

Request for Proposal For ”Streetscape & Beautification in Srimanta Sankardev Kalakshetra at Guwahati (Assam)”

VOL-II -

SCOPE OF WORKS & TECHNICAL SPECIFICATION



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1 Background

Street scape & beautification in Srimanta Sankardev Kalashetra, Guwahati (Assam) area based improvement project proposed under Guwahati Smart City Mission. The objective under this project is to upgrade existing infrastructure of Srimanta Sankardev Kalashetra, premises and augment the tourism potential of the city.

The project background, site analysis, major scope of works, minimum general specifications of key equipments to be deployed for the project by the implementing agency and possible theme of the project are discussed in the subsequent sections.

2 Project Introduction

Guwahati is gifted with different heritage sites, cultural and religious structures including war memorial, temples, museums etc. in and around the city. Srimanta Sankardev Kalashetra (SSK) is one of the tourist attractions in the heart of the city.

SSK is one of the most popular tourist destinations of Guwahati, this complex has been identified for a planned intervention. The cultural museum complex and structure has been identified for revival and restoration by upgrading the existing infrastructure to preserve the heritage and historical significance of the site and to convert the place into a potential tourism spot of the city by the Guwahati Smart City Limited (GSCL).

The project “**Street scape & Beautification in Srimanta Sankardev Kalashetra, Guwahati**” is envisaged to be taken up under Guwahati Smart City Limited.

2.1 Project Objective/ Intent

The Streetscape & Beautification on the Srimanta Sankardev Kalashetra, Guwahati, will be theme based and is intended to showcase the **Cultural heritage of Assam, Assam contribution towards India**. Moreover, during special occasion like Bihu, TEA festival, Kherai festival, etc. special theme on Assam history shall also have to be incorporated in the show as per direction of authority.

The intervention aims to convert the Srimanta Sankardev Kalashetra complex into a vibrant urban space that would provide the visitor a comprehensive introduction to the heritage of Assam inclusive of its chronological history, historical monuments in the city. It is also expected that implementation of the project will add value to the already enhanced environment in the Srimanta Sankardev Kalashetra premises resulting in more visits by tourists.

3 Brief Description of Project

Selected bidder/ contractor shall be responsible for **Street scape & beautification in Srimanta Sankardev Kalashetra, Guwahati** (Assam) and its DLP for a period of 1 year.

Scope of Work of Contractor under this RFP is detailed subsequently, brief of which is given below:

Name of Work:

Viewers gallery up gradation, control room, wall redevelopment, Footpath, Landscaping, Innovative Sculptures, Wall murals etc. as per the project concept/design approved by the Authority.

DLP for 1 Year after its commissioning.

Project Commissioning Period:

Within 240 days from the date of signing of contract agreement.

Defects Liability Period:

1 Year from the date of commissioning of project.

Life of Project:

The implementation of the Project is of permanent nature & all the components are expected to have life of not less than 10 years except routine wear and tear.

4 Detailed Scope of Works: **STREETSCAPE, BEAUTIFICATION, CIVIL MODIFICATIONS**

Brief scope of work are structural civil, plumbing, electrical, landscaping, pavement etc.

The above gives the general scope of work, however tenderer is supposed to acquaint himself of various items as detailed in SOR. Tenderer may also visit the site before quoting their rates to assess the nature of work.

All type of works, as mentioned above are to be done as per safety norms and site requirement. The necessary barriers, signage for diversion etc. may be placed at site during execution of work for better traffic control and also to avoid any accident. Nothing extra shall be paid for all the above operations other than for the items specified in the SOR.

The contractor shall have to make necessary arrangements for proper storage of materials brought for the execution of work. The contractor is required to make all arrangements for barricading the site.

Necessary arrangements for storage of material, preventing dust pollution, ensuring proper barricading with entry gates and security arrangement to ensure no unauthorized entry etc. are in the scope of the contractor and no extra cost shall be paid for any of these items.

GSCL has engaged M/s DESIGN CONSORTIUM I-1778, Lower Ground Floor, Chittaranjan Park, New Delhi-110019 as their Project Management Consultant (PMC)/ Engineer-In-Charge (EIC). They shall be responsible for Preparation of working Drgs., approval of drgs., project monitoring, monthly progress report, Supervision of Construction Activities at site, Quality Control, Checking & Certification of Contractors Bill and recommending to CIC, conducting Project Review meeting, Closure of contract and all other related activities as required during construction.

INCOMING MATERIAL REPORT

All material entering the site shall be properly recorded by contractor's representative with detail of challan, bill and quantity.

INSPECTION AND APPROVAL

- a. All works embracing more than one process shall be subject to examination and approval at each stage thereof or one stage as per instruction of PMC/ EIC. The Contractor shall give due notice in writing (if required) to the PMC/ EIC when each stage is ready. In default of such a notice, the PMC/ EIC shall be entitled to appraise the quality by such measures as considered appropriate, at the cost of the Contractor.
- b. No work shall be covered up or put out of view without the approval of the PMC/ EIC and the Contractor shall afford full opportunity and facility for examination and measurement of any work which is about to be covered up or put out of view, this applies to examination of foundation also before permanent work is placed thereon. The Contractor shall give due notice in writing (if required) to the PMC/ EIC whenever any such work or stage of work including foundation work is ready for examination prior of start of concreting or covering up of the foundation and the PMC/ EIC shall without reasonable delay, unless he considers it unnecessary and advises the Contractor in writing accordingly, attend for the purpose of examining and measuring such work or of examining such foundations. In the event of the failure of the Contractor to give such notice in writing he shall, if required by the PMC/ EIC, uncover and dismantle such work at the Contractor's expense.
- c. The PMC/ EIC shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

List of documents/registers to be maintained at site

- a. Site order book
- b. Tender: Certify copy with accepted rates & specifications.
- c. Drawing: One set of all architectural and other drawings issued for the job.
- d. Time bar chart: Showing latest items wise progress & bar charts for planning.
- e. Hindrance Register
- f. Cube Test Register, if applicable
- g. Level-Record register, if applicable
- h. Record for JCB use, if applicable.

