

SCHEDULE 11- SPECIFICATIONS AND STANDARDS

OF

PROJECT DEVELOPMENT AND MANAGEMENT AGREEMENT

between

GUJARAT COUNCIL OF SCIENCE CITY (AUTHORITY)

and

(DEVELOPER)

For

**Tender for Development, Operation and Maintenance of
Multimedia Laser and Video Show on Water Screen with
musical dancing fountain at Gujarat Science City on PPP
mode**

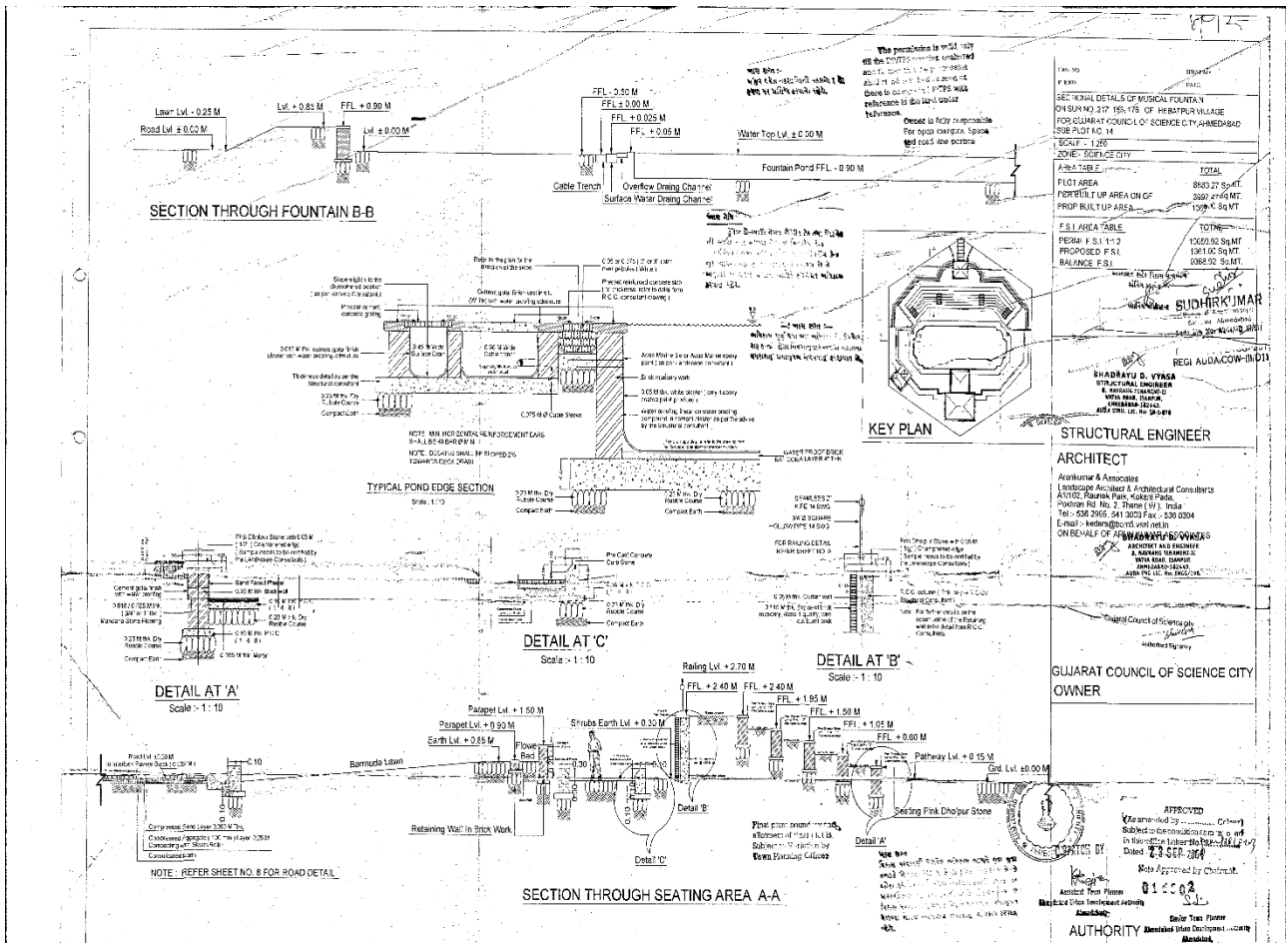
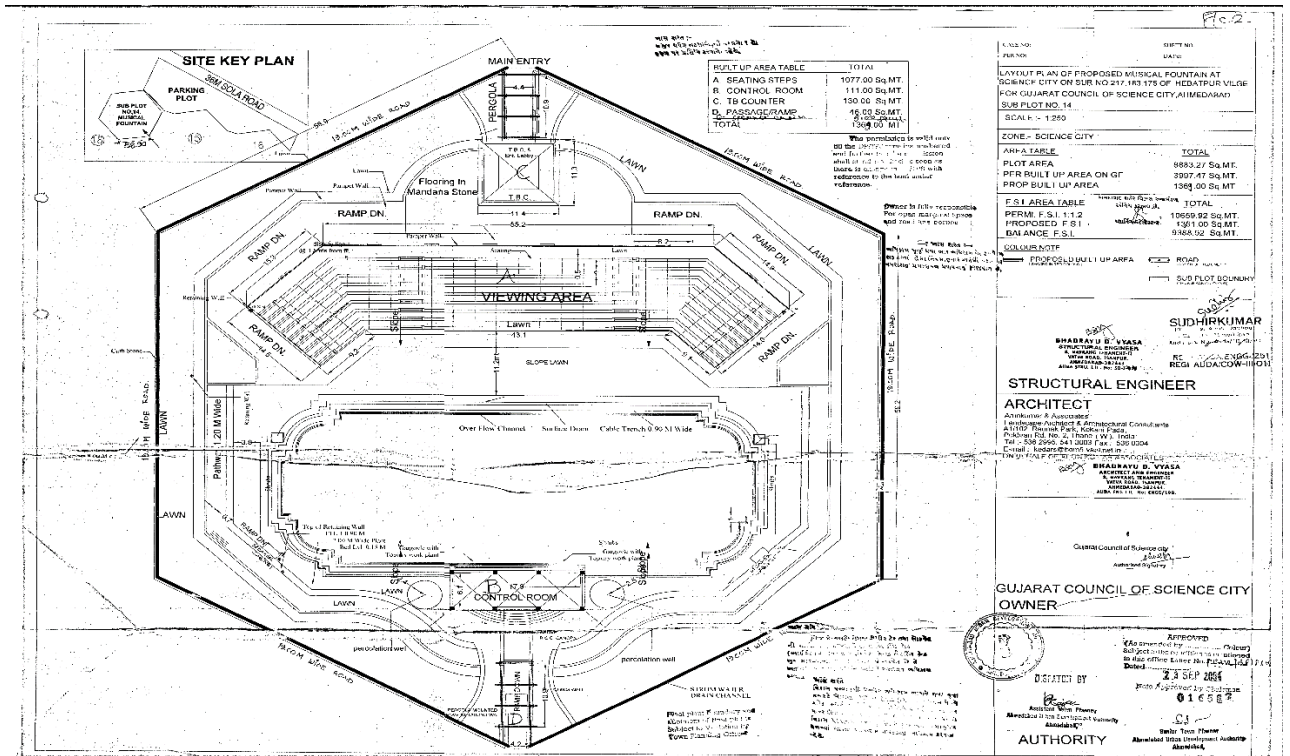


