Request for Proposal

For

Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal

Revision-001

Reference No: MPBSCDCL/TENDER NO- 51

Date: 14/08/2018

Bhopal Smart City Development Corporation Ltd.
Bhopal, Madhya Pradesh

Table of Contents

Abbreviations

Acronym	Full Form
AMR	Automatic Meter Reading
ARV	Air Relief valve
BSCDCL	Bhopal Smart City Development Corporation Limited
BWUMS	Bhopal Water Utility Management System
CMS	Central Monitoring System
CMMS	Computerized Maintenance Management System
CPU	Central Processing Unit
DMA	District Metered Areas
EIC	Engineer In Charge
EMD	Earnest Money Deposit
EOL	End Of Life
EOS	End Of Support
ESR	Elevated Storage Reservoir
FO	Fibre Optics
FAT	Final Acceptance Test
GIS	Geographic Information System
HA	High Availability
HMI	Human Machine Interface
IT	Information Technology
ICCC	Integrated Command And Control Centre
LOI	Letter Of Intent
MCC	Motor Control Center
MIS	Management Information System
MLD	Million Liters Per Day
SI	Master System Integrator
NRW	Non-Revenue Water
ODBC	Open Database Connectivity
OEM	Original Equipment Manufacturer
OHT	Overhead Tanks
O&M	Operations & Maintenance
OMS	Outage Management System

OPC	Computerized Maintenance Management System
PLC	Programmable Logic Controller
PZ	Pressure Zone
QMR	Quadruple Modular Redundant
RBE	Report By Exception
RFP	Request For Proposal
RTU	Remote Terminal Unit
SAT	Site Acceptance Test
SCADA	Supervisory Control And Data Acquisition
SCC	Scada Control Center
SI	System Integrator
SITC	Supply,Installation,Testing and Commissioning
SLA	Service Level Agreement
SOP	Standard Operating Procedures
SOW	Scope Of Work
TMR	Triple Modular Redundant
UAT	User Acceptance Test
UOM	Unit Of Measurement
WTP	Water Treatment Plant

Bidding Data Sheet

S. No	Particulars	Details
1.	Name of Client	Bhopal Smart City Development Corporation Limited (BSCDCL)
2.	Name of the Engagement	Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal
3.	Availability of the document	RFP is available and downloadable on MP e-procurement portal: (http://www.mpeproc.gov.in) All subsequent changes to the RFP shall be published on the above mentioned website.
4.	Start date for Purchase of RFP	<18-05-2018> at <20:00 hrs>
5.	Last date for Purchase of RFP	<20-06-2018> at <23:00 hrs>
6.	Cost of RFP Document	INR 50, 000 to be paid online through e- Procurement portal
7.	Sharing of pre-bid queries	Pre bid queries to be shared at bscdcl@smartbhopal.cityby 30-05-2018
8.	Pre-Bid Meeting	12:00 hours to be held at 31-05-2018
9.	Earnest Money Deposit (EMD)	INR 50 Lacs to be paid in the form of Bank guarantee of any nationalized / scheduled banksor online through e-Procurement portal or offline in form of Demand Draft drawn by one of the Nationalized / Scheduled Banks in India in favour of CEO,Bhopal Smart City Development Corporation Ltd, payable at Bhopal. Scan copy should be uploaded with Technical Document and original DD should be submitted in BSCDCL at the time of opening of Technical proposal. (Please note that no exemption for EMD will be accepted)
10.	Last date of submission of Proposal	Online at https://mpeproc.gov.in - <20-06-2018> by <23:30 hrs>
11.	Last date of hardcopy submission	<23-06-2018> at <15:00 hrs>

S. No	Particulars	Details
12.	Date and Time of opening of Prequalification Proposal and Technical Proposal	<25-06-2018> at <11:00 hrs>
13.	Presentation on technical solution by bidders	<29-06-2018> at <11:00 hrs>
14.	Date of opening of Financial proposal	To be intimated to the successful bidder
15.	Email Address	The prospective Bidder requiring any clarification to the RFP shall contact BSCDCL through email by sending the queries at bscdcl@smartbhopal.city
16.	Address for Communication	Chief Executive Officer Bhopal Smart City Development Corporation Limited, Zone 14, near Tatpar petrol pump, BHEL Govindpura, Bhopal, Madhya Pradesh- 462023 Phone:0755- 2477770

Notice Inviting Bid

Dated: 16/07/2018

RFP for "SELECTION OF SYSTEM INTEGRATOR FOR SUPPLY, INSTALLATION, INTEGRATION AND COMMISSIONING OF WATER UTILITY MANAGEMENT SYSTEM FOR BHOPAL".

The Bhopal Smart City Development Corporation Limited represented by CEO now invites bids from eligible System Integrators for this project.

The complete BID document (Tender Document) can be viewed / downloaded from the department account of Bhopal Smart City Development Corporation Limited on e-procurement portal https://www.mpeproc.gov.in.

Bid must be submitted online at https://www.mpeproc.gov.in. by 20/06/2018 11:30 pm, along with hardcopy submission as per instructions of RFP. Bids received online shall be opened on 25/06/2018 (at 11:00 hours IST). Bid through any other mode shall not be entertained. The physical submission of the bid document as per instructions of RFP should done by 23/06/2018 (at 15:00 hours IST).

Please note that the BSCDCL reserves the right to accept or reject all or any of the BIDs without assigning any reason whatsoever.

Chief Executive Officer

Bhopal Smart City Development Corporation

Zone -14, Bhopal Municipal Corporation, BHEL. Govindpura, Bhopal –462023

1. Section I: Introduction and Background

1.1 About BSCDCL and BMC

Bhopal is among the first 20 cities selected in first round of smart cities challenge under Government of India's (GoI) smart cities mission (SCM) to implement the smart city proposal (SCP). In this context, Bhopal has incorporated a special purpose vehicle (SPV) – Bhopal Smart City Development Corporation Limited (BSCDCL) (the "Authority") to plan, design, implement, coordinate and monitor the smart city projects in Bhopal. BSCDCL is a company incorporated under Indian Companies Act 2013 with equal shareholding from Madhya Pradesh Urban Development Company Limited (MPUDCL) on behalf of Government of Madhya Pradesh (GoMP) and Bhopal Municipal Corporation (BMC).

Bhopal Municipal Corporation (BMC) manages the water supply of the city, which covers approximate area of 450 sq.km. with a population of over 2,371,061.

1.2 About the Project

Bhopal Smart City Development Corporation Limited (BSCDCL) is planning 24x7 water supply for the project area of Bhopal city. The city has intermittent water supply and availability. However it is setting targets and processes in place to try to improve its water supply.

Bhopal Smart City Development Corporation Limited (BSCDCL) has planned to implement the existing Bhopal City Water Utility Management System (BWUMS) with GIS integrated Supervisory Control, Real time Water Loss Detection System and Data Acquisition along with the centralized Control Centre.

The present water supply source of water is given in the table below:

Sr. No.	Source of Supply	Actual Avg. Drawl (MLD)
1.	Kolar Dam	155
2.	Upper Lake	105.75
3.	Narmada river	185
4.	Tube wells – 1104 nos	50
	Total Supply	**495.75**

Bhopal Smart City Development Corporation Limited (BSCDCL) now intends to select an Implementation Agency to design and assist the Client in implementing the Bhopal Water Utility SCADA Management System (BWUMS) as one of the smart solutions.

1.3 Project objectives

The key objective of this project is to establish an equitable & continuous supply of water to citizens and businesses within Bhopal Municipal Corporation that allows an automatic control and

monitoring of assets from Centralized Control Station. The objective of project is to achieve optimization of existing network and strive for 100% water Supply as per their required quota.

- Real time remote monitoring of water treatment to distribution network on Bhopal city on the parameter of Flow, Pressure, Energy Consumption and Water Quality.
- To make provision of flow measurement, inlet and outlet pressure measurement, and level measurement at all the 145 ESRs along with 30 upcoming ESRs.
- To provide control of Flow Control Valves from Central Monitoring System (CMS) to control the inlet and outlet flow of service reservoirs by operation of inlet and outlet valves
- To install Instrumentation systems at each ESR/OHT to control the flow so that the designed demand to respective command area and zone of town is delivered.
- Real time assessment of water supply situation for efficient operation
- Real time data on water quality
- Readily available on-line information of distribution data in command areas periphery network
- To provide alert in case of deviation to set parameters.
- To reduce non-revenue water into the system,
- To improve the technical & commercial efficiency of the complete water supply system from Water Treatment Plants to ESR/OHT and there on to respective zone.
- To have a Reliable & safe database on filling & emptying of ESR, its level monitoring, correct data building and record keeping of complete system and its parameters such as flow, volume, & pressure at Pump House, and ESR.
- Integrate with SCADA all the project components to operate and control, monitor and measure the same.
- Asset and performance management will help department in minimizing the downtime.

1.4 Project Beneficiaries

The beneficiaries of the project include:

- Citizens
- Government Departments

1.5 Brief Scope of Work

BSCDCL intends to select a System Integrator (SI) by following competitive bidding process to design, develop, implement and maintain the Bhopal Water Utility SCADA Management System (BWUMS) for a period of five (5) years after Go Live date.

The scope of the project in the RFP shall entail the detailed digitization, planning, design, optimization, implementation and monitoring of the Bhopal Water Utility Management System (BWUMS) for the below system.

1. **Automation of 175x (145 existing+30 proposed) Elevated Storage Reservoirs (175 Nos)** – Reservoir/Outlet Management System at the inlet and outlet of ESR's to manage the inflows and outflows at a particular reservoir ,estimation of water loss, water quality monitoring, equitable

supply of water to the ESR and from the ESR to the distribution system. Hence, this would avoid the manual intervention to the daily operation and lead to a smooth transition to continuous water supply system.

2. **Automation with water quality sensors of 12x Water Treatment Plant** outlets only with Flow & pressure Control /leak detection, ,estimation of water loss,remote monitoring and control using SCADA

3. **Automation of Water Feeder distribution Line** detailed below in Section 4.3 controlling the downstream discharge to Distribution Networks in controlled fashion as per quota or demand required. Their objective in this particular project is to guarantee an equitable distribution of the available water, in distribution networks and to avoid the manual intervention to the daily zone valve operation/throttling.

4. SITC of Integrated Instrumentation and Water Quality measurement devices.

5. Pumping Station's automation and their augmentation with BWUMS for better efficiency and less power consumption.

6. Water Loss detection of Main feeder/distribution lines with leakage localization.

7. Complete integration of BWUMS system with GIS and ICCC.

8. O&M for 5 years after Go-Live.

9. SMART Project documentation for the entire city for ease of maintenance.

10. Establishment of SCADA Control Center at the assigned BMC Premise.

The work described under this tender document shall also include following works for which no extra payment will be made:

1. All preliminary works required to meet the project scope as per instruction of EIC (Engineer-in-Charge), as described elsewhere in these specifications, for such work no extra payment shall be made to the Bidder. The Bidder is advised to inspect site before tendering to ascertain the quantum and cost of such work and include this cost in their offer.

2. Confirmatory survey of sites, assessment and determination of quantities of various civil works including proper installation and finishing as per arrangement drawings.. Warehouse will be provided by the Authority for which safety and security of the materials will be ensured by the bidder for which no extra payment shall be made to the bidder.

3. Excavation of trenches and foundations for all works and other ancillary works in all sorts of strata including refilling, ramming, watering and reinstatement of trenches properly with disposal of surplus soil (at the location provided by the Authority) and waste material and clearance of site properly as per instruction and satisfaction of EIC.

4. Making all arrangements including supply of all materials, electric installations ,Skilled/ unskilled mistries, masons and labourers, excavator and vehicle etc. arrangement of clear water (As per latest IS: 456) for construction purpose etc.

5. Site clearances and ROW will be provided by the BSCDCL.

6. Electricity Provision (if any) at desired locations would be provided by BSCDCL.

7. Compliance of all safety rules at work sites.

8. To take all safe guards to avoid accident at site, prevent loss to other pipe lines, telephone and electric cables and other government or private property during all phases of working.

9. Submission of completion drawings (as executed on ground) of installation of Electrical,Instrumentation and Mechanical equipments etc., showing all the details and important landmarks. And all allied works.

2. Section II: Instructions to Bidders

This section specifies the procedures to be followed by Bidders for the preparation and submission of their Bids. It is important that the Bidder carefully reads and examines all the terms and condition of this RFP

2.1 General

- From the time of bid advertisement to the time of Contract award, if any Bidder wishes to contact the BSCDCL (or designated officer) on any matter related to the bid, it should do so in writing at the address mentioned in Bid Fact Sheet.
- The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the BSCDCL shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- Bidders should submit only one Bid.
- The Bids shall remain valid for the period of 180 days after the bid submission deadline date prescribed by the BSCDCL.
- In exceptional circumstances, prior to the expiration of the bid validity period, the BSCDCL may request Bidders to extend the period of validity of their bids. In case of Bidder extending of the bid, the Bidder granting the request shall also extend the bid security for forty-five (45) days beyond the deadline of the extended validity period.
- Any bid NOT accompanied by an enforceable and compliant bid security (EMD) may be rejected by the BSCDCL as non-responsive.
- The bid security of unsuccessful Bidders shall be returned as promptly as possible upon award of contract to the successful Bidder. No interest will be payable by the BSCDCL on the amount of the Bid Security.
- The bid security of the unsuccessful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
- The bid security will be forfeited by BSCDCL on account of one or more the following reasons:
    - If a bidder withdraws its bid during the period of bid validity
    - If the successful bidder fails to sign the contract in accordance with terms and conditions of this RFP.
    - In the case of a successful bidder, if the Bidder fails to sign the Contract or to furnish Performance Bank Guarantee within specified time

2.2 Consortium Condition

- *The number of consortium members cannot exceed three, including the Prime Bidder*.
- A Bidder applying individually or as consortium member shall not be entitled to submit another application either individually or as a member of any other consortium, as the case may be.

- Consortium members must provide a Memorandum of Understanding (MoU) covering above points and showing their intention to enter into such an Agreement at the time of bidding along with Pre-Qualification Bid.
- A Bidding Consortium is required to nominate a Prime Member. The formation of the consortium including identification of Prime member and role and responsibilities of each member shall be supported by Memorandum of Agreement and Power of Attorney signed by all the members on a stamp paper of INR 100/-.
- The successful bidder (SI) shall require to enter into agreement with the Consortium Member specifying following points in the Agreement. These points shall also be captured in MoU
    a. Identity Prime Member and Power of Attorney in favor of Prime Member.
    b. Roles and responsibilities of the consortium partner, the identification of the lead partner, and providing for joint and several liability for each partner.
    c. All consortium members would be available throughout the Contract Period.
    d. The Prime bidder shall be jointly and severally responsible for complete scope, whereas consortium partner shall be severally responsible only for its respective scope.
    e. The role and responsibility of any member must be commensurate with the technical/financial capabilities that such member is contributing towards meeting the qualification criteria. Each consortium member is liable to contribute resources in terms of knowledge, skills and trained manpower commensurate with its role and responsibilities during the Contract Period.
    f. The Consortium Agreement must also state that the period of the Agreement would coincide with the Contract period. Consortium must continue to be in existence during the period of the contract and that any change will be subject to approval of the Authority (BSCDCL) only.
    g. The final contract between the consortium members (The Consortium Contract) would be available for legal vetting and open to suggestions by the BSCDCL. BSCDCL will suggest binding corrections if it finds that such contract does not meet its requirements and interests as per the Tender in letter and spirit.
    h. The Agreement should be on stamp paper and notarized. The signatories must be duly authorized.
    i. Any modification in roles and responsibilities between consortium members during Contract Period shall be allowed only after approval from BSCDCL. Any changes and deviation of roles and responsibilities of consortium members during the execution, operation and maintenance of this Project without prior approval of Authority shall be viewed seriously by the BSCDCL as it can affect an important public service. Such unilateral action by the SI shall entitle BSCDCL to take appropriate action including considering it an Event of Default under this Contract leading to consequences including termination with appropriate notice.
    j. Any Dispute arising during Contract Period between the Consortium Member shall be resolved amicably without adversely impacting Project Implementation and Operation. If in BSCDCL's opinion, Dispute between Consortium members adversely impacting implementation and operation of the Project then Authority may its sole discretion in the

interest of the Project (a) Terminate the Contract after due process and/or (2) Provide a binding solution.

k. In case BSCDCL Intends to proceed for Termination on account of SI Event of Defect and /or unresolved disputes between the Consortium Members, all the Consortium Members shall be jointly and severally liable for Implementation, Operation and Maintenance of project at Agreed prices and payment terms specified in this Tender till Authority or any new agency appointed by it takes over the Project

l. BSCDCL reserves the right to reject the Bid in case of change in the constitution of the consortium after the submission of Bid and before the execution of the Agreement

2.3 Pre-Bid Meeting and Clarifications

- BSCDCL shall schedule a Pre-Bid meeting with the prospective bidders as per the timelines mentioned in the Bid Fact Sheet.
- The interested bidders need to ensure that they have submitted their queries as per the date mentioned in the Bid Fact Sheet.
- Queries provided by the Bidders should be as per the format provided in the Bidding Forms
- Response to the queries and clarification shall be uploaded by the BSCDCL on MP e-Procurement Portal.
- At any time prior to the last date of receipt of the bids, BSCDCL may, for any reason, whether at its own initiative or in response to a clarification raised by a prospective bidder, modify the Bidding Document through a Corrigendum.
- Any such corrigendum shall become part of this RFP.
- In order to provide prospective bidder reasonable time for taking the corrigendum into account, BSCDCL may, at its discretion, extend the last date for the submission of the Bid.
- The purpose of the pre-bid meeting is to provide a forum to the bidders to clarify their doubts / seek clarification or additional information necessary for them to submit their bid. Date, Time and Venue for the Pre-Bid Meeting :

    - Pre-Bid conference will held on 31 May 2018 at 12:00 p.m.
    - Venue for Pre-Bid conference: Bhopal Smart City Development Corporation Limited, Zone 14, near Tatpar petrol pump, BHEL, Govindpura, Bhopal, Madhya Pradesh-462023

- The queries should necessarily be submitted in the following format:

Request for Clarification	
Name and Address of the Organization submitting request	
Name and Position of Person submitting request	

Contact Details of the Organization / Authorized Representative			
Tel: Mobile: Fax: Email:			
Sr. No	**RFP Document Reference (Volume, Section No., Page No.)**	**Content of the RFP requiring clarification**	**Clarification Sought**
1			

2.4 Sealing, Marking and Submission of Bids

Bidders are required to submit their bids in separate sealed envelopes as per instructions given below:

Part 1: Pre-Qualification Bid, Bid Fees, EMD shall be submitted online at www.mpeproc.gov.in along with duly bound hardcopy and soft copy in CD/DVD/ Pen drive/ USB stick with complete details as mentioned in Section 8.2 in **"Envelope 1"** super scribed **"Pre-Qualification Bid"** with Tender No, Due Date and RFP Name – ***"Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal"***. The proposal shall also consist with all supporting documents.

Part 2: Technical Bid shall be submitted online at www.mpeproc.gov.inalong with duly bound hardcopy and soft copy in CD/DVD/ Pen drive/ USB stick with complete details as mentioned in Section 8.3 in **"Envelope 2"** super scribed **"Technical Bid"** with Tender No, Due Date and RFP Name – ***"Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal"***. The proposal shall also consist all supporting documents, RFP Copy, Addendum & Corrigendum, if any.

Part 3: Financial Bid: The Financial Bid shall be submitted online at www.mpeproc.gov.inas per formats and instructions as mentioned in Section8.4

The large envelope / outer envelope containing above envelopes must be sealed and super scribed and shall be sent as under:

Details to be mentioned exactly on sealed envelope	
Tender Details • RFP No.: MPBSCDCL/ TENDER No - 51, Date: 18th May 2018 • Bid for "Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal". • Last date of Submission: Online Submission of Bid is to be done on or before 20 June 2018 by 11:00 p.m. at www.mpeproc.gov.in Hardcopy submission : In sealed envelope strictly by in Person/RPAD/Postal Speed Post On or before 23rd June 2018 by 3:00 p.m. addressing to "CEO, Bhopal Smart City Development Corporation Limited Zone 14, near Tatpar petrol pump, BHEL Govindpura, Bhopal, Madhya Pradesh- 462023".	To, Chief Executive Officer (CEO) Bhopal Smart City Development Corporation Limited, Zone 14, near Tatpar petrol pump, BHEL Govindpura, Bhopal Madhya Pradesh- 462023

1. BSCDCL will not accept submission of a proposal in any manner other than that specified in the document. Proposals submitted in any other manner shall be treated as defective, invalid and rejected.
2. If the envelopes are not sealed and marked as instructed above, the BSCDCL assumes no responsibility for the misplacement or premature opening of the contents of the application and consequent losses, if any suffered by the Bidder.
3. Each Bidder shall submit only one proposal containing documents as below. A bidder who submits more than one proposal under this contract will be disqualified

a. Original copy of the Bid fee & EMD
b. Pre-qualification criteria related documents
c. Technical Proposal related documents
d. RFP Copy and Addenda & Corrigendum
e. The Bidder shall prepare original set of the Proposal (together with originals /copies of documents required to be submitted along therewith pursuant to this document) and applicant shall also provide a soft copy on a Compact Disc (CD) / Pen Drive / USB stick. In the event of any discrepancy between the original and CD/Pen Drive/USB stick, the original shall prevail

f. Each page of the above should bear the initials of the Applicant along with the seal of the Applicant in token of confirmation of having understood the contents. In case of consortium the bid will be signed by the Prime Bidder.

4. Pre-qualification and technical bid should be signed by an authorized person of the bidder. The pre-qualification bid should be submitted along with a certified true copy of a board resolution/power of attorney empowering authorized signatory to sign/act/execute documents binding the bidder to the terms and conditions detailed in this proposal. In case of the Consortium the Prime bidder will submit this document.

5. Bids must be direct, concise, and complete. BSCDCL will evaluate bidder's bid based on its clarity and completeness of its response to the requirements of the project as outlined in this RFP. The CEO, BSCDCL reserves the right to accept or reject any or all the bids without assigning any reason.

2.5 Submission and Opening of Bids

- The prices should NOT be indicated in the Technical Proposal. The failure to comply shall lead to rejection of bids.
- Conditional bids are liable to be rejected.
- The bids submitted by physical submission/telex/telegram/fax/email shall not be entertained.
- The MP e-Procurement Portal shall not permit the bidder to submit the bids after the deadline for submission of bids.
- BSCDCL shall not be responsible for delay or non-receipt of the documents.
- The bidder's representative (max 2), may attend the bid opening.
- To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the BSCDCL may, at its discretion, seek any clarification from bidders.
- If the Bidder does not provide clarifications of its bid by the date and time set in the BSCDCL's request for clarification, the bids shall be evaluated basis the information available with the BSCDCL.
- BSCDCL 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

3. Section III: Qualification & Evaluation Methodology

3.1 Pre-Qualification Criteria

Following criteria's prescribed as the Pre-Qualification criteria for bidder interested in undertaking the project:

S. No.	Parameter	Eligibility criteria	Supporting documents required	Compliance (Yes/No)
1.	Legal Entity	The Sole Bidder OR Prime Bidder (in case of consortium) and each consortium members Should be i. A company incorporated in India under the Companies Act, 1956 and subsequent amendments thereto ii. Should have GST Number Consortium Members •Max 3 companies are allowed in a consortium including Prime bidder Note: •The Prime bidder shall be jointly and severally responsible for complete scope, whereas consortium partner shall be severally responsible only for its respective scope.	i. For Sole/Prime Bidder/Consortium Member, Copy of Certificate of Incorporation and Copy of Memorandum of Associations (MOA), Articles of Association (AOA) , duly signed by the authorized signatory of the bidder. ii. For Sole/Prime Bidder/Consortium Member, GST Registration Copy	
2.	Financial Strength	The bidder (Prime Bidder in case of consortium) should have positive Net Worth for the last three financial year's i.e. 2015-16, 2016- 2017 and 2017-	CA certificate mentioning net worth of the bidder should be enclosed.	

		2018		
		The Sole Bidder / Lead Member (in case of Consortium) should have a minimum cumulative turnover of Indian Rs. 175 crores during the last three (3) financial years from ICT system integration, services communication infrastructure, SCADA, utility management and command & control centre implementation in India; and the Consortium partner should have a minimum cumulative turnover of Indian Rs. 50 (Fifty) crores during the last three (3) financial years i.e. 2015-16, 2016- 2017 and 2017-2018 (Provisional Figures for 2017-18 are allowed) ** ICT stands for Information & Communication Technology project and include any IT systems integration project.	Certificate from the statutory auditor / CA certified provisional figures CA clearly specifying the annual turnover for the specified years. Notarized copy of the certificate should be submitted	
3.	Black Listing	The sole bidder OR the Prime bidder and each of the member of the Consortium should not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government (Central or State), Semi-Govt. & PSU in India in last five years (from the date of submission of bid)	Self-Declaration Letter duly signed by authorized signatory on company letter head as per format given in Section VIII of this RFP	

4.	OEM Undertaking	The Sole Bidder / Lead Member (in case of Consortium) should submit valid letter from all the OEMs confirming that the products quoted shall not become “end of life or end of sale" for next 5 years beginning from the date of installation.	Undertaking from OEMs as per format given in Section 8of this RFP.	
5.	No Deviation	Statement of No Deviation from the RFP Requirements to be submitted by the Sole Bidder / Lead Member (in case of Consortium)	Letter from authorized signatory of the Bidder as per format given in Section 8of this RFP	
6.	Standards/ Certifications	The sole bidder OR the Prime bidder and each of the member of the Consortium must possess at the time of bidding, a valid ISO 9001:2008 or CMM/CMMI Level 3 or higher	Copy of valid certificate	

Note:

- All the proposed equipment should not be declared End-of-Support by the OEMs for next 5 years from the date of bid submission.

3.2 Technical Evaluation Criteria

a) Technical Proposal for only those Bidders will be opened who have found to be in compliance with the Pre-Qualification Criteria.

b) BSCDCL may invite bidders to make a presentation at a date, time and locations determined by it. The purpose of such presentations and demonstration would be to allow the Bidders to present their proposed solutions, approach, implementation plan, etc. to the BSCDCL.

c) The committee shall check Technical eligibility of the bidder based on criteria given in table below.

#	Description (Evaluation criteria)	Marks	Maximum Score/ Requirement
I	Proposed Solution should be in compliance with all the Mandatory items as specified in the Functional and Non-Functional Specifications and Scope of Work.		Mandatory
II	Bidder needs to provide OEM declaration that the proposed tool shall not be declared end-of-life in the next 5 years and shall not be declared end of support in the next 5 years from the date of submission of the Proposal.		Mandatory
III	**Technical Evaluation Framework**		
A	**Organization's Experience**		**60**
1.	**Experience in Implementation and Maintenance of large scale Utility Management Projects** The Bidder (sole bidder/lead bidder/any of the consortium partner) should have an experience in Implementation & maintenance of large Utility Management System Projects in Government or Private domain. Assignment should be started or completed in last 7 years from the submission of the bid. .Value of project should be at least of INR 10 crores.	Number of Projects:- • >4 Projects =20 Marks • 2 – 4 Projects=15 Marks • <2 Projects = 07 Marks	20

2.	**Experience in Implementation/Setting up of Water SCADA Utility Infrastructure Components** The Bidder (sole bidder/lead bidder/any of the consortium partner) should have experience in Implementation, maintenance and setting up of Water SCADA Utility infrastructure components like Water Management and Water Loss Detection system, control and instrumentation of Reservoir Management System, establishment of Central Command and Control Centre (or equivalent) based on SCADA in Government or Private domain. Assignment should be started or completed in last 7 years from the submission of the bid. Value of project should be at least of INR 10 crores.	Number of Projects:- • >4 Projects = 20 Marks • 2 – 4 Projects=15 Marks • <2 Projects = 07 Marks	20
3.	**Experience of implementing ICT solution in Government Sector/Smart Cities** The Bidder (sole bidder/lead bidder/any of the consortium partner) should have experience working as Master System Integrator in implementation of urban sector e-governance and ICT solution in Government/PSU organization/Smart Cities. Assignment should be started or completed in last 7 years from the submission of the bid. Value of project should be at least of INR 5 crores.	Number of Projects:- • >4 Projects = 17 Marks • 2 – 4 Projects= 12 Marks • <2 Projects = 05 Marks • Additional 3 marks will be allotted to Smart Cities Projects	20
B	**Approach and Methodology**		**20**
1.	Bidders Proposed Solution	Following parameters will be evaluated: • Understanding of the project • Proposed solution and solution design of the complete Water Utility System. • Strategy to ensure implementation of project within stipulated timelines. • Approach towards the	20

		scalability, Interoperability and modularity features of the project considering future expansion and growth of the water distribution system that may be envisaged or developed in future. • Identification of major risks and their mitigation plan • Key learnings from similar projects and how do you propose to incorporate them in execution of this assignment • Strategy to maintain all the SLAs and handling change requests • Clarity and details provided in un-priced BOQ, make and model of the proposed component/solution and referencing of the qualifying functional/technical specification on the product/solution datasheet or literature.	
C	**Technical presentation**	Following parameters will be evaluated during presentation: • System Integrators understanding of Bhopal's Water requirements	**20**

		(functional and technical) and completeness of proposed solution • Presentation of Approach & Methodology for Implementation • Clarifications given during Presentation • Similar Case Studies (Based on bidder experience)	

Note: Sub contracted Purchase Orders/Work Orders shall not be allowed except the conditions given in Section7.13

1. At the stage of technical evaluation, BSCDCL will assign points (quality of services score) to the pre-qualified bidders based on the technical evaluation criterion prescribed in this RFP. To qualify the technical evaluation stage, the bidder must score a minimum of **70 marks.**
2. Documentary evidence (Citation, Copy of completion / ongoing client certificate and work order / Contract) is required for all project experience.
3. In case project is on-going a certificate from the Charted Accountant/Statutory Auditor has to be provided mentioning that 80% of Capex is complete and O&M has started.
4. For International project if the original client certificate and other documents are in language other than English than a translated copy duly verified by Indian embassy shall be submit with bid document
5. For projects where fee has been received in any currency other than Indian Rupees, than the foreign currency conversion rate available on Reserve Bank of India's portal as on the date of publication of the tender document shall be used for conversion of amount in foreign currency to Indian Rupees equivalent.
6. BSCDCL (or a nominated party) reserves the right to check/validate the authenticity of the information provided in the Pre-qualification and Technical Evaluation criteria and the requisite support must be provided by the Bidder.

3.3 Evaluation of Financial Bids

- The financial bids for only those bidders will be opened who have qualified in the technical criteria (section 3.2).
- Financial bids, not substantially responsive or incomplete in any manner, are liable to be disqualified. The bidder with lowest bid value shall be declared as Lowest Bidder (L1).

Additional information/clarification –

BSCDCL reserves the right to ask for any additional information, as it may deem necessary to evaluate the bid proposal. Bidders that fail to submit additional information or clarification as sought by evaluation committee within 7 days of date of letter requesting for such additional information and/or clarification from BSCDCL, their bids will be evaluated based on the information furnished along with the bid proposal.

4 Section IV: Detailed Scope of Work

The scope of services described hereunder is neither exhaustive nor complete and is indicative only. The SI shall undertake detailed investigation of the project facilities, study, make assessments and ascertain all by itself the required tasks, interventions, inputs and all other necessities to determine the complete Scope of Services.

The SI needs to do the appropriate solution design and sizing for the project as per the scope of work and other terms and conditions of the RFP. In case SI has not considered any component/service which is necessary for the project requirement, the same needs to be brought by the SI at no additional cost to BSCDCL.

The SI will have to operate and maintain the Bhopal Water Utility SCADA Management System (BWUMS) for a period of five (5) years after Go Live date.

The scope of the project shall entail the design, supply, install and maintain the SCADA system for Water Management System, Leak detection, Water Quality Monitoring& total water lossestimation at Bhopal Municipal Corporation for below mentioned Water entities :-

4.1 Automation at the outlets of 12 Water Treatment Plants:

All necessary instrumentation like Electrically Actuated Flow Control Valves, Pressure Transmitters, Level Transmitter, Flow Transmitter, water quality sensors etc., communication modules, PLC/RTUs, UPS, cables, control wiring etc. at outlets of WTP's with Flow & pressure Control /leak detection, NRW estimation,remote monitoring and control through Water SCADA and as required to meet the functional requirements and SLAs of this RFP, are to be included by the bidder in his submitted quote. For NRW Estimations , the Meter Readings for Bulk Connections can be provided by the Authority to the Bidder in the form of API , which can be integrated to the available Application.*

4.2 Automation of 175 Elevated Storage reservoir (Reservoir/Outlet Management System):

All necessary instrumentation like Electrically Actuated Valves, Pressure Transmitters, Flow meters etc., *communication* modules, PLC/RTUs, UPS, cable, control wiring etc. ,calibration at 175 ESR's with inlet and outlet flow & pressure monitoring &Control, water loss estimation, required interlockwith remote monitoring and control through Water SCADA and as required to meet the functional requirements and SLAs of this RFP, are to be included by the bidder in his submitted quote.*

The envisaged system should avoid the overflow of Reservoirs,allow Uniform distribution of Water to the reservoirs irrespective of its location and distance from the source of supply. Also system should be enabled to record, monitor and control the instantaneous and Cumulative flow delivered to the Reservoirs.
The civil work may include but not limit to erection including excavation, making connection to *inlet/outlet pipe, cutting, welding and associated fittings with accessories, backfilling and commissioning of the Reservoir/Outlet Management system.*
The bidder shall be responsible to complete the job including enclosure box, controller and level sensor with respect to requirement and BSCDCL satisfaction including trial run and commissioning.

4.3 Automation of Water Feeder Distribution Line which includes:-

a) Distribution from Pumping Station/Water Treatment Plant to Elevated Storage Reservoirs

b) Distribution from outlet of the Elevated Storage Reservoirs

(The range of Water Feeder Distribution Line to be automated as per the criteria mentioned will be at the discretion of BSCDCL and the bidder has to take a sign off from BSCDCL on this)

Note: A maximum of 5 Sensors/other Hardware/Instrumentation components to be installed per water distribution line from the outlet of ESR mentioned in Section 4.3 b).

Study the pipe line laidacross the Bhopal city to distribute water at city level WTPoutletto Elevated Storage reservoir/Underground reservoir. Pipe line detail is attached in Annexure 5 for reference. All necessary instruments like Electrically actuated valve, pressure transmitter, flow transmitter, PLC/RTU, UPS, cables etc. at the necessary location i.e.branches/nodes/intermediate to maintain/monitor & control equitable flow & pressure remote monitoring and control through Water SCADA and as required to meet the functional requirements and SLAs of this RFP, are to be included by the bidder in his submitted quote.*

The civil work may include but not limit to excavating the trench, erection(cutting/drilling of hole/welding of main WSS pipeline, associated fittings with accessories), commissioning of the tamperproof enclosure system(if required) with alerts , burst monitoring by pressure monitoring .

The bidder shall be responsible to complete the job with respect to requirement and BSCDCL satisfaction including trial run and commissioning.

4.4 Automation of Pump Houses:

All necessary instrumentation like Electrically Actuated Valves, Pressure Transmitters, Flow meters, level transmitter etc., along with communication modules, PLC/RTUs, MCC/IMCC with VFD and Soft Starter (if required),UPS, cable, control wiring, drives, etc. at Pump Houses with inlet and outlet flow & pressure monitoring & Control with the required interlock for remote monitoring and control through Water SCADA and as required to meet the functional requirements and SLAs of this RFP, are to be included by the bidder in his submitted quote.*Bidder needs to decide on the compatibility of the existing pumps for the required automation and quantify the MCC/IMCC panels accordingly.

4.5 Network Connectivity:

• The communication between the PLC/RTU to the different sensors/equipment should be wired or wireless, to ensure robust IT Network. The bidder should come up with an efficient robust network solution.

The field RTU/ PLC system shall communicate with the SCADA Control Centre (SCC) using GPRS communication. The communication system shall comprise of Redundant GPRS modem based communication module comprising of one Main and One standby Modem with suitable antenna, modem controller and 02 nos. data enabled SIM cards (01 no. per modem) using two different service providers .

The module shall be programmed to automatically toggle between the service providers based on the actual signal strength, switch to the stand by modem in case the main modem fails

(a) **GPRS Controller**

(i) The GPRS controller shall have at least 2 serial ports
(ii) Two GPRS modems shall be connected on two independent serial ports
(iii) The controller shall constantly monitor the signal strength and the signal quality of the modems and send this data to the PLC
(iv) In case there is a break in the OFC connectivity the PLC shall send a command to the controller to initiate data transfer via the GPRS modems.
(v) In case there is a drop in the signal strength or quality of one service provider the controller shall start using the second modem to transfer data

(b) GPRS Modems

i. Two GPRS modems shall be provided with SIM cards of two different service providers
ii. The modems shall be controlled by the GPRS controller as described above

End Mile Connectivity
The bidder should ensure operation of PLC/RTU/Equipment's etc. through GPRS with SCADA Control Centre. It should allow for remote monitoring and control through Water SCADA and as required to meet the functional requirements and SLAs of this RFP. The connectivity from SCADA Control Centre to ICCC , if needed , in future can be done by the bidder using the FO city network, at the discretion of BSCDCL.

4.6 Design, Supply, Installation and Commissioning of IT Infrastructure at SCADA Control Centre (SCC) at BMC office

1. It is proposed that the SI shall provide the IT hardware infrastructure at the SCC for successful operations of the systems. The Application will be hosted on the local On Premise Server and the data shall be mirrored on the ICCC Cloud.. The SCC has been envisaged to be established in an

approximate area of 1000 Square Feet at the assigned premises of BMC. SI has to ensure that redundancy is provided for all the key components to ensure that no single point of failure affects the performance of the overall system. It will be SI's responsibility to:

a. Supply, Install and Commission of IT Infrastructure including site preparation in SCC

b. Establish LAN and WAN connectivity at SCC

2. Access to the SCC Space where the BWUMS Infrastructure is deployed should be demarcated and physical access to the place would be given only to the authorized personnel. Networking & Security Infrastructure and other associated IT Components.

3. Civil Construction for the SCADA Control Centre would be provided by BMC.Necessary interiors and furnishing needs to be provided by the bidder , which is included in the Financial Bid , in section 8.4.2

4. The SI shall provide system integration services to customize and integrate the applications procured through the projects. The BWUMS applications proposed by the SI should have open APIs and should be able to integrate and share the data with ICCC, Madhya Pradesh Application and any other third party systems already available or coming up in the near future

5. As part of preparing the final bill of material for the SCC, the successful SI will be required to list all passive & active components required in the SCC , as per the site survey done by the bidder before the proposal submission.