SITE LABORATORY REQUIREMENTS

- i. Equipment for conducting necessary tests (as per APWD Specifications 2004-05) shall be provided and installed at site in the well-furnished site laboratory by the agency at his own cost. The following laboratory equipment should be in general or as and when required be set up at site laboratory: -
- j.

Sl. No.	Equipment	Numbers
1.	100MT compression testing machine, electrical-cum-manually operated)	
2.	Slump cone, steel plate, tamping rod, steel scale, scoop	
3.	Vicat Apparatus with Desk pot	
4.	Megger & earth resistance tester	
5.	Pumps and pressure gauges for hydraulic testing of pressure	
6.	Weighing scale platform type 100 Kg	
7.	Graduated glass measuring cylinder of various capacity	
8.	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm, 2mm, 12.5mm]	

9.	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm; 2.36mm; 1.18mm; 600microns; 300 microns & 150 micron, with lid and pan]	
10.	Sieve Brushes and sieve shaker capable of 200mm and 300mm dia sieves, manually operated with timing switch assembly	
11.	Cube moulds size 70mmx70mmx70mm	
12.	Cube moulds size 150mmx150mmx150mm	
13.		
14.	Hot air oven temp. Range 50°C to 300°C-sensitivity 1 degree	
15.	Electronic balance 600gx0.1g., 10kg and 50 kg	
16.	Physical balance weight up to 5 kg	
17.	Digital thermometer up to 150°C	
18.	Air Content of concrete testing machine	
19.	Measuring jars 100ml, 20ml, 500ml	
20.	Gauging trowels 100mm & 20mm with wooden Spatula 100mm & 20mm with long blade wooden handle	
21.		
22.	Vernier calipers 12" & 6" size	
23.	Digital PH meter least count 0.01mm	
24.	Digital Micrometer least count. 0.01mm	
25.	Digital paint thickness meter for steel 500 microns	
26.	GI tray 600x450x50mm, 450x300x40mm, 300x250x40mm	
27.	Electric Motor mixer 0.25 cum capacity	
28.	Rebound hammer test digital rebound hammer	
29.	Screw gauge 0.1mm-10mm, least count 0.05	
30.	Water testing kit	

31.	Motorized sieve shaker	
32.	Pruning Rods 2 Kg weight length 40 cm and ramming face 25 mm ²	
33.	Extra Bottom plates for 15 cm cube mould	
34.	Standard Vibration Table for gauging the Cubes	
35.	Pocket concrete penetrometer 0 to 50kg/sq.cm	
36.	Concrete temperature measuring thermometer with Brass protection sheath 0- 100 degree centigrade	
37.	Mortar Cube vibrator	
38.	Dial type spring balance preferable with zero correction knob capacity 100 kgs. Reading to ½ kg.	
39.	Counter scale capacity 1 kg and 10 kg	
40.	Iron Weight of 5 kg, 2 kg, 1 kg, 500 gm, 20 gm, 100 gm	
41.	Brass Weight of 50 gm, 2 gm, 10 gm, 5 gm, 2 gm, 1 gm	
42.	Measuring cylinder TPX or Poly propylene capacity 100 ml, 500 ml, 250ml, 100 ml	
43.	Pyrex, corning or Borosil beakers with cover capacity 500 ml, 20 ml, 50ml	
44.	Wash Bottles capacity 500 ml	
45.	Thermometers 1-100 degree centigrade / max. and Min/ Dry and wet with table	
46.	Set of box spanner ratchet	
47.	Hammer 1lb & 2lb	
48.	Distance metre (of 100 metre)	
49.	Hacksaw with 6 blades	
50.	Measuring tape (5 metre)	
51.	Depth gauge 2 cm	
52.	Shovels & Spade	
53.	Steel plates 5 mm thick 75x75 cm	
54.	Plastic or G.I. Buckets 15 ltr, 10 ltr, 5 ltr	
55.	Wheel Barrow	
56.	Floor Brushes, hair dusters, scrappers, wire brush, paint brushes, shutter steel plate oil, kerosene with stove etc.	
57.	Any other equipment for site tests as outlined in BIS codes and as directed by the Engineer-in-charge.	
58.	Concrete Core cutter Machine	

REQUIREMENTS OF PLANT AND EQUIPMENT AT SITE

Sl. No.	Equipment	Numbers
1		
2		
3		
4	Concrete Mixer Machine (with weigh batcher)	
5	Excavator cum loader (JCB 3D model or equivalent)	
6	Vibratory roller	
7	DG set of minimum capacity 62.5 KVA.	
8	Builders hoist	
9	Needle Vibrators	
10	Automatic Ring making machine (Reinforcement)	
11	Dumper/Tipper	
12	Reinforcement cutting machine	
13	Power driven earth rammer (Soil compactor)	
14	Total station	
15	Water tanker (Minimum capacity of 4000 liters)	
16	Welding machine 400 Ampere	
17	Screener for coarse sand and fine sand	
18	Water pump minimum capacity 2 HP	
19	Plastering machine	
20	Drilling machine	
21	Shuttering with necessary props	100 sq.mt.
22	Air compressor	2
23	Granite cutting machine	4
24	Ceramic tile cutting machine	5
25	Granite polishing machine	4
26	Mobile crane (Hydra or equivalent)	1
27	Desktop Computers/ Laptop	1
28	Vehicles with driver for movement of engineers & supervisors from one building to other for supervision, coordination with various agencies and delivery of samples for Third Party Labs (Sumo/Bolero or equivalent)	3
29	Good quality Camera for taking photographs and video recording of major activities for record purpose and for quality assurance.	2
30	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Requirement

k. Note: 1. The above list is only indicative and not exhaustive. The Bidder may be required to deploy more T&P as per requirement of work.

l. 2. All the above plants & equipment are to be deployed as and when required or directed by Engineer-in-Charge.