Gujarat Council of Science City
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Contents

SCOPE OF WORK	4
1. SCOPE OF WORKS- GENERAL	4
2. SCOPE OF WORKS- FOUNTAIN AND SHOW	5
3. SCOPE OF RENOVATION AND RETROFITTING OF EXISTING FACILITY:	17
3.1 Pond Area:	17
3.2 Control Room:.....	17
3.3 Visitor's Area including entrance:	18
3.4 Water Treatment Plant:.....	18
4. SCOPE OF OPERATION AND MAINTENANCE:.....	19

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City



Scope of Work

1. Scope of Works- General

- i. Bidders are advised to submit their respective Bids after visiting the Project site and ascertaining for themselves the site conditions, location, surroundings, climate, availability of power, water and other utilities for renovation, access to site, handling and storage of materials, weather data, applicable laws and regulations, and any other matter considered relevant by them
- ii. Electricity- Developer shall utilize the existing electricity and water infrastructure for executing the construction works. Cost of Electricity and Water shall be borne by GCSC during the Construction Phase. Developer shall be responsible for making their own arrangements for drawing water and electricity, if additional load is envisaged. During the O&M phase, the cost of electricity and water shall be borne by the Developer, which shall be through a metered connection, monitored separately
- iii. Commissioning of the Project shall be completed on or before Scheduled Commercial Operation Date
- iv. Property Tax (if any), shall be borne by the Developer

2. Scope of Works- Fountain and Show

- i. The Developer shall design, supply, install, commission, Operate & Maintain at site the Musical Fountain in accordance with relevant approved drawing, document and manuals etc., including all related civil & plumbing works.
- ii. The scope includes conceptualization and finalization of theme/s, content development including all scripts, voice and musical recordings, all designs and related engineering solutions, preparation of drawings, providing, supplying, laying and fixing of all necessary light fixtures, fountains, cascades etc. with necessary components, operation & maintenance for maximum three years after performance test and issuance of completion certificate.
- iii. Projection mapping on a civil structure near the Musical Fountain – use of technology by the Developer to project imagery onto traditional flat surfaces. Projections mapping shall be an integral part of the musical fountain show. All civil works required to execute the structure of the projection mapping shall be carried out by the Developer.
- iv. The system shall work with a flexible set up. We require submersible pumps which have to be fully controllable. All frequency controllers need to provide the required safety for the usage of electricity inside water as per best practices and standards.
- v. The water patterns should be synchronized in such a manner that it should blend the events and if needed, amplify it. The patterns should be a harmony of music, water and lights.
- vi. The show should comprise of water effects which are switched on and off in a split second. The water effects appear to travel all over – all lit in a multiplicity of beautiful colors. The features should comprise of a computerized control system – software specifically written for controlling and synchronizing the water features.
- vii. The floating synchronized dancing water features should comprise of fast high-speed acting jets which can form a high definition screen.
- viii. Water effects: Minimum should be considered by the Developer, as mentioned in S.No ix. Developer would have the flexibility to choose any additional effect of his choice provided that it is approved by GCSC. The proposed effects shall be made part of the presentation to be submitted and presented to GCSC as part of tender evaluation.
- ix. Show control system: Developer are not just to deliver an engineering project but to have a demonstrated ability to integrate engineering with a creative and artistic process to produce a complete show/spectacle. Show Manager should be capable of integrating user created artwork, videos, photos, sounds etc. With the aid of a timeline, any number of levels, tracks, layers. Chapters and animation parameters, still images, the system should be compatible of rendering images on the water screen. All elements should be loaded form the centralized data server into the resources window and previewed without any heavy rendering process, stitching, slicing etc. All required software with license is to be supplied by the Developer. The Show Control System should be an easy to use, versatile programme running on a dedicated computer which enables complex multimedia shows to be organized and run automatically. The system should control water effects, projectors, and stream music and voiceover. Complex and spectacular shows should be easy to assemble, edit and run with exceptional ease of use. The system shall have the following unique features such that:
 - a. Programming of the water features can be done at site by Developer’s personnel.
 - b. Fine tuning can be done at site and to meet specific requirements.
 - c. Programming can be done online – implementing a command on screen will bring up the effect on the fountain.
 - d. Programming is faster and more accurate.
- x. Content Production: Contents shall be as per the concept with consultation of GCSC.

- a. Produce different subject based mixed media content with light, sound & laser of duration of about 20-25 minutes each using the laser beam animation, fountain formations and video projection system with projection mapping as per the approved script by GCSC
- b. All scripts and shows must get approval from GCSC and any modifications/alterations suggested by GCSC should be suitably modified and altered to the satisfaction of GCSC
- c. New mixed media content needs to be developed and played every three months during the operation period
- d. The content must be innovative and world-class
- e. The thematic content of the fountain shows shall be based on both Science/Technology as well as rich culture and heritage of Gujarat.
- f. Voice over and storyline are crucial elements of the entire show. Developer to ensure content development, script and voice in different languages, sound and overall dramatization effect shall be done by reputed personalities in these fields. All show elements shall be scrutinized by the Authority before production. Any suggestion for modification/ improvement by the GCSC shall be duly incorporated. The narration shall be in Hindi and English
- g. The Show will be held for 6 (six) days in a week in the evening time after sunset. There will be four shows each of two of the languages
- h. This Musical Fountain will be operated in synchronization with the ambience lighting system, thus enhancing the aesthetics of this place during show time. The work of ambience shall be in the scope of the Developer.
- i. The Developer has to ensure that the copyright and intellectual property rights issues are not violated in any form.
- j. The Developer shall be ready with and get at least 2 different productions approved before commissioning of the project (each show in two languages)
- k. In addition, one new show needs to be produced during each of the three years of concession period (each show to be in the two languages). The same will be prepared and submitted by the Developer prior to the start of the respective year
- l. After the show is soft commissioned, the same will be reviewed by GCSC. Suggestion in the concept/integration, voice, etc. received from GCSC same need to be incorporated before the show is finally commissioned.
- m. Royalties and rights of contents will remain with GCSC. The Developer shall have no claims, whatsoever, on the content.