6. The bill of material proposed by the successful SI will be approved by BSCDCL for its supply and installation.

7. The SI shall prepare the overall SCC establishment & their operational plan for this project. The plan shall comprise of deployment of all the equipment required under the project. The implementation roll-out plan for setting up the SCC shall be approved by BSCDCL. The detailed plan shall be also comprise of the scalability, expandability and security of SCC.

8. The system integrator shall be required to submit a detailed installation report post installation of all the equipment at assigned location. The report shall be utilized during the acceptance testing period of the project to verify the actual quantity of the equipment supplied and commissioned under the project.

4.7 Integration

- For successful integration it is required to have protocol and component level compatibility between existing systems and the envisaged Bhopal City Water Utility Management System (BWUMS) in order to have one uninterrupted operating picture of the city along with the SCADA Control Station.
- The solution implemented will be scalable across all future integrations and demands that arise for technology solutions that will augment to the city wide network of sensors.
- All integrations will be real time API interfaces.
- The following are some of the integration touchpoints, as envisaged. This list is clearly indicative and can be expanded/modified at the discretion of BSCDCL.

#	System	Architecture/Components Touchpoints

1.	Geographical Information System	BWUMS system shall be GIS based with layers defined and all assets existing and proposed mapped on the GIS base map. All the alarms with priority wise shall be visualized on GIS screen for proactive action.
2.	Integrated Command & Control Centre	BWUMS system shall be integrated with ICCC,Madhya Pradesh located at BSCDCL,Bhopal. The Open interfaces provided as integrated components of the SCADA system are required: o OPC Data Access (OPC-DA) or OPC Unified Architecture (OPC-UA) to the SCADA server real-time and configuration database o ODBC and OLE-DB to the SCADA server real-time database, historian, event / parameter journal and configuration database o OPC Historic Data Access (OPC-HDA) to historian o OPC Alarm & Event (OPC-AE) to event sub-sys
3.	Sensors & Actuators	Currently Water Utility system has some existing sensors & Actuators .The New Water Quality sensors and actuators (to be captured by the Bidder during Site Survey)to be added should be able to connect with the existing system.
4.	Existing pumps and MCC	BWUMS shall be integrated with the existing Pumps & MCC .New pumps/MCC will be added as per requirement.
5.	Billing System/Software (if any)	BWUMS shall provide the required inputs/information to the billing software if required in future when AMRs are installed.
6.	Decision Support	Impact assessment of operations, Simulate Impact of Field Operations such as valve closure and what if scenarios. These Decision Making (use cases)needs to be finalized and taken sign off by the Authority.
7.	NRW Reporting	BWUMS shall provide water loss estimation, interactive dashboard, customizable reports, and water balance calculations.
8.	24/7 Notification	BWUMS will give Advance sensing platform measuring multiple indicators like flow, pressure
9.	Asset Failure Prediction	Asset management, Monitor surges that damage the pipe and accelerate their fatigue process.
10.	Document Management System	SMART Document management system for the entire water network. Based on COTS software.

4.8 Manpower Requirements

- It is envisaged to have 1 SCADA Project Manager, 1 Network cum System Administrator ,3workstation operators and 2 Field Technician.
- All incidents, tickets, change requests etc. should be initiated through the workstation operators with its complete track.
- SI shall maintain online log for receiving and resolving of incidents. Dedicated trained manpower should be deployed to address the issues in timely manner as per the defined SLA's. Workstation operators should support in resolution of both IT and NON IT issues.
- Workstation operators should be trained enough to perform root cause analysis of issues.

- This system should operate 365x24x7
- Incident reporting system should be provided to workstation personnel's to record each incident and remedial action. All necessary software licenses for help desk shall be procured by SI.
- SI shall set up all necessary channels for reporting issues to help desk.
- Roaster should be maintained for all preventive measures of IT/Non-IT components and its timely reporting should be submitted to BSCDCL. For all reactive measures, workstation personnel's must initiate a ticket with its severity level.

S. No.	Role	Requirement	Minimum Qualifications
1	SCADA Project Manager	1	B.E./B.Tech/ MCA, 7 Years of experience in Water SCADA implementation and maintenance project.
3	Network cum System Administrator	1	B.E./B.Tech/ MCA, 3 Years relevant experience, CCNA or equivalent
4.	Workstation Operators	3	Diploma/B.E./B.Tech/BCA/BSc./ MCA, 3 Years relevant experience
5.	Field Technician	2	ITI, 2 years relevant experience

4.9 Documentation

1. System Documentation both in hard copy and soft copy to be supplied for BWUMS including its control center applications along with licenses (wherever applicable), document updates shall include but not limited to following:

- Functional Requirement Specification (FRS)
- High level design of whole system
- Low Level design for whole system / Module design level
- System Requirements Specifications (SRS)
- Any other explanatory notes about system
- Traceability matrix
- Technical and product related manuals
- Installation guides
- User manuals
- System administrator manuals

- Toolkit guides and troubleshooting guides
- Other documents as prescribed by BSCDCL
- Quality assurance procedures
- Change management histories
- Version control data
- SOPs, procedures, policies, processes, etc.
- Programs:

a. Entire source codes (for the Bespoke customization, APIs etc build / customized for this project).The source code of the bespoke solution that is one of the deliverables under the current scope will rest with BSCDCL. Adequate protection to the pre-existing rights of the Vendors are already accorded.
b. All programs must have explanatory notes for understanding
c. Version control mechanism
d. All old versions to be maintained

- Test Environment:

a. Detailed Test methodology document
b. Module level testing
c. Interoperability Testing
d. Overall System Testing
e. Acceptance test casess

2. The above mentioned documents are required to be updated and to be maintained updated during entire project duration. The entire documentation will be the property of BSCDCL.

3. SI shall submit documentation for all new components installed/upgraded by them that includes (but not limited to) original delivery notes, original OEM manuals, system configuration documentation, etc.

4. SI shall also maintain and submit Standard Operating Procedure (SOP) documents for all the components/sub-components/services being maintained/provided.

5. Vendor shall submit certified drawings and specification sheet for each instrument and its accessories which shall include the following, as a minimum :

- Configuration diagram
- Detailed dimensional drawings of internal components
- Power consumption in volt-amperes
- GA (General Arrangement) drawings
- Logic / Ladder diagrams
- Input / Output (I/O) assignments
- Power supply distribution drawings
- Heat Dissipation figures for all components
- Functional Design Specification (Hardware and Software)
- FAT / SAT procedures
- Wiring drawings for system cabinet & marshalling racks.
- I/O mapping with CCC including MODBUS address.

- UAT
- Inspection/Test Report.

4.10 Operation and Maintenance for a period of 5 years:

The Operations and maintenance phase will be for a period of 5 (five) years after Go-Live.

Success of the Project would lie on how professionally and methodically the entire Project is managed once the implementation is completed. From the System Integrator perspective too this is a critical phase since the quarterly payments are linked to the SLA's in the post implementation phases. System Integrator thus is required to depute a dedicated team of professionals to manage the Project and ensure adherence to the required SLAs. SI shall provide operations and maintenance services for the software, hardware and other IT and Non-IT infrastructure installed as part of BWUMS project for a period of 5 Years. Following will be the scope of services during the O&M period.

- Ensure availability of infrastructure (both Non-IT and IT) including but not limited.
- SI shall also maintain log/records of all maintenance activities and shall maintain a logbook on-site that may be inspected by BSCDCL at any time during contract period
- SI shall have to maintain necessary stock and provide adequate onsite and offsite spare parts and spare components to ensure that the SLA is met for the entire contract period. To provide this service it is important for the selected bidder to have necessary back to back arrangement with the respective OEMs / vendors.
- SI shall provide comprehensive technical support services for all the proposed hardware and software for the entire duration of the contract. The technical support should include all the upgrades, updates and patches that are released by the respective OEMs
- SI shall implement and maintain standard operating procedures for the maintenance of all the infrastructure based on the policies formulated in discussion with BSCDCL
- SI to ensure continuous operation and upkeep of the SCADA infrastructure.
- The SI will ensure comprehensive maintenance inclusive of replacement of spares in case of damage, manufacturing defect, failure during operations and similar other conditions.

4.11 Warranty support

- SI shall provide comprehensive and on-site warranty for 5 years from the date of Go-Livefor the infrastructure deployed on the project. SI need to have OEM support for thesecomponents and documentation in this regard need to be BSCDCL on annual basis.
- SI shall provide the comprehensive & onsite manufacturer's warranty in respect of properdesign, quality and workmanship of all hardware, equipment, accessories etc. covered by theRFP. SI must warrant all hardware, equipment, accessories, spare parts, software etc.procured and implemented as per this RFP against any manufacturing defects during thewarranty period.
- SI shall provide the performance warranty in respect of performance of the installedhardware and software to meet the performance requirements and service levels in the RFP.
- SI is responsible for sizing and procuring the necessary hardware and software licenses asper the performance requirements provided in the RFP. During the warranty period SI shallreplace or augment or procure higher-level new equipment or additional licenses/hardware atno additional cost to the BSCDCL in case the procured hardware or software is not enough or isundersized to meet the service levels and the project requirements.
- During the warranty period SI shall maintain the systems and repair/replace at the installedsite, at no charge to BSCDCL, all defective components that are brought to the SI's notice.
- The SI shall carry out Preventive Maintenance (PM) of all hardware and testing for virus, ifany, and should maintain proper records at each site for such PM. The PM should be carriedout at least once in six months as per checklist and for components agreed with BSCDCL.
- The SI shall carry out Corrective Maintenance for maintenance/troubleshooting of suppliedhardware/software and support infrastructure problem including network (active/passive)equipment, security and rectification of the same. The SI shall also maintain completedocumentation of problems, isolation, cause and rectification procedures for buildingknowledge base for the known problems in centralized repository, accessible to BSCDCL teamas well.
- SI shall monitor warranties to check adherence to preventive and repair maintenance termsand conditions.
- The SI shall ensure that the warranty complies with the agreed technical standards, securityrequirements, operating procedures, and recovery procedures.
- SI shall have to stock and provide adequate onsite and offsite spare parts and sparecomponent to ensure that the uptime commitment as per SLA is met.

- Any component that is reported to be down on a given date should be either fully repairedor replaced by temporary substitute (of equivalent configuration) within the time frameindicated in the Service Level Agreement (SLA).
- The SI shall introduce a Comprehensive Assets Management process & appropriate toolto manage the entire lifecycle of every component of Water SCADA Utility System.

4.12 MIS Reports

BWUMS control center applications should be able to generate various kind of SI reports. SI shall be required to generate and submit the reports as specified under on a regular basis in a format decided by BSCDCL. The following is only an indicative list of MIS reports which would need to be shared bySI.

Daily reports

- Summary of issues / complaints logged at the Technical Support desk
- Summary of resolved, unresolved and escalated issues / complaints
- Log of backup and restoration undertaken.

Weekly Reports

- Summary of issues / complaints logged with the OEMs.
- Inventory of spare parts.

Monthly reports

- Component wise IT & Non IT infrastructure availability and resource utilization.
- Consolidated SLA / non-conformance report.
- Summary of component wise uptime.
- Log of preventive / scheduled maintenance undertaken
- Log of break-fix maintenance undertaken
- Summary of attendance of SI's staff
- Consolidated component-wise ICT infrastructure availability and resource utilization.

Note:

- BSCDCL may ask for additional reports related to Non-IT and IT infrastructure as and when required.

4.13 Functional and Technical Requirements

Water Utility Management System

A smart water utility management system is proposed and designed looking at BSCDCL's current requirement that will help BSCDCL to gather meaningful and actionable data about the flow, pressure and distribution of a city's water supply system which will eventually help in better city water management and operations.

**** The SI should survey all the sites before preparation of requirement specifications.**

The following functional and technical requirements are indicative and BSCDCL is authorized to make any requirement change during the project execution phase.

Sr. No.	Components
1	**Requirement Gathering**
	Study the current water supply system of Bhopal Municipal corporation and gather requirements from SCADA implementations perspective in terms of software applications, hardware and instrumentation (flow meters, electrically actuated control valves, level transmitters, residual chlorine analyzers, pH meters, turbidity analyzers etc.) for designing a comprehensive Water SCADA system, Water management for: Impact Assessment Operations - Water Loss Estimation - Asset Failure Detection The existing drawings and instrumentation (provided in Annexure 2, 3, 4&5) are comprehensive while Proposed Instrumentation is illustrative. All of the existing instruments may not be sufficient for the proposed solution and some additional instruments may need to be installed by SI. Based on proposed solution requirement, SI has to suggest additional (proposed) instrumentation, design and implement city level Water SCADA system, Water management System. The envisaged solution has to overcome the following problems occurring in the current Water Management Scenario in Bhopal :- • Sensor Data Management • Monitoring multiple pipe leakage indicators- pressure, acoustic and flow. • Non-Revenue Water Tracking • Water loss management and anomaly alerts • Inefficient Plant Operation (WTP and ESR) • Manual Control

	• Inadequate Air Management. • Monitoring pipe damaging pressure surges • Determine source of Surge events with identification of stressed pipelines. • Manual Control of ESR's • Inadequate Water Quality monitoring and maintenance. • Absence of Proactive control of assets like Pumps/ Motors/Valves/Pipeline • Absence of a document management system with asset historical data. • Absence of Water Quality measurement parameters like chlorine, turbidity and pH.
2.	**Water SCADA Management System**
	The supplier shall offer a smart water network solution, including hardware and software, able to deliver a set of network management functions described below: The solution shall provide the required advanced simulation capabilities and shall enhance the SCADA functions, by combining historical, real-time and forecast data within the SCADA interface, without any other middleware module. **The SCADA solution shall be used to monitor and control the water supply and distribution network. Following are the functions required in the solution:** • **Enhanced network monitoring**: The system shall provide information about flow, pressure and water quality conditions in the water distribution network for all the nodes and customers, including those that are not measured by field sensors/devices. • **What if scenarios:** the system shall allow the operator to create operational what if scenarios and visualize the results of these scenarios for easy comparison and decision making. • **Single point of information for control room operators:** The system shall present all the information directly in the existing SCADA HMI, by incorporating in the SCADA alerts related to level of service breaches (outage, pressure and water quality issues), thematic maps related to current and future operating conditions of the network, option to simulate the effects of what-if operational scenarios, possibility to notify alarms to water network managers and field technicians on duty. Local HMI to be considered for WTP & Pumping Stations. • **Utility wide view:** In order to share relevant data to other stakeholders within the organization, the system shall include a web based HMI where input data and simulation results for the entire network can be visualized, in the form of thematic maps, time series graphs, tables and longitudinal profiles.

	• Study and propose any other gap infrastructure/hardware related to implementing the Water SCADA in above specified locations. • Supply, Configure, Install, Test and Commission comprehensive SCADA system for complete Bhopal Water Supply System. • Proposed SCADA system shall monitor, operate and control operations of all units/systems and associated equipment's/devices/instruments etc. at Water Treatment Plant, Clear Water gravity main pipeline, ESRs with Pump House at various locations across Bhopal. • Proposed System shall be able to calculate water loss level across the entire water network • Proposed system should provide the option to generate alerts/messages/alarms with respect to specific configurable parameters. It should be possible for the Engineer-in-charge (and a few other senior officers) to monitor the complete water network from any PC/laptop/tablet/mobile on the network using a standard browser.
3.	**Application User Interface**
	a. Operational view - Web based HMI In order to help the water distribution department's activities, the SCADA add-on shall provide information at least on the following aspects. This list in only indicative: **Day to day operation** • Data on flows, pressures, tank and reservoir levels, water age and disinfectant concentration for the next 48 hours. • View at a glance the current levels of services (outage, pressure, water quality) in the distribution network zones. • Analyze in detail the behavior of a specific zone over the last 48 hours. • Check the status of all the storage points (ESRs) and their trends over the last 48 hours. • Alarms based on the expected situation of hydraulic and water quality parameters. **Service disruptions** • View at a glance about the distribution network zones and how many customers are likely to experience disruptions over the next 48 hours. • Analyze the results of an alternative what-if scenario and compare it with the business as usual scenario. • Evaluate the impact of planned maintenance on levels of service (number of customers affected). • Notify issues to the staff in charge of the zone/asset where the problem is located. **Service performance** • Pumping stations with the highest energy consumption.

	• Most inefficient pumping stations. • Zones with the lowest standard of service in terms of pressure supply. • Zones with the lowest standard of service in terms of supplied water quality. • Zones with the highest cost of energy associated to water distribution. • Zones with the greatest potential for active pressure management.
4.	**Results within SCADA HMI**
	As part of the enhancement of the SCADA monitoring capabilities to be provided by the solution, the SCADA operator shall automatically get relevant information from the simulation and optimization results, giving him/her support when making operational decisions. This shall be provided on the SCADA interface itself. Information from the on-line simulation shall be shown in the right mode, format and time on the SCADA client, through built-in navigation capability: • The SCADA operator shall have capability to scroll back and forth along a time bar and the contents in the map view from within the SCADA HMI shall change accordingly. The operator shall therefore be able to compare the current situation with forecast results, and take action accordingly. • The SCADA operator shall be able to examine data such as attribute information, pressure and flow figures and forecasts for a selected object, and to display object time series or other predefined time series. • The system shall be able to generate alerts associated to: ongoing breaches of service levels (pressure and water quality); forecast breaches of service levels; data anomalies. A context-sensitive menu shall be available, allowing the Operator to acknowledge, comment or disable these alerts. • The SCADA operator shall be able to notify the alerts to network managers and field technicians so to take immediate actions to prevent or minimize service disruptions. • It should be possible to scroll back and forth and obtain data for pressure, flow and water quality at any given time - in the past, now or in the future, anywhere in the network. Predict the network behavior and see what will happen before it happens • Improves service and planning: Plan ahead and save time and money • Builds on your existing data and IT: Gives existing software systems new functionalities • It should be possible to simulate scenarios to see operation & maintenance impacts in advance, making easier to choose the best option for a smooth and risk less operation • It should be possible to monitor Water quality and early warning on pollution/bad quality

	cases to reduce health threatening events. o • It should also possible to combine with weather forecast data to predict future consumption – even during periods of changeable or extreme weather conditions.
5.	**SCADA Architecture**
	The SCADA architecture shall provide the following: • Client / Server architecture based on TCP/IP networking and report-by-exception (RBE) technology • Standalone single server operation.Fully Automated data transfer between servers to provide complete server redundancy • Symmetric main-standby & capacity for triple standby server functionality. • Additional servers for client load sharing and remote locations. • Permanent Standby Server designed to be placed outside corporate firewalls providing a read-only access to the server while ensuring corporate security. • Fully automated data transfer between servers to provide complete server redundancy. This transfer shall include configuration, real-time data, historic data and event lists. Database updates shall be on an incremental basis with tuneable parameters • A scalable fully distributable architecture providing: o Unlimited number of server systems. o Unlimited number of display clients. • Where multiple servers are deployed, the system shall be capable of being configurable from a single client. • All redundancy shall be handled by the database, with the operational state of systems preserved through a server changeover. The system shall not rely on driver redundancy for data transfer when providing redundant server. The system shall present a uniform view of data including communication status after a fail over. • Forced changeover between main and standby allowing seamless changeover between main and standby servers without shutting down either server. • Clients to connect to a synchronizing server as soon as the configuration and current data in the database has synchronized. Incomplete data sets as per clients request on event or trend provide indications that the synchronization is still in progress to ensure that conclusions are not drawn from incomplete data sets. • Configurable compression of data communications between client/server and server/server to allow optimization of communications performance over WAN networks. • Change reporting on Client/Server and Server/Server links rather than polled communication to permit operation on WAN networks. • Capable of operating Client/Server and Server/Server links over low to medium speed channels depending upon database size (e.g. 128K)

	• The SCADA system shall provide a built in data historian with the following facilities as standard features. These shall be provided without the addition of external software modules:
	  o Time-series relational database
	  o ODBC / SQL interface to historical (trend) data
	  o Historical data to be stored with time-stamp, point quality, alarm status
	  o Historic storage is to be based on configurable criteria including time between samples, alarm state change
	  o Compression capability
	• Historical files supporting fixed interval sampling only will not be accepted.
	• Where historic data can be retrieved through communication devices such as PLC/RTUs, the historic data sub-system shall natively provide the capability to backfill this data in to the historian.
	• No loss of data or gaps in data as a result of communication or server failure shall be accepted. The vendor must demonstrate its ability to ensure data integrity and history data recovery.
	• The historic data subsystem shall provide fixed and user configurable views of the historic data tables. These views are required to provide SQL pre-processing and present historic data in aggregate format.

9.	**System Security & Access**
	• The SCADA system shall provide a high level of inherent security. To this end the SCADA software shall provide security access down to data point level, and support individual Users, User Groups and a matrix of system capability and access to any level of the SCADA database. • Full function Rich & Web client interfaces shall require explicit administrative configuration to valid connection to the SCADA server. • Web interface facilities shall provide the capability to operate the Web interface using SSL and encrypted data. The Web functionality shall be provided in an integrated way with the web server facility tightly coupled with the SCADA database. It is not acceptable for the system to utilize IIS or similar external web interfaces, or require web pages to be "published" from the SCADA system. Changes in configuration to the SCADA system shall not require additional steps in order to provide modified information to the SCADA Web interface.
10.	**Open Connectivity**
	• To provide easy access for customized reports and external data manipulation the SCADA software shall provide inherent OPC and ODBC database connectivity without the need for additional software options or modules. • The following Open interfaces shall be provided as integrated components of the SCADA

	system are required: o OPC Data Access (OPC-DA) to the SCADA server real-time and configuration database o ODBC and OLE-DB to the SCADA server real-time database, historian, event / parameter journal and configuration database o OPC Historic Data Access (OPC-HDA) to historian o OPC Alarm & Event (OPC-AE) to event sub-system o OLE Automation interface to the SCADA server database
11.	**Reports**
	• An integrated reporting package shall be able to generate, print and export reports: o Triggered by SCADA events o On user demand o On timed schedules • Report generation shall use latest technology in database access and be capable of combining data from multiple databases via ODBC/SQL. This shall include SCADA and non-SCADA databases.
12.	**Standard Drivers**
	The SCADA system shall provide native support for fully integrated Wide Area SCADA PLC/RTU protocols. This shall include the capability for supporting all protocols in redundant SCADA server configurations and support redundant communication paths.
13.	**Protocol Support**
	Wide area PLC/RTU protocols shall support: • Local serial port communication • Terminal server serial port communication • Ethernet LAN communication via TCP and UDP ports • Time synchronization • Presetting output configuration points where configured • Fully integrated incorporation of events from a PLC/RTU • Unsolicited exception reporting • Where RTUs utilize the DNP3 communications protocol, those devices must support the DNP3 Secure Authentication standard.

14.	**Real-time visibility of assets**
	Bidder will import a logical or representative schematic of the water supply system from BSCDCL with assets such as ESRs, reservoirs, flow sensors, pressure gauges into Bidder's software. This map will be used as the central navigation tool by BSCDCL engineers. Smart Water Management Software will connect to the operational technology system database server and retrieve data for processing and display.
16.	**Pressure Management**
	• The system shall be able to manage pressure across the entire water network including Pressure Zones (PZ). • The system shall be able to monitor PZ performance in terms of: o Level of service to customers (pressure of supply within an optimal range). • The system shall provide PZ optimization tools that recommend the operator changes in the setting of PZ pressure regulating devices and also automatically send the recommended set points of PZ pressure regulating devices to the SCADA system.
17.	**Alarm Management**

	• The system shall be able to identify and alert the operator on the occurrence of different types of anomalies in the water network normal operation in a real time environment including:
	  o Bursts/leakage.
	  o Faulty metering equipment.
	  o Anomalous consumption.
	  o Unreported network operation.
	  o Zone boundary breach.
	  o Anomalous behaviour in network operations and faulty metering equipment.
	• The system shall propose to the operator a set of default alarm associated to specific network assets.
	• The system shall allow the operator to configure the default alarms and create ad-hoc alarms.
	• The system shall allow alarm thresholds to be profiled by time:
	  o Time of the day.
	  o Day of the week.
	  o Period of the year/season.
	  o Bank holidays.

18.	**Data Validation**
	• The system shall use an engine to automatically validate each data stream entering the system. Data shall undergo a series of comparison tests against discrete values, historical values, and averages/totals. The outcome of these tests determines the data quality flag of each measurement reading. • The system shall be able to recognize anomalies in the data streams and flag them as erroneous. • The system shall provide the operator with the results of all the validation tests and sort the results based on the data quality flag. • If the data failed the validation check, the system shall flag the data or mark it invalid. These values will not be used in calculations. • Operators shall be able to review all failed data and decide whether accept their values or to discard and substitute them with an estimated value.
19.	**Reporting**
	• The system shall provide a comprehensive set of water balances, standard reports and performance indicators regarding water loss. Reports shall be made available in the system at various hierarchical levels and zone aggregations. • The system shall contain dashboards summarising real time key performance measurements. Each user shall be able to configure these dashboards by selecting the content to be displayed.
20.	**General Requirements**
	• The system shall be a web-based application. • The system shall run in a technical environment using computing resources that are hosted at client or client service provider premises, and be accessible over the client's network. • The system shall provide support for mobile devices. • The system architecture shall be scalable to allow for future growth in both data volumes and user volumes. • Access to all functions shall be controlled on an individual user basis and on a grouping basis where users with similar roles can be easily assigned the same functions. • The system shall provide additional authentication for the execution of critical functions. • All actions carried out within the system shall be recorded for audit purposes.

4.14 Geographical Information System (GIS) Platform and Asset Management Software

1) Geographical Information System (GIS) is for management, analyzing and displaying data of all areas within Bhopal which are spatially referenced to earth for efficient and effective decision making, spatial planning, management of crisis/disasters and for monitoring of normal circumstances, thus providing an important tool to respond faster to incidents or even avert certain incidents

2) GIS platform is intended to provide common GIS capability to all systems being deployed as part of Bhopal Smart City initiative. The objective of architecting a common GIS layer is to keep a single repository of all GIS data for easy maintenance, avoid duplication and easy dissemination of information to all the dependent systems.

3) The GIS platform would also need to exchange data with a number of external applications and therefore should be capable of exporting data in most industry standard formats.

4) All elements related to Water Supply – treatment, pumping and distribution shall be mapped on Google earth as the base map.

5) The layer created by the Bidder should be available as API's for integration with the existing GIS Map of BSCDCL, if required.

6) All elements of the like WTPs and internal buildings, roads, other civil structures inside the WTP, Pump houses, pipelines upto the ESRs and ESR shall surveyed by the contractor using existing maps, DGPS and total station equipment and then accurately depicted on Google earth.

7) The survey shall also involve the use of geophysical tools such as Pipe locators and / or Ground Penetrating radars for locating and mapping the underground pipelines.

GIS Implementation:-

1) Survey

The survey of the area of interest shall be carried out by the use of Differential Geographical Positioning Systems (GPS) Devices, total station, Pipe locators, Ground penetrating radars and existing maps (if available) .

2) Mapping of Water Supply Utilities

Mapping will be with an exhaustive asset management survey specific to the requirements of the Water Supply system. The Base map (google earth) shall be populated with all elements (pumps, valves, meters, pipelines etc.), including civil structures (filter beds, Ground storage reservoirs, Pump houses, Elevated storage Reservoirs etc.) related to the water supply network upto ESRs.

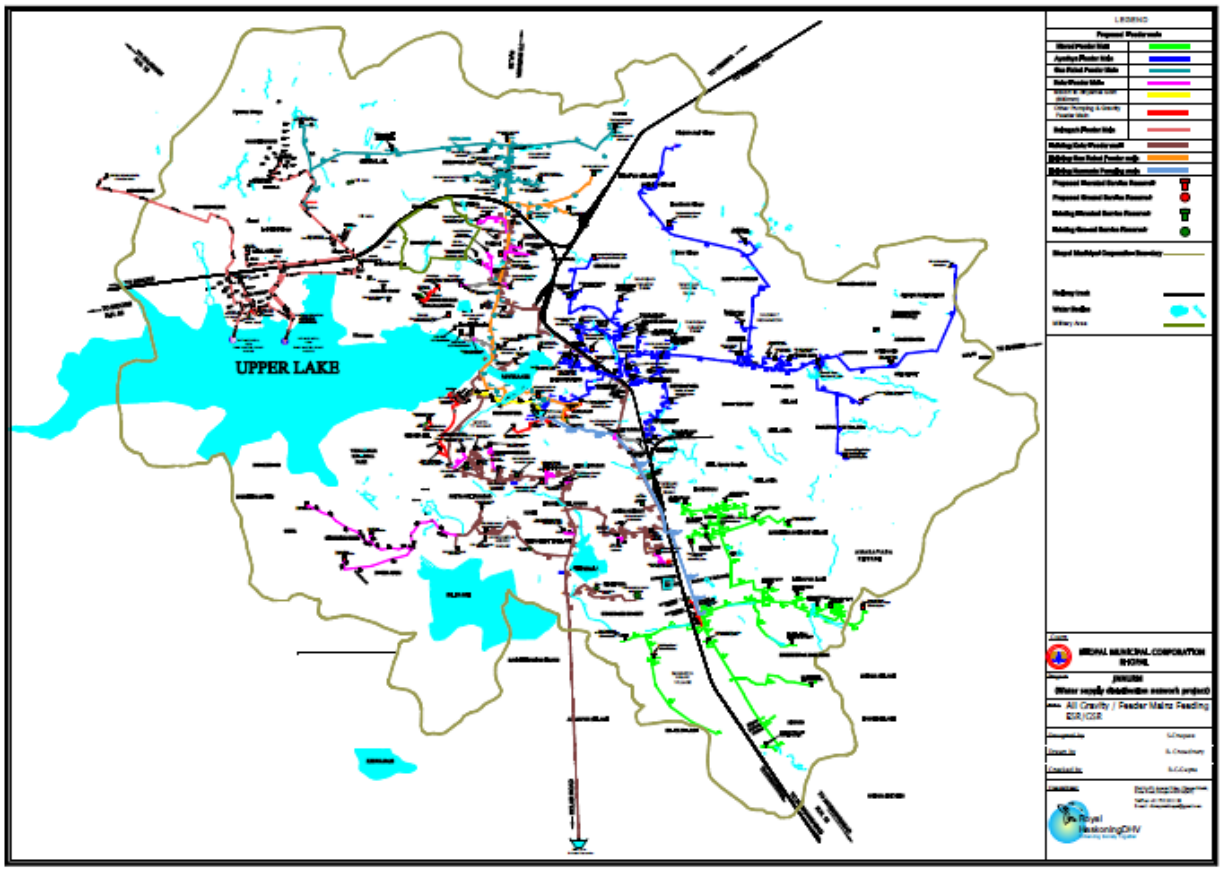
All elements shall be accurately depicted on google maps by the contractor using existing maps, survey information, and information from the concerned engineers

Minimum Functionality of GIS based application for Water Utility Management System.

Service	Input	Output
• Water supply including Water Bodies • Water supply mains upto ESR • Management and future Planning of Water works / supply	• Water Loss rectificationdata • Database for undergroundreservoirs • Database forESR's • Location of pumpingstation • Water Treatment plantbuilt • Location and structural details of reservoir tanks including balancingtanks • Location details of watersources • Location details of pump station and water bodies. • Location details ofESR's • Location details of undergroundpipeline upto ESR	• Detection of Water Loss in the pipes and segments where occurred . • Segregation of certain type of complaintarea

4.15 Proposed Layout

(This diagram has been provided for reference. The actual layout can be provided to the Bidder, whenever he requires during the bidding period.)



5 Section V: Project Implementation and Payment Schedule

5.1 Milestones and Payment Schedules for Implementation Phase

Based on findings of the Site survey done by the SI, the SI may propose a change in the number of sites or individual units to be deployed in the overall scope. BSCDCL also retains the right to change the number of sites or individual units to be deployed for each scope item. The final decision on change in implementation and related change in payment schedules shall be at the discretion of BSCDCL.

The project implementation timelines and payment schedule shall be as under:

T= Date of Contract signing.

S. No.	Major Milestone	Timeline	Deliverable	Payment
1	Completion of Site	T+2 weeks	• Inception Report	-

	Survey		• Project Plan • Risk Management and Mitigation Plan • Site survey report (SCADA sites) alongwith key observations which require intervention of the tendering authority. • Final BoQ	
2	Study of existing system and provide documentation describing the identified gaps and proposed solution along with customization and integration with the application software .	T+4 weeks	• Functional Requirement Report for operationalization of complete system • Application architecture documents. • Technical Architecture documents. • Network Architecture documents. • Material Dispatch, Commissioning,Go-Live Schedule	10 % of CAPEX Cost
3	Delivery and Receipt of IT and non-IT equipment's at site and after Verification of such items by BSCDCL/BSCDCL authorized agency.	T+ 14 weeks	• Phase completion report signed by inspection team • Functional Test Plans • Change management Plan	30% of CAPEX Cost
5	Installation of all IT and non-IT equipment's	T+16 weeks	• IT and Non-IT Infrastructure Installation Report	20% of CAPEX Cost
6	• Supply and installation of required customized and integrated application software alongwith proper testing • Establishment of IoT gateway at SCADA Sites and data transmission	T+24 weeks	• Application deployment and configuration report • Completion of Testing and closure of observations report • Integration Testing Report • Installation and inspection Report • Warranty Certificates for items supplied	10% of CAPEX Cost

	in to water information hub at ICCC • Inspection of successful installation of all the hardware and software			
9	• FAT and Successful Go-Live • Training and Documentation	T+30weeks	• FAT Completion report • Training completion report • Deployment of FMS team • Go-Live Report	10% of CAPEX Cost
10	Two months of successful operation and Maintenance after ProjectAcceptance	T + 38 Weeks		Remaining 20 % of the completed portionwould be distributed in equal instalments during the 5 years of O&M period.

Note:

a) The supplier's/ selected bidder's request for payment shall be made to the purchaser in writing, accompanied by invoices describing, as appropriate, the goods delivered and related services performed, and by the required documents submitted pursuant to general conditions of the contract and upon fulfilment of all the obligations stipulated in the Contract.

b) Due payments shall be made promptly by the purchaser.

c) The currency or currencies in which payments shall be made to the supplier/ selected bidder under this Contract shall be Indian Rupees (INR) only.

d) All remittance charges will be borne by the supplier/ selected bidder.

e) In case of disputed items, the disputed amount shall be withheld and will be paid only after settlement of the dispute.

f) Payment in case of those goods which need testing shall be made only when such tests have been carried out, test results received conforming to the prescribed specification.

g) Any penalties/ liquidated damages, as applicable, for delay and non-performance, as mentioned in this bidding document, will be deducted from the payments for the respective milestones.

h) Taxes, as applicable, will be deducted/ paid as per the prevalent rules and regulations

i) The above payments are subject to meeting of SLA's failing which the appropriate deductions as mentioned in the SLA document of this RFP.

5.2 Milestones and Payment Schedules for Operations and Maintenance Phase

The Operations and maintenance phase will start as soon as Go-Live (T+31 weeks) occurs. The SI will be required to adhere to the SLA and provide post implementations support for a period of 5 Years.

Payment of Operations and maintenance phase will be made on quarterly basis (at completion of each quarter) based on the adherence to SLA, for the amount quoted for each respective year.

S.No.	Payment Milestones for the Implementation % Payment of Time Schedule Phase	Payment Schedule	Deliverable	Time Schedule
1.	Year 1 payment for O&M after Go-Live • Q1 : 25% of Yearly Payment • Q2 : 25% of Yearly Payment • Q3 : 25% of Yearly Payment • Q4 : 25% of Yearly Payment • 20% of remaining CAPEX value to be distributed during each year of O&M on pro-rata basis.	Quarterly O&M Payments	O&M Report	Payment of Year 1 and 20% of the remaining CAPEX value would be equally distributed, during each year of O&M on pro-rata basis.
2.	Year 2 payment for O&M after Go-Live • Q1 : 25% of Yearly Payment • Q2 : 25% of Yearly Payment • Q3 : 25% of Yearly Payment • Q4 : 25% of Yearly Payment • 20% of remaining CAPEX value to be distributed during each year of O&M on pro-rata basis.	Quarterly O&M Payments	O&M Report	Payment of Year 2 and 20% of the remaining CAPEX value would be equally distributed, during each year of O&M on pro-rata basis.

3.	Year 3 payment for O&M after Go-Live • Q1 : 25% of Yearly Payment • Q2 : 25% of Yearly Payment • Q3 : 25% of Yearly Payment • Q4 : 25% of Yearly Payment • 20% of remaining CAPEX value to be distributed during each year of O&M on pro-rata basis.	Quarterly O&M Payments	O&M Report	Payment of Year 3 and 20% of the remaining CAPEX value would be equally distributed, during each year of O&M on pro-rata basis.
4.	Year 4 payment for O&M after Go-Live • Q1 : 25% of Yearly Payment • Q2 : 25% of Yearly Payment • Q3 : 25% of Yearly Payment • Q4 : 25% of Yearly Payment • 20% of remaining CAPEX value to be distributed during each year of O&M on pro-rata basis.	Quarterly O&M Payments	O&M Report	Payment of Year 4 and 20% of the remaining CAPEX value would be equally distributed, during each year of O&M on pro-rata basis.
5.	Year 5 payment for O&M after Go-Live • Q1 : 25% of Yearly Payment • Q2 : 25% of Yearly Payment • Q3 : 25% of Yearly Payment • Q4 : 25% of Yearly Payment • 20% of remaining CAPEX value to be distributed during each year of O&M	Quarterly O&M Payments	O&M Report	Payment of Year 5 and 20% of the remaining CAPEX value would be equally distributed, during each year of O&M on pro-rata basis.

	on pro-rata basis.			

6 Section VI: Service Level Agreements

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service which shall be expected by the System Integrator to BSCDCL for the duration of this contract.

BSCDCL shall regularly review the performance of the services being provided by the SIand the effectiveness of this SLA.

Liquidated damages to be levied shall be capped at 5% of the CAPEX value during Implementation period and at 10% of the OPEX value during Operation and Maintenance (O&M) period. However, BSCDCL would have right to invoke termination of the contract in case the overall liquidated damages equals 10% of total contract value.

6.1 Definition

Service Level Agreement (SLA) is the agreement between the BSCDCL and the SIbidding for the project. BSCDCL would monitor SI's compliance of the SLA. SLA defines the responsibility of the SIin ensuring the performancebased on the agreed performance indicators.