4.1 Streetscape & Beautification:

- 4.1.1 Illumination of gates, structures. etc
- 4.1.2 Develop area for food stall for Guest near Gift Shop, and near OAT, Construction of KIOKS, tiles flooring, electrical , plumbing works outlets.
- 4.1.3 Illumination of water bodies, installation of circular fountain, and new fountains at existing water bodies.
- 4.1.4 Illumination of Trees.
- 4.1.5 Wall development along Streetscape, Commercial Artist decorative painting, Murals depicting cultural heritage of Assam. Assam contribution to India.
- 4.1.6 Innovative sculptures, Fixtures at the main road median.
- 4.1.7 Supply and Installation Signage.
- 4.1.8 Lighting around the OAT area, pavers.
- 4.1.9 Water body structure up gradation, repair cracks, repair of all leakages, railings, tilling etc.
- 4.1.10 Entrance area paving, Construction of Ticket Booth
- 4.1.11 Pavers along Footpath, Kerb Stones, Driveway, New parking area, modification in heritage walk pavers.

4 Project Commissioning Period**4.1 Project commissioning schedule**

- 4.1.9 Contractor shall complete/commission the Project in all respect and shall commence Sound & Light Show within 240 days from the Appointed Date (the "Project Commissioning Period"). Appointed Date is the 15th day of signing of Contract Agreement between the Authority and the Contractor OR the date on which the Authority has provided the Contractor access to the Project Site for implementation of the Project, whichever is later.
- 4.1.10 Bidder shall be required to adhere the following project timelines in order to complete the Project (the "Project Commissioning Schedule").

Project Commissioning Schedule of Streetscape and Beautification works.

Project Milestones Streetscape and Beautification	Works to be Completed Streetscape and Beautification	Scheduled Period of Completion
	Appointed Date- 'Notice to proceed' date	A
Project Milestone -1	Site mobilization , start of procurement of materials, Submission of Project Implementation Plan comprising project layout plan, planning of re-alignment of road and pavement area in 2 parts OAT surrounding and rear site area, rest of the site area., identification of all services like electrical, plumbing, etc. civil works existing and new work, Start of civil, plumbing, electrical other service works etc. at site.	A + 30 days
Project Milestone -2	Total Completion of civil structure and laying of underground services plumbing, electrical other service works, like lighting, signage, sculptures, wall Murals, commercial artist painting, ticket counters, food kiosks, street furniture etc. routing of all services, drainage etc.	A + 90 days
Project Milestone -3	Procurement & Delivery of all fixtures, installations, equipment, controls, items, machinery and other required fixtures at the Project cabling work, and Start of installations. Part completion of all work, like lighting,	A + 140 days

	sub-base, signage, sculptures, wall Murals, commercial artist painting, ticket counters, food kiosks, street furniture etc.	
Project Milestone -4	Part Completion of all works including equipment and installations like signage, sculptures, wall Murals, commercial artist painting, ticket counters, food kiosks, street furniture etc.	A + 200 days
Project Milestone -5	Completion of all works, rectifications installation of all fixtures, signage, control, equipment, hardware, fixture, signage, murals, food kiosk, paving work, food kiosks, panels, plaster paint, Sculptures, Ticket Booths, lighting etc.	A + 220 days
Project Milestone -6	Successful commissioning of Project conforming to all conditions of the Contract Agreement.	A + 240 days

5 Defects & Liability Period

5.1 Liability during DLP period

- 6.1.1 Contractor, from the date of issuance of Project Commissioning Certificate to till the expiry of DLP Period (i.e. 1 Year1 from the date of issuance of Project Commissioning Certificate), shall be responsible entirely for replacement/repair of any spare part/ consumables, tools/ equipment/ hardware/machinery, etc. free of cost (including transportation and insurance expenses). Contractor shall undertake its liabilities promptly under Defects Liability Period, failing which the Contractor shall be subjected to penalties and other actions as per the terms of Contract Agreement.
- 6.1.2 Contractor shall ensure smooth running of the show in accordance with the provisions of the Contract Agreement.

7 Liquidated Damages

7.1 Liquidated damage for delay

- 7.1.1 Contractor shall be liable to pay liquidated damages at the rate of 0.05% of the Bid Price for delay of each day reckoned from the date of scheduled period for completion/ Scheduled Project Commissioning Date as detailed in the Contract Agreement. The total liquidated damages of delay shall be subject to an overall maximum of 10% of the Bid Price. In case, the Contractor is not able to perform as per the satisfaction of the Authority or in case of inordinate delay, the Authority reserves the right to terminate the Contract Agreement and the Contractor shall be liable to compensate for the losses.

8 Handing Over the Project

- 9.1.1 Prior termination of the Contract Agreement, the Contractor shall handover the Project along with all Project Assets in good working & running condition to the Authority.

9 Approvals & Permissions

- 10.1.1 Following minimum approvals & permissions are required from various Government departments/ authorities:
- APDCL connection for the additional electricity demand in any earthing protection system. Contractor shall coordinate with APDCL for additional load connections if required. Any fees need to be deposited shall be reimbursed to the contractor by GSCL at actual.
 - If any tree comes in the line of construction need to be cut-down, then the contractor shall initiate the process of obtaining approval from GSCL and other concerned department/ stakeholder. After obtaining the requisite approval the contractor shall go ahead with the cutting. Any fees need to be deposited shall be reimbursed to the contractor by GSCL at actual.

Technical Specifications:

The specifications for the entire work shall be in accordance with latest CPWD specifications, Latest IS codes and manufacturer's specification, unless otherwise specified hereinafter in the detailed technical specifications.

In the absence of any Specifications covering any material, design of work (s) the same shall be performed / supplies / executed in accordance with Standard Engineering Practice as per the instructions / directions of the PMC / Engineer-in-Charge, which will be binding on the Contractor. Tenderer must inspect and read carefully before submitting their quotation. It is fully read and understood by the tenderer irrespective of the fact whether they have done so or not and no claim on this account shall be entertained at a later date. It is deemed understood that the tenderer have thoroughly read the conditions of contract before filling in the rates.