xi. Viewers Gallery, Control Room

- a. The cost of all the civil works for viewer's gallery will be in scope of the Developer
- b. Developer shall bear the cost of civil works, furniture, Air Condition or any other equipment or machinery that shall be used in the control room.

xii. Component wise requirements, specifications, makes and/or brands:

S. No.	Component Name	Minimum Required Specifications	Material of Construction (MoC)
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1	360° / 180° moving fountain system	<p>a) Developer to develop a system without belts and automatic positioning for vertical position</p> <p>b) Fast and wide range to offer a wide range of effects</p> <p>c) Set up within the show line instead of static fountain</p> <p>d) Minimum height of water –to suit the requirement of the design brief.</p> <p>e) Nozzles of required type and capacity should be installed to achieve desired effect</p> <p>f) Pumps of required type and capacity to achieve desired effect</p>	<p>a) Pumps – CI. Material with low maintenance and high durability.</p> <p>b) Pipes and Nozzle - Stainless steel</p>
2	Frequency controlled water jets	<p>a) Minimum height of water - to suit the requirement of the design</p> <p>b) The listed water effects should also be included</p> <ul style="list-style-type: none"> • Central Jet- It is expected that the central jet to be at least 30-40 m in height. • Sun burst Jet • 2D Nozzles • 3D Nozzles • Chasing Set • Inner Drop • Outside Drop • Flame Effect • Arch Jet • Air shooters jet <p>The above-mentioned water effects are not exhaustive, and Developer can add more as per their design plan.</p> <div data-bbox="563 1451 959 1731" data-label="Image"> </div> <p><i>Illustrative image of water jets</i></p>	<p>a) Pumps - CI;</p> <p>b) Metals for the water fountain - high quality nylon or HDPE/Stainless steel/brass</p>

3	Frequency controlled water cannon	<p>a) Minimum height of water- to suit the requirement of the design brief– Nozzle of a minimum inner diameter to suit the requirement of the design brief</p> <p>b) Solenoid valves could also be used.</p>	<p>a) Pumps - CI; b) Metals for the water fountain - high quality nylon or HDPE/Stainless steel/brass</p>
4	<p>Water Screen to be at least approx. 10 m Height *30 Width (single screen or a combination of two/three screens)</p>	<p>a) Nozzles to be polished with high finish surface for best laminar flow</p> <p>b) Developers should choose a combination of pumps to achieve the desired effect</p> <p>c) Water Screen should create a volume of water which gives an impressing feeling of 3D effect. The water screen should be mapped to give better experience.</p> <p><i>Illustrative image of water screen</i></p> 	<p>a) Pumps - CI/GI; all technology sealed in an oil bath / submersible pump</p>
5	Projection Mapping	<p>a) Refer 2(iii) above</p>	
6	Water/haze fog system / Oil Hazer	<p>b) Water fog nozzles including pumps to create real fog</p> <p>c) pump with digital switches on/off</p>	<p>a) Water fog nozzle – Stainless Steel b) Pump – CI</p>
7	LED lights	<p>a) LED lights - RGBW punch light systems (light effects or luminosity should reach to top of each water effect). Wattage to be estimated by the Developer</p> <p>b) Under water light - water proof (IP68)</p> <p>c) Separated power supply pack outside the water</p> <p>d) Light panels IP 65</p>	<p>SS 304 Body and SS Cable Gland with required stand</p>

9	Show control system	<p>a) Auto run ability show control system</p> <p>b) Fibre glass connection between controls and systems with back up connection</p> <p>c) High Performance Gigabit/Fiber Optic Ethernet Switch (managed), 8-port Gigabit Network/ 2-port along with compatible fiber and cable drum</p> <p>d) Audio Source min quality 44.1kHz stereo WAF format; digital audio player with SMPTE 25f/s TC interface</p> <p>e) Latest generation of control software system. Server with Required software for DMX control along with related accessories. It shall be fully loaded with software package & valid license as required for controlling the sound, Lights, laser, projector and other requirements.</p> <ul style="list-style-type: none"> • media control server complete with in-built hardware interfaces for 2D, 3D mapping, animation as per following details Gigabit Ethernet • Server grade hardware component, built for 24/7 use • Enterprise level NVMe SSD • 3 x stereo pairs audio out (unbalanced, 3.5 mm) and line-in for timecode • Genlock input • Frame lock input • 4 Channel Output • 4/6 x Mini Display Port 1.4 • Up to 4K@ 60Hz 4:4:4 per channel <p>The above-mentioned details are not exhaustive.</p>	<p>a) Show Control System: Hedge Hog 4X or Avolite/ Watchout / Coolux / ShowCAD Artist/ Synchronom</p> <p>b) Media Control Servers/Fountain control server with Software's & licenses - Dataton/ Coolux (Christie) /Medialon/AV Stumpfl/Standalone/Syncronorm</p> <p>a) Fiber System: Rock Solid Technologies, RockLink, Fiberfox® EBC 1502 or better brand product with equivalent specifications</p>
10	Audience + FOH effect lights	<p>a) LED Pars: RGB W/ 54/10 /12 channel/IP 65 (waterproof)</p> <p>b) B330 moving head: \ 30 channel/32 gobo/3 zoom/IP 65</p> <p>c) Lighting control boards: 4064 channel/digital/programmable/8 USB</p> <p>d) Aluminum Truss</p>	<p>a) LED Pars: Acme or Silverstar or Flash/DTS/LBT/Anolis/Wibre</p> <p>b) Moving Head: Silverstar/Numedia/NJR/DTS/Flash / Robe / LBT / Anolis / Wibre</p> <p>c) Lighting control boards: avolite Pearl 2015 / ShowCAD Artist</p> <p>d) The lighting control board should be an updated one as per recent technologies</p>