For purposes of this SLA, the definitions and terms as specified in the contract along with the following terms shall have the meanings set forth below:

a. "Uptime" shall mean the time period for the specified services / components with the specified technical service standards are available to the user department. Uptime, in percentage, of any component (Non IT & IT) can be calculated as:

Uptime = {1- [(Downtime) / (Total Time – Maintenance Time)]} * 100

b. "Downtime" shall mean the time period for which the specified services / components with specified technical and service standards are not available to the user department and excludes downtime owing to Force Majeure & Reasons beyond control of SI.

c. "Incident" refers to any event / abnormalities in the functioning of the Services specified as part of the Scope of Work of the Systems Integrator that may lead to disruption in normal operations of the BWUMS System.

d. "Resolution Time" shall mean the time taken (after the incident has been reported at the helpdesk), in resolving (diagnosing, troubleshooting and fixing) or escalating (to the second level or to respective vendors, getting the confirmatory details about the same from the vendor and conveying the same to the end user), the services related troubles during the first level escalation.

6.2 Pre Implementation SLA

These SLAs shall be used to evaluate the timelines for completion of deliverables till Go-Live.

Definition	**Timely Delivery of Deliverables** **(This shall comprise entire bill of material, including application systems, and successful UAT of the same)**
Service Level Requirement	All deliverables defined in the contract has to be submitted on-time on the date as mentioned in the contract with no delay.
Measurement of Service Level Parameter	To be measured in number of weeks of delay from the timelines mentioned in section 5of this RFP.
Penalty for Non-achievement of SLA Requirement	Any delay in the delivery of the project deliverables (solely attributable to vendor) would attract liquidated damage as given in this Section of RFP. Liquidated damage will be computed on CAPEX value of Contract. If the liquidated damages reach 10% of the total contract value, Employer may invoke termination clause.

6.3 Post Implementation SLA and Matrix

- This section describes the target performance levels which the system integrator shall aim to deliver for the services, the system integrator's procedures for managing unavailability of the services, and the penalties which will be applied if system integrator fails to deliver any service performance targets in accordance with this Agreement.
- These SLAs shall be used to evaluate the performance of the services on monthly basis but penalties would be levied for cumulative performance for the quarterly basis.
- The SLA parameters shall be measured for each of the sub systems' SLA parameter requirements and measurement methods, through appropriate SLA measurement tools. All such required tools should be provided by the successful bidder. The employer will have the authority to audit these tools for accuracy and reliability.
- Penalty would be levied for every unit down time hour - be it for non-availability of network or non-availability of resources etc. because the System Integrator is responsible for supply of all enabling components on end-to-end basis.

- Penalty levied for non-performance as per SLA requirements shall be deducted through subsequent payments due from Employer.
- Liquidated damage will be computed on OPEX value of Contract. If the liquidated damages reach 10% of the total contract value, Employer may invoke termination clause.
- The SLA has been logically segregated in the following categories:

a. IT and non IT Infrastructure service levels

This service level will be applicable on following IT equipment's and Non IT equipment's which are part of BOQ .However additional hardware which may be deployed during the project period , on the discretion of BSCDCL.

S. No.	Service Description	Measurement parameter	Target	Penalty
1.	SCADA Control Centre Uptime calculated for each IT and Non IT equipment supplied by SI	Uptime of an equipment	>=99%	NA
			<99 and >=97%	For every 0.5% degradation in the uptime there will be a penalty of 1% of Agreed Quarterly Payment
			<97%	For every 0.5% degradation in the uptime there will be a penalty of 2% of the Agreed Quarterly Payment
2.	Availability of RTUs/P LCs	Measured as the percentage of time each of the PLC/RTU is up and	>=99%	NA

		running. Uptime of the equipment will be measured on 24X7 basis. Average Uptime = (((Total Uptime-Planned downtime)-Downtime)*100)/(Total Uptime-Planned downtime)	<99 and >=97%	For every 0.5% degradation in the Availability there will be a penalty of 1% of Agreed Quarterly Payment
			<97%	For every 0.5% degradation in the Availability there will be a penalty of 2% of the Agreed Quarterly Payment
3.	Availability of Sensors –Flow/Pressure Transmitter, PH/TDS/Chlorine/Turbidity Analyser	Measured as the percentage of time each of the sensors is up and running. Uptime of the equipment will be measured on 24X7 basis. Average Uptime = (((Total Uptime-Planned downtime)-Downtime)*100)/(Total Uptime-Planned downtime)	100%	NA
			>=98% and <=100%	For every 0.5% degradation in the Availability there will be a penalty of 1% of Agreed Quarterly Payment
			<98%	For every 0.5% degradation in the Availability there will be a penalty of 2% of the Agreed Quarterly

				Payment
2.	Preventive Maintenance	Parameters to be provided by the Bidder and taken sign off by BSCDCL. 99.9% Averaged over adherence to all the parameters by the SI.	>=99.9%	NA
			<99.9% and >=97%	For every 0.5% degradation in the Availability there will be a penalty of 1% of Agreed Quarterly Payment
			<97%	For every 0.5% degradation in the Availability there will be a penalty of 2% of the Agreed Quarterly Payment

The bidder should provide the necessary tools to measure service levels.

b. Technical Manpower Availability/ Service Levels

SI shall appoint as many team members, as deemed fit by them, subject to the minimum manpower specified below to meet the SLA requirements. The tendering authority would not be liable to pay any additional cost for this. SI shall provide detailed CV of each of the resource being provided to tendering authority before deployment of the resource at SCADA center.

Minimum Manpower Resource Table:

S. No.	Role	9:30 AM to 5:30 PM	5:30 PM to 10:00 PM	Requirement	Penalty on non-availability of resource (per week)
1	SCADA Project Manager	1	-	1	2,000
3	Network cum System Administrator	1	-	1	2,000
4.	Workstation Operators	2	1	3	2,000
5.	Field Technician	1	1	2	2,000

- SI shall always maintain above minimum manpower on-site throughout the O&M period of the contract (5 Years after Go-Live).

  Note: Every resource has to hand over his shift to other resource mandatorily.

c. Workstation service levels

The service level standards under this sub section pertain to all services which (i) do not impact the uptime of the equipment's mentioned in sub section A above and (ii) are not related to security related services. Thus, if services are not available because of a virus attack, penalties under this sub section shall not be applicable. However, penalties may be attracted both under sub section A and sub section B (mentioned above) if any of the service mentioned in these subsection are hampered because of shortage or unavailability of manpower. It is further clarified that in some cases breakdown of equipment may generate a service request for restoring services on another equipment and non-compliance of service level for the generated service request may lead to penalties under sub section A and this sub-section.

S. No.	Service	Measurement	Target	Penalty

	Description	parameter		
1.	Fault/Alarm Clearance Resolution Time. Various service related to comprehensive onsite maintenance and Help Desk promptly	Resolution time measured as the time taken by the SI to troubleshoot and fix the problem. Call will be treated as logged immediately after any incident/ problem occurs/ request made.	1 hour for incident of severity level 1;	1% of the Agreed Quarterly Payment for every 30 mins (or its part) delay.
			4 hours for incident of severity level 2;	0.5% of the Agreed Quarterly Payment for every 60 mins (or its part) delay.
			8 hours for incident of severity level 3;	0.25% of the Agreed Quarterly Payment for every 120 mins (or its part) delay.

- It is clarified that the downtime on account of delay by the OEM/maintenance service provider (other than SI) in repairing / replacing equipment's for which either warranty/comprehensive maintenance has not been asked for from the SI or for which warranty already exists (or was taken by tendering authority) shall not be counted.

7 Section VII: General Terms and Conditions

7.1 Contract and Interpretation

1. Law and Language

- The Contract shall be governed by and interpreted in accordance with laws of India.
- The language of the Contract shall be stated in the English.

2. Time for Commencement and Completion

- SI shall commence work as per the period specified in the RFP. SI shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Implementation Schedule and any refinements made in the Agreed and Finalized Project Plan.
- SI shall attain Completion Certificate / Sign Off of such part as specified in the Contract, within the time stated in the RFP or within such extended time to which the SI shall be entitled.

3. General

- **Survival of the Contract**: The provisions of the clauses of this Contract in relation to documents, data, ownership of data, processes, property, Intellectual Property Rights, indemnity, publicity, warranties, disputes and ownership survive the expiry or termination of this Contract and in relation to confidentiality, the obligations continue to apply unless the BSCDCL notifies the SI of its release from those obligations.
- **Notice:** All notices, requests or consents shall be sent to a Party hereto at its address and contact number specified in Bid Fact Sheet or at such other address and contact number as is designated by such Party in a written notice to the other Parties hereto. All such notices and communications shall be effective:
  - if sent by fax, when sent (on receipt of a confirmation to the correct fax number) with correct answerback,
  - if sent by person, when delivered with delivery receipt,
  - if sent by e-Mail, followed by hardcopy with delivery receipt.

7.2 Payment terms

1. **Terms of Payment**

1.1 SI alone shall invoice all payments after receiving due approval/acceptance of Products/Services / Deliverables from BSCDCL. Such invoices shall be correct and accurate and shall be raised in a timely manner.

1.2 Subject to accomplishment to obligations of SI and delivery of Products/Services / Deliverables to the satisfaction of BSCDCL, payment shall be made by BSCDCL upon receipt of invoice along with supporting documents.

1.3 SI's request for payment shall be made to the BSCDCL in writing, accompanied by an invoice describing, as appropriate,

(a) The Products and/or Services provided;

(b) When the Products and/or Services supplied are accepted; and

(c) All taxes, duties and other charges of the products and services have been duly paid by the SI.

1.4 All payments agreed to be made by BSCDCL to the SI in accordance with the Bid shall be inclusive of all, statutory levies, duties, taxes and other charges whenever levied/applicable including costs of

maintenance, if any and BSCDCL shall not be liable to pay any such levies/other charges under or in relation to this Contract and/or the Services.

1.5 No invoice for extra work/ change order on account of change order will be submitted by the SI unless the said extra work / change order has been authorized/ approved by the BSCDCL in writing.

1.6 In the event of BSCDCL noticing at any time that any amount has been disbursed wrongly to the SI or any other amount is due from the SI to the BSCDCL, BSCDCL may without prejudice to its rights recover such amounts by other means after notifying the SI or deduct such amount from any payment falling due to the SI. The details of such recovery, if any, will be intimated to the SI. SI shall receive the payment of undisputed amount under subsequent invoice for any amount that has been omitted in previous invoice by mistake on the part of the BSCDCL or the SI.

1.7The SI shall be solely responsible to make payment to its personnel, sub-Bidders, OEMs, third parties.

2. Deductions

2.1 BSCDCL shall be at liberty to deduct penalties/liquidated damages from the invoices raised by the SI as calculated by BSCDCL for non-adherence to Service Level Agreements.

2.2 All payments to the SI shall be subject to the deductions of tax at source under Income Tax Act, and other taxes and deductions as provided for under any law, rule or regulation. All costs, damages or expenses which BSCDCL may have paid or incurred, for which under the provisions of the Contract, the SI is liable, the same shall be deducted by BSCDCL from any dues to the SI. All payments to the SI shall be made after making necessary deductions as per terms of the Contract and recoveries towards facilities, if any, provided by the BSCDCL to the SI on chargeable basis.

2.3 BSCDCL shall provide the SI with the original tax receipt of any withholding taxes paid by BSCDCL or its nominated agencies on payments under the RFP within reasonable time after payment. SI agrees to reimburse and hold BSCDCL or its nominated agencies harmless from and against any claims, losses, expenses (including attorney fees, court fees) etc. arising out of deficiency (including penalties and interest) in payment of taxes that is the responsibility of the SI.

3. Securities

3.1 **Issuance of Securities**

SI shall provide the securities specified below in favor of the BSCDCL at the times, and in the amount, manner and form specified below.

3.2 **Performance Security**

SI shall, within fifteen (15) days of the issuance of Purchase Order, provide an unconditional, irrevocable and continuing security for the due performance of the Contract as per the Bid Fact Sheet. The format of the Performance Security is provided in Format for Performance Security.

The performance security shall be valid for a period of 6 months beyond the expiry of the contract or any extended period. If the Performance Security is liquidated /encashed, in whole or in part, during the currency of the Performance Security, the SI shall top up the Performance Security with the same amount as has been encashed within 15 days of such encashment without demur.

4. Taxes and Duties

4.1 For Products and/or Services supplied from outside the country, the SI shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies, payable in that country.

4.2 For Products and/or Services supplied locally, the SI shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Products or Services to the BSCDCL.

7.3 Performance Bank Guarantee

1. The successful bidder shall at his own expense, deposit with department, within 15 days of issuance of LoI, an unconditional and irrevocable Performance Bank Guarantee (PBG) from a list of nationalized/scheduled banks given in this Bid Document, in favour of Bhopal Smart City Development Corporation Limited (BSCDCL) for the due performance and fulfilment of the contract by the bidder.

2. This Performance Bank Guarantee will be for an amount equivalent to 5% of quoted value. All charges whatsoever such as premium, commission, etc. with respect to the Performance Bank Guarantee shall be borne by the bidder.

3. The successful bidder shall maintain a valid and binding Performance Guarantee for a period of three months after the expiry of the Contract Period ("Validity Period").

4. The Performance Bank Guarantee letter format can be found in the Annexure, section 8 of this document.

5. The Performance Bank Guarantee may be discharged/ returned by department upon being satisfied that there has been due performance of the obligations of the Bidder under the contract. However, no interest shall be payable on the Performance Bank Guarantee.

6. If the Bidder, fails to furnish the Performance Guarantee, it shall be lawful for the Authority to forfeit the EMD and cancel the contract or any part thereof

7. In the event of the Bidder being unable to service the contract for whatever reason, department would evoke the PBG. Notwithstanding and without prejudice to any rights whatsoever of department

under the Contract in the matter, the proceeds of the PBG shall be payable to department as compensation for any loss resulting from the Bidder's failure to complete its obligations under the Contract. Department shall notify the Bidder in writing of the exercise of its right to receive such compensation within 14 days, indicating the contractual obligation(s) for which the Bidder is in default.

8. Department shall also be entitled to make recoveries from the Bidder's bills, performance bank guarantee, or from any other amount due to him, the equivalent value of any payment made to him due to inadvertence, error, collusion, misconstruction or misstatement.

7.4 Intellectual Property Rights (IPR) and Ownership Rights

1.1 **IPR:**BSCDCL shall own and have a right in perpetuity to use all newly created Intellectual Property Rights which have solely arisen out of or havebeen developed solely during execution of the Agreement, including but not limited to all processes, products, specifications, reports, drawings and other documents which have been newly created and developed by the SI solely during the performance of the Services / delivery of Products and for the purposes of, inter-alia, use or sub-license of such Services under the Agreement. The SI undertakes to disclose all such Intellectual Property Rights arising in performance of the Services to BSCDCL and execute all such agreements/documents and file all relevant applications, effect transfers and obtain all permits and approvals that may be necessary in this regard to effectively transfer and conserve the Intellectual Property Rights of BSCDCL.

1.2 Any / all Intellectual Property owned by the BSCDCL prior to the execution date and/ or any Intellectual Property Right applied for prior to the execution date shall strictly vest with the BSCDCL and the SI shall have no right whatsoever on such Intellectual Property.

1.3 **Pre-existing work:** All intellectual property rights existing prior to the date of execution of the agreement shall belong to the Party that owned such rights immediately prior to such date. Subject to the foregoing, BSCDCL will also have rights to use and copy all intellectual property rights, process, specifications, reports and other document, drawings, manuals provided or used by the SI as part of the Scope of Works under the RFP on non-exclusive, non-transferable, perpetual, royalty-free license to use basis.

1.4 SI shall be obliged to ensure that all approvals, registrations, licenses, permits and rights etc. which are inter-alia necessary for use of the products, deliverables, services, applications , services etc. provided by the SI under the RFP shall be acquired in the name of the BSCDCL and SI shall have the non-exclusive, limited right to use such licenses till the term of the agreement on behalf of the BSCDCL solely for the purpose of execution of any of its obligations under the terms of the RFP. However, subsequent to the term of the agreement, such approvals, registrations, licenses, permits and rights etc. shall perpetually endure to the exclusive benefit of the BSCDCL.

1.5 **Third Party Products:** If license agreements are necessary or appropriate between the SI and third parties for purposes of enabling / enforcing/implementing the provisions hereinabove, the SI shall enter into such agreements at its own sole cost, expense and risk and all such licenses etc. shall be bought in name of the BSCDCL unless otherwise directed in writing by BSCDCL.

1.6 **Transfer of Risk and ownership in Products**

a. Subject to the terms of the RFP, SI shall sell, assign, convey, transfer and deliver to BSCDCL, and BSCDCL shall purchase, receive and accept from the SI, all right, title and interest in and to the products required to be provided by the SI as per the RFP. The SI shall not make any substitute for the products of any other model, capacity, or manufacturer without the prior written consent of BSCDCL which consent shall not be unreasonably delayed or withheld.
b. SI shall arrange for delivery of the Products to the delivery site identified by BSCDCL (the "Delivery Site") as per the Timelines provided in the RFP unless otherwise notified by BSCDCL. In addition to paying all transportation charges for the Products, the SI shall insure, and pay all insurance charges for the products.
c. Title to and ownership of the Products designated as being purchased by BSCDCL hereunder shall remain vested in the SI until written acceptance and go live by BSCDCL under the terms hereof, at which time title to and ownership of such products shall transfer to BSCDCL. SI shall execute such documents as may be required by BSCDCL for documenting the transfer of title and ownership of products. Upon transfer of ownership of the Products to BSCDCL, the SI shall treat such Products as Assets as detailed above in the Agreement.

7.5 Indemnity

1. General Indemnity

1.1 Subject to Clause 8.5 below, the SI (the "Indemnifying Party") undertakes to indemnify BSCDCL and its nominated agencies (the "Indemnified Party") from and against all losses, claims, damages, compensation etc. on account of bodily injury, death or damage to tangible personal property arising in favour of any person, corporation or other entity (including the Indemnified Party) attributable to the Indemnifying Party's negligence, wilful default, lack of due care or breach of terms of the RFP.

2. IPR Indemnity

If the Indemnified Party promptly notifies the Indemnifying Party in writing of a third party claim against the Indemnified Party that any Products / Deliverables/ Services provided by the Indemnifying Party infringes a copyright, trade secret, patent or other intellectual property rights of any third party, the Indemnifying Party will defend such claim at its expense and will pay any costs or damages that may be finally awarded against the Indemnified Party. The Indemnifying Party will not indemnify the Indemnified Party, however, if the claim of infringement is caused by (a) The Indemnified Party's misuse or modification of the deliverables; (b) The Indemnified Party's failure to

use corrections or enhancements made available by the Indemnifying Party; (c) The Indemnified Party's use of the deliverables in combination with any product or information not owned or developed or supplied by the Indemnifying Party. If any of the deliverables is or likely to be held as infringing, the Indemnifying Party shall at its expense and option either (i) procure the right for the Indemnified Party to continue using it, (ii) replace it with a non-infringing equivalent, (iii) modify it to make it non-infringing.

3. Conditions of Indemnity

Without prejudice to the rights of BSCDCL in respect of indemnification for any claim:

i. BSCDCL shall notify the SI upon receipt of any notice of claim setting out in reasonable particulars, the details of such notice of claim;

ii. Immediately upon receipt of notification of any claim from the BSCDCL, the SI within a period of 5 days from date of receipt of such notice from the BSCDCL, notify the BSCDCL whether the SI wish to assume the defence in relation to such claim (including settlement or resolution thereof). Thereafter, the SI shall be entitled in consultation with the BSCDCL, and only to the extent such action does not in any manner compromise, prejudice or adversely affect the interests of the BSCDCL, to take such action as mutually agreed upon by SI and the BSCDCL to avoid, dispute, deny, resist, appeal, compromise or consent such claim, within a period of 30 days from the date of receipt of such claim notification;

iii. Notwithstanding anything contained herein, the SI and the BSCDCL agree and covenant that a notice by the BSCDCL to the SI in relation to the claim as aforesaid shall amount to express acceptance and consent by the SI to indemnify the BSCDCL for all losses in relation to such claim. Upon notice by the SI, the BSCDCL shall reasonably co-operate with the SI at the sole costs of the SI, only to the extent the same does not in any manner compromise, prejudice or adversely affect the rights of the BSCDCL. The BSCDCL shall have the right, at its option, to participate in the defense of such claim;

iv. If the SI fails to take any action as per the above clause within the time period as specified therein, the BSCDCL shall have the right, in its absolute discretion, to take such action as it may deem necessary to avoid, dispute, deny, resist, appeal, compromise or contest or settle any claim (including without limitation, making claims or counterclaims against third parties). If the SI does not assume control of the defence of such claims (as mentioned above), the entire defense, negotiation or settlement of such claim by the BSCDCL shall be deemed to have been consented to by, and shall be binding upon, SI as fully as though the SI alone had assumed the defence thereof and a judgement had been entered into by the SI, for such claim in respect of the settlement or judgement.

7.6 Confidentiality

1. **Confidential Information**

1.1 All information (whether written/ tangible or oral/ Intangible) furnished by the BSCDCL or any third party to the SI or SI's Representatives/ employees/ agents, in connection with the RFP and the Contract, and all analyses, compilations, studies or other information documents or materials prepared by SI or SI's Representatives/ employees/ agents etc., in relation to information obtained by the SI in connection to and under the purview of the RFP and the subsequent contract shall be considered Confidential Information.

1.2 All information disclosed in writing or email or other tangible electronic storage medium, shall be clearly marked "Confidential" by the BSCDCL.

1.3 The term confidential information does not, however, include any information which:

- basis from a source (other than the BSCDCL) which, to the best of SI's knowledge after reasonable inquiry, is not known to be bound by confidentiality clause/ agreement, or other legal or contractual restriction that may prohibit the disclosure of such information;
- was or became publicly available as a matter of law or otherwise without any disclosure by the SI or SI's Representatives;
- was or is developed by the SI or SI's Representatives without reference to any information received from the BSCDCL in connection with the Agreement;
- has been approved for release in writing by an authorized representative of the BSCDCL; and

2. **Terms of Confidentiality**

2.1 SI shall:

a. acknowledges the confidential and proprietary nature of the information

b. shall keep the information confidential and will not without the prior written consent of the BSCDCL, disclose any information to any person (including, without limitation, any member of the media, or any other individual, corporation, partnership, limited liability company, Government agency, or group) in any manner whatsoever

c. will not use any information other than for the purpose contained within the contract terms.

2.2 SI shall be responsible for any breach of confidentiality by any of its employees/ agents/ representatives.

2.3 SI shall use all reasonable endeavors to ensure that any Government Department, Court, Contracting Authority, employee, third party to whom the Bidder's Confidential Information is disclosed is made aware of the SI's obligations of confidentiality.

2.4 SI and/ or its agents/ employees/ representatives shall not (unless provided for elsewhere in the contract), without prior written consent from the BSCDCL, disclose to any person the fact of the Contract arising out of this RFP or the information existing therein or which has been made available, that the SI is considering the transaction, or that discussions or negotiations are taking place or have taken place concerning the transaction or any term, condition or other fact relating to the contract flowing from this RFP, the transaction thereof or such discussions or negotiations, including, without limitation, the status thereof.

2.5 In the event that SI is requested pursuant to, or required by, applicable law, regulation or legal process to disclose any of the confidential information or matters contemplated hereinabove, then the SI shall furnish only that portion of the confidential information which is legally required. SI will

otherwise reasonably cooperate with the BSCDCL to preserve the confidentiality of the Information. SI shall however, immediately notify the BSCDCL promptly so that the BSCDCL may seek a protective order or other appropriate remedy.

2.6 BSCDCL shall retain all rights to prevent, stop and if required take the necessary punitive action against the SI regarding any forbidden disclosure. BSCDCL reserves the right to adopt legal proceedings, civil or criminal, against the SI in relation to a dispute arising out of breach of obligation by the SI under this clause.

2.7 The SI shall execute a corporate non-disclosure agreement with BSCDCL in the format provided by the BSCDCL and shall ensure that all its employees, agents and sub-Bidders execute individual non-disclosure agreements, which have been duly approved by BSCDCL with respect to this project.

2.8 The SI may only disclose the Confidential Information in the following circumstances:

a) with the prior written consent of BSCDCL;

b) to a member of the SI's Team ("Authorised Person") provided the Authorised Person needs to know the Confidential Information for accomplishment of the Services and the Authorised Person has executed a confidentiality agreement with BSCDCL prior to receiving such information (SI and every other member of SI's Team shall ensure that such Authorised Person to whom such information is disclosed are bound by the similar confidentiality obligations as applicable to each member of SI's Team. Disclosure to any such Authorised Person shall be made in confidence on need to know basis i.e., so far as may be necessary for such Authorised Person for the purposes of-performance of the obligations of the Agreement); and

c) if and to the extent that the SI is compelled legally to disclose the Confidential Information.

2.9 When the SI is aware of any steps being taken or considered to compel legally the SI or an Authorised Person to disclose the Confidential Information, it shall:

a. to the extent legally permitted, defer and limit the disclosure with a view to preserving the confidentiality of the Confidential Information as much as possible;

b. promptly notify BSCDCL; and

c. do anything reasonably required by BSCDCL to oppose or restrict that disclosure.

2.10 The SI shall notify BSCDCL promptly if it is aware of any disclosure of the Confidential Information otherwise than as permitted by under the RFP or with the authority of the BSCDCL.

3. Publicity, Media and Official Enquiries

3.1 SI undertakes not to make any press announcement or publicize the contract flowing out of this RFP or any part thereof in any way, except with the prior written consent of the BSCDCL.

3.2 SI undertakes to take all reasonable steps to ensure that its servants/ employees/ agents / representatives/ professional advisors and consultants comply with the RFP and the contract.

7.7 Default

1. Event of Default by the SI

1.1 The failure on the part of SI to perform any of its obligations or comply with any of the terms of the RFP and the Contract shall constitute an Event of Default on the part of the SI. The events of default as mentioned above may include but not restricted to inter-alia the following:

- SI's Team has failed to perform any instructions or directives issued by the BSCDCL which it deems proper and necessary to execute the scope of work or provide services under the RFP; and/or
- SI's team has failed to conform/adhere to any of the Service Level Agreements resulting in falling short of matching such standards / benchmarks / targets as the BSCDCL may have designated with respect to the system or any products, tasks or services, necessary for the execution of the scope of work and performance of services under the RFP and the Contract. The above mentioned failure on the part of the SI may be in terms of failure to adhere to performance, quality, timelines, specifications, requirements or any other criteria as defined by the BSCDCL; and / or the SI has failed to remedy a defect or failure to perform its obligations in accordance with the specifications issued by the BSCDCL from time to time, despite being served with a default notice which laid down the specific deviance on the part of the SI's Team to comply with any stipulations or standards as laid down by the BSCDCL; and / or
- SI's Team has failed to adhere to any amended directions, instructions, modifications, notifications or clarifications as issued by the BSCDCL during the term of the Contract and which the BSCDCL deems proper and necessary for the execution of the scope of work under the Contract; and / or
- SI's Team has failed to demonstrate or sustain any representation or warranty made by it in the contract, with respect to any of the terms of its Bid, the RFP and the Contract; and / or
- there is a proceeding for bankruptcy, insolvency, winding up or there is an appointment of receiver, liquidator, assignee, or similar official against or in relation to the SI; and / or
- SI's Team has failed to comply with or is in breach or contravention of any applicable laws; and/ or
- SI's Team has failed to comply with or adhere to any of the terms & conditions of the contract.
- Quality of products, deliverables and services consistently not being to the satisfaction of BSCDCL
- SI has failed to remedy a failure to perform its obligations in accordance with the specifications issued by BSCDCL, despite being served with a default notice which laid down the specific deviance on the part of the SI to comply with any stipulations or standards as laid down by BSCDCL; or
- SI or its team has failed to conform with any of the service specifications as set out in the RFP or the agreement or has failed to adhere to any amended direction, modification or clarification as issued by BSCDCL during the term of the agreement and which BSCDCL deems proper and necessary for the execution of the scope of work under the RFP.

1.2 Where there has been an occurrence of such defaults inter alia as stated above, the BSCDCL shall issue a notice of default to the SI, setting out specific defaults / deviances / omissions / non-compliances / non-performances and providing a notice of Sixty (60) days to enable such defaulting party to remedy the default committed.

1.3 Where despite the issuance of a default notice to the SI by the BSCDCL the SI fails to remedy the default to the satisfaction of the BSCDCL, the BSCDCL may, where it deems fit, issue to the defaulting party another default notice or proceed to adopt such remedies as may be available to the BSCDCL.

2. Consequence of Event of Default

2.1 Where an Event of Default subsists or remains uncured the BSCDCL shall be entitled to:

a)Impose any such obligations and conditions and / or issue any directions / notifications / clarifications as may be necessary to inter alia ensure smooth continuation of the project and the services which the SI shall be obliged to comply with that may include re-determination of the consideration payable to the SI as agreed mutually by BSCDCL and SI or through a third party acceptable to both parties. SI shall in addition take all available steps to minimize loss resulting from such event of default.

b)Suspend all payments to the SI under the Contract by a written notice of suspension to the SI, provided that such notice of suspension:

i. Shall specify the nature of the failure; and
ii. Shall request the SI to remedy such failure within a specified period from the date of receipt of such notice of suspension by the SI.

c)Terminate the agreement in full or in part;

d) Retain such amounts from the payment due and payable by the BSCDCL to the SI as may be required to offset any losses caused to the BSCDCL as a result of such event of default and the SI shall compensate the BSCDCL for any such loss, damages or other costs, incurred by the BSCDCL in this regard. Nothing herein shall effect the continued obligation of the SI and SI's Team to perform all their obligations and responsibilities under the RFP and the Contract in an identical manner as were being performed before the occurrence of the default.

e)Invoke the EMD and other Guarantees furnished hereunder, enforce the Indemnity, recover such other costs/losses and other amounts from the SI as may have resulted from such default and pursue such other rights and/or remedies that may be available to the BSCDCL under law.

f)Require the SI to make all such payments as may be incurred / losses borne by the BSCDCL in getting such work done through any third party as a result of any default on the part of the SI. SI agrees to compensate the BSCDCL for all such costs incurred by the BSCDCL in this regard.

7.8 Termination

1. Termination

1.1 BSCDCL may, terminate the Contract in whole or in part by giving the SI a prior and written notice of 90 days indicating its intention to terminate the Contract under the following circumstances:

1.1.1 **Termination for breach**

- Where the BSCDCL is of the opinion that there has been such Event of Default on the part of the SI which would make it proper and necessary to terminate the Contract and may include failure on the part of the SI to respect any of its commitments with regard to any part of its obligations under its Bid, the RFP or under the Contract.
- Where it comes to the BSCDCL's attention that the SI (or the SI's Team) is in a position of actual conflict of interest with the interests of the BSCDCL, in relation to any of terms of the SI's Bid, the RFP or the Contract.
- Where the SI ability to survive as an independent corporate entity is threatened or is lost owing to any reason whatsoever, including inter-alia the filing of any bankruptcy proceedings against the SI, any failure by the SI to pay any of its dues to its creditors, the institution of any winding up proceedings against the SI or the happening of any such events that are adverse to the commercial viability of the SI. In the event of the happening of any events of the above nature, the BSCDCL shall reserve the right to take any steps as are necessary, to ensure the effective transition of the project to a successor agency, and to ensure business continuity.
- BSCDCL may terminate the Agreement if it comes to knowledge of BSCDCL that the SI or any of the SI's personnel or the SI's sub-Bidders or such sub-Bidder's personnel have been involved in any fraudulent or corrupt practices or any other practice of similar nature.

1.1.2 **Termination for Insolvency:**

- BSCDCL may at any time terminate the Contract by giving written notice to the SI, without compensation to the SI, if the SI becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the BSCDCL. Upon such termination, BSCDCLshall reserve the right to take any steps as may be necessary, to ensure the effective transition of the project to a successor SI, and to ensure business continuity provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to BSCDCL.

1.1.3 **Termination for convenience**

- BSCDCL, may by a written notice sent to the SI, terminate the contract, in whole or in part at any time for its convenience. The notice for such termination may specify that the termination is for the BSCDCL's convenience, the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.

1.1.4 **Rights other than termination**

- The termination hereof shall not affect any accrued right or liability of either Party nor affect the operation of the provisions of the Contract that are expressly or by implication intended to come into or continue in force on or after such termination. The termination provisions set out in this Clause are in addition to any termination rights that BSCDCL may have under RFP and are in addition to, and without prejudice to, other rights that BSCDCL may have under law and the Agreement.

2. Consequence of Termination

2.1In the event of termination of the Contract due to any cause whatsoever (whether consequent to the stipulated Term of the Agreement) ,BSCDCL shall be entitled to impose any such obligations and conditions and issue any clarifications as may be necessary to ensure an efficient transition and effective business continuity of the project which the SI shall be obliged to comply with and take all available steps to minimize loss resulting from that termination/breach, and further allow and provide all such assistance to the BSCDCL and/or the successor agency, as may be required, to take over the obligations of the erstwhile SI in relation to the execution/continued execution of the scope of the RFP and the Contract, even where such assistance is required to be rendered for a reasonable period that may extend beyond the contract term/ termination hereof.

2.2 In the event that the termination of the agreement is due to the expiry of the Term of the Agreement a decision not to grant any (further) extension by BSCDCL, or where the termination is prior to the expiry of the stipulated term due to the occurrence of any Event of Default on the part of the SI, the SI herein shall be obliged to provide all such assistance to the successor SI or any other person as may be required and as BSCDCL may specify including training, where the successor(s) is a representative/personnel of BSCDCL to enable the successor to adequately provide the Services hereunder, even where such assistance is required to be rendered for a reasonable period that may extend beyond the Term/earlier termination hereof. Without prejudice to the foregoing, upon termination (or upon expiry of the Term) of the Agreement, the Parties will comply with the Exit Management Schedule/ Plan set out in the RFP.

2.3 Where the termination of the Contract is prior to its stipulated term on account of a default on the part of the SI or due to the fact that the survival of the SI as an independent corporate entity is threatened/has ceased, or for any other reason, whatsoever, the BSCDCL through re-determination of the consideration payable to the SI as agreed mutually by BSCDCL and SI or through a third party acceptable to both parties may pay the SI for those products that have been satisfactorily installed and commissioned and for that part of the Services which have been authorized by the BSCDCL and satisfactorily performed by the SI up to the date of termination. Without prejudice to any other rights, the BSCDCL may retain such amounts from the payment due and payable by the BSCDCL to the SI as may be required to offset any losses caused to the BSCDCL as a result of the Termination or due to any acts/omissions of the SI. In case of any loss or damage due to default on the part of the SI in performing any of its obligations with regard to executing the scope of work under the RFP and the Contract, the SI shall compensate the BSCDCL for any such loss, damages or other costs, incurred by the BSCDCL.

2.4 Nothing herein shall restrict the right of the BSCDCL to invoke the Bank Guarantee and other Guarantees furnished hereunder, enforce the Indemnity clause and pursue such other rights and/or remedies that may be available to the BSCDCL under law.

2.5 The termination hereof shall not affect any accrued right or liability of either Party nor affect the operation of the provisions of the Contract that are expressly or by implication intended to come into or continue in force on or after such termination.

2.6 Any and all payments under this clause shall be payable only after the SI has complied with and completed the transition and exit management as per the Exit Management Plan to the satisfaction of BSCDCL. In case of expiry of the Agreement, the last due payment shall be payable to the SI after the SI has complied with and completed the transition and exit management as per the Exit Management Plan to the satisfaction of BSCDCL.

7.9 Arbitration

1. Arbitration

1.1 BSCDCL and the successful bidder shall make every effort to resolve amicably by direct informal or formal form of negotiation any disagreement or dispute arising between them under or in connection with the Contract. If, after thirty (30) days from the commencement of such negotiations, BSCDCL and the selected Bidder have been unable to amicably resolve dispute, either party may require refer that the dispute to arbitration. The arbitration shall be conducted in accordance with the rules and procedures of the Arbitration and Conciliation Act of 1996 or any re-enacment or medication thereof. be referred for resolution to the formal mechanisms, which may include, but are not restricted to, conciliation mediated by a third party acceptable to both, or in accordance with the Arbitration and Conciliation Act, 1996. The arbitration shall be presided upon by a panel of three arbitrators wherein each Party shall appoint one arbitrator each and the two appointed arbitrators shall appoint a third arbitrator. All Arbitration proceedings shall be held at Madhya Pradesh State and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.
The decision of the arbitrator' panel shall be final and binding upon both Parties. The expenses of the arbitrators' panel (as determined by the arbitrators' panel) shall be borne by such party as decided by the arbitrators' panel. However, the expenses incurred by each Party in connection with the preparation, presentation shall be borne by the Party itself. All arbitration awards shall be in writing and shall state the reasons for the award.

7.10 Force Majeure

1. Force Majeure

1.1 Neither party shall be responsible to the other for any delay or failure in performance of its obligations due to any occurrence commonly known as Force Majeure which is beyond the control of any of the parties, including, but without limited to, fire, flood, explosion, acts of God or any Governmental body, public disorder, riots, embargoes, or strikes, acts of military authority, epidemics, strikes, lockouts or other labour disputes, insurrections, civil commotion, war, enemy actions.

1.2 If a Force Majeure arises, the SI shall promptly notify BSCDCL in writing of such condition and the cause thereof. Unless otherwise directed by BSCDCL, the SI shall continue to perform his obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. The successful bidder shall be excused from performance of his obligations in whole or part as long as such causes, circumstances or events shall continue to prevent or delay such performance.

7.11 Change Order

1. Change Order

1.1 BSCDCL may at any time order the SI through Notice, to make changes within the general scope of the Contract with relation to the services to be provided by the SI as per scope of work of this RFP.

1.2 If any such change causes an increase or decrease in the cost of, or the time required for, the SI's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery and Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the SI for adjustment under this clause must be asserted within thirty (30) days from the date of the SI's receipt of the BSCDCL's change order.

1.3 Prices to be charged by the SI for any related services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the selected bidder for similar services.

1.4 Upon receiving any revised requirement/advice, in writing, from the BSCDCL or BSCDCL's Technical Representative, the SI would verbally discuss the matter with BSCDCL's Representative.

1.5 In case such requirement arises from the side of the SI, he would also verbally discuss the matter with BSCDCL's Representative giving reasons thereof.

1.6 In either of the two cases as explained in Clause 1.4 and clause 1.5 above, the representatives of both the parties will discuss on the revised requirement for better understanding and to mutually decide whether such requirement constitutes a change order or not.

1.7 If it is mutually agreed that such Requirement constitutes a "Change Order" then a joint memorandum will be prepared and signed by the SI and BSCDCL to confirm a "Change Order" and basic ideas of necessary agreed arrangement.