1.0 SCOPE

This specification covers the design, manufacturing, inspection, testing, painting, packing, forwarding, supply, installation, testing and commissioning of complete Electrical Works with all its fittings & accessories etc. as required.

Details of Supply & Installation Scope have been clearly specified in the attached Schedule of Quantities. This specification covers technical requirements for equipment, materials and supply installation methods, testing and commissioning of electrical works which will generally include the following.

- Internal Wiring & conduiting
- Internal Lighting Fittings Raw Power socket Outlets
- External Lighting
- Cables and Terminations
- Main LT Panel / Electrical Panels/ Distribution Boards etc.
- Earthing System
- Lightning Protection & surge voltage system
- Lighting Transformer
- Fire Detection & Alarm System
- Close Circuit Television Camera (CCTV)

This specification defines the basic guidelines to develop a suitable electrical system as necessary for the complex. All data required in this regard shall be taken into consideration to develop a detailed engineering of the system. Site conditions as applicable are mentioned elsewhere.

Compliance with these specifications and/or approval of any of the Contractor's documents shall in no case relieve the Contractor of his contractual obligations.

All work to be performed and supplies shall be effected as a part of contract requires specific approval/review of PMC/ EIC. Major activities requiring approval/review shall include but not be limited to the following:

Annexure-A

- Basic engineering documents e.g. overall single line diagram, area classification drawing, overall cable layout, testing, type test report, guaranteed particulars of all equipments and maintenance manuals.
- Quality assurance procedures.
- Field testing and commissioning procedures.
- Basic engineering calculations viz. load analysis; load flow, fault level calculations, and voltage drop calculations etc.
- Control and protection schemes.
- Load sharing and annunciation scheme,
- Sizing calculation for cable trays/cable trenches.
- Area-wise illumination level calculation and preparation of power supply distribution drawing.

Bidder shall be responsible for:

- Detailed co-ordination with other services, shop drawings for various electrical layouts such as equipment layout, lighting layouts, cabling layouts, earthing and lightning protection layouts, including equipment installation and cable termination details etc. prior to start of work.
- Preparation of bill of materials for cabling, lighting, earthing and miscellaneous items etc.
- Cable schedule.
- Lighting/power panel schedule.
- Interconnection drawing.
- Protection co-ordination drawings/tables for complete power system.
- Shop inspection and testing procedures.
- Field testing and commissioning procedures.

Bidder shall also be responsible for:

Any other work/activity which is not listed above, however is necessary for completeness of electrical system.

2. DESIGN CRITERIA

2.01 ELECTRICAL DETAILS OF INCOMING SUPPLY

a) Supply Voltage – 415KV AS PER GAIL PATA APPROVED.

2.02 L.T. POWER DISTRIBUTION SYSTEM

A)	Voltage	415V /240V
B)	Frequency	50HZ
C)	Neutral Earthing	GROUNDING
D)	Short Circuit Capacity	Fault withstand 10 KA - 35 KA (1 Sec.) as per B.O.Q. and specification.

2.03 CONTROL SUPPLY FOR ELECTRICAL SYSTEM

The various supply voltage to be used in the control panels for main equipments are:

A)	Spring Charge Motor	230V A/C
B)	Closing / Trip Coil	24V DC / 110V AC
C)	Alarm/Indication/Relay	24 V DC/ 230 V AC
D)	Heaters	230 V AC

2.04	POWER SUPPLY LOAD	433 V TPN / 240 V 1 phase A.C.
	CONTROL/DISTRIBUTION PANEL	(other supply if required shall be derived by package vendor).
2.05	PAINTING OF PANEL	Powder coating of approved shade
2.06	PAINTING OF CABLE TRAY AND STRUCTURE STEEL	Powder coated of approved shade
3.0	CABLE DETAILS	
3.01	INTERNAL WIRING	Copper conductor PVC insulated 1.1 KV grade as called for in BOQ.
3.02	POWER CABLES (L.T.)	XLPE insulated Al. Armoured Cable as called for in BOQ.
3.03	GROUNDING CONDUCTOR	Copper/G.I. strip as mentioned in BOQ
3.04	LIGHTNING CONDUCTOR	G.I. Strip
4.0	ACCURACY CLASS OF METERS	

Revenue Metres Class-0.5 or as per SEB approved.
 Ammeter Voltmeter and Other Instrument Class – I Digital Analogue as mentioned in BOQ

Slots	2 PCI Express Gen2 x16 mechanical/electrical, 1 PCI Express Gen2 x8 mechanical/x4 electrical, 1 PCI Express Gen1 x8 mechanical/x4 electrical, 2 PCI
Graphics	Professional 2D: NVIDIA Quadro NVS 295 (2 GB), NVIDIA Quadro NVS 450 (4 GB)
Audio	High Definition Integrated Realtek ALC262 Audio, optional Creative X-Fi Titanium PCIe Audio Card, optional HP Thin USB Powered Speakers
Network	Integrated Broadcom 5764 LAN, Infineon TPM 1.2 controller, optional Broadcom NIC, optional Intel NIC
Ports	Front: 2 USB 2.0, 1 IEEE 1394a standard, or IEEE 1394b optional via add-in card; 1 microphone in, 1 headphone out, HP 22-in-1 Media Card Reader
	Rear: 6 USB 2.0, 2 optional IEEE 1394a or IEEE 1394b ports via add-in PCI card; 1 audio in, 1 audio out, 1 microphone in, 2 PS/2, 1 RJ-45 to integrated Gigabit LAN, 1 serial
	Internal: 4 USB 2.0; supports up to two HP Internal USB Port Kits (one port on each Kit), up to two USB Media Card Readers, or one Internal Port kit and one USB Media Card Reader
Input devices	USB standard keyboard, USB 3-button optical mouse

Annexure-A

Monitors (screen size diagonally measured)	LCD Monitor for 24x7 use, size 20 inch flat
Warranty	Limited three-year parts, labor and 24 x 7 phone support

LIST OF APPROVED MAKE

The contractor shall supply the material as per list of Approved make of material. Due to non-availability of any material as per the make list given below or any other material not covered below, substitute material shall be used only after detail of material accompanied by all technical data, sizes, submitted to PMC/ EIC for obtaining written approval, for such material.

