and direction of Project Manager/appropriate government authority appointed by GSCDL.

Providing, fitting and fixing Compact grade glass 12mm thickness for Cubicle of reputed brands, including transportation, fixing and taxes all complete as directed by Project Manager/appropriate government authority appointed by GSCDL.

2.3.3 *Glass Partition*

Supplying and fixing of manually operated 12mm thick toughened glass partition cum door including lock, handles & screws etc. other such fittings required including all labour charges for fixing and all applicable taxes etc., complete and as per approved drawing and as directed by Project Manager/appropriate government authority appointed by GSCDL.

PART II- EMPLOYERS REQUIREMENT

2.3.4 Bricks

Bricks shall be sound, hard, well-burnt, uniform in size, shape and colour, homogeneous in texture, giving a metallic ringing sound, free from flaws, cracks, holes, lumps or grit and arises should be square, straight and sharply defined. They shall not break when struck against each other and dropped flat from a height of 1 m to the ground. They shall conform to IS 1077 giving classes of common burnt clay bricks. Maximum absorption shall not be more than 20% of its dry weight on immersion in water for 24 hours. Minimum crushing strength shall be 75 kg/sq cm. Bricks for masonry work in foundations as well as in superstructure shall be first class burnt clay bricks conforming to Sikkim PWD Specifications. C.R. Masonry shall be with conformity to I.S.1597. Brick masonry shall be with conformity to I.S.2212. Cement plastering shall be with conformity to I.S.9103 & 6925. Mortar shall be with conformity to I.S.2250

2.3.5 Cement

Ordinary Portland Cement (OPC) 43/53 grade Conforming to latest Sikkim PWD Building Works Specifications and IS 8112- 2013/12269-2013/ I.S. 269/455 shall be allowed for concreting in both plain & R.C.C. works. In no case Portland Pozzolonic cement shall be allowed for such work. In case of non-availability of O.P.C. Cement Port Land Pozzolonic cement, conforming to relevant IS specification of the same popular brands shall be permitted for masonry work in foundations and superstructure with the permission of the Project Manager/appropriate government authority appointed by GSCDL. Cement shall be stored and stacked at the site of work according to Sikkim PWD norms. In no case, the cement shall be procured for requirement beyond 3 months and the same shall also be consumed within three months' time. All such cements, which shall be having storing age more than three months or otherwise appeared to be deteriorated, shall be got retested for compressive strength and initial and final setting time, before use. Decision for equivalent use or no use of such cements for works other than concreting shall be taken by the as per directions of Project Manager/appropriate government authority appointed by GSCDL and shall be final and binding.

2.3.6 Concreting

In order to achieve accuracy in the proportion of batching, batching plant should be installed and maintained at the site for the concreting work or Ready-mix concrete shall be procured on prior approval of as per directions of Project Manager/appropriate government authority appointed by GSCDL. Vibrator to be used for concreting purposes should be confirming to I.S. 7246. Cement Concrete in foundation shall be with conformity to I.S.2571

PART II- EMPLOYERS REQUIREMENT

2.3.7 *Steel Reinforcement*

High yield strength deformed bar TMT (HYSD TMT) having minimum strength of 415 N/ mm² up to and including 25 mm diameter and 500 N/mm² for bigger diameter conforming to IS: 1786 shall be used as reinforcement for RCC works. Binding wire shall be conforming to IS 432/ I.S. 1786 of 2008. All steel shall be sound and free from cracks surface flaws laminations, rough and imperfect edges and all other defects. The variation in weight per meter length of the bars shall be permitted only up to the following limits:

- 6 mm & 8mm +7%
- 10 mm & 12 mm +4%
- 16 mm & above +3%

Spacer blocks shall be made conforming to M15 concrete tied with binding wires as specified or PVC spacer shall be used prior approval of Project Manager/appropriate government authority appointed by GSCDL.

Binding Wire shall confirm to standards I.S. 280 (galvanized minimum 1 mm)

2.3.8 *Structural steel*

General requirements relating a supply of structural steel shall conform to IS 8910. Requirements for mild steel (standard quality) plate, sections bars etc., designated as E250 (Fe 410-W) for use in structural work (as per IS: 2062-2006, superseding IS 1977, 8500). Structural steel such as angle section, T-sections, I-sections, Channels & steel plates shall be conforming to IS 226. Structural steel used in the works other than steel in reinforced concrete, rails and fastenings shall be either of the following type:

- Mild steel conforming to IS: 226 - "Structural Steel (Standard quality)" or IS: 2062 - "Structural Steel (fusion welding quality)
- Whenever high tensile steel is specified, it shall be conforming to IS 961 - "Structural steel (High Tensile)".
- All steel tubes shall be hot finished seamless steel tubes (HFS) of the specified strength and shall conform to IS 1161. Tubes made by other processes and which have been subjected to cold working, shall be regarded as hot finished if they have been subsequently been heat treated and are supplied in the normalized condition

2.3.9 *Water*

Water for mixing and curing shall be clean, free from injurious amount of oil, salt, acid, vegetable materials and other substances and harmful to concrete in

PART II- EMPLOYERS REQUIREMENT

conformity to I.S. 456 and I.S. 2025. Water for all purposes of preparing, mortars, concrete and curing of masonry and concrete works in construction shall conform to Sikkim PWD Specifications shall be procured on prior approval of as per directions of Project Manager/appropriate government authority appointed by GSCDL.

2.3.10 *Earth*

Earth for embankment and backfills in masonry works etc. shall be free from slumps, roots, grass, clods and large pieces of stones, and shall be conforming to Sikkim PWD Specifications.

2.3.11 *Brick Ballast*

Bricks ballast for use in foundation and under floors shall conform Sikkim PWD Specifications.

2.3.12 *Fine Aggregate*

The Fineness Modulus (FM) of sand shall be 2.0-3.50 as per latest IS-383, I.S. 515. It shall be free from harmful impurities and deleterious substances. In case fine dust and silt is found more than 4% the same shall be washed thoroughly before use.

2.3.13 *Sand for Plastering and Mortars*

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

2.3.14 *Coarse Aggregate*

Unless, otherwise specified or ordered, only 3/4 " (20 mm) nominal size crushed aggregate shall be used as coarse aggregate for concreting purpose in slabs, beams, columns, in superstructure and foundations as per IS: 383-1970, IS : 515. The same size aggregate shall be used for conglomerate floors also. In lintels and

PART II- EMPLOYERS REQUIREMENT

slabs having thickness less than 12 cm, 12.5 mm nominal size, crushed aggregate shall be used. Crushed aggregate shall not be having aggregate impact value more than 30 and water absorption more than 2%.

2.3.15 *Glass Panes*

Thickness of glass panes according to the size of opening and its quality shall conform to Sikkim PWD Specifications. Only the first quality glass panes of popular brands shall be permitted for use and approval of as per directions of Project Manager/appropriate government authority appointed by GSCDL. Glass panes shall be checked both for the required thickness as well as weight per unit area.

2.3.16 *Bitumen for coating DPC*

Suitable type of bitumen as per Sikkim PWD Specifications or CPWD Specifications or relevant IS code shall only be permitted for bitumen coatings of roof top and D.P.C. DPC shall be with conformity to I.S.3067 / I.S.1346

2.3.17 *Timber/ Joinery*

Timber for joinery purpose shall conform in general to Sikkim PWD Specifications / I.S. 7452/82 & IS 4021/1995.

2.3.18 *Plywood*

The plywood in general shall be conforming to Sikkim PWD Specifications for cupboard shutters the specified ply should be urea bonded whereas for flush doors shutters the specified ply to be used shall be phenol bonded only. The plywood should be termite proof and waterproof.

2.3.19 *Wire Gauge*

Wire gauge for joinery purpose shall conform to Sikkim PWD Specifications.

2.3.20 *Other Materials*

- i. All other materials required for the construction shall conform to relevant Sikkim PWD Specifications/or latest BIS specification or CPWD Specifications, or as per directions of Project Manager/appropriate government authority appointed by GSCDL.
- ii. White cement: Wherever is to be used, shall comply with India standard IS: 269 and its colour shall be pure white.
- iii. Paints and allied material: Painting to all surfaces shall be with conformity to I.S.2395 (Part – I & Part – II). Steel painting shall be with conformity to I.S.1477 (Part – I & Part – II) I.S.1661. Only first quality paints duly BIS

PART II- EMPLOYERS REQUIREMENT

marked shall be used for the finishing item wherever required. Material shall be as per the following IS specification: wooden & metallic surface:

- Synthetic enamel finish (for exterior uses) as per IS: 520
- Synthetic enamel with semi glass finish (for interior uses) as per IS: 133
- Priming coat IS: 102
- Zinc chromate primer on Iron Steel IS: 107/ IS 2074
- Aluminum paint IS: 165/IS 2339
- Turpentine oil IS: 83/ IS 533
- Linseed oil IS: 77,75 & 78
- Varnish Exterior IS: 338
- Varnish Interior IS: 337
- Filler for enamel paints IS: 110
- Wood filler IS: 345
- Putty for wooden frame IS: 419
- Putty for metal frame IS: 420 □ Brushes IS: 384
- Paint remover IS: 430
- Shellac IS: 16

2.3.21 CI Pipe Fitting (Rain water pipe)

The pipes shall be manufactured by closed grain CI and shall satisfy IS 1230 / I.S. 2527 in all respects. The number of pipes and the diameter shall be worked out based on 1" Sq. of CSA for every 60 specifications No. 3.54. The minimum weight v/s nominal diameter shall be as under:

Table 5: Minimum Weight and Nominal Diameter

Nominal (mm)	Weight/m	Length (m)	Size of socket	Thick (mm)
90	14	1.8	114.4	3.2
50	26	1.8	166.2	3.6

2.3.22 Aluminum Grille

Designing, providing and fixing of Aluminum Grille / Louvers of Faneline make shall be fixed on the system by using aluminum box section 50mm X100mm with minimum 2.20mm thick as a main frame. Grille / Louver panel shall be fixed on the aluminum main framing system with suitable size and thick brackets shall be fixed on the RC / MS surface with vertically to the spacing not more than 1500mm and horizontally not more than 1500mm by using SS 316 grade anchors and bolts and

PART II- EMPLOYERS REQUIREMENT

the complete system shall be designed to with stand the design wind pressure as per IS code or relevant international code (Test pressure shall be 1.5 times of the design wind pressure)

In addition to the aluminum main frame, aluminum clip on vertical support of 2.0mm thick & covering profile of 0.7mm thick to fix the aluminum Grille shall be fixed at every vertical aluminum main frame as per manufacturer specification with specified product code in the bills of quantities with not less than 0.80 mm thick shall be fixed as per drawing with pitch as specified in the BOQ using SS 316 grade bolt and nut arrangement. The aluminum grille and all aluminum frames shall be finished with PVDF coating with approved colour. All aluminum sections shall be 6063-T6 Conforming to BS 1474 / 63400 (H9) grade conforming to IS 8147. Rate shall include the supplying and fixing of aluminum main frame, sub frames to receive the grille, aluminum brackets / clamps with necessary SS 316 grade anchor fastener, nuts, bolts, rivets, aluminum end caps on the terminations and washers of approved make and all materials involved in the work.

Mode of Measurement: Length and breadth of the superficial area of the finished Louver area shall be measured on the external surface viewed externally correct to a centimeter under the respective items. Areas shall be calculated in a square meter correct to two places of decimal.

2.3.23 *Laminated sandwiched composite panel cladding system and associated works*

Scope: Designing the cladding system with Laminated sandwiched composite panel (Aluminum composite panel) as per design intent, preparation of shop drawings for approval, supply, fabricate, erect as per approved shop drawings at all floor levels and at all floor heights and the cladding shall be provided matching the plane of glazing system as shown in the approved drawings, wherever required. Design the framing system with the gap as per drawing between wall/column/steel structures/any supporting system & cladding. Frame to support Laminated sandwiched composite panel and Decorative capping to any shape & profile and shall be supported between the aluminum angle brackets anodized finish.

Brackets shall be fixed on to the Masonry wall with Solid block (Compressive strength not less than 5.5 N/mm²) / RCC / steel structures/any other supporting structures like brackets, Angles and the brackets shall be fixed with Polyamide expansion SS anchors of suitable dia and length with the strength as per design criteria. In order to decide the actual strength of expansion bolts to be achieved as per design, a pull out test on bolts shall be conduct at site on the block wall/RCC member at minimum 3 locations on each. Pull out test results will decide the type of anchors (PMC/Architect. All fasteners and expansion bolts shall be Hilti make or approved equivalent. Groove width in the system both in horizontal and vertical shall not be more than 18 mm and the groove width shall be maintained uniform for

PART II- EMPLOYERS REQUIREMENT

both structural glazing and cladding system. Groove shall be sealed with non-structural and non-staining sealant.

a) DESIGN

- i. Design : Design the cladding system with Laminated sandwiched composite panel for the external surface like column, wall, jambs, sills, projected area, ceiling, decorative cladding on any surface to any profile and shape at horizontally / vertically / sloped / curved / circular etc with approved make of Laminated sandwiched composite panel (ACP) - 4 mm thick (0.5 mm thick aluminum sheet on top & bottom sandwiched with 3 mm thick core material confirming to BS 1467 in combination with approved Solid and Metallic colour panels Laminated sandwiched composite panel. The complete system shall be designed to with stand the design wind pressure as per IS code or relevant international code (Test pressure shall be 1.5 times of the design wind pressure). Necessary pull out test of anchor fastener shall be carried out on the masonry wall /RCC structure to check the load carrying capacity of the bolt designed under suction pressure for designing the supporting and anchoring system.
- ii. Movement: System shall be designed to accommodate movement due to any force including the movement resulting from the exterior skin temperature ranging from 15 to 85 degree Celsius and also to accommodate the horizontal building movement of 10 mm per panel & vertical movement of 20 mm between floors on the aluminum framing system with support brackets, glass, gaskets and fastening devices. System shall be designed to accommodate the size and shape of the Laminated sandwiched composite panel as per the approved drawings including approved modifications as may be required during execution as well as all other incidental forces and stresses likely to be experienced under service conditions, i.e. Lateral force, Dead weight and Thermal expansion due to building movement both vertical and horizontal etc. Grooves shall be designed in such a way to accommodate weather sealant - Non staining sealant of approved make.

b) MATERIALS

- i. Frames: Providing and fixing Aluminum extruded members (Box Tube) designed to with stand design wind pressure and movement as specified as continuous member for cladding the aluminum Composite panel. Aluminum member shall be fixed into masonry wall / RCC member /steel structures with Brackets / Clamps and it shall be of chromotised finish aluminum. All fastening straps, nuts & bolts, rivets, washers/other fastening materials shall be of non-magnetic Stainless steel and aluminum brackets shall be considered for ACP cladding with standard dimension and after the site survey if any undulation is observed in tern that doesn't allow to fix the

PART II- EMPLOYERS REQUIREMENT

aluminum bracket only in these areas the additional support with locally fabricated Hot dip galvanized bracket can be considered. The bidder shall include the provision for these brackets also with in the quoted rate for ACP cladding works. Aluminum shim shall be used for level adjustment of bracket but more than 20 mm is not acceptable. If more than 20 mm bracket shall be designed according to site condition. Aluminum brackets / clamps shall be fixed with chemical injection technique threaded anchor rods of Hilti make or approved equivalent to the base structure in the case of masonry wall / RCC members and SS anchor bolts in the case of steel structure. Extruded member shall be designed to accommodate Laminated sandwiched composite panel as per the approved shop drawings and extruded aluminum member shall be 6063 T6 or 63400 (H9) grade conforming to BS 1467 or IS 8147, finished with transparent electrolytic colour anodic coating AC15 grade conforming to IS 1868.

- ii. Composite Panel: Laminated sandwiched composite panel of approved make as specified in BOQ in combination with solid and Metallic colours and it shall consist of 3 mm thermoplastic 100% virgin core of polyethylene sandwiched between 2 skins of 0.5mm thick Aluminum sheet (alloy designation 3000 series – H14 to H16 conforming to BS 1475) making a consolidated panel thickness of 4 mm ranging 5.30 to 5.50 kg/sqm and to be fixed on the framing system described above. Laminated sandwiched composite panel finished with PVDF (Polyvinylidene fluoride) coating containing minimum 70% kynar 500 and 30% resin or Lumiflon based coating on the topside / top surface and the dry film thickness shall not be less than 23 microns for solid colour and 33 microns for Metallic colour with natural pearl pigment. The reverse side coated with polyester based wash coat and top surface shall be protected with a self-adhesive peel-off foil. Lamination process of Aluminum panel shall only be Glue Technology and the source of complete composite panel shall only be accepted.

Providing and fixing Laminated sandwiched composite panel suitably stiffened internally on the back side for preventing deformation due to design wind pressure beyond permissible limits by using aluminum flat 25 mm wide – 4 mm thick glued with 3 M make Double adhesive tape in order to maintain panel flatness and to avoid permanent deformation over a period. Stiffener shall be provided at 600 mm c/c behind ACP panel irrespective of structural check of the panel against stability and deflection. Aluminum flat of size 25 mm wide and 3 mm thick shall be provided to a length 100 mm bent to shape, wherever the Inner skin is cut to bend the ACP at the corners and as per approved shop drawing. Methodology of fixing the stiffener/Flat in the corner panel shall be established in the drawing or to be glued to ACP on the backside of the panel in such a way the fixing mechanism of stiffener / Flat shall not be visible on the elevation of the panel / outside.

- iii. Sealing: Providing and applying the sealant for Jointing / Sealing and it shall be done

PART II- EMPLOYERS REQUIREMENT

with Non-structural (weather) sealant / Non staining sealant of DC 991 HP of Dow corning make or approved equivalent with Polyurethane baker rods of Supreme make or approved equivalent. Acetoxy sealant shall not be used for Structural Glazing application. Sealing shall be carried out with Non-structural (weather) sealant / Non staining sealant with Polyurethane baker rods, wherever the system is interfacing with glazing, cladding groove and any other groove.

- iv. Flashing: providing and fixing flashing at terrace level as part of the system made to profile as shown in the approved shop drawings and the profile shall be made out of hot dip galvanized sheet 1.2 mm thick and galvanizing coating thickness shall be in accordance with IS 2629 & 4759. In general, the flashing shall be provided to the entire length of cladding horizontally at terrace level with necessary anchoring system with SS fastening devices of Hilti make or approved equivalent. In addition, the flashing shall be provided at parapet top below the coping to drain the water during any seepage through the sealant joints with overlap of 100 to 125 mm in plan with sealant at joints to make sure that no water leakage through coping / flashing joints.
- v. Field Test: Conduct Field test at site on the installed system as per the criteria set out in the particular specification in the presence of Engineer in charge. Methodology for carrying out the test shall be submitted to Employer/PMC/Architect for approval prior to testing. Record the results and submit the report to the Employer/ PMC/ Architect for approval. If Field test fails, correct the defects revealed to the satisfaction of the performance data as set out in the Technical Specification with the prior approval of Employer/PMC/Architect on defects rectification Methodology.
- vi. General Guideline: System design in total, including Aluminum extruded member, type & thickness of Aluminum composite panel, Aluminum sleeves at connections, inserts, Sealant, Supporting system/bracket including fastening and anchoring system & Materials specified in the schedule and the system details as shown in the tender drawing are only tentative and is meant to set out a general outline of the Proprietary system. Since the cladding system in terms of Design, materials, all fixing details, methodology of execution are proprietary in nature, the onus of the design and Performance requirements, shop drawing, execution etc. satisfying the design intent, particular specification and site conditions lies solely with the Contractor.
- vii. Mode of Measurement: Length and width of the superficial area of the finished work shall be measured centre to centre of the grooves on the external surface viewed externally correct to a centimeter under the respective items. Areas shall be calculated in a square meter correct to two places of decimal.
- viii. Rate. Quoted rate shall include the cost of all materials and labour involved in the item for all operation described above and any other stipulations in the

PART II- EMPLOYERS REQUIREMENT

particular specification and agreement. Also, include the cost of scaffolding, infrastructure facility and all other consumables to execute the work as specified above.

2.3.24 Inspection and Testing of Materials

- i. The Contractor shall be required, if requested to produce the manufacturers' test certificate for the particular batch of materials supplied by him and all materials to be used by him on site shall confirm to specifications mentioned in the tender or as directed by Project Manager/appropriate government authority appointed by GSCDL. The test carried out shall be as per the relevant Indian Standards.
- ii. All tests required for designing (e.g., hill side stability test, soil bearing test, other such relevant tests required) the MLCP Development Area at UDD Engineering Cell structure to be carried out by Contractor as per specifications mentioned in the tender or as directed by Project Manager/appropriate government authority appointed by GSCDL. The test carried out shall be as per the relevant Indian Standards. The Contractor shall be required to produce all such certificates, if requested.
- iii. Laboratory for testing fineness, consistency, setting time compressive & tensile strength of cement compressive & flexural strength of cement concrete and proof stress, elongation, tensile strength, bending & re-bending of reinforcement steel. Fully equipped field level laboratory for testing of general materials located at project site or at authority approved nearby place.

Table 6: Description of Test, Reference / Standards and Sample Quantity

S. No.	Description of Test	Reference / Standard	Quantity Required of Samples
Aggregates (Coarse & Fine)			
1	Sieve analysis (dry)/ fineness modulus	IS 2386: Part I – 1963, IS 383 – 1970, MORTH – 4th Revision, 2001	20 kg
2	Silt content		2 kg
3	Specific gravity	IS 2386: Part III – 1963	1 kg
4	Impact test	IS 2386: Part III – 1963,	10 kg
5	Crushing Values / 10% fine value	MORTH – 4th Revision 2001	10 kg
6	Los Angeles abrasion value		10 kg
7	Water absorption	IS 2386: Part III – 1963, MORTH – 4th Revision 2001	1 kg

PART II- EMPLOYERS REQUIREMENT

S. No.	Description of Test	Reference / Standard	Quantity Required of Samples
8	Flakiness index	IS 2386: Part I – 1963, MORTH – 4th Revision 2001	10 kg
9	Elongation index		10 kg
10	Combined flakiness & elongation index		20 kg
Cement			
11	Cement (initial & final setting time, compressive strength)	IS 269, IS 8112, IS 12269	7 kg
Bricks			
12	Bricks (Set of Ten) (compression test, absorption test)	IS 1077-1986	10 nos.
Steel			
13	Steel bars (6 mm dia. to 20mm dia.) (Area on weight basis. Yield Stress/0.02% Proof Stress, Ultimate Tensile Strength, % Elongation)	IS 432 – 1986 IS 1786 – 2008	60 cm
14	Steel bars (above 20 mm dia.) (area on weight basis, yield stress / 0.02 % Proof stress, ultimate tensile strength, % elongation)	IS 432 – 1986 IS 1786 – 2008	60 cm
Concrete			
15	Concrete cube (compressive strength)	IS 456-2000, IS 516 – 1959	3 nos.
16	Concrete beam (Flexure test) (10x10x50 cm)	IS 456-2000, IS 516 – 1959	3 nos.
17	Concrete beam (Flexure test) (15x15x70 cm)		3 nos.
Tiles			
18	Tile (Absorption test)	IS 1237-1980, IS 13801-1993	6 nos.
19	Tiles (Wet transverse strength test)	IS 1237-1980, IS 13801-1993	6 nos.
20	Tile (abrasion test)	IS 13630 Part 12- 1993	As decided by Project Manager/ appropriate government

PART II- EMPLOYERS REQUIREMENT

S. No.	Description of Test	Reference Standard	Quantity Required of Samples
			authority appointed by GSCDL
Wood			
21	Wood (Moisture content)	IS 287 – 1993 (Reaffirmed 1998) IS 11215-1991	As decided by Project Manager/ appropriate government authority appointed by GSCDL
Cores			
22	CC Road core (Compression test)	IS 456-2000, IS 516 -1959	
RCC Covers			
23	RCC Cover & Dhapa testing	IS 12592 : Part I, 1998	
24	RCC Pipes (Hume pipes)		
25	Hume pipe testing	IS 3597 – 1998 (Reaffirmed 2001), IS 458 -1988	Minimum one pipe of each dia per lot
26	Up to 600 dia		
27	600 to 900 mm dia		
28	900 mm and above		
Concrete Paving Blocks			
29	Paver blocks (as per road department requirement)		
30	Compressive test		Up to 3 nos.
31	Water absorption test	BS 6717 – 1993 ASTM C936 IS 1237 BS 6717-2001	Up to 3 nos.
32	c) Flexure test		Up to 3 nos.
33	d) tensile splitting test		Up to 3 nos.
34	Paver blocks (as per road dept. requirement)	IS – 15658-2006	3 Nos.
35	Compressive test		8 Nos.
36	Water absorption		8 Nos.
37	Flexure test		8 Nos.
38	Tensile splitting test		8 Nos.
39	Abrasion test (dry condition)		

In addition to above IS codes for tests to be carried all equipment shall be made available to site testing laboratory required for testing all materials used at site or

PART II- EMPLOYERS REQUIREMENT

during construction works and as directed by Project Manager/appropriate government authority appointed by GSCDL.

- a) For examination and testing of materials and works at the site the Contractor shall provide all testing and gauging equipment necessary but not limited to the following:
- Theodolite
 - Dumpy level
 - Steel tapes
 - Weighing machine
 - Plumb bob, Spirit levels, Hammers
 - Micrometers
 - Thermometers, Stoves
 - Hydraulic test machine □ Smoke test machine
- b) All such equipment shall be tested for calibration at any approved laboratory, if required by the Project Manager/appropriate government authority appointed by GSCDL.
- c) All testing equipment shall be preferably located in special room meant for the purpose.

2.4. *Specifications of Work*

2.4.1. *Internal Civil Works*

- a) Earth excavation embankments & cuttings: Making up of plinths shall be carried out as per Sikkim PWD Specifications. Source of soil for filling purposes shall have to be got approved from the Project Manager/appropriate government authority appointed by GSCDL of work.
- b) Compaction of Earthwork: Compaction of earthwork shall be carried out as per Sikkim PWD Specifications. Earthwork excavation of foundations and filling of trenches and filling under floors as per Sikkim PWD Specifications.
- c) Demolition: Demolition, if any involves shall be carried out as per Sikkim PWD Specifications. Disposed- nothing shall be paid for disposal of non-perishable material. Perishable material shall be handed over to Authority.
- d) Centering and Shuttering: Centering and shuttering shall be carried out as per Sikkim PWD Specifications.
- e) Cement concrete for Ordinary structures: Cement concrete for ordinary structures shall be executed as per Sikkim PWD Specifications.

PART II- EMPLOYERS REQUIREMENT

- f) Reinforced concrete: For all works in super structure/ foundation 1:1.5:3 nominal mix by volume shall be used for achieving strength of M20 concrete. Only crushed coarse aggregates shall be used for concreting. Steel shall be high yield strength deformed bars conforming to IS – 1786 or TMT steel.
- g) DPC: Item of D.P.C. shall be executed as per Sikkim PWD Specifications. DPC shall be with conformity to I.S.3067 / I.S.1346.
- h) Precast Lintels: All lintels upto 7' in length in masonry work over doors and windows shall not be laid Cast-in-Situ but shall be pre-casted as per instruction of the Project Manager/appropriate government authority appointed by GSCDL and shall be hoisted and placed at appropriate level, during masonry work, lintels beyond 4'-6" length shall be laid in situ. Lintels will be casted over a pucca platform, and shall be cured for at least 10 days in a tank built at site and be dried completely before placing.
- i) Brick Masonry: Wherever the brick masonry shall involve in the execution of work, the same shall be carried out as per Sikkim PWD Specifications. All the instructions regarding workmanship such as bond and laying, joints straightness, face work raking of joints and scaffolding etc. shall be followed as per the Sikkim PWD Specifications. The masonry shall be carried out in the cement mortar. Corbelling, Coping and Cornices shall be executed as per specifications. 4 1/2" and 3" thick masonry partition walls. Partition walls shall be constructed as per Sikkim PWD Specifications. C.R. Masonry shall be with conformity to I.S.1597. Brick masonry shall be with conformity to I.S.2212. Cement plastering shall be with conformity to I.S.9103 & 6925. Mortar shall be with conformity to I.S.2250. White and colour washing shall be with conformity to I.S.6278.
- j) Roofing and Water proofing treatments / drainage:
 - i. Rooftops shall be painted with bitumen, as per Sikkim PWD Specifications.
 - ii. Laying brick bat coba water proofing of average 115 mm thick at terrace using cement mortar 1:3 arranging brick bats according to the slope, adding suitable water proofing compound for water tightness and again providing on top cement mortar 1:3 including addition of water proofing compound and finishing the top with neat cement @ 2.75 kg/m² and preparing the rough surface as per directed.
 - iii. Water Proofing for Basement floor and surface: Providing & laying Box type waterproofing treatment to floors and external surfaces of underground structures. The treatment comprises of waterproofing layer, average 100 mm. thick for floors, using two layers of polished kota stones placed diagonally with cut joints Bottom layer of 15 mm. thick 1:3 C.M. bedding with approved waterproofing chemical. 20 mm. to 25 mm. thick rough polished kota stone laid diagonally above the 1st layer with cut joints. Joints shall be sealed by 1:1 C.M. with approved waterproofing chemical. The above two

PART II- EMPLOYERS REQUIREMENT

layers shall be laid again, in the same manner as described above. The final layer of 30 mm. thick I.P.S. shall be laid with approved water proofing chemical having desired finish as directed including curing etc. complete on any surface, at all heights. The contractor to give testing for water tightness.