1.8 SI will study the revised requirement in accordance with the joint memorandum under Clause 1.7 and assess subsequent schedule and cost effect, if any.

1.9 Upon completion of the study referred to above under Clause 1.8, the results of this study along with all relevant details including the estimated time and cost effect thereof with supporting documents would be submitted to the BSCDCL to enable the BSCDCL to give a final decision whether SI should proceed with the change order or not in the best interest of the works.

1.10 The estimated cost and time impact indicated by SI shall be considered as a ceiling limit and shall be provisionally considered for taking a decision to implement change order.

1.11 The time impact applicable to the Contract shall be mutually agreed, subsequently, on the basis of the detailed calculations supported with all relevant back up documents.

1.12 In case SI fails to submit all necessary substantiation/calculations and back up documents, the decision of the BSCDCL regarding time and cost impact shall be final and binding on the SI.

1.13 If BSCDCL accepts the implementation of the change order under Clause 1.9 in writing, which would be considered as change order, then SI shall commence to proceed with the enforcement of the change order.

1.14 In case, mutual agreement under Clause 1.7 above, i.e. whether new requirement constitutes the change order or not, is not reached, then SI in the interest of the works, shall take up the enforcement of the change order, if advised in writing to do so by BSCDCL's Representative pending settlement between the two parties to the effect whether such requirement constitutes a change order or not as per the terms and conditions of Contract documents. The time and cost effects in such a case shall be mutually verified and recorded. Should it establish that the said work constitutes a change order, the same shall be compensated taking into account the records kept in accordance with the Contract.

1.15 The SI shall submit necessary back up documents for the change order showing the break-up of the various elements constituting the change order for the BSCDCL's review. If no agreement is reached between the BSCDCL and SI within 60 days after BSCDCL's instruction in writing to carry out the change concerning the increase or decrease in the Contract Value and all other matters described above, either party may refer the dispute to arbitration.

1.16 The provisions of the Contract shall apply to revised work / change order as if the revised work / Change order has been included in the original Scope of work. However, the Contract Value shall increase / decrease and the schedule shall be adjusted on account of the revised work / Change orders as may be mutually agreed in terms of provisions set forth in previous clauses of Change Order. The Bidder's obligations with respect to such revised work / change order shall remain in accordance with the Contract.

7.12 Limitation of Liability

1. Limitation of Liability

1.1 The liability of the SI (whether in contract, tort, negligence, strict liability in tort, by statute or otherwise) for any claim in any manner related to the Agreement, including the work, Deliverables or Productsand Services covered by the RFP and the Agreement, shall be the payment of direct damages only which shall in no event in the aggregate exceed the Total Contract Value.

1.2 Except as otherwise provided herein, in no event shall either party be liable for any consequential, incidental, indirect, special or punitive damage, loss or expenses (including but not limited to business interruption, lost business, lost profits, or lost savings) nor for any third party claims, even if it has been advised of their possible existence.

1.3 Notwithstanding anything contained in the foregoing, the liability cap and exclusion for the SI given under this Clause 14 shall not be applicable to the indemnification obligations, confidentiality obligations and obligations of the SI to comply with the security and safety standards as laid down in this RFP.

7.13 Sub-Contracting

Only non - ICT / Civil work may be subcontracted by the SI, SI is not allowed to subcontract Core SCADA / IT components.

7.14 Liquidated Damages

1. Liquidated damages

1.1 Excluding to Section 7.10(Force Majeure), if the SI fails to complete the works before the scheduled completion date or the extended date or if SI repudiates the Contract before completion of the Work, the BSCDCL may without prejudice to any other right or remedy available to the BSCDCL as under the Contract.

Recover from the SI, as liquidated damages and not by way of penalty a sum equivalent to 0.3% of the "IT and Non IT components Infrastructure Cost" for each day delay beyond the Scheduled completion date or part thereof, subject to a maximum of 10% of the Total Contract Value.. In case the SI is not solely liable for the breach of the Timelines or the Service Levels, amount of liquidated damages shall be deducted on proportionate / pro rata basis depending upon the SI's extent of fault in such breach of the Timelines or the Service Levels. BSCDCLshall have the right to determine such extent of fault and liquidated damages in consultation with the SI and any other party it deems appropriate. Payment of liquidated damages shall not be the sole and exclusive remedies available to BSCDCL and the SI shall not be relieved from any obligations by virtue of payment of such liquidated damages.If the liquidated damages cross the cap on liquidated damages mentioned in this Clause, BSCDCL shall have the right to Terminate the contract or a portion or part of the work thereof. The purchase shall give 30 days' notice to the SI of its intention to terminate the Contract and shall so terminate the Contract unless during the 30 days' notice period, the SI initiates remedial action acceptable to the BSCDCL.

7.15 Suspension of Work

1. Suspension of Work

1.1 SI shall, if ordered in writing by the BSCDCL/ its Representative, temporarily suspend the performance of any services or provision of any product or any part thereof for such specified/ ordered period and time. BSCDCL shall inform the SI about such suspension at least 15 days in advance. SI shall not be entitled to claim compensation for any loss or damage sustained by him by reason of such temporary suspension of the services for a continuous period of 30 days. BSCDCL may consider suitable compensation to the SI in the event of suspension extending beyond the continuous period of 30 days. An extension of time for completion, corresponding with the delay caused by any

such suspension of the works as aforesaid shall be granted to the SI, if written request for the same is made and that the suspension was not consequent to any default or failure on the part of the SI. In case the suspension of works, is not consequent to any default or failure on the part of the SI, and lasts for a period of more than 3 months, the SI shall have the option to request the BSCDCL to pay reasonable mobilization and immobilization charges as me consented by BSCDCL .

1.2 In the event BSCDCL suspends the progress of work for a period in excess of 30 days in aggregate, rendering the SI to extend the SI's Performance Guarantee then BSCDCL shall bear only the cost of extension of such bank guarantee for such extended period restricted to the normal bank rates as applicable in the banking procedures subject to the SI producing the requisite evidence from the concerned bank.

7.16 Audit, Access and Reporting

i. BSCDCL reserves the right to inspect and monitor/assess the progress of the project at any time during the course of the Contract, after providing due notice to the SI. BSCDCL may demand and upon such demand being made, BSCDCL shall be provided with any document, data, material or any other information which it may require, to enable it to assess the progress of the project.

ii. BSCDCL shall also have the right to conduct, either itself or through another agency as it may deem fit, an audit to monitor the performance by the SI of its obligations/functions in accordance with the standards committed to or required by BSCDCL and the SI undertakes to cooperate with and provide to BSCDCL/ any other agency appointed by BSCDCL, all documents and other details as may be required by them for this purpose. Any deviations or contravention, identified as a result of such audit/assessment, would need to be rectified by the SI failing which BSCDCL may, without prejudice to any other rights that it may have issue a notice of default

iii. Without prejudice to the foregoing, the SI shall allow access to BSCDCL or its nominated agencies to all information which is in the possession or control of the SI and which relates to the provision of the Products/Services / Deliverables.

7.17 Security and Safety

i. The SI shall comply with the technical requirements of the relevant security, safety and other requirements specified in the Information Technology Act any other Applicable Law, IT Security Manual of BSCDCL as specified by BSCDCL from time to time and follow the industry standards related to safety and security (including those as specified by BSCDCL from time to time), insofar as it applies to the provision of the Products/Services / Deliverables under the RFP and the resulting agreement.

ii. The SI shall also comply with BSCDCL security standards and policies in force from time to time at each location of which BSCDCL or its nominated agencies make the SI aware in writing insofar as the same apply to the provision of the Products, Services and Deliverables.

iii. The Parties shall use reasonable endeavours to report forthwith in writing to each other all identified attempts (whether successful or not) by unauthorized persons (including unauthorized persons who are employees of any Party) either to gain access to or interfere with BSCDCL as the case may be or any of their nominees data, facilities or the Confidential Information.

iv. The SI shall upon reasonable request by BSCDCL as the case may be or their nominee(s) participate in regular meetings when safety and Information Technology security matters are reviewed.

v. As per the provisions of the RFP, the SI shall promptly report in writing to BSCDCL or its nominated agencies, any act or omission which they are aware that could have an adverse effect on the proper conduct of safety and Information Technology security at the facilities of BSCDCL as the case may be.

7.18 Insurance Cover

Obligation to maintain Insurance:

i. The SI shall take out and maintain, at its cost but on terms and conditions approved by BSCDCL, insurance against the risks, and for the coverages, as specified below:

a) Third Party motor vehicle liability insurance as required under Motor Vehicles Act, 1988 in respect of motor vehicles operated in India by the SI or their Personnel for the period of the assignment.

b) Third Party liability insurance with a minimum coverage, of Rs. 50, 00,000 for the period of the assignment.

c) Professional liability insurance, with a minimum coverage equal to estimated remuneration and reimbursable.

d) Employer's liability and workers' compensation insurance in respect of the Personnel of the SI in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate; and

e) Insurance against loss of or damage to the SI's property used in the performance of the Services, and any documents prepared by the SI in the performance of the Services.

ii. The SI shall not use these documents for purposes unrelated to the Agreement without the prior written approval of the BSCDCL.

iii. The SI shall at the BSCDCL's request, provide evidence to the BSCDCL showing that such insurance has been taken out and maintained and that the current premia thereof have been paid

7.19 Exit Management Plan

An Exit Management plan shall be furnished by SI in writing to the BSCDCL within 90 days from the date of signing the Contract, which shall deal with at least the following aspects of exit management in relation to the contract as a whole and in relation to the Project Implementation, and Service Level monitoring.

i. A detailed program of the transfer process that could be used in conjunction with a Replacement Service Provider including details of the means to be used to ensure continuing provision of the services throughout the transfer process or until the cessation of the services and of the management structure to be used during the transfer;
ii. Plans for provision of contingent support to Project and Replacement Service Provider for a reasonable period after transfer.
iii. Exit Management plan in case of normal termination of Contract period
iv. Exit Management plan in case of any eventuality due to which Project is terminated before the contract period.

v. Exit Management plan in case of termination of the Bidder

Exit Management plan at the minimum adhere to the following:

i. Three (3) months of the support to Replacement Service Provider post termination of the Contract
ii. Complete handover of the Planning documents, bill of materials, functional requirements specification, technical specifications of all equipment's, change requests if any, sources codes, reports, documents and other relevant items to the Replacement Service Provider/ BSCDCL
iii. Certificate of Acceptance from authorized representative of Replacement Service Provider issued to the SI on successful completion of handover and knowledge transfer
iv. In the event of termination or expiry of the contract, Project Implementation, or Service Level monitoring, both SI and BSCDCL shall comply with the Exit Management Plan.
v. During the exit management period, the SI shall use its best efforts to deliver the services.

8 Section VIII: Bidding Formats

8.1 Formats for Clarification

8.1.1 Format for submission of Queries

[ON BIDDERS LETTERHEAD]

To

Date: DD/MM/YYYY

Sub: Submission of Clarification of Clarifications by <<firm name>>

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: __/__/_____)

Dear Sir,

We have gone through the bid document and have the following queries. Request you to kindly address the same. We seek your clarification on the queries mentioned below.

#	Clause No in RFP	Page Number	Existing Clause	Query/Remarks

Date:

Signature of Authorized Representative

Name of SI:

Full Address:

Telephone No.:

8.2 Formats for Pre-Qualification Bid

8.2.1 Checklist for Pre-Qualification Bid

Sl. No.	Items	Submitted (Yes /No.)	Documentary Proof (Page No.)
1.	RFP Fee of Rs 50000/-		
2.	EMD of Rs 50 lacs		
3.	PQ_1- Bid Cover letter		
4.	PQ_2- Bidder's Particulars		
5.	PQ_3- Power of attorney / board resolution to the authorized Signatory for Prime Bidder of Consortium		
6.	Copy of Certificate of Incorporation (In case of Consortium all members to submit)		
7.	Copy of Memorandum and Articles of Associations (In case of Consortium all members to submit)		
8.	Copy of GSTIN and PAN		
9.	PQ_4- Certificate from the statutory auditor/ CA towards positive net worth of the company.		
10.	PQ_5- Chartered Accountant certificate for Turnover for the last three financial year's i.e. 2015-16, 2016- 2017 and 2017-2018		
11.	PQ_5: Auditor's Certificate for turnover		

	for bidder/each member of Consortium		
12.	PQ_6- Self-Declaration letter of Non-Black listing duly signed by authorized signatory on company letter head		
13.	PQ_7- Undertaking from OEM's on Products/Services		
14.	PQ_8- Statement of No Deviation from the RFP requirements		
15.	Consortium Agreement with clear defining roles and responsibilities of each consortium partner .		
16.	Copy of Valid Standards/Certification		

8.2.2 PQ_1- Format for Pre-Qualification Bid Cover letter

[ON BIDDERS LETTERHEAD]

To

CEO

Bhopal Smart City Development Corporation Limited

Date: DD/MM/YYYY

Sub: Submission of EligibilityProposal

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: ___/___/_____)

Dear Sir,

Having examined the RFP, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to product and services as required and outlined in the RFP. We attach hereto our responses to EligibilityCriteria.

We confirm that the information contained in these responses or any part thereof, including the exhibits, and other documents and instruments delivered or to be delivered to BSCDCL is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead the department in its short-listing process.

We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the selection process, we are liable to be dismissed from the selection process or termination of the contract during the project, if selected to do so.

We agree for unconditional acceptance of all the terms and conditions set out in the RFP document and also agree to abide by this RFP response for a period of 180 days from the date fixed for bid opening.

We hereby declare that in case we are chosen as successful bidder, we shall submit the PBG in the form prescribed in the RFP. We do hereby undertake, that until a contract is prepared and executed, this bid together with your written acceptance thereof, the RFP and placement of letter of intent awarding the contract, shall constitute a binding contract between us.

We agree that you reserve the right in absolute sense to reject all or any of the products/ services specified in the RFP response with or without assigning any reason whatsoever.

It is hereby confirmed that I am entitled to act on behalf of our company/ corporation/ firm/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

Date:

Signature of Authorized Representative

Name of Bidder:

Full Address:

Telephone No.:

8.2.3 PQ_2- Format for Particulars of the Bidder

Details of the Bidder (Company)		
A.	Name of the Bidder	
B.	Address of the Bidder	
C.	Year of Incorporation	
D.	Registration Number & Registration Authority	
E.	Legal Status (Public/Private)	
F.	Name & Designation of the Authorized person to whom all references shall be made regarding this RFP	
G.	Telephone No. (with STD Code)	
H.	E-Mail of the Contact person:	
I.	Fax No. (with STD Code)	
J.	Website	
K.	Financial Detail (Organization's turnover of last three financial years)	FY 17-18:
		FY 16-17:
		FY 15-16:
L.	GSTIN Number	
M.	PAN	
N.	EMD Details	

Date:

Signature of Authorized Representative

Name of SI:

Full Address:

Telephone No.:

8.2.4 PQ_3- Power of Attorney for Lead Member of Consortium

Whereas the Bhopal Smart City Development Corporation Limited has invited applications from interested parties for the Selection of "Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal".

Whereas ....., and ..... (Collectively "Consortium") being Members of the Consortium are interested in bidding for the Project in accordance with the terms and conditions of the Request for Proposal (RFP document) and other connected documents in respect of the Project, and

Whereas, it is necessary for the Members of the Consortium to designate one of them as the Prime Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's bid for the Project and its execution.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS

I, ... Having our Registered office at .....,

(hereinafter collectively referred to as the "Principals") do hereby irrevocably designate, nominate, constitute, appoint and authorize M/s. ..... having its registered office at ....., being one of the Members of the Consortium, as the Prime Member and true and lawful attorney of the Consortium (hereinafter referred to as the "Attorney"). We hereby irrevocably authorize the Attorney (with power to sub-delegate) to conduct all business for and on behalf of the Consortium and during the bidding process and, in the event the Consortium is awarded the concession/contract, during the execution of the Project and in this regard, to do on our behalf and on behalf of the Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the pre-qualification of the Consortium and submission of its bid for the Project, including but not limited to signing and submission of all applications, bids and other documents and writings, participate in bidders and other conferences, respond to queries, submit information/ documents, sign and execute contracts and undertakings consequent to acceptance of the bid of the Consortium and generally to represent the Consortium in all its dealings with the BSCDCL, and/ or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the Consortium's bid for the Project and/ or upon award thereof till the Concession Agreement is entered into with the BSCDCL.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us/ Consortium.

IN WITNESS WHEREOF WE THE PRINCIPALS ABOVE NAMED HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS ..... DAY OF ....., 20....

For .....

(Signature)

.....

(Name & Title)

For .....

(Signature)

.....

(Name & Title)

Witnesses:

1.

2.

(Executants)

(To be executed by all the Members of the Consortium)

Notes:

- The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
- Also, wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders' resolution/power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.
- For a Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention, 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostle certificate.

8.2.5 PQ_4- CA Certificate for networth for bidder

Date: dd/mm/yyyy

To

Chief Executive Officer (CEO),

Bhopal Smart City Development Corporation Limited,

Zone 14, near Tatpar petrol pump, BHEL

Govindpura, Bhopal

Madhya Pradesh- 462023

Sir/Madam,

This is to certify that the Networth as per books and records of _____ for the following financial years are as under.

S.No.	Financial Year ending	Networth (Rs in Crores)
1.	31st March, 2018	

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

Signature of Auditor (with official seal)

Name :

Designation :

Address :

Telephone& Fax :

E-mail address :

8.2.6 PQ_5: Bidders Annual turnover (Turnover of Prime Bidder in the Consortium) & Turnover of Consortium member over last 3 financial years

<< To be submitted by each member company is case of Consortium on company's letterhead>>

Date: dd/mm/yyyy

To

Chief Executive Officer (CEO),

Bhopal Smart City Development Corporation Limited,

Zone 14, near Tatpar petrol pump, BHEL

Govindpura, Bhopal

Madhya Pradesh- 462023

Subject: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: __/__/_____)

Sir/ Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal.

I hereby declare that below are the details regarding Overall turnover over last 3 financial years for our organization as well as the turnover of the consortium members over last 3 financial years.

#	Details	FY 2015-16	FY 2016-17	FY 2017-18	Average Turnover

		(in Crores) (i)	(in Crores) (ii)	(in Crores) (iii)	[(i)+(ii)+(iii)/3]
1	Overall Annual Turnover- Sole/Prime Bidder				

#	Details	FY 2013-14 (in Crores) (i)	FY 2014-15 (in Crores) (ii)	FY 2015-16 (in Crores) (iii)	Average Turnover [(iv)+(v)+(vi)/3]
1	Overall Annual Turnover- Consortium Member 2(if any)				
2	Overall Annual Turnover- Consortium Member 3(if any)				

Contact Details of officials for future correspondence regarding the bid process:

Details	Authorized Signatory	Secondary Contact
Name		
Title		
Company Address		
Mobile		
Fax		
Email Id		

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

Signature of Authorized Signatory (with official seal)

Name :

Designation :

Address :

Telephone& Fax :

E-mail address :

8.2.7 PQ_5: Auditor's Certificate for turnover for bidder/each member of Consortium

<<To be submitted by each member company is case of Consortium on company's letterhead>>

Date: dd/mm/yyyy

To

Chief Executive Officer (CEO),

Bhopal Smart City Development Corporation Limited,

Zone 14, near Tatpar petrol pump, BHEL

Govindpura, Bhopal

Madhya Pradesh- 462023

Sir/Madam,

This is to certify that the Cumulative Turnover as per books and records of _____ for the following financial years are as under.

NOTE: To be filed for each Member company in case of a consortium

S.No.	Financial Year ending	Annual Turnover (Rs in Crores)
1.	31st March, 2016	
2.	31st March, 2017	
3.	31st March, 2018	
	Average Turnover	

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

Signature of Auditor (with official seal)

Name :

Designation :

Address :

Telephone& Fax :

E-mail address :

8.2.8 PQ_6- Format for Self-declaration by Bidder for not being Blacklisted

[ON BIDDERS LETTERHEAD]

To

CEO

Bhopal Smart City Development Corporation Limited

Date: DD/MM/YYYY

Sub: Declaration of no valid ineligibility for corrupt or fraudulent practices or blacklisted by Government (Central or State)/Semi-Govt. or PSUas on 31-03-2018.

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: __/__/_____)

Dear Sir,

In response to the above mentioned RFP I,_____, as _____ <Designation>_____ of M/s_____, hereby declare that our Company / Firm _____has not been declared blacklisted or ineligible to participate for bidding by any State/Central Govt., Semi-Govt.or PSU in last years from the date of submission of bid.

Date: Signature of Authorized Representative

Name of SI:

Full Address:

Telephone No.:

8.2.9 PQ_7- Format for Authorization by OEM to provide services based on their products

(Please provide separate letter for each OEM)

[ON OEM's LETTERHEAD]

To

CEO

Bhopal Smart City Development Corporation Limited

Date: DD/MM/YYYY

Sub: Authorization of <<Name of the Bidder >> to provide services based on our product(s)

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: __/__/_____)

Dear Sir,

I, hereby, declare that <<Name of the OEM>> am the Original Equipment Manufacturer in respect to the product (s) proposed in the RFP. I confirm that <Name of the Bidder> has due authorization from us to provide product(s) listed below and related services of warranty, licensing and maintenance, to BSCDCL, as per your RFP (Ref. No. ..... dated .....).

Having read, examined, and understood the RFP, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to product and services as required and outlined in the RFP. I agree for unconditional acceptance of all the terms and conditions set out in the RFP document.

I endorse the terms and conditions specified in the RFP, contracting and licensing terms provided by <Name of the Bidder> to BSCDCL. I declare that the proposed products shall not become "end of life or end of sale" for next 5 years beginning from the date of installation. Also the support including spares, patches for the quoted products shall be available for next 5 years beginning from the date of installation.

I endorse to provide direct technical support to the BSCDCL for the contract period even in absence of the <Name of the Bidder> providing services to the BSCDCL. The warranty shall be onsite replaceable warranty of the products that are listed below. I also certify that the below mentioned product being supplied by the <Name of the Bidder> meets the minimum specifications given in the RFP.

#	Name of Product (s)	Remarks (if any)
1		
2		

Date:

Signature of Authorized Representative

Name of SI:

Full Address:

Telephone No.:

8.2.10 PQ_8- Format for Statement of No Deviation from the RFP

[ON BIDDERS LETTERHEAD]

To,

CEO

Bhopal Smart City Development Corporation Limited

Date: DD/MM/YYYY

Sub: Undertaking of no deviation from RFP terms and condition

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: ___/___/_____)

Dear Sir,

This is to confirm that the proposal submitted by <<Bidder name>>, is in complete agreement with the RFP and the corrigendum(s) issued thereof and there is no deviation what so ever.

Date:

Signature of Authorized Representative

Name of SI:

Full Address:

Telephone No.:

8.2.11Format of Earnest Money Deposit

Date: dd/mm/yyyy

To,

Chief Executive Officer (CEO),

Bhopal Smart City Development Corporation Limited,

Zone 14, near Tatpar petrol pump, BHEL

Govindpura, Bhopal

Madhya Pradesh- 462023

Whereas M/s <<Name of Bidder>>, a company incorporated under the <<Act>>, its registered office at ..... or (hereinafter called 'the Bidder') has submitted its Proposal dated ---------- for "Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: __/__/_____)"

KNOW ALL MEN by these presents that WE <<Name of Bank>> of ---------- having our registered office at ---------- ---------- (hereinafter called "the Bank") are bound unto the Bhopal Smart City Development Corporation Limited (hereinafter called "the Client") in the sum of Rs. 50,00,000/- (Rupees 50 Lakh Only) for which payment well and truly to be made to the said Client, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this ---------- day of ----------2017

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid

2. If the Bidder, having been notified of the acceptance of its Proposal by the Client during the period of validity of Proposal, bidder:

a. withdraws his participation from the Proposal during the period of validity of Proposal document;

b. fails to extend the validity if required and as requested or

c. fails to produce Performance Bank Guarantee in case of award of tender within 15 days of award of LOI or awarding contract whichever is earlier

We undertake to pay to the Client up to the above amount upon receipt of its first written demand, without the Client having to substantiate its demand, provided that in its demand the Client will note that the amount claimed by it is due to it owing to the occurrence of one or any or a combination of the above conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to the period of bid validity and its validity should be extensible to 90 days beyond the bid validity date. Any demand in respect thereof should reach the Bank not later than the above date.

(Authorized Signatory of the Bank)

8.3 Formats for the Technical Bid

8.3.1 General Instructions on Preparation of the Technical Proposal

i. Bidders have to submit a very structured and organized technical bid, which will be analysed by the Technical Evaluation Committee for different compliances with regards to the requirements of the project. The document submitted must be searchable and well indexed without any handwritten material. Since the cut-off marks for Technical bid Score is 70, the quality and completeness of the information submitted by the Bidder will matter a lot. All the documents must be submitted in one file only.

ii. Bidder is expected to divide its Bid in following sections / documents:

a. Bidder's Competence to execute the project

This document should bring about the capability of the firm to execute this project. Some of the required documents are as follows:

- Experience in Similar projects

b. Technical Proposal: The technical proposal should specify the following:

- Understanding of the Project
- Clear articulation and description of the design and technical/functional solution and various components including (Infrastructure architecture, Application architecture, data Architecture and physical layer architecture)
- Details of the SCADA application software proposed
- Integration approach with existing Infrastructure
- Reasoning for selection of the proposed technology over other options.
- Strength of the Bidder to provide services including examples or case-studies of similar solutions deployed for other clients
- Clearly articulate the Strategy and Approach and Methodology for Design, Installation, Configuration and Maintenance of Water Utility components and infrastructure of the project.
- Approach and Methodology for Management of SLA Requirements specified in the bid. Bidder is required to clearly articulate how the SLA requirements would be adhered.
- Detailed Project Plan with timelines, resource allocation, milestones etc. for supply, installation and commissioning of the various project components.

- Internet bandwidth and the MPLS bandwidth requirement for the operations
- Risk Mitigation plan

c. Other Details

- **Bill of Material:** This document should give details of all the proposed IT and Non-IT components, without specifying the costs. Please note that the bid shall get disqualified if Bidder gives price details in the technical document.
- Compliance to Technical and Functional Specifications as mentioned in Section IV and X.
- Make & Model of all IT as well as non IT components along with datasheets highlighting the Technical Specification parameters in each datasheet for compliances
- CVs of the Key Manpower proposed (Qualification of each resource is provided in this RFP Section 4.8)

8.3.2 Check-list for the documents to be included in the Technical Bid

#	Documents required	Submitted (Y / N)	(Page No.)
1.	Format TQ_1: Technical Proposal Cover Letter		
2.	Format TQ_2: Details of System Integration Experience for experience in Implementation & maintenance of large Utility Management System Projects in Government or Private domain.		
3.	Format TQ_3: Details of System Integration Experience for Implementation, maintenance and setting up of Water SCADA Utility infrastructure components like Water Management and Water Loss Detection system, control and instrumentation of Reservoir Management System, establishment of Central Command and Control Centre (or equivalent) based on SCADA in Government or Private domain.		
4.	Format TQ_4: Details of System Integration Experience working as Master System Integrator in implementation of urban sector e-governance and ICT solution in Government/PSU organization/Smart Cities.		
5.	Approach and Methodology- details as per parameters mentioned in Technical Evaluation criteria of Section 3.2		
6.	Format TQ_5: CVs of the Key Manpower proposed		
7.	Detailed Project Plan with timelines, resource allocation, milestones etc. for supply,		

	installation and commissioning of the various project components.		
8.	Bandwidth requirement for the operations		
9.	Bill of Material without prices		
10.	Make & Model of all IT as well as non IT components		
11.	Compliance to Functional and Technical Requirements , Specifications as mentioned in Section 4.13,10 along with referencing of the qualifying functional/technical specification on the product/solution datasheet or literature.		
12.	Datasheets highlighting the Technical Specification parameters in each datasheet for compliances		
13.	Letter on company's letter head to establish Project office with warehouse facility in Bhopal within 45 days from signing contract		

8.3.4 TQ_1- Format for Technical Proposal Cover Letter

To,

CEO

Bhopal Smart City Development Corporation Limited

Date: DD/MM/YYYY

Sub: Submission of Technical Compliance Proposal

Ref: Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal (RFP No: _____ Dated: ___/___/_____)

Dear Sir,

Having examined the RFP, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to product and services as required and outlined in the RFP. We attach hereto our responses to Technical Compliance Criteria.

We confirm that the information contained in these responses or any part thereof, including the exhibits, and other documents and instruments delivered or to be delivered to BSCDCL is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead the department in its short-listing process.

We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the selection process, we are liable to be dismissed from the selection process or termination of the contract during the project, if selected to do so.

We agree for unconditional acceptance of all the terms and conditions set out in the RFP document and also agree to abide by this RFP response for a period of 180 days from the date fixed for bid opening.

We hereby declare that in case we are chosen as successful bidder, we shall submit the PBG in the form prescribed in the RFP. We do hereby undertake, that until a contract is prepared and executed, this bid together with your written acceptance thereof, the RFP and placement of letter of intent awarding the contract, shall constitute a binding contract between us.

We agree that you reserve the right in absolute sense to reject all or any of the products/ services specified in the RFP response with or without assigning any reason whatsoever.

It is hereby confirmed that I am entitled to act on behalf of our company/ corporation/ firm/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

Date:

Signature of Authorized Representative

Name of Bidder:

Full Address:

Telephone No.:

8.3.5 TQ_2: Details of System Integration Experience for experience in Implementation & maintenance of large Utility Management System Projects in Government or Private domain.

Sl. No.	Name of Project	Year of Project	Page Number
1.			
2.			
3.			
4.			
5.			

Detailed Project Experience *(please provide separate table for each project)*

Project Information	
Name of the project	
Client Name	
Name and contact details of the client	
Description of the project	
Scope of services	
Start date	
Completion date	

Duration of the project	
Other Relevant Information (if any)	
Please check (√) on the supporting documents enclosed: • Work Order received from Client • Agreement signed between Bidder and Client • Client Certificate/ others (if any)	

8.3.6 TQ_3: Details of System Integration Experience for Implementation, maintenance and setting up of Water SCADA Utility infrastructure components like Water Management and Water Loss Detection system, control and instrumentation of Reservoir Management System, establishment of Central Command and Control Centre (or equivalent) based on SCADA in Government or Private domain.

Sl. No.	Name of Project	Year of Project	Page Number
6.			
7.			
8.			
9.			
10.			

Detailed Project Experience *(please provide separate table for each project)*

Project Information	
Name of the project	
Client Name	
Name and contact details of the client	
Description of the project	
Scope of services	
Start date	
Completion date	
Duration of the project	
Other Relevant Information (if any)	
Please check (√) on the supporting documents enclosed: • Work Order received from Client • Agreement signed between Bidder and Client • Client Certificate/ others (if any)	

8.3.7 TQ_4: Details of System Integration Experience working as Master System Integrator in implementation of urban sector e-governance and ICT solution in Government/PSU organization/Smart Cities.

Sl. No.	Name of Project	Year of Project	Page Number
11.			
12.			
13.			
14.			
15.			

Detailed Project Experience *(please provide separate table for each project)*

Project Information	
Name of the project	
Client Name	
Name and contact details of the client	
Description of the project	
Scope of services	
Start date	
Completion date	

Duration of the project	
Other Relevant Information (if any)	
Please check (√) on the supporting documents enclosed: • **Work Order received from Client** • **Agreement signed between Bidder and Client** • **Client Certificate/ others (if any)**	

8.3.8 TQ_5: CVs of the Key Manpower proposed

1	Name of the Staff	
2	Current Designation in the Organization	
3	Proposed Role in the Project	
4	Proposed Responsibilities in the Project	
5	Date of Birth	
6	Education	▪ Degree / Diploma, College, University, Year of Passing ▪ Degree / Diploma, College, University, Year of Passing
7	Summary of Key Training and Certifications	
8	Language Proficiency	**Language** | **Reading** | **Writing** | **Speaking** | | | | | | | | | | | |

<table>
<tr><td>9</td><td>Employment Record
(For the total relevant experience)</td><td><table>
<tr><td>From / To:</td><td></td></tr>
<tr><td>Employer:</td><td></td></tr>
<tr><td>Position Held:</td><td></td></tr>
<tr><td>From / To:</td><td></td></tr>
<tr><td>Employer:</td><td></td></tr>
<tr><td>Position Held:</td><td></td></tr>
<tr><td>From / To:</td><td></td></tr>
<tr><td>Employer:</td><td></td></tr>
<tr><td>Position Held:</td><td></td></tr>
</table></td></tr>
<tr><td>10</td><td>Total No. of Years of Work Experience</td><td></td></tr>
<tr><td>11</td><td>Total No. of Years of Experience for the Role proposed</td><td></td></tr>
<tr><td>12</td><td colspan="2">Highlights of relevant assignments handled and significant accomplishments (Use following format for each project)<table>
<tr><td>Name of assignment or project:</td><td></td></tr>
<tr><td>Year:</td><td></td></tr>
<tr><td>Location:</td><td></td></tr>
<tr><td>Client:</td><td></td></tr>
<tr><td>Main project features:</td><td></td></tr>
<tr><td>Positions held:</td><td></td></tr>
<tr><td>Activities performed:</td><td></td></tr>
</table></td></tr>
</table>

8.3.9 Format of undertaking for setting a Project Office and Warehouse in Bhopal

<<To be provided on Prime Bidders company's letterhead and signed by Authorized signatory>>

Date: dd/mm/yyyy

To

Chief Executive Officer (CEO),

Bhopal Smart City Development Corporation Limited,

Zone 14, near Tatpar petrol pump, BHEL

Govindpura, Bhopal

Madhya Pradesh- 462023

Sir/Madam,

In response to the Tender Ref. No. _____ dated_____ for 'Selection of System Integrator for Supply, Installation, Integration and Commissioning of Water Utility Management System for Bhopal' , as an owner/ partner/ Director of _____, I/ We hereby declare we will establish Project office and warehouse facility in Bhopal within 45 days from signing contract.

If this declaration is found to be incorrect then without prejudice to any other action that may be taken, my/ our security may be forfeited in full and the tender if any to the extent accepted may be cancelled.

Name of the Bidder :

Authorized Signatory :

Seal of the Organization :

Business Address :

Date :

Place :

8.4 Financial Bid Format and instructions

8.4.1 General Instructions

a. Financial Bid needs to be submitted online as per the instructions given in the RFP in the format prescribed in this section.
b. Bidder should provide all prices as per the prescribed format under this Section.
c. All the prices are to be entered in Indian Rupees (INR) only
d. Prices indicated in the schedules shall be inclusive of all taxes, Levies, duties etc. The prices should also specify five year support cost as per provided formats.
e. It is mandatory to provide breakup of all Taxes, Duties and Levies wherever asked for.
f. BSCDCL reserves the right to ask the SI to submit proof of payment against any of the taxes, duties, levies indicated.
g. The SI needs to account for all Out of Pocket expenses due to Boarding, Lodging and other related items.
h. The Unit Rate as mentioned in the following formats may be used for the purpose of 'Change Order' for respective items, if any. However, based on the market trends, BSCDCL retains the right to negotiate this rate for future requirement
i. The variation in individual item of quantities permitted, provided it shall not exceed ± 30% in individual item of quantities. The successful bidder shall not object to the upward or downward variation in quantities of any item within the variation limits.
j. Payment for additional quantities within the variation limit shall be made at tender rates and the tender rates shall be valid for entire duration of the contract.
k. No claim shall be entertained or become payable for price variation of additional quantities
l. Bidder shall be bound to give same or more % of discount on the list price of the OEMs on the future purchases (additional purchases within the contract period) by BSCDCL. Bidder shall ensure that the future products supplied are of latest specifications as per the OEM roadmap.
m. For the purpose of evaluation of Financial Bids, BSCDCL shall make appropriate assumptions to arrive at a common Bid price for all the bidders. This however shall have no co-relation with the Contract value or actual payment to be made to the Bidder.
n. BSCDCL also intends to utilize various rates obtained through this tender for requirements across various departments. Bidders are requested to factor this larger demand and give the best possible rate to BSCDCL.
o. SI should refer Section 10 of the Tender for details on the technical/functional requirements of the system and the benchmark specifications for the items mentioned in the Financial Formats.
p. Line items mentioned in the Financial Formats are for representation purpose and SI may propose alternate technology / solution (with proper justification). Bidders are required to suitably add line items / merge the cost components depending upon their proposed solution.
q. No escalations of prices will be considered under any circumstances.
r. Bidders must carefully read the Scope, Technical & Functional Requirements and the SLAs mentioned in this RFP and accordingly propose the software, hardware, accessories and services and their respective quantities required to completely meet the requirements of this RFP.