12	Audio for FOH	<ul style="list-style-type: none"> a) Injection molded speaker cabinets, with IP 65 rating (outdoor use) with multi-tap voltage transformer b) 500-watt amplifiers c) 32 channel mixers d) Racks and Stands e) Cordless Mikes f) Handheld Mikes g) DAC h) Delay i) High quality sound system with amplifiers and wide frequency speakers for dynamic and surround sound should be used. j) The loudspeaker shall be able to handle 800 watts of Pink Noise power for at least 100 hours continuously. k) 7.1 surround System or higher surround range surround system with standard Configuration and format with balanced sound stage created for operational Performance to the intended gathering. 	<ul style="list-style-type: none"> a) Speakers - JBL/ Bosch (EV) / Martin/Bose/QSC b) Amplifiers - Crown / Powersoft / Lab Gruppen / Bose/ Dyna Cord /QSC c) Channel Mixer <ul style="list-style-type: none"> i. Manual - Allen & Heath / Mackie / Soundcraft / Yamaha ii. Automatic – BIAMP / Clear One / Polycom/Shure d) Cordless Mikes - UHF- Shure/ Sennheiser / Bayer Dynamic e) Handheld Mikes - Shure/Sennheiser f) DAC – Denon / Yamaha / Pioneer
13	Laser System	<ul style="list-style-type: none"> a) Minimum 20W RGB solid State white light system - Cambridge scanner system; min scan speed 50 kpps; mechanical beam safety device; ILDA and Ethernet CAT 5 compatible; Max angles 80°; Max beam diameter 5mm or less b) Show control system 	<ul style="list-style-type: none"> a) 20W RGB solid State white light system - Laser Animation/Kvant / Laser World/ Tarm/ HB Laser b) Show Control System – DSP Laser Animation Show Control or Pangolin c) Showcad/ Pangolin/ Avolite/ Synchronom Grand MA/ Realizzer or equivalent indigenous make
14	Projection System	<ul style="list-style-type: none"> a) Projector with brightness 20.000 ANSI Lumen (20.000 center Lumen) b) Original Lenses c) Flying frame for stacking d) 1 No. Media server with WUGXA for various high-resolution media contents with network ability e) Light source Laser; f) Resolution \geq (1920 X 1080) or better; g) Contrast Ratio \geq 2000:1 or better; h) Light source lifetime: \geq 20,000 Hours or better i) Power Consumption 2200 W or less j) Dust protection with IP60 standards or better. k) Filter less operation with liquid cooled technology 	<ul style="list-style-type: none"> a) Projector - Christie/Barco/Panasonic/ Digital Projection 20000 lumens high resolution b) Original Lens - From respective OEM

Note:

1. Electrical Network System shall be approved from GCSC before procurement and installation.

2. *Electrical fixtures that would be subjected regularly to water: IP68 and Others electrical fixtures: IP65; Cables to be used under water shall be submersible type.*
3. *Any other requirement not specified above but would be required to execute the project as per the approved design/concept to be incorporated by the Developer. No additional cost will be provided in this regard.*

xiii. Performance Guarantee Test: The Developer shall conduct hydraulic Tests in dry bed condition to ensure a watertight plumbing and joinery works and then a performance test of the musical fountain in water-filled pond. The performance Tests shall be carried out for continuous 3 hours of unhindered/ uninterrupted operation and shall be continued till one such successful operation is performed to the entire satisfaction of the client. Upon conducting one such successful Tests, the same 3-hour duration performance test shall be repeated till 15 more successful consecutive operation are achieved in 15 consecutive days. For all imported critical materials /components that will normally remain submerged underwater, another similar successful operation shall be carried out for consecutive 7 days. The decision on any item/component whether to be repaired or replaced following defect/non-performance of those items during performance test shall be solely at the discretion of the client

List of Major Equipment with Makes

Civil, Architecture and Interior Works		
Sr. No.	Description	Approved Make/ Approved Vendor
1.	Vitrified Tiles	Kajaria, Qutone, Asian, Hr Jhonson, Somany, Nitko
2.	Epoxy Terrazzo Flooring	Neocreate, Cmc, Flowcrete, Optimal Floor
3.	Ceramic Tiles	Kajaria, Qutone, Asian, Hr Jhonson, Somany, Nitko
4.	Carpet	Shaw, Interface, Tandus, Miliken
5.	Teak Wood Skirting	Burma/Ballasha/Ghana/ Nagpur Cp Teak
6.	Porcelain Mosaic Tiles	Piccolo, Paladio, Bisazza
7.	Paver Block	Endura, Spectra, Vyara
8.	Gypsum Board Ceiling	USG Boral, Saint Gobain
9.	Mineral Fibre Acoustical Ceiling	Armstrong, Gyproc, Knauf, Hunter Douglas
10.	Stretch Fabric Ceiling	Pandora, Barrisol, Barrilux, Euroceil
11.	Gypsum Board Partition	USG Boral, Saint Gobain, Armstrong
12.	Open Cell Ceiling	Armstrong, Hunter Douglas, USG Boral, Linder
13.	Micro Perforated Gypsum Ceiling	Saint Gobain, USG Boral, Knauf
14.	Moisture Resistant Gypsum Ceiling	Saint Gobain, USG Boral, Knauf
15.	Plywood	Century, Green Ply, Kitply
16.	False Ceiling Tiles/ Grid Ceiling	Armstrong, Gyproc, Knauf
17.	Vinyl Print (Backlit, Edgelit, Translit, Signages Etc)	3m, Avrey, Lg (Approved Vendor Universal Signage)
18.	Water Proofing Cement Paint	Asian Paint, Nerolac, Jotun, Berger
19.	Enamel Paint	Asian Paint, Nerolac, Jotun, Berger
20.	Primer	Asian Paint, Nerolac, Jotun, Berger
21.	Putty	Birla Putti, Asian Paints, Gyprock, Berger
22.	Acrylic Emulsion Paint	Asian Paint, Nerolac, Jotun, Berger
23.	Copolymer Emulsion Paint	Asian Paint, Nerolac, Jotun, Berger