- iv. Checking the leakage & seepage with ponding test & application of approved waterproof compound 2 coats over the roof slab & continued over R.C.C. parapet wall. Coping with 1:4 Cement mortar admixed with approved waterproof compound. Followed by a protection screed (1:1.5:3) in panels of size 2mtr x 2mtr to drain the rain water towards rain water pipe & finally filled the joint groove with Polyurethane sealant of approved make. Complete as per manufacturer specification and direction of engineer in charge. Note: Excluding cost of concrete.
- v. Cleaning of surface, provision of Sika Swell S2 & Sika Swell A (Acrylic Profile over swellable sealant at construction joints at retaining wall), Providing & applying of Sika Top seal 109hi (2 component based acrylic polymer coating over a coat of primer over PCC followed by protection plaster. Consumption 2.4Kg/sqm followed by a protection plaster over a bond coat of Sika Latex (1:4:6). Note: pressure grouting of cement slurry at joints with expanding grout polymer Sika Intraplast or equivalent EP@0.5Kg/50 Kg Cement. Complete as per manufacturer specification and direction of Project Manager/appropriate government authority appointed by GSCDL. Note: Excluding cost of concrete & plaster.
- vi. Rain water pipes shall be fixed as per Sikkim PWD Specifications and confirm to I.S. 2527
- vii. Execution of top and bottom khurras and spouts shall be done as per Sikkim PWD Specifications.
- viii. Unless, otherwise specified, the normal bitumen felt waterproofing treatment shall be executed as per Sikkim PWD Specifications.
- ix. Wherever required the water proofing of roofs shall be as per manufactures specifications approved by the Project Manager/appropriate government authority appointed by GSCDL.
- x. Floorings and Dados: Mosaic flooring with conformity to I.S.2114. Various types of flooring and dados shall be executed as per Sikkim PWD Specifications, as detailed below:

Table 7: Flooring and Dados Specifications

S. No.	Item
1	White glazed ceramic Tile flooring
2	Marble flooring
3	Polished kota stone flooring
4	Rough Polished kota stone flooring

PART II- EMPLOYERS REQUIREMENT

5	Vitrified Tile flooring
6	Granite Stone flooring
7	Ironite flooring/Cement Concrete Flooring with Metallic Hardener Topping
8	Granite Tile flooring
9	Trimix flooring

a) Sal Wood:

The decking material will have planks of natural Sal Hard Wood (Imported or Local) with minimum thickness of 50mm and installed by joining in different sizes as flooring on decks on confirming IS Codes on approval of the Project Manager/appropriate government authority appointed by GSCDL.

b) Cement Concrete Tile :

Supplying, fitting and fixing in position 25mm thick cement concrete tile of Ultra category-1/Eurocon or equivalent type of approved make, quality, colour and size in all floors at all height on 20mm thick bed of cement mortar of mix (1:4) laid in proper slope and gradient grouted with neat white cement slurry with required quantities of pigments of approved marks watering and curing for 21 days, including cost, conveyance, loading, unloading, royalties and taxes of all materials, cost of all labour, sundries, T&P required for the work complete in all respect as directed by the Project Manager/appropriate government authority appointed by GSCDL.

c) Vitrified Tile Flooring:

Providing vitrified tile flooring using double charged vitrified tiles of premium grade of Johnson/Kajaria/Asian/Somany/Rak/Nitco equivalent make having thick of 10mm conforming to IS 13756 of 800mmx800mm/ 600mmx600mm coloured / printed series (homogeneous) of approved quality, colour in floors, treads on steps and landings in all floors at all height on 20mm thick bed of cement mortar of mix (1:4) laid in proper slope and gradient with screened and washed sharp sand for mortar and grouted with epoxy grout with required quantities of pigments of approved marks to match the shades of the vitrified tile if required watering and curing for 21 days, including cost, conveyance, loading, unloading, royalties and taxes of all materials, cost of all labour, sundries, T&P required for the work, complete in all respect as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

d) Vitrified Tile Skirting:

Supplying, fitting and fixing of double charged vitrified tiles in skirting of premium grade of Johnson/Kajaria/Asian/Somany/Rak/Nitco or equivalent make having thickness of 10mm conforming to IS 13756 of 800mmx800mm /600mmx600mm coloured / printed series (homogeneous) of approved quality, colour of approved

PART II- EMPLOYERS REQUIREMENT

quality and size in dadoes in all floors at all heights and riser of steps on 12mm thick cement plaster (1:3) using screened and washed sharp sand for mortar with grouted Epoxy grout to match the shade of the tiles including cost, conveyance, loading, unloading, royalties and taxes of all materials, cost of all labour, curing sundries and T&P, etc. required for the work complete as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

e) Ceramic Floor Tile:

Providing 30cmx30cm/40cmx40cm size special plain/printed series ceramic floor tiles of premium grade of Kajaria power line series/Somany/Johnson/Asian or equivalent type of approved make having thickness 7mm to 8mm, conforming to IS 13755 for ceramic tile flooring of approved quality, colour and size in floors, treads on steps and landings in all floors at all height on 20mm thick bed of cement mortar of mix (1:4) laid in proper slope and gradient, grouted with neat white cement slurry jointing the tile with neat white cement slurry mixed with required quantities of pigments of approved marks to match the shades of the ceramic tile if required, watering and curing for 21 days, including cost, conveyance, loading, unloading, royalties and taxes of all materials, cost of all labour, sundries, T&P required for the work, complete in all respect as directed by the Project Manager/appropriate government authority appointed by GSCDL.

f) Ceramic Wall Tile:

Providing 30cmx45cm size special plain/printed series edge cut ceramic wall tiles of premium grade of Kajaria digital highlighter/Somany/Johnson/Asian or equivalent type of approved make having thickness 6.5mm to 6.7mm conforming to IS 13753 of approved make & shade in Dadoes over 12mm thick cement plaster 1:3 (1 Cement: 3 Coarse sand) finished with modular pointing in white cement & pigment to match the shade of the tiles including cost, conveyance, loading, unloading, royalties and taxes of all materials, cost of all labour curing sundries and T & P etc. required for the work etc. complete as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

g) Granite Flooring:

Providing 20mm thick avg. and above 0.40 Sqm size granite tile flooring in staircase of approved quality, colour and size in floors, treads on steps and landings in all floors at all height on 25mm thick bed of cement mortar of mix (1:1) laid in proper slope and gradient with screened and washed sharp sand for mortar and grouted with neat white cement slurry jointing the tile with neat white cement slurry mixed with required quantities of pigments of approved marks to match the shades of the granite tile if required watering and curing for 21 days, including cost, conveyance,

PART II- EMPLOYERS REQUIREMENT

loading, unloading, royalties and taxes of all materials, cost of all labor, sundries, T&P required for the work including rubbing mechanically and wax polishing etc. complete in all respect as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

Polished kota stone flooring shall be carried out as Sikkim PWD building Specifications. Polished kota stone shall be as per direction of Project Manager/appropriate government authority appointed by GSCDL. Dado: Polished kota stone or Vitrified tile dado shall be executed as per the relevant specification of Sikkim PWD building Specifications. Skirting (3/4" thick) of Polished kota stone shall be executed as per the relevant specification of Sikkim PWD building Specifications. Granite Stone shall be executed as per the relevant specification of Sikkim PWD building Specifications. Vitrified tile shall be executed as per the Sikkim PWD building Specifications. Ironite flooring/ Cement Concrete Flooring with Metallic Hardener Topping shall be executed as per the relevant

Sikkim PWD building Specifications. Granite tiles shall be executed as per Sikkim PWD building Specifications. Trimix flooring shall be executed as per Sikkim PWD building Specifications of pavement in material Specification.

h) Shutters:

- i. Cupboard Shutters: Cupboard shutters shall be wooden as per Sikkim PWD building Specifications.
- ii. Door Shutters: All door shutters shall be 40 mm thick wooden with 12 mm thick panels of waterproof as per Sikkim PWD building Specifications. Also following standards shall confirm to for Steel Window Frame I.S. 1038/83 and Steel Door Frame I.S. 4351/75

Door:

- i. Sal Wood Frame :Providing and fixing in position well dressed, naturally seasoned sal wood rebated frames of size 125mmx63mm to doors including two coats of hot bitumen applied to rear of frame in contact with masonry or concrete surface fixed with MS hold fast of 35x5mm embedded in cement concrete blocks 15x10x10cm of 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) complete with all materials, labors, T & P including cost, conveyance, loading, sundries required for the work etc. complete in all respect confirming to I.S. 7452/82 &IS 4021/1995as directed by the Project Manager/appropriate government authority appointed by GSCDL.
- ii. PVC Door & Frame: Providing and fixing factory made PVC door frame of size 50x47mm with a wall thickness of 5mm rigid PVC foam sheet, mired at

PART II- EMPLOYERS REQUIREMENT

corners and jointed with 2 nos of 150mm long brackets of 15x15mm MS square tube, the vertical door frame profiles to be reinforced with 19x19mm square tube of 19 gauges. The door frame to be fixed to the wall using MS screws of 65/100mm size. PVC door shutter consisting of frame made out of MS tubes of 19-gauge thickness and size of 19x19mm for style and 15x15mm for top and bottom rails. MS frame shall have a coat of steel primers of approved make and manufacture. MS frame covered with 5mm thick heat molded PVC C channel of size 30mm thickness, 70mm width out of which 50mm shall be flat and 20mm shall be tapered in 45-degree angle on both side forming styles and 5mm thick, 95mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered in 45 degree on the inner side to form top and bottom rail and 115mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered on both sides to form lock rail. Top bottom and lock rails shall be provided with both side of panel 10mm (5mmx2) thick, 20mm wide cross PVC sheet be provided as gap insert for top rail and bottom rail. Paneling of 5mm thick of both side PVC sheet to be fitted in MS frame welded/sealed to the styles and rails with 7mm (5mm+2mm) thick x 15mm wide PVC sheet beading on inner side and joined together with solvent cement adhesive. An additional 5mm thick PVC strip of 20 mm width is to be stock on the interior side of the channel using PVC solvent adhesive etc complete as per direction of Project Manager/appropriate government authority appointed by GSCDL.

iii. Flush Door:

Supplying fitting and fixing in position 35mm thick flush door including lamination of Greenply/Mayur/Century/Kitply or equivalent type of approved make with teak wood beading and 1mm thick sun mica mechanically hot pressed to both side including fixing of fixtures like Godrej make Mortice lock having model no 9168, Godrej make Door closure heavy duty type having model no 8340, 125mm aluminum hinges, handle, tower bolt, stopper including cost of all materials, labour, all taxes, transportation, loading & unloading etc. complete as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

iv. Teak wood Shutter:

Supplying, fitting and fixing in position 38 mm thick decorative Teak wood shutter 38mm style and 22mm to 25mm thick panel well-seasoned and well-dressed fitted and fixed to sal wood choukaths in all floors at all heights including providing ornamental design as per approved drawing with necessary beadings, cutting grooves in *choukaths* and for lapping portion of shutter where necessary, including fitting and fixing of Godrej make Mortice lock having model no 9168, Godrej make Door closure heavy duty

PART II- EMPLOYERS REQUIREMENT

type having model no 8340, 125mm brass hinges, handle, tower bolt, stopper including cost of all materials, labour, all taxes, transportation, loading & unloading etc. complete as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL

v. Aluminum Door:

Providing & fixing of DOMAL - 40 Aluminum Building Systems, made from 6063 T-6 alloy and tempered euro groove aluminum profile, in approved surface coating, mechanically mitered & jointed with corrosion resistance DOMAL accessories and hardware. Glass infill, of desired thickness, shall be fixed onto using non-aging siliconized microwave treated DOMAL gaskets depending upon on the structural conditions, functions and statistical load requirements.

vi. Sensor Door:

Providing and installation of DORMA ES200 easy OPERATOR: Providing Dorma ES200 easy bi parting sliding door (Size- 6'-0"x8'-0") operator with 12mm thick toughened clear glass shutters, anchor fast not, BR soft nose seal, modular design, including internal cover with operator, microprocessor control, self-learning, reversing when obstruction is encountered. Microprocessor-controlled control unit with adjustable parameters for opening and closing speed, hold open time and opening and closing force. Class of protection 20. The system shall have constant power supply 230V, 50/60Hz, UPS supply for various opening sizes all complete as per design. ES 200 is TUV type tested, compliant EU Low voltage directives, production according to ISO 9001 certification type B. The cost including conveyance, loading, unloading, royalties and taxes of all materials, curing-sundries and T&P, etc. required for the work complete as per specification and direction of Project Manager/appropriate government authority appointed by GSCDL.

iii. Windows Shutters: Window shutters shall be 35 mm thick of wooden having glass panes as per Sikkim PWD building Specifications. Wire gauge shutters should be provided wherever required.

Aluminum Window:

Providing & fixing of DOMAL - 40 Aluminum Building Systems, made from 6063 T-6 alloy and tempered euro groove aluminum profile, in approved surface coating, mechanically mitered & jointed with corrosion resistance DOMAL accessories and hardware. Glass infill, of desired thickness, shall be fixed onto using non-aging siliconized microwave treated DOMAL gaskets depending upon on the structural conditions, functions and statistical load requirements.

PART II- EMPLOYERS REQUIREMENT

- iv. Wire gauge Shutters: Wire gauge shutters shall be as per Sikkim PWD building Specifications.
- v. Doors, Windows and Shutters Other than Wooden

Table 8: Specifications for Doors, Windows and Shutters other than Wooden

a	Aluminum door, windows and ventilators	As per IS 1948-1961 & IS 1949-1961 and Sikkim PWD building Specifications
b	Collapsible gates	As per IS 10521-1983 and Sikkim PWD building Specifications
c	Steel rolling shutters	As per IS 6248-1979 and Sikkim PWD building Specifications
d	Steel door frames	As per IS 4351-1976 and Sikkim PWD building Specifications
e	Steel doors, windows and ventilators	As per IS 1038-1983 & Sikkim PWD building Specifications
f	Pressed steel <i>chowkhats</i>	Sikkim PWD building Specifications

Factory made pressed steel *chowkaths* shall be manufactured out of 16 gauge M.S. Sheet (1.25 mm thick) cutting bending straightening and finishing shall be mechanical and not manual. *Choukaths* shall be framed with 6mm fillet seam welding. The pressed steel *chowkaths* shall be provided with two coats of steel primer and the *chowkaths* cavity shall be filled with 1:2:4 concrete, prior to fixing at site.

- k) Plastering, Pointing and Rendering: Cement plaster will be executed in the specified mortars as per Sikkim PWD building Specifications. For cement rendering and for cement pointing Sikkim PWD building Specifications shall be followed. Cement plastering shall be with conformity to I.S.9103 & 6925. Mortar shall be with conformity to I.S.2250
- l) Painting, White washing and Distempering: These items shall be executed as per Sikkim PWD building Specifications. Painting and varnishing works shall be executed as per Sikkim PWD building Specifications. Painting on Plastered/ Concrete Surface: The plastered surface above dado as per relevant Specification of Sikkim PWD building Specifications. Only first quality paint/emulsion shall be used. The item shall be executed as per Sikkim PWD building Specifications of painting. Painting Wooden Surfaces shall be painted with first quality approved brand of paint and execution of item shall be carried out as per Sikkim PWD building Specifications. Painting Iron and Steel Work: Iron and Steel Works shall be painted as per Sikkim PWD building Specifications. The first coat shall be applied of red oxide primer of first quality. The subsequent

PART II- EMPLOYERS REQUIREMENT

coats shall be of approved shade and approved brands of first quality paints. White Washing shall be executed as Sikkim PWD building Specifications and Colour washing shall be executed as per Sikkim PWD building Specifications. Oil Bound distempering for internal finishing shall be executed as per Sikkim PWD building Specifications. Cement based paints: Cement based paints of approved make and shade shall be executed as per relevant specifications. White and colour washing shall be with conformity to I.S.6278

- m) Cement Concrete Road works: Latest edition of IRC and MoRTH specifications shall be followed for road works.

Note: For road work (Approach Road) specification as per road and bridges (latest edition) published by I.R.C & M.O.S.T. shall be followed. In case of any doubt and absence of provision, regarding specification I.S. shall be referred (Indian standard).

- n) Expansion Joints: Expansion Joints shall be provided in the buildings wherever required. Construction joints shall conform to I.S. 3414. The conditions for providing expansion joints are as under:

- i. Where the length of the building blocks exceed 50 meters.
- ii. All the components such as ramps stain links of corridors with the main building.
- iii. In case of provision for horizontal further expansion be provided.
- iv. In case of level difference exceeding 1.8 mts.

Type of expansion joints: In case of larger blocks framed shutters, only double column, double beam expansion joints shall be provided:

- i. In case of masonry blocks, double beam expansion joints will be provided along with expansion joints on walls.
- ii. In case of connecting link corridors, cantilever type of expansion joints will be provided. These joints shall be maintained in the flooring itself preferably or will be covered with 300 mm wide separate piece of flooring material specified.

Expansion Joints in the wall shall be covered from inside with 14 gauge aluminum sheet 150 mm wide fixed with appropriate fastener on one side of the wall. In no case bracket type expansion joints will be provided.

2.4.2. External Civil Works

- a) Parking Area: Covered area with interlocking pavers shall be as per Sikkim PWD Specifications.

PART II- EMPLOYERS REQUIREMENT

- b) M.S. Gates: M.S. Gates shall be as per Sikkim PWD Specifications.
- c) Boundary Wall: Boundary wall around the MLCP Development Area at UDD Engineering Cell shall be 1.8m high, constructed in first class brick masonry.
- d) Kerb & Channels: Kerbs & channels wherever provided along the roadside shall conform to relevant Sikkim PWD Specifications.
- e) Jungle Clearance: Clearing of weeds, shrubs, brushwood and congress grass under this item shall be removed by roots. Tree shall not be cut. The item shall be executed as per Sikkim PWD Specifications.
- f) Subgrade of Internal Roads: The top 2' portion of embankment in the complete formation width of the internal roads, which is sub grade of the road, shall consist of sandy soils. A1, A2 and A3 type soils as per PRA classification conforming to latest IRC specification shall be only allowed in sub grade. Silty & clayey soil, which make weak sub grade & have no self-drainage shall not be permitted for use.
- g) Stone Metal 60-11.2 mm: Crushed stone metal of Sikkim government approved quarries shall be only used for construction for roads. It should be angular and drawn from hard durable tough stones of uniform texture. It should not absorb water more than 1% and its aggregate impact value should not be more than 30. The grading should confirm to MoRTH specification as given in table below:

Table 9: Grading of Crushed Stone Metal

Sieve Designation	Percent by weight passing
60 mm	100.00
53 mm	95-100
45 mm	65-90
22.4 mm	0-10
11.2 mm	0-5

- h) Grit: The crushed aggregates for mix seal surfacing shall be blended in the requirement ratio or achieving the proper gradation as per MoRTH specification. The individual size of the grit should also be conforming to MoRTH, specification.

Table 10: List of Approved makes to be used for MLCP Development Area at UDD Engineering Cell Project

PART II- EMPLOYERS REQUIREMENT

S. No.	Description	Makes¹
1	Tiles	
1a	White Glazed Tiles	RAK / Johnson / Somany / Kajaria or equivalent
1b	Vitrified tiles	RAK / Johnson / Somany / Kajaria or equivalent
1c	Granite tiles	RAK / Johnson / Somany / Kajaria or equivalent
2.	Flush doors and plywood products	
3.	Steel doors & windows	TATA / SAIL Steel, Cuirass, or equivalent
4.	Rolling shutters & grills	TATA / SAIL Steel, or equivalent
5.	Aluminum door & window sections	Kalco / Milgard / ClimateGuard or equivalent
6.	Water proofing compounds	Dr.Fixit / Tikitar / Dubond or equivalent
7.	Paints & Distempers	Asian / Berger / Dulux or equivalent
8.	Red oxide	Berger / Asian Paint / Dulux or equivalent
9.	Water proofing cement paint	Dr. Fixit / Durabuild / Rainguard or equivalent
10.	Glass	Saint Gobain / Asahi / Modiguard or equivalent
11.	Pressed Steel Sections	Jindal / Kamdhenu or equivalent
12.	Reinforcing Steel	TATA / SAIL or equivalent
13.	Cement	(43,53 Grade) Ambuja / Ultratech / ACC or equivalent
14.	Structural Steel Sections	Jindal / Kamdhenu or equivalent
15.	Z Sections	Jindal / Kamdhenu or equivalent
16	Cup boards	Use best quality of marine ply or equivalent as directed by Project Manager/appropriate government authority appointed by GSCDL
17	Water Supply Pipes & its accessories	(Medium with high quality fibre with ISI Mark) Esco / Jaguar / Prince / Astral / Finolex / Supreme or equivalent
18	Lifts / Escalators	Schindler / Schneider / Omega / Otis / Hitachi / Mitsubishi or equivalent
19	CCTV Cameras and its allied accessories	Hikvision / CP Plus / Zicom / Sony / Samsung / AVTech / Bosch / LG or equivalent
20	Fire extinguishing systems	Omex / Lifeguard / Ceasefire / Agni or equivalent
21	Sanitary wares	Jaguar / Hindware / Simpolo / Cera or equivalent
22	Wire	(Fire Proof) Havells, Polycab. KEI, Universal, Finolex or equivalent

¹ The GSCDL is the authority to provide a list of approved makes

PART II- EMPLOYERS REQUIREMENT

S. No.	Description	Makes ¹
23	Switches/Sockets	MK / Crabtree / Legrand or equivalent

Note: The above list is indicative but not exhaustive.

2.5. Technical Specifications – Public Health and Fire Fighting Works

2.5.1. General Technical Conditions and Scope of Work

- a) Work under this section shall consist of furnishing all materials, equipment and applicable necessary and required to completely furnish all the plumbing and other specialized services as described herein.
- b) Without restricting to the generality of the foregoing the sanitary fixtures shall include the following:
 - Sanitary Fixtures
 - Soil, waste, rainwater and vent pipes Water supply (internal and external) External sewerage system
 - Storm water drainage system
- c) The Contractor must get acquainted with the proposed site for the works and study specifications carefully.
- d) Works area shall be as per finalized and approved drawings from the Project Manager/appropriate government authority appointed by GSCDL.

2.5.2. Specifications

- a) Work under this section shall be carried out strictly in accordance with specifications.
- b) Items not covered under these specifications due to any ambiguity or misprints, or additional works, the work shall be carried out as per the Sikkim PWD Specifications.
- c) Works not covered above shall be carried out as per relevant Indian Standards specifications or codes of practice or as per directions of Authority.

2.5.3. Execution of Work

- a) The work shall be carried out in conformity with Architectural, HVAC, Electrical, plumbing, Structural, and other specialized services.
- b) The Contractor shall make provision for hangers, sleeves, structural openings and other requirements well in advance to prevent hold up of progress of construction program.

PART II- EMPLOYERS REQUIREMENT

- c) On award of the Contract, the Contractor shall submit a program of construction in the form of a PERT chart or bar chart for approval of the Project Manager/appropriate government authority appointed by GSCDL. All the dates and time Chapter agreed upon shall be strictly adhered to, within the stipulated time of completion/ commissioning along with the specified phasing, if any.

2.5.4. Drawings

- a) Plumbing drawings would be diagrammatic and shall be followed as closely as actual construction permits. Any deviations made shall be in conformity with the Architectural drawings.
- b) Architectural drawings shall take precedence over plumbing or other services drawings as to all dimensions.
- c) Contractor shall verify all dimensions at site and bring to the notice of the Project Manager/appropriate government authority appointed by GSCDL of works all discrepancies or deviations noticed. The Project Manager/appropriate government authority appointed by GSCDL decision shall be final.
- d) Large size details and manufacturers dimension for materials to be incorporated shall take precedence over small-scale drawings.

2.5.5. Inspection and testing of materials

- a) The Contractor shall be required, if requested to produce the manufacturers' test certificate for the particular batch of materials supplied by him. The test carried out shall be as per the relevant Indian Standards.
- b) For examination and testing of materials and works at the site the Contractor shall provide all testing and gauging equipment necessary but not limited to the following:
 - i. Theodolite
 - ii. Dumpy level
 - iii. Steel tapes
 - iv. Weighing machine
 - v. Plumb bob, Spirit levels, Hammers
 - vi. Micrometers Thermometers, Stoves
 - vii. Hydraulic test machine
 - viii. Smoke test machine
- c) All such equipment shall be tested for calibration at any approved laboratory, if required by the Project Manager/appropriate government authority appointed by GSCDL. All testing equipment shall be preferably located in special room meant for the purpose.

2.5.6. Metric conversion

PART II- EMPLOYERS REQUIREMENT

- a) All dimensions and sizes of materials and equipment given in the specifications are commercial metric sizes.
- b) Any weights or sizes given in the specification having changed due to metric conversion, the nearest equivalents sizes accepted by Indian Standards shall be acceptable without any additional cost.

2.5.7. Reference points

- a) The Contractor shall provide permanent benchmarks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of the work.
- b) All such reference points shall be in relation to the levels and locations given in the Architectural and plumbing drawings (to be detailed out by the Contractor).

2.5.8. Reference Drawings

- a) The Contractor shall maintain one set of all drawings issued to him as reference drawings. These shall not be used on site.
- b) All corrections, deviations and changes made on the site shall be shown on these reference drawings for final incorporation in the completion drawings. All changes to be made shall be initiated by the Project Manager/appropriate government authority appointed by GSCDL. These will then form the —As-Built Drawings.

2.5.9. Shop Drawings

- a) The Contractor shall submit to the Project Manager/appropriate government authority appointed by GSCDL four copies of the shop drawings. Shop drawings shall be submitted under following conditions:
 - Showing any changes in layout in the plumbing drawings
 - Equipment layout and piping, wiring diagram
 - Manufacture's or Contractor's fabrication drawings for any materials or equipment supplied by them.
- b) The Contractor shall submit four copies of catalogues, manufacturer's drawings. Equipment characteristic data or performances charts as required by the Project Manager/appropriate government authority appointed by GSCDL.

2.5.10. Completion Drawings

- a) On completions of work the Contractor shall submit one complete sets of original tracings and two prints of —as builtll drawings to the employer. These drawings shall have the following information:

PART II- EMPLOYERS REQUIREMENT

- Run of all piping and diameters on all floors and vertical stacks.
 - Ground and invert levels of all drainage pipes together with location of all manholes and connections upto outfall
 - Run of all water supply lines with diameters, locations, of control valves, access panels
 - Locations of all mechanical equipment with layout and piping connections.
- b) The Contractor shall provide four sets of catalogues performances data and list of spare parts together with the name and address of the manufacturer for all electrical and mechanical equipment provided by him.

2.5.11. Testing

- a) Piping and drainage works shall be tested as specified under the relevant clauses of the specifications.
- b) Tests shall be performed in the presence of the Project Manager/appropriate government authority appointed by GSCDL.
- c) All materials and equipment found defective shall be replaced and whole work tested to meet the requirements of the specifications.
- d) The Contractor shall perform all such tests as may be necessary and required by the local authorities to meet Municipal or other bye-laws in force.
- e) The Contractor shall provide all labour, equipment and materials for the performances of the tests.

2.5.12. Site Clearance and Clean up

- a) The Contractor shall, from time to time clear away all debris and excess materials accumulated at the site
- b) After the fixtures, equipment and appliances have been installed and commissioned, the Contractor shall clean up the same and remove all plaster, paints, stains, stickers and other foreign matter of discoloration leaving the same in a ready to use condition
- c) On completion of all works, the Contractor shall demolish all stores, remove all surplus materials and leave the site in a broom clean condition

2.5.13. License and Permit

- a) The Contractor must hold a valid plumbing licenses issued by the Municipal Authority or other Government Agency under whose jurisdiction the work falls

PART II- EMPLOYERS REQUIREMENT

- b) The Contractor must keep constant liaison with the Government Agency and obtain approval of all drainage and water supply works carried out by him.
- c) The Contractor shall obtain, from the Government Agency certificates with respect to his work as required for occupation of the building.
- d) All inspection fees or submission fees should be paid by the Contractor.

2.5.14. Cutting and Making good

No structural member shall be chased or cut without the written permission of the Project Manager/appropriate government authority appointed by GSCDL.

2.5.15. Materials

- a) All materials used in the works shall conform to the tender specification.
- b) As far as possible materials bearing BIS certification marks shall be used with the approval of the Project Manager/appropriate government authority appointed by GSCDL.
- c) Unless otherwise specified and expressly approved in writing by the Project Manager/appropriate government authority appointed by GSCDL, materials of makes and specifications mentioned with technical specification shall be used.

2.5.16. Mock up

- a) The Contractor shall install all pipes, fixtures, clamps and accessories and fixing devices in mock up shaft and room so constructed as directed by the Project Manager/appropriate government authority appointed by GSCDL without any cost. The materials used in the mock up may be reused in the works if found undamaged.
- b) Any tiles or finished surfaces or floors damaged by the Contractor while doing his work shall be made good with new tiles or other finishing material.

2.6. Technical Specifications - Sanitary Fixtures

2.6.1. Scope of Work

- a) Work under this section shall consist of furnishing all material and labour as necessary and required to completely install all sanitary fixtures, brass and chromium plated fittings and accessories, as specified hereinafter.
- b) Without restricting to the generality of the foregoing the sanitary fixtures shall include all sanitary fixtures, C.P. fittings and accessories etc. necessary and required for the building.
- c) Whether specifically mentioned or not all fixtures and appliances shall be provided with all fixing devices, nuts, bolts, and screws, hangers as required.

PART II- EMPLOYERS REQUIREMENT

2.6.2. General Requirements

- a) All fixtures and fittings shall be provided with all such accessories as are required to complete the item in working condition
- b) All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles of interior finish. Whether necessary the fittings shall be centered to dimensions and pattern desired.
- c) Fixing screws shall be half round head chromium plated brass with C.P. washers wherever required as per direction of the Project Manager/appropriate government authority appointed by GSCDL.
- d) All fittings and fixtures shall be fixed in a neat workman-like manner true to levels and heights and in accordance with the manufacturer's recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tiling or terrace shall be made good by the Contractor.
- e) When directed the Contractor shall install fixtures and accessories in a mock-up room for the approval of the Project Manager/appropriate government authority appointed by GSCDL.

Sample room fixtures may be reused on the works if undamaged.

2.6.2.1. Indian W.C.

- a) Indian W.C. pan shall be Orissa pattern of size. Each WC shall be provided with a 100 mm diameter cast iron or porcelain 'P' or 'S' traps with or without vent horn.
- b) W.C. shall be flushed by means of a C.I. high level flushing cistern or low-level cistern of polyethylene body complete with accessories or with 32 mm diameter C.P. flush valve.

2.6.2.2. Anglo Indian W.C.

- a) Anglo Indian W.C. shall be wash down type 'P' or 'S' trap set.
- b) Plastic seat shall be so fixed that it remains absolutely stationery in vertical position without falling down on the W.C
- c) Each Anglo-Indian W.C. set shall be provided with a solid plastic seat, rubbers buffers and chromium-plated hinges.
- d) Each Anglo-Indian W.C. shall be flushed with porcelain flushing cistern or an exposed or concealed type flush valve. Flush pipe/bend shall be connected to the W.C. by means of a suitable rubber adapter. 25 % of total W.C are Indian W.C

2.6.2.3. European W.C.

PART II- EMPLOYERS REQUIREMENT

- a) European W.C. shall be wash down single or double symphonic type floor or wall mounted and flushed by means of porcelain low level flushing cistern or the exposed or concealed type flush valve. Flush pipe/bend shall be connected to the W.C. by means of suitable rubber adapter.
- b) Wall hung W.C. shall be supported by C.I. floor mounted chair. 50 % of total W.C are Indian W.C
- c) Each W.C. seat shall be so fixed that it remains absolutely stationery in vertical position without falling down on the W.C.

2.6.2.4. Urinals

- a) Urinals shall be lipped type half stall white glazed vitreous China of approximate Size 630 x 420 x 380 mm size.
- b) Half stall Urinals shall be provided with 15 mm diameter C.P. spreader, 32 mm diameter C.P. domical waste and C.P. brass bottle trap with pipe and wall flange and shall be fixed to wall by one C.I. bracket and two C.I. wall clips as recommended by manufacturers' or as directed by the Project Manager/appropriate government authority appointed by GSCDL.
- c) Half stall urinals shall be fixed with C.P. brass screws and shall be provided with 32mm diameter domical waste leading to urinals trap.
- d) Urinals shall be flushed by means of automatic porcelain flushing cistern or exposed or concealed type urinal flush valve, as specified in manual flushing system.
- e) Flush valve for urinal shall be provided.
- f) Flush pipes of flushing cistern with sizes of main and branch flush pipe shall be as follows:

Table 11: Flush Pipes Sizes

No. of urinals in Range	Capacity of cistern litres	Size of main flush pipe	Size of branch flush pipe	Size of connection urinal
One	5	-	-	15
Two	10	20	-	15
Three	10	25	-	15

- g) Alternatively, Urinals may be flush with flush valves, exposed or concealed type.
- h) Waste pipes for urinals shall be any one of the following:
 - G.I. pipe
 - Rigid P.V.C

PART II- EMPLOYERS REQUIREMENT

- U. P.V.C. or PE pipes

i) Waste pipes may be exposed on wall or concealed in chase. Specifications for waste pipes shall be same as given in Sikkim PWD Specifications

2.6.2.5. Lavatory Basin

- a) Lavatory basins shall be white glazed vitreous china or poly marble of size, shape and type specified in the bill of quantities.
- b) Each basin shall be provided with R.S. or C.I. bracket and clips and the basin securely fixed to wall. Placing of basins over the brackets without secure fixing shall not be accepted.
- c) Each basin shall be provided with 32mm diameter C.P. brass bottle trap with C.P. pipe to wall and flame.
- d) Each basin shall be provided with fittings or mixing fittings.
- e) Basins shall be fixed at proper heights.