8.4.2 Format for Financial Bid

**** Bidder are requested to visit the site and do the preliminary survey before quoting the bid.**

Bidder can refer to the Annexure 1,2,3,4,5 for more details on the existing BMC Water Management Entities in Bhopal

Total Prices Summary

Sl. No.	Head	Amount (in Numbers)	Amount in Words
1.	**Total CAPEX Price**		
2	**Total OPEX Prices**		
3	**Total Price (1+2)**		

Price Components for CAPEX

Sl. No.	Line Item	Unit of Measurement	Proposed Quantity	Unit base price
1	2	4	5	6
A.	**Hardware Infrastructure**			
A1.	**Water Treatment Plants Outlet-12 Nos.**			
A1.1	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of PLC / RTU Control Panel with all accessories, civil works like foundation etc., power and control cables	Number	12	
A1. 2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of UPS with Battery (1 hours Backup as per technical specification and SLA mentioned in this RFP).with all accessories	Number	12	

A1.3	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Electrical Actuator on the existing installed Flow Control Valves with all accessories including construction of chamber (if needed)	Number	12	
A1.4	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Flow Meter with Transmitter with all accessories. The quoted rates shall include all accessories like flanges, nuts, bolts washers, gaskets, packings, MS tool piece {reducer and enlarger} (if needed)			
	Size : 300mm	Number	4	
	Size : 400mm	Number	2	
	Size : 450mm	Number	4	
	Size : 500mm	Number	1	
	Size : 600mm	Number	1	
A1.5	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Pressure Transmitter with all accessories	Number	12	
A1.6	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Level Transmitter with all accessories	Number	12	
A1.7A	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of MCC Panel suitable for 02 Nos 150 HP Pumps with all accessories, civil works like foundation etc., power cables	Number	1	
7B	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of MCC Panel suitable for 02 Nos 75 HP Pumps with all accessories, civil works like foundation etc., power cables	Number	1	
A1.8	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of PH Analyser with all accessories	Number	12	
A1.9	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of TDS Analyser	Number	12	
A1.10	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Residual Chlorine Analyser	Number	12	
A1.11	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Turbidity Analyser	Number	12	
A2.	**Elevated Storage Reservoir (175 Nos.)**			
A2.1	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of PLC / Remote Terminal Unit (RTU) Control Panel with all accessories, civil works like foundation etc., power and control cables	Number	175	

A2.2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Electrical Actuator on the existing installed Flow Control Valves with all accessories including construction of chamber (if needed)	Number	350	
A2.03	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Flow Meter and Transmitter . The quoted rates shall include all accessories like flanges, nuts, bolts washers, gaskets, packings, MS tool piece {reducer and enlarger} (if needed)			
	Size : 50mm	Number	10	
	Size : 80mm	Number	60	
	Size : 100mm	Number	36	
	Size : 125mm	Number	27	
	Size : 150mm	Number	92	
	Size : 200mm	Number	86	
	Size : 250mm	Number	19	
	Size : 300mm	Number	5	
	Size : 350mm	Number	7	
	Size : 400mm	Number	4	
	Size : 500mm	Number	2	
	Size : 600mm	Number	2	
A2.04	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Control Valve . The quoted rates shall include all accessories like flanges, nuts, bolts washers, gaskets, packings, MS tool piece (if needed)			
	Size : 50mm	Number	2	
	Size : 80mm	Number	6	
	Size : 100mm	Number	4	
	Size : 125mm	Number	3	
	Size : 150mm	Number	10	
	Size : 200mm	Number	10	
	Size : 250mm	Number	2	
	Size : 300mm	Number	1	
	Size : 350mm	Number	1	
	Size : 400mm	Number	1	
	Size : 500mm	Number	1	
	Size : 600mm	Number	1	
A2.05	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Pressure Transmitter	Number	350	
A2.06	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of UPS with Battery (1 hour Backup as per technical specification and SLA mentioned in this RFP).	Number	175	
A3.	**Pumping Stations (6 Nos.)**			
A3. 1	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of UPS with Battery (1 hour Backup as per technical specification and SLA mentioned in this RFP).	Number	**6**	

A3.2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of PLC / Remote Terminal Units (RTU) Control Panels with SCADA compatible Energy Meters for all pumps with all accessories, civil works like foundation etc., power and control cables	Number	6	
A3.3	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of MCC Panel suitable for 01 Nos 150 HP Pumps with all accessories, civil works like foundation etc., power cables	Number	1	
A3.4	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of MCC Panel suitable for 01 Nos 150 HP Pumps with all accessories, civil works like foundation etc., power cables	Number	1	
A3.5	Supply, installation, testing and commissioning Pump set comprising of Horizontal Split Case / Multistage Centrifugal pump set with motor including fabricating MS angles, plates, channels, accessories, Base frame, foundation bolt, coupling, coupling guard, neoprene pads, Non Return Valve, Foot Valve, Suction and Delivery Sluice Valves, Priming Arrangement, Power Cable, RCC Foundation complete etc. as required as per enclosed specification as below for Pure water PH. Flow and Head shall be as per site and system requirements a) Impeller: CI d) Shaft: SS 410 e) Sleeve: SS 410 f) Mechanical sleeve g) Mover: Electric Motor TEFC h) RPM: 1450 i) Motor Rating: 175 H.P	Number	1	
A3.6	Supply, installation, testing and commissioning Pump set comprising of Horizontal Split Case / Multistage Centrifugal pump set with motor including fabricating MS angles, plates, channels, accessories, Base frame, foundation bolt, coupling, coupling guard, neoprene pads, Non Return Valve, Foot Valve, Suction and Delivery Sluice Valves, Priming Arrangement, Power Cable, RCC Foundation complete etc. as required as per enclosed specification as below for Pure water PH. Flow and Head shall be as per site and system requirements a) Impeller: CI d) Shaft: SS 410 e) Sleeve: SS 410 f) Mechanical sleeve g) Mover: Electric Motor TEFC h) RPM: 1450 i) Motor Rating: 75 H.P	Number	1	
A3.5	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Pressure Transmitter	Number	6	

a3.8	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Pressure Switches	Number	12	
A3.9	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Flow Flow Meter and Transmitter . The quoted rates shall include all accessories like flanges, nuts, bolts washers, gaskets, packings, MS tool piece {reducer and enlarger} (if needed)Transmitter			
	Size : 400mm	Number	6	
	Size : 300mm	Number	6	
A4.	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Electrical Actuator on the existing installed Flow Control Valves with all accessories including construction of chamber (if needed)	Number	12	
B.	**Networking and End Mile Connectivity**			
B1.1	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Dual GPRS modem & Controller System	Job	193	
B1.2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over ofNetworking Cost (Passive Components) (Pl. specify the details like OFC, Cat6 Cable, Power Cable, Control & Instrumentation Cable and other accessories)	Job	1	
C	**Water SCADA Control Centre (Software +IT Infrastructure)**			
C1.1	Supply, Installation, Programming, Integration, Commissioning, Handing Over of Anti-virus Software	Job	1	
C1.2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of SCADA & Other Software latest version + License as below			
C1.2A	a. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of01 Nos. SCADA server runtime with unlimited tags to be installed and deployed on the central server for servicing clients	Job	1	
C1.2B	b. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of06 Nos. concurrent SCADA clients license with unlimited tags be installed on client machines (operator work stations)	Job	1	
C1.2C	c .Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of suitable OPC server for unlimited tags with MODBUS TCP/equivalent driver to exchange data between the PLC based panels and the SCADA system	Job	1	
C1.2D	d. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning to be able to send the OPC data to a broker on the central server using the latest MQTT protocol or equivalent . It shall be able to support 5000 tags.	Job	1	

C1.2E	e. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of MQTT/equivalent broker at the central server to service publish and subscribe requests from the OPC server and the web clients	Job	1	
C1.2F	f. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Apps for Android Operating Systems along with the design and development of APIs at server side using JAVA / dotnet technologies to provide data to Android apps required to fetch and display data like (a) Status of Level Sensors, Motorised Valves, Level Sensors (b) Energy Parameters of Pumps (c) Pressure Transducers (d) Any other parameter available in the system and as required by the Engineer in Charge With a minimum of 25 concurrent licenses.	Job	1	
C1.2G	g. Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of latest HTML/UI Framework Application connected to the SCADA server having the following features	Job	1	
	i) 25 client licenses			
	ii) Monitoring Platform in boot strap to create representation of existing infrastructure			
	iii) Javascript or latest UI scripting to subscribe and publish to the MQTT/equivalent broker at the server			
	iv) Parse the response and display the data using HTML/latest UI,CSS, Bootstrap			
	v) Create online graphical trends .			
	vi) Create database and use the database to create historical trends, dashboards and reports			
C1.2H	h .Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Email and SMS Utility The Central Server shall have an Email and SMS Server which shall send out email and SMS to concerned officers in case of certain events or alarm conditions. It shall be user configurable on the following counts a. User Name and Password protected b. Connectivity to Database generated by the SCADA c. Configuration of Email Ids and Phone numbers of recipients d. Conditions like alarms and events to be user defined There shall be no limit to the number of recipients	Job	1	
C1.3	Survey and underground pipe detection (>=80mm dia.) using DGPS , Total Station, Pipe Locators, Ground Penetrating Radar, old existing maps with the client and necessary customisation for asset management for all water supply assets from source to ESR such as WTP, Pump Houses etc. and mapping on suitable GIS platform	Job	1	
D	**Water SCADA Control Centre (IT & Other Infrastructure)**			

D1.1	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of L3 Switches	Number	2	
D1.2	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Routers/Network Accessories	Number	1	
D1.3	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Operator Workstations with monitors	Number	6	
D1.4	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Multi-Function Laser Printer	Number	1	
D1.5	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of IP Phones	Number	4	
D1.6	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Furniture for Water Operations Room- Operator/Engineer Desks	Number	5	
D1.7	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Operator/Engineer DesksFurniture for Water Operations Room- Manager's Desk	Number	1	
D1.8	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Air Conditioning for: • Water Utility Operations Room • Manager's Room	Number	2	
D1.9	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of UPS with Battery backup of 1 hour	Number	1	
D1.10	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Access Control System	Job	1	
D1.11	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Electrical and power cabling for SCC Fire Alarm, CCTV, Access Control etc.	Job	1	
D1.12	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Electrical Cabling & Necessary Illumination Devices	Job	1	
D1.13	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of LAN and CAT-6 cabling	Job	1	
D1.14	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, of Video Walls with Video Wall Controller Software	Job	2	

D1.15	Supply, Installation, Testing, Trials, Programming, Integration, Commissioning, Handing Over of Civil Work (Raised Floor, False Ceiling, Ducting, Access Doors, Painting, Partitioning etc.) 1. Water Operations Room (800 Sq. Feet) 2. Utility Room (AHU + UPS + Battery) (100 sq.feet) 3. Washrooms (100 Sq. Feet)	Job	1	
E.	**Training**			
E1.1	Functional & Administrative Training for 07 Persons	Job	1	

Total CAPEX Price (in words) -

_____

_____

N.B – Bidder must ensure that all the line items are covered as specified in BOM and all required fields in the Commercial bid format are duly filled and calculated appropriately. All amounts to be quoted in INR.

Price Components for OPEX

SI #	Line Item	Unit of Measurement	Annual Comprehensive Maintenance Contract Cost for Each Unit year wise (In Indian Rupees)				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	2	3	4	5	6	7	8
A.	Technical & Operational Manpower	Man year rate as per the project plan proposed by bidder					

B.	Network Connectivity required for the project	Job					
C.							
	ICT and Non-ICT Components	Inclusive of Comprehensive and Preventive Maintainence as per the required successful operations of the project.					
Total amount for five year opex with applicable taxes and duties :-							

The Bidder may add any additional line item (with adequate details and pricing information) in table below towards the end that may be required to fulfill the RFP and project requirements in totality.

Total OPEX Price (in words) -

_____

_____

N.B – Taxes as applicable at the time of invoicing shall be considered. Any changes (upward or downward) in the taxes/duties shall be accordingly revised at the time of actual payments and paid. Taxes will be applicable as per the norms defined by Government of India at the time of actual payment.

OPEX cost shall include of manpower, training, and required maintenance of SCADA setup. The cost of Comprehensive Maintenance Contract (CMC) which includes preventive maintenance including testing & calibration as per technical/ service /operational manual, labour , replacement of spares (which gets damaged, have manufacturing defects, gets failed during operation) , may be quoted for next 5 years on yearly basis for complete equipment. Bidder is required to capture cost for all components separately in each line.

8.5 Format for Performance Bank Guarantee

[*On Appropriate Stamp Paper*]

Bank Guarantee No. _____

THIS DEED OF GUARANTEE is executed on this [insert date] day of [insert month and year] at [insert place] by [insert name of bank] with its head/registered office at [insert address], (hereinafter referred to as the Guarantor, which expression shall unless it is repugnant to the subject or context thereof include successors and assigns)

IN FAVOUR OF:

BHOPAL SMART CITY DEVELOPMENT CORPORATION LIMITED, a company incorporated under the (Indian) Companies

Act, 2013, with its registered office at _____ (hereinafter referred to as BSCDCL, which expression shall, unless it be repugnant to the context or meaning thereof, include its successors-in-title and permitted assigns);

WHEREAS:

A. BSCDCL has entered into a contract for providing Implementation services dated [insert date] (the **Contract**) with [insert name of Implementing Agency], a company/firm [incorporated/registered] under the [insert name of the relevant statute under which the Implementing Agency has been incorporated or registered, as the case may be], [with its [registered/principal] office at [_____]] (hereinafter referred to as the **Implementing Agency**, which expression shall, unless it be repugnant to the context or meaning thereof, include its successors-in-title and permitted assigns).

B. In terms of the Contract, the Implementing Agency has agreed to provide the Implementation Services for Bhopal Water Utility Management System (BWUMS), which involve the use of technology, information and data to improve water utility infrastructure and services within the city of Bhopal (the **BWUMS Project**), to implement the Smart Cities Mission in Bhopal, pursuant to the Request for Proposal dated [____] (referred to as the **RFP**) and other related documents including without limitation the draft Contract (collectively referred to as **Bid Documents**).

C. In terms of the letter of award (the LOA) dated [insert date] issued by Client to the Implementing Agency and **Clause I** of the Contract, the Implementing Agency is required to furnish to BSCDCL, an unconditional, irrevocable, on demand bank guarantee for an amount equivalent to Rs. [_____] [Insert amount equivalent to 10% of the Total Value of Contract] (the Guaranteed Amount) as security for the due and punctual performance or discharge of the Implementing Agency's obligations and liabilities under the Contract.

D. At the request of the Implementing Agency and for sufficient consideration, the Guarantor has agreed to provide an unconditional, irrevocable and on-demand bank guarantee, for the due and punctual performance or discharge by the Implementing Agency of its obligations and liabilities under the Contract.

NOW THEREFORE THIS DEED WITNESSETH AS FOLLOWS:

1. Capitalised terms used herein but not defined shall have the meaning ascribed to them in the Contract.

2. The Guarantor hereby irrevocably and unconditionally guarantees and secures, as primary obligor and not merely as guarantor, to BSCDCL the payment in full of all amounts at any time that may be due, owing or payable to BSCDCL from the Implementing Agency for the failure of the Implementing Agency to duly and punctually perform all of its obligations under the Contract during the term **(Guarantee)**, without any demur, reservation, protest or recourse, immediately on receipt of a demand from BSCDCL.

The Guarantee is given on consideration received from the Implementing Agency (the receipt and sufficiency of which is hereby acknowledged).

The Guarantor agrees that the value of the Guarantee shall at all times be maintained at the amount equivalent to the Guaranteed Amount.

The Guarantor further agrees that this Guarantee does not limit the number of claims that may be made by BSCDCL against the Guarantor. Upon a payment being made under this Guarantee, the amount of the Guarantee shall automatically be replenished to the full Guaranteed Amount.

Any payment made hereunder shall be made free and clear of and without deduction for, or on account of, any present or future Taxes, deductions or withholdings of any nature whatsoever and by whomsoever imposed, and where any withholding on a payment is required by any Applicable Law, the Guarantor shall comply with such withholding obligations and shall pay such additional amount in respect of such payment such that BSCDCL receives the full amount due hereunder as if no such withholding had occurred.

3. The Guarantor shall not go into the veracity of any breach or failure on the part of the Implementing Agency or validity of demand so made by BSCDCL and shall pay the amount specified in the demand notwithstanding any direction to the contrary given or any dispute whatsoever raised by the Implementing Agency or any other Person. The Guarantor's obligations hereunder shall subsist until all such demands are duly met and discharged in accordance with the provision hereof.

4. The obligations of the Guarantor herein are absolute and unconditional, irrespective of the value, genuineness, validity, regularity or enforceability of the Contract or the insolvency, bankruptcy, re-organisation, dissolution or liquidation of the Implementing Agency or any change in ownership of the Implementing Agency or any purported assignment by the Implementing Agency or any other circumstance whatsoever, which might otherwise constitute a discharge or defence of a guarantor or a surety.

Further, this Guarantee is in no way conditional upon any requirement that BSCDCL shall first attempt to procure the Guaranteed Amount from the Implementing Agency or any other Person, or resort to any other means of obtaining payment of the Guaranteed Amount.

5. In order to give effect to this Guarantee, BSCDCL shall be entitled to treat the Guarantor as the principal debtor. The obligations of the Guarantor under this Guarantee shall not be affected by any act, omission, matter or thing which, but for this provision, would reduce, release or prejudice the Guarantor from any part of the Guaranteed Amount or prejudice or diminish the Guaranteed Amount in whole or in part, including, whether or not known to it, or BSCDCL:

a. any time or waiver granted to, or composition with, the Implementing Agency or any other Person;

b. any incapacity or lack of powers, authority or legal personality of or dissolution or change in the status of the Implementing Agency or any other Person;

c. any variation of the Contract so that references to the Contract in this Guarantee shall include each variation;

d. any unenforceability, illegality or invalidity of any obligation of any Person under the Contract or any unenforceability, illegality or invalidity of the obligations of the Guarantor under this Guarantee or the unenforceability, illegality or invalidity of the obligations of any Person under any other document or Guarantee, to the extent that each obligation under this Guarantee shall remain in full force as a separate, continuing and primary obligation, and its obligations be construed accordingly, as if there was no unenforceability, illegality or invalidity;

e. the partial or entire release of any Guarantor or other Person primarily or secondarily liable or responsible for the performance, payment or observance of any of the Implementing Agency 's

obligations during the term of the Contract; or by any extension, waiver, or amendment whatsoever which may release a guarantor or the Guarantor, other than performance or indefeasible payment of the Guaranteed Amount; or

f. any part performance of the Contract by the Implementing Agency or by any failure by BSCDCL to timely pay or perform any of its obligations under the Contract.

6. If, and to the extent that for any reason the Implementing Agency enters or threatens to enter into any proceedings in bankruptcy or re-organisation or otherwise, or if, for any other reason whatsoever, the performance or payment by the Implementing Agency of the Guaranteed Amount becomes or may reasonably be expected to become impossible, then the Guaranteed Amount shall be promptly paid by the Guarantor to BSCDCL on demand.

7. So long as any amount is due from the Implementing Agency to BSCDCL, the Guarantor shall not exercise any right of subrogation or any other rights of a guarantor or enforce any guarantee or other right or claim against the Implementing Agency, whether in respect of its liability under this Guarantee or otherwise, or claim in the insolvency or liquidation of the Implementing Agency or any such other Person in competition with BSCDCL. If the Guarantor receives any payment or benefit in breach of this clause 7, it shall hold the same upon trust for BSCDCL.

8. This Guarantee shall remain in full force and effect from the date hereof until 60 days beyond issuance of the Completion Certificate.

Notwithstanding the foregoing, this Guarantee shall continue in effect until the sums payable under this Guarantee have been indefeasibly paid in full and the Guarantor receives written notice thereof from BSCDCL, such notice to be issued promptly upon such occurrence.

9. The Guarantor represents and warrants to BSCDCL that:

a. it has the power to execute, deliver and perform the terms and provisions of this Guarantee and has taken all necessary action to authorise the execution, delivery and performance by it of this Guarantee;

b. the Guarantor has duly executed and delivered this Guarantee, and this Guarantee constitutes its legal, valid and binding obligation enforceable in accordance with its terms except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, moratorium or other similar laws affecting the enforcement of creditors' rights generally and by general equitable principles;

c. neither the execution, delivery or performance by the Guarantor of this Guarantee, nor compliance by it with the terms and provisions hereof will: (i) contravene any material provision of any Applicable Law; (ii) conflict or be inconsistent with or result in any breach of any of the material terms, covenants, conditions or provisions of, or constitute a default under any agreement, contract or instrument to which the Guarantor is a party or by which it or any of its property or assets is bound; or (iii) violate any provision of the Guarantor's constituent documents;

d. no order, consent, approval, license, authorisation or validation of, or filing, recording or registration with, except as have been obtained or made prior to the date hereof, or exemption by, any governmental or public body or authority, or any subdivision thereof, is required to authorise, or is required in connection with: (i) the execution, delivery and performance of this Guarantee; or (ii) the legality, validity, binding effect or enforceability of this Guarantee; and

e. this Guarantee will be enforceable when presented for payment to the Guarantor's branch in Bhopal at [_____].

10. This Guarantee is a continuing one and all liabilities to which it applies or may apply under the terms hereof shall be conclusively presumed to have been created in reliance hereon. No failure or delay on the part of BSCDCL in exercising any right, power or privilege hereunder and no course of dealing between BSCDCL and the Guarantor, or the Implementing Agency, shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power or privilege.

11. The rights, powers and remedies expressly provided in this Guarantee are cumulative and not exclusive of any rights, powers or remedies which BSCDCL would otherwise have. No notice to or demand on the Guarantor in any case shall entitle the Guarantor to any other further notice or demand in similar or other circumstances or constitute a waiver of the rights of BSCDCL to any other or further action in any circumstances without notice or demand.

12. If any one or more of the provisions contained in this Guarantee are or become invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby, and the Guarantor shall enter into good faith negotiations with BSCDCL to replace the invalid, illegal or unenforceable provision.

13. The Guarantor hereby agrees to execute and deliver all such instruments and take all such actions as may be necessary to make effective fully the purposes of this Guarantee.

14. This Guarantee may be executed in one or more duplicate counterparts, and when executed and delivered by the Guarantor and BSCDCL shall constitute a single binding agreement.

15. BSCDCL may assign or transfer all or any part of its interest herein to any other person with prior written notice to the Guarantor. The Guarantor shall not assign or transfer any of its rights or obligations under this Guarantee.

16. All documents arising out of or in connection with this Guarantee shall be served:
a. upon BSCDCL, at [insert address]; and
b. upon the Guarantor, at [insert address].

17. Any demand, notice or communication would have been deemed to have been duly served:
a. if delivered by hand, when left at the proper address of services; and
b. if given or made by pre-paid registered post or facsimile, when received.

18. Either party may change the above address by prior written notice to the other party.

19. This Guarantee shall be governed by, and construed in accordance with, the laws of India. The Guarantor irrevocably agrees that any dispute arising out of or relating to this Guarantee may be brought in the courts in Madhya Pradesh.

IN WITNESS WHEREOF the Guarantor has set its hands hereunto on the day, month and

year first hereinabove written.

Signed and delivered by [**insert name of Bank**] Bank, by [**insert name of branch**] Branch by

hand

Of [**insert name of signatory**]

It's [**insert designation**] and duly authorized representative

Authorized by [Power of Attorney dated [**insert date**]] OR [Board resolution dated [**insert**

date]].

9 Section IX: General Conditions of Contract

9.1 Definition of Terms

Unless the context otherwise requires, capitalized terms used in this Agreement shall have the following meaning:

1.1. **"Authority":** Bhopal Smart City Development Corporation Limited (BSCDCL).

1.2. **"Acceptance of System":** The system including the hardware, software, solution or any deliverable shall be considered to have been acceptedby designated authority, subsequent to its installation, rollout and deployment of trained manpower, when all the activities as defined in Scope of Work as laid down in the RFP have been successfully executed and completed by the SI to the satisfaction of designated authority and the designated authority has indicated its acceptance by signing the Acceptance Certificate.

1.3. "**Acceptance Certificate**" - means that document issued by the designated authority signifying Acceptance of a hardware, software, solution, or any other deliverable pursuant to the successful completion of the acceptance test of the System.

1.4. **"Applicable Law(s)":** Any statute, law, ordinance, notification, rule, regulation,judgment, order, decree, bye-law, approval, directive, guideline, policy, requirement or other governmental restriction or any similar form of decision applicable to the relevant party and as may be in effect on the date of the execution of this Agreement and during the subsistence thereof, applicable to the Project.

1.5. **"Bidder"** shall mean organization/ consortium submitting the proposal in responseto this RFP.

1.6. **"SI**" or "**Lead Bidder**" means the bidder including the consortium who is selected by the designated authority at the end of this RFP process and shall be deemed to include the SI's successors, representatives (approved by the designated authority), heirs, executors, administrators and permitted assigns, as the case may be, unless excluded by the terms of the contract. The word SI when used in the pre-award period shall be synonymous with parties bidding against this RFP.

1.7. '**Confidential Information**' means all information including any information (whether in written, oral, electronic or other format) which relates to the technical, financial and business affairs, dealers, suppliers, products, developments, operations, processes, data, trade secrets, design rights, know-how, plans, budgets and personnel of designated authority which is disclosed to or otherwise learned by SI in the course of or in connection with the Contract but does not include information which is available lawfully in the public domain

1.8. "**Contract**" or the "**Agreement**" means the Contract this agreement and all documents forming part of this agreement as mentioned herein

1.9. **"Contract Value"** means _____, the amount quoted by the SI in its Financial bid. If the Contract Value is increased due to change request, increase in tax rates/tax laws etc. in accordance with the terms of this Agreement, then the Authority shall have the right to seek additional Performance Guarantee to such increased extent of Contract Value and the penalties/liquidated damages etc. getting affected by such increase would be calculated based on such increase from the effective date of such increase in the Contract Value. For purpose of this clause, the Contract Value shall be deemed to increase on every 20% increase in original Contract Value (quoted by the SI in its Financial bid).

1.10. **"Commercial Off-The-Shelf (COTS)"** refers to software products that are ready-made and available for sale, lease, or license to the general public.

1.11. **"Document**" means any embodiment of any text or image however recorded andincludes any data, text, images, sound, voice, codes, databases or any other electronic documents as per IT Act 2000.

1.12. **"Effective Date"** means the date on which this Contract is signed or LoI is issuedby designated authority. If this Contract is executed in parts, then the date on which the last of such Contracts is executed shall be construed to be the Effective Date.

1.13. **"Goods"** means all of the equipment, sub-systems, hardware, software, products accessories, software and/or other material / items includes their user manuals, technical manuals, operating manuals, service mechanisms, policies and guidelines (such as security related, data migration related) and all its modifications which SI is required to supply, install and maintain under the contract.

1.14. **"Integrated Command and Control Center"** means the integrated/centralized operation center to implement holistic and integrated solution for multiple (existing and future) IT initiative for the designated authority. The IT initiative may of any department for example whether it is safe city (CCTV surveillance) and DIAL 100 of police department, DIAL 108 of health department or network of Municipal Corporation. The end objective of establishing ICCC is to drive the actions by designated authority on behalf of all the departments for city operations.

1.15. **"Delivery of Goods"**- shall be deemed to have completed when the delivery of all the Goods under the proposed bill of material has reached the respective designated sites or locations wherein the delivery, installation, integration, management and maintenance services as specified under the Scope of Work are to be carried out for the purpose of this RFP / Contract and has been duly acknowledged by the designated authority's representative.

1.16. **"Intellectual Property Rights"** means any patent, copyright, trademark, tradename, service marks, brands, proprietary information whether arising before or after the execution of this Contract and the right to ownership and registration of these rights.

1.17. **"BSCDCL"** means the Bhopal Smart City Development Corporation Ltd.

1.18. '**BSCDCL's Representative / Project Coordinator**' means the person or the persons appointed by the designated authority from time to time to act on its behalf for overall coordination, supervision and project management.

1.19. "**Scope of Work**" means all Goods and Services, and any other deliverables as required to be provided by the SI under the RFP.

1.20. **"SI's Team"** means SI who along with all of its Consortium Members who have to provide Goods & Services to the designated authority underthe scope of this Contract. This definition shall also include any and/or all of the employees of SI, Consortium Members, authorized service providers/ partners and representatives or other personnel employed or engaged either directly or indirectly by SI for the purposes of this Contract.

1.21. '**Service Level(s)**' means the service level parameters and targets and other performance criteria which will apply to the Services and Deliverables as described in the RFP; 'SLA' or 'Service Level Agreement' means the service level agreement specified in the RFP;

1.22. '**Service Specifications'**means and includes detailed description, statements to technical data, performance characteristics, and standards (Indian as well as International) as applicable and as specified in the RFP and the Contract, as well as those specifications relating to industry standards and codes applicable to the performance of work, work performance quality and specifications affecting the work or any additional specifications required to be produced by the SI to meet the design criteria.

1.23. '**System'** means integrated system/solution emerging out of all the Goods indicated in the Scope of Work and covered under the scope of each Purchase Order issued by the designated authority.

1.24. "**Purchase Order**' means the purchase order(s) issued from time to time by the designated authority to the SI to provide Goods and Services as per the terms and conditions of this Contract.

1.25. "**Consortium**" means _____, _____and _____entering into the Contract with the designated authority and includes their respective successors and assignees.

1.26. "**Replacement Service Provider**" means the organization replacing SI in case of contract termination for any reasons

1.27. "**Sub-Bidder**" shall mean the entity named in the contract for any part of the work or any person to whom any part of the contract has been sublet with the consent in writing of the designated authority and the heirs, legal representatives, successors and assignees of such person.

1.28. **"Services"** means the work to be performed by the agency pursuant to the RFPand to the contract to be signed by the parties in pursuance of any specific assignment awarded by the designated authority. In addition to this, the definition would also include other related / ancillary services that may be required to execute the Scope of Work under the RFP.

1.29. '**Timelines'** means the project milestones for performance of the Scope of Work and delivery of the Services as described in the RFP;

9.2 Interpretation

1.1 In this Contract unless a contrary intention is evident:

a. the clause headings are for convenient reference only and do not form part of this Contract;

b. unless otherwise specified a reference to a clause number is a reference to all of its sub-clauses;

c. the word "include" or "including" shall be deemed to be followed by "without limitation" or "but not limited to" whether or not they are followed by such phrases;

d. unless otherwise specified a reference to a clause, sub-clause or section is a reference to a clause, sub-clause or section of this Contract including any amendments or modifications to the same from time to time;

e. a word in the singular includes the plural and a word in the plural includes the singular;

f. a word importing a gender includes any other gender;

g. a reference to a person includes a partnership and a body corporate;

h. a reference to legislation includes legislation repealing, replacing or amending that legislation;

i. where a word or phrase is given a particular meaning it includes the appropriate grammatical forms of that word or phrase which have corresponding meanings.

9.3 Documents forming part of Agreement

2.1 The following documents shall be deemed to form and be read and constructed as part of the Contract viz.:

(a) The Contract;

(b) The RFP comprising of all volumes and any corrigenda, clarification thereto;

(c) The Proposal of the SI as accepted by the designated authority along with any related documentation.

(d) The designated authority's Letter of Award;

(e) The SI's Acceptance of Letter of Award, if any;

(f) The tripartite agreement to be entered into between ISP, SI and Authority for provision of bandwidth services, if any;

(g) The Corporate Non-disclosure agreement and any other document to be submitted by the SI and appended to this Agreement.

9.4 Ambiguities within Agreement

In case of ambiguities or discrepancies within the Contract, the following principles shall apply:

i. As between the provisions of RFP and any Corrigendum issued thereafter, the provisions of the Corrigendum shall, to that extent only, prevail over the corresponding earlier provision of the RFP;

ii. As between the provisions of the Contract and the RFP and the Proposal, the Contract shall prevail; and

iii. As between any value written in numerals and that in words, the value in words shall prevail.

9.5 Conditions Precedent

The payment obligations of under the Contract shall take effect upon fulfillment of the following conditions precedent by SI.

a) All the members of the Consortium shall have executed a binding Consortium Contract / Agreement copy of which shall have been delivered to the designated authority without the commercials;

b) The designated authority reserves the right to waive any or all of the conditions specified in Clause 5 above in writing and no such waiver shall affect or impair any right, power or remedy that the designated authority may otherwise have.

9.6 Key Performance Measurements

a. Unless specified by the designated authority to the contrary, SI shall deliver the Goods, perform the Services and carry out the Scope of Work in accordance with the terms of the Contract, Scope of Work and the Service Specifications as laid down in the RFP

b. If the Goods and Service Specification includes more than one document, then unless the designated authority specifies to the contrary, the later in time shall prevail over a document of earlier date to the extent of any inconsistency.

c. The SI shall commence the performance of its obligations under the Agreement from Effective Date and shall proceed to provide Goods and carry out the Services with diligence and expedition in accordance with any stipulation as to the time, manner, mode, and method of execution contained in this Agreement. The SI shall be responsible for and shall ensure that all the Goods and Services are performed in accordance with the specifications and that the SI's Team complies with such specifications and all other standards, terms and other stipulations/conditions set out hereunder.

d. The Goods supplied under this Agreement shall conform to the standards mentioned in the technical specifications given in the RFP, and, when no applicable standard is mentioned, to the authoritative standards, such standards shall be the latest issued by the concerned institution. Delivery of Goods shall be made by the SI in accordance with the Agreement and the terms specified by the designated authority. In case if it is found that the Goods provided by SI do not meet one/ more criteria, the SI shall remain liable to provide a replacement for the same which meets all the required specifications and as per choice of SI, at no additional cost to SI.

9.7 Commencement and Progress

a. The SI shall commence the performance of its obligations in a manner as specified in the Scope of Work, Service Level agreements and other provisions of the Contract from the Effective Date.

b. SI shall proceed to carry out the activities / services with diligence and expedition in accordance with any stipulation as to the time, manner, mode, and method of execution contained in this Contract.

c. SI shall be responsible for and shall ensure that all activities / services are performed in accordance with the Contract, Scope of Work and Service Specifications and thatSI's Team

complies with such specifications and all other standards, terms and other stipulations/conditions set out hereunder.

d. SI shall perform the activities / services and carry out its obligations under the Contract with due diligence, efficiency and economy, in accordance with generally accepted techniques and practices used in the industry and shall observe sound management, engineering and security practices. It shall employ appropriate advanced technology and engineering practices and safe effective equipment, machinery, material and methods.SI shall always act, in respect of any matter relating to this Contract, as faithful advisors to the designated authority and shall, at all times, support and safeguard the designated authority's legitimate interests in any dealings with Third parties.
e. The Goods supplied under this Agreement shall confirm to the Standards mentioned in the technical specifications given in the RFP, and, when no applicable standard is mentioned, to the authoritative standards, such standard shall be the latest issued by the SI to be proposed and approved by the designated authority in accordance with the Agreement and the terms specified by the designated authority in the Purchase Order.

9.8 Constitution of Consortium

a. For the purposes of fulfillment of its obligations as laid down under the Contract, where the designated authority deems fit and unless the contract requires otherwise, Prime Bidder shall be the sole point of interface for the designated authority and would be absolutely accountable for the performance of its own, the other member of Consortium and/or its Team's functions and obligations.
b. The Consortium member has agreed that SI is the prime point of contact between the Consortium member and the designated authority and it shall be primarily responsible for the discharge and administration of all the obligations contained herein and, the designated authority, unless it deems necessary shall deal only with SI.SI along with all consortium members shall be jointly and solely responsible for the Project execution
c. Without prejudice to the obligation of the Consortium member to adhere to and comply with the terms of this Contract, each Consortium member, shall, in addition to a binding Consortium Agreement, has executed and submitted a Power of Attorney in favour of SI authorizing him to act for and on behalf of such member of the Consortium and do all acts as may be necessary for fulfillment of contractual obligations.
d. The SI and each of the Consortium Members shall be bound by all undertakings and representations made by their authorized representative and any covenants stipulated hereunder with respect to the Contract, for and their behalf.
e. SI shall submit the Consortium Agreement to be entered into between SI, _____ and _____ for the designated authority's review without commercials. SI shall not, except with the prior approval of the designated authority, have any provision in the consortium agreement or make any amendments to the said consortium agreement which affects the rights and/or obligations of SI, OEM-ES and/or _____ under this Agreement or any amendment which is contrary to the provisions of this Agreement.
f. A notice of at least 3 months in advance is required to be given by the SI to the designated authority if during the Term of the Contract the SI desires to terminate any contract/arrangement relating to the performance of Services hereunder with any member of the Consortium. Where, during the Term of the Contract, SI terminates any

contract/arrangement or agreement relating to the performance of Services with any consortium member (subject to approval of the designated authority), SI shall be liable for any consequences resulting from such termination. SI shall in such case ensure the smooth continuation of Services by providing a suitable replacement to the satisfaction of the designated authority at no additional charge and at the earliest opportunity.