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City

24.	Weatherproof Emulsion Paint	Exterior	Asian Paint, Nerolac, Jotun, Berger
25.	Pop Plaster		Birla Putti, Asian Paints, Gyprock, Berger
26.	Pu Paint		Sunanda, Jotun
27.	Water Proofing		Pidilite, Fosroc, Basf, Sika
28.	Cement		Ultratech, Ambuja, ACC
29.	Laminate		Greenlam, Century, Royal Touch, Merino
30.	Modular Toilet Partitions		Greenlam, Merino
31.	Metal Door		Shakti Hormann/Ardor/ Navair /Aaccess /Ozone
32.	Metal Fire Doors		Shakti Hormann/Ardor/ Navair /Aaccess /Ozone
33.	All Hardware and Hardware Fittings		Dorma/Hafele /Kitch/Geze/Ozone
34.	Spring, Door Closer/Automatic Sliding Door		Dorma/Hafele /Kitch/Geze/Ozone
35.	Door Lock & Handle		Dorma/Hafele /Kitch/Geze/Ozone
36.	Sealing Compounds		Fosroc/ Stp/Dow Corning/Sika/Basf
37.	MS Pipe		M/S Steel Authority of India (Sail)/M/S Tata Steel/ Jindal
38.	Flush Door		Century, Green Ply, Kitply
39.	Plain Mirror		Modi Guard /Saint Gobain / Asahi /Ais
40.	Glass/Float Toughened	Glass/	Saint Gobain, Ais, Gurdian
41.	All Modular Furniture		HNI, Featherlite, Steelcase, Wipro, Hurman Miller
42.	MDF		Century, Green Ply, Kitply
43.	Hard Surface (Corian)		Dupont, Corian, LG
44.	Acrylic Sheets		GNFC, Mg Polyplas, Prakash Acrylics
45.	Wooden Flooring		Pergo, Mikasa, Ego
46.	Aluminum Perforated Cladding System		Preksha Marketing, Hi Fab Aluminum
47.	Patch Fittings / Friction Fittings, Floor Spring, Door Closer		Dorma/Hafele /Kitch/Geze/Ozone
48.	SS Railing		Dorma /Q Railing / M/S Technorail, M/S Hi Fab Aluminium/Kitch/Ozone
49.	Roller Blinds		Vista, Farari, Hunter Douglas
50.	Modular Matting		3m, Milican, Connexx,
51.	Enamel Paints		Asian Paint, Nerolac, Jotun, Berger
52.	Synthetic Enamel Paint for Steel		Asian Paint, Nerolac, Jotun, Berger
53.	Zinc Chromate Primer for Metal		Asian Paint, Nerolac, Jotun, Berger
54.	Fire Retardent Paint		Sunanda, Jotun, Vermiculite
55.	Automated Sliding Door		Dorma, Geze, Hafele, Kitch, Ozone
56.	Soft Fiber Acoustics Ceiling		Armstrong, Ecophone, Gyprock
57.	Soft Fiber Acoustics Wall Paneling		Armstrong, Ecophone, Gyprock
58.	Vinyl Flooring		Armstrong Flooring, Tarket, Ger Floor
59.	Concrete Admixture		Fosroc, Sika, Basf, Cico
60.	Reinforcement Steel / Tmt Steel		Tata Tiscon, Vizag, Sail, Arcelor Mittal
61.	Structural Steel		Tata Steel, Sail, Jindal,

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City

62.	Fastner	Hilti, Fischer
63.	Projector	Panasonic, Christie, Barco, Digital Projection
64.	Water Stopper	Sika, Basf, Fosroc
65.	Expansion Joints	Sika, Basf, Fosroc
66.	Raised Floor	Unitile, Camfloor, Dmc
67.	Epoxy Grout	Myk Laticrete, Dow Corning, Dubond, Sika, Basf, Fosroc
68.	Adhesive for Fixing Mosaic Tile	Bal Endura, Myk Laticrete, Kerakol, Mapai.
A/V System		
Sr. No.	Description	Approved Make/ Approved Vendor
69.	Audio/Dimmer Racks	President/Netrack/Dynamic/Rittal
70.	Digital Signal Processor	Biamp/Bss/Klark Teknik/Pevay-Mediamatrix/Bose
71.	Audio Power Amplifier	Crown/Labgruppen/Bose/ Powersoft / JBL / Lab Gruppen / Dynacord/ QSC
72.	Main Loudspeaker, Sub-Woofers, Surround Speaker	Jbl/ Bose/Martin/Bosch (EV)/QSC
73.	Hard Disc Recorder with Audio Interference	Tascam/Motu/Fostex/Behringer
74.	Headphone, Transmitter, Receiver, Charger For Audio Guide/Multilingual System	a) Beyerdynamics/Sennheiser/William Sound Cordless Mikes - UHF- Shure/ Sennheiser / Bayerdynamic b) DAC – Denon / Yamaha / Pioneer c) Channel Mixer i. Manual - Allen & Heath / Mackie / Soundcraft / Yamaha ii. Automatic – BIAMP / ClearOne / Polycom/Shure
Media & Laser Control System		
75.	UPS	Liebert Emerson/Microtek/Eaton/Apc
76.	Show Control Computers	Showcad/Dell/Hp/Asus/ Synchronorm
77.	Media Control Servers/Fountain Control Server with Software's & Licenses	Dataton/ Coolux (Christie) /Medialon/Av Stumpfl/Standalone/Synchronorm
78.	Laser & Lighting Control Software with License	Showcad/ Pangolin/ Avolite/ Grand Ma/ Realizzer Synchronorm
79.	DMX Splitter	Liteputter/Dts/Griven/Sgm
80.	Transmitter and Receiver	Kramer/ Extron/ Blue sound
81.	Lasers	Laser World/Tarm/Lps/Kvant
82.	Laser/Projector/Moving Head/Gobo Enclosures	Tempest/ Screen Solution/Asl/Vizbox/Claypaky
Electrical		
Sr. No.	Description	Approved Make/ Approved Vendor
83.	Oil Type Transformer	Abb / Schneider / Ge / Voltamp / Crompton
84.	Lt Panels Enclosure	Legrand / Schneider / Siemens / L&T / Abb / Rittal / C&S / Cpri
85.	Distribution Boards	Legrand - Ekinoxe / Schneider - Acti9 / Siemens / Hager L&T / Abb / C&S / Havells
86.	Medium Voltage Cable	Finolex / Ravin / Polycab / Rr Kabel / Gemscab / Kei