2.6.2.6. Sinks

- a) Sinks shall be of stainless steel.
- b) Counter top sinks shall be fixed with suitable angle iron clips or brackets as recommended by the manufacturer. Each sink shall be provided with 40mm diameter C.P. waste with chain and plug or P.V.C. waste. Fixing shall be done as directed by the Project Manager/appropriate government authority appointed by GSCDL.
- c) Each sink shall be provided with R.S. or C.I. brackets and clips and securely fixed.
- d) Fittings for supply to sinks shall be C.P. brass single hole mixing fitting with swinging spout for hot and cold water and C.P. brass swan neck tap swinging spout for cold water supply.

2.6.2.7. Mirrors

- a) Mirrors shall be electro coated copper 5.5 mm thick of guaranteed reputed make.
- b) The image shall be clear and without waviness at all angles of vision.
- c) Mirrors shall be provided with backing of 12 mm thick 6mm thick cement asbestos sheet fixed with C.P. brass semi round- headed screws and cup washers or C.P. brass clamps as specified or instructed by the Project Manager/appropriate government authority appointed by GSCDL.

2.6.2.8. Shower set

PART II- EMPLOYERS REQUIREMENT

- a) Shower set shall comprise of one/two C.P. brass concealed stop cocks with two long body brass/C.P. brass bid cock, or bath spout.
- b) Each shower set shall also be provided with C.P. shower arm with wall flange and showerhead of approved quality.
- c) Concealed stop cocks shall be so fixed as to keep the wall flange clear off the finished wall. Wall flanges embedded in the finishing of wall shall not be accepted.

2.6.2.9. Accessories

- a) The Contractor shall install all chromium plated and porcelain accessories or as directed by the Project Manager/appropriate government authority appointed by GSCDL.
- b) All C.P. accessories shall be fixed with C.P. brass half round head screws and cup washers in wall with raw plugs or nylon sleeves and shall include cutting and making good as required or directed by the Project Manager/appropriate government authority appointed by GSCDL.
- c) Porcelain accessories shall be fixed in walls and set in cement mortar 1:2 (1 cement: 2 coarse sand) and fixed in relation to the tiling work.

2.6.2.10. Urinal Partitions

- a) Urinal partitions shall be white glazed vitreous china or 25mm thick marble of size.
- b) Porcelain partitions shall be fixed at proper height with C.P. brass bolts, anchor fasteners C.P. brass bolts, anchor fasteners and M.S. clip as recommended by the manufacturer and directed by the Project Manager/appropriate government authority appointed by GSCDL.

2.7. Technical Specifications – Soil, Waste & Vent Pipes

2.7.1. Scope of work

- a) Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install all soil, waste, vent and rainwater pipes.
- b) Without restriction to the generally of the foregoing, the soil, waste, vent and rainwater pipes system shall include the followings:
 - i. Vertical and Horizontal soil, waste and vent pipes, rainwater pipes & fittings, joint clamps and connections to the fixtures
 - ii. Connections of pipes of gully traps and manholes etc.
 - iii. Floor and urinal traps, cleanout plugs, inlet fittings and rainwater head as specified.

PART II- EMPLOYERS REQUIREMENT

- iv. Waste pipes connections from all fixtures e.g. wash basins, sinks, urinals, and kitchen equipment.
- v. Testing of all pipes.

2.7.2. General Requirements

- a) All materials shall be new of the best quality conforming to specifications and subject to the approval of the Project Manager/appropriate government authority appointed by GSCDL.
- b) Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workman like manner.
- c) Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.
- d) Pipes shall be securely fixed to walls and ceiling by suitable clamps at intervals specified.
- e) Access doors for fitting and cleaning shall be so located that they are easily accessible for repair and maintenance.
- f) All works shall be executed as directed by the Project Manager/appropriate government authority appointed by GSCDL.

2.7.3. Cast iron pipes and fittings Cast Iron Pipes

- a) Soil, waste, vent anti-symphonize and rainwater pipe shall be cast iron pipes/UPVC.
All pipes shall be straight and smooth and inside free from irregular bore, blowholes cracks and other manufacturing defects. Pipes shall be centrifugally spun iron soil pipes conforming to IS: 3989-1970, or sand cast IS: 1729-1967.
- b) Standard weight, dimensions and pig lead required for joints shall be as follows:
For pipes conforming to IS: 3989- 1970 (centrifugally spun soil pipes).

Table 12: Pipe Joints Sizes and Weights

Nominal (inch)	Diameter (mm)	Thickness (mm)	Overall Weight 6' length or 1.83m (kg)	Internal diameter of socket (mm)	Depth of lead (mm)
2	50	3.5	8.5	73	25
3	75	3.5	12.7	99	25
4	100	4.0	19.2	126	25
6	150	5.0	35.5	178	38
For conforming to IS 1729-19 67 (sand cast iron soil pipes and fittings)					
2	50	5	11.41	76	25

PART II- EMPLOYERS REQUIREMENT

Nominal (inch)	Diameter (mm)	Thickness (mm)	Overall Weight 6' length or 1.83m (kg)	Internal diameter of socket (mm)	Depth of lead (mm)
3	75	5	16.52	101	25
4	100	5	21.67	129	25
6	150	5	31.91	181	38

c) Tolerance

Acceptable tolerance for pipes to I.S. 3989 and ISI 1729 shall be as follows:

- Wall thickness -15%
- Length +20mm
- Weight -10%

d) Fittings

- Fittings shall conform to the same Indian Standard as for matching Contractor use pipes and fittings of matching specifications.
- Fittings shall be of the required degree of curvature with or without access doors.
- Access door shall be made up with 3mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal later. The fixing shall be air and watertight.

e) Fixing

- All vertical pipes shall be fixed by M.S. clamps truly vertical. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl. (Terminal Guard).
- Horizontal pipes running along ceiling shall be fixed on structural adjustable clamps of special design shown on the drawings or as directed. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them.
- The Contractor shall provide all sleeves, openings, hangers, and inserts during the construction. All damages shall be made good to restore the surface.

2.7.4. Cast iron pipes for drainage

- All drainage lines passing under building, floors and roads, in exposed position above ground or at basement ceiling level shall be C.I.L.A pipes position of such

PART II- EMPLOYERS REQUIREMENT

pipes shall be generally shown either on ground level drawing or ceiling of basement.

- b) Cast iron pipes shall be centrifugally spun iron pipes conforming to I.S. 1536-1967.
- c) Quality certificates shall be furnished.
- d) Fittings and Inspection Chambers:-
 - i. Fittings used for C.I. drainage pipe shall conform to ISI 1538-1967. Junction from branch pipes shall be made by Y, T.
 - ii. The Contractor shall provide cast iron inspection chamber at all junction. Inspection chamber shall be specially cast with inlet, outlet and branches or appropriate and required sizes.
- e) Cleanout plugs shall be provided on head of each drain. Cleanout plugs shall be of size matching the full bore of the pipe. Plugs shall be made out with G.I. coupling caulked into the socket of the pipe or fittings. The end shall be provided with a brass screwed plug with suitable key for opening.
- f) Laying
 - i. All cast iron pipes and fittings shall be joined with best quality soft pig lead, which shall be free from impurities. In wet trenches joints shall be made from lead wool. Nothing extra shall be paid for lead wool joints. Depth of the pig lead and weight for joints shall be as given in this section above.
 - a. The spigot of pipe fittings shall be centered in the adjoining socket by caulking. Sufficiently turns of tarred gaskin will be given to leave unfilled depth of socket for depth of 45mm when the gaskin has been caulked tightly barrel and against the face of the socket. Molten pig lead shall then be poured to fill the remainder of the socket. The lead shall then be solidly caulked with suitable tools and hammer weighting not less than 3 kg weight, ring round the joint to make up for the shrinkage of the molten metal on cooling. It should be preferably finished 3 mm behind the socket face. Lead for caulking shall conform to the standards. It is essential that the pipes be perfectly dry before lead run joints are made, otherwise blow holes may occur in the lead and because of water turning to steam, injury may result to the pipe mechanic. This method is, therefore, unsuitable for use in wet trenches. Caulking of joints is carried out only after convenient lengths of pipes are paid in position and leaded.
 - b. For lead wool joints the socket shall be caulked with tarred gaskin, as explained above. The lead wool shall be inserted into the sockets and tightly caulked home skein with suitable tools and hammer of not less than 2 kg weight until joint is filled.

PART II- EMPLOYERS REQUIREMENT

g) Testing: All cast iron pipes for drainage shall be tested to a hydraulic test of 3-meter head. Test for straightness shall be same as for stoneware pipe. A test register shall be maintained which shall be signed and dated by the Contractor, and representative of the Project Manager/appropriate government authority appointed by GSCDL.

h) Clamps

- i. M.S. clamps shall be of standard design and fabricated from M.S. flat 40x3mm thick. They shall be painted with two coats of black bitumen paint before fixing.
- ii. Where M.S. clamps are to be fixed on RCC columns or slotted angles, walls or beam they shall be fixed with 40x3mm flat iron —Ull type clamps with anchor fasteners of approved design or 6mm nuts and bolts.
- iii. Structural clamps shall be fabricated from M.S. structural members e.g. rods, angles, channels flats. The Contractor shall provide all nuts bolts, welding material and paint the clamps with one coat of red oxide and two or more coats of block enamel paint. Wooden saddles, where required shall be provided free of cost.
- iv. Slotted angle/channel supports on walls shall be provided. Angles/channels shall be fixed to brick walls with bolts embedded in cement concrete blocks and to RCC walls with suitable anchor fasteners. The spacing of support bolts horizontally shall not exceed 1m.
- v. Wherever M.S. clamps are required to be anchored directly to brick walls, concrete slabs, beams of columns, nothing extra shall be payable for clamping arrangement and making good with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 mm stone aggregate 20mm nominal size).

i) Traps

i. Nahni Traps or Floor Traps

Nahni Traps or floor traps shall be cast iron, deep seal with an effective seal of 50mm. The trap and waste pipes shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in 1:2:4 mix (1 cement:2 coarse sand:4 stone aggregate 20 mm nominal size) and extended to 40 mm below finished floor level. The Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30x30cms of the required depth.

ii. Urinal Traps

Urinal Traps shall be cast iron P or S trap with or without vent and set in cement concrete blocks specified above without extra charge. Vitreous china channel with Openable cover shall be provided under the urinals.

iii. Floor Trap inlet

PART II- EMPLOYERS REQUIREMENT

Bathroom traps and connections shall ensure free and silent flow of discharging water. Where specified, the Contractor shall provide a special type cast iron inlet hopper without or with one, two or three inlet sockets to receive the waste pipes. Joint between waste and hopper inlet socket shall be lead caulked joint. Hopper shall be connected to a C.I. P. or S. trap with at least 50mm seal (Hopper and traps shall be paid for separately) floor trap inlet hoppers and the trap shall be set in cement concrete blocks as specified above without extra charge.

iv. C.P. /Stainless Steel Gratings

Floor and urinal traps shall be provided with 100, 150 mm square or round C.P. / Stainless steel grating with frame of approval design and shape. Minimum thickness shall be 4-5 mm or as specified in the bill of quantities.

j) Jointing

i. Soil waste vent and rainwater pipes shall be jointed with refined pig lead conforming to IS 27-1977. A sufficient skein or jute rope shall be caulked to leave a minimum space for the pig lead as given in Sikkim PWD Specifications /CPWD Specifications to pour in. After pouring the lead shall be caulked in the joint with request caulking tool and hammer. All surplus lead shall be cut and joint left 460 with rim of the socket neatly.

ii. Cleanout Plugs

The Contractor shall provide cast brass cleanout plugs as required cleanout plugs shall be threaded and provided with keyholes for opening. Cleanout plugs shall be fixed to the pipe by a G.I. socket and lead caulked joint.

2.7.5. Waste Pipe from Appliances

- a) Waste pipe from appliances e.g. washbasins, sinks, urinals, bathtubs, water coolers shall be of galvanized steel, lead or PVC.
- b) All pipes shall be fixed in gradient towards the outfalls of drains. Pipe inside a toilet room shall be in chase where required pipes may be run at ceiling level in suitable gradient and supported on structural clamps. Spacing for clamps for such pipes shall be as follows:

Table 13: Pipe wise Spacing for Clamps

Pipes	Vertical Spacing (cm)	Horizontal Spacing (cm)
G.I. Pipes	300	240
P.V.C. Pipes	180	120
Lead pipes	120	120

i. Galvanized Pipes

PART II- EMPLOYERS REQUIREMENT

Pipes shall be galvanized steel tubes, conforming to I.S.: 1239- 1979 (medium class) and quality certificates shall be furnished. Pipes shall be provided with all required fittings e.g. Tees, couplings, bends, elbows, Unions, Reducers, Nipples, Plugs. All G.I. waste pipes shall be terminated at the point of connection with the appliance with an outlet of suitable diameter.

- ii. Lead Pipes
 - a. Where specified, lead pipes shall be used for waste and connections to anti- siphonage pipes and W.C. connections.
 - b. Lead pipes shall be seamless drawn pipes conforming to IS. 404 (part-I) 1977. Weight and wall thickness shall be as follows:

Table 14: Weight and Wall Thickness Details for Lead Pipes

Nominal I/D (mm)	Wall Thickness	Wt. Kg/m
32	2.6	3.28
40	2.6	3.95
50	2.7	5.07
75	2.7	7.48
100	2.7	9.88

- c. Lead pipes shall be straightened by wooden mandrel and bent to required shape by filling sand Connection between appliance, stacks or traps shall be made with solder joints. Solder shall be 64% lead and 36% pure tin. All lead waste pipes in exposed positions shall be painted with one coat of red primer and two or more coats of synthetic enamel paint of approved quality and shade.

- iii. Polyethylene Pipes
 - a) Where specified, polythene pipes shall be high-density polythene pipe confirming to IS: 4984-78. The details of the nominal outer diameter, weight and working pressure at 20 degree C shall be as per the above standards or as per manufacturer's specifications subject to approval of the Project Manager/appropriate government authority appointed by GSCDL.
 - b) Polythene pipes may be cold bending to a radius of not less than eight times of their external diameter. Pipes bent for smaller radius may be made by not bending.
 - c) Fittings used for polythene pipes shall be compression moulded fittings matching to the above specifications or for higher diameter, fabricated as per required specifications.
 - d) Jointing

PART II- EMPLOYERS REQUIREMENT

Jointing and fixing for polythene pipes shall be made as per manufacturer's specifications but generally by means of butt welding or detachable nuts or flanged joints or screwed joints. The type of joint shall be used as per the site conditions. The ultimate finish of pipe shall be complete as directed by the Project Manager/appropriate government authority appointed by GSCDL.

- e) All pipes shall be tested after installation for a pressure equal to twice the maximum working pressure in the line.

iv. Cement Concrete

Cast iron soil and waste pipes under floor, in concrete slabs and in wall chases (When cut specially for the pipe) shall be encased in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 stone aggregate 20mm size) 75 mm in bed and all-round. When pipes are running well above the structural slab, the encased pipes shall be supported with suitable cement concrete pillars of required height and size of intervals as directed by the Project Manager/appropriate government authority appointed by GSCDL.

v. Painting

- a. H.C.I. soil waste vent and rainwater pipes in exposed location, in shafts and pipe spaces shall be painted with two or more coats of synthetic enamel paint to give an even shade.
- b. Paint shall be of approved quality and shade where directed pipes shall be painted in accordance with approved pipe colour code.
- c. Waste pipes in chase shall be painted with two coats of bitumen paint, covered with polythene tape and a final coat of bitumen paint. Exposed pipes shall be painted with two or more coats of synthetic enamel paint.
- d. C.I. soil and waste pipes below ground and covered in cement concrete or lead pipes shall not be painted.

vi. Cutting and Making Goods

Pipes shall be fixed and tested as building proceeds. The Contractor shall provide all necessary holes cut outs and chases in structural as building works proceeds. Wherever holes are cut or left originally, they shall be made good with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal size) or cement mortar 1:2 (1 cement: 2 coarse sand) and the surface restored as in original condition.

vii. Testing

PART II- EMPLOYERS REQUIREMENT

- a) Before use at site all C.I. soil pipes shall be tested by filling up with water for at least 10 minutes. After filling, pipes shall be struck with a hammer and inspected for blowholes and cracks. All defective pipes shall be rejected and removed from the site within 48 hours. Pipes with minor sweating shall be accepted at the discretion of the Project Manager/appropriate government authority appointed by GSCDL.
- b) Pipes shall be tested after installation, by filling up the stack with water. All openings and connections shall be suitable plugged. The total head in the stack shall however not 3m exceed.
- c) Alternatively, the Contractor may test all soil and waste stacks by a smoke testing machine. Smoke shall be pumped into the stack after plugging all inlet and connections. The top end shall however be left open. The stack shall then be observed for leakage and all defective pipes and fittings removed or repaired as directed by the Project Manager/appropriate government authority appointed by GSCDL.
- d) A test register shall be maintained and all entries shall be signed and dated by the Contractor and the Project Manager/appropriate government authority appointed by GSCDL.

2.7.6. Excavation and Pipelines

a) Excavation

The excavation for pipe works shall be open cutting unless the permission of the Project Manager/appropriate government technical specifications, in accordance with which the construction works of the authority appointed by GSCDL for the ground to be tunneled is obtained in writing. Where sewers have to be constructed along narrow passages, the Project Manager/appropriate government authority appointed by GSCDL may order the excavation to be made partly in tunnel and in such cases the excavated soil shall be brought back later on for refilling the trenches or tunnel.

b) Opening out Trenches

In excavation the trenches, etc. the solid road metaling, pavements, curbing etc. and turf is to be placed on one side and preserved for reinstatement when the trenches or other excavation shall be filled up. Before any road metal is replaced, it shall be carefully shifted. The surface of all trenches and holes shall be restored and maintained to the satisfaction of the Project Manager/appropriate government authority appointed by GSCDL and of the owners of the roads or other property traversed and the Contractor shall not cut out or break down and live fence of trees in the line of the proposed works but shall tunnel under them, unless the Project Manager/appropriate government authority appointed by GSCDL shall order to the contrary.

PART II- EMPLOYERS REQUIREMENT

The Contractor shall grub up and clear the surface over the trenches and other excavations of all trees, stumps roots and all other encumbrances effecting execution of the work and shall remove them from the site to the approval of the Project Manager/appropriate government authority appointed by GSCDL.

c) Obstruction of Roads

The excavation for pipe works shall be open cutting unless the permission of the Project Manager/appropriate government authority appointed by GSCDL for the ground to be tunneled is obtained in writing. Where sewers have to be constructed along narrow passages, the Project Manager/appropriate government authority appointed by GSCDL may order the excavation to be made partly in tunnel and in cases the excavated soil shall be brought back later on for refilling the trenches or tunnel.

d) Removal of Filth

All night soil, filth or any other offensive matter met with during the execution of the works, immediately removed after it is taken out of any trench, sewer or cess pool, shall not be deposited on to the surface of any street or where it is likely to be a nuisance or passed into any sewer or drain but shall be at once put into the Carts and removed to a suitable place to be provided by the Contractor.

e) Excavation to be taken to Proper Depths

The trenches shall be excavated to such a depth that the pipes shall rest on concrete or on firm bedding as described in the several clauses relating to these so that the inverts may be at the levels given in the sections. In bad ground the Project Manager/appropriate government authority appointed by GSCDL may order the Contractor to excavate to a greater depth and to fill up the excavation to the level of the sewers with concrete, broken stone, gravel or other materials.

f) Refilling

After the pipes or other work has been laid and proved to be water light, the trench or other excavations shall be refilled. Utmost care shall be taken in doing this, so that no damage shall be caused to sewer site and other permanent work. The filling in the hunches and upto 75 cm above the crown of the sewer shall consist of the finest selected materials placed carefully in 15 cm layers and flooded and consolidated. After this has been laid, the trench and other excavation shall be refilled carefully in 15 cm layers with materials taken from the excavation, each layer being watered to assist in the consolidation unless the Project Manager/appropriate government authority appointed by GSCDL shall otherwise direct.

g) The Contractor to Restore Settlement and Damages

The Contractor shall at his own costs and charges make good promptly during the whole period the works are in hand, any settlement that may occur in the surfaces

PART II- EMPLOYERS REQUIREMENT

of roads, berms, footpaths, gardens, open spaces etc. whether public or private caused by his trenches or by his other excavations and he shall be liable for any accidents caused thereby. He shall also at his own expenses and charges repair and make good and damage done to buildings and other property.

h) Disposal of Surplus Soil

The Contractor shall at his own costs and charges provide places for disposal of all surplus materials not required to be used on the works. As each trench is refilled, the surplus soil shall be immediately removed, the surface properly restored and roadways and sides left clear.

i) Timbering of Sewer and Trenches

- The Contractor shall at all times support efficiently and effectively the sides of the sewer trenches and other excavations by suitable timbering, piling and sheeting and they shall be close, timbered in loose or sandy strata and below the surface of the sub soil water level.
- All timbering sheeting and plinth with their walls and supports shall be of adequate dimensions and strength and fully braced and strutted so that no risk of collapse or subsidence of the walls of the trench shall take place.
- The Contractor shall be held responsible and will be accountable for the sufficiency of all timbering, branches, sheeting and piling used as also for all damage to persons and property resulting from improper quality, strength, placing, maintaining or removing of the same.

j) Shoring of Buildings

The Contractor shall shore up all buildings, walls and other structures, the stability of which is liable to be endangered by the execution of the work and shall be fully responsible for all damages to persons or property resulting from any accident.

k) Removal of Water from Sewer, Trench etc.

The Contractor shall at all times during the progress of the work keep the trenches and excavations free from water which shall be disposed of by him in a manner as will neither cause injury to the public health nor to the public or private property nor to the work completed or in progress nor to the surface of any roads or streets, nor cause any interference with the use of the same by the public.

l) Width and Depth of Trench

The Project Manager/appropriate government authority appointed by GSCDL shall have the power of giving an order in writing to the Contractor to increase the maximum width for excavation in trenches for various classes of sewer, manholes and other works in certain lengths, to be specifically laid down by him, where on

PART II- EMPLOYERS REQUIREMENT

account of bad ground or other unusual conditions, he considers that such increased widths are necessary in view of the site conditions.

2.8. Technical Specifications – Water Supply

2.8.1. Scope of Work

- a) Work under this section consists of furnishing all labour, material, equipment and appliances necessary and required to completely install the water supply system as required by the drawings, specified hereafter.
- b) Without restricting to the generality of the foregoing the water supply system shall include the following:
 - i. All water lines to different parts of building and making connection from source etc.
 - ii. Pipe protection and painting.
 - iii. Providing hot water geysers/system and insulation of hot water pipe lines, wherever required.
 - iv. Control valves, masonry chambers and other appurtenances.
 - v. Connections to all plumbing fixtures, kitchen equipment, tanks and appliances.
 - vi. Excavation and refilling of pipe trenches wherever necessary

2.8.2. General Requirements

- a) All materials shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Project Manager/appropriate government authority appointed by GSCDL.
- b) Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.
- c) Short or long bends shall be used on all main pipelines as far as possible. Use of elbows shall be restricted for short connections.
- d) As far as possible all bends shall be formed by means of a hydraulic pipe bending machine for pipes up to 65mm diameter.
- e) Pipes shall be fixed in manner as to provide easy accessibility for repair and maintenance and shall not cause obstructions in shafts, passages etc.
- f) Pipes shall be securely fixed to walls and ceiling by suitable clamps at intervals specified.
- g) Valves and other appurtenances shall be so located as to provide easy accessibility for operations, maintenance and repairs.

2.8.3. G. I. Pipes, Fittings and Valves

PART II- EMPLOYERS REQUIREMENT

- a) All pipes inside the buildings and where specified, outside the building shall be galvanized steel tubes conforming to IS 1239-1979 of class specified. When class is not specified they shall be medium class.
- b) Fittings shall be malleable iron galvanized fittings, approved make. All fittings shall have manufactures trademark stamped on it. Fittings for G.I pipes shall include bends, tees, reducers, nipples, unions, bushes. Fittings shall be as directed by Project Manager/appropriate government authority appointed by GSCDL or appropriate authority appointed by GSCDL.
- c) Pipes and fittings shall be jointed with screwed fittings care shall be taken to remove burr from the end of the pipe after cutting by a round file. Genuine red lead with grummet and a few strands of fine hemp shall be applied. Care shall be taken to avoid air pockets G.I. pipes inside toilets shall be fixed in wall chases well above the floor. No pipes shall be inside a sunken floor as far as possible. Pipes may be run under the ceiling or floors.

2.8.4. Clamps

G.I. pipes in shafts and other locations shall be supported by M.S. clamps of design approved by the Project Manager/appropriate government authority appointed by GSCDL. Pipe in wall chases shall be anchored by iron hooks. Pipes at ceiling level shall be supported on structural clamps fabricated from M.S. structural as described in section II. Pipes in typical shafts shall be supported on slotted angles/ channels as specified elsewhere.

2.8.5. Unions

The Contractor shall provide adequate number of unions on all pipes to enable dismantling later Unions shall be provided near each gunmetal valve, stop cocks, or check valves and on straight runs as necessary at appropriate locations.

2.8.6. Flanges

Flanged connections shall also be provided on all equipment connections as necessary and required or as directed by the Project Manager/appropriate government authority appointed by GSCDL. Flanges shall be of forged type and not casted. Connections shall be made by the correct number and size of the bolts and made with 3mm thick insertion rubber washer. Where hot water or steam connections are made insertion gasket shall be of 1.5 m thick compressed asbestos fibre gaskets approved by the Project Manager/appropriate government authority appointed by GSCDL. Bolts hole diameter. For flange shall conform to match the specifications for C.I. sluice valve to IS 780- 1984.

2.8.7. Trenches

PART II- EMPLOYERS REQUIREMENT

All G.I. Pipes below ground level shall be laid in trenches shall have a minimum cover of 60 cm. Excavation for trenches shall be done as specified, but the width and depth of the trenches shall be as follows:

Table 15: Diameter wise Width & Depth of Trenches

Diameter of pipes	Width of Trenches	Depth of Trenches
15 mm to 50 mm	30 cm	75 cm
65 mm to 100mm	45 cm	100 cm

Where specified in the bill of quantities all G.I. pipes in trenches shall be protected with fine sand 15cm thick layer all-round before filling in the trenches.

2.8.8. Painting

- a) All pipes above ground shall be painted with one coat of red lead and two coats of synthetic enamel paint of approved shade and quality. Pipe shall be painted to standard colour code.
- b) All pipes in chases and below floor shall be painted two or more coats of anti-corrosive bitumen paint.

2.8.9. Pipe Protection

Where specified in the Chapter of quantities all pipes in chase or below ground shall be protected against corrosion by applying two coats of bitumen paint, wrapping with polythene tape and finishing with one more coat of bitumen paint.

2.8.10. H.D.P.E. Threaded Pipes

- a) The H.D.P.E. pipe shall be a threaded type of GI standard i.e. having specifications equivalent of GI of IS 1239 medium class but confirming to IS 4984-78
- b) The H.D.P.E. pipe shall confirm to pressure rating of 10 kg/sq cm and shall only be used for internal cold water in the building.
- c) All other specification for laying and jointing shall conform to BIS so that GI pipe including for fitting etc., except no pipe protection is required in this case as specified in para 9.a, 9.b and 10.

2.8.11. Gun Metal Valves

Valves 65mm diameter and below shall be heavy gunmetal full may valves are globe bulbs confirming to IS: 778-1971, 10kg/sq cm or 20 kg/cm square as specified in bill of quantities. Valves shall be attested at manufacturer's work and the same on it. All valves shall be approved by the Project Manager/appropriate government

PART II- EMPLOYERS REQUIREMENT

authority appointed by GSCDL before they are allowed to be used on work. However the final responsibility of the quality of material lies with the Contractor.

2.8.12. Sluice valves

A valves 80mm diameter and above shall be CI double flanged sluice walls and/ or as specified in bill of quantities. Sluice valves shall be cast iron double flanged, with rising spindle is sluice valve shall be provided with wheels for valves in exposed position and kept for underground valves. The Contractor shall provide suitable operating keys for sluice valves with cap tops.

Sluice valves shall be best quality confirming to IS: 780-1969 of class specified.

2.8.13. Butterfly valves

Butterfly valves shall be C.I. as per IS 13095-1991 and having C.I. body, epoxy power coated disc, nitrile rubber sheet and all other detail as per requirement. The valves shall be jointed with flanged joints. The specification of the flanges shall be as per I.S.-6392-1971.

Valve up to 150 mm diameter shall be either hand lever or cap operated and from 200mm diameter and above shall be gearbox operated.

2.8.14. Testing

- a) All pipes, fittings and valves shall be tested by hydrostatic pressure of 7.5 kg/sq cm.

Pressure shall be maintained for a period of at least 120 minutes without any drop in the pressure after fixing at site. A test register shall be maintained and all entries shall be signed and dated by the Contractors and the Project Manager/appropriate government authority appointed by GSCDL.

- b) In addition to the sectional testing carried out during the construction, the Contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building, furniture and fixtures shall be made good by the Contractor.
- c) After commissioning of the water supply system, the Contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves, which do not effectively operate, shall be replaced by new ones and the same shall be tested as above.

2.8.15. Insulation

PART II- EMPLOYERS REQUIREMENT

a) Magnesia Insulation

Hot water pipe fixed in case shall be insulated by wrapping 6mm thick asbestos dipped in 85% magnesia solution around the pipes and finished with a port of 1:3 cement plaster mixed with rapid hardening cement.

- b) External hot water pipes in shafts floors and trenches shall be insulated by 2 layers of 6mm thick insulation and then will be having finished smooth surface with 12mm thick cement plaster (two layers of 6mm thick or mix 1:2 Portland cement and fine sand).

2.8.16. Cast Iron Pipes s/s

- a) Where specified pipes 80mm id and above shall be S/S spun cast iron pipes' conforming to IS 1536-1967. Pipes shall be of maximum lengths available and suitable for moulded rubber joints.