9.9 SI's Obligations

a. The obligations of the SI described in this clause is in addition to, and not in derogation of, the obligations mentioned in the RFP and the two are to be read harmoniously. SI's obligations shall include all the activities as specified by the designated authority in the Scope of Work and other sections of the RFP and Contract and changes thereof to enable designated authority to meet the objectives and operational requirements.
b. The SI shall also be the sole point of contact for all matters relating to the RFP and Contract thereof.
c. It shall be SI's responsibility to ensure the proper and successful implementation, performance and continued operation of the proposed solution in accordance with and in strict adherence to the terms of his the RFP and the Contract.
d. In addition to the aforementioned, SI shall provide services to manage and maintain the said system and infrastructure as mentioned in the RFP.
e. The designated authority reserves the right to interview the personnel proposed by the SI that shall be deployed as part of the project team. If found unsuitable, the designated authority may reject the deployment of the personnel. But ultimate responsibility of the project implementation shall lie with SI.
f. The designated authority reserves the right to require changes in personnel which shall be communicated to SI. SI with the prior approval of the designated authority may make additions to the project team. SI shall provide the designated authority with the resume of Key Personnel and provide such other information as the designated authority may reasonably require. The designated authority also reserves the right to interview the personnel and reject, if found unsuitable. In case of change in its team members, for any reason whatsoever, SI shall also ensure that the exiting members are replaced with at least equally qualified and professionally competent members.
g. SI shall ensure that none of the Key Personnel and manpower exit from the project during first 6 months of the beginning of the project. In such cases of exit, replacement has to be approved by the designated authority.
h. SI should submit profiles of only those resources who shall be deployed on the Project. Any change of resource should be approved by the designated authority and compensated with equivalent or better resource. The designated authority may interview the resources suggested by SI before their deployment on board. It does not apply in case of change requested by the designated authority.
i. In case of change in its team members, SI shall ensure a reasonable amount of time overlap in activities to ensure proper knowledge transfer and handover / takeover of documents and other relevant materials between the outgoing and the new member.
j. SI shall ensure that SI's Team is competent, professional and possesses the requisite qualifications and experience appropriate to the task they are required to perform under this Contract. SI shall ensure that the services are performed through the efforts of SI's Team, in accordance with the terms hereof and to the satisfaction of the designated authority. Nothing in the Contract relieves SI from its liabilities or obligations under the Contract to provide the Services in accordance with the designated authority's directions and requirements and as stated in this Contract and the Bid to the extent

accepted by the designated authority and SI shall be liable for any non-performance, non-compliance, breach or other loss and damage resulting either directly or indirectly by or on account of its Team.

k. SI shall be fully responsible for deployment / installation / development/ laying of network fibre and integration of all the software and hardware components and resolve any problems / issues that may arise due to integration of components.

l. SI shall ensure that the OEMs supply equipment/ components including associatedaccessories and software required and shall support SI in the installation, commissioning, integration and maintenance of these components during the entire period of contract. SI shall ensure that the COTS OEMs supply the software applications and shall support SI in the installation / deployment, integration, roll-out and maintenance of these applications during the entire period of contract. It must clearly be understood by SI that warranty and CMC of the system, products and services incorporated as part of system would commence from the day of Go-Live of system as a complete Smart city solutions including all the solutions proposed. SI would be required to explicitly display that he/ they have a back to back arrangement for provisioning of warranty/ CMC support till the end of contract period with the relevant OEMs. The annual maintenance support shall include patches and updates the software, hardware components and other devices.

m. All the OEMs that Bidder proposes should have Dealer possession licenses.

n. The designated authority reserves the right to review the terms of the Warranty and AnnualMaintenance agreements entered into between SI and OEMs.

o. Shall ensure that none of the components and sub-components is declared end-of-sale or end-of-support by the respective OEM at the time of submission of bid. If the OEM declares any of the products/ solutions end-of-sale subsequently, the SI shall ensure that the same is supported by the respective OEM for contract period.

p. If a product is de-supported by the OEM for any reason whatsoever, from the date of Acceptance of the System till the end of contract, SI should replace the products/ solutions with an alternate that is acceptable to the designated authority at no additional cost to the designated authority and without causing any performance degradation.

q. Further, the SI shall be obliged to ensure that all approvals, registrations, licenses, permits and rights which are, inter-alia, necessary for use of the Deliverables, goods, services, applications, services etc. provided by the SI / Consortium / SI's subBidders under the Contract shall be acquired in the name of the designated authority and SI shall have the non-exclusive, limited right to use such licenses till the Term on behalf of the designated authority solely for the purpose of execution of any of its obligations under the terms of the Contract. However, subsequent to the Term of this Contract, such approvals etc. shall endure to the exclusive benefit of the designated authority.

r. That the SI shall procure all the necessary permissions and adequate approvals and licenses for **use** of various software and any copyrighted process/product for use of the copyright/process/products that the SI has proposed to supply under the Contract free from all claims, titles, interests and liens thereon;

s. SI shall ensure that the OEMs provide the support and assistance to SI in case ofany problems / issues arising due to integration of components supplied by him with any other **component**(s)/ product(s) under the purview of the overall solution. If the same is not resolved for any reason whatsoever, SI shall replace the required component(s) with an equivalent or better substitute that is acceptable to designated authority without anyadditional cost to the designated authority and without impacting the performance of the solution in any manner whatsoever.

t. SI shall ensure that the OEMs for hardware servers/equipment supply and/or installall type of updates, patches, fixes and/or bug fixes for the firmware or software from time to time at no additional cost to the designated authority.

u. SI shall ensure that the OEMs for hardware servers/ equipment or Bidder's trainedengineers conduct the preventive maintenance on a Quarterly basis and break-fix maintenance in accordance with the best practices followed in the industry.SI shall ensure that the documentation and training services associated with the components shall be provided by the OEM partner or OEM's certified training partner without any additional cost to the designated authority.

v. The training has to be conducted using official OEM course curriculum mapped withthe hardware / **Software** Product's to be implemented in the project.

w. SI and their personnel/representative shall not alter / change / replace any hardware component proprietary to the designated authority and/or under warranty or CMC of third party without prior consent of the designated authority.

x. SI shall provision the required critical spares/ components at the designated Datacenter Sites / office locations of the designated authority for meeting the uptime commitment of the components supplied by him.

y. SI's representative(s) shall have all the powers requisite for the execution of Scope of Work and performance of services under the Contract. SI's representative(s) shall liaise with the designated authority's Representative for the proper coordination and timely completion of the works and on any other matters pertaining to the works. SI shall extend full co-operation to designated authority's Representative in the manner required by them for supervision/ inspection/ observation of the equipment/ goods/ material, procedures, performance, progress, reports and records pertaining to the works. He shall also have complete charge of SI's personnel engaged in the performance of the works and to ensure compliance of rules, regulations and safety practice. He shall also cooperate with the other Service Providers/Vendors of the designated authority working at the designated authority's office locations & field locations and DC sites. Such Bidder's representative(s) shall be available to the designated authority Representatives at respective Datacenter during the execution of works.

z. SI shall be responsible on an ongoing basis for coordination with other vendors and agencies of the designated authority and its nominated agency in order to resolve issues and oversee implementation of the same. SI shall also be responsible for resolving conflicts between vendors in case of borderline integration issues.

9.10 Access to Sites

a. Access will be provided to different sites only after approval of their respective authorities and as per access policy.

b. The designated authority's Representative upon receipt of request from SI intimating commencement of activities at various locations shall give to SI access to as much of the Sites, on a non-permanent basis, as may be necessary to enable SI to commence and proceed with the installation of the works in accordance with the program of work subject to compliance by the SI with any safety and security guidelines which may be provided by the designated authority and notified to the SI in writing. Any reasonable proposal of SI for access to Site to proceed with the installation of work in accordance with the program of work shall be considered for approval and shall not be unreasonably withheld by the designated authority. Such requests shall be made to the designated authority's Representative in writing at least 7 days prior to start of the work.

c. At the site locations, the designated authority's Representative shall give to SI access to as much as may be necessary to enable SI to commence and proceed with the installation of the works in accordance with the program of work or for performance of Facilities Management Services.

d. Access to locations, office equipment and services shall be made available to the SI on an "as is, where is" basis by the designated authority as the case may be or its nominated agencies. The SI agrees to ensure that its employees, agents and Bidders/Sub-Bidders shall not use the location, services and equipment referred to in the RFP for the following purposes:

i. For the transmission of any material which is defamatory, offensive or abusive or of an obscene or menacing character; or

ii. In a manner which constitutes violation of any law or a violation or infringement of the rights of any person, firm or company (including but not limited to rights of copyright or confidentiality); or

iii. For their own purpose or for conducting their own business or for providing services to any third party.

9.11 Start of Installation

a. Bidder shall co-ordinate with the designated authority and stakeholders for the complete setup of sites before commencement of installation. SI shall also co-ordinate regarding Network / Bandwidth connectivity in order to prepare the installation plan and detailed design / architectural design documents.

b. The plan and design documents thus developed shall be submitted by SI for written approval by the designated authority.

c. After obtaining the approval from the designated authority, SI shall commence the installation.

9.12 Reporting Progress

a. SI shall monitor progress of all the activities related to the execution of the Contract and shall submit to the designated authority, progress reports with reference to all related work, milestones and their progress during the contract period.

b. SI once in every 15 days during the implementation phase to discuss the progress of implementation. After the implementation phase is over, the meeting shall be held as an ongoing basis, as desired by designated authority, to discuss the performance of the contract.

c. SI shall ensure that the respective solution teams involved in the execution of work are part of such meetings.

d. Several review committees involving representative of the designated authority and senior officials of SI shall be formed for the purpose of this project. These committees shall meet at intervals, as decided by the designated authority later, to oversee the progress of the implementation.

e. All the Goods, Services and manpower to be provided / deployed by SI under the Contract and the manner and speed of execution and maintenance of the work and services are to be conducted in a manner to the satisfaction of designated authority's Representative in accordance with the Contract.

f. Should the rate of progress of the works or any part of them at any time fall behind the stipulated time for completion or is found to be too slow to ensure completion of the works by the stipulated time, or is in deviation to Tender requirements/ standards, the BSCDCL designated authority's Representative shall so notify SI in writing.

g. SI shall reply to the written notice giving details of the measures it proposes to take to expedite the progress so as to complete the works by the prescribed time or to ensure compliance to RFP requirements. SI shall not be entitled to any additional payment for taking such steps. If at any time it should appear to the designated authority or designated authority's Representative that the actual progress of work does not conform to the approved plan SI shall produce at the request of the designated authority's Representative a revised plan showing the modification to the approved plan necessary to ensure completion of the works within the time for completion or steps initiated to ensure compliance to the stipulated requirements

h. The submission seeking approval by the designated authority or designated authority's Representative of such plan shall not relieve SI of any of his duties or responsibilities under the Contract.

i. In case during execution of works, the progress falls behind schedule or does not meet the Tender requirements, SI shall deploy extra manpower/ resources to make up the progress or to meet the RFP requirements. Plan for deployment of extra man power/ resources shall be submitted to the designated authority for its review and approval. All time and cost effect in this respect shall be borne, by SI within the Contract Value.

j. The designated authority reserves the right to inspect and monitor/ assess the progress/ performance of the work / services at any time during the course of the Contract, after providing due notice to the SI. The designated authority may demand and upon such demand being made, SI shall provide documents, data, material or any other information pertaining to the Project which the designated authority may require, to enable it to assess the progress/ performance of the work / service under the Contract.

k. At any time during the course of the Contract, the designated authority shall also have the right to conduct, either itself or through another agency as it may deem fit, an audit to monitor the performance by SI of its obligations/ functions in accordance with the standards committed to or required by the designated authority and SI undertakes to cooperate with and provide to the designated authority/ any other agency appointed by the designated authority, all documents and other details as may be required by them for this purpose. Such audit shall not include Bidder's books of accounts. Any deviations or contravention, identified as a result of such audit/assessment, would need to be rectified by the SI failing which the designated authority may, without prejudice to any other rights that it may have issue a notice of default. Cost of acquisition of deliverables by the SI and other Sub-Bidders is out of the purview of audit/inspections.

l. Without prejudice to the foregoing, the SI shall allow access to the designated authority or its nominated agencies to all information which is in the possession or control of the SI and which relates to the provision of the Services/Deliverables as set out in the Audit, Access and Reporting Schedule and which is reasonably required by the designated authority to comply with the terms of the Audit, Access and Reporting provision set out in this Contract.

m. Knowledge of Network Operations Center (NOC), Server Room, Command and Control Center, City Operation Center and areas of city kiosk centers

n. SI shall be deemed to have knowledge of the SCADA, Command and Control Center, its surroundings and information available in connection therewith and to have satisfied itself the form and nature thereof including, the data contained in the Bidding Documents, the physical and climatic conditions, the quantities and nature of the works and materials necessary for the completion of the works, the means of access, etc. and in general to have obtained itself all necessary information of all risks, contingencies and circumstances affecting his obligations and responsibilities therewith under the Contract and his ability to perform it. However, if

during pre-installation survey / during delivery or installation, SI detects physical conditions and/or obstructions affecting the work, SI shall take all measures to overcome them.

9.13 Project Plan

a. Within 15 calendar days of Effective Date of the contract/ Issuance of LoI, SI shall submit to the designated authority for its approval a detailed Project Plan with details of the project showing the sequence, procedure and method in which it proposes to carry out the works. The Plan so submitted by SI shall conform to the requirements and timelines specified in the Contract. The designated authority and SI shall discuss and agree upon the work procedures to be followed for effective execution of the works, which SI intends to deploy and shall be clearly specified. The Project Plan shall include but not limited to project organization, communication structure, proposed staffing, roles and responsibilities, processes and tool sets to be used for quality assurance, security and confidentiality practices in accordance with industry best practices, project plan and delivery schedule in accordance with the Contract. Approval by the designated authority's Representative of the Project Plan shall not relieve SI of any of his duties or responsibilities under the Contract.
b. If SI's work plans necessitate a disruption/ shutdown in designated authority's operation, the plan shall be mutually discussed and developed so as to keep such disruption/shutdown to the barest unavoidable minimum. Any time and cost arising due to failure of SI to develop/adhere such a work plan shall be to his account.

9.14 Compliance with Applicable Law

a. SI's Team shall comply with the provision of all laws including labour laws, rules, regulations and notifications issued there under from time to time. All safety and labour laws enforced by statutory agencies and by the designated authority shall be applicable in the performance of the Contract and Bidder's Team shall abide by these laws. The SI shall take all measures necessary or proper to protect the personnel, work and facilities and shall observe all reasonable safety rules and instructions.
b. Access to the Data centers of other IT systems (DIAL 100, CM Helpline, safe city etc.) and its Server Room shall be strictly restricted. No access to any person except the essential members of SI's Team who are authorized by the designated authority and are genuinely required for execution of work or for carrying out management/ maintenance shall be allowed entry. Even if allowed, access shall be restricted to the pertaining equipment of the designated authority only. SI shall maintain a log of all activities carried out by each of its team personnel.
c. All such access should be logged in a loss free manner for permanent record with unique biometric identification of the staff to avoid misrepresentations or mistakes
d. Each Party to the Contract accepts that its individual conduct shall (to the extent applicable to its business like the SI as an Information Technology service provider) at all times comply with all laws, rules and regulations of government and other bodies having jurisdiction over the area in which the Services are undertaken provided that changes in such laws, rules and regulations which result in a change to the Services shall be dealt with in accordance with the Change Management and Control set out in the RFP.
e. SI shall take all measures necessary or proper to protect the personnel, work and facilities and shall observe all reasonable safety rules and instructions. SI's Team shall adhere to all security

requirement/ regulations of the designated authority during the execution of the work. Designated authority's employee also shall comply with safety procedures/ policy.

f. SI shall report as soon as possible any evidence, which may indicate or is likely to lead to an abnormal or dangerous situation and shall take all necessary emergency control steps to avoid such abnormal situations.

9.15 Statutory Requirements

a) During the tenure of the Contract the SI shall comply with all Applicable Laws and shall obtain and maintain all statutory and other approvals required for the performance of the Services under the Contract and nothing shall be done by SI or his team including Consortium in contravention of any law, act and/ or rules/regulations, there under or any amendment thereof governing inter-alia customs, stowaways, foreign exchange etc. and shall keep designated authority indemnified in this regard.

9.16 Representations and Warranties

a) Representations and warranties of the SI

The SI hereby represents and warrants as of the date hereof, which representations and warranties shall remain in force during the Term and extension thereto, the following:

(i) it is duly organized and validly existing under the laws of India, and has full power and authority to execute and perform its obligations under this Contract and other agreement and to carry out the transactions contemplated hereby;

(ii) it is a competent provider of a variety of Information Technology and business process management services. It has taken all necessary corporate and other actions under laws applicable to its business to authorize the execution and delivery of this Contract and to validly exercise its rights and perform its obligations under this Contract;

(iii) That all conditions precedent under the Contract have been satisfied;

(iv) That the selected SI along with its consortium members have the power and the authority that would be required to enter into this Contract and the requisite experience, the technical know-how and the financial wherewithal required to successfully execute the terms of this Contract and to provide services sought by the designated authority under this Contract;

(v) That the SI and its team has the professional skills, personnel, infrastructure and resources/ authorizations that are necessary for providing all such services as are necessary to fulfil the scope of work stipulated in the tender and this Contract;

(vi) That the SI shall ensure that all assets/ components including but not limited to equipment, software, licenses, processes, documents, etc. installed, developed, procured, deployed and created during the term of this Contract are duly maintained and suitably updated, upgraded, replaced with regard to contemporary requirements;

(vii) The SI/ SI's team shall use such assets of the designated authority, as the designated authority may permit for the sole purpose of execution of its obligations under the terms of the Bid, Tender or this Contract. The SI shall however, have no claim to any right, title, lien or other interest in such property, and any possession of property for any duration whatsoever shall not create any right in equity or otherwise, merely by fact of such use or possession during or after the term thereof;

(viii) it has the financial standing and capacity to undertake the Project and obligations in accordance with the terms of this Contract;

(ix) in providing the Services, it shall spare no effort to prevent any disruption to designated authority's normal business operations;

(x) this Contract has been duly executed by it and constitutes a legal, valid and binding obligation, enforceable against it in accordance with the terms hereof, and its obligations under this Contract shall be legally valid, binding and enforceable against it in accordance with the terms hereof;

(xi) the information furnished in the Proposal is to the best of its knowledge and belief, true and accurate in all respects as at the date of this Contract;

(xii) the execution, delivery and performance of this Contract shall not conflict with, result in the breach of, constitute a default by any of the terms of its Memorandum and Articles of Association or any Applicable Laws or any covenant, contract, Contract, arrangement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;

(xiii) there are no material actions, suits, proceedings, or investigations pending or, to its knowledge, threatened against it at law or in equity before any court or before any other judicial, quasi-judicial or other authority, the outcome of which may result in the breach of this Contract or which individually or in the aggregate may result in any material impairment of its ability to perform any of its material obligations under this Contract;

(xiv) it has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any court or any legally binding order of any Government Instrumentality which may result in any adverse effect on its ability to perform its obligations under this Contract and no fact or circumstance exists which may give rise to such proceedings that would adversely affect the performance of its obligations under this Contract;

(xv) it has complied with Applicable Laws in all material respects and has not been subject to any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have an Adverse Effect on its ability to perform its obligations under this Contract;

(xvi) no representation or warranty by it contained herein or in any other document furnished by it to the designated authority or its nominated agencies in relation to the any consents contains or shall contain any untrue or misleading statement of material fact or omits or shall omit to state a material fact necessary to make such representation or warranty not misleading;

(xvii) no sums, in cash or kind, have been paid or shall be paid, by it or on its behalf, to any person by way of fees, commission or otherwise for entering into this Contract or for influencing or attempting to influence any officer or employee of the designated authority or its nominated agencies in connection therewith;

(xviii) That the SI shall procure all the necessary permissions and adequate approvals and licenses for use of various software and any copyrighted process/product for use of the copyright/process/products that the SI has proposed to supply under this Contract free from all claims, titles, interests and liens thereon;

(xix) That the sub-Bidder proposed and/or deployed by the SI meets the technical and financial qualifications prescribed in the RFP; and

(xx) That the representations made by the SI in its Proposal and in this Contract are and shall continue to remain true and fulfil all the requirements as are necessary for executing the obligations and responsibilities as laid down in the Contract and the RFP and unless the designated authority specifies to the contrary, the SI shall be bound by all the terms of the Contract;

(xxi) That the SI certifies that all registrations, recordings, filings and notarizations of the Contract and all payments of any tax or duty, including but not limited to stamp duty, registration charges or similar amounts which are required to be effected or made by the SI which is necessary to ensure the legality, validity, enforceability or admissibility in evidence of the Contract have been made;

(xxii) That the SI confirms that there has not and shall not occur any execution, amendment or modification of this contract without the prior written consent of the designated authority;

(xxiii) That the SI owns or has good, legal or beneficial title, or other interest in, to the property, assets and revenues of the SI on which it grants or purports to grant or create any interest pursuant to-the Contract, in each case free and clear-of any-encumbrance and further confirms that such Interests created or expressed to be created are valid and enforceable;

(xxiv) That the SI-owns, has license to use or otherwise has the right to use, free of any pending or threatened liens or other security or other interests all Intellectual Property Rights, which are

required or desirable for the project. In case of any infringement, designated authority is not responsible. Action will be taken as per the clauses defined in this RFP.

(xxv) That the SI shall provide adequate and appropriate support and participation, on a continuing basis, in tuning/ upgrading all supplied hardware and software to meet the requirements of the applications;

b) **Representations and warranties of the** designated authority

The designated authority represents and warrants to the SI that:

i. it has full power and authority to execute, deliver and perform its obligations under this Contract and to carry out the transactions contemplated herein and that it has taken all actions necessary to execute this Contract, exercise its rights and perform its obligations, under this Contract and carry out the transactions contemplated hereby;

ii. it has taken all necessary actions under Applicable Laws to authorize the execution, delivery and performance of this Contract and to validly exercise its rights and perform its obligations under this Contract;

iii. it has the financial standing and capacity to perform its obligations under the Contract;

iv. this Contract has been duly executed by it and constitutes a legal, valid and binding obligation enforceable against it in accordance with the terms hereof and its obligations under this Contract shall be legally valid, binding and enforceable against it in accordance with the terms thereof;

v. the execution, delivery and performance of this Contract shall not conflict with, result in the breach of, constitute a default under any of the Applicable Laws or any covenant, contract, Contract, arrangement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;

vi. it has complied with Applicable Laws in all material respects.

9.17 Obligations of the designated authority

a. The obligations of the designated authority described in this clause is in addition to, and not in derogation of, the obligations mentioned in the RFP are to be read harmoniously. Without prejudice to any other undertakings or obligations of the designated authority under the Contract or the RFP, the designated authority shall perform the following:

b. The designated authority or his/her nominated representative shall act as the nodal point for implementation of the contract and for issuing necessary instructions, approvals, commissioning, Acceptance Certificate(s), payments etc. to SI.

c. The designated authority shall ensure that timely approval is provided to SI as and when required, which may include approval of project plans, implementation methodology, design documents, specifications, or any other document necessary in fulfillment of the contract.

d. The designated authority's Representative shall interface with SI, to provide the required information, clarifications, and to resolve any issues as may arise during the execution of the Contract. Designated authority shall provide adequate cooperation in providing details, coordinating and obtaining of approvals from various governmental agencies, in cases, where the intervention of the designated authority is proper and necessary.

e. The designated authority may provide on Bidder's request, particulars/ information/ or documentation that may be required by SI for proper planning and execution of work and for providing Goods and Services covered under the contract and for which SI may have to coordinate with respective vendors.
f. The designated authority shall provide to SI only sitting space and basic infrastructure not including, stationery and other consumables at the designated authority's office locations.
g. The designated authority reserves the right to procure the hardware including devices on quarterly basis in first year based on actual deployment and CMC shall be applicable whenever the devices are procured and deployed till end of the contract.
h. **Site Not Ready**: The designated authority hereby agrees to make the project sites ready as perthe agreed specifications, within the agreed timelines. The designated authority agrees that SI shall not be in any manner liable for any delay arising out of designated authority's failure to make the site ready within the stipulated period.

10 Section X: Specifications

The following Specifications are indicative and the bidder has to adhere to any changes made by BSCDCL during the project execution and maintenance phase.

10.1 General Specifications.

This specification defines the minimum requirements of system design including hardware & software, configuration, manufacture, engineering, programming, inspection and testing, documentation, installation, commissioning and shipping of Programmable Logic Controller (PLC). This shall include at the minimum

- Manufacture, procure, supply, testing, installation, handling and commissioning of all equipment and accessories.
- The bidder should propose for wired and wireless network both, in the complete system, to ensure a robust IT connectivity.
- Building of all Operator interface, screen displays, database and reports.
- System Hardware & Software configuration.
- FAT of all hardware / software and system integration testing under simulated conditions at vendor's works.
- Supply, install, test and commission system cabinets and consoles / printers. Including cables, terminals, IS barriers and power supplies
- Supply of all system as well as control room furniture as per ergonomic and Owner requirements.
- Proving of PLC system functionality as per requirements
- Training of Owner's personnel at factory and at site on functional, operational and maintenance aspects of the system.
- Supply of complete technical and as built documentation in electronic form as well as hardcopy.
- Supply of all software on CDs along with required software licenses.
- The related standards referred to herein and mentioned below shall be of the latest editions at the time of purchaser's enquiry.
- The detailed scope of work, specific job requirements, exclusions, deviations, additions etc. shall be indicated in the material requisition and job specification.
- Where any conflict exists between this specification and other job specification, the purchaser shall be consulted. Vendor shall not deviate from this specification without prior approval from the purchaser.

10.2 STANDARD SPECIFICATIONS:

Following references shall be applicable where-ever required:

LIST OF STANDARD CODES

IS: 376	Safety Code for Excavation Work
IS:5531	Specifications for Cast Iron Specials for Asbestos Cement Pressure Pipes for Water, Gas and Sewage
IS: 8794	CI detachable joints for use with Asbestos Cement pressure pipes
IS:5382	Rubber sealing Rings for Gas mains, Water mains and Sewers
IS:10292	Dimensional Requirements for Rubber Rings
IS:5913	Asbestos Cement Products :- Method of Tests
IS:7639	Methods of sampling AC Products
IS: 1536	Specification for Centrifugally Cast (Spun) Iron Pressure Pipes for Water, Gas and Sewage
IS: 1538	Specification for Cast Iron Fittings for Pressure Pipes for Water, Gas and Sewage
IS: 11606	Methods for Sampling of Cast Iron Pipes and Fittings
IS : 630	Rubber Insertion Sheet for flanged joints
IS: 3114	Code of Practice for Laying of CI Pipes
IS : 1363	Nut, Bolts for joints
IS: 10500	Drinking water specification
IS: 3400	Methods of test for vulcanised rubber (part-1 to 22)

IS: 1387	General requirements for the supply of metallurgical material
IS: 1367	Technical supply conditions for threaded steel fasteners
IS: 14846	Sluice valve for water works purposes 50 to 1200 mm size
IS: 7181	Horizontally cast iron double flanged pipes for water, gas and sewage.
IS: 5382	Rubber sealing rings for gas mains, water mains and sewers
IS: 9862	Ready mixed paint, brushing, bituminous, black, lead free, acid, alkali, water and chlorine resisting
IS: 1239	Mild steel tubes, tubular and other wrought steel fittings
IS: 9523	Specification for DI fittings for pressure pipes for water, gas, and sewage.
BS: 4772	Specification for DI fittings
IS: 8329	Centrifugally cast (spun) ductile iron pressure pipes for water, gas and sewage.
ISO 2531	Specifications for Ductile Iron Pipe
IS: 12288	Code of practice for use and laying of ductile iron pipes
IS: 4984	High Density Polyethylene pipes for water supply
IS 2530	Methods of test for polyethylene moulding materials and polyethylene compounds GRP pipes, joints, and fittings for use for Potable Water Supply
IS 5382	Rubber Sealing rings for gas mains, water mains and sewers
IS 4905	Methods for random sampling

IS 7328	High Density Polyethylene materials for moulding and extrusions
IS 7634	Laying and Jointing of Polyethylene (PE) pipes
ISO 4427	Polyethylene Pipes for water supply-specifications
IS: 12820	Dimensional requirements for rubber gaskets for mechanical joints and push on joint for use with cast iron pies and fittings for carrying water, gas and sewage
IS:2692	Specifications for ferrule for water services
ISO:2531	Ductile iron pipes, fittings, accessories and their joints for water or gas applications.
ISO:8179-1-2004	Ductile iron pipes, fittings, accessories and their joints for water or gas applications
ISO:8179-2-1995	Ductile iron pipes – External zinc coating – Part 2: Zinc rich paint with finishing layer
ISO:4179	Ductile iron pipes and fittings for pressure and non-pressure pipelines -- Cement mortar lining
ISO:4633:2002	Rubber seals -- Joint rings for water supply, drainage and sewerage pipelines -- Specification for materials
IS-1239/ 2004	For GI Pipes & Fittings
IS-456/ 2000	For R.C.C. Works
IS-5389/ 2001	For MS pipes
IS-1786/ 1985	For High Tensile Steel Bars

CPHEEO	Manual on Water Supply and Treatment, III edition, Ministry of Urban Development, New Delhi- May 1999
Code of **Building works**	Relevant code and Standard Manual of Building works as per BIS will be applicable for standard practice, sequence of execution and specifications.

Make and specifications of materials to be used in building works should be as per standard practice/ specifications and relevant BIS standard with marking of IS code, where-ever applicable.

The bidder may propose at no extra cost to the Project Manager, the use of any relevant authoritative internationally recognized Reference Standard, including Indian Standard.

All details, materials and equipment supplied and workmanship performed shall comply with these standards. If bidder offers equipment to other standards, the equipment/material should be equal or superior to those specified and full details of the difference shall be supplied.

10.3 Hardware Specifications

This specification together with the attachments covers the design, engineering, supply, factory inspection and testing, field testing and calibration, installation and commissioning of instrumentation and control systems for its successful operation. Bidder shall be fully responsible for design, material selection, sizing and proper selection of a instruments and systems being supplied by them. Any approval or comment on any document or guideline issued to Bidder before or after placement of contract or during execution of the contract shall not absolve the Bidder of their contractual obligations and responsibility with regards to completeness, proper selection, satisfactory operation and easy maintenance of the unit.

Note: - *The equipments specified below should ensure both wired and wireless connectivity.*

10.3.1 Programmable LogicController/Remote Terminal Units

The PLC / RTU shall form a very critical component in the entire system.

The PLC / RTU shall be a fully modular i.e. the PLC / RTU must comprise of separate modules for

a. Power Supply Module
b. CPU with Memory and Communication Ports Module
c. Digital Inputs Module
d. Digital Outputs Module
e. Analog Inputs Module
f. Analog Outputs Module
g. Communication Ports Module

The I/Os of the offered PLC / RTU shall be hot swappable.
All the components of the PLC / RTU shall be provided with **"conformal coating"/G3** (ANSI/ISA S71.04 standard)by the manufacturer. The conformal coating certificate from the manufacturer shall be provided by the contractor with mention of each part no. of the PLC / RTU supplied for the project.

Each PLC / RTU shall be accompanied by

a. Individual PLC / RTU Programming Software (licensed copy from manufacturer).
b. Individual PLC / RTU Programming Cable

The manufacturer along with the PLC / RTU shall provide the License Nos. of the Programming Software
for the entire project. The license shall be in the name of the customer or as directed by the Engineer In Charge.

The minimum acceptable specifications for the components or sub systems for PLC/RTU are provided below. The bidder is needed to provide detailed compliance statements for all
Components from the OEM/s.

1. **PLC / RTU Power Supply**

Power Supply	11-30VDC/ 24VAC
Input Voltage Range	85-260VAC
Supply Frequency	40-65 Hz, +/- 6%
Power Consumption	20VA nominal
Inrush Current	8Amps for 10ms typical at 220V
Output Voltage	5-24 V dc, 3 Amps
Allowable Instantaneous Power Failure	Operation should continue upon occurrence of instantaneous power failure for time duration of 10ms or less
Protections	0.8 Amps miniature fuse protection for incoming mains
	MOV protection for input overvoltage
	Output Short Circuit Protection
Noise Immunity	Conform to EMC requirements of EN61131-2(2003) ,EN61000-6-2 or equivalent

2. **PLC / RTU CPU**

CPU	16/32 Bit Microcontroller
Maximum Program Scan Time	250ms default, modifiable up to 1 second
Application Memory with ECC and memory size will be as per manufacturing standards	
Application Program Security	Password protection support for a. Project file/ POU read or write, Source code upload

Operating Modes	RUN, STOP, Single cycle etc
Diagnostic LEDs	Power, Run, CPU Error, I/O Error, Memory Error, Low Battery
Communication Ports	Min. 4Nos. Serial ports supporting open protocols
Programming	Standard – IEC 61131-3, Software – Windows based , Languages- IL, LD, FBD, SFC, ST
Noise Immunity – As per IEC 61000-4-4	+/- 2KV conductive noise for power, +/- 1 KV capacitive noise for serial ports

3. PLC / RTU Digital Inputs

Nominal Inputs	16/32
Voltage Rating	24V dc (18-30V dc including ripple)
Input Type	Sink/ Source in a group
Groups	4 groups of 4/2 Groups of 8/4 Groups of 8
Indication for Input	Green LED for individual Input
ON Voltage	18V dc
OFF Voltage	5Vdc maximum
OFF Current	1mA maximum
Current per input	7mA at 24Vdc
Input Impedance	4.7kOhms
Isolation	1.5kV optical from Internal Bus
Filter time	10ms default and programmable
Pulse Catch Inputs	Minimum pulse width 500*u*secs
Isolation	1.5kV optical from Internal Bus
Filter time	10ms default and programmable
Pulse Catch Inputs	Minimum pulse width 500*u*secs
I/O Points Consumption	16/32 Input Points
Connection	10 pin terminal blocks, push type

4. PLC / RTU Digital Outputs

Nominal Outputs	16 /32
Voltage Rating	24V dc (18-30V dc including ripple)
Current Rating	250mA per Output, 1A max per group (Allowable through extra relays)
Output Type	Source
Output Device	MOSFET
Indication for Input	Red LED for individual output
ON Voltage drop	<= 2V dc
OFF Voltage	<=1.5V dc
OFF Voltage	5Vdc maximum
Response Time	OFF- ON : 0.1ms
	ON- OFF : 0.4ms
Inrush Current	600mA for 700us
Off State Leakage Current	10uA maximum
Protection	Reverse Voltage, Over voltage protection upto 42 Vdc, Output Short Circuit protection, Fast demagnetization for inductive loads
Isolation	1.5kV optical from Internal Bus
External Power Supply	18-30Vdc including ripple, 30mA (for driving output circuit)
I/O Points Consumption	16/32 Output Points
Connection	10 pin terminal blocks, push type

5. PLC / RTU Analog Inputs

4/8/16 Channel, 16 Bit Analog V/I Input Module

No. of Analog Input Channels	04/08/16
Analog Input Interface	Differential, non isolated
ADC type	Sigma Delta ADC
Output Type	Source

Output Data	Input type :	
	+/- 10Vdc	-32000 to +32000
	+/- 5Vdc	-32000 to +32000

	0 to 20mA	0 to +32000
	4 to 20mA	0 to +32000
Resolution	Input type :	
	+/- 10Vdc	15 bits + Sign
	+/- 5Vdc	14 bits + Sign
	0 to 20mA	14 bits
	4 to 20mA	0 to 13.7 bits

Channel Updation Time	5ms if only one channel is enabled, 10 ms if 4 channels are enabled
Accuracy	0.2% of full scale reading at 25 deg.C
	0.4% of full scale reading at 55 deg.C
Isolation	1.5 KV Optical (Channel to internal circuit)
Absolute Maximum Input	Voltage : +/- 30V dc with protection upto 220V ac/dc, Current : +/- 30mA
Input Impedance	Voltage 1 MOhm, Current 250Ohm
Module Supply Requirement	24V dc(18-30Vdc inclusive of ripple), 55mA at 24Vdc
Module Supply Protection	Reverse Polarity Preotection
EMI / EMC Compliance (IEC 61131-2)	+/- 2 KV conductive on module power supply, +/-1 KV on analog input signal
Connection	10 pin terminal blocks, push type

6. HMI (Human Machine Interface) – 7 ” WVGA, TFT Color, Touch Screen Display

Operating Ambient Temperature	0-55 deg. C
Operating Ambient Humidity	10-90% RH , non condensing

Touch Panel

Display Device: TFT Color LCD

Screen Size	7 inch
Resolution	800 x 480 dots

Number of Characters	16-dot standard font : 50chars x 30 lines
Display Color	65536 colors
Backlight	LED with settable screen saving time

Power Supply

Voltage	24Vdc +10%, -15%, ripple voltage <=200mV
Power Consumption	7.6W or less
With Backlight Off	3.8W or less
Allowable Momentary Power Failure Time	Within 5ms
Noise Immunity	Conforms to IEC61000-4-4, 2kV (power supply line)
Insulation Resistance	10MOhmsor higher with insulation resistance tester

10.3.2 Cabinet forPLC/RTU

- All PLC/RTU system cabinets shall be completely wired with all modules in place. Inside cabinet wiring shall preferably be done using pre-fabricatedcables.
- All the cabinets shall be free standing, enclosed type and shall be designed for bottom entry of cables.Cabinetstructureshallbesoundandrigidandshallbeprovidedwithremovableliftinglugs to permit lifting of thecabinets
- Cabinet shall be fabricated from cold rolled steel sheets of minimum 2 mm thickness suitably reinforced to prevent warping and buckling. Doors shall be fabricated from cold rolled steel sheet of minimum 1.6 mm thickness. Cabinets shall be thoroughly deburred and all sharp edges shall be grounded smooth afterfabrication.
- Cabinetfinishshallincludesandblasting,grinding,chemicalcleaning,surfacefinishingbysuitable filterandtwocoatsofhighgradelacquerwithwetsandingbetweentwocoats.Threecoatsofpaint in the cabinet colour shall be given for non-glossy high satin finish. Colour of the cabinets shall be as per jobspecification.
- Each cabinet shall be of suitable size, maximum 2100 mm high (excluding 100 mm channel base). 1200 mm wide and 800 mm deep in general. Construction shall be modular preferably to accommodate 19” standard electric racks. All cabinets shall be preferably of same height however can be changed keeping in mind site conditions and requirements . Maximum swing out for pivoted card racks, doors and drawers shall be limited to 800mm.

- Cabinetsshallbeequippedwithfrontandrearaccessdoors.Doorsshallbeequippedwithlockable handles and concealed hinges with pull pins for easy doorremoval.
- In order to remove dissipated heat effectively from cabinets each cabinet shall be with internal temperature device andcoolingfans.Analarmshallbeloggedontheoperatorconsoleincaseofexcesstemperaturein any of the cabinets or cooling fanfailure.
- IlluminationshallbeprovidedforallcabinetbyLEDlamps,whichshallbeoperatedbydoor / switch.
- Equipment within the cabinet shall be laid out in an accessible and logically segregated manner.
  Cableglandsshallbeprovidedforincomingandoutgoingcablestopreventexcessivestressonthe individual terminals. All metal parts of the cabinet shall be electrically continuous and shall be provided with a common groundinglug.
- Each I/O module shall be provided with separate terminals for individual inputs andoutputs.
- Allintercubicleandinternalsignalwiringshallbedoneusingminimum1.0mm2strandedcopper conductor, and power wiring shall be done using minimum 1.5 mm2 stranded copper conductor. All terminals shall be suitable for minimum 2.5 mm2cables.
- All cabling inside each panel shall follow a common colour coding for cables. The same shall be based on the type ofsignals.

10.3.3 Pressure Transmitter

- Pressure transmitters shall have over range protection up to 1.5 times the maximum line pressure and shall be capable of withstanding full line pressure on any side with the other side vented to atmosphere without damage or effect on the calibration.
- No plastic material shall be used in their construction. Internal parts shall be of stainless steel, bronze or approved corrosion-resistant material.
- Where necessary, a special diaphragm shall be used to segregate the gauge tube from corrosive fluid media.
- In chlorine applications, the diaphragm shall be in silver or tantalum. In sulphur dioxide applications, the diaphragm shall be in tantalum. The minimum diameter for any pressure gauge shall be 150 mm unless specified otherwise or where the gauge forms part of a standard item of equipment.
- Where compensation of more than 2% of the instrument span is needed for the difference in levelbetween the instrument and the tapping point, the reading shall be suitably adjusted and the amount of compensation shall be marked on the dial.
- The zero and span of a pressure transmitter shall not change by more than 0.1% of the span per 0C change in ambient temperature.
- After application for 10 minutes of pressure at 130% of maximum pressure, the change in zero and span shall not exceed 0.1% of the span.
- Pressure transmitters shall have an accuracy typically better than 0.055% of span , depending on the application and shall be protected to BS EN 60529:1992, IP 65 standard or higher.

- For transmitters installed in locations liable to flooding or underwater applications, they shall be to IP 65 standard or better and shall operate up a to maximum submergence of 20 meters of water.
- Pressure transmitters shall provide a 4 to 20mA d.c. output proportional to the pressure range at a maximum load of 550-750 ohms.

10.3.4 Modbus Compatible Energy Meter

The energy consumed by all pumps shall be monitored using MODBUS compatible Energy Meters.

The input voltage and current signals shall be scaled down through resistor network and Current Transformers respectively. The scaled down signals are fed to precision ADC with built in programmable gain Amplifiers.

1. Parameters Measurement

a. Phase to Phase Voltages

b. Phase to Neutral Voltages

c. Phase / Line Currents

d. Line Frequency

e. Phase Wise & Total Power Factor

f. Phase Wise & Total Active Power

g. Phase Wise & Total Reactive Power

h. Phase Wise & Total Apparent Power

i. Active, Reactive & Apparent Energy

2. Response Time : Less than 500ms
3. Accuracy Class : +/- .5% of span
4. Operating Temperature : 0-55 deg C, 95% RH Non condensing
5. Isolation Test Voltage (Between) : 2kV, 50 Hz for 1 min.(Inputs, Outputs, Aux. Supply)

10.3.5 Electric Actuator

Multiturn 3 phase Actuator for existing Sluice Valve having appropriate bracket / mounting arrangement including two nos. limit switches for open and close condition, torque limit switch and splash proof enclosure.