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City

87.	Cable Tray (Ladder Type / Perforated)	Obo Bettermann / Legrand / Indiana / Profab Local Fabricators/ Bharati/Slotco/ Steelways / Profab / Rico / Mem
88.	Ups	Numeric / Eaton / Apc/ Delta / Consul-Neowatt
89.	Spd (Surge Arrester)	Pheonix Contact / Obo / Legrand / Schneider
90.	Lt Switchgear (Acb)	45b/Release / L&T U-Power Mtx 3.5sec Release /Abb Emax Pr123 Release
91.	Lt Switchgear (Mccb)	Legrand – DPX3/ Schneider-NX3/Siemens-3VA/L&TDSIGN/ABB-TMAX
92.	Lt Switchgear (Mcb)	Legrand – DX3/ Schneider-ACTI9 /Siemens 5SL 10ka/ L&T-Au / Abb - S800
93.	Lt Switchgear (Contactor, Relay, Mpcb)	Legrand - Dtx3/Mpx3/Rtx3 / Schneider / Siemens / L&T / Abb
94.	Busbar Trunking/ Busduct	Legrand / Schneider / C & S / Godrej
95.	Meters (Analog)	Meco / Risabh / Nippen / Conserve / Ae/Secure/ Elmeasure/ Crystal/ Naptune
96.	Meters (Digital)	Ae / Schneider / Nippen / Conserve / L&T/Secure/ Elmeasure/ Crystal/ Naptune
97.	Energy Meter	Schneider / L&T / Nippen / Hpl / Socomec/Secure/ Elmeasure/ Crystal/ Naptune
98.	Load Manager	Schneider / Nippen/ L & T / Hpl / Socomec/Secure/ Elmeasure/ Crystal/ Naptune
99.	Indicating Lamps	Schneider / L & T / Salzer/ Ge/ Abb
100.	Electric Timer	Siemens / Legrand / L&T / Legrand / Meco/Siemens/
101.	Rotary Switch	Siemens / Keycee / Salzer / Meco
102.	Push Button And Push Button Set	Siemens / Schneider Electric / L & T / Legrand / C&S / Abb/
103.	Selector Switch	Keycee / Salzer / Meco/ Siemens/ L&T/ Schneider/ Abb
104.	Apfc Relay	Enercon / L & T / Trinity / Beluk/ Ducati/ Siemens/ Epcos/ Abb/ Schneider
105.	Lt Capacitors	L & T / Epcos / Legrand / Schneider Subodhan / Vishay / Shreem / Pmx/ Ducati/ Epcos/ Abb/ Schneider
106.	Lugs	Dowell's /3d/Hex Jainson/Comet/Hmi/Cci
107.	Bimetallic Lugs	Dowell's /3d/Hex Jainson/Comet/Hmi/Cci
108.	Cable Gland	3d / Comet / Hmi/ Grippwell/ Dowels
109.	Pvc Conduits and Accessories	Precision / Diamond / Astral / Nihir / Polycab/ Anchor by Panasonic/ Akg/ Bec/ Finolex/ Atul/ Nelco
110.	M.S. Conduit and Accessories	Akg / Bec / Steelcraft/ Anchor by Panasonic/ Finolex/ Atul/ Nelco
111.	Modular Switches, Sockets & Other Accessories	Norisys / L&T Crabtree/ Abb/ Wipro/ Siemens/ Clipsal & Model Shall Be as Approved as Per Architect /Wipro
112.	Metal Clad Socket with Mcb	Legrand / Hensel / Schneider / Scame / Spelsberg/ Hager/ L&T/ Abb/ Siemens
113.	Pvc Tape	Steel Grip
114.	Pvc Junction Box	Hensel / Clipsal / Spelsberg / Scame / Sintex
115.	Wires for Internal Wiring	Finolex / Havells / Polycab / Rr Kabel / Kei Anchor / C&S / Rajnigandha/ Universal/ Cci/ Nicco/ Skytone/ Lapp/ Rpg
116.	Flexible Wire	Finolex / Havells / Polycab / Rr Kabel / Kei Anchor / C&S / Rajnigandha/ Universal/ Cci/ Nicco/ Skytone/ Lapp
117.	Signal Cable	Enercon / Lapp India / System Tek / Caliplast / Eminent / Rajnigandha

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City

118.	Multicore Flexible Cable	Finolex / Polycab / Havells / Rr Kabel / Caliplast / Eminent /
119.	Connectors (Colours As Per Phase & Neutral)	Wago / Phoenix Contact/ Connectwell
120.	Light Fixtures	Philips / Havells / Klite / Wipro / Surya/Regent & As Per Approved by Architect
121.	Outdoor Decorative Light Luminaire	Philips /K-Lite/ Schreder/Wipro/ Surya & As Per Approved by Architect
122.	Control Transformer [Pt / Ct]	Ashmor / Kappa / Elmex/ Ae/ Precise/ Pragati/ / Ecs/ Kalpa
123.	Paint	Nerolac / Asian Paints/ Jotun
124.	Ceiling Fan / Exhaust Fan	Crompton / Bajaj / Orient / Havells/ Anchor By Panasonic/ Usha
125.	Floor Trunking	Mk / Legrand / Obo Bettermann/ Schneider
126.	Floor Junction Box	Legrand / Mk / Obo Bettermann/ Schneider
127.	Fire Extinguisher	Firex/ Minimex / Safex / Ceasefire
128.	Chemical Earthing	Obo Bettermann / Ashlok / Jef / Powertrack
129.	Convectional Lps	Erico / Obo / Abb / Powertrack / Dehn Or Any Local System/ Furse
130.	Up To 33 Kv VCB	Siemens / Schneider / Abb/ C&S/ Ge
131.	Up To 33 Kv Ht Cable	Finolex / Ravin / Polycab / Rr Kabel / Gemscab / Kei
132.	Up To 33 Kv Ht End Termination Kit	Raychem / 3m / Rpg
133.	Dc Battery Charger	Chhabi / Hbl
134.	SMF Battery	Excide / Amarraraja / Rocket / Amaron/ Standard/ Amco/ Prestolite
135.	Solar PV Cells	Canadian Solar / Sonali / Zinco / Waree / Bosch / Vikram
136.	Grid Tie Inverter	Hitachi / Abb / Bosch / Tata / Delta / Sma
137.	H.T. Cable (XLPE)	Finolex / Gloster / Ravin / Polycab
138.	Fire Barrier	Hilti / Obo / 3m
139.	Dmx Cables, Power/Control Cables	ISI Approved Indigenous Make
140.	Ethernet Switch/Network Switch	Dlink/Cisco/Netgear/Trendnet
141.	Moving Head/ Gobo Lights	Sgm/Martin/Clay Paky/Canara Lighting
142.	Submersible Luminaries	Martin/Griven/Clay Paky/Studio Due/Canara Lighting/Havells
143.	General Lighting Like Pathway Etc.	Phillips/Crompton/Wipro/Canara Lighting/Havells
ELV		
Sr. No.	Description	Approved Make/ Approved Vendor
144.	Fire Alarm Panel	Siemens - Firefinder / Utc - Edward / Tyco - Simplex /
145.	Fire Alarm & Music Wire	Lapp India / Finolex / Caliplast / Eminent/ Polycab/Rr Kabel/ Tyco/ Delton/ Frtrek/ Afw
146.	Connectors (Colours As Per Phase & Neutral)	Wago / Phoenix Contact / Connectwell
147.	Analog Pa System	Bosch / Bose / Aties / Honeywell/Intivio/ Ravel/ Stanely
148.	Multiplexer	Pelco / Philips / Bosch / Bose
149.	CCTV Monitor	Samsung / Sony / Lg/ Panasonic Hikvision/Cp Plus
150.	Ip CCTV Camera System	Sony / Samsung / / Pelco / Honeywell / Bosch/ Lg /
151.	Access Card System	Siemens / Honeywell / Bosch / Hid/ Lenel

Development, Operation and Maintenance of Musical Fountain at Gujarat Science City