- b) Fittings shall be S/S cast iron conforming to IS 1538-1967.

c) Laying Pipes

- i. Pipes shall be laid out in open trenches with a minimum cover of 75 cm over the crown of the pipes. Width of the trench shall be nominal pipe diameter plus 45 cm with a minimum of 60 cm.
- ii. Pipes may be laid on RCC slabs/rafts and shall be supported by bricks pillars at intervals not exceeding 2.4 m.
- iii. The socket of the pipes shall be laid facing the flow (the water should enter from socket end)
- iv. Pipes should be kept thoroughly clean during the course of laying. Each end shall be blocked by a thick block of wood and wedged at the end of each day's work to prevent dirt and animals from entering the pipes.

- d) Joints for pipes and between spun pipes and C.I. fittings, collars, etc. shall be made with moulded rubber and refined pig lead conforming to IS 27 2977 respectively. The spigot of the pipe of fittings shall be centered in the adjoining socket by caulking. Sufficient turns of tarred gaskin shall be caulked to leave required depth on the socket for lead.

After pouring the lead, it shall be solidly caulked with suitable tools and hammers. Depth and weight of lead shall be:

Table 16: Pipe Diameter wise Depth and Wight of Lead

Pipe diameter	Weight of lead/joint	Depth of lead
80 mm	1.8 kg	45 mm
100 mm	2.2 kg	45 mm
150 mm	3.4 kg	45 mm

PART II- EMPLOYERS REQUIREMENT

200 mm	5.0 kg	50 mm
250 mm	6.1 kg	50 mm
300 mm	7.2 kg	55 mm

- i. Rubber Joint
Joints between two pipes shall be made by premoulded rubber joints with suitable tackles in a manner recommended and approved by the manufacturer. No joints shall be covered until the lines are hydraulically tested.
 - ii. Lead Caulked Joints
- e) Joints between pipes and C.I. fittings shall be made with refined pig lead. The spigot of the pipe shall be centered in the adjoining socket by caulking sufficient turn of tarred gaskin, which will be caulked into the joint to leave a depth of 45 mm for pig lead. Molten pig lead shall then be poured into the joint in one pouring. The lead shall then be solidly with suitable tools and hammers.
 - f) The Contractor may use lead wool joints in wet trench conditions.

2.8.17. Anchor Blocks

Suitable anchor blocks shall be provided at all bends and tees to encounter the excessive thrust development due to water hammer.

2.8.18. Valves

a) Air Valves

- i. Air valves shall be provided in all high points in the system to prevent air locks.
- ii. Air valves shall be of single acting heavy duty brass spring type.

b) Scour Valves

Scour valves shall be provided at all low points in the system. Valves shall be gunmetal full way valves for sizes 50 mm diameter and below and butterfly valves 65 mm diameter and above.

c) Sluice Valve

- i. Sluice valve shall be socket type or double flanged type confirming to IS 780.
- ii. Joints for socket valves shall be lead caulked joints as specified above.
- iii. Joints for double flanged sluice valve shall be made with suitable tail/socket pieces on pipe line and flanges joints made with 3mm thick insertion rubber gasket with appropriate number of bolts, nuts, washers etc.

PART II- EMPLOYERS REQUIREMENT

2.8.19. Fire Hydrants

- a) Fire hydrant shall be cast iron stand post type with 63mm diameter instantaneous gunmetal outlets conforming to I.S. 908
- b) Each fire hydrant shall be provided with an 80 mm cast iron sluice valve, duct foot bend and a suitable 63 mm diameter flanged cast iron pipe for correcting the installation height of the hydrant.

2.8.20. Valve chambers

- a) The Contractor shall provide suitable brick masonry chambers in cement mortar 1:5 (1 cement: 5 coarse sand) on cement concrete foundations 150 mm thick 1:4:8 mix (1 cement: 4 fine sand: 8 graded stone aggregate 40 mm nominal size) 15 mm thick cement plaster of 1:4 (1 cement: 4 coarse sand) inside and outside finished with a floating coat at neat cement inside with casts iron surface box approved by fire brigade including excavation, back filling complete.
- b) Valve chamber shall be of following size:
 - For depth 90 cms – 60 x 60 cms
 - For depths upto 100 cms beyond–120x120 cms

2.8.21. Disinfective

- a) After completion of the work, the Contractor shall flush clean the entire system with the city's filtered water after connection has been made.
- b) After the first flushing, add commercial bleaching powder or achieve a dosage of 2 to 3 mg/l of water in the system added and flushed. This operation should be performed twice to ensure that the system is fully disinfected and usable.

2.8.22. Pre-commissioning

- a) Ensure that all pipes are free from debris and obstructions.
- b) Check all valves and fire hydrant for effective opening and closing action. Defects should be rectified or valves replaced.
- c) Ensure that all connections to branches have been made.
- d) Ensure that mains have been connected to the respective pumps, underground and overhead tanks.
- e) Water supply should be available at main underground tank.
- f) All main line valves should be closed.

2.8.23. Commissioning

PART II- EMPLOYERS REQUIREMENT

- a) Fill tank with water. Add 1 kg fresh bleaching powder after making a solution to be added near inlet.
- b) Start water supply pumps and allow water to fill main underground tank. Water will first fill the fire tank and then overflow to the domestic tanks.
- c) After filling overhead reservoirs drain the same to its one fourth capacity through tank scour valve (this is to ensure removal of all mud, debris etc. from the tank).
- d) Fill overhead tank to full.
- e) Release waste in the main lines by opening valves in each circuit. Drain out water in the system through system scour valve or fire hydrant in lower regions. Ensure clean water is now coming out of the system.
- f) Open valves for individual cluster. Observe for leakages or mal function, check pressure and flow at end of line by opening hydrants etc. Remove and rectify defects notice.
- g) Check all fire hydrants for proper operation by opening each valve and allowing water to flow for few minutes. Also check for effective closure of valve.
- h) The entire water supply system should be disinfected with bleaching powder and system flush cleaned.
- i) Send four samples of water drawn from four extreme locations for testing for bacteriological in sterilized bottles obtained from the concerned laboratory.
(Laboratory personal may collect the samples themselves).

2.8.24. Responsibility

Responsibility for various activities in pre commissioning and commissioning procedures will rest with the Contractor.

2.9. Technical Specifications – Sewerage/Drainage System

2.9.1. Scope of Work

- a) Work under the section shall consist of furnishing all labour materials equipment and appliances necessary and required to completely finish sewerage / drainage system as required by the proposal approved and specified hereinafter.
- b) Without restricting to the generality of the foregoing the sewerage / drainage system shall include
 - i. Internal / External sewer line.
 - ii. Excavation including refilling etc.
 - iii. Construction of collection chambers manholes and drop connections.
 - iv. Construction of grease trap etc.
 - v. Construction of external sewer line.

PART II- EMPLOYERS REQUIREMENT

- vi. Storm water drainage and disposal.

2.9.2. General Requirements

- a) All materials shall be new of the best quality conforming to specifications and subject to the approval of the Project Manager/appropriate government authority appointed by GSCDL.
- b) Drainage lines shall be laid to the required gradients and profiles
- c) All drainage work shall be done in accordance with the local municipal byelaws
- d) Contractor shall obtain necessary approval and permission for the drainage system from the municipal or any other Government Agency.
- e) Location of all manholes, catch basins, etc. shall be confirmed by the Project Manager/appropriate government authority appointed by GSCDL before the actual execution of work at site.
- f) All works shall be executed as directed by the Project Manager/appropriate government authority appointed by GSCDL.

2.9.3. Alignments and grade

The sewers and storm water lines shall be laid to alignment and gradient shown on the drawings but subject to such modifications as shall be ordered by the Project Manager/appropriate government authority appointed by GSCDL from time to time to meet the requirements of the works. No deviations from the lines depths of cutting or gradients of sewer shown on the plans and sectors shall be permitted except to the direction in writing of the Project Manager/appropriate government authority appointed by GSCDL.

2.9.4. Excavation

- a) The excavation for sewers and storm water drains shall be in open cutting unless the permission of the Project Manager/appropriate government authority appointed by GSCDL for the ground to be tunneled is obtained in writing. Where sewers have to be constructed along narrow passages, the Project Manager/appropriate government authority appointed by GSCDL may order the excavation to be made partly in tunnel and in such cases the excavated soil be brought back later on for refilling the trenches or tunnel.
- b) Opening Out Trenches
In excavation the trenches, etc., the soiling roads, metalling, pavement, kerbing etc., and turf shall be placed on one side and preserved for reinforcement when the trenches or other excavation shall be filled up. Before any road metal is replaced, it shall be carefully shifted. The surface of all trenches and holes shall be restored and maintained to the satisfaction of Authority/Project Manager/appropriate government authority appointed by GSCDL. the Project

PART II- EMPLOYERS REQUIREMENT

Manager/appropriate government authority appointed by GSCDL and of the owners of the roads or other property traversed and the Contractor shall not cut out or break down any live fence of trees in the line of the proposed works but shall tunnel under them, unless the Project Manager/appropriate government authority appointed by GSCDL shall order to the contrary. c) Obstruction of Roads

The Contractor shall not occupy or obstruct by his operation more than one half of the width of any road or street and if insufficient space shall then be left for public and private transit, he shall remove the materials excavated and bring them back again when the trench is required to be refilled. The Contractor shall obtain the consent of the Project Manager/appropriate government authority appointed by GSCDL in writing before closing any road to vehicular traffic and the foot walks must be clear at all times.

d) Removal of Filth

All night soil, filth or any other offensive matter is met with during the execution of works, immediately after it is taken out of any trench, sewer or cesspool, shall not be deposited on the surface of any street or where it is likely to be a nuisance or passed into any sewer or drain but shall be at once put into the carts and removed to suitable place to be provided by the Contractor.

e) Excavation to be taken to Proper Depth

The trenches shall be excavated to such a depth that the sewer shall rest on concrete described by the several clauses relating thereto and so that the inverts may be at the levels given the sections. In bad ground, the Project Manager/appropriate government authority appointed by GSCDL may order the Contractor to excavate to a greater depth than that shown on the drawings and to fill up the excavation to the level of the sewer with concrete, broken stone, gravel or other materials.

f) Refilling

After the sewer or other work has been laid and proved to be water tight, the trench or other excavations shall be refilled. Utmost care shall be taken in doing this, so that no damage shall be caused to the sewer and other permanent work. The filling in the haunches and upto 75 cm above the crown of the sewer shall consist of the finest selected materials place carefully in 15 cm. Layers and flooded and consolidated. After this has laid the trench and other excavation shall be refilled carefully in 15 cm layers with materials taken from the excavation, each layer being watered to assist in the consolidation unless the Project Manager/appropriate government authority appointed by GSCDL shall otherwise direct.

g) The Contractor to restore settlement and damages

The Contractor shall at his own costs and charges, make good promptly during the whole period, the work are in hand, any settlement that may occur in the surfaces of roads, berms, footpaths, gardens, open spaces, etc., whether public

PART II- EMPLOYERS REQUIREMENT

or private caused by his trenches or by his other excavations and he shall be liable for any accidents caused thereby, he shall also, at his own expenses and charges repair and make good any damage done to buildings and other property.

h) Disposal of Surplus Soil

The Contractor shall at his own costs and charges provide places for disposal of all surplus materials not required to be used on the works. As each trenches refilled the surplus soil shall be immediately removed, the surface properly restored and roadways and sides left clear.

i) Timbering of sewer and trenches

The Contractor shall at all times support efficiently and effectively the sides of the sewer trenches and other excavation by suitable timbering, piling and sheeting and they shall be closed, timbered in loose or sandy strata and below the surface of the sub-soil water level. All timbering sheeting and piling with their walling supports shall be adequate dimensions and strength and fully braced and strutted so that no risk of collapse or subsidence of the walls of the trench shall take place.

The Contractor shall be held responsible and will be accountable for the sufficiency of all timbering, bracing, sheeting and piling used as also for, all damage to persons and property resulting from improper quality, strength, placing maintaining or removing of the same.

j) Shoring of building

The Contractor shall shore up all buildings, walls and other structures, the stability of which is liable to be endangered by the execution of the work and shall be fully responsible for all damages to persons of property resulting from any accident.

k) Removal of water from sewer, trench etc.

- i. The Contractor shall at all times during the progress of the work keep the trenches and excavations free from water which shall be disposed of by him in a manner as will neither cause injury to the public health nor to the public or private property nor to the work completed or in progress nor to the surface of any roads or streets, nor cause any interference with the use of the same by the public.
- ii. If any excavation carried out at any point or points to a greater width than the specified cross section of the sewer with its envelope, the full width of the trench shall be filled with concrete by the Contractor.

l) Width of Trench

PART II- EMPLOYERS REQUIREMENT

The Project Manager/appropriate government authority appointed by GSCDL shall have power by giving an order in writing to the Contractor to increase the maximum width for excavation in trenches for various classes of sewer, man holes and other works in certain lengths to be specifically laid down by him, where on account of bad ground or other unusual conditions, he considers that such increased widths are necessary in view of the site conditions.

2.9.5. Salt Glazed Stoneware Pipes

a) Stoneware pipes shall be first class quality salt glazed and free from rough texture inside and outside and straight. All pipes shall have the manufacturer name marked on it and shall comply to IS 651-1971. Approved makes [PERFECT or BURN].

b) Laying and jointing of stone ware salt glazed pipes

- i. Pipes are liable to be damaged in transit and not withstanding tests that may have been made before dispatch each pipe shall be examined carefully on arrival at site. Each pipe shall be rung with a wooden hammer or mallet and those that do not ring true and clear shall be rejected. Sound pipes shall be carefully stacked to prevent damage. All defective pipes should be segregated, marked in a conspicuous manner and their use in the works prevented.
- ii. The pipes shall be laid with sockets leading up hill and should rest on solid and even foundations for the full length of the barrel. Socket holes shall be formed in the foundation sufficiently deep to allow the pipe jointer room to work right round the pipe and as short as practicable to admit the socket and allow the joint to be made.
- iii. Where pipes are not bedded on concrete the trench bottom shall be left slightly high and carefully bottomed up as pipe laying proceeds so that the pipe barrels rest on firm ground, if excavation has been carried too low it shall be made up with cement concrete (1:5:10) mix at the Contractor's expenses and charges.
- iv. If the bottom of the trench consists of rock or very hard ground that cannot be easily excavated to a smooth surface, the pipes shall be laid on cement concrete bed to ensure even bearing.

c) Jointing of pipes

Tarred gasket shall first be wrapped round the spigot of each pipe and the spigot shall then be placed in to the socket of the pipe previously laid, the pipe then shall be adjusted and fixed in its correct position and the gasket caulked tightly home so as to fill not more than one quarter of the total length to the socket.

PART II- EMPLOYERS REQUIREMENT

The remainder of the socket shall be filled with a stiff mix of cement mortar (1 cement: 1 clear sharp washed sand). When the socket is filled, a fillet should be formed round the joint with a trowel forming an angle of 45 degrees with the barrel of the pipe. The mortar shall be mixed as needed for immediate use and no mortar shall be beaten up & used after it has begun to set.

After the joint has been made and extraneous materials shall be removed from inside the joint with a suitable scraper —badger. The newly made joints shall be protected until set from the sun, drying winds, rain or dust. Sacking or other materials, which can be kept damp, shall be used. The joint shall be exposed and spaces left all-round the pipes for inspection by the Project Manager/appropriate government authority appointed by GSCDL. The inside of the sewer must be left absolutely clear in bore and free from cement mortar or other obstructions throughout its entire length, and shall efficiently drain and discharge.

d) Testing

All lengths of the sewer and drain shall be fully tested for water tightness by means of water pressure maintained for not less than 30 minutes. Testing shall be carried out from manhole to manhole. All pipes shall be subjected to a test pressure of at least, 1.5 meter head of water at the highest point. Pressure shall, however, not exceed 1.5 meter head at any point. The pipes shall be plugged preferably with standard design plugs with rubber plugs on both ends. The upper end shall, however, be connected to a pipe for filling with water and getting the required head.

A test register shall be maintained which shall be signed and dated by Contractor and Project Manager/appropriate government authority appointed by GSCDL.

2.9.6. Gully Traps

- a) Gully traps shall be of the same quality as described for stoneware pipes in Clause 5 above.
- b) Gully traps shall be fixed in cement concrete 1:4:8 mix and brick masonry. Chamber 30x 30cm C.I. sealed cover and frame weighing not less than 7.3 Kg to be constructed as per standard drawings. Where necessary, sealed cover shall be replaced with C.I. grating of the same size (1 Cement: 4 Coarse: 8 stone aggregate 40 mm nominal size).

2.9.7. Reinforced Cement Concrete Pipes

- a) All underground storm water drainage pipes and sewer lines where specified (other than those specified cast iron) shall be centrifugally spun RCC pipes of specified class. Pipes shall be true and straight with uniform bore throughout. Cracked, warped pipes shall not be used on the work. All pipes shall be tested

PART II- EMPLOYERS REQUIREMENT

by the manufacturer and the Contractor shall produce, when directed, a certificate to the effect from the manufacturer.

b) Laying

R.C.C. spun pipes shall be laid on cement concrete bed or cradle as specified and shown on the detailed drawings. The cradle may be precast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12mm below the invert level of the pipe and properly placed on the solid to prevent any disturbance. The pipe shall then be placed on the bed concrete of cradles and set for the line gradient by means of sight rails and boning rods, etc. Cradles or concrete bed may be omitted, if directed by the Project Manager/appropriate government authority appointed by GSCDL.

c) Jointing
After setting out the pipes the collar shall be centered over the joint and filled in with tarred gaskin, so that sufficient space is left on either side of the collar to receive the mortar. The space shall then be filled with cement mortar (1 cement: 2 fine sand) and caulked by means of proper tools. All joints shall be finished at an angle of 45 degrees to the longitudinal axis of the pipe on both sides of the collars neatly.

d) Testing

All pipes shall be tested to a hydraulic test of 1.5 m head for at least 30 minutes at the highest point in the section under test. Test shall also be carried out similar to those for stoneware pipes given in this chapter. The Contractor shall also carry out the smoke test. A test register shall be maintained which shall be signed and dated by Contractor/ Project Manager/appropriate government authority appointed by GSCDL.

2.9.8. Cast Iron Pipes for Drainage

- a) All drainage lines passing under building, floors and roads with heavy traffic, in exposed position above ground e.g. service floor and basement ceiling shall be cast iron pipes.
- b) Cast iron pipes shall be centrifugally spun cast iron pipes conforming to IS 1536-1967.
- c) Quality certificate shall be furnished.
- d) Fittings and Inspection Chambers

Fittings used for C.I. drainage pipes shall conform to IS 1538-1967. Wherever, possible junction from branch pipes shall be made by a Y tee. Cleanout plugs shall be provided on head of each drain and at locations indicated on plans or as directed by Project Manager/appropriate government authority appointed by GSCDL. Cleanout plugs shall be of size matching the full bore of the pipe. Plugs shall be made from G.I. coupling caulked into the socket of the pipe for fitting. The end of the provided with a brass screwed plugs with suitable key for opening.

PART II- EMPLOYERS REQUIREMENT

e) Laying

- i. All cast iron pipes and fittings shall be joined with best quality soft pig lead (conforming to IS 279-1977) which shall be free from impurities.
- ii. The spigot of pipe or fittings shall be centered in the adjoining socket by caulking.

Sufficient turns of tarred gaskin will be given to leave unfilled the required depth of socket for depth 45 mm when the gaskin has been caulked tightly home jointing ring shall be placed round the barrel and against the face of the socket. Molten pig lead shall then be poured to fill the remainder of the socket. This shall be done in one pouring. The lead shall then be solidly caulked with suitable tools and hammers weighing not less than 2 kg. For lead wool joints the socket shall be caulked with tarred gaskin as explained above. The lead wool shall be inserted into the sockets and tightly caulked home by gaskin with suitable tools and hammers of not less than 2 kg.

- iii. For the lead wool joints the socket shall be caulked with tarred gaskin, as explained above. The lead wool shall be inserted into the sockets and tightly caulked home by gaskin with suitable tools and hammers of not less than 2kg weight until joint is filled.

f) Testing

All cast iron pipes for drainage shall be tested to a hydraulic test of 3- meter head. Test for straightness shall be same as for stoneware pipe given in point 5.d. A test register shall be maintained which shall be signed and dated by Contractor and Project Manager/appropriate government authority appointed by GSCDL.

2.9.9. Cement Concrete and Masonry Works (for manholes and chambers, etc.)

- a) Water: Water used for all constructional purpose shall be clear and free from oil, acid, alkali, organic and other harmful matters, which can deteriorate the strength and / or durability of structure. In general, the water suitable for drinking purpose shall be considered as good enough for constructional purposes.
- b) Aggregate For Concrete: The aggregate for concrete shall be in accordance with I.S. 383 and I.S. 515 in general; these shall be free from all impurities that may cause corrosion of the reinforcement. Before actual use these shall be washed in water, if required as per the direction of Project Manager/appropriate government authority appointed by GSCDL. The size of the coarse aggregate shall be done as per IS 383.
- c) Sand: Sand for various constructional purposes shall comply in all respects with I.S. 650 and I.S. 2116. It shall be clean, coarse hard and strong, sharp, durable, uncoated, free from any mixture of clay, dust, vegetable matter, mica, iron

PART II- EMPLOYERS REQUIREMENT

impurities soft or flaky and elongated particles, alkali, organic matter, salt, loam and other impurities which may be considered by the Project Manager/appropriate government authority appointed by GSCDL as harmful for the construction.

- d) Cement: The Cement used for all construction purpose shall be ordinary Portland cement or rapid hardening Portland cement conforming to I.S. 269.
- e) Mild Steel Reinforcement. The mild steel for reinforcement bars shall be in the form of round bars conforming to all requirements of IS 432 (Grade I).
- f) Bricks: Bricks shall uniform colour, thoroughly burnt but not over burnt, shall have plan rectangular faces with parallel sides and sharp right- angled edges. They should give ringing sound when struck. Brick shall not absorb more than 20% to 22% of water, when immersed in water for 24 hours. Bricks to be used shall be approved by the Project Manager/appropriate government authority appointed by GSCDL.
- g) Other Materials: Other materials not fully specified in these specifications and which may be required in work shall conform to the latest IS All such material shall be approved by the Project Manager/appropriate government authority appointed by GSCDL before use.
 - i. Cement Concrete (Plain or Reinforced)
 - a. Cement concrete pipes bedding, cradles, foundations and R.C.C. slabs for all works shall be, mixed by a mechanical mixer where quantities of the concrete poured at one time permit, hand mixing on properly constructed platforms may be allowed for small quantities by the Project Manager/appropriate government authority appointed by GSCDL.
 - b. Concrete works shall be of such thickness and mix
 - c. All concrete work shall be cured for a period of at least 7 days. Such work shall be kept moist by means of gunny bags at all times. All pipes trenches and foundations shall be kept dry during the curing period.
 - ii. Masonry Work
Masonry work for manholes, chambers, septic tanks and other such works as required shall be constructed from stone. All joints shall be properly raked to receive plaster.
 - iii. Cement Concrete for Pipe Support
 - a) Wherever specified or shown on the drawings all pipes shall be supported in bed and all round or in haunches. The thickness and mix of the concrete shall be of appropriate width of the bedding.

PART II- EMPLOYERS REQUIREMENT

- b) Unless otherwise directed by the Project Manager/appropriate government authority appointed by GSCDL, cement concrete for bed, all round or in haunches shall be laid as follows.
 - c) R.C.C. Pipes or C.I. pipes may be supported on brick masonry or precast R.C.C. or in situ cradles.
- iv. Pipes in loose soil or above ground shall be supported on bricks or stone masonry pillars.

Table 17: Mix of Concrete for Pipe Support

Pipes	Upto 1.5 m depth	Upto 1.5 m depth	Beyond 3 m depth
Stoneware pipe in open ground(no sub soil water)	All round 1:3:6	In haunches 1:3:6	All round 1:2:4
RCC or SW pipes in sub soil water	All round 1:3:6	In haunches 1:3:6	All round 1:2:4
GI pipe (in all conditions)	Sand filling	Sand filling	Sand filling
RCC pipes or CI pipes under road or building	All round 1:3:6	In haunches 1:3:6	All round 1:2:4
(1=1 cement ; 3-6 = coarse sand ; 6-12 = stone aggregate 20 mm nominal size)			

2.9.10. Manhole and Chambers

- a) All manholes, chambers, septic tanks and other such works as specified shall be constructed in RR Stone Masonry (1:6) I.S. (1 cement: 6 coarse sand).
- b) All manholes, chambers, septic tanks, etc., shall be supported one base of cement concrete of such thickness and mix.
- c) All manholes shall be provided with cement concrete benching in 1:2:4 mix (1 cement 2 coarse sand 4 stone aggregate 20 mm nominal size) The benching shall have a slope of 10 cms towards the channels. The depth of the channel shall be full diameter of the pipe. Benching shall be finished with a floating coat of neat cement.
- d) All manholes shall be plastered with 25 mm thick cement mortar 1:3 mix (1 cement 3 coarse sand) in finished with a floating coat of neat cement inside. Manholes shall be plastered outside as above but with rough plaster.
- e) All manholes with depths greater than 1 m shall be provide with Ferro Cement Foot Steps.
- f) All manholes shall be provided with cast iron covers and frames and embedded in reinforced cement concrete slab. Weight of cover and frame shall be approximately chosen.

PART II- EMPLOYERS REQUIREMENT

- g) Size of Manhole should not be less than 1500 x 900 mm in normal circumstances. Circular manhole shall be construction with minimum 1 meter internal dia.
- h) Drop Connection
 - i. Drop connections shall be provided between branch sewer and main sewer or in the main sewer itself in the steep ground when the difference in the invert level of the two exceeds 45 cm of the required size.
 - ii. Drop connections from the gully trap to main sewer on rectangular manholes shall be made inside the manhole and shall have H.C.I. special type door on top and heel rest bend at bottom connected by a H.C.I. pipe. This pipe shall be supported by holder bat clamp at 180 cm intervals with one clamp for each drop connection. All joints shall be lead caulked joints 25 cm deep.
 - iii. Drop connections from branch sewer to main sewer shall be made outside the manhole wall with glazed stone ware pipe tee connection, vertical pipe and bend at the bottom. The top of the tee shall be finished up to the surface level and provided with a C.I. hinged type frame and cover 30 cm x 30cm. The connection shall be embedded in the cement concrete 1:2:4 mix 15 cm all-round the pipe and tee upto the surface chamber of the tee.
 - iv. Drop connection made from vertical stack directly into the manhole shall not be considered as drop connection.

2.10. Technical Specifications – Fire Hydrant System

2.10.1. Scope of work

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install wet. Riser fire system as required by the drawings and specified hereinafter or given in this Chapter of quantities. Without restricting to the generally of the foregoing, the fire hydrant system shall include the following:

- a) Black steel mains including valves, hydrants and appurtenances.
- b) Black steel pipe fire risers within the building
- c) Landing valves, canvas hose pipes, hose reels, hose cabinets, fire brigade connections to pumps, appliances and pressure reducing devices.
- d) Excavation, anchor blocks and valve chamber.

2.10.2. General Requirements

All materials shall be of the best quality conforming to the specifications and subject to the approval of the employer. Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

PART II- EMPLOYERS REQUIREMENT

Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts passages, etc. Pipes shall be securely fixed to walls and ceilings by suitable clamps at intervals specified. Only approved type of anchor fasteners shall be used for R.C.C. ceilings and walls. Valves and other appurtenances shall be so located that they are easily accessible for operations, repairs and maintenance.

2.10.3. Pipes and fittings for Internal Work

a) Jointing

M.S. Pipes: Pipes 50 mm diameter, and below shall be provided with metal to metal tapered threaded joints. Red lead shall be used for lubrication and rust prevention.

Pipes 65 mm diameter and above shall be provided with electrical resistance welding, jointing shall be butt welded between pipe and fittings.

Joints between C.I and M.S. pipe shall be made by providing a suitable flanged tail or sockets piece and M.S. flanges on the M.S. pipe shall have appropriate number of holes and shall be fastened with nuts, bolts and 3 mm thick compressed asbestos gaskets.

2.10.4. Excavation

Excavation for pipelines shall be open trenches to levels and grades shown on the drawings or as required at site, Pipelines shall be buried to a minimum depth of 1 to 1.5 meter or as shown on the drawings:

- a) Wherever required the Contractor shall support all trenches or adjoining structures with adequate timber supports.
- b) On completion of testing and painting, trenches shall be refilled with excavated earth in 15 cm layers and consolidated.
- c) Contractor shall dispose of all surplus earth within a lead of 200 meter or as directed by the Project Manager/appropriate government authority appointed by GSCDL.

2.10.5. Anchor blocks

The Contractor shall provide suitable cement concrete anchor blocks of ample dimensions at all bends, tee connections and other places required and necessary for overcoming pressure thrusts in pipes. Anchor blocks shall be of cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal gauge).

2.10.6. Valves

PART II- EMPLOYERS REQUIREMENT

Sluice valves 80mm diameter and above diameter shall be cast iron double flanged solid wedge, outside screw non rising stem, yoke type bonnet and two piece gland construction. The valves shall have renewable screwed body seat rings. Flanges shall have raised faces and serrated face finish and shall conform to IS 780-1984. Check valves shall be cast iron double flanged conforming to IS: 5312-1975 with cast iron steel body 13% chrome steel disc, hang pin and body seat ring.

2.10.7. *Fire hydrants external hydrants*

The Contractor shall provide external hydrant. The hydrants shall be controlled by a cast iron sluice valve. Hydrants shall have instantaneous type 63 mm diameter outlets. The hydrants shall be of gunmetal and flange inlet and single outlet conforming to IS: 908-1975 with G.I. duct foot bend and flanged riser of required height to bring the hydrant to correct level above ground.

The Contractor shall provide for each external fire hydrant two nos. of 63 mm diameter. 15 meter long rubberized fabric linen hose pipe with gunmetal male and female instantaneous type couplings machine wound with G.I. wire (hose to IS: 636 type 2 and couplings to IS: 903 with IS: certification) gunmetal branch pipe with 16 mm nozzle to IS: 903.

2.10.7. *Internal hydrants*

The Contractor shall provide on each landing and other locations, one single headed gunmetal landing valve with 63 mm diameter outlets and 80 mm inlet (IS: 5290-1969) with individual shut off valves and cast iron wheels. Landing valves shall have flanged inlet and instantaneous type outlet. Instantaneous outlet for hydrants shall be of standard pattern approved and suitable for fire brigade hoses. The Contractor shall provide for each internal fire hydrant station four numbers of 63 mm id 15 meter long rubberized fabric linen hose pipes with G.I. wire (Hose to I.S. 636 type 2 and couplings to IS: 903 with IS: certification), fire hose reel, gunmetal branch pipe with nozzle IS: 903 and fireman's axe.

Each hose box shall be conspicuously painted with the letters —FIRE HOSE.

2.10.8. *Fire hose reels*

The Contractor shall provide standard fire hose reels with 20 mm diameter high pressure rubber hose of 36.5 meter length with gunmetal nozzle with 5mm bore, and control valve, shut of nozzle connected wall mounted on circular hose reel of heavy duty mild steel construction and cast iron brackets. Hose reel shall conform to IS: 884-1969. The hose reel shall be connected directly to the M.S pipe riser through an independent connection.