LIST OF APPROVED MAKES

S.No.	ITEMS	APPROVED MAKE
1	CEMENT (PPC)	ACC, LAFARGE, AMBUJA, BIRLA GOLD; ULTRA TECH
2	WHITE CEMENT	ACC, LAFARGE, AMBUJA, BIRLA GOLD; ULTRA TECH
3	WALL PUTTY	BIRLA, J.K WHITE, ASIAN PAINTS, BERGER
4	REINFORCEMENT STEEL (SUPER DUCTILE FE-500 GRADE)	From Primary Producers: TATA/ SAIL/ Essar Steel/ Jindal steel/ Shyam steel/ RINL
5	STRUCTURAL STEEL (FE-310)	TATA, SAIL, RINL, NEZONE
5	ANTI-TERMITE TREATMENT	CHLOROPYRIPHOS
6	CONSTRUCTION CHEMICALS	FOSROC, SIKA, CHOKSEY, PIDILITE, BASF, PENETRON
7	PRELAMINATED FLUSH DOORS / SHUTTERS	GREENPLY, ARCHIDLAM, ARCHID PLY, CENTURY
8	FLUSH DOORS / SHUTTERS (35 mm thickness)	GREENPLY, ARCHID PLY, SANTRO, ARCHID PLY, CENTURY
9	PLYWOOD / BLOCK BOARD / SOFT BOARD	FIDEN, CENTURY, AUSTIN PLY, GREEN PLY, ARCHIDPLY (BWR)
10	PRELAMINATED PARTICLE BOARD	GREEN LAM, MERINO, ARCHIDLAM, ARCHID PLY
11	LAMINATES (1mm thick)	GREENPLY, CENTURY, GREENLAM, ARCHIDLAM, ARCHID PLY
12	MDF BOARD	GREENLAM, CENTURY, ARCDHIDLAM, ARCHID PLY
13	ADHESIVE FOR WOOD WORK	DUNLOP, FEVICOL, PIDILITE
14	POLYRETHANE SEALANT	PIDILITE, FOSROC, CHOKSEY, SIKA, CICO, BASF
15	POLYETHELENE BOARD/ BACK UP ROD	SUPREME INDUSTRIES, FINOLEX
16	ALUMINIUM SECTIONS	JINDAL, HINDALCO, NALCO, BAEL
17	STAINLESS STEEL	JINDAL, TATA, SAIL
18	STAINLESS STEEL RAILING	GODREJ, TATA, OZONE, DORMA
19	EXPANSION / FASTNERS	FISHER, HILTI, RAWLPLUG/ AXEL India (Trixel)
20	FLOAT GLASS / TOUGHENED GLASS	SAINT GOBAIN, AIS GLASS, MODIGUARD
21	CERAMIC TILES	SOMANY, NITCO, VARMORA, JOHNSON, ORIENT BELL, QUTONE, BONZER 7,

22	VITRIFIED TILES (DOUBLE CHARGED)	SOMANY, NITCO, VARMORA, JOHNSON, ORIENT BELL, QUTONE, BONZER 7,
23	PAVER TILES	OMI or equivalent
24	EXTERIOR WALL TILES	PAVIT, ULTRA DESIGNER TILES, KAJARIA
25	PARKING TILES	NITCO, JOHNSON, QUTONE
26	TERRAZZO TILES	SOMANY, NITCO, VARMORA, JOHNSON, ORIENT BELL, QUTONE, BONZER 7,
27	CEMENT CONCRETE TILES	EUROCON, NITCO
28	SYNTHETIC ENAMEL PAINTS	BERGER (LUXOL GOLD), ASIAN (APCOLITE), ICI DULUX (GLOSS)
29	OIL BOUND DISTEMPER	ASIAN PAINT, BERGER (BISON), NEROLAC.
30	CEMENT BASED PAINT	SNOWCEM PLUS, BERGER (DUROCEM EXTRA),
31	PLASTIC EMULSION PAINT	ICI, ASIAN PAINT, BERGER, DULUX
32	OTHER PAINTS / PRIMERS	ICI DULUX, ASIAN, BERGER, NEROLAC, DULUX
33	PAINTS	BERGER, ASIAN PAINTS, ICI, NEROLAC., DULUX
34	SURFACE TEXTURE PAINT (EXTERIOR)	ULTRATECH, SPECTRUM, HERITAGE, DULUX
35	SURFACE TEXTURE PAINT (INTERIOR)	ASIAN PAINT, BERGER
36	DOOR HARDWARE	GODREJ, DORMA , OZONE , DORSET , HETTICH , KICH.
37	DOOR / WINDOWS PATCH FITTINGS	EBCO, GODREJ, DORMA, OZONE. KICH, DORSET
38	LOCKS	GODREJ, HARRISON, DOORSET
39	WARDROBE/ CUBBOARDS HANDLES	GODREJ, HETTICH, OZONE, DORMA, DOORSET
40	NON METALLIC HARDENER COMPOUND	CICO, PIDILITE, FAIRMATE.
41	POLYSULPHIDE SEALANT	PIDLITE, FORROC, FAIRMATE, PENETRON
42	PAVEMENT TILES	PAVIT, NITCO, OMI
43	MS PIPE	TATA, SAIL, NEZONE
44	MS TUBE	TATA, NEZONE
45	HOLLOW SECTION PIPES	TATA, NEZONE
46	S.S. HINGES	GODREJ, HETTICH, EBCO
47	M.S. HINGES	GODREJ, HETTICH, EBCO.
48	DOOR CLOSER	GODREJ, HETTICH, DOORSET
49	METAL FALSE CEILING (ANTIBACTERIAL / ANTI FUNGAL)	FAMELINE, ARMSTONG, GRID SQUARE.
50	SILICON SEALANT	DOW CORNING, GE BAYER, WICKER