152.	Fire Barrier	Hilti / Obo / 3m
153.	Fire Detection & Suppression	Faast/Xtralis
154.	Fire Suppression-Novec	Utc-Kidde/Siemens-Sinorix/Tyco/Honeywell
155.	CCTV For Fire Detection	Fike / Bosch
Digital Signages		
Sr. No.	Description	Approved Make/ Approved Vendor
156.	Ful Hd Digital Signage Player With 1 Hdmi Out, 1 Audio Out & 1 RS232	LG/Samsung/Panasonic
157.	Digital Signage Content Management and Designer Software and License Upgradable Minimum 30 Devices	LG/Samsung/Panasonic
158.	Inten Xeon Processor Octa Core, 16 Gb Ram, 1 Tb Hdd/Sdd, 2 Gb Graphic Card	HP / Dell / Lenovo
Others		
Sr. No.	Description	Approved Make/ Approved Vendor
159.	Submersible Pump	Crompton Greaves/Kirloskar/Grundfos/KSB/Wilo/Mather+Platt
160.	Nozzles for Fountain	Fabrication
161.	Stainless Steel	RINL/Sail/Jindal/TATA
162.	Galvanized Iron	RINL/Sail/Jindal/TATA
163.	Pipes	Ratnamani/Jindal/TATA/MSL
164.	Valves	Advance/AUDCO/L&T/Zoloto/Sant
165.	GI Sheets (if required)	TATA/Jindal/SAIL/Nippon
166.	WTP	Ion Exchange/Thermax (low flow)/Pentair/Micro Pure
General Note for Entire Make List: -		
(1) Developer Shall be submit sample to authority for Approval (if need be)		
(2) For any additional makes, not specified above, prior approval shall be obtained from GCSC		

3. Scope of Renovation and Retrofitting of existing facility:

3.1 Pond Area:

- i. Dismantling of existing trenches (if required) and construction of new trenches (as required).
- ii. Removal of existing waterproofing system and replacing the same with a suitable system, such that the waterproofing shall have minimum 10 years warranty.
- iii. Removal of existing tiles and replacing the same with tiles suitable for underwater usage. Installation of tiles should be as per manufacturer's specification.
- iv. Nozzle / Injection grouting using suitable non-shrink grouts or epoxy grout to ensure water tightness of the pond structure.
- v. All required core cutting/saw cutting of the pond structure as required for execution of new fountain system.
- vi. Bolt material used shall preferably be corrosion resistant (e.g. SS304 or adequate corrosion resistant treatment over mild steel bolts or any other suitable material or methodology).
- vii. Chemical/anchor bolts/anchor fasteners as required.
- viii. Supply of grating cover/chequered plates for trenches / manholes
- ix. Excavation, backfilling, disposal of debris outside Science City at appropriate location as per local norms, dewatering etc.
- x. Supply, placement, installation and testing as per applicable standards of cement, aggregates, steel (reinforcement/coils/plates/sections), paints, grouts etc. including all tools and tackles, labors, supervision manpower (technical and non-technical), equipment etc as required for completion of the works.

3.2 Control Room:

- i. Dismantling of existing flooring, painting, roof water proofing, fixtures (lights, fans, air conditioning system, switches etc.), control console, cables (control and power) etc.
- ii. No modification in existing load bearing RCC structure shall be permitted.
- iii. Supply, installation, testing and commissioning of
 - a. Internal LED lights
 - b. Fire Retardant power cable of adequate diameter.
 - c. Air Conditioning system
 - d. Switch with metallic back box.
 - e. Fire hydrants of adequate capacity as per applicable law
 - f. Emergency lights
- iv. All cables shall be concealed
- v. Existing doors and windows to be replaced with aluminum anodized sections (anodization thickness of 0.2 mm minimum). For operator's window, toughened glass is to be used.
- vi. Internal walls to be painted in minimum 2 coats of acrylic emulsion paint over one coat of primer and putty.
- vii. Removal of existing waterproofing system and replacing the same with a suitable system, such that the waterproofing shall have minimum 10 years warranty.
- viii. Installation of gypsum false ceiling in 600mmx600mm grid.
- ix. Minimum 2 coats of external weatherproof acrylic emulsion paint over a coat of primer.
- x. Installation of antistatic PVC tiles (min 2 mm thick) and false flooring (if required) inside the control room and heat resistant tiles on the roof.
- xi. Chemical/anchor bolts/anchor fasteners as required.

3.3 Visitor's Area including entrance:

- i. Polishing of existing floor using suitable method.
- ii. Installation of signages
- iii. Painting of all walls and surfaces using enamel paints/external weatherproof acrylic emulsion / epoxy, as required to give good aesthetics
- iv. Replacement of broken floor tile / stone with matching tile / stone
- v. Repair and refurbishing of seats
- vi. Supply, installation, testing commissioning of
 - Fire hydrants of adequate capacity as per applicable law
 - Emergency lights
 - Public Address cum announcement system
 - SS barricades as required for crowd control
- vii. Repair/refurbishment of Laying of rainwater drainage
- viii. CCTV cameras to cover entire visitor area connected to a screen inside the control room.
- ix. Making of ramps and other aids as required for differently abled people.

3.4 Water Treatment Plant:

It is envisaged that a water filtration plant be established in the vicinity the fountain for storage and filtration of water used. Capacity and type of the storage and filtration plant to be designed by the Developer and approved by the Authority during execution stage.

Minimum storage capacity of treated water required should not be less than 120% of the volume of water required for the fountain. Storage tanks is envisaged to be HDPE tanks.

All associated civil, electrical and mechanical works to be done by the Developer.

Note:

- I. It is envisaged for the Developer to supply one standby of all pumps.*
- II. All electrical, electronic and mechanical systems should have built-in redundancy to ensure smooth operation even in an event a part of the system is not operational.*
- III. Software upgradation support for the control system for 10 years*

4. Scope of Operation and Maintenance:

- i. Developer shall be hall be responsible for full operation and maintenance of all MEPF systems (until the end of the concession period), which shall include but not limited to piping systems, storages, machinery, W.T.P. and other related structures for defect liability period as mentioned in the contract.
- ii. Developer shall, always, operate and maintain the Project in accordance with the provisions of the Contract, Applicable Laws and permits. In particular, the Developer shall, always during the Maintenance Period, conform to the service and maintenance requirements set forth hereof and as per Good Industry Practice.
- iii. The Developer shall repair or rectify any defect or deficiency set forth hereof within the time limit specified therein and any failure in this behalf shall constitute a breach of the Contract. Upon occurrence of any breach hereunder, the Authority shall be entitled to recover as per contract.
- iv. The Developer shall undertake clearing of any choking in the drainages, manholes, etc.
- v. The Developer shall not damage, destruct or demolish any structure, area or asset, which is owned by Authority, inside or outside Project Facility areas without prior instructions and / or approval of Authority.
- vi. There shall be a regular maintenance program in place for all mechanical, electrical and piping systems.