2.10.9. *Orifice flanges*

PART II- EMPLOYERS REQUIREMENT

Provide orifice flanges fabricated from 6 mm thick stainless steel plate to reduce pressure on individual hydrants to restrict the operating pressure to 3.5 kg/sqm. The design of the orifice flanges shall be given by the Contractor as per the location and pressure conditions of each hydrant/hose reel.

2.10.10. Fire brigade connection

Provide gunmetal two or four way collecting head with 63 mm diameter instantaneous type inlet with built in check valve and 100/150 mm diameter outlet connection to the fire main grid and for tank filling, collecting head shall conform to IS 904-1965.

2.10.11. Draw off connection

a) Air valves

Provide 25 mm i/d. screwed inlet single acting brass air valve on all high points in the system on top of air cushion tanks.

b) Drain valve

Provide 50 mm id. G.I. pipe to IS: 1239 (Medium class) with 50 mm gunmetal full way valve for draining any water in the system in low pockets as directed by the Project Manager/appropriate government authority appointed by GSCDL.

c) Hydrant/Valve Chambers

The Contractor shall provide suitable brick masonry chambers in cement mortar 1:5 (1cement: 5 coarse sand) on cement concrete foundations 150 mm thick 1:4:8 mix (1 cement:4 fine sand:8 graded stone aggregate 40mm nominal size) 15 mm thick cement plaster inside and outside finished with a floating coat of neat cement, inside with cast iron surface box approved by fire brigade including excavation, back filling, complete Valve chamber shall be of the following size:

- For depths 100cm and beyond 120x120 cms
- Weight of C.I. frame and cover shall be 38 kg.

2.10.13. Pipe protection

All pipes above ground and in exposed locations shall be painted with one coat of red- oxide primer and two or more coats of synthetic enamel paint of approved shade. All buried MS. Pipes shall be provided with protection against soil corrosion by applying two coats of coal tar hot enamel paint, two layers reinforced fiber glass tissue and finished with one coat of the above paint (as per IS: 10221)

2.10.14. Pipe support

PART II- EMPLOYERS REQUIREMENT

All pipes shall be adequately supported from ceiling or walls from existing inserts by structural clamps fabricated from M.S. Structural, e.g., rods, channels, angles and flats. All clamps shall be painted with one coat of red lead and two coats of black enamel paint.

- d) Where inserts are not provided the Contractor shall provide anchor fasteners. Anchor fastener shall be fixed to walls and ceilings by drilling holes with electrical drill in an approved manner as recommended by the manufacturer of the fasteners.

2.10.15. Testing

All pipes in the system shall be tested to a hydrostatic pressure of 14.5 kg/sq.cm. without drop in pressure for at least 2 hours.

2.10.16. Hose cabinets

Provide hose cabinets for internal/ external hydrants fabricated from 16 gauge MS sheet with single or double glass front door and locking arrangement with breakable glass key access arrangement, duly painted red with stove enamelled paint fixed to wall or self-supported on floor as per site conditions. The cabinet shall also have a separate chamber to keep the key with breakable glass as per approved design. Hose cabinets shall be fabricated from 16 gauge MS sheet of fully welded construction with hinged double front door partially glazed with locking arrangement stove enameled fire red paint with —FIRE HOSE written on it prominently. Samples of hose cabinet for internal and external works are not approved from the Project Manager/appropriate government authority appointed by GSCDL before installation at site.

2.11. Technical Specifications – Pumps and Ancillary Equipment

2.11.1. Scope of work

Work under this section shall consist of furnishing all labour, materials, Equipment and appliances necessary and required to completely install electrically operated pumps for fire hydrant and sprinkler installations as specified hereinafter. Without restricting to the generality of the foregoing, the pumps and the ancillary equipment shall include the following:-

- a) Electrically operated pumps with motors, base plate and accessories Alarm system with all accessories wiring and connections.
- b) Pumps suction and delivery headers, valves, air vessel & connections.
- c) Pressure gauges.
- d) Electrical switchboard, wiring, cabling, cable tray and earthing.

PART II- EMPLOYERS REQUIREMENT

2.11.2. *General requirements*

Pumps shall be installed true level on suitable concrete foundations. Base Plate shall be firmly fixed by foundation bolts properly grouted in the concrete foundations. Pumps and motors shall be truly aligned by suitable instruments. All pumps connection shall be standard flanged type with appropriate number of bolts. Manufacturer's instructions regarding installation connections and commissioning shall be followed with respect to all pumps, switchgear and accessories.

2.11.3. *Fire and jockey pumps*

a) Pumping Sets

Pumping sets shall be multistage horizontal centrifugal multi-stage outlet pumps with cast iron body and bronze dynamically balanced impeller connecting shaft shall be stainless steel. Pumps shall be connected to drive by means of a flexible coupling with sheet metal guard. Pumps shall be provided with approved type of mechanical seals and pressure gauge with isolation cock on the delivery side.

Pumps shall be capable of furnishing not less than 150% of the rated capacity at a head of not less than 65 % of the rated head. The shut off head shall not exceed 120% of the rated head.

b) Wet Riser Hydrant and Sprinkler Systems

Wet riser hydrant and sprinkler shall be pressurized through a set of pumps driven by electric motors. Desired pressure shall be created and maintained in the systems by means of main and Jockey pump sets. The working of the pumps sets shall be as under:

- Main pump for Hydrant and Sprinkler systems.
 - Automatic start on reduction in the pressure in the system at predetermined level.
- Also manual start arrangement shall be made in case of failure of automatic start system.
 - Pump set shall stop by manual operation only.

c) Stand by main pump (Diesel Engine Driven)

In the event of failure in the operation of main pump sets for hydrants and sprinklers, the standby main pump shall come into operation when the pressure in the system is reduced to a predetermined level. Also manual start arrangement shall be made in case of failure of automatic start arrangements. Pump set shall stop by manual operation only.

PART II- EMPLOYERS REQUIREMENT

d) Jockey Pump

Starting and stopping of Jockey pump set shall be automatic at pre- determined levels. However, arrangements for manual start and stop of the pump shall also be made. Jockey pump shall take care of small leakages in the piping system and pumps cushion tanks.

2.11.4. Electric Drive

Electrically driven pumps shall be provided with totally enclosed induction motors suitable for fire pumps. The motors should be rated not to draw more than 4.5 times the starting current. Motors shall be at least equivalent to the horse power required to drive the pump at 150% of its rates discharge. The motors shall be wound for class E insulation and windings shall be vacuum impregnated with heat and moisture resisting varnish, glass fibre insulated.

2.11.5. Diesel Engine

Diesel Engine shall be of suitable HP with individual heat assemblies. The engine shall be water cooled and shall include heat exchanger and connecting piping strainer isolating and pressure reducing valves, bye-pass line complete in all respects. The Engine shall be of direct injection type with low noise and exhaust emission levels. The speed of engine shall match the pump speed for direct drive.

The engine shall be capable of being started without the use of the wicks, cartridge heater plugs or either at engine room temperature of 7 degree C. and shall take full load within 15 seconds from the receipt of the signal to start. The engine shall effectively operate at 38 degree C. ambient temperature at 150 meters above mean sea level. Noise level of the engine shall not exceed 105 db. (free field sound pressure) at 3 meters distance. The engine shall be self-starting type up to 4 deg. C shall be provided with one 24 volts heavy duty D.C. battery, star term cut out, battery leads complete in all respects. One additional spare battery shall be provided. The battery shall have a capacity of 200 ampere hours and 640 amperes cold cranking amperage. Provide a battery charger of 10 to 15 amperes capacity with trickle and booster charging facility and regulators. Arrangement for starting shall be automatic on receiving the signal. However, shut off shall be manual. The engine shall be provided with an oil bath or dry type air cleaner as per manufacturer's design. Engine shall be suitable for running on high speed diesel oil. The system shall be provided with a control panel with push button starting. Arrangement also wired to operate the engine on a differential pressure gauge.

The entire system shall be mounted on a common structural base plate with anti - vibration mounting, Dunlop make, and flexible connections on the suction and delivery piping. Provide one fully mounted and supported day oil tank fabricated from 6 mm thick MS sheet electrically welded of 8 hours working load but not less

PART II- EMPLOYERS REQUIREMENT

than 200 litres. Provide level indicators- low level and fill level in the day oil tank on the control panel through float switches and an air breather. Provide on exhaust pipe with suitable muffler (resident type) to discharge the engine gases to outside in open air as per site conditions (Contractor to check the site). Provide all accessories, fittings, and fixtures necessary and required for a complete operating engine set. The exhaust pipe shall be taken outside the Building with a number of bends (approx. length 20 meters.) and shall be duly heat insulated with rain cover. The Contractor shall indicate special requirement, if any, for the ventilation of the pump room.

2.11.6. Base Plate

Pumps and motors shall be mounted on a common structural base plate with anti-vibration mounting.

2.11.7. Air Vessel

Provide one air vessel fabricated from 12 mm M.S. plate with dished ends & suitable supporting legs. Each air vessel shall be provided with a 100 mm diameter flanged connection from pump, one 25 mm diameter drain with valve, one gunmetal water level gauge and 25 mm sockets for pressure switches. The vessel shall be 450 mm diameter x 2000 mm high and tested to 28 kg / sqcm pressure.

The fire pumps shall operate on drop of 1 kg / sqcm pressure in the mains. The pump operating sequence shall be arranged in a manner to start the pumps automatically but should be stopped by starter push buttons only.

2.11.8. Vibration eliminators

Provide on all suction and delivery lines double-flanged reinforced neoprene flexible pipe connectors. Connectors should be suitable for a working pressure of each pump and tested to the test pressure give in the relevant heat. Length of the test connector shall be as per manufacturer details.

2.11.9. Switchboard cubicle

Provide and install one switchboard cubicle of approved dust and vermin proof type fabricated from 16-gauge M.S. sheet and finished with synthetic enamel paint of approved shade and shall have plastic identification for different motors. The cubicle shall comprise of the following:-

- a) Aluminum bus bar of rated capacity in a separate chamber with two additional share chambers.
- b) Incoming main isolation switch fuse unit of required capacity HRC fuses.
- c) Isolation switch fuse unit of required capacity HRC fuses, one for each motor.

PART II- EMPLOYERS REQUIREMENT

- d) Fully automatic auto transformer starters with push buttons one for each motor.
- e) Fully automatic —STAR DELTA starters with push buttons for jockey pumps.
- f) Single phasing prevention for suitable rating for each motor.
- g) Panel type ampere meters, one for each motor.
- h) Panel type voltmeter on incoming main with rotary selector switch to read voltage between phase to neutral and phase to phase.
- i) Three neon phase indicating lamps on incoming main.
- j) Two rotary switches for manual/ auto operations of fire and sprinkler pumps.
- k) All interconnecting colour coded wiring from incoming main to switch gear, meters and accessories within the switchboard panel.

All switchgears and accessories shall be of approved make such as SIEMENS, ENGLISH

ELECTRIC, LARSEN AND TOUBRO or equivalent as approved by the Project Manager/appropriate government authority appointed by GSCDL. Switchboard cubicles shall be floor-mounted type.

2.11.10. Cables

The Contractor shall provide all power and control cables from the motor control centre to various motors and control devices. Cables should conform to IS: 1554 and carry BIS certification mark. Wiring cables should conform to IS: 694. All power and wiring cables shall be aluminum conductors PVC insulated armoured and PVC sheathed of 1.1 KW grade. All control cables shall have stranded conductors. The cables shall be supplied in drums as far as possible and bear the manufacturer's identification mark. All cable joints shall be made in an approved manner as per accepted practice.

2.11.11. Earthing

There shall be two independent earthing stations at least 3 meters away from the pump room. The earthing shall consist of an earth tape connected to an independent plate made of C.I. having a conductivity of not less than 100% international standard. All electrical apparatus, cable boxes and sheath/ armour clamps shall be connected to the main bar by means of branch earth connections of appropriate size. All joints in the main bar and branch bar shall have the lapping surface properly tinned to prevent oxidation. The joints shall be riveted and sweated.

Earth plates shall be buried in a pit 1.2 x 1.2 meter a minimum depth of 3 meter below the ground. The connections between the main bars shall be made by means of three 10 mm brass studs and fixed at 100 mm centres. The pit shall filled with coke breeze, rock salt and loose soil. A. G.I. Pipe of 20mm i/d. with perforation on

PART II- EMPLOYERS REQUIREMENT

the periphery shall be placed vertically over the plate to reach ground level for watering. A brick masonry manhole 30 x 30 x 30 cm. size shall be provided to surround the pipe for inspection. A bolted removable link connecting main bar outside the pit portion leading to the plate shall be accommodated in this manhole for testing.

2.11.12. Commissioning

Commissioning of the systems shall commence only after:

- a) All pipes, accessories, pumping set, fire alarms, etc., have been completely installed and tested.
- b) The electrical connection has been made & direction of motors rotation checked.
- c) Related works by other agencies has been completed in all respects.
- d) Water supply is available in adequate quantity in the underground tank.
- e) Basement drainage pumps are fully commissioned.
- f) On completion of all related work given in para above, start pumping sets and develop desired pressures in both the systems.
- g) Open one hydrant and test if pump starts at desired drop in pressure and the alarm operates. If required make adjustments and retest.

2.11.13. Maintenance manual

On completion of the entire work and successful commissioning, the Contractor shall hand over four copies of maintenance manuals of all equipment installed by him. Maintenance manuals shall include information relating to make, model No. year of manufacture for all electrical and mechanical equipment with names of local supplies or manufacturers' agents.

2.12. Technical Specifications – Commissioning for Fire-fighting System

2.12.1. Scope of Work

Work under this section shall consist of pre commissioning, commissioning, testing and providing guarantees for all equipment, appliances and accessories supplied and installed by the Contractor under this contract.

2.12.2. General Requirements

The Contractor shall provide all tools, equipment, metering and testing devices required for the purpose.

PART II- EMPLOYERS REQUIREMENT

On award of concession, the Contractor shall submit a detailed proposal giving methods of testing and gauging the performance of the equipment to be supplied and installed under this contract.

2.12.3. Pre-commissioning

On completion, the installation of all pumps, piping, valves, pipe connections, electrical wiring, motor control panels and water level controlling devices the Contractor shall proceed as follows:

Testing of M.C.C.:

- a) Insulation resistance test with 500-volt megger, before and after high voltage test, on all power and control wiring.
- b) High voltage test at 2000 volts A.C. for one minute on all power and control wiring.
- c) Low voltage continuity test (t volts) on power wiring of each feeder, between bus bars and outgoing terminals with switches and conductors in closed position.
- d) Low voltage continuity test (6 volts) on all control wiring.
- e) Operation test for all feelers with only control supply made —ONII to ensure correctness of control wiring, operation of the various equipment used, such as push buttons, protective devices, indicating lamps and relays, etc. All conductors shall be checked for the presence of humming and chattering.
- f) Earth continuity test with voltage not exceeding 6 volts between various non-current carrying metallic of equipment, steel work, etc., and the earth bus provided in the M.C.C.
- g) Operation of all instruments and meters provided on the M.C.C.

2.12.4. Fire Protection System

- a) Check all hydrant valves and if any valve is open than close it. Check that all suction and delivery connections are properly made.
- b) Tests run and check rotation of each motor and correct the same required.

2.12.5. Pipe Work

Check all clamps, support and hangers provided for the pipes. Fill up pipes with water and apply hydrostatic pressure to the systems as given in the specifications if any leakage is found. Rectify the same and retest the pipes.

2.12.6. Commissioning and Testing Fire Hydrant System

PART II- EMPLOYERS REQUIREMENT

- a) Pressurize the fire hydrant system by running the main fire pump and after attaining the required pressure shut off the pump.
- b) Open by-pass valve and allow the pressure to drop in the system. Check that the jockeys pump cuts-in and cuts-out at the preset pressures. If necessary, adjust the pressure switch for the jockey pump. Close by-pass valve.
- c) Open hydrant valve and allow the water to flow into the firewater tank in order to avoid wastage of water. The main fire pump should cut-in the present pressure and should not cutout automatically on reaching the normal line pressure. The main fire pump should stop only by manual push button. However, the jockey pumps should cut out as soon as the main pump starts.
- d) Switch off the main fire pump and test check the diesel engine driven pump in the same manner as the electrically driven pump.
- e) When the fire pumps have been checked for satisfactory working on automatic, open fire hydrant valves simultaneously and allow the hosepipes to discharge water into the fire tank to avoid wastages. The electrically driven pump should run continuously for eight hours so that its performance can be checked.
- f) Diesel engine driven pump should also be checked in the same manner as given above by running for 8 hours.
- g) Check each landing valve, male and female coupling and branch pipes for compatibility with each other. The Contractor shall replace any fitting, which is found to be incompatible and does not fit into the other properly. Landing valves shall also be checked by opening and closing under pressure.

2.12.7. Handing Over

The Contractor to the complete satisfaction of the Project Manager/appropriate government authority appointed by GSCDL shall do all commissioning and testing. The Contractor shall also get the system approved from the local fire authorities and submit NOC received from the Fire Department /Authority.

2.12.8. Regulations, codes of practice, references and standards

The aspects of the design, which are related to HSE, must respect applicable Regulations, Codes of Practice and Standards. Those, which are relevant to this project, are listed below in order of priority. International codes and regulations shall be applied unless more stringent national rules exist. In case of conflict, priority shall be given according to the following list:

- a) National Regulations,
- b) Manufacturers Standards,
- c) International Codes and Standards.

PART II- EMPLOYERS REQUIREMENT

National regulations

The MLCP Development Area at UDD Engineering Cell project shall comply with the applicable International, National & State regulations.

Company standards

The design of project facility shall comply with the latest revisions of the State Safety Standards, Fire Brigade & International Codes, Specifications and design criteria as provided in the contract.

2.13. Technical Specifications – Installation of Tube well

2.13.1. Selection of site

The site where the employer wants to sink the tube well should be examined. Any previous data available with the Contractor, of the nearby areas should be made use to evolve suitable procedure for drilling, developing and testing etc.

2.13.2. Drilling

The drilling shall be done in accordance with the specification contained in IS: 2800 Part_ I, 1979 and as described in Chapter of work.

2.13.3. Drilling time logbook

As the drilling progresses, and accurate drilling time logbook shall be maintained by the Contractor, indicating time taken to drill every two meters of depth where there is change of strata. This log will enable interpretation regarding the nature of formation (hard, soft, unconsolidated etc.), which has a bearing of water fielding capacity of the formation.

2.13.4. Geological data

Samples of drill cuttings from different strata shall be collected at suitable intervals preferably at every two meters depth drilled or at closer intervals, if a change in strata is met with. After the drilling has reached sufficient depth all the samples of strata collected shall be got examined analysed in a laboratory.

2.13.5. Design and lowering of pipe assembly

The design and diameter of the housing pipe shall be as specified in the Chapter of work. The size and length of blind pipes and slotted shall be in accordance with the requirements to the strata met with, the expected discharge and the depth of tube well. The design of the pipe assembly for strainer pipe and column pipe shall be submitted by the Contractor and approved by the Project Manager/appropriate government authority appointed by GSCDL.

PART II- EMPLOYERS REQUIREMENT

2.13.6. Gravel packing

All gravel shall consist of hard well-rounded particles reasonably uniform in diameter meter and shall be of a size given in the Chapter of work

2.13.7. Developments of Tube well

The well shall be developed either by surging and agitating or by over pumping and back wash with an acceptable method may also be adopted with the consent of the Project Manager/appropriate government authority appointed by GSCDL. The development process shall be continued until the stabilization of sand and gravel pack has taken place. The development of the tube well by over pumping should be done at 15% to 25% higher discharge than the expected discharge from the tube well

2.13.8. Grouting and sealing

Grouting and sealing of the tube may well be done, if required by the corporation depending upon the site conditions and quality of the discharge of the strata encountered. It should be applied in one continuous operation. Sealing of the tube well may be done by grouting angular space between bore and the housing pipe, thickness of grouting depending upon the quality of water

2.13.9. Handing over of the Tube well

The tube-well should be handed over to the employer in complete shape and closed by a well cap for the period between the completions of tube well and the installation of the pump set. The following information should be furnished by the Contractor on completion of the tube well

- Strata chart of the tube well indicating different types of soil met with at different depth.
- Samples of strata collected, neatly packed and correctly marked in sample bags/wooden box.
- Chart of actual pipes assemble lowered indicating size of pipes, depth range where slotted/ strainer pipes, depth ranges, where slotted/ strainer pipes have been used, depth and diameter of housing pipe, reduced level of the top of the housing pipe and diameter and depth of the bore hole.
- Geo hydro testing result of the bore well
- Position of every joint in the well assembly.
- Hours of development done by compressed air, pump set or by other means.
- Pumping water level at developed discharge

PART II- EMPLOYERS REQUIREMENT

- Report of the samples of water got tested in the approved laboratories

2.13.10. . Verticality and alignment As per IS: 2800(part- II) 1980

Table 18: List of IS Codes Relating to Plumbing Works

Vitreous Sanitary appliances	IS 2556-1981 (Part II) IS: 2556-1974
Cast Iron Cistern	IS: 2556-1984 IS: 774-1984
Ball Valve	IS: 1703-1977
Cistern Brackets Toilet Seat Cover	IS: 775-1970 IS: 2548-1983
Vitreous China Cistern Sand Cast Iron Pipes & Fittings	IS: 2326-1987 IS: 1729-1979
Spun Cast Iron Pipes & Fittings GI Pipes	IS: 3989-1984 IS: 1239-1979
Galvanizing for GI pipe Pipe Threads	IS: 4736-1986 IS: 554-1985
Malleable Iron Fitting	IS: 1879-1987
Cast Iron Sluice Valves Full way valves	IS: 780-1984 IS: 778-1984
Brass Ferrule Stone Ware Gully Trap	IS: 2692-1978 IS: 651-1980
R.C.C. Pipes	IS: 458-1971
Cast Iron Class L.A. Pipes	IS: 1536-1989
Cast (Spun) Iron Fittings Pig Lead	IS: 1538-1976 IS: 782-1966
Induction Motors	IS: 4691 / IS 325 / IS 4029

2.14. Electrical Installation Works

2.14.1. General

Separate earth wire (Copper) will run for the light and power sockets.

- a) The main switches and BDB's shall be connected with thimbles /lugs duly crimped with crimping tools.
- b) Only BIS mark or as per BIS copper cable should be used (as per list of approved makes attached) or equivalent as approved by the Project Manager/appropriate government authority appointed by GSCDL.
- c) The cable and connections should be done to the switchgear by suitable size glands.

PART II- EMPLOYERS REQUIREMENT

- d) The insulation test, continuity test, earthlings test & other electrical installation tests will be done by the bidder in the presence of the Project Manager/appropriate government authority appointed by GSCDL at site work after the completion of the work
- e) ELCB should be of approved makes as per list attached or equivalent as approved by the Project Manager/appropriate government authority appointed by GSCDL.
- f) The piano type accessories such as switches, sockets, ceiling roses etc., should be of BIS marked only.
- g) The fans should be of approved makes as per list attached.
- h) The fluorescent fitting, mirror optics fittings and street light fittings etc. should be of approved makes as per list attached.
- i) The switch gear should be got approved from the Project Manager/appropriate government authority appointed by GSCDL of work before installation at site.
- j) The junction box from where wires lead to BDB shall be at least 100mm deep & 150 mm high and long enough to accommodate the conduit pipe in a straight line.
- k) The light plug shall be tapped from nearby power by means of 1.5 sq mm (1/1.80 mm) cable through 20mm diameter conduit pipe and max. 1 no. light plugs can be tapped from the power plug, where there is no power plug separate circuit with 2.5 sqm. cable shall be drawn for feeding the supply to the light plugs.
- l) The Bakelite sheets to be provided should be of 3 mm thickness of makes HYLAM, FORMICA or any other make approved by the Project Manager/appropriate government authority appointed by GSCDL.
- m) Only BIS mark Batten Holders and Bakelite accessories shall be used or as approved by the Project Manager/appropriate government authority appointed by GSCDL.
- n) The work shall be carried out in strict accordance with the CPWD Specifications for electrical works in Government Buildings in the State and to the satisfaction of the Project Manager/appropriate government authority appointed by GSCDL.
- o) The C.I./M.S. fan box for suspension hook should be of size 4.5" diameter, 4" deep and of 16 gauge with 0.5" diameter (Plain steel for suspension hook. The rod should be projected 6" on each side of the box or the design of the fan box shall be as approved by the Project Manager/appropriate government authority appointed by GSCDL.
- p) The breaking up and making good of wall ceiling and floors shall be done by the Contractor at his own cost and to the entire satisfaction of the Project Manager/appropriate government authority appointed by GSCDL of the work. No extra payment will be made for the same.
- q) Looping in system, of wiring shall be adopted for all sub circuit wiring.

PART II- EMPLOYERS REQUIREMENT

- r) The size of Branch Distribution Board (BDB) shall be designed on the basis of 8 points (light, fan,) and light plug connected one way of BDB and in case of 10/Amp. power plug points, two power plugs are to be connected to one way of 32 Amp. BDB's or one point per way 16 Amp. BDB's. This practice should strictly be followed for connecting points to way of the BDB's.
- s) The G.I. Pipe for earthing purpose, for protection of earth wires should be class 'A' water quality.
- t) Before energizing the system the following tests shall be given by the Contractor so as to find out the installation to the relevant rules/regulations: -
 - i. Earth resistance test
 - ii. Earth continuity test of conduit pipe or other iron clad system etc.
 - iii. Insulation test
 - iv. Polarity test
- u) The control switch should not be installed at height less than 120 cm from floor level or as directed by the Project Manager/appropriate government authority appointed by GSCDL or as per site requirement.
- v) The bodies of branch distribution fuse board should be machine made with 1.60 mm thick solid steel sheet.
- w) Grip fuse units of sheet metal/iron clad, switch & branch distribution fuse boards should be of N.C. type so as to have the facility of interchange ability.
- x) Brass screws to fix brown Bakelite/white glazed or translucent backside Painted sheet cover 3 mm thick. This should be fixed by means of flat-headed brass machines screws with brass ring washers underneath.
- y) All conduit used in work shall be adequately bushed with P.V.C. bushes to prevent abrasion of insulation of conductor and shall also be bonded earth.
- z) The connection of earth wire with sheet metal/iron clad switch and branch distribution fuse boards or other metallic cases shall be according to the Indian Electricity Rules and made by means of suitable cable socket soldered at the end of earth wire.
- aa) Welded conduit pipe (Screw type) made from 1.60mm thick sheet coated with two coats of approved paint shall be used. The conduit pipe shall be joined by means of screwed sockets so that it shall be electrically continuous throughout. The threads shall be free from grease oil etc. and no material of nature should be allowed to come in contact with the conduit. Sharp edges or bare should not be allowed to remain due to which insulation of conduit pipe is likely to be damaged.
- bb) For the complete work of Electrical Installation, the Contractor shall provide circuit key diagram before the finalizing of bill for display at the important places in the Bus Terminal as per the instructions of the Project Manager/appropriate

PART II- EMPLOYERS REQUIREMENT

government authority appointed by GSCDL. cc) The electrical installation work shall be carried out in accordance with Indian Standard Code of practice for Electrical wiring installation IS: 732-1989 and IS: 2274-1963. It shall also be in conformity with the current Indian Electricity Rules & Regulations and Requirements of the local electricity supply authority and fire insurance regulation. Electrical work in general shall be carried out as per CPWD Specifications with upto date amendment.

2.14.2. Scope of Work

The scope of work shall cover internal and external electrical works for proposed bus stand. The items/activities covered under internal electrical works shall include the following: -

- a) Main Distribution Boards, Sub Distribution Boards. Switch fuse unit/MCB isolators etc. complete in all respect.
- b) Cables from Main Distribution Board to Sub Distribution Boards. Sub main Wiring from Main/Sub Distribution Boards to various final Distribution Boards.
- c) Point wiring of all lights points. Ceiling fan points, exhaust fan points, light Plug points, general power points, metal clad plug & socket outlet points etc., including supply and fixing of light and power accessories etc. complete in all respects.
- d) Light fixtures, ceiling fans, exhaust fans.
- e) Provision for telephone system consisting of conduit and cabling from telephone distribution board upto each outlet including main & sub tag blocks, telephone outlets incoming GI/SW pipe etc. complete in all respect.
- f) SW/GI pipes for cables, manholes, cable tray and other items required to complete with electrical installation work in all respects.
- g) Earthing of electrical installation complete in all respects.
- h) Scope of work shall include supply installation, testing and commissioning of complete electrical installation as described above.
- i) Providing standby Power by installation of D.G. set of suitable capacity.
- j) Sub-station work covering 11 KV Board, 11KV Cable, Transformer, LT Cable and main LT panel and Emergency panel etc.
- k) External cabling from Substation to various blocks.
- l) Obtain NOC from Electrical Inspector for the Electrical Substation

2.14.3. Standard & Regulations

All equipment, switchgear, cables and other items of work shall conform to Indian Standard specifications

PART II- EMPLOYERS REQUIREMENT

The installation shall conform in all respects to Indian Standards Code of Practice for Electrical Wiring Installation IS: 732-1989. It shall also be in conformity with the current Indian Electricity Rules and the Regulations and Requirements of the Local Electric Supply Authority, Local laws/by laws as far as these become applicable to the installation. Wherever these specifications call for a higher standard of materials and/or workmanship than those required by any of the above regulations, these specifications shall take precedence over the said regulations and standard. In general, the materials, equipment and workmanship shall conform to the following Indian Standards with up to date amendments/revisions if any unless otherwise called for.

Table 19: List of Approved Makes

Description	Specification	Makes
Specification for DG Set 415V 3 Phase 4 wire, 50Hz	IS 4722-1992 BS 5514	Mahindra, Kirloskar, Cummins, Ashok Layland or equivalent
11 KV Vacuum Circuit Breaker	IS 3427-1991 IS 12729-1988	L & T, Siemens, Hager, ABB or equivalent
Transformer 111 KV/0.433 KV	IS 2026-1977	Voltamp, BHEL, Kirloskar, Crompton Greeves or equivalent
XLPE cable 11 KV	IS 7098 Part I & II 1988/1985	Polycab, Havells, Skytone, Paramount, CCI, Finolex or equivalent
PVC insulated (heavy duty) electric cable Part I for voltage upto 1100 volt	IS 1554-1988	Polycab, Havells, Paramount, CCI, Finolex or equivalent
Making arrangement for Switch gear Bus bars, main connection & auxiliary wiring	IS 375-1963	Havells, Indo Asian, L & T, Siemens, Hager, C & S or equivalent
Specifications for normal duty air break switches & composite units for air break switches & fuses for voltage not exceeding 1000 volts	IS 13947-1993 (Part I to V)	Havells, Indo Asian, L & T, Siemens, Hager, C & S or equivalent
Specification for low voltage switchgear & control gear assemblies.	IS 8623-1993 (Part I to III)	Havells, Indo Asian, L & T, Siemens, Hager, C & S or equivalent
Specifications for enclosed distribution	IS 2675-1983	Havells, Indo Asian, L & T, Siemens, Hager, C & S or equivalent

PART II- EMPLOYERS REQUIREMENT

Description	Specification	Makes
Installation & maintenance of Switchgear	IS 10118-1982 (Part I to IV)	Havells, Indo Asian, L & T, Siemens, Hager, C & S or equivalent
HRC Fuses	IS 9224-1979	Havells, Indo Asian, L & T, Siemens, Hager, C S or & equivalent
Specification for Rigid Steel conduits for electrical wiring	IS 9537-1981 (Part – II)	Nihir, Precision, BEC, Vraj, AKG or equivalent
Specifications for accessories for rigid steel conduits for Electrical wiring	IS 3837-1976	Nihir, Precision, BEC, Vraj, AKG
3 pin plugs & socket outlets	IS 1293-1988	Anchor, Hager, Cab tree, C & S, Havells, HPL Sudhir, Diamond, L&T Panels, Capitor Panels or equivalent
General & Safety requirements for electric light fittings.	IS 1913-1978	---
Electric ceiling fans & regulators	IS 374-1979	Havells, Crompton, Orient, Bajaj or equivalent
Code of practice for earthing	IS 3043-1987	Electrode Earth or equivalent
Current transformers	IS 2705 – 1992 (Part – I)	AE, Kappa, L&T or equivalent
Shunt capacitors for power system	IS 2834 – 2986	GE, ABB, or equivalent
Exhaust Chimney	IS 6533 – 1989 (Part– II)	Usha, Havells, Crompton, Bajaj, Almonard or equivalent
HSD Storage Tanks	IS 803/864	As per brand approved

Inspection and approval of the work by local authority on completion of this work. The Contractor shall obtain and deliver to the Project Manager/appropriate government authority appointed by GSCDL all the certificates of inspection and approval by the electrical inspectorate as required.