51	PAD LOCKS	GODREJ, HARRISON, LINK, DOORSET, KICH
52	FIRE DOORS	GODREJ
53	PVC DOOR FRAMES / SHUTTERS	FENESTA, WINSTA KOMMERLING
54	METAL (GI) SHEET ROOFING	TATA BLUESCOPE, SAIL, JINDAL
56	POLYCARBONATE ROOF SHEETING	AS APPROVED
57	FLOOR SPRING	DORMA, OZONE, KICH, DOORSET
58	AUTOCLAVED AREATE D CONCRETE (AAC)	GREEN AAC, SUPERLITE, BRICK-O-LITE
59	ROLLING SHUTTER	AS APPROVED
60	EXPANSION JOIN T BOARD & ACCESSORIES	SUPREME INDUSTRIES, FOSROC
61	ALLUMINIUM COMPOSITE PANEL	ALUCOBOND, ALSTRONG, FAMELINE.
63	TILE JOINT FILLER	DURACREATE, ROFF RAINBOW TILE MATE, WINSIL 20 / SILICON SEALANT OF GE BAYER SILICON,
64	EPDM & SILICON GASKET/ RUBBER GASKET	SCHUCO/ SAPA BUILDING SYSTEMS / EUROPEAN FAÇADE PRODUCT (EPF) / RAYNERS
65	MELAMINE	ICI DULUX, ASIAN, MRF
66	SILICON WATER REPELLENT SOLUTION	GE BAYER, REMMERS, DUPONT
67	GYPSON BOARD FALSE CEILING	INDIA GYPSON, LAFARGE, GYPROC, GYPSTEEL
68	MINERAL FIBRE TILES CEILING	ARMSTRONG, USG BORAL, GYPROC
69	LAMINATED WOODEN FLOORING	PERGO, TARKETT, ARMSTRONG / GREENPLY
70	CURTAIN ROD/ DRAPERY ROD	VISTA/ MAC DECOR, DECK, ROMA
71	VENETIAN BLINDS	VISTA, MAC DECOR, HUNTER DOUGLAS
72	PVC FLOORING	ARMSTRONG, FORBO, TARKETT
73	EXTERIOR WOOD HIGH PRESSURE LAMINATE WALL CLADDING	GREENLAM, ARCHIDLAM
74	WOODEN PANELLING	ARMSTRONG, FAMELINE,
75	ALUMINIUM LOUVERS	FAMELINE, DEXON, CREDANCE , DURLUM
76	MODULAR FURNITURE	GODREJ, FEATHERLITE, WIPRO, DURIAN
77	GLASS MOSAIC TILES	CORAL, BISAZZA, OPIO, ITALIA

List of approved Makes - PLUMBING AND FIRE FIGHTING		
Sl. NO.	ITEMS	MANUFACTURER'S/BRAND
J	PLUMBING SYSTEM	
1	VITREOUS CHINA SANITARYWARE	HINDWARE/ROCA / JAQUAR/KOHLER
2	PLASTIC W.C.SEATS & COVERS	HINDWARE/ROCA / JAQUAR/KOHLER
3	C.P. FITTINGS:	HINDWARE/JAQUAR / GROHE/KOHLER/ROCA
4	AUTOMATIC WATER TAPS, AUTOMATIC URINAL FLUSHING SYSTEM	HINDWARE/JAQUAR / GROHE/KOHLER/ ROCA
5	TOWEL RING, TOWEL ROD, TOWEL RACK, COAT HOOK ETC. (304 GRADE S.S.)	HINDWARE/JAQUAR / GROHE/KOHLER/ ROCA
6	CHROMIUM PLATED / STAINLESS STEEL / POLY VENIEL CHLORIDE GRATING	HINDWARE/JAQUAR / GROHE/KOHLER/ ROCA
7	STAINLESS STEEL SINK	NIRALI
8	CAST IRON PIPE, HORIZONTALLY / VERTICALLY CASTED S & S AS PER IS:1729	AS PER APPROVAL
9	G.I. AND M.S. PIPES	TATA / JINDAL / NEZONE
10	G.I. AND M.S. FITTINGS	ZOOTO
11	UPVC PIPES & FITTINGS	PRINCE/SUPREME / FINOLEX INDUSTRIES/ SFMC
12	CPVC PIPES & FITTINGS	PRINCE /SUPREME/AKG /FINOLEX INDUSTRIES/ SFMC
15	FORGED BRASS BALL VALVE	ZOOTO /SANT
16	F.B. MULTI UTILITY CHECK VALVE	ZOOTO/SANT
17	F.B. AIR VENT	ZOOTO /SANT
18	F.B.P.R.V.	HONEY WELL/ ZOOTO /SANT
19	FLOAT VALVE	SANT/ZOOTO
20	C.I, SLUICE VALVE	KIRLOSKER / ZOOTO /SANT
21	C.I. BUTTER FLY	ZOOTO/SANT
22	C.I.NRV REFLUX	SANT/ ZOOTO
23	C.I. DUAL PLATE	SANT/ ZOOTO
24	D.I. WAFER TYPE CHECK VALVE	ZOOTO /SANT
25	C.I. Y TYPE STRAINER	EMERALD /SANT
26	C.I. DOUBLE ACTING AIR VALVE	NVR/ KIRLOSKER /SIR
27	FOOT VALVE	ZOOTO /SANT
28	REST ALL TYPE OF VALVE	SANT/ ZOOTO
29	C.I. MANHOLES COVER & G.I. GRATING	AS PER APPROVAL
33	STORAGE TYPE WATER HEATER	VENUS / RACOLD/ CROMPTON/ BAJAJ