1. Input voltage: 430 V, A.C.
2. Electric motor TEFC, 3ph, S-1 Duty, Insulation class 'F'
3. Travel limits switches -2 Nos (1NO + 1 NC)
4. Torque limits switches -2 Nos(l NO + 1 NC)
5. Continuous type local position indicator
6. Handwheel with clutch mechanism
7. Protection class IP 65
8. In built Serial / USB communication Port
9. In built data logger with memory
10. In built SD Card
11. Space Heater
12. Mounting: Direct / In Chamber with extension arrangement
13. Designed line pressure: 10 kg/sq cm.
14. Input & Output : 4-20 mA analog

In built blue tooth transceiver with capability of pairing with any android based smart phone to download logged data.

Mounting : Extended type with universal joint for installation at suitable height above ground level with angle mounting including raising of existing chamber if required as per site conditions
Note : The scope of work shall include supply and fixing of jointing material, rubber gasket, nuts and bolts etc. complete as required

10.3.6 Full- Bore Electromagnetic flow meter

- Protection Class : IP 68
- The following performance shall be available as a minimum; superior standards shall be met where

  Stated elsewhere in the Specification or where so required by the metering and/or control requirements. Overall flow system accuracy for local display should be

Scale setting	True flow as % of full Maximum error
20 to 100%	+/- 0.5 % of true value
10 to 20%	+/- 1.0 % of true value
5 to 10%	+/- 2.5 % of true value
Repeatability	Not exceeding 0.2 of true value

- Measuring transmitters shall be interchangeable with those of any other Electromagnetic

  Flow meter of the same design. Calibration checking shall require no auxiliary test meter or simulator. Measuring sensor & transmitter enclosures shall have a degree of protection of not less than IP 68.

- Sampled flow meter as per sampling plan shall be wet-tested and calibrated in the presence

  the customer representative/TPI. With velocity value not exceeding to the specified for a permanent test rig. The meter shall be with a valid Quality Assurance Certificate or Calibration Certificate issued by the National Standards or Calibration Authority of the country of origin of the flow meter.

- The Electromagnetic Flow Meter shall be based on Faraday's law of Electromagnetic Induction.
- The Process connection should be flanged type. The Meter should comply with ISO 4064 in general.
- The flow metering system shall provide volume and rate of flow respectively.
- All parts which are coming in contact with water / fluid being metered should be suitable for potable water applications.
- The flanges shall be compatible with those specified for the associated pipe work Measuring sensors shall have a degree of protection IP68 and shall be suitable for indefinite submersion under ahead of water equal to the chamber depth or 3 meters whichever is the greater.
- The Electromagnetic Flow Meters and the accessories shall be suitable for continuous operation under an ambient temperature of 0-65°C and Relative Humidity of 0-95%. Weather canopy for protection from direct sunlight and direct rain shall also be offered as an option. Material of all fittings shall be carbon steel. Meter should able to detect forward, reverse & net flow volume and shall have facility to send rate of flow, totalizer forward reverse and net value, date, time and site identity.
- The Flow meter should have on board diagnostic function and fault indicator. The flowmeter should have the capability to interface with external battery.

A. <u>The Flow Meter Manufacturer shall meet all the following Criteria</u>:

1. The Original Equipment Manufacturer of the flow meter shall be well established reputed manufacturer having flow meter manufacturing set up at least for 15 years since year 2001 in India / abroad.

2. The Manufacturer should have enclosed min. 3 performance certificates of Electromagnetic flow meter only form Govt / State Govt. water bodies, the certificate should signed by, not less than the rank of Executive Engineer / Chief Officer.

B. Criteria for Technical Qualification

1. The Flow meter Manufacturer should have an ISO 9001 – 2015 Certification OR ISO 14001 Certification.

2. The Flow Meter Manufacturer should have "CE" Marking Certification.

3. The Flow Meter Manufacturer should have NABL Accredited Flow calibration Laboratory Confirming to ISO/ IE17025:2005 as per ISO 4185 Standard. The scope of NABL flow Laboratory should have minimum 400 m3/hr. flow rate & above.

10.3.7 Analyser Specifications

PH, TDS, Residual Chlorine & Turbidity Sensor and Transmitter fixed in Panel of suitable size along with necessary piping and Accessories

1. pH Sensor:

- Measuring Range: 0 to 14 pH
- Accuracy: Less than 0.1 pH under reference conditions
- Temperature Range: 0 to 105°C (32 to 221°F)
- Flow Rate: 0 to 2 m/s (0 to 6.6 ft./s); non-abrasive
- Pressure Range: 0 to 6.9 bar at 100°C (0 to 100 psig at 212°F)
- Signal Transmission Distance: 100 m (328 ft.) when used with the Digital Gateway and a Digital Controller. 1000 m (3280 ft.) when used with the Digital Gateway, Termination Box, and a Digital Controller.
- Sensor Cable: Integral coaxial cable (plus two conductors for temperature compensator option);
  - 4.5 m (15 ft.) long
- Sanitary style: 316 stainless steel sleeved PVDF body Common materials for all sensor styles include PTFE
- Teflon double junction, glass process electrode, and Viton® O-rings

2. Turbidity Sensors:

- Range: 0.001-100 Nephelometric Turbidity Units (NTU)
- Accuracy: (Defined according to ISO 15839.) ±2% of reading or ±0.015 NTU

- (Whichever is greater) from 0 to 40 NTU; ±5% of reading from 40 to 100 NTU

- Displayed Resolution: 0.0001 NTU up to 9.9999 NTU; 0.001 NTU from 10.000 to 99.999 NTU
- Repeatability: (Defined according to ISO 15839.) Better than ±1.0% of reading or ±0.002 NTU, whichever is greater

3. Residual Chlorine sensor

- Residual Chlorine Sensor and Transmitter a fixed in Panel of suitable size along with necessary piping
- Range: 0 to 5 mg/L free or total residual chlorine
- Accuracy: ±5% or ±0.035 mg/L as CL2, whichever is greater
- Precision:±5% or 0.005 mg/L as CL2, whichever is greater
- Minimum Detection Limit: 0.035 mg/L
- Cycle Time: 2.5 minutes
- Inlet Pressure to Instrument: 1 to 5 psig (1.5 psig is optimum)
- Inlet Pressure to Sample Conditioning: 1.5 to 75 psig
- Sample Flow: 200 to 500 mL per minute minimum required
- Sample Temperature: 5 to 40°C (41 to 104°F)
- Operating Temperature: 5 to 40°C (41 to 104°F)
- Operating Humidity: 90% at 40°C (90% at 104°F) maximum
- Recorder Outputs: One 4-20 mA with an output span programmable over any portion of the 0 to 5 mg/L range, 130 V isolation from earth ground, 500 ohm maximum One isolated recorder output, 4–20 mA (can be adjusted to 0–20 mA), recommended load impedance 3.6 to 500 ohms.
- Alarm Relay Outputs: Two alarms selectable for sample concentration alarm, analyzer system warning, or analyzer system shut-down alarm. Each is equipped with an SPDT relay with contacts rated for 5A resistive load at 230 Vac.
- Sample Inlet Connection: 1/4-inch OD polyethylene tube, quick disconnect fitting
- Drain Connection: 1/2-inch ID flexible hose, hose barb
- Certification: CE approved ETL listed to UL 1262, ETL certified to CSA 22.2 No. 142
- Enclosure: ABS plastic, two clear polycarbonate windows, IP62-rated with the gasket door latched

10.3.8 Ultrasonic Level Transmitter

- Range : 0-5 metres
- Accuracy : 0.5 % minimum
- Supply Voltage : 24V dc
- Output : 4-20 mA
- Ultrasonic Frequency:75 kHz burst, rep. rate 96 ms
- Delay at Power-up: 1.5 seconds
- Temperature Effect: Uncompensated: 0.2% of distance/°C &Compensated: 0.02% of distance/°C
- Resolution: 1.0 mm
- Output Response Time: 100 ms to 2300 ms
- Minimum Window Size: 20 mm

- **Environmental Rating:**

a) Leakproof design is rated IEC IP67; NEMA 6P

b) Operating Conditions: Temperature: –20 °C to 70 °C (–4 °F to 158 °F)

c) Maximum relative humidity: 100%

- **Indicators**

a) Green Power On LED: Indicates power is ON

b) Red Signal LED: Indicates target is within sensing range, and the condition of the received
c) signal

d) Teach/Output indicator (bicolor Amber/Red):

e) Amber – Target is within taught limits;

f) Flashing Amber – Target is outside taught window limits;

g) Red – Sensor is in TEACH mode

10.3.9 GPRS Communication Modem

The Modem shall be supplied along with suitable external antenna, patch chord and mounting accessories and activated data SIM Card with required data .

GSM – Quadband, GPRS - Class 10.

Voice/Data/FAX/SMS facility

TCP/IP - Full (FTP & E Mail add)

Functional Features

a) Input/output Digital -01

b) Down load over the air

c) At command set (GSM 07.05, GSM 07.07 and Wave com)>300

d) Auto restore -time reset.

e) Voice ,Data and SMS Features

f) Data circuit synchronous , transparent and non transparent up to 14,400 bits

g) Automatic tax group 3 (class 1 & class 2)

h) MNP @ V, 42 BIS

i) Text & PDU SMS

j) Point to point SMS (MT/MO)

k) UC S2 character set management

l) Din rail mounting

m) Casing- Metal/plastic

n) Operating status LED

INTERFACES

a) SIM Plug in card reader - 1.813 V

b) PS 232 on 15 Pin Sub.D connector

c) Pin power supply connector -04 pin DC

d) SMA Antenna connector

e) (v)Temp Range Operating range - 20+55 degreec/ -25 to 70 degree C

f) Power supply -5 to 32 V DC

g) Protection Class-IP 55

h) Certification -CE Certification, GCG Certification, ROHS Compliance

i) Programming /Parameterization 01 modem - Direct.

10.3.10 SparePhilosophy.

- Installed engineering spare modules of 20% shall be provided in input/output subsystem for each type of module with a minimum of one module of each type to enhance the system functional requirements.Allinstalledspareshallbefullywireduptofieldterminationlevel.
- Inadditionthesystemshallhavethefollowingminimumsparecapability:
- I/O racks of PLC shall have 10% usable spare slots for installing I/O modules of each type in future. These racks shall be part of theoffer.
- The processor system shall have the capability to execute logic's for additional I/O's as per above. Inadditionitshallbepossibletoextendmemorybyadditional20%atalaterstage.
- Powersupplymodulesshallbecapabletotakeloadofthesparesasoutlinedabove.
- ThePLCconsoleshallhavecapacitytomeetallrequirementsfortheadditionalinput
- Outputs as outlinedabove.
- Whenever relays are used to interface process input / outputs with PLC, 20% additional relays shall be provided. In addition, 20% spare space shall be provided in cabinets to install 20% additional relays infuture.
- Vendor shall design all systems / racks based on the above. Additional terminals shall be provided to enable termination of above spare I/O's and also to terminate spare cores of existing multipair cables. This shall be adhered to under allcircumstances.

  ThepurposeofLocalHMIistoindicatecurrentstatusofthelevel,pressure,flow,energydataandwater quality etc.at the fieldstations.

  TheHMIshallalsoactasanaidtofacilitatePopupalarms,entertimedelays,andoperatethenecessary equipment. The HMI shall have 1 printer port and 1 USB port as a minimum. The HMI shall be Touch screen with minimum diagonal screen size of10"

10.3.11 Cables

- The power and control cables shall be generally as per BS 6346. For these cables, equivalent IEC/IS specifications are alsoacceptable.
- The insulation grade shall be 1100 V for allcables.
- All cables shall be armoured and suitable for operation and installed asfollows:

  - Directly buried in theground

- Fastened to cable ladder rack or tray in the openair
- In undergroundducts
- In overhead closed cableducts

- Running length of the cable shall be printed at least at every metre interval. For multipair/ multitriad cables, pair identification shall be provided with numbers at interval of not more than 250 mm as per vendor'sstandard.
- A pair of communication wire shall be provided for multipair /multritraid cables. Each wires shall be 0.5 mm2 of plain annealed single or multi-strand copper conductor with 0.4 mm thick 85 Deg.C XLPE insulation.
- All cables shall be fire retardant and lowsmoke.

a) Power & ControlCables

DESCRIPTION	**STANDARDS**
Conductors	IS : 8130 / BS 6360, Annealed Copper
Insulation-XLPE	Insulation shall be Cross-linked Polyethylene (XLPE) as per BS 5308 / IS 7098.
Armour	Round wire armour galvanized steel as per IS 1554 Part 1

Inner & Outer Sheath-PVC	Extruded Fire Retardant, Low Smoke, Low Halogen, Low Toxic, PVC having physical properties as per IS 5831- Type ST2. Flammability and chemical properties shall be as follows: • Oxygen Index: 30 (minimum) at room Temp asper ASTM-D-2863-77 • Temperature Index: 250 Deg C (minimum) atOxygen Index of 21 as perASTM-D-2863. • Light Transmission: 70% (minimum) as per IEC1034. • Flammability test: As per IEC 332 Part-1 &Part-3 Cat.A • Corrosivity of combustion gases: pH-index> 4.3, Electrolytic conductivity < 100 micro S/cm as perIEC 754-2 • Toxicity index: Maximum 05 Gases to be extracted – HCL, HBr, HF, CO, CO2, NO, SO2, HCN asper NES-713. HCL shall be first gas to beextracted. Inner Sheath and outer sheath thickness: Min. Inner sheath thickness and outer sheath thickness shall be as per IS:1554(P-1)1988, should not be less than 0.5 mm. Power Cables: Black Control Cables: Blue or Black.

Testing and Dimensions of the cables	IS : 1554 Part I, BS 6469 / BS 6346

10.3.12 ControlValves

- Controlvalvesshallnormallybeglobe / sluicetype,singleseatedordoubleseated.Othertypeofvalvelike butterfly, ball, rotary plug, angle or 3 way etc., shall be selected as per servicerequirements.
- Control valve sizing shall be carried out as per ISA S75-01. In general, control valves shall be sized so that the valve opening is as notedbelow;

  At max. Flow: less than 90% open

At normal flow: about 75% open
At minimum flow: more than 20% open.

- Unless specified otherwise flanged control valves shall be used. Body material, body rating and flange rating, shall be as per piping specifications, as aminimum.
- Trim characteristics shall be equal percentage type unless required otherwise because of process application.Controlvalveplugsshallbetopandbottomguidedfordoubleseatedvalvesandheavy top guided for single seated valves. Cage guided valves shall be selected for control valve size of 2" and above, ingeneral.
- Anti-cavitation trim shall be selected wherever cavitation is expected in thevalve.
- Valve seat leakage shall be as per ANSI/FCI 70.2 and shall be selected with due consideration to meet the requirement. For shutdown valves leakage class VI shall beconsidered.

10.4 Civil Work, Excavation & other Site Activities.

All the civil work, excavation, and other activities like HDD, fabrication, welding etc. are in the scope of vendor.

10.5 Safety

The bidder shall be fully and solely responsible for making all the safety arrangements pertaining to the work. The bidder shall be fully responsible and liable in all respects for any accidents and subsequent legal action initiated by any party including the department.

10.6 Material

- All materials incorporated in the Works shall be the most suitable for the duty concerned and shall be new and of reputed make/approved quality, free from imperfections and selected for long life and minimum maintenance. Non-destructive tests, if called for in the specification, shall be carried out.
- If, after installation, the operation or use of the materials or equipment furnished by the Bidder proves to be unsatisfactory, The Project Manager shall have the right to operate or use such materials or equipment until correction of defects, errors or omissions are carried out by the Bidder by repair or by partial or complete replacement.
- All submerged moving parts of the plant i.e. shafts, spindles, rotating elements or faces etc. in contact with water shall be of corrosion resistant materials. All parts in direct contact with water shall be completely resistant to corrosion or abrasion and shall maintain their properties without ageing due to the passage of time, operating load, environment, heating due to operation or any other cause.

10.7 Workmanship - General

Workmanship and general finish shall be of first class quality and in accordance with best workshop practice.

- All similar items of the plant and their components shall be completely interchangeable. Spare parts shall be manufactured from the same materials as the originals and shall fit all similar items. Machining fits on renewable parts shall be accurate and to specified tolerances so that replacements can be readily installed.
- All equipment shall operate without excessive vibration and with minimum noise. All revolving parts shall be truly balanced both statically and dynamically so that when running at normal speeds at any load up to the maximum, there shall be no vibration beyond permissible limit due to lack of balance.
- All parts, which can be worn or damaged by dust, shall be totally enclosed in dust proof enclosure.
- Castings and fabricated materials shall be finished smooth all over.
- The works as a whole shall be new, of sound workmanship, robustly designed for a long reliable operating life and shall be capable of 24 hours per day continuous operation for prolonged period in the climatic and working conditions prevailing at the site, and with minimum of maintenance. Particular attention shall be given to temperature changes, the stability of paint finish for high temperatures, the rating of machinery, thermal overload services, cooling systems and the choice of lubricants for possible high and prolonged operating temperatures. The Bidder shall be called upon to demonstrate this for any component part either by service records, or evidence about similar equipment already installed elsewhere or relevant type test.
- Bright parts and bearing surfaces shall be protected from corrosion by the application of a rust-preventive lacquer, high melting point grease or similar fluid.

10.8 Trial and Commissioning

10.8.1 FAT (Factory Acceptance Test)

- SI shall test and demonstrate the functional integrity of the system hardware and software. No material or equipment shall be transported until all required tests are successfully completed and certified “Ready for Shipment” by the owner/consultant.
- The purchaser reserves the right to be involved and satisfy himself at each and every stage of inspection. The purchaser shall be free to request any specific test on any equipment considered necessary by him although not listed in this specification, as a part of approval of factory testing procedure. The cost of performing all tests shall be borne by the vendor
- SI to note that acceptance of any equipment or the exemption of inspection or testing shall in no way absolve the vendor of the responsibility for delivering the equipment meeting all the requirements specified in Material Requisition.
- It shall be SI’s responsibility to modify and/or replace any hardware and modify the software if the specified functions are not completely achieved satisfactorily during FAT.
- The schedule for the FAT shall be included in the SI’s proposal. Factory acceptance test procedure shall be submitted for approval at least 4 weeks before the FAT at vendor works.

- Vendor shall not replace any system component/module/sub-system unless it is failed. A log of all failed components/modules in a system shall be maintained .If malfunction of a component/module in a system repeat, the test shall terminate and vendor shall replace the faulty component/module. Thereafter the test shall commence all over again. If a system fails during the test and is not repaired and made successfully operational within 4 (four) hours of active repair time after the failure, the test shall be suspended and restarted all over again only after the vendor has replaced the device in the acceptable operation. The inspection and FAT shall be carried out in two phases The minimum requirements for testing during these two phases shall be as follows:-
- Under first phase vendor shall perform tests at his works to ensure that all components function in accordance with their respective specifications for each type of test. A test report shall be submitted to the owner/consultant for review within two weeks of completion of each type of test giving details. All systems shall undergo a minimum of 3 days burn-in period. The burn-in time shall start after the system in fully assembled condition is powered up and shall include any such time for which the system has beenkept powered even for system generation. Following tests shall be performed by the vendor and report shall be forwarded to the owner/consultant.
- Quality control tests shall be carried out to assure quality of all components and modules in accordance with vendor's quality control and assurance procedures. Vendor shall forward the details of these procedures for owner/consultant's review.
- System pre-test which shall be physical check of all subsystem components, modules and racks.
- System Power-up test which shall functionally check the systems hardware and software including diagnostic software at sub-system level by stimulating the inputs.
- Second phase of test shall systematically, fully and functionally test all the hardware and software in the presence of purchaser representative. All the systems shall be interconnected to simulate, as close as possible, the total integrated system. Vendor purchased item shall also be connected to the system. Barrier cabinets shall be used as the connecting points for test inputs and outputs.
- The duration of the testing shall be mentioned by the vendor with reasons. System shall be shipped to site only after this testing and certified ready for shipment by owner/consultant.
- Following steps will be carried out
    - Data review: Owner/consultant shall perform a comparison of all current data. Any revision or changes required shall be informed to the vendor. The test reports forwarded by vendor after first phase testing shall be reviewed. Owner/Consultant has right to witness any test performed in first phase, if deemed necessary.
    - Visual and mechanical testing : Visual and mechanical testing shall be carried out in principle to assure correct, proper, good and neat workmanship by the vendor.
    - Functional testing shall include the simulation of each input and output to verify proper system response for both analog and discrete signals. The testing, as a minimum, shall include the following:-
        - Complete system configuration loading
        - Demonstration of all Processor functions from local as well as from central level e.g. changing of running constants, loop tuning, checking of algorithm functions changing algorithms, changing Processor mode, changing Processor action etc.
        - Checking of scan time values

- Checking of loop configuration for correctness with respect to ranges, limits, alarm points, engineering units etc.
- Checking of all types of TFT displays including process and system displays on operator Engineering and PLC consoles.
- Checking of correct functioning of key-board operation for operator and Engineering console.
- System Redundancy Check including correct change-over of the back-up units in case of main units failure. This shall be carried out for processors, power supplies, communication bus and any other redundancy specified.
- Checking of Processor loading
- System diagnostics check for all sub-systems on local level as well as of operator/engineering console. These shall include failure of a sub-system, module, power supply, interface unit, failure of transfer to redundant module on main module failure etc. and other detailed diagnostic displays. Diagnostic alarms for any ventilation fan failure shall also be checked.
- Testing of proper functioning of all printers and hard copy units.
- Testing of system features like interchangeability between consoles, synchronisation of system clocks, selective running from Engineering console, key-lock functions etc.
- Checking of various log formats, shut down reports, I/O mapping and other MIS formats printing.
- Checking of shutdown and interlock configuration and proper operation thoroughly.
- Proper system operation at power supply specifications specified in the Material Requisition.
- Checking of proper operation of all interfaces with the system like interface with PLC, computer, analyser system etc. as specified in Material Requisition.
- Checking of bus-degradation while loading the bus from 10% to 100%
- Simulation of power failure and restarts.
- Checking of all hardwired instrumentation including all alarm cards, alarm annunciator system, switches and other indicating instruments.

10.8.2 SAT (System Acceptance Test)

- The purchaser shall provisionally takeover the system from vendor after system acceptance test. System acceptance test shall be started only after the satisfactory performance of loop checking and verification of records by Engineer-in-charge.
- The system acceptance test shall be carried out in the presence of purchaser's representative and Engineer-in-charge or his authorised representative.
- SI shall carry out the following functional tests, as a part of system acceptance test as a minimum :-
- Hardware verification as per final bill of material.

- Visual and mechanical check-up for proper workmanship, identification, ferruling, nameplates etc.
- System configuration as per approved configuration diagram.
- Demonstration of all system diagnostics.
- Checking of correct change-over of redundant devices
- Checking of proper functioning of all disc drives, alarm summary, printers etc.
- All Graphical user interface, reports, trends, pressure regulation mechanism, leak detection system etc. shall be user friendly and shall be validated by end user during SAT.

10.8.3 UAT (User Acceptance Test)

The final acceptance shall cover 100% of the Bhopal BWUMS Project, after successful testing by the BSCDCL and Bhopal Municipal Corporation or its PMU; a Final Acceptance Test Certificate (FAT) shall be issued by the BSCDCL and BMC to the SI.

Prerequisite for Carrying out FAT activity:

1. Detailed test plan shall be developed by the SI and approved by BSCDCL. This shall be submitted by SI before FAT activity to be carried out.
2. All documentation related to Bhopal BWUMS project and relevant acceptance test document (including IT Components, Non IT Components etc.) should be completed & submitted before the final acceptance test to the BSCDCL and BMC.
3. The training requirements as mentioned should be completed before the final acceptance test.
4. For both IT & Non-IT equipment's / software manuals / brochures / Data Sheets / CD / DVD / media for all the Bhopal BWUMS Project supplied components.

The FAT shall include the following:

1. All hardware and software items must be installed at respective sites as per the specification.
2. Availability of all the defined services shall be verified.
3. The SI shall be required to demonstrate all the features / facilities / functionalities as mentioned in the RFP.
4. The SI shall arrange the test equipment required for performance verification, and will also provide documented test results.
5. The BSCDCL/Bhopal Municipal Corporation may carry out the security audit of the established BWUMS system by a certified third party.

Any delay by the SI in the Final Acceptance Testing shall render him liable to the imposition of appropriate Penalties. However, delays identified beyond the control of SI shall be considered

appropriately and as per mutual agreement between BSCDCL and SI. In the event the SI is not able to complete the installation due to non-availability of bandwidth from the bandwidth service providers, the Supplier and BSCDCLmay mutually agree to redefine the Network so the SI can complete installation and conduct the Final Acceptance Test within the specified time.

10.9 SCADA Control Center (SCC)

The below mentioned list for SCADA Control Centre is not complete. Kindly refer to the section 3.3 for more details on the SCC component listing.

10.9.1Functional Requirements

A. **Features and Functions**

1. Online Monitoring of Status and Data

i. The SCC will be provided with Client versions of SCADA software and will get connected with Server version of SCADA software and Database hosted on the ICCC cloud of BSCDCL
ii. The data from remote PLC / RTU based panels shall be no older than 10 seconds and shall be provided with time stamping
iii. Online and Historic trends to be created for various analog parameters
iv. Alarm and Events to be logged and highlighted with time stamp of occurrence and acknowledgement.
v. User settings like Open, Close times etc. of the valves etc. to be seen and editable at the SCC.

2. Broad Band Connectivity

i. Broad band connection with a Static IP in the name of BSCDCL shall be facilitated by the
ii. Contractor. The annual charges for the broadband connection shall be paid by the contractor during commissioning and for the duration of the defect liability period as a part of the connectivity/communication charges. This broadband connection shall be used for hosting the OPC Server, webpage, APIs for Mobile App connectivity

3. Gateway Utility

i. There shall be a configurable gateway utility/server program installed at the SCC/ICCC to receive
ii. Data directly from any of the two GPRS modems installed at each remote PLC / RTU panel.
iii. This gateway shall be permanently connected to the GPRS controller installed at each
iv. Remote PLC / RTU panel.

4. Web Page development

i. The SCC/ICCC shall be provided with host webpages which can be accessed by approved users with passwords to view the data from any authorized user machine outside the GPRS environment.
ii. The webpage shall display data and equipment status from each pump house.

5. Email and SMS Utility

i. The SCC shall be provided with an Email and SMS Server which shall send out email and
ii. SMS to concerned officers in case of certain events or alarm conditions. It shall be user
iii. Configurable on the following counts

a. User Name and Password protected
b. Connectivity to Database generated by the SCADA
c. Configuration of Email Ids and Phone numbers of recipients
d. Conditions like alarms and events to be user defined
e. There shall be no limit to the number of recipients

6. App Server

i. The SCC shall be provided with a suitable API and app server to provide data to Mobile clients
ii. This shall include IOS and Android based APPs to be installed on the users phones.
iii. There shall be no limit on the number of authorized users who can use the Apps. There shall be no recurrent charges for the same.

7. Reporting Software

i. The reporting software shall be User and Password protected
ii. It shall have an admin panel to configure the users, databases, tags and report types
iii. The user shall be able print reports which are configured by the administrator.
iv. The user shall be able to choose the time range for the reports
v. The reports shall have the BSCDCL logo, name of the user and the time and date when the report was fired
vi. The report shall be available in crystal report and excel format.

8. Security

i. User Groups

a. Users and Passwords shall be allocated at each SCC. Administrator privileged shall not be provided to any user except the administrator of the system. No other user shall be allowed to install, uninstall or modify any software programs on the machine.

ii. Anti-Virus

a. A suitable antivirus which can disable the use of various interface devices like

- DVD drive, USB ports etc as per the user's requirement. The access to such hardware interfaces shall be password protected. The user may be allowed to use pre approved/trusted devices as an exclusion to the above rule.

b. Restricted use of internet as per categories of websites. These stations shall be provided internet access only to facilitate the Webpage, Mobile apps, Email and SMS Utility and any other web browsing shall be disabled and password protected.

c. The antivirus software shall have the following user settable features

- File, mail, web and IM antivirus

- Firewall with configurable Application network rules, network packet rules and available network selection
- Network Attack blocker which detects suspicious activities from other computers within the network and blocks them
- Scan Scheduling option

iii. Restore Software

- Each workstation shall be provided with a restore software that takes images of the entire system at regular intervals and store it on the hard disk. In case of an OS crash the system shall have the ability to restore form the last available image.

iv. Cloning and Image Storage

- Clones of the entire hard disk shall be made at SCC on the standby hard disk provided in the machine.
- In case of a crash and in the event the restore software also fails to revive, the user shall simply plug out the existing hard disk and plug the standby hard disk.
- The image of the entire system shall be stored as a backup on an external hard drive / ICCC server and handed over to BSCDCL for safe keeping.

v. Web Protection Software

- The system shall have a suitable software installed to allow only authorized applications to access the data available on the system
- The web protection shall have the following user configurable features

1. Web Categories to block
   A list of categories to be available which can be blocked
2. Time Restrictions
   User settable timings which can be used to deactivate/activate the software
3. Website exceptions
   User settable websites that can be allowed to access.
4. Blocking Effects
   If a blocked site is accessed the software should give out an audio alarm
5. URL Keywords
   Certain keywords if they figure in the accessed websites it should pop up a dialog box
6. Safe Search
   The search engine used goes into safe search mode to block unwanted content
7. Password Email
   Admin password changing facility. Also the email to be configurable on which admin generated alerts are to be sent.

B. SCADA, Reporting Software, Email Utility& Smart Phone App

The SCADA software is essentially a user interface that collects and collates data from each of the PLC /RTU based control Panels and depicts the same in an easy to understand user defined screens. The main screen shall offer detailed and illustrative schematics of the Bhopal with a user friendly option of going into the detailed and illustrative schematics of each individual Panel.

The SCADA software shall have all the below mentioned features;

Graphics: Ability to create sophisticated interfaces with point and click, drag and drop ease import Graphics from more than fifteen different formats for enhanced and realistic screens. Provide an object oriented environment for simple application development. In built extensive symbol library to simplify development.

Alarms / Events: Shall provide a powerful alarm / event management system to generate alarm / events in user defined formats. The system shall have the ability to send these to various utilities such as screens, e-mails, Web Browser, archives etc.

Trending: Enables keeping track of process behavior on – line or through historical trending.

Recipes and Reports: Ability to create flexible, user defined recipe groups, to provide user configurable reports, including text and graphics that can be displayed in an application or on the web.

Input / Output: The software should support more than 200 device drivers, OPC (client and server) and various PC control packages.

General: The software shall provide for a powerful, flexible tags database (Boolean, Integer, Real and string) array tags, classes and indirect tag pointer. It shall provide an advanced Math library with more than 100 standard functions. It shall provide for programming via a flexible and easy to use scripting language. It conforms to industry standards such as Microsoft. NET, OPC, DDE, ODBC, XML, SOAP and ActiveX. It allows data exchange between wireless and mobile devices.

C. Detailed functionality

1) Monitoring

1. Online Parameters and Status

The water level in different OHTs shall be available on line at any point in time.
These values shall not be older than 10 seconds Values. This shall be done by using GPRS communication from remote locations and wired communication at the local OHTs

2. Events and Alarms

There shall be events and alarms screens as per the requirement of the BSCDCL which shall show

- Tag Name
- Tag Description
- Threshold/ Trigger Value for analog alarms (like Level < 130 cms)
- Alarm/ event Date & Time
- Acknowledge time

3. Database Generation

The SCADA shall generate databases in SQL as well as MS access for its own use (like for Historical trends and also for other utilities like Email sending, Android App etc.
The interval of logging shall be settable like every 5 mins/ 10 mins etc.

2) Reporting System

1. The Reporting System Software shall retrieve data from the databases created by the SCADA software.

2. It shall be a Custom built Software and the user shall be given all the setup files of the utility.

3. The Software shall have the following features

- Unlimited no. of reports for Parameters, Events and Alarms Occurrences
- Multiple Database Selection
- Parameters selection for every report by the user
- Time Period for every report selectable by the User
- Each Report shall have the User Name, Logo, Page Nos., Date and Time of Report
- The report shall be in SAP Crystal format or Excel Format for the user to be able to use in other reports if required

D. EMAIL/SMS UTILTY

Functions

- The Email SMS utility is used for notifying predefined conditions that may occur in the automation/SCADA system.
- The Email/SMS utility shall be a custom built application which shall be used to send Emails to the configured recipients as per the results of evaluation of various conditions configured by the user in the program.
- It shall be using the SQL database created by the SCADA software to get the values of the tags which are required to be evaluated by the program.

The following are the basic a guidelines and minimum features that have to strictly adhered to while designing the application.

1) Types of Users

A. Administrator
B. Application Users

A. Administrator - Password Protected

The Administrator shall have the following functions

1. Configure Settings

a. **Application User** – Configures the following

- The administrator username
- The administrator password
- Password confirmation
- Clear, save, edit, modify, delete, cancel and exit tabs

b. Create Phone Book

The Administrator shall create a phone book having the following information

- Username
- Mobile no
- Email ID
- Clear, save, edit, modify, delete, cancel and exit tabs

c. Create Project

The administrator shall create every project by feeding the following data

- Project Name
- SQL server name
- Database Password
- Drop down list for databases
- Selection of databases for on change and also for periodic parameters.
- Sending Email ID details as follows
- User Name
- Sending Email ID and Password
- SMTP Server and password
- Configurable Subject Line which shall appear in all Emails generated by the utility
- Configurable Beginning Line which shall appear in all Emails generated by the utility
- Configurable End Line which shall appear in all Emails generated by the utility.

2) Configuration of conditions

There shall be 3 types of conditions to be monitored and responded to by sending SMS and Emails

a. Digital Conditions
b. Analog Conditions
c. Formula Conditions

a. Digital Conditions

These conditions are applicable only for digital tags which are being recorded by the SCADA software using SQL database

Features

- Project Name Selection from Drop down Menu
- Value Table Name: drop down menu to select the name of the field which contains all the values of the tags

- Value Field Name: drop down menu to select the name of the field which contains the names of all the tags
- Time Stamp Field Name: drop down menu to select the name of the field which contains all the time stamps for every record.
- Tag Name: drop down menu to select the name of the tag as recorded by the SCADA software.

Conditions

- Toggle gets activated if there is any change in the digital status of the tag
- On gets activated only if the tag gets turned on
- Off gets activated only if the tag gets turned off

Additional Configurations

Options to be given in the configuration screen

- To Send Value of the Tag in the Email
- To send the timestamp of the tag in the Email
- To disable the utility from START TIME to END TIME, so that the user is not disturbed at odd hours.

Message Configuration

- The text message for the email.
- Tag Title/ Alias to be linked to the actual tag name from a drop down menu.
- Names of users to be selected using check boxes to which emails have to be sent.

b. Analog Condition

These conditions are applicable only for analog tags which are being recorded by the SCADA software using SQL database

Features :-

- Project Name Selection from Drop down Menu
- Value Table Name : drop down menu to select the name of the field which contains all the values of the tags
- Value Field Name: drop down menu to select the name of the field which contains the names of all the tags
- Time Stamp Field Name: drop down menu to select the name of the field which contains all the time stamps for every record.
- Tag Name: drop down menu to select the name of the tag as recorded by the SCADA software.
- Select Operator: The selected tag shall be compared with either another tag (configurable) or a constant value (configurable) using the 6 following operators

- Less than
- Greater than
- Less than and equal to
- Greater than and equal to
- Equal to
- Not equal to
- Min and Max Range of the selected tag

- The tag shall necessarily have to be between the min and max values otherwise the conditions defined will not be executed. This is to take care of sporadic erratic values that may get recorded.

Additional Configurations

- Options to be given in the configuration screen
- To Send Value of the Tag in the Email
- To send the timestamp of the tag in the Email
- To disable the utility from START TIME to END TIME, so that the user is not disturbed at odd hours.

Message Configuration

- The text message for the email.
- Tag Title/ Alias to be linked to the actual tag name from a drop down menu.
- Names of users to be selected using check boxes to which emails have to be sent.

c. Formula Conditions

Sometimes a formula may be required to be evaluated and the result then compared with another tag or a constant value.

Features

- **Project Name** Selection from Drop down Menu

- **Value Table Name**: drop down menu to select the name of the field which contains all the values of the tags

- **Value Field Name**: drop down menu to select the name of the field which contains the names of all the tags

- **Time Stamp Field Name**: drop down menu to select the name of the field which contains all the time stamps for every record.

Additional Configurations

Options to be given in the configuration screen

- To Send Value of the Tag in the Email
- To send the timestamp of the tag in the Email
- To disable the utility from START TIME to END TIME, so that the user is not disturbed at odd hours.

Message Configuration

- The text message for the email.
- Tag Title/ Alias to be linked to the actual tag name from a drop down menu.
- Names of users to be selected using check boxes to which emails have to be sent.

Formula Definition

- Tag Name or Input Value
- Arithmetic Operator to be used with the second tag
- Formula: Expressions to be created one by one with an arithmetic operator
- Relational operator to compare the expression of the formula with another tag
- Logical Operator to be used to compare the evaluation of the first condition with the evaluation of the second formula

E. Smart Phone App

APPS for Smart Phones- including IOS and Android Operating Systems

Function of Apps:-

There shall be different apps for the different operating systems.

Apps shall function like SCADA for personnel on the field. The various features of Apps shall be as Follows:

1. SQL database running on SCADA Server containing only those tags that are required to be displayed on the smart phones
2. The logging interval shall not be more than 60 seconds
3. The database should be cleaned on daily basis, so that the retrieval of data is not slowed down.
4. The App shall be password protected.

5. The on/off/fail status of every equipment shall be displayed on the smart phone app.
6. Analog values may be represented in a tabular form on the app.
7. There shall be a time stamp in the app along with a refresh button wherever required.
8. There shall be zoom in and zoom out feature wherever required to ensure proper visibility.
9. No operation of devices shall be done from these Apps
10. The App shall be downloadable as an Email attachment and shall install itself on the smart phone.
11. It shall have the facility of user authentication. At the server end the control room should be able to enable/disable the users of the app.