2.14.4. Panel, Main Distribution Boards / Sub distribution Boards

2.14.4.1. General

PART II- EMPLOYERS REQUIREMENT

The scope covers supply, installation, testing and commissioning of power panels, incorporating circuit breakers, fuse units, bus bars, interconnections, earthing etc., meeting the requirements shown in

equipment Chapter and the drawings. The Panel should be fabricated by CPRI approved panel builder only & should strictly follow all standards & code.

Main Distribution Board/ Sub Distribution Boards shall be metal clad totally enclosed, rigid, floor mounting, air insulated, cubicle type for use on 415 volts, 3 phase, 50 cycle system. System shall be suitable for a fault withstand capacity of 50 KA RMS, symmetrical equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions.

2.14.4.2. Standards

- a) The equipment shall be designed to conform to the requirement of:
 - i. IS-8623 – Factory Built Assemblies of switchgear and control gear
 - ii. IS-4237 – General requirements for switchgear and control gear for Voltages and exceeding 1000 volts.
 - iii. IS-2147 – Degree of Protection provided by enclosures for low voltage switchgear and control gear.
 - iv. IS-375 – Marking and arrangement of bus bars
- b) Individual equipment housed in the Main & Sub Distribution Board shall Conform to the following IS specifications with upto date amendments if any
 - i. Moulded Case Circuit Breakers IS 2516 (Part I & II/ Sec I) – 1977
 - ii. (Fuse Switch & Switch Fuse Units IS 4064 – 1978
 - iii. H.R.C. Fuse links IS 2208-1962 or IS 9224-1979
 - iv. (Current Transformers IS 2705
 - v. Voltage Transformer IS 3156 (f) Relays IS 32.31
 - vi. Indicating Instruments IS 1248
 - vii. Integrating Instruments IS 722
 - viii. Control Switches & Push Buttons IS 6875
 - ix. Auxiliary Contractors IS 2959
- c) Distribution Boards: It includes Supply, Installation, Testing and Commissioning of Distribution Boards standard company fabricated or to be fabricated by fabricator & should be double door type. Distribution Board shall be double door type with extended loose wire box at the top & suitable for flush installation. All distribution boards shall be of three phase (415 Volts) type with incoming

PART II- EMPLOYERS REQUIREMENT

isolator or MCB &/or ELCB as in Chapter of quantities. Distribution boards shall contain plug in or bolted type miniature circuit breaker mounted on bus bars. Miniature circuit breakers shall be quick make & quick break type with trip free mechanism. MCB shall have thermal & magnetic short circuit protection. MCB shall conform to IS 8828-1978. Distribution boards shall comprise of 200A rating copper bus bar, earth terminal, MCB, DP, RCCB and neutral link mounted in three-tier phase wise. All distribution boxed shall be made by approved/licenses MCB/DP manufacturer. The bus bar shall be such that circuit could be isolated easily. Neutral bus bars shall be provided with the same number of terminals, as there are single ways on the board, in addition to the terminals for incoming mains. An earth bar of similar size at the neutral bar shall also be provided. Phase barrier shall be fitted and all live parts shall be screened from the front. Ample clearance shall be provided between all live metal and the earth case & adequate space for all incoming & outgoing cables. All distribution boards enclosures shall have an etched zinc base stove painted followed by synthetic stoved enamel, colour light gray. A circuit identification card in clear plastic cover shall be provided for each distribution board and made from 16-gauge sheet.

Earth leakage circuit breaker/residual current circuit breakers-Earth leakage circuit breaker shall be current operated type and of 100 ma. sensitivity unless otherwise stated. For single phase distribution, ELCB shall be housed within the DB box. For three-phase distribution board, the ELCB shall be housed in the same box.

d) Metallic Conduct-Wiring System

i. Type and Size of Conduit

All conduit pipes shall be of approved gauge (not less than 16 SWG for conduits of sizes up to 32 mm diameter) solid drawn or reamed by welding finished with stove enameled surface). All conduit accessories shall be of threaded type and under no circumstances pin grip type accessories shall be used. The maximum number of PVC insulated 650/1100 volts grade copper conductor cable that can be drawn in conduit of various sizes shall be as per IS: code. No conduit less than 20 mm in diameter shall be used.

ii. Conduit Joints

Conduit pipes shall be joined by means of threaded couplers, and threaded accessories only. In long distance straight run of conduits inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jamnuts shall be provided. In the latter case the bare threaded portion shall be treated with anti- corrosive preservative. Threads on conduit pipes in all cases shall be between 13mm to 19mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories.

iii. Cut end of conduit pipe shall have no sharp edges or any burrs left to avoid damage to the insulation of conductor while pulling them through such pipes.

PART II- EMPLOYERS REQUIREMENT

- iv. Protection Against Condensation
The layout of conduit should be such that any condensation or sweating inside the conduit is drained out. Suitable precaution should also be taken to prevent entry of insects inside the conduit.
- v. Protection of Conduit Against Rust
The outer surface of conduit including all bends, unions, tees, junction boxes etc. forming part of conduit system shall be adequately protected against rust when such system is exposed to weather by being painted with two coats of oxide paint applied before they are fixed. In all cases, no bar threaded portion of conduit pipe shall be allowed. Unless such bare thread portion of conduit is treated with anti-corrosive preservation or covered with approved plastic compound.
- vi. Painting of Conduit and Accessories
After installation, all accessible surface of conduit pipes, fittings, switch and regulator boxes etc. shall be painted with two coats of approved enameled paint or aluminum paint as required to match the finish of surrounding wall, trusses etc.
- vii. Fixing of Conduits
 - a. Recessed/ concealed conduit
The case in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after creation of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in the position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and burying the conduit in mortar before the plastering shall form part of point wiring work. The condition pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing.
- viii. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself will treated with some approved preservation compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirement shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 meters, then circular junction box shall be provided.
- ix. Outlet Boxes & Covers

PART II- EMPLOYERS REQUIREMENT

The switch box shall be made of metal on all sides except on the front. Boxes shall be hot tip galvanized mild steel. Upto 20 x 30 cm size M.S. box shall have wall thickness of 16 SWG. The metallic boxes shall be painted with anti-corrosive paint before erection. Clear depth of the box shall not be less than 60 mm. All fitting shall be fitted in the flush pattern. Phenolic laminated sheet of approved shade shall be used for switch box covers. These shall be of 3 mm thick synthetic phenolic resin bonded laminated sheet as base material and conform to grade P-1 of IS 2036-1994.

x. Erection and Earthing of Conduits

The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirement by means of special approved type of earthing clamp effectively fastened to conduit pipe in a workmen like manner for a perfect continuity between the earth and conduit. Gas, water pipe shall not be used as earth medium.

xi. Switches

All 5- and 15-Amp switches shall be of piano type of 240 volts A.C. grade to be installed. All switches shall be fixed on 3 mm thick laminated sheet cover. All 5 Amp socket shall be 3 pin type. All 15 Amp socket shall be 6 pin type suitable for 15/5 Amp. All switches & sockets outlets controlling the lights or fans shall be connected to the phase wire of the circuit. Switches shall be located at 1200 mm above finished floor level unless otherwise indicated or as directed by the Project Manager/appropriate government authority appointed by GSCDL.

xii. Flush Cover Plates

All switches, sockets, telephones and TV outlets etc. shall be fixed on 3 mm thick phenolic laminated sheet cover unless otherwise specified. Flush cover plate shall be secured to the box with counter sunk brass screws & cup washers.

xiii. Wall Socket Plate

All 5- and 15-Amp socket outlet shall be 3 and 6 pin respectively. Each outlet shall have a switch located beside the socket preferable on the same flush cover plate or as per site requirement. The earth terminal of the socket shall be connected to the earth wire.

xiv. Wiring

All internal wiring shall be carried out with PVC insulated wires of 650/1100 volts grade. The circuit wiring for points shall be carried out in looping in system and no joint shall be allowed in the length of the conductors. Circuit wiring shall be laid separate conduit originating from distribution board to switch board for light/fan. A light/fan switchboard may have more than on

PART II- EMPLOYERS REQUIREMENT

circuit but shall have to be of same phase. Looping circuit wiring shall be drawn in the same conduit as for point wiring. Each circuit shall have a separate neutral wire. Neutral looping shall be carried out from point to point or in light/ fan switchboards. A separate earth wire shall be used. Red colour wire shall be used for phase and black colour wire for neutral. Circuit wiring shall be carried out with red, yellow or blue colour PVC insulated wire for RYB phase wire respectively and black colour PVC insulated wire for the neutral wires. Bare copper wire shall be used as earth continuity conductor and shall be drawn along with other wires. No wire shall be drawn into any conduit until all work of any nature, that may cause injury to wire is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire.

Before the wires are drawn into the conduit, the conduit shall be thoroughly cleaned of moisture, dust and dirt. Drawing & jointing of copper conductor wires & cables shall be as per CPWD Specifications.

xv. Joints

All joints shall be made at main switches, distribution board socket and switch boxes only. No joints shall be made in conduits & junction boxes. Conductors shall be continuous from outlet to outlet.

xvi. Main and Sub mains

Main and sub main cable where called for shall be of the rated capacity and approved make. Every main and sub main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawings of the sub main & main cables. Cost of junction box/ drawn box is deemed to be included in the rates of sub main wiring. As independent earth wire of proper rating shall be provided for every sub main. Single-phase sub main shall be provided with two earth wire where mains and sub mains cables are connected to the switchgear. Sufficient extra lengths of sub main and mains cable shall be provided to facilitate easy connections and maintenance for termination of cables crimping type cable socket/plugs shall be provided. Some colour code as for circuit wiring shall be followed.

xvii. Load Balancing

Balancing of circuits in three-phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

xviii. Classification of points

Classification and measurement of point wiring shall be as per Sikkim PWD or CPWD Specifications for Electrical Works – 2013.

xix. Conductor size

Wiring shall be carried out with following sizes of PVC insulated single core copper conductor wire/ cable.

PART II- EMPLOYERS REQUIREMENT

- a. Light point 1.5 Sq. mm
- b. Ceiling/Cabin/Exhaust Fan Point 1.5 Sq. mm
- c. Call Bell Point 1.5 Sq. mm
- d. Plug Point (5A. outlet) 1.5 Sq. mm
- e. Circuit Wiring 1.5 Sq. mm
- f. General Power Point 4.0 Sq. mm
- g. Power Point for A.C. Unit 6.0 Sq. mm
- h. Power Point for Geyser, Drinking Water Coolers &
- i. 4.0 Sq. mm hand dryers

xx. Telephone wire/cables

Separate conduits shall be provided for internal telephone wiring of telephone wiring of telephone system commencing from tag block. Each telephone outlet shall be wired with 2 pair telephone cable from the tag block. All telephone wires shall be of .61 mm diameter annealed tinned high conductivity copper conductor PVC insulated & PVC sheathed gray conforming to ITD specifications SWS 113 B & C. Multipair PVC insulated cables and laid in conduit shall be provided for connecting various tag blocks. Telephone cables used for external connections shall be armoured. This cable shall be laid directly in ground or in pipe etc. as call for elsewhere.

Following number of 2 pair wire/ cables shall be drawn in various sizes of conduits as listed below:

- a. 20 mm conduit - upto 3 cables
- b. 25 mm conduit - more than 3 and upto 6 cables.

Maximum number of wires that can be taken in any conduit shall be as per the Table given below:

Table 20: Maximum Permissible Number of Wires in a Conduit

Nominal Cross Sectional area of conductor in sq. mm	20 mm		25 mm		32 mm		38 mm		51 mm		64 mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1	2	3	4	5	6	7	8	9	10	11	12	13
1.5	5	4	10	8	18	12	-	-	-	-	-	-
2.5	5	3	8	6	12	10	-	-	-	-	-	-
4	3	2	6	5	10	8	-	-	-	-	-	-
6	2	-	5	4	8	7	-	-	-	-	-	-

PART II- EMPLOYERS REQUIREMENT

Nominal Cross Sectional area of conductor in sq. mm	20 mm		25 mm		32 mm		38 mm		51 mm		64 mm	
	2	-	4	3	6	5	8	6	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-	-	-
16	-	-	2	2	3	3	6	5	10	7	12	8
25	-	-	-	-	3	2	5	3	8	6	9	7
35	-	-	-	-	-	-	3	2	6	5	8	6
50	-	-	-	-	-	-	-	-	5	3	6	5
70	-	-	-	-	-	-	-	-	4	3	5	4

Note:

- a) The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.
- b) The columns headed ||S|| apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not defect from the straight by an angle of more than 15 degrees. The columns headed —B|| apply to runs of conduit, which defect from the straight by an angle of more than 15 degree.
- c) Conduit sizes are the nominal external diameter.

2.14.5. Lighting Fixture and Fans, Air Cooling & AC

2.14.5.1. General

- i. The Contractor shall apply and install lighting fixtures including but not limited to lamps, ballasts, accessories fixing hardware necessary for installations, as required, and as herein specified.
- ii. All fixtures shall be delivered to the building complete with suspension accessories, canopies, casing, sockets, holders, reflectors, ballasts, diffusing material, louvers, plaster frames, recessing boxes, etc. all wired and assembled as indicated.
- iii. Fixtures, housing, frame or canopy, shall provide a suitable cover for fixture outlet box or fixture opening. iv. Fixtures shall comply with all applicable requirements as herein outlined unless otherwise specified.
- v. Manufacturer's name and catalogue number of lighting fixtures are given for general reference only. It shall be understood that the actual fixtures supplied shall meet all the requirements of the specification, and if necessary, the standard fixture indicated for reference, shall be modified accordingly.
- vi. Fixtures shall bear manufacturer's name and the factory inspection label.

PART II- EMPLOYERS REQUIREMENT

- vii. Fixtures shall be completely wired can constructed to comply with the IEE wiring regulations requirements for lighting fixtures, unless otherwise specified.
- viii. Re-clamping the fixture shall be possible without having to remove the fixture from its place.
- ix. Lamps of the proper type, wattage and voltage rating shall be furnished and installed in each fixture.

2.14.5.2. Construction

- i. Fixture shall be constructed of 0.5mm thick steel minimum. If other metals are used they shall be of the required thickness to have at least the same mechanical strength. Cast portions of fixtures shall be not less than 1.5 mm thick.
- ii. Metal parts of the fixture, shall be completely free from burrs & tool marks.
- iii. Solder shall not be used as a mechanical fastening device on any part of the fixture joints shall be welded and ground smooth.
- iv. Fixtures with visible frames shall have concealed hinges and catches.
- v. Recessed fixtures shall be constructed so as to fit into ceiling without distorting either the fixture or the ceiling. Plaster rings shall be provided for plaster ceilings. The Contractor shall coordinate the dimensions with the false ceiling tile dimensions.
- vi. Outdoor fixtures (under canopy or directly exposed to the weather) shall be constructed of an appropriate weather resistant material including gasketing- preventing entrance of water into wiring, and shall be marked by the manufacturer — Suitable for outdoor use.
- vii. Fixture with hinged diffuser doors shall be provided with spring clips or other retaining devices to prevent the diffuser from moving.
- viii. All plastic diffusers shall be of acrylic, unless otherwise noted.
- ix. Incandescent fixtures shall be equipped with porcelain medium base with nickel- plated shells.
- x. Pendent fixtures and lamp holders shall be provided with ball type aligners.
- xi. Fluorescent fixtures shall be provided with white lamp holders.
- xii. Industrial type fluorescent fixtures shall have turret type lamp holders

2.14.5.3 Finish

- i. All hardware shall be bonderised, cadmium plated, given a corrosion resistant phosphate treatment or other approved rust inhibiting prime coat, to provide a rust proof base before application of finish. Finish shall be baked enamel.

PART II- EMPLOYERS REQUIREMENT

- ii. Non-reflecting surfaces such as fixture frames and trims shall be finished with baked enamel paint, unless otherwise specified. The colour of the paint shall be as directed later by the Project Manager/appropriate government authority appointed by GSCDL.
- iii. Light reflecting surfaces shall be finished with baked white enamel paint having a reflection factor of not less than 85%.
- iv. All parts of the reflector shall be completely covered by the finished and free from irregularities.
- v. Unpainted surfaces shall finished with a clear lacquer except for anodized or —Azac surfaces.
- vi. After finish has been applied and cured, it shall be capable of withstanding a 1 cm radius bend without showing signs of cracking, peeling or loosening from the base metal.
- vii. Finish shall be capable of withstanding 72 hours exposure to an ultra – violet.
- viii. RS sun lamp placed 10 cm from the surface without discolouration, hardening, or warping and shall retain the same reflection characteristics after exposure.

2.14.5.4 Wiring

- i. Fluorescent fixtures shall be wired with not lesser than 1.5 sq.mm. asbestos-covered wire. No splice or tap shall be located within an arm, stem or chain. Wire shall be continuous from splice in outlet box of the building wiring system to lamp socket or to ballast terminals.
- ii. Wiring within incandescent fixtures and for connection to the branch circuit wiring up to the outlet box of lighting point shall not be less than 1.5 sq.mm. silicone rubber insulated wire. (150 degree centigrade temperature)

2.14.5.5 Installation

- i. Fixtures shall be installed at mounting heights as instructed on site by the Engineer. Pendent fixtures within the same room or area shall be installed plump and at a uniform height from the finished floor. Adjustment of height shall be made during installation. Flush mounted recessed fixtures, shall be installed so as to completely eliminate leakage of light within the fixture and between the fixture and adjacent finish.
- ii. Fixture mounted outlet boxes shall be rigidly secured to a fixture stud in the outlet box. Hickeys or extension pieces shall be installed where required to facilitate proper installation. Fixture located on the exterior of the building shall be installed with non-ferrous metal screws finished to match the fixtures.

2.14.5.6 Lamps-General

PART II- EMPLOYERS REQUIREMENT

- i. Lamp shall be supplied and installed in all lighting fixtures listed in the Schedules of lighting fixtures on the drawings.
- ii. Lamps used for temporary lighting service shall not be used in the final lamping of fixture units.
- iii. Lamps shall be of wattage and type as shown in this Schedule.
- iv. Lamps for permanent installation shall not be placed in the fixtures, until so directed by the Project Manager/appropriate government authority appointed by GSCDL and this shall be accomplished directly before the building areas are ready for occupancy.
- v. LED lights & fittings shall be used.

2.14.5.7. Fixture Samples

Detailed catalogue for all fixtures or as required by the Project Manager/appropriate government authority appointed by GSCDL, sample fixtures shall be submitted for prior approval of the Project Manager/appropriate government authority appointed by GSCDL before orders for the fixtures are placed.

2.14.5.8. Testing

After all lighting fixtures are installed and are connected their respective switches, test all fixtures to ensure operation on their correct switch in the presence of the Engineer. All un-operating fixtures or ones connected to the wrong or inconvenient located switch shall be correctly connected as directed by the Project Manager/appropriate government authority appointed by GSCDL.

2.14.5.9. Ceiling Fans

All ceiling fans shall be provided with suspension arrangement in the concrete/slab/roof member. Fan box with MS hook to be provided under by electrical Contractor covered under subhead point wiring item no. 1 ceiling fan shall be double ball bearing type, copper wound motor complete with canopy, down rod, blades etc. and shall conform to relevant IS standards. Ceiling fan shall be white in colour. Ceiling fan shall be provided with standard regulator. Regulator shall be suitable for 240 volts A.C. supply 50 Hz and shall be of continuous duty type.

2.14.5.10. Exhaust Fans

Exhaust fans shall be heavy-duty type with double ball bearing & conforming to IS 2312-1967. Exhaust fan shall be complete with copper wound motor, capacitor, louvers/shutter frame & mounting bracket. Exhaust fan shall be suitable for operation on 240 volts single phase A.C. supply.

2.14.5.11. Wiring

PART II- EMPLOYERS REQUIREMENT

- a) All the wiring outside the panel interconnection between AMF and DG set shall be drawn into 14 gauge MS conduits or enclosed trunking.
- b) The minimum size of wire outside the AMF panel shall be as per the requirement of electric load and adequate size.
- c) The size of control cable inside the panel shall be 2.5 sq. mm copper control cable.
- d) All the wires and cables shall be suitable for 650/1100 volts.
- e) All the wiring shall be carried out as per IS: 700 / IS 732

2.14.6. Earthing

2.14.6.1. General

All the non-current metal parts of electrical installation shall be earthed properly. All metal conduits trunking, switchgear, distribution boards, switch boxes, outlet boxes and all other parts made of metal shall be bounded together and connected by means of specified earthing conductors to an efficient earthing system.

Earthing work shall be conforming to Sikkim PWD or CPWD Specifications for Earthing work and IS 3043.

2.14.6.2. Earthing Conductor

Earth continuity conductor along with sub main wiring from Main/ Sub Distribution boards to various distribution boards shall be of copper. Earth continuity conductor connecting Main & Sub Distribution boards to earth electrode shall be with galvanized MS strip.

2.14.6.3. Plate Earth Electrode

Earthing shall be provided with either GI Plate electrode or copper plate electrode of following minimum dimensions:

GI Plate Electrode 600m x 600mm x 6mm thick

Copper Plate Electrode 600m x 600mm x 3 mm thick

The electrode shall be made cylindrical buried in ground with its faces vertical and not less than 3 meters below ground level 20 mm diameter medium class GI Pipe shall be provided and attached to the electrode. A funnel with mesh shall be provided on the top of this pipe for watering and earth electrode. Earth electrode the watering funnel attachment shall be housed in masonry enclosure of not less than 300x300x300 mm deep. A cast iron or MS frames with cover having locking arrangement shall be provided at top 3 meters from the building. Care shall be taken that the excavation for earth electrode may not affect the column footing or

PART II- EMPLOYERS REQUIREMENT

foundation of the building. In such cases electrode may be further away from the building.

If the earth resistance is too high and multiple electrode earthing does not give adequate low resistance to earth, then the soil resistivity immediately surrounding the electrode shall be reduced by addition of sodium chloride calcium chloride, sodium carbonates, copper sulphates, salt and soft coke or charcoal in suitable proportions.

2.14.6.4. Resistance to Earth

The resistance of earthing system shall not exceed 2 ohm.

2.14.7. Commissioning Check List of Electrical Works

2.14.7.1. Scope

Before commissioning of the electrical installations the Contractor shall check all the items mentioned and arrange for testing of all the equipment in the presence of the Project Manager/appropriate government authority appointed by GSCDL.

a) Functional Checking

- i. Check all closing, tripping, supervision & interlock of control devices.
- ii. Check operation of all alarm circuits.
- iii. All 415 and 230 V power cables to be meggered.

b) Earthing

- i. Measure resistance of each earth well/rod by isolating the same from station grid as well as from other earth well/ rods and when resistance of two earths at a time measure by D.C. drops method.
- ii. Check continuity of grid conductors and wires
- iii. Soil resistivity tests.
- iv. In addition to the above, any other specified by manufactures shall be carried out as per manufacturer's instructions.
- v. Measurement voltage across bearing pedestal insulation & between rotor shaft & bearing.
- vi. Test the fire detection system if provided.
- vii. Check operation of protection relays by putting short circuit bat at different location.
- viii. Check open circuit and short circuit characteristics of generators.
- ix. Check load characteristics of exciters.

PART II- EMPLOYERS REQUIREMENT

c) Metals

- i. Check nameplate details according to specification.
- ii. Physical check for any damage.
- iii. Check calibration by comparing it with a substandard meter.
- iv. Megger all insulated portions.
- v. Check C.T. and V.T. connections with particular reference to their polarities for power type meter.

d) Relays

- i. Check nameplate details according to specifications.
- ii. Check for any physical damage.
- iii. Check internal wiring.
- iv. Megger all terminals to body; Megger AC to DC Terminals.
- v. Check operating characteristics by secondary injections
- vi. Check minimum pick up voltage of D.C. coils.
- vii. Check operation of electrical / mechanical targets.
- viii. Relay settings.
- ix. Check C.T. and V.T. connection with particular reference to their polarities for directional, distance type relays.

e) Current Transformer - Preliminary checks

- i. Check nameplate details according to specification.
- ii. Check for physical damage
- iii. Check tightness of all bolts, clamps, connecting terminals
- iv. Check for oil level and leakages
- v. Check connections
- vi. Check cleanliness of insulators and bushings

f) Commissioning Checks

- i. Megger between winding & winding terminals to body
- ii. Polarity test:
- iii. Ratio identification checking of all ratios on all cores by primary injection of current.
- iv. Magnetization characteristics, secondary winding resistance
- v. Capacitance and tan – deltas test
- vi. Dielectric test of oil (wherever applicable)

PART II- EMPLOYERS REQUIREMENT

vii. Spare CT cores, if any to be shorted and earthed.

g) Control Panels - Preliminary Checks

- i. Check name plate details of every associated equipment according to Specifications
- ii. Check for physical damage
- iii. Check tightness of all nuts, clamps, connecting terminals.
- iv. Check cleanliness
- v. Check earthing

h) Commissioning Checks

- i. Switch developments
- ii. Each wire shall traced by continuity tests & it should be made sure that the wiring is as per relevant drawings. All interconnections between panel/ equipment shall be similarly checked.
- iii. All the wires should be meggered to earth
- iv. Checks on relays
- v. Checks on motors
- vi. Settings of relays, other alarm, tripping devices interlocks as per schemes
- vii. Phase angle checks measurements of magnitude and phase angle of current transformer secondary currents and potentials transformer secondary voltages.
- viii. Functional checking of all control circuit e.g. closing tripping. Control, interlock, supervision and alarm circuit including proper functioning of the component equipment.

i) Diesel Generating Set

- i. Factory Tests
- ii. Factor test shall incorporate the following:
- iii. Routine tests
- iv. High voltage tests
- v. Short circuit tests
- vi. Instantaneous short circuit. Withstanding test
- vii. Insulation resistance test.

The Contractor shall furnish type tests certificate for Project Manager/appropriate government authority appointed by GSCDL. These tests shall be conducted as per the requirement of BIS: 2613 or IS : 4722 and the original test certificate shall be furnished.

PART II- EMPLOYERS REQUIREMENT

a) Site Tests

After erection is completed following test shall be conducted.

- i. Insulation resistance of the generator.
- ii. Speed no load voltage and full load voltage regulation
- iii. Frequency on no load half load and full load
- iv. Full load test for 6 hrs at rated voltage, speed & frequency

The readings shall be observed with calibrated meter. Only meter shall be used for the test. The reading shall be properly tabulated submitted in triplicate to the Project Manager/appropriate government authority appointed by GSCDL.

b) Testing Of Control

All the safety control and protection devices of the DG set shall be tested for correct calibration and operation. The result of the test shall be tabulated and submitted in triplicate to the Project Manager/appropriate government authority appointed by GSCDL.

c) Trials - Preliminary Trials

After completion of erection of DG set and before carrying out main trials. Preliminary trials shall be conducted in the presence of the Project Manager/appropriate government authority appointed by GSCDL; such trials include the checking and adjustment of all instruments relays timers' interlocks and meters. Crankshaft alignment shall be checked when the engine is cold insulation of stator, rotor & exciter windings reading recorded.

d) Main Trials

Main trial shall be of 12 hrs continuous run at full load and including one hour at 110% of full load.

e) AMF Panel and Engine Trial

AMF Panel and engine control panel shall be tested for automatic operation by injecting proper current one voltage by a separate source. The satisfactory working of automatic operation shall be tested & necessary adjustment shall be done for relays in the presence of the Project Manager/appropriate government authority appointed by GSCDL and the result shall be recorded in the test sheet at 30 minutes interval. Alternator efficiency as determined in works test shall be used as the basis of calculation for fuel consumption rate. Test providing the satisfactory performance of all safety and operating controls shall be carried out. Starting time of sets shall be tested at least five times and the sufficient time interval to allow for cold start. A set of tools and tackles has to be supplied along with each set and shall be included in the cost of DG set.

f) Transformer - Preliminary Checks

PART II- EMPLOYERS REQUIREMENT

- i. Compare name plate details with the specifications
- ii. Check for any physical damage, in particular of bushings
- iii. Check tightness of all bolts, clamps, connecting terminals
- iv. Check cleanliness of bushings
- v. Check for oil leakage and oil level
- vi. Breather condition, check whether breathing line is free, silica gel is reactivated oil is available at the bottom.
- vii. Check for clearances, particularly in case of bus ducts
- viii. Water tightness of terminal boxes and bus ducts.
- ix. Ensure that all cooler and cooler header valves are opened
- x. Releasing of air from bushings (Very important) Buchholz relay.
- xi. Check the bushing horn gaps
- xii. Check that the transformer is correctly installed with reference to its phasing.

g) Commissioning Tests

- i. Test the transformer oil for dielectric strength, tan-delta, and activity resistivity and dissolved gases.
- ii. Test bushing oil for dielectric strength.
- iii. Insulation test of winding (including tertiary winding if available).
- iv. Capacitance and tan-delta test of condenser type bushings, before assembly.

h) Test the Transformer for the following

- i. Voltage/turns ratio at all the taps
- ii. Winding resistance at all the taps
- iii. Short circuit impedance at full winding
- iv. Magnetic balance at full winding
- v. Core loss at service tap at low voltage
- vi. Capacitance and tan-delta
- vii. IR and PI
- viii. Vector group test
- ix. Phase sequence test

i) Current Transformer

- i. Continuity test

PART II- EMPLOYERS REQUIREMENT

- ii. Polarity test
- iii. Insulation resistance tests
- iv. Magnetization characteristics
- v. Rough ratio test
- vi. Secondary winding resistance
- vii. Line connection as per phasing diagram
- viii. Winding resistance
- ix. Insulation resistance of control wiring
- x. Core load test
- xi. Buchholz relay operation for alarm and trip
- xii. OLTC control indicating and alarm circuits
- xiii. Operation test of all protective devices and interlocks
- xiv. Calibration of temperature indicator (oil& winding temperature relays)

j) Cooling System

- i. Fan motor rating and fan mounting (wherever applicable)
- ii. Oil pumping equipment (wherever applicable)
- iii. Operation of valves
- iv. Operation of flow switches
- v. Operation test of cooling equipment
- vi. Check fan motors for insulation, continuity, vibration and temperature rise and direction of rotation.
- vii. Check the lightning arrester installation

2.14.8. Safety Equipment

a) Danger Notices

Danger notices shall be affixed permanently in a conspicuous position in Hindi or English and the local language of the district with sign of skull and bones at every overhead lines, transformer, electrical equipment motors, etc.

b) First aid box

Standard first aid box with all standard contents shall be supplied.

c) Fire buckets

PART II- EMPLOYERS REQUIREMENT

The fire buckets unit shall consist of our galvanized iron baskets which shall be with round bottom and of 13 litres capacity. They shall be filled with dry sand. Arrangement shall be made to hang them on GI Pipe stand comprising of at least 2 vertical and one horizontal members of 500 mm GI Pipe. The stands have books and locking chain arrangement. The buckets and stand shall be painted with epoxy red paint.

d) Fire extinguisher

Fire extinguisher of 4.5 kg. capacity shall be of approved make. It shall be filled with Carbon tetrachloride. It shall have horns. Extinguishers shall be fixed on wall/ columns with necessary clamps made out 50 mm x 6 mm MS flat and coated bolts and nuts ground in wall/ columns. e) Instruction Chart

Printed instruction chart shall be in English, Hindi and local dialects, duly framed with front glass, prescribing treatment to be persons having Electric shock, shall be supplied.