34	INSULATION	THERMAFLEX, AEROFLEX, K FLEX
35	SOLAR HOT WATER EQUIPMENT	TATA SOLAR/ SOLAHART /HONEYWELL/SOL POWER
36	ELECTRICAL HOT WATER HEATER	VENUS/ KINGSTON /CG/ HAVELLS
37		
38	STAINLESS STEEL PIPES	JINDAL/ TATA/ SAIL
39	COPPER PIPES	RALCO/ LAWTON/ INDIGO
K	PUMPS AND EQUIPMENTS	
1	WATER TRANSFER PUMPS	GROUNDFOFOS/KIRLOSKER/CROMPTON
2	IRRIGATION PUMP	GROUNDFOFOS/KIRLOSKER/CROMPTON
3	SUMP PUMP	GROUNDFOFOS/KIRLOSKER/CROMPTON
4	WATER LEVEL INDICATOR	AS PER APPROVAL
5	WATER LEVEL CONTROLLER	AS PER APPROVAL
6	ELECTRONIC SENSING PROBE	AS PER APPROVAL
7	PRESSURE GAUGE	AS PER APPROVAL
8	ELECTRICAL PANEL	AS PER APPROVAL
9	NON RETURN VALVE (65MM DIA & ABOVE)	KIRLOSKAR/ ZOLOTO /SANT
10	BUTTERFLY VALVE (LEVER TYPE)	SANT/ ZOLOTO
11	BUTTERFLY VALVE (GEAR TYPE)	SANT/ ZOLOTO
12	FILTER AND SOFTENER	THERMAX, DOLPHIN
13	MOTORIZED VALVE	DANFOSS/ HONEYWELL /Belimo/Siemens/SANT
14	VIBRATION PAD	RESISTOFLEX/ SYNTAX
15	VIBRATION ELIMINATOR	RESISTOFLEX/ SYNTAX
16	STP / ETP / WTP	B. S. ENVIRO / THERMAX /ION EXCHANGE
L	FIRE FIGHTING SYSTEM	
1	ELECTRIC DRIVEN MOTOR AND PUMPS	GROUNDFOFOS/KIRLOSKER/CROMPTON
2	ELECTRIC DRIVEN MOTOR AND PUMPS (INDIAN STANDARD)	GROUNDFOFOS/KIRLOSKER/CROMPTON
3	DIESEL ENGINE / DIESEL FIRE PUMP	KIRLOSKAR / EICHER/ MAHINDRA
4	G.I. AND M.S. PIPES	TATA / JINDAL
5	FIRE HOSE PIPES / R R.L. HOSE PIPE WITH COUPLING (GUN METAL / BRASS /SS/ ALUMINIUM)	NEWAGE / MINMAX / SAFFIRE /CEASEFIRE
6	FIRST AID FIRE HOSE REEL WITH BRACKET, DRUM AND SHUT OFFNOZZLE	NEWAGE / MINMAX / SAFFIRE /CEASEFIRE

LIST OF APPROVED BRAND OF MATERIALS		
SL. NO.	ITEM	BRAND
1	Video Conferencing System	Polycom , Tandberg, Sony
2	Quad BRI module for Video conferencing unit	Polycom , Tandberg , Sony
3	Plasma / LCD / LCD-LED Display Panel / TV	Panasonic / Sony/ Samsung/Bose Video Wave
4	LCD / DLP/ LED Projector	Christie/ Sony / NEC / EPSON
5	Audio / Video/ Computer signal processing equipment - Switcher , Distribution amplifier , Scaler	Kramer / Extron /Bose
6	Manual Pull down / Motorized Projection Screen	Liberty / Draper
7	Motorized ceiling Lift	Liberty / Draper
8	Projector Mount	Anson/ Draper / Liberty
9	Low noise shielded Video signal cable	Kramer / Extron/ Bose/ Gotham/ Klotz
10	VGA to HDMI converter / scaler	Kramer / Extron /Bose
11	Table Pop up box with VGA /HDMI/ RJ 45 / Power / Audio	Kamer / Extron/ Magnum/ Bose
12	VGA , BNC , RCA connector	Kramer / Neutrik /Bose
13	Pan / Tilt / Zoom - Dome / Robotic camera	Sony / Samsung
14	Digital Twisted pair Audio / Video encoder transmitter / receiver	Kramer / Extron
15	Digital Video Recorder	Samsung/ Bosch / Sony
16	Professional grade CD/ DVD player	Tascam/ Sony/ Panasonic
17	Low noise composite video cable	Kramer / Extron/Gotham/ Klotz /Bose
18	Digital Interactive Pen display	Wacom -Japan/ Qomo
19	Document Camera	Qomo / Lumens
20	Wall plates with VGA / HDMI / Analog Audio	Kamer / Extron/ Magnum
21	Skew free data cables	Kramer / Extron
22	Wired/ Wireless touch screen control system pack for controlling Audio, Video,Lighting & other electrical equipment	Crestron/ AMX
23	Video Wall & video wall processor	Vtron / Christie
24	In Ceiling / In Wall Speaker	JBL / Bose /Tanoy / Funktion
25	Speaker for PA system	JBL / Bose /Tanoy / Funktion
26	Professional Audio Amplifier / Mixer amlifier	Crown / Bose / Bittner / QSC/ Ohm/ Lab-Gruppen