The Developer shall follow the following timetable for routine cleaning of the Project Facility:

SI No	Description	Minimum Frequency
1.	Inspection and cleaning of the water pond	Once a week
2.	Preventive maintenance of all electrical, electronic, mechanical and piping.	Once a week
3.	Inspection of all nozzles, pumps, and moving components	Once a day
4.	Electric Meter	The Developer shall check all meters once in a month time to ensure that they are functioning and are showing correct readings.
5.	Safety	Any fault in the electrical equipment like switches, receptacles, wiring etc. shall be identified, tested and repaired within 24 hours of detection to prevent accidents.
6.	Fire Fighting Facilities	The Developer shall provide the required fire hydrants conforming to relevant standards and the applicable laws and regulations. Additionally, Developer to ensure that the same are available at all time.
7.	Facilities for Physically Challenged Persons	The Developer shall provide all the necessary facilities to the entry/exit seating and movement of physically challenged persons including wheel chairs, ramps etc.

- vii. The Developer is to ensure that shows are conducted regularly as per timing decided by the Authority. Failure to conduct a show on account of maintenance requirement / breakdown of any component of the system shall constitute a breach. Under such circumstances, Authority reserves their rights to levy damages as per provisions of the contract.
- viii. The Developer shall, through its engineer, undertake a daily visual inspection of the Project and maintain a record thereof in a register to be kept in such form and manner as the Authority may

specify. Such record shall be kept in safe custody of the Developer and shall be open to inspection by the Authority.

- ix. In respect of any defect or deficiency not specified in hereunder the Developer shall undertake repair or rectification in accordance with Good Industry Practice and within the time limit specified by the Authority

SI No.	Nature of defect or deficiency	Time limit of Rectification
1.	Any failure of the internal and/ or exterior lighting	4 hours
2.	Defects in electrical/mechanical/HVAC	24 hours; however, Developer is to ensure that shows are conducted as per the schedule without affecting the quality of the show.
3.	Cracks/gaps in flooring/wall in visitor area and control room	2 days
4.	Damages to filtration plant	24 hours
5.	Damages to furniture, fixtures, signage etc.	3 days
6.	Damages to CCTV and security system	1 day
7.	Any other Defect as identified by the Authority and communicated to the Developer	Within 24 hours or as communicated by the Authority

In the event that the Developer fails to respond to any defects or deficiencies as per the timelines set forth above, it shall be deemed to be Developers Default and the Authority shall be entitled to recover Damages by way of deduction of the relevant amount from the monthly maintenance fee as per the calculation detailed below: -

- (i) INR 15,000 per day for the first 14 days from the date of occurrence of the breach.
- (ii) INR 50,000 per day for the next 7 days.
- (iii) INR 1,00,000 per day thereafter subject to a maximum of 10% of the Estimated Contract Price; the breach of such limit of liability shall be construed as Developers 's default and make the Contract liable for termination

- x. The general scope of work includes operations, monitoring team and maintenance related works. The manpower deployed shall carry out equipment operations & maintenance works and attend to breakdowns as and when required. Also, the maintenance schedules shall be prepared by Developer and site-based team shall carry out the equipment related works as per schedules & instructions.
- xi. Developer shall deploy adequate safety and crowd control personnel.
- xii. The basic tools required for maintenance, access ladders including special tools & tackles, measuring instruments, access ladders, scissor lift / boom lift for high access...etc and PPE's are included in the scope of Developer and this is included as part of operation cost.
- xiii. All necessary logbooks, computers, office space, tables, chairs, registers & stationeries for report generation shall be arranged and provided by Developer.
- xiv. Storage space / Cupboards shall be provided by Developer for keeping the tools and tackles and other instruments.
- xv. All equipment spares shall be provided by Developer and has to monitor the spares & if stock of spares is less, the same should be arranged and provided by the Developer.
- xvi. Developer has to ensure the Tools & PPE's quantity as much as sufficient for the trouble-free service.
- xvii. In case of any defect in materials, workmanship of any element or the building, the Developer shall make good, rectify or replace the element/structure.
- xviii. Maintenance person should be qualified (B.E / Diploma / ITI) and experience in the related field. Persons deployed should be approved / confirmed by Authority, if persons deployed are found unsatisfied by Authority after necessary communication to Developer, they have to replace the person immediately.

- xix. Developer has to prepare / follow standard operating sheet / operation control procedure for all Maintenance work – should get approval from Authority.
- xx. All the person should undergo regular training for the operation and maintenance of the plant & safety measure. The same shall be arranged and ensured by Developer.
- xxi. Developer has to supply sufficient manpower after considering weekly off's and statutory leaves in a month.
- xxii. Electrical supervisor should have valid license –C license & electrical technician should have a valid B license.
- xxiii. All safety measures to be taken care during operation & maintenance of the plant. (In case any safety deviation Authority can levy damages @ 0.5% of the Performance Guarantee subject to 100% of Performance Guarantee and Termination thereafter or Developer has to replace the person violated safety)
- xxiv. Developer should maintain all necessary documentation and records such as logbook / sheets, inventory registers, daily report, weekly report, monthly report, performance reports all such other related documentation as per Authority requirement.
- xxv. Developer should maintain accounts for receipts, consumption and inventory of all consumables & spares as per the consumption pattern.
- xxvi. Developer should prepare / adhere to the Authority maintenance schedule for mechanical, electrical & instrumentation should be approved by Authority.
- xxvii. Carrying out routine, preventive and break down maintenance in mechanical, electrical and instruments category and record to be maintained and submitted to Authority periodically
- xxviii. Before taking up major maintenance, Developer should inform and obtain permission from Authority and proper approval shall be obtained and further approvals in the form of Electrical clearance / LOTO procedures shall be adopted.
- xxix. Spares shall be procured and supplied by Developer as per requirement.
- xxx. The damaged / repaired equipment's (Mechanical / Electrical / Instrument equipment/exhibit/) which are coming under warranty & guarantee the Developer has to co-ordinate with supplier and get it replaced / serviced at free of cost from the equipment manufacture / supplier.
- xxxi. Developer should periodically check equipment, lubrication, adjustments etc. to ensure proper performance as per Project Manager Check sheet.
- xxxii. Developer has to follow getting safety & security permit from Authority safety for necessary job.
- xxxiii. For Internal Transportation Developer has to arrange vehicles and Maintained in Good condition (Petrol & other consumables is in Developer scope) along with valid driving license and insurance.