2.14.9. Drawing, Procurement & Inspection of Equipment

Based on the proposal drawings and the equipment/ scheme finally selected, the Contractor shall supply layouts, cable line diagrams etc. required for the satisfactory and complete installation of the total electrical power supply and distribution system. Some of the important drawings/ details to be submitted for approval are given below.

- i. General arrangement drawings of DG equipment, LT switchgear, Panels, transformers ducts, etc.
- ii. Single line and three-line diagrams of DG set and sub-station.
- iii. Wiring diagram, schematic diagrams and control diagrams for equipment, Switchgear, PCC and the whole system. Chapter and termination details shall also be provided.
- iv. Building plan, elevation / section and details including the layout of plant, equipment, switchgear, bus ducts and related services like chimneys, cooling systems, fuel handling system etc. with dimensions based on the equipment finally selected.
- v. Details of all foundations, cable ducts, cable protections pipes and other civic works.
- vi. Complete Chapter for LT Cables, instrument/ control cables.
- vii. Layout plan showing the coordinates/ routing for power cables. Control / instrument cables and other cables as required, coordinated with other services, like water supply line, drainage/ sewerage lines, fire lines, mechanical service pipes line etc. The sectional details, road-crossing details

PART II- EMPLOYERS REQUIREMENT

- etc. shall also be given at different locations. viii. Technical catalogue for all equipment, switchgear, cables and materials including a complete wire up / details of operation, interlocks and control etc.
- ix. Operation and maintenance manuals along with list of spare parts for all equipment, switchgear, cables and materials etc.
 - x. A detailed explanatory note giving the details of operational sequence, time period and safety aspects etc. on changeover from P.S.E.B supply source to stand by D.G. power.
 - xi. Procurement & Inspection of Equipment

Approval list of makers and vendors are given. The Independent Engineer reserves the right to amend make of equipment/materials. Materials supplied shall be strictly as mentioned therein. For items not specifically mentioned, prior approval shall be taken before procurement of the same, all equipment/ material/ supplied shall be brand new and shall be procured directly from the manufacturers, dealers or authorized agents. The Independent Engineer shall have access to the manufacturer's premises for stage inspection / final inspection of any item during its design, manufacturing, assembly, and testing. After carrying out the necessary factory tests and routine tests as per IS standards, a copy of the routine test certificates shall be forwarded along with the call for carrying out the inspection at the manufacturers' works.

2.14.10. PA system

Scope: Scope includes supply, Installation, testing & commissioning of PA System complete in all respect as per drawing or directed by site in charge. The System should be clearly audible

2.14.11. List of Approved Makes

1. Moulded Case Circuit Breakers / A.C.B's : GEC Alsthom (English Electric), L & T Siemens. Switch Fuse Unit : L & T, GEC Alsthom (English Electric) Siemens or equivalent
2. Voltmeter & Ammeter : AE, MECO, Rishline (L & T), Rishab or equivalent
3. Selector Switch : Kaycee, L & T, BCH or equivalent
4. Current Transformer : Kappa, Rishline (L & T), Jyoti or equivalent
5. Indication Lamp : L & T, BCH, Siemens or equivalent
6. Panels, MBS, SDB's, Main : As per specifications & Sub Distribution Boards approval of the manufacture to be obtained from the Independent Engineer. Charge and manufacturer shall have CPRI, test certificate for panel or from a source with prior approval of the Independent Engineer.

PART II- EMPLOYERS REQUIREMENT

7. Distribution Board with Miniature Circuit Breakers: Morarji Dorman Smith (MDS), Siemens, GEC Alsthom (English Electric), Standard, L & T, Plaza or equivalent.
8. XLPE Insulated PVC sheath Armoured cables of 1.1 KV grade as per IS : 1554 : ICL, Fort gloster, CCI(Cable Corporation of India), NICCO, Paramount or equivalent.
9. FRLS Insulated copper conductor single core standard wires of 650/1100 volt grade:
National, Finolex, RPG, and FordGloster, Paramount or equivalent.
10. Switches & Sockets : Anchor, SSK, Havells, MK or equivalent.
11. Telephone Wire : National, Plaza, Universal, NICCO, Paramount, finolex or equivalent
12. M.S. Conduit (BIS marked) : BEC, NIC, Steel craft, AKG or equivalent
13. Fluorescent Light Fixture: Philips, Wipro, Bajaj Incandescent Light fixture. Bajaj, Decon, Philips or equivalent.
14. Ceiling fan & Cabin fan : Crompton, Bajaj, Usha or equivalent
15. Earth Leakage Circuit Breajers/RCCB: MDS, GEC Alsthom (English Electric) Datar, L & T/ Hager, Siemens, Plaza or equivalent.
16. Diesel Generator Set; Kirloskar, Ashok Leyland, Greaves cotton, Ruston, Stampford or equivalent.
17. Alternator : Kirloskar, Greaves, Stampford, Jyoti or equivalent
18. KV Switch gear with VCB/Load break switch: SIEMENS, L & T, B.H.E.L., GEC Alsthom or equivalent.
19. KV/0.433 KV Transformer: GEC Alsthom B.H.E.L., Bharat Bijle, Kirloskar, Volttas or equivalent.
20. KV cable: Cable Corporation of Indiameter, Fort Gloster, Industrial Cable Universal Cable, Torrent, Paramount or equivalent.
21. Capacitors: L & T, GEC, C & G, Asian or equivalent
22. H.T. Termination: Xencon (CCI) Raychem, Dension Mahindra & Mahindra or equivalent.
23. Street light fixture: Philips, Bajaj, Wipro, Crompton or equivalent.
24. Amplifier: Boss, Ahuja. Bosch or equivalent.
25. Speaker: Boss, Ahuja, Bosch or equivalent.
26. LT Panels : Advance, Adlec, Tri Square, Diamond Electric, Sudir Gensets or equivalent
27. 11 KV HT Panels: Advance, Adlec, Tri Square or equivalent Note: The above list is indicative but not exhaustive. Below are Some IS Codes to be referred:

PART II- EMPLOYERS REQUIREMENT

Table 21: IS Codes for Internal/ External work

Indian Standard Codes	Reaffirmation	Subject
27-1992	Reaffirmed 200 2	Specifications for Pig Lead
269-1989	Reaffirmed 200 4	Specificationsfor33 grade Ordinary Portland Cement
407-1981	Reaffirmed 2001	Brass tubes for general purposes
456-2000	--	Code of practice for Plain & Reinforced concrete
458-2003	--	Specifications for Concrete pipes
554-1999	--	Dimensions for pipe thread where pressure tight joints are required
636-1988	Reaffirmed 200 3	Firefighting hose, rubber line dor fabric reinforced rubber lined woven Jacketed
638-1979	Reaffirmed 2003	Sheet rubber jointing & rubber insertion jointing
651-1992	Reaffirmed 2003	Specifications for Salt Glazed stone ware pipes & fittings
771(P-I&VI)		Glazed fire clay sanitary appliance
771-1979(P-I)	Reaffirmed 2003	General requirements
771-1985(P-II)	Reaffirmed 2003	Specific requirements for kitchen & laboratory sinks
771-1979(P-III)	Reaffirmed 2003	Specific requirements of urinals
771-1985(P-III)	Reaffirmed 2000	Specific requirements of urinals
771-1979(P-IV)	Reaffirmed 2003	Specific requirements of post mortem slabs
771-1979(P-V)	Reaffirmed 2003	Specific requirements of shower trays
771-1979(P-VI)	Reaffirmed 2003	Specific requirements of bed pan sinks
771-1979(P-VII)	Reaffirmed 2003	Specific requirements of slope sinks
774-1984	Reaffirmed 2000	Flushing cistern for water closet & urinals

PART II- EMPLOYERS REQUIREMENT

For Electrical Installation Codes as below or as directed by Project Manager/appropriate government authority appointed by GSCDL

CODES: Codes shall mean the following including the latest ascendants and / or replacement if any.

1. Indian Boiler Act, 1923 and Rules and Regulations made there under
2. Indian Electricity Act, 1923 and Rules and Regulations made there under
3. Indian Factories Act, 1948 and Rules and Regulations made there under
4. The minimum wages Act
5. The Women's Compensation Act
6. The Payment of Wages Act
7. The Fatal Accident Act
8. The Industrial Employment Act
9. The Employment provident Fund Act
10. Indian Explosive Act 1984 the Rules and Regulations made there under
11. Indian Petroleum Act 1934, and Rules and Regulations made there under
12. A.S.M.E. Test Codes
13. AIRE Test, Codes
14. American Society of Materials Testing Codes
15. Standards of the Indian Standards Institution
16. Electricity Act 2003
17. Electricity Rule 2005
18. Low Tension Circuit Breakers: IS 2516-1955 Part I Sec.1
19. Switchgear Bus Bars IS 375-1963
20. HRC fuse links IS 2208-1962
21. Distribution fuse boards IS2675-1966
22. Enclosure for Low Voltage switchgear IS214701962
23. PVC Cables IS1554-1975
24. Tabular fluorescent lamps for Cameral lighting service IS2418-1963
25. Tungsten Filament Lamps for cameral service IS415-1963
26. Ceiling Fans IS274-1966 10) Flood lights IS1947-1961
27. Wall Glass flame-proof electric light fittings IS2206-1962 (Part 1)
28. Watertight Electric Light Fittings IS3553-1956
29. Steel Boxes for Enclosure of Electrical Accessories IS5133-1969
30. Fittings for Rigid Steel conduit IS2667-1979
31. Rigid steel circuits for electrical wiring IS3837-1966

PART II- EMPLOYERS REQUIREMENT

32. Accessories for Rigid Steel Conduits for Electrical Wiring IS3837-1966
33. Switch Socket Outlets IS3837-1966
34. PVC Wiring IS694-1977
35. Switches for domestic and similar purpose IS3854-1966
36. PVC wiring IS694-1977
37. Call Bell and Buzzers IS2268-1966
38. Straight through joint boxes and leads sleeves or paper insulated cables- EID-0032-1964 147
39. Earthing IS3043-1966
40. Electrical Wiring installations IS732-1963
41. Switchgear IS3072-1965 (Part I)
42. Lighting protection IS2309 –1969
43. Public Address system IS1882-1962
44. Low Tension switch use units IS4064-1978
45. Code of Practice for Automatic FIRE ALAM system IS2189-1970
46. Specification for Heat Sensitive Fire Detectors IS2175-1977
47. Guide for Safety procedure in Electric work IS5216-1969
48. Rubber Mats for Electric works IS5424-1969
49. Other internationally approved standards and / or Rules and Regulations touching the subject matter of the contract.

3. Drawings

Reference in Vol III of the bid document

The drawings are only indicative, and the contractor will have apply the detail drawings as it is a Design Build Transfer project.

4. Terms of Payment

1. In accordance with the provisions of GCC Clauses 39 and 40, the Employer shall pay the Contractor in the manner and at the times set out in this Terms and Procedures of Payment Schedule. As per the schedule given below the Employer shall subject to provisions of Clause 5 of this section, no later than 28 days after the receipt of Project Manager / Engineers in Charge statement by the Employer if Project Manager / Engineers in Charge has verified and is satisfied with details in statement such that payment can be made based on such statement submitted by Contractor.

2. Item wise breakup of the payment schedule is given in the table below:

Table 23: Item wise breakup of the payment schedule

Sl. No.	Particulars	Performance Level of work	% of payment allowed (on pro-rata basis)
1.	Dismantling of existing building	On Complete demolition of the existing structure including clearance and disposal of all debris to safe location as approved by the Project Manager.	100%
2.	Designing and construction of Mechanical Multilevel Car Parking cum Community Centre cum Sporting Complex (civil structure)	1. Submission of soil test report along with complete building designs including structural, architectural drawings, etc. complete and after approval from the Project Manager	5%
		2. Completion of foundation & masonry work up to plinth including site preparedness and protective works	15%
		3. On completion of RCC frame of columns, beams, staircase, ramps and slab.	40%
		4. On completion of walls, with plastering inside and outside	15%
		5. On completion of flooring, erection of doors /windows/ ventilators/ grills, painting inside &	20%

PART II- EMPLOYERS REQUIREMENT

Sl. No.	Particulars	Performance Level of work	% of payment allowed (on pro-rata basis)
		outside and all civil works complete.	
		6. On completion of finishing of all works pertaining to the building at per the direction of Project Manager.	5%
3.	Internal & external water supply	Submission of design of plumbing layout both internal and external all complete and after approval of Project Manager	5%
		Internal water supply and sanitary installations.	84% (14% for each floor)
		External water supply connection.	11%
4.	Internal & external electrification and electrical supply	Submission of design of electrical plan & layout both internal and external all complete and after approval of Project Manager	5%
		Internal electrical installations along with lightening conductor.	75% (12.5% for each floor)
		External electrical service connections up to substation of building from main source as provided by Power Department.	20%
5.	Fire detection & fighting	Submission of fire-fighting plan along with specification and OEM detail and after approval of Project Manager along with obtaining NOC from Sikkim Fire Division	5%
		Fire alarm (automatic alarm system) – installation	15%
		Firefighting (wet riser and sprinkler system) – installation	60%
		Fire alarm (automatic alarm system) – testing & commissioning	5%

PART II- EMPLOYERS REQUIREMENT

Sl. No.	Particulars	Performance Level of work	% of payment allowed (on pro-rata basis)
		Firefighting (wet riser and sprinkler system) – testing & commissioning	15%
6.	Passenger Lift - 2 numbers	Submission of specification & OEM and after approval of Project Manager	5%
		Installation	75%
		Testing & Commissioning	20%
7.	Rainwater Harvesting	Submission of specification & OEM and after approval of Project Manager	5%
		Installation	75%
		Testing & Commissioning	20%
8.	Solar Water Heating System	Submission of specification & OEM and after approval of Project Manager	5%
		Installation	75%
		Testing & Commissioning	20%
9.	Electrical substation, DG Set and	Submission of design & layout of transformer, LT/HT panel, DG Set along with specification & OEM and after approval of Project Manager	5%
		Installation of transformer, LT/HT panel and connection with main line	45%
		Installation of DG Set	35%
		Testing & Commissioning of transformer, LT/HT panel	10%
		Testing & Commissioning of DG Set	5%
10.	CCTV system with control room	Submission of specification & OEM and after approval of Project Manager	5%

PART II- EMPLOYERS REQUIREMENT

Sl. No.	Particulars	Performance Level of work	% of payment allowed (on pro-rata basis)
		Installation	75% (12.5% on each floor)
		Testing & Commissioning	20%
11.	Mechanical Car Parking	Survey, investigation, layout, design-drawing, etc. for fabrication, erection and commissioning of Mechanized multilevel Smart parking solution for minimum 90 Nos. of Four-Wheeler Parking. Ticket counters, Control Room, arrangements and after approval of Project Manager	5%
		After Construction, Completion of Fabrication/Manufacturing/Erection, supplying of materials of Mechanized multilevel Smart parking for minimum 90 Nos. Parking. Running Bills will be paid as detailed below :-	75%
		ii. 30% on delivery & installation of drive assembly and pallets of each module on prorata basis.	
		iii. 20% on delivery & installation of electrical spares and control panel of each module on prorata basis	
		iv. 15% on Commissioning and handing over of the Car Parking Module on prorata basis.	
		v. 10% for providing & commissioning of software / hardware components with LED signage, Smart Parking solutions etc.,	
After Construction of Ticket counters, Control Room, integration of firefighting system arrangements, finishing works and other miscellaneous works as per approved design-drawing,	10%		

PART II- EMPLOYERS REQUIREMENT

Sl. No.	Particulars	Performance Level of work	% of payment allowed (on pro-rata basis)
		specifications of relevant I.S. Codes and circulars issued by the Department from time to time as per the direction of the Project Manager.	
		After successful operation and maintenance- 1 year	5%
		After successful operation and maintenance- 2 year	5%
12.	Furniture & Fixture	Submission of specification & OEM and after approval of Project Manager	5%
		Installation	95%

3. The amounts to be paid to the Operator in accordance with Clause 2 of this Terms and Procedures of Payment Section shall exclude all costs, expenses, taxes applicable and levied by Central Government and State Government of the contractor in building the structures.
4. The amounts paid to the Operator in accordance with Clause 2 of this Terms and Procedures of Payment Section shall be repaid to the Contractor as part of the payments set out in Clause 2 of this section by reducing those payments by an amount equal to the advance payment times the same percentage of the Contract Amount that the Engineer in Charge determines in accordance with Clause 2 of this Terms and Procedures of Payment Section.
5. The Employer shall deduct from each payment to the Contractor pursuant to Clause 2 this Term and Procedures of Payment Section, Retention in the amount of 10 per cent of each payment to the Contractor.

The Retention amount may be released to the Contractor subject to the Operator furnishing an irrevocable Bank Guarantee from the nationalized Bank equivalent to the Retention amount. The Employer shall pay the 100 per cent of the Retention amount back to the Contractor after the expiry of Defects Liability Period

5. Supplementary Information

1. Co-operation: The Contractor shall establish full co-ordination with the officials of Employer/GSCDL, extend co-operation to complete work.
2. Records procedures and reports: A work order book shall be maintained by the contractor at site/workshop for taking insp;[Instructions from employer or his representative. The Contractor shall maintain records pertaining to the quality of installation / erection work and inspection, testing, compliance with all technical requirements in respect of all this works as described before. The Contractor shall submit such records to the Employer after the completion of any particular work before submitting the bill.
3. Personnel:-The contractor shall depute sufficient staff to carry out installation, the maintenance and repair work efficiently and satisfactorily. The Contractor shall undertake to comply with applicable legislation and the code of labour law on matters of health, hygiene and safety, and shall assume responsibility for works required in the event of any change in applicable regulations. The contractor shall provide all necessary superintendence during the execution of works and during maintenance. The Contractor's staff shall include adequate and competent persons with proven suitable, previous experience on similar contracts to supervise the works and sufficient skilled, semi-skilled and unskilled labour to ensure completion of works in time. The Contractor shall not remove any representative or skilled labour from the site without prior approval of the Employer's Representative for the proper fulfilling of the contractors obligations under the contract. The contractor or a competent and authorized agent or representative approved in writing by Employer on the basis of qualification and experience to be furnished by the contractor, which approval may at any time be withdrawn, is to be constantly on the works and shall give his whole time to the superintendence of the work.
4. Public Authorities: - The Contractor shall comply with all rules & regulations, byelaws and directives given from time to time by any local or public authority in connection with this work and shall himself pay fees or charges, which shall be levied on him without any extra cost.
5. Safety:-The Contractor will be responsible for safety of the material supplied and kept in joint custody of the employer and the contractor till completion of contract. The Contractor shall at his own expense arrange for the safety of his labour / supervisor staff employed by him directly or indirectly for performing the work, as per statutory requirement. The Contractor shall report any accident or unusual occurrence with the work at site that take place to employer immediately with the action, which he might have taken.

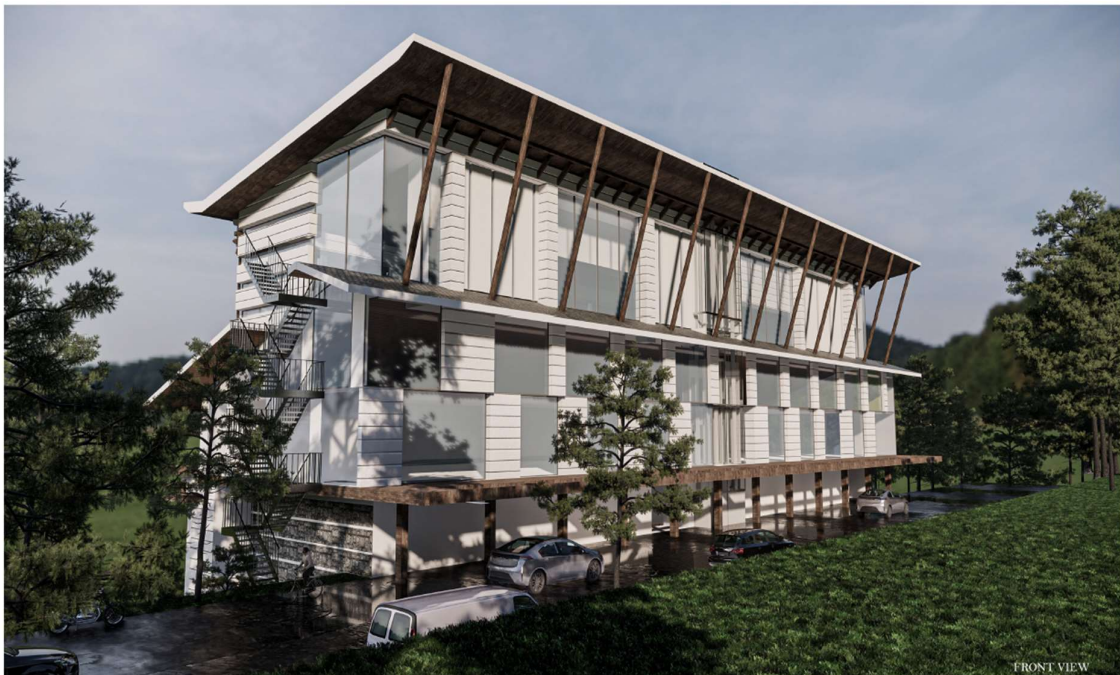
PART II- EMPLOYERS REQUIREMENT

6. Acquaintance with Site and Work Conditions: - The Bidder shall study the site and general conditions in respect of approaches, labourers, climate and the data included in the tender documents and get it verified with actual inspections of the site, before submitting the tender. In case of doubt about any item or data included in the tender, the same shall be got clarified in pre-bid meeting. Once the tender is accepted, it shall be concluded that the Contractor has verified and made himself conversant with all the details required for completing the work as stipulated conditions and specifications.

GANGTOK SMART CITY DEVELOPMENT LIMITED



REQUEST FOR PROPOSAL (RFP)



NAME OF THE WORK: MULTILEVEL CAR PARKING CUM COMMUNITY CENTRE CUM SPORTING COMPLEX AT DEVELOPMENT AREA

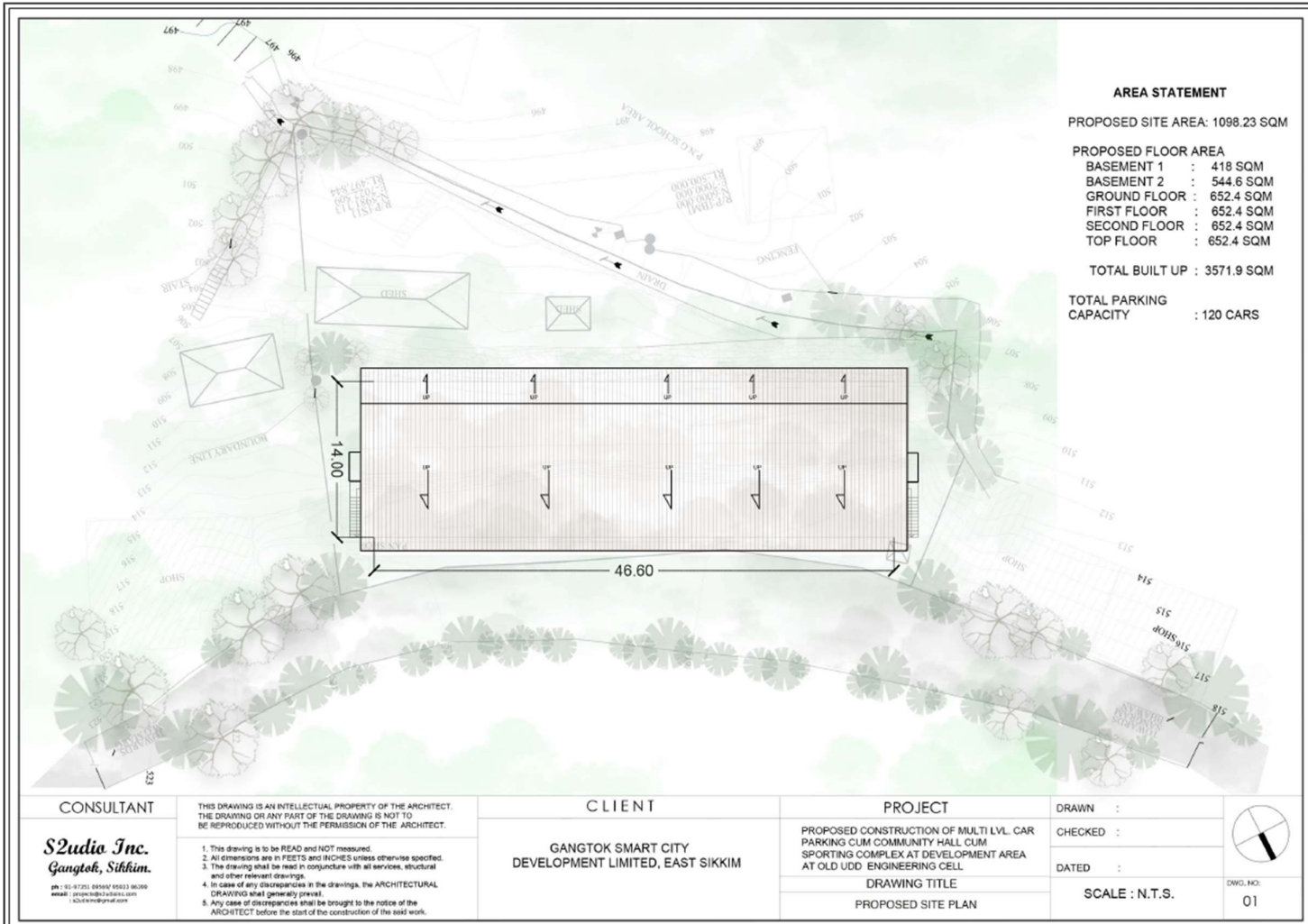
Single-Stage, Two-Envelope

Volume - III

Issued on : 25.02.2022

Invitation for Bids No: 019/SPV/GSCDL/2020; Dated: 25th February 2022

EMPLOYER : GANGTOK SMART CITY DEV. LTD.