27	Table embedded Microphone	Crown/ AKG/ Sennheiser / Shure
28	Boundary Layer Microphone	Crown/ AKG/ Sennheiser / Shure
29	Dynamic Microphones for Vocal / Musical instrument	Crown/ AKG/ Sennheiser / Shure
30	UHF cordless Microphone - Handheld/ Lapel /Headworn	Crown/ AKG/ Sennheiser / Shure
31	Digital Programmable audio processor with Mic, Line input , Auto echo cancellation , auto adjustable noise threshold	Blamp-USA / Bose / BSS -London
32	Analog Audio mixer with pahatom power	Bose/ AKG/ Crown/ Soundcraft / Allen heath
33	Automatic Feedback suppressor with programmable Fixed & Live filters	dbx/ Bose/ Shure
34	Automatic audio mixer with AGC , Compressor , Phantom power , Gain adjustment	AKG/ Blamp/ Shure/ Bose / Sound craft / Makie / Allen heath
35	Loudspeaker management processor	dbx/ Bose
36	Audio Conferencing system Wired/ Wireless	Bose/ AKG/ Bosch/ Shure / Sennheiser/ Beyerdynamic / Crown
37	Low noise two core speaker cable	Kramer/ Extron/ Klotz/ Gotham/Bose
38	Low noise two core audio signal cable	Kramer/ Extron/ Klotz/ Gotham / Bose
39	Professional grade patch cord for VGA / HDMI / Audio	Bandrdge / Kramer
40	Audio XLR / RCA / Phono/ BNC connector	Neutrik/ Amphenol
41	Equipment Rack	APW / Valrack
42	Online / Off Line UPS system	APC / Neumeric/ Orion
43	Servo controlled stabilizer	Vertex / Max
44	Dimmable Ballast - (Analog, DALI , DSI) for Crestron/ AMX control	Osram/ Phillips / Tridonic -ATCO
45	Analog to DSI converter for Dimmable Ballast	Osram/ Phillips / Tridonic -ATCO

SL NO	SUB HEAD OF ELECTRICAL WORKS	DESCRIPTION OF WORK	STANDARDS / NORMS
1	CONDUITING & WIRING	Concealed copper wiring with multistrand FR / HFFR copper conductor with necessary earth continuity	Wires: FR / HFFR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts Works : As per IE Rules ammended up-todate
2	SWITCHGEAR & PROTECTION	Modular switches with GI Metal Box with circuit protection arrangement with MCBs & MCCBs, RCCBs and Distribution Boards and circuit protective devices	DBs: IP 43 Switches : IS 3854:1997 MCBs, RCCBs & MCCBs : IS/IEC 60898-1:2015
3	CABLE LAYING WORKS	Laying of Power cable from Transformer to Panel & Feeder Panel etc	PVC/XLPE insulated and PVC sheathed 1.1 KV Grade Solid Aluminium conductor up to 10 sq mm balance stranded conductor, XLPE Insulated, cores laid up, PVC tape inner sheathed, Armour IS 7908(Part 1) 1988 armoured U.G. cable U.G. cable laid in ground/partially in air (as required for termination over ground including excavation of cable trench up to depth of 75cm, refilling, protective brick covering, Sand cushioning etc complete handling of surplus spoil etc. As per IEC 60227/IS 694, IEC 60502/IS1554standards
4	EARTHING WORKS	Installation of Earthing Installation and drawing continuity	As per IE Rules
5	PANEL BOARDS	Fabrication of Panel Boards after approval of SLDs	Metal Sheet: 16 SWG Switchgear: As per approved Specification & Brand only Earthing : As per IE Rules
6	EXTERNAL ELECTRICAL WORKS	Installation of Transformer, Substation Equipement, Earthing, Liasioning with Local DISCOM (APDCL) for load sanction & Supervision charges & CEIA authority for approval for charging the Installation.	Transformer: As per IS 1180-2014, IS 2026, BS 171, IEC76 (As per APDCL approved Brand) Fitting & Accessories : As per IS 3639 (as per APDCL approved Brand only)
7	CAMPUS ILLUMINATION	Illumination of campus considering security aspect.	Light fixtures : As per approved brand Poles : as per approved Brand IS 2629/IS2633/IS4759 Standard with average coating thickness of 65 micron, can withstand wind speed of 180 kMPH; with Decorative Arm for light fixtures Illumination : Recommended Light level 30 Lux

Annexure-A

9	LIGHTNING PROTECTION	Advanced OPR Lightning protection system	As per IE Rules and as per IEC 62305
10	LED Light fixtures	Supply & Installation of LED Surface / Recessed Down lighters, Tubes and Bulbs as required as per approved design	Brand: As per approved brand having BIS standards only as per BIS 16102(Part 2) : 2012
11	Ceiling Fans/ Exhaust Fans	Supply & Installation of 5 Star Rating Ceiling Fans / Exhaust Fan as per design	Brand: As per approved brand having IS standards only as per IS 374:2019
12	Air conditioning Work		As per ASHRAE standards with approved brand only
13	VENTILATION	Ducting for ventilation and use of Inline axial Ex Fan for proper ventilation	Proper Ventilation should be provided at Electrical Room, Toilet and Laboratory as per ASHRAE guidelines
14	Lighting Automation	Corridors and Toilet should be provided with Motion sensors for illumination of light	As per approved Brand of Sensors only
15	LIFT	As per design	Conform to Harmonised guidelines to access by Diblyanga People and recommended Indian Standards are IS 14665 and IS 15259. If it is a machine room less elevator then IS 15785 with Auto Rescue Device only
16	Audio Video works for Conference Room	As per design	With approved Brand of Materials only
17	Water Pumps	As per design	Should be operated through Hydro-numatic switchgear only
18	Fire Detection & Announcing System	As per design	As per ISO 7240-14:2013 with approved Honeywell or other brand only
19	Fire Hydrant Electrical Works	As per design	As per State Fire & Emergency Services Department Norms

APPLICABLE PERMITS

1 Applicable Permits

1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

- a. Permission of the State Government for extraction of stone from quarry;
- b. Permission of Village Panchayats and Pollution Control Board for installation of crushers;
- c. Licence for use of explosives;
- d. Permission of the State Government/ local bodies for drawing water for construction;
- e. Permission of the State Government for felling of trees or jungle clearance;
- f. Licence from inspector of factories or other competent Authority for setting up batching plant;
- g. Clearance of Pollution Control Board for setting up batching plant;
- h. Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
- i. Permission of Village Panchayats and State Government for borrow earth; and
- j. Any other permits or clearances required under Applicable Laws.

1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.