AREA STATEMENT


PROPOSED SITE AREA: 1098.23 SQM

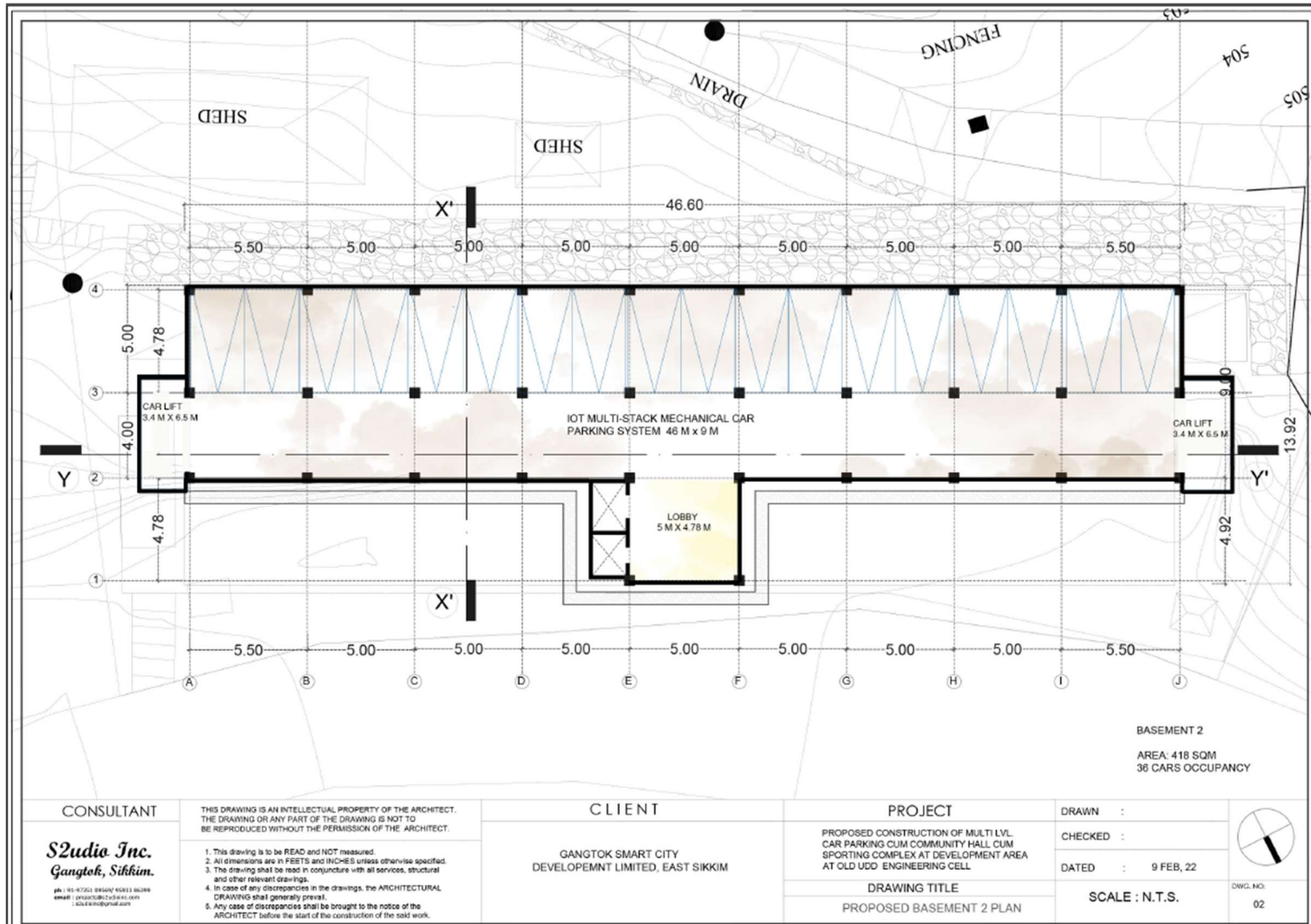
PROPOSED FLOOR AREA

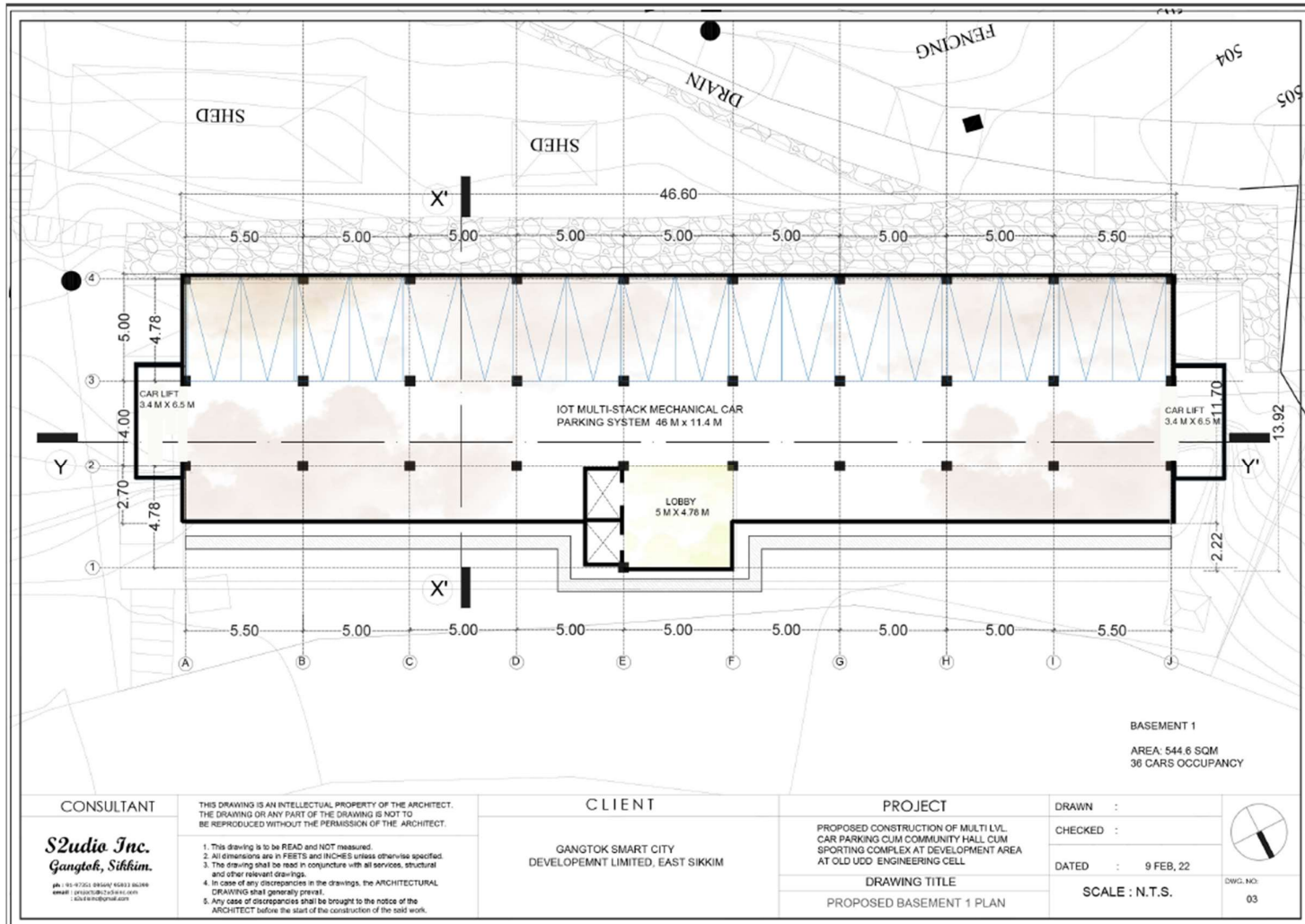
BASEMENT 1	: 418 SQM
BASEMENT 2	: 544.6 SQM
GROUND FLOOR	: 652.4 SQM
FIRST FLOOR	: 652.4 SQM
SECOND FLOOR	: 652.4 SQM
TOP FLOOR	: 652.4 SQM

TOTAL BUILT UP : 3571.9 SQM

TOTAL PARKING CAPACITY : 120 CARS

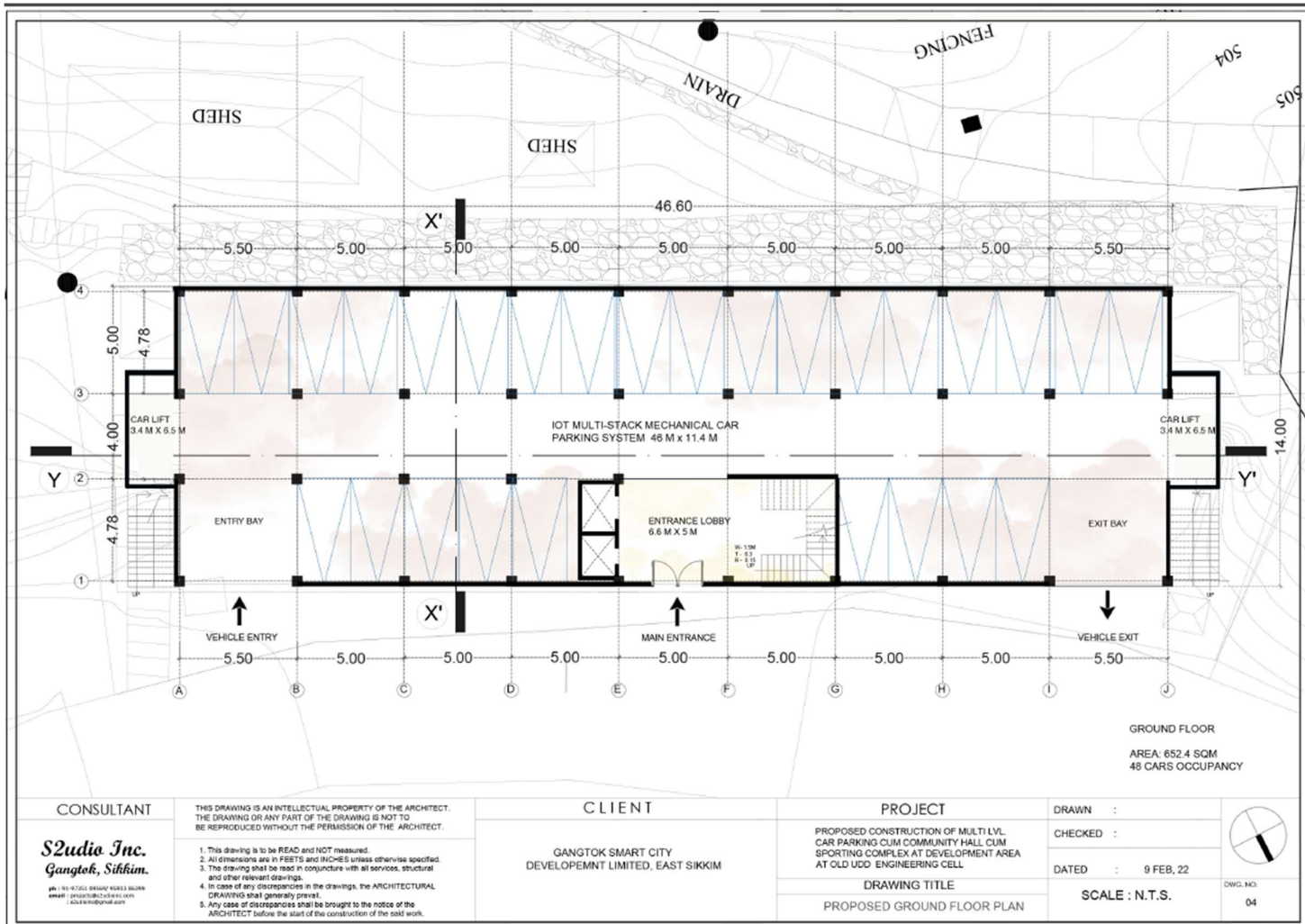
<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>PH: +91 97201 89349/ 65023 36308 email: s2udioinc@rediffmail.com s2udioinc@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <p>1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work.</p>	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPMENT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED :</p>	 <p>DWG. NO.: 01</p>
			<p>DRAWING TITLE</p> <p>PROPOSED SITE PLAN</p>	<p>SCALE : N.T.S.</p>	

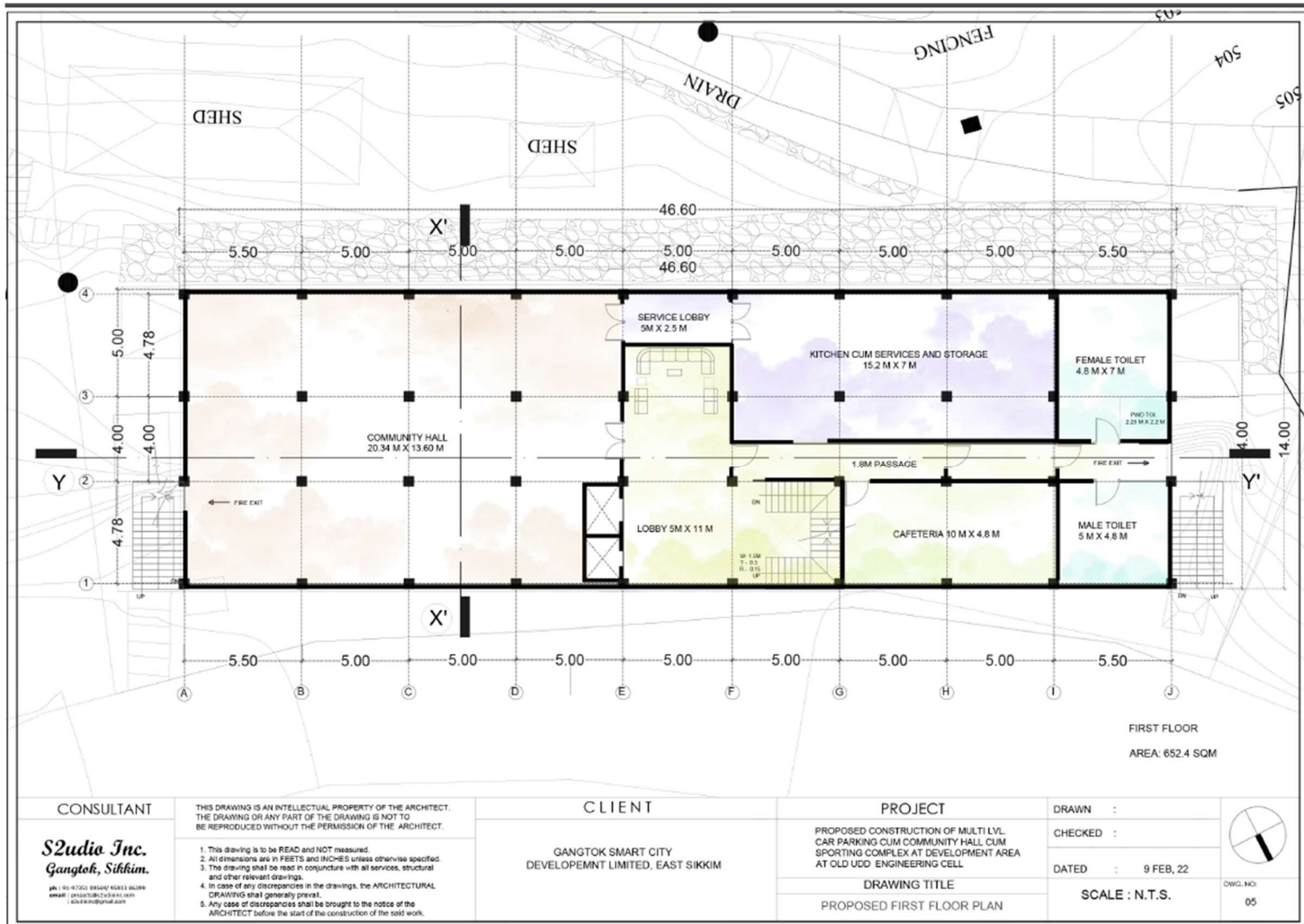




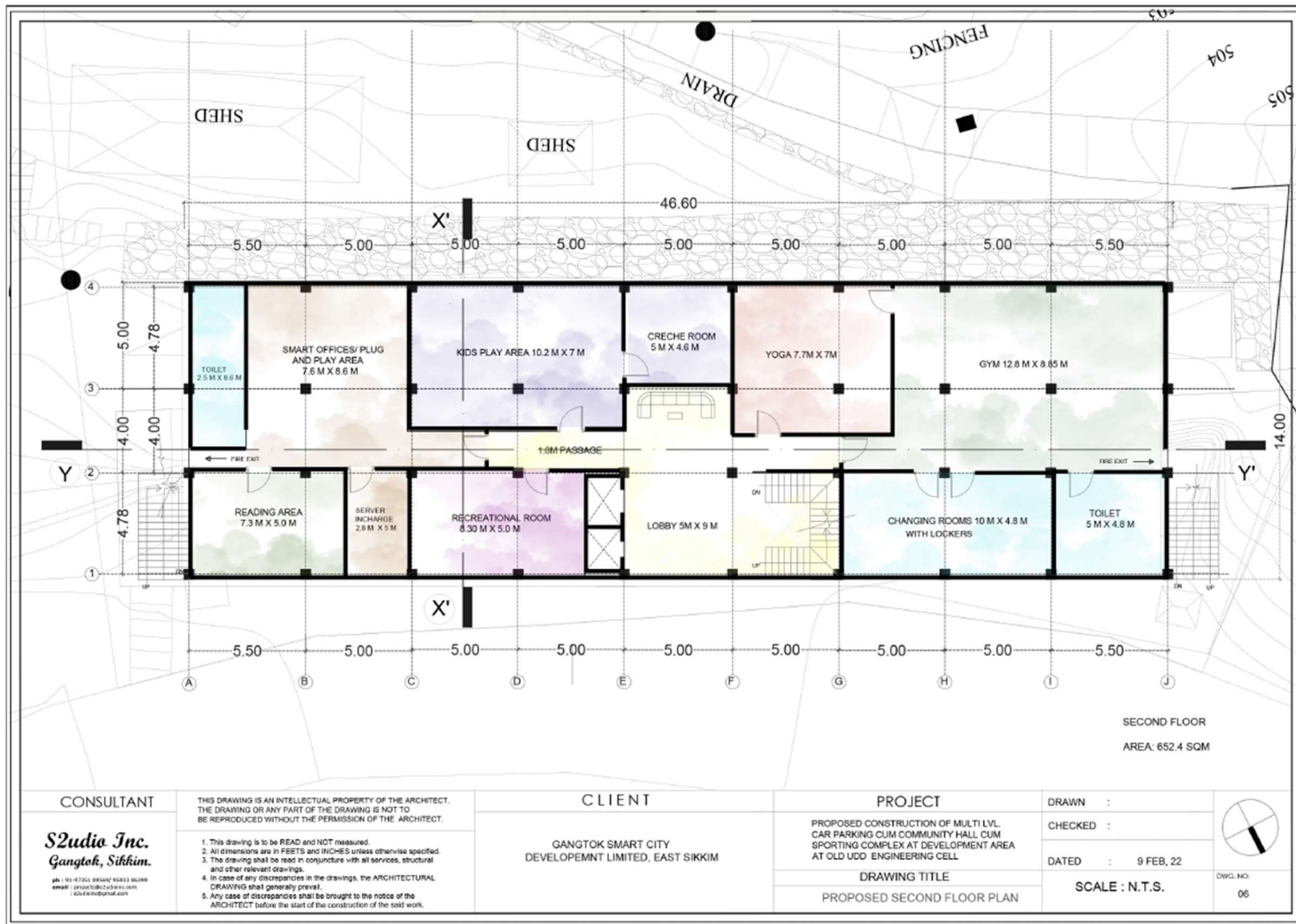
BASEMENT 1
 AREA: 544.6 SQM
 36 CARS OCCUPANCY

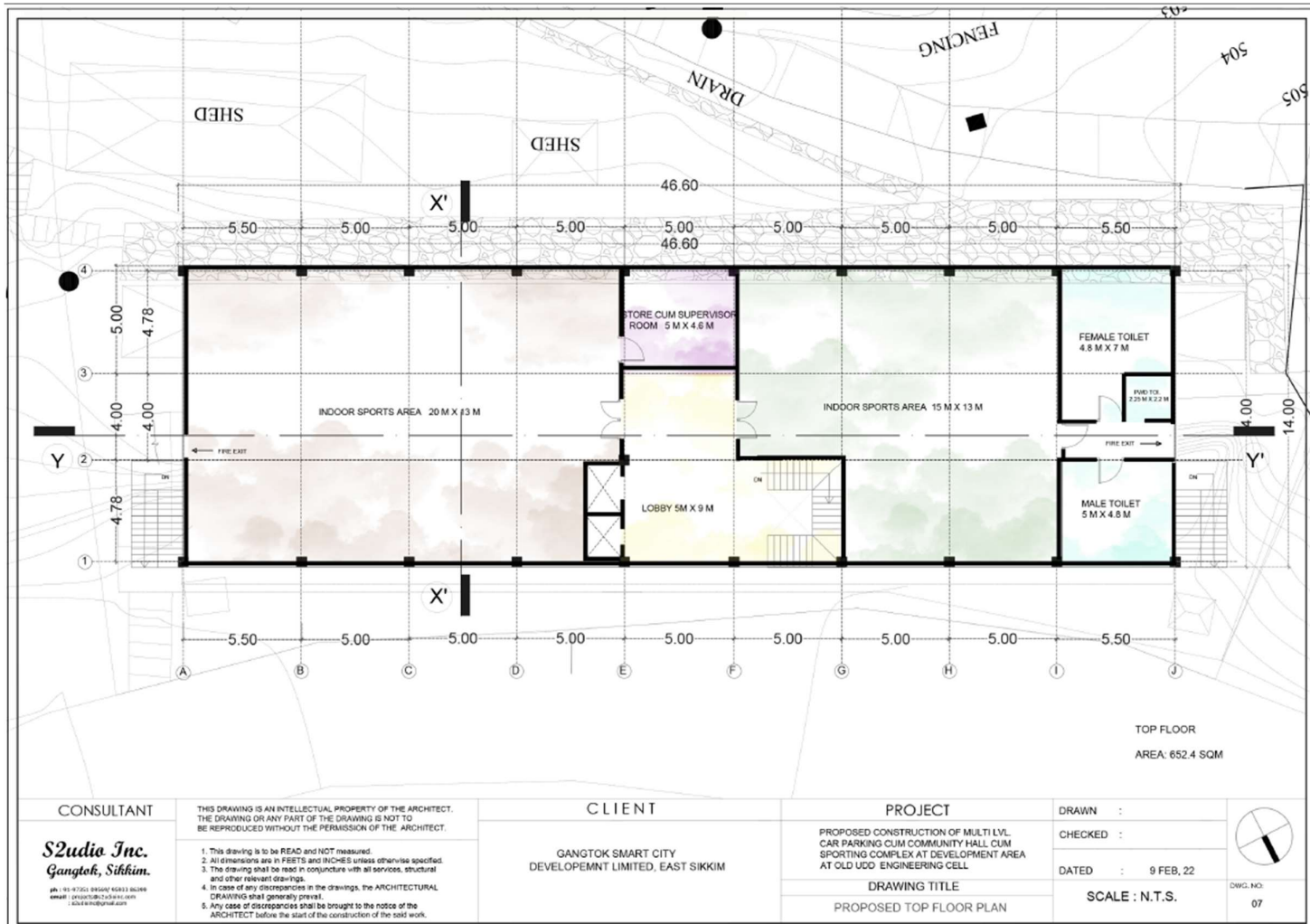
<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>ph: +91-97521 89647 62333 86288 email: s2udioinc@s2udioinc.com s2udioinc@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> 1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET'S and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>PROPOSED BASEMENT 1 PLAN</p>	<p>DRAWN : _____</p> <p>CHECKED : _____</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	 <p>DWG. NO.</p> <p>03</p>
---	---	---	---	--	---

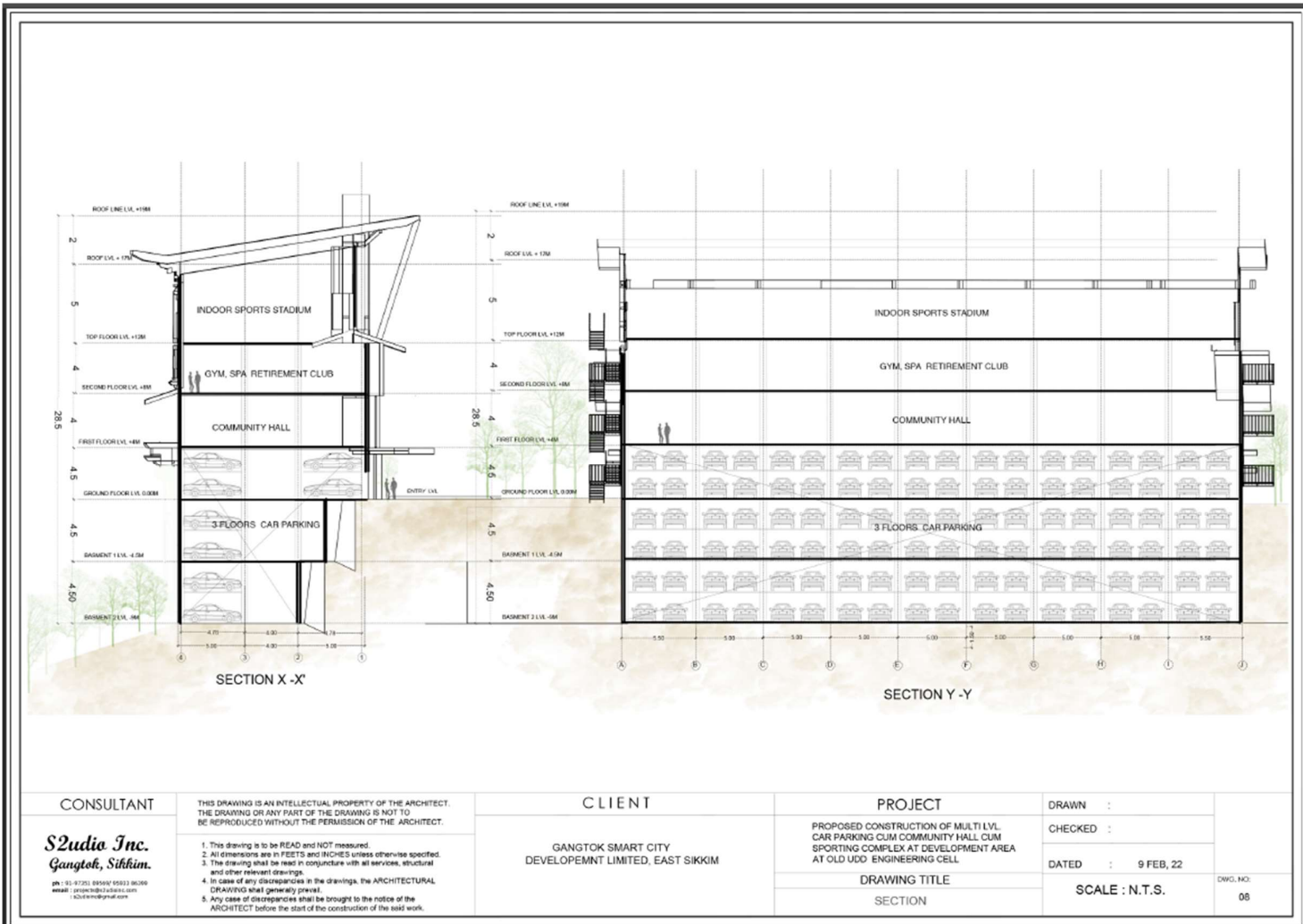




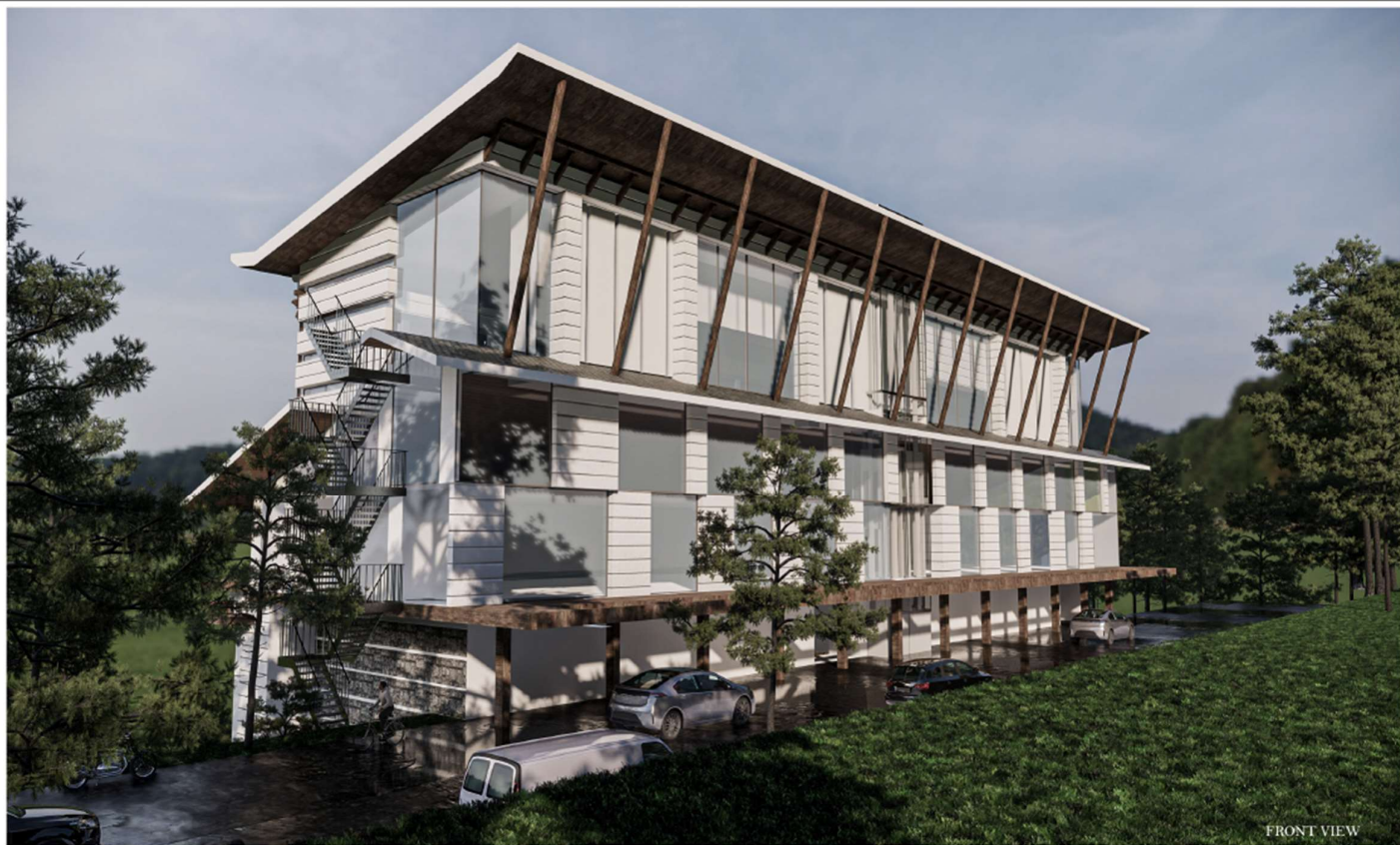
CONSULTANT	CLIENT	PROJECT	DRAWN :	 <small>DWG. NO.</small> 05
S2udio Inc. Gangtok, Sikkim. <small>ph: +91-91221 89494 4031 80299</small> <small>email: info@s2udio.com</small> <small>s2udio@gmail.com</small>	GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM	PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL	CHECKED :	
		DRAWING TITLE PROPOSED FIRST FLOOR PLAN	DATED : 9 FEB, 22 SCALE : N.T.S.	







<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>ph: +91 97251 89597 45523 86100 email: s2udio@rediffmail.com s2udio@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> This drawing is to be READ and NOT measured. All dimensions are in FEET and INCHES unless otherwise specified. The drawing shall be read in conjunction with all services, structural and other relevant drawings. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWINGS shall generally prevail. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>SECTION</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	<p>DWG. NO.</p> <p>08</p>
---	---	--	--	--	---------------------------



<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>ph : (+91) 97201 89094 9933 86289 email : s2udioinc@s2udio.com s2udioinc@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> 1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>3D RENDER</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	<p>DWG. NO.</p> <p>09</p>
--	---	--	---	--	---------------------------



SIDE VIEW

<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>PH: 91-97201 88490 80033 30399 Email: s2udio@s2udio.com s2udio@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> 1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CLUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>3D RENDER</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	<p>DWG. NO:</p> <p>10</p>
--	---	--	--	--	---------------------------



BACK VIEW

<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>ph : (+91) 87251 89497 60533 86386 email : s2udio@s2udio.com s2udio@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> 1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET'S and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CLUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDD ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>3D RENDER</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	<p>DWG. NO.</p> <p>11</p>
---	---	--	--	--	---------------------------



<p>CONSULTANT</p> <p>S2udio Inc. Gangtok, Sikkim.</p> <p>PH : 91-8721-694547 50533 30359 EMAIL : s2udioinc@s2udio.com s2udioinc@gmail.com</p>	<p>THIS DRAWING IS AN INTELLECTUAL PROPERTY OF THE ARCHITECT. THE DRAWING OR ANY PART OF THE DRAWING IS NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF THE ARCHITECT.</p> <ol style="list-style-type: none"> 1. This drawing is to be READ and NOT measured. 2. All dimensions are in FEET and INCHES unless otherwise specified. 3. The drawing shall be read in conjunction with all services, structural and other relevant drawings. 4. In case of any discrepancies in the drawings, the ARCHITECTURAL DRAWING shall generally prevail. 5. Any case of discrepancies shall be brought to the notice of the ARCHITECT before the start of the construction of the said work. 	<p>CLIENT</p> <p>GANGTOK SMART CITY DEVELOPEMNT LIMITED, EAST SIKKIM</p>	<p>PROJECT</p> <p>PROPOSED CONSTRUCTION OF MULTI LVL. CAR PARKING CUM COMMUNITY HALL CUM SPORTING COMPLEX AT DEVELOPMENT AREA AT OLD UDO ENGINEERING CELL</p> <p>DRAWING TITLE</p> <p>3D RENDER</p>	<p>DRAWN :</p> <p>CHECKED :</p> <p>DATED : 9 FEB, 22</p> <p>SCALE : N.T.S.</p>	<p>DWG. NO:</p> <p>12</p>
--	---	--	---	--	---------------------------