10.9.2 SCC Server

Air conditioned Rack mounted Central (Redundant) Server System having;

a) Base Workstation INTEL Xeon processor E3-1220 v5(3.0GHz, 8MB/80W), 4 DIMMS / 2x8GB RAM / 2x1TB SATA 3.5" 7200Rpm/ 16x DVD +/-RW Drive - 02 nos

b) b.USB Optical Mouse / USB Keyboard / Windows 12 Server version OS/ Anti virus software / Restore software / 3 years Pro Support

c) Monitor 24"

d) Rack 18 U x 600Wx1000D with side panel - 02 Nos. / Front - rear Door - 02 Nos./ Caster - 01 set / Fans - 02 Nos. / Cable Manager - 01 No.

e) Router RV 042G - 2 WAN and 4 LAN ports

f) Accessories: LAN Cable, KVM Cable, connectors etc.

10.9.3 Online UPS Specifications

#	Parameter	Minimum Specifications
1.	Capacity	1 KVA
2.	Output Wave Form	Pure Sine wave
3.	Input Power Factor at Full Load	>0.90
4.	Input Voltage Range	180-250 VAC at Full Load

5.	Input Frequency	50Hz +/- 3 Hz
6.	Output Frequency	50Hz+/- 0.5% (Free running); +/- 3% (Sync. Mode)
7.	Inverter efficiency	>90%
8.	Over All AC-AC Efficiency	>85%
9.	UPS shutdown	UPS should shutdown with an alarm and indication on following conditions 1)Output over voltage 2)Output under voltage 3)Battery low 4)Inverter overload 5)Over temperature 6)Output short
10.	Battery Backup	1 hour in full load

10.9.4 Laser Printer

#	Parameter	Minimum Specifications
1.	Print speed black (normal, A4)	Up to 25 ppm
2.	Print quality black (best):	Up to 1200 x 1200 dpi
3.	Print technology :	Monochrome Laser
4.	Duty cycle (monthly, A4)	Up to 15,000 pages
5.	Recommended monthly page	volume 250 to 2000
6.	Standard memory:	Minimum 128 MB
7.	Processor speed:	Minimum 700 MHz
8.	Paper handling standard/input	Up to 250-sheet input tray
9.	Paper handling standard/output	Up to 150-sheet output bin
10.	Media sizes supported	A4, A5, A6, B5, postcard
11.	Media types supported	Paper, transparencies, postcards, envelopes, labels
12.	Standard connectivity	Hi-Speed USB 2.0 port with USB data cable, Ethernet with RJ45 connectivity
13.	Duplex printing	Automatic (standard)

14.	Compatible operating systems	Microsoft Windows 7 Professional(64bit), Windows 8 Pro(64 bit), Windows 8.1, Windows 10, Server 2008 R2, Server 2012 R2, MAC OS 9.0, MAC OS X, Linux
15.	Power requirements:	Input voltage 220 to 240 VAC (+/- 10%), 50 Hz (+/- 2 Hz);
16.	Power consumption during printing	Less than 500W
17.	Energy Efficiency	BEE or Energy Star certified
18.	Front operating Panel	Graphical LCD display

10.9.5 Anti-virus Software

Advanced antivirus, antispyware, desktop firewall, intrusion prevention (comprising of a single, deployable agent) which can be managed by a central server. (Support, updates, patches and errata for the entire contract/ project period)

10.9.6 L3 Switches

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Ports	• 24 or 48 (as per requirements) 10/100/1000 Base-TX/FX ports and extra 2 or 4 nos of 10G Base SX/LX/LR ports as per network solution offered. • TX/FX Split as per field/site requirement		

		• All ports can auto-negotiate between 10Mbps/ 100Mbps/ 1000Mbps, half-duplex or full duplex and flow control for half-duplex ports.		
4.	Switch type	Layer 3		
5.	MAC	Support 8K MAC address.		
6.	Backplane	Properly sized Switching fabric capacity (as per network configuration to meet performance requirements of wire speed switching for the connected devices)		
7.	Forwarding rate	Packet Forwarding Rate should be 70.0 Mpps or better		
8.	Port Features	Must support Port Mirroring, Port Trunking and 802.3ad LACP Link Aggregation port trunks		
9.	Flow Control	Support IEEE 802.3x flow control for full-duplex mode ports.		
10.	Protocols	• IPV4, IPv6 • Support 802.1D, 802.1S, 802.1w, Rate limiting • Support 802.1Q VLAN encapsulation, IGMP v1, v2 and v3 snooping • 802.1p Priority Queues, port mirroring, DiffServ • DHCP support • Support upto 1024 VLANs • Support IGMP Snooping		

		and IGMP Querying • Support Multicasting • Should support Loop protection and Loop detection, • Should support Ring protection		
11.	Access Control	• Support port security • Support 802.1x (Port based network access control). • Support for MAC filtering. • Should support TACACS+ and RADIUS authentication		
12.	VLAN	• Support 802.1Q Tagged VLAN and port based VLANs and Private VLAN • The switch must support dynamic VLAN Registration or equivalent • Dynamic Trunking protocol or equivalent		
13.	Protocol and Traffic	• Network Time Protocol or equivalent Simple Network Time Protocol support • Switch should support traffic segmentation • Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, TCP/UDP port number		
14.	Management	• Switch needs to have console port for management via PC • Must have support SNMP v1,v2 and v3 • Should support 4 groups of RMON • Should have accessibility using Telnet, SSH, Console access, easier software upgrade through network using TFTP etc. Configuration		

		management through CLI, GUI based software utility and using web interface		

10.9.7 Routers/Network Accessories

#	Item	Minimum Specifications	Bidder Compliance (Yes, No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Multi-Services	Should deliver multiple IP services over a flexible combination of interfaces		
4.	Ports	As per overall network architecture proposed by the bidder, the router should be populated with required number of LAN/WAN ports/modules, with cable for connectivity to other network elements.		
5.	Speed	As per requirement, to cater to entire bandwidth requirement of the project.		
6.	Interface modules	Must support minimum 2* 10G Port with necessary SFP+ Modules. Must have capability to interface with variety interfaces.		
7.	Protocol Support	Must have support for TCP/IP, PPP		

		Must support IPSEC VPN Must have support for integration of data and voice services Routing protocols of RIP, OSPF, and BGP. Support IPV4 & IPV6		
8.	Manageability	Must be SNMP manageable		
9.	Scalable	• The router should be scalable. For each slot multiple modules should be available. • The chassis offered must have free slots to meet the scalability requirement of expansion of the project in the future.		
10.	Traffic control	Traffic Control and Filtering features for flexible user control policies		
11.	Bandwidth	Bandwidth on demand for cost effective connection performance enhancement		
12.	Remote Access	Remote access features		
13.	Redundancy	• Redundancy in terms of Power supply(s). Power supply should be able to support fully loaded chassis • All interface modules, power supplies should be hot-swappable		
14.	Security	• MD5 encryption for routing protocol • NAT • URL based Filtering • RADIUS		

		Authentication • Management Access policy • IPSec / Encryption L2TP		
15.	QOS Features	• RSVP • Priority Queuing • Policy based routing • Traffic shaping • Time-based QoS Policy • Bandwidth Reservation / Committed Information Rate		

10.9.8 Video Wall Cubes in 2 X 2 matrix(LED)

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	Make	<to be provided by the bidder>		
2.	Model	<to be provided by the bidder>		
3.	Configuration	Seamless Video wall of DLP Cubes. Each cube size to be 72" (72 Inches diagonally) or more with complete configuration of (2 cubes x 2 cubes) with covered base. All cubes have to be of the exactly same size, configuration and model wise mandatorily. The wall to be installed in curved fashion with all required support system like Controller / stand for DLP Cubes / Interfaces / Connecting cables.		
4.	Operation	24 X 7 : The Video Walls & Controllers and all support systems should be capable of working in 24 x 7 mode without any deterioration in		

		the performance		
5.	Chip Type	1-chip 0.95" Digital Micro Mirror Device		
6.	Resolution	1920 x 1200 native (WUXGA Display)		
7.	Light Source Type	LED light source with separate LED array for each colour (RGB)		
8.	Brightness ANSI	Minimum 700 Lumens		
9.	Brightness Uniformity	≥ 90 %		
10.	Dynamic Contrast	1400000:1 or more		
11.	Redundant Dual Power Supply	Cube should be equipped with a built in dual redundant power supply		
12.	Hot Swappable Power Suply	The inbuilt power supply should be hot swappable		
13.	Control	IP based control to be provided		
14.	Remote	IR remote control should also be provided for quick access		
15.	Screen to Screen Gap	≤ 0.3 mm		
16.	Screen Support	Screen should have an anti reflective glass backing to prevent bulging		
17.	Cooling Inside Cube	By Means of a heat pipe. No liquid cooling.		
18.	Cube Depth	740mm or less		
19.	Maintenance Access	Rear		
20.	Inputs in the Cube	DVI-2, HDMI-1, HDbaseT-1, Display port-1		
21.	Output in Cube	DVI – 1		
22.	Cube control & Monitoring	Video wall should have cube control & monitoring system		

		which can provide video wall status including source, light source, temperature, fan & power information. The system should be based on web-browser architecture. Should be able to provide an error message in three sections: a) Problem area b) Error Module Location c) Error Module Image		

10.9.9 Video wall controller with wall management software

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	Make	<to be provided by the bidder>		
2.	Model	<to be provided by the bidder>		
3.	Display controller	Controller to control Video Walls in a matrix of 5 x 2 with 16 DVI outputs (for future expansion) , 4 Universal inputs & DUAL LAN INPUTS along with necessary software's		
4.	Processor	Single Quad Core Intel® Xeon/i7 64-bit 2.0 GHz CPU or better		
5.	RAM	8GB		
6.	HDD	500 GB Hard Disk		
		Hard disk Capacity should be upgradable		
7.	RAID	* RAID 0 configured with usable space of 500 GB in each controller		
8.	Networking	* Dual-port Gigabit Ethernet Controller inbuilt		
		* Support for Add on Network adapters		
		* Support for Optical Fiber		

		interface Adapters		
9.	Accessories	DVD-R,DVD+RW,, Keyboard, mouse		
10.	OS	* Supports 64-bit Operating Systems Windows 7		
11.	Power Supply	(1 + 1) Redundant AC-DC high-efficiency power supply w/ PFC		
		* AC Voltage 100 - 240V, 50-60Hz		
12.	Chassis	* 19" industrial Rack mount movable		
		Front Panel should have lockable Door to Protect Drives		
13.	System Reliability	* Operating Temperature range : 10° to 35°C (50° to 95°F)		
		* Non-operating Temperature range : -40° to 70°C (-40° to 158°F)		
		* Operating Relative Humidity rnge : 8% to 90% (non-condensing)		
		* Humidity: 10 – 90% non-condensing		
		* Non-operating Relative Humidity: 5 to 95% (non-condensing)		
14.	Wall configuration	16 DVI-D Outputs		
15.	Resolution	1920x1200 per output minimum (WUXGA)		
16.	Universal Inputs	8 Universal Inputs (Should be able to accept at least 4 kinds of signals i.e. DVI/RGB/Component Video) along with USB 3.0		

17.	Redundancy Support	System Should have the redundancy support for Controller HDD, power supply & LAN (Gigabit Ethernet RJ-45 connection)		
18.	Connectivity	Connectivity between the controller & Video wall should be on Optical Fiber cables only.		
19.	Video Wall, Controller, Cube & wall management	Video Wall, Controller, Cube & Wall management software should be from same OEM for ensuring smooth operations and seamless integration and feature enablement and enhancement. All licenses of the software supplied with Controller and Video Wall should be with perpetual license and cost of the same should be included in the quoted cost.		
20.	Controller configuration	Two controllers should be provided which can act as backup to each other i.e. a single controller should be able to drive all the cubes of both the video walls.		
21.	Video Wall stand	Video Wall should be mounted on stand with minimum height of 750 mm (two and half feet) with flexibility of 50 mm height		
22.	Warranty	Comprehensive onsite warranty on the DLP video		

		wall and Controller for 5 years		

10.9.10 Operator Workstations with two monitors

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Processor	Latest generation 64bit X86 Quad core processor(3Ghz) or better		
4.	Chipset	Latest series 64bit Chipset		
5.	Motherboard	OEM Motherboard		
6.	RAM	Minimum 8 GB DDR3 ECC Memory @ 1600 Mhz. Slots should be free for future upgrade. Minimum 4 DIMM slots, supporting up to 32GB ECC		
7.	Graphics card	Minimum Graphics card with 2 GB video memory (non- shared)		
8.	HDD	2 TB SATA-3 Hard drive @7200 rpm with Flash Cache of 64GB SSD. Provision for installing 4 more drives.		
9.	Media Drive	NO CD / DVD Drive		
10.	Network interface	10/100/1000 Mbps autosensing on board integrated RJ-45 Ethernet port.		
11.	Audio	Line/Mic IN, Line-		

		out/Spr Out (3.5 mm)		
12.	Ports	Minimum 6 USB ports (out of that 2 in front)		
13.	Keyboard	104 keys minimum OEM keyboard		
14.	Mouse	2 button optical scroll mouse (USB)		
15.	PTZ joystick controller *(with 2 of the workstations in SCOC)*	• PTZ speed dome control for IP cameras • Minimum 10 programmable buttons • Multi-camera operations • Compatible with all the camera models offered in the solution • Compatible with VMS /Monitoring software offered		
16.	Monitor	Two Monitors of 22" TFT LED monitor, Minimum 1920 x 1080 resolution, 5 ms or better response time, TCO 05 (or higher) certified. The TFT Monitor, CPU, Mouse and keyboard workstation shall be of same make.		
17.	Certification	Energy star 5.0/BEE star certified		
18.	Operating System	64 bit pre-loaded OS with recovery disc		
19.	Security	BIOS controlled electro-mechanical internal chassis lock for the system.		
20.	Antivirus feature	Advanced antivirus, antispyware, desktop		

		firewall, intrusion prevention (comprising of a single, deployable agent) which can be managed by a central server. (Support, updates, patches and errata for the entire contract/ project period)		
21.	Power supply	SMPS; Minimum 400-watt Continuous Power Supply with Full ranging input and APFC. Power supply should be 90% efficient with EPEAT Gold certification for the system.		

10.9.11 IP Phone Specifications:

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		

2.	**Model**	<to be provided by the bidder>		
3.	Display	2 line or more, Monochrome display for viewing features like messages, directory etc.		
4.	Integral switch	10/100 mbps for a direct connection to a 10/100BASE-T Ethernet network through an RJ-45 interface		
5.	Speaker Phone	Yes		
6.	Head set	Port for Head set (Headset also to be provided)		
7.	VoIP Protocol	SIP V2		
8.	PoE	IEEE 802.3af or better		
9.	Supported Protocols	SNMP, DHCP, DNS		
10.	Codecs	G.711, G.722 including handset and speakerphone		
11.	Speaker Phone	Full duplex speaker phone with echo cancellation Speaker on/ off button, microphone mute		
12.	Volume control	Easy decibel level adjustment for speaker phone, handset and ringer		
13.	Phonebook/Address book	Minimum 100 contacts		
14.	Call Logs	Access to missed, received, and placed calls. (Minimum 20 overall)		
15.	Clock	Time and Date on display		

16.	Ringer	Selectable Ringer tone		
17.	Directory Access	LDAP standard directory		

10.9.12 Electrical and power cabling

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)
1.	Standards	All electrical components shall be design manufactured and tested in accordance with relevant Indian standards IEC's	

10.9.13 Fire & Smoke Detection System

#	Description	Bidder Compliance (Yes/No)
A.	**System Description**	
1	The Fire alarm system shall be an automatic 1 ton (e.g. 8) zone single loop addressable fire detection and alarm system, utilizing conventional detection and alarm sounders.	
2	Detection shall be by means of automatic heat and smoke detectors located throughout the Control Room (ceiling, false floor and other appropriate areas where fire can take place) with break glass units on escape routes and exits.	
B.	**Control and Indicating Component**	
1	The control panel shall be a microprocessor based single loop addressable unit, designed and manufactured to the requirements of EN54 Part 2 for the control and indicating component and EN54 Part 4 for the internal power supply.	
2	All controls of the system shall be via the control panel only.	

3	The system status shall be made available via panel mounted LEDs and a backlit 8 line x 40-character alphanumeric liquid crystal display.	
4	All system controls and programming will be accessed via an alphanumeric keypad. The control panel will incorporate form fill menu driven fields for data entry and retrieval.	
5	The system will include a detection verification feature. The user shall have the option to action a time response to a fire condition. This time shall be programmable up to 10 minutes to allow for investigation of the fire condition before activating alarm outputs. The operation of a manual call point shall override any verify command.	
C.	**Manual Controls**	
1	Start sounders	
2	Silence sounders	
3	Reset system	
4	Cancel fault buzzer	
5	Display test	
6	Delay sounder operation	
7	Verify fire condition	
8	Disable loop	
D.	**Smoke detectors**	
1	Smoke detectors shall be of the optical or ionisation type. Devices shall be compatible with the CIE conforming to the requirements of EN54 Part 7 and be LPCB approved. The detectors shall have twin LEDs to indicate the device has operated and shall fit a common addressable base.	
2	Heat detectors	
3	Heat detectors shall be of the fixed temperature (58° C) or rate of temperature rise type with a fixed temperature operating point.	
4	Devices shall be compatible with the CIE conforming to the requirements of EN54 Part 5 and be LPCB approved.	

5	The detectors shall have a single LED to indicate the device has operated and shall fit a common addressable base.	
E.	**Addressable detector bases**	
1	All bases shall be compatible with the type of detector heads fitted and the control system component used. Each base shall comprise all necessary electronics including a short circuit isolator.	
2	The device shall be automatically addressed by the CIE on power up of the loop without the need of the insertion of a pre-programmed EPROM or setting of DIL switches.	
3	Detector bases shall fit onto an industry standard conduit box.	
F.	**Audible Alarms**	
1	Electronic sounders shall be coloured red with adjustable sound outputs and at least 3 sound signals. The sounders should be suitable for operation with a 24V DC supply providing a sound output of at least 100dBA at 1 meter and 75 dBA min, for a bed head or sounder base type device. The sounder frequency shall be in the range of 500Hz to 1000Hz.	
G.	**Commissioning**	
1	The fire detection and alarm system will be programmable and configurable via an alpha numeric keypad on the control panel.	

10.9.14 Fixed Dome Cameras

#	Parameter	Minimum Specifications or better	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Video Compression	H.264		
4.	Video Resolution	1920 X 1080		
5.	Frame rate	Min. 25 fps		
6.	Image Sensor	1/3" Progressive Scan CCD / CMOS		
7.	Lens Type	Varifocal, IR Correction Full HD		

		lens compatible to camera imager		
8.	Lens#	Auto IRIS 2.8-10mm		
9.	Multiple Streams	Dual streaming with 2nd stream at minimum 720P at 30fps at H.264 individually configurable		
10.	Minimum Illumination	Colour: 0.1 lux, B/W: 0.01 lux (at 30 IRE)		
11.	IR Cut Filter	Automatically Removable IR-cut filter		
12.	Day/Night Mode	Colour, Mono, Auto		
13.	S/N Ratio	≥ 50 dB		
14.	Auto adjustment + Remote Control of Image settings	Colour, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Gain Control, Auto back focus		
15.	Wide Dynamic Range	True WDR upto 80 db		
16.	Audio	Full duplex, line in and line out, G.711, G.726		
17.	Local storage	Local storage- Minimum 32 GB Memory card in a Memory card slot. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is		

		restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.		
18.	Protocol	HTTP, HTTPS, FTP, RTSP, RTP, TCP, UDP, RTCP, DHCP, ONVIF Profile S &G		
19.	Security	Password Protection, IP Address filtering, User Access Log, HTTPS encryption		
20.	Intelligent Video	Motion Detection & Tampering alert		
21.	Alarm I/O	Minimum 1 Input & Output contact for 3rd part interface		
22.	Operating conditions	0 to 50°C		
23.	Casing	NEMA 4X / IP-66 rated & IK 10		
24.	Certification	UL/EN, CE,FCC		
25.	Power	802.3af PoE (Class 0) and 12VDC/24AC		

11 Annexure -1: Common guidelines/comments regarding the compliance of equipment/systems

1. The specifications mentioned for various IT / Non-IT components are indicative requirements and should be treated for benchmarking purpose only. Bidders are required to undertake their own requirement analysis and may propose higher specifications that are better suited to the requirements.

2. Any manufacturer and product name mentioned in the Tender should not be treated as a recommendation of the manufacturer / product.

3. None of the IT / Non-IT equipment's proposed by the Bidder should be End of Life product. It is essential that the technical proposal is accompanied by the OEM certificate in the format given in Section 8.2.9 of this Tender, where-in the OEM will certify that the product is not end of life & shall support for at least 5 years from the date of Bid Submission.

4. Technical Bid should be accompanied by OEM's product brochure / datasheet. Bidders should provide complete make, model, part numbers and sub-part numbers for all equipment/software quoted, in the Technical Bid.

5. Bidders should ensure complete warranty and support for all equipment from OEMs. All the back-to-back service agreements should be submitted along with the Technical Bid.

6. All equipment, parts should be original and new.

7. The user interface of the system should be a user friendly Graphical User Interface (GUI).

8. Critical core components of the system should not have any requirements to have proprietary platforms and should conform to open standards.

9. For custom made modules, industry standards and norms should be adhered to for coding during application development to make debugging and maintenance easier. Object oriented programming methodology must be followed to facilitate sharing, componentizing and multiple-use of standard code. Before hosting the application, it shall be subjected to application security audit (by any of the CERTIN empanelled vendors) to ensure that the application is free from any vulnerability; and approved by Owner.

10. All the Clients Machines / Servers shall support static assigned IP addresses or shall obtain IP addresses from a DNS/DHCP server.

11. The Successful Bidder should also propose the specifications of any additional hardware/Non IT infrastructure, if required for the system.

12. The design consideration of the system is given in this RFP. The Successful Bidder must provide the architecture of the solution it is proposing.

13. SI is required to ensure that there is no choking point / bottleneck anywhere in the system (end-to-end) and enforce performance and adherence to SLAs. SLA reports must be submitted as specified in the Bid without fail.

14. All the hardware and software supplied should be from the reputed Original Equipment Manufacturers (OEMs).

15. All licenses should be in the name of the BSCDCL and should be Perpetual.

16. The proposed solution of SI should meet the minimum specification requirements for respective component, bidder need to size the solution components to meet the project requirement. In case any of the system / appliance could not meet the performance requirement during the implementation

testing or operations phase, SI will be responsible to change the same with equivalent/better product without any additional cost to BSCDCL

17. All components to be maintained in redundancy with Active - Active / Active- Passive Clustering based on the SLA requirements, architecture and performance. Bidder need to provide the compliance with respect to each clause and clear reference-able document, highlighting how the stated requirement is being met. All components should be sized to meet the required performance and SLA level when one of the redundant devices is down.

18. The proposed solution should be optimized for power, bandwidth while ensuring high availability and no single point of failure across the architecture.

19. The proposed systems and IT Infrastructure components like network etc. should be of enterprise class and must be current as per OEMs latest offering, in line with advancements of technology in these domains. Bidder need to provide the published benchmarks for the stated systems along with the sizing assessment sheet being certified by the OEM for the stated systems. All the components should be able to handle expected loads and provision the desired transaction times and throughputs.

20. The database layer should utilize the database servers for consolidating the database requirements. The architecture should have horizontal scalability. Benefits/additional security, reliability, availability features at the server level architecture would be given due consideration during evaluation

21. Redundancies/teaming should be maintained at different interconnecting fabrics so as to avoid any single point of failure / performance bottleneck

22. Networking equipment should be capable of processing IPV4 & IPV6 traffic. Security features that are delivered shall be IP v 6 ready.

23. All devices should be IPv4 and IPv6 ready from day-1. SI shall deploy IPv4 and IPV6 dual stack supported network from day-1. The proposed solution and all appliances should meet this requirement. The SI shall also be responsible for security adherence on both IPv4 and IPv6.

24. Scalability

The component in the architecture will be capable of being scaled up to more user requests or handling more no. of input resources in various modules. Even inclusion of additional application functionalities can be catered to by upgrading the software editions with minimal effort.

The design of the system to consider future proofing the systems for volume handling requirements

- The application functions to be divided logically and developed as Modular solution.
- The system should be able to scale horizontally & vertically.
- ***User Base -*** Must support One Thousand users (knowledge workers) with projected growth of 10 %/year. Concurrent users at peak time may be assumed to be at 20 Internal and 2000 external concurrent users. The design of the Solution should be scalable to handle increasing number of users.

- ***Data Volume-*** Ability to support 20 % projected volume growth in content post system implementation & content migration.
- ***Functionality*** – Ability to extend functionality of the solution without significant impact to the existing functional components and infrastructure.
- **Loose coupling through layered modular design and messaging** - The architecture would promote modular design and layered approach with clear division of responsibility and separation of concerns at the data storage, service and integration layer in order to achieve desired interoperability without any affinity to platforms, programming languages and network technologies. The architecture has to be scalable, maintainable and flexible for modular expansion as more citizen and business services are provided through the Smart City system. Each of the logical layers would be loosely coupled with its adjacent layers
- **Data partitioning and parallel processing** - Smart City system functionality naturally lends itself for massive parallel and distributed system. For linear scaling, it is essential that entire system is architected to work in parallel within and across machines with appropriate data and system partitioning. Choice of appropriate data sources such as RDBMS, Hadoop, NoSQL data stores, distributed file systems; etc. must be made to ensure there is absolutely no "single point of bottleneck" in the entire system including at the database and system level to scale linearly using commodity hardware.
- **Horizontal scale for compute, Network and storage** – Smart City system architecture must be such that all components including compute, network and storage must scale horizontally to ensure that additional resources (compute, storage, network etc.) can be added as and when needed to achieve required scale.

27. Reliability

This is a very crucial system and data are of high sensitivity, the data transfer and data management should be reliable to keep the confidence of the stakeholders. The system should have appropriate measures to ensure processing reliability for the data received or accessed through the application.

It may be necessary to mainly ensure the following

- Prevent processing of duplicate incoming files/data
- Unauthorized alteration to the Data uploaded in the system should be prevented
- Ensure minimum data loss(expected zero data loss)

12 Annexure- 2 Details of Pumping Stations

S No.	Item	Unit	ANSAL BHAVAN ESR		PRATRAKAR BHAVAN ESR		VETERINARY HOSPITAL ESR		EIDGAH ESR		MANAV SANGRAHALAYA ESR		Ahmadpur	
			AT ESR Site		AT 5 MGD WTP GSR		At Arera Hills Vidhan Bhavan GSR		At Eidgah Hills WTP		at UC Reservoir (Proposed GSR At 5 mgd Plant		Pumping Station	
			Middle	**Ultimate**	**Middle**	**Ultimate**	**Middle**	**Ultimate**	**Middle**	**Ultimate**	**Middle**	**Ultimate**	**Middle**	
1	Static Head													
1.1	Lower RL of GSR		596.65	596.18	559.18	559.18	554.7	554.7	567	567	546	546	471.8	
1.2	Pumping RL of GSR		623.15	623.15	566.34	566.34	561.65	561.65	587.5	587.5	575.6	575.6	546.8	HGL Reqd. at pumping station
1.3	Total Static Lift	M	26.5	26.5	7.16	7.16	6.95	6.95	20.5	20.5	29.6	29.6		
2	Size of RM	mm	250	250	400	400	350	350	200	200	350	350		
3	Flow	mld	**3.88**	5.7	**10.66**	15.66	**8.18**	12.03	**3.6**	8.9	**7.75**	11.39	45	
3.1	Flow	lps	46.86	68.84	128.74	189.13	98.79	145.29	62.5	107.49	93.6	137.56	543.48	
3.2	Flow	m3	168.7	247.83	463.48	680.87	355.65	523.04	225	386.96	336.96	495.22	6563	

		/ hr										.75	
4	Length Of RM	M	50	50	1270	1270	670	670	150	150	2200	2200		
5	Coefficient of Roughness C		140	140	140	140	140	140	140	140	140	140	140	
6	RM friction losses including 10% extra for bends etc	M	0.19	0.38	3.12	6.35	1.93	3.94	2.83	7.71	5.74	11.7		
7	Friction losses inside pump house	M	2	2	2	2	2	2	2	2	2	2		
8	Residual Head (Assumed)	M	5	5	5	5	5	5	5	5	5	5		
9	Total Head	M	33.69	33.88	17.28	20.51	15.88	17.89	30.33	35.21	42.34	48.3		
10	**Recommended Head***	**M**	**34**	**34**	**22**	**21**	**16**	**18**	**31**	**36**	**43**	**49**	**75**	
11	**Recommended discharge**	**lps**	**47**	**69**	**129**	**190**	**99**	**146**	**63**	**108**	**94**	**138**	**280**	Per Pump

S No.	Item	Unit	ANSAL BHAVAN ESR	PRATRAKAR BHAVAN ESR	VETERINARY HOSPITAL ESR	EIDGAH ESR	MANAV SANGRAHALAYA ESR	Ahmadpur

			AT ESR Site		AT 5 MGD WTP GSR		At Arera Hills Vidhan Bhavan GSR		At Eidgah Hills WTP		at UC Reservoir (Proposed GSR At 5 mgd Plant		Pumping Station
Motor Voltage			**LT**	**440 V**	**HT**	**440 V**	**HT**	**440 V**	**11 KV**	**440 V**	**HT**	**440 V**	**33 KV / 440 V**
Motor & Pipe Diameter (Inlet & Outlet)			**2 Motor75 HP**	**Outlet 400 mm Inlet 300 mm**	**2 Motor75 HP**	**Outlet 300 mm Inlet 300 mm**					**2 Motor75 HP**	**Outlet 400 mm Inlet 300 mm**	

13 Annexure- 3 Details of Water Treatment Plant

S.No.	Name	Present capacity of WTP(in MGD)	Note on actual capacity to be used for Upper Lake WTP after zoning of three sources (Narmada,Kolar and upper Lake)	Capacity to be used as per zoning (year 2030) (MGD)	Outlet Details
1	Arera Hill	5	The Arera Hill WTP is already connected with Narmada Feeder from MSBR and as per source zoning only Narmada water will be supplied from this WTP.Hence no Upper Lake water will be required for this WTP	0	2 Outlets with 450mm Dia. 2 Outlets with 300 mm dia. 1 outlet with 400 mm Dia
2	PulPokhta	3	the Pulpokhta WTP is already connected with Kolar water and as per source zoning only Kolar water will be supplied in Arera under this WTP.Hence no Upper Lake water will be required for this WTP	0	
3	BadaMahal	1	This WTP is considered for further supply to Medical College over Head Tanks	1	
4	Idgah Hill	5	Total 8 MGD water will be required for year 2030 & 12 MGD will be required for the year 2045 from Upper Lake	8	
5	Bairagarh No.1	1	Existing WTPs will work at same capacities.Existing 3 MGD + proposed 3 MGD WTP will fulfil the water requirement for year 2030 from Upper lake	1	
6	Bairagarh No.2	2		5	

7	Shymla Hills/Yatch Club No. 1	4.5	This WTP is already connected with Kolar and Narmada Feeder.Hence no Upper Lake water will be required for this WTP	0	2 Outlet with 450 mm Dia. 1 Outlet with 300 mm Dia.
8	Shymla Hills/Yatch Club No. 2	2	This WTP is already connected with Kolar and Narmada Feeder.Hence no Upper Lake water will be required for this WTP	0	1 Outlet with 400 mm Dia. 1 Outlet with 300 mm Dia.
9	BHEL Filter Plant (Capacity 12 MGD)	6	The BHEL WTP is already connected with Narmada Feeder from MBSR and as per source zoning only Narmada water will be supplied from this WTP.Hence no Upper Lake water will required for this WTP	0	
10	Bhauri Water Supply Scheme	0	New Scheme Proposed for supply water to Bhauri Area	0	
11	Proposed WTP at Mahavirgiri		**For Northen Part of New Bhopal City**	2	
12	Kerwa Dam	6			
Total	**MGD**	**29.5**		**11**	
				28	

14 Annexure- 4 Details of ESRs

ESR-1:

S.No.	Name of the ESR	Capacity (KL)	Staging (Meter)	Diameter of pipe		Diameter of Electromagnetic flowmeter
				Inlet (MM)	Outlet (MM)	
1	Suraj Nagar	500	15	200	200	100
2	Gore gaon	1000	15	300	350	125
3	Barkhedikala	1500	15	300	350	150
4	Kokta Anand Nagar	2500	20	400	500	200
5	Govt.Middile school Tilajamalpura	500	18	200	200	100
6	Wahidya school ground Hamidiya hospital	1500	18	300	350	150
7	Green park colony	1550	20	300	350	150
8	In front of housing board office sector j	2000	20	350	400	200
9	Gandhi medical collage Lokayukt office	1750	20	300	350	200
10	Ram Nagar (Model school ground Shahjahanabad Putlighar)	2000	20	350	400	200
11	Near T.T. stadium	500	18	200	200	100
12	Behind Jone 8 office	2000	20	350	400	200
13	Manav sanghralay	2000	18	350	400	200
14	Choikse Nagar	2225	20	350	400	200

S.No.	Name of the ESR	Capacity	Staging	Diameter of pipe		Diameter of Electromagn
	(Indra Sahayta Nagar)					
15	Open land in shanti Nagar	2400	20	350	400	200
16	Near Akhil Bhartiya Raghuvanshi Mahasabha office	3000	20	400	500	250
17	Hariom basti	1000	18	300	350	150
18	Singar Chouli (Airport)	1500	20	350	400	150
19	Meera mandir	2500	GSR	350	400	200
20	One Tree hill	2500	GSR	350	400	200
21	Old OHT campus, Charimli	1550	18	300	350	200
22	In front of Block 89 Vyamshala Tulsi Nagar	2000	18	300	350	200
23	M.P. Nagar	1000	20	250	300	150
24	Gautam Bhudha Math	1400	20	300	350	150
25	Patrakar Bhavan	2754	20	400	500	250
26	Behind Narmada Bhavan	1100	20	300	300	150
27	1100 Quarter	2000	20	350	400	200
28	Rajendra Nagar	2000	20	350	400	200
29	Shabri Nagar	1500	20	350	400	200
30	Govindpura Industrial Area	2000	18	350	400	200
31	Abhiruchi Parisar, Old Subhash Nagar	500	18	200	250	100
32	Galla Mandi	1000	18	300	350	150
33	Veternary Hospital	2115	20	350	400	200

S.No.	Name of the ESR	Capacity	Staging	Diameter of pipe		Diameter of Electromagn
	Ground , Jahangirabad					
34	Rashidiya School Barkhedi	1750	18	300	350	200
35	Housing Board colony Ashbag	2370	20	350	400	250
36	Janta Quarter , Ashbag	2150	20	350	400	200
37	Barkheda Pathani	1800	20	300	350	200
38	Bal Vihar Garden , Chandbad	2000	20	350	400	200
39	Ashoka Garden	1000	20	300	350	150
40	Ratnagiri	1400	20	300	350	150
41	Bharat Nagar	3000	20	500	600	250
42	Semra Rajiv Nagar	2750	20	500	600	250
43	Open land infront of Shhahpura Police Station	400	20	200	250	100
44	Near Misrod Thana	700	20	250	300	125
45	Amarwada Khurd Housing Board Park campus	900	18	300	350	125
46	Bag sevaniya near Durga Mandir	1000	18	300	350	150
47	Infront of Sai Nagar gate	1200	20	300	350	150
48	Ward No.57 ground	1325	20	300	350	200
49	Damkheda School Ground	1150	18	300	350	150
50	Idgah near cancer Hospital	1600	20	350	400	200
51	Pinjumal Dharmshala	1600	18	350	400	200

S.No.	Name of the ESR	Capacity	Staging	Diameter of pipe		Diameter of Electromagn
52	Mufti sahab Kabristan Sahajahanadad	2000	20	350	400	200
53	Sharda Nagar Ground Narial Kheda	3350	20	500	600	250
54	Anshal Apartment	1000	18	300	350	150
55	Nayapura Near gwal baba ka chabutra	1000	18	300	350	150
56	Rohit Nagar phase-1	2000	20	350	400	200
57	4.5 MGD Plant	5000	GSR	600	600	350
58	Indrapuri Sector B	1000	20	300	350	150
59	Sonagiri Sector C	1000	20	300	350	150
60	Samanvay Nagar Garden	1550	18	350	400	200
61	Traffik Park	1900	20	350	400	200
62	Viklang Punarwas Kendra	2000	20	350	350	200
63	Jaatkhedi	3000	20	500	600	N.A.

ESR-2

S.No.	Name of the ESR	Capacity	Staging	Dia of pipe		Diameter of Electromagnetic flowmeter
				Inlet (MM)	Outlet (MM)	
1	School Ground Gandhinagar	1000	12	300	N.A.	150
2	C.T.O.	1000	18	300	N.A.	150
3	Vijay nagar - New	1000	18	300	N.A.	150

S.N	Name of the	Capacit	Stagin	Dia of pipe		Diameter of
	Ward office					
4	Nehru Park Near Zonal office	1000	12	300	N.A.	150
5	One Tree hill GSR	1300	GSR	300	N.A.	150
6	Khanoogaon	227	N.A.	200	N.A.	80
7	BDA Kohefiza	277	N.A.	200	N.A.	80
8	N.R.I. Amdabad OHT	454	N.A.	150	N.A.	100
9	H.B. Kohefiza	227	N.A.	200	N.A.	80
10	Hamidia Hospital	1362	N.A.	150	N.A.	150
11	New VIP Guest House	227	N.A.	200	N.A.	80
12	Old Reservoir Amdabad	182	N.A.	200	N.A.	80
13	Idgah Hill OHT	908	N.A.	100	N.A.	125
14	S tank Neelkanth Nagar	227	N.A.	100	N.A.	80
15	Bhagat Singh Park	227	N.A.	300	N.A.	80
16	S.Bad OHT	2270	N.A.	100	N.A.	200
17	Sanjay Nagar, Ram Nagar Old	227	N.A.	100	N.A.	80
18	Sanjay Nagar S.Tank	227	N.A.	100	N.A.	80
19	Sanjay Nagr New S. Tank	136	N.A.	200	N.A.	50

S.N	Name of the	Capacit	Stagin	Dia of pipe		Diameter of
20	Resham Kundra Nariyal Kheda	450	20	200	N.A.	100
21	BDA Teela Jamalpura	1350	20	200	N.A.	150
22	Congress Nagar	450	20	200	N.A.	100
23	J.P. Nagar	450	20	200	N.A.	100
24	Arif Nagar	450	20	200	N.A.	100
25	PGBT Tank	1350	20	200	N.A.	150
26	Bag Munshi hussain Khan	450	18	200	N.A.	100
27	Putli Ghar	450	18	200	N.A.	100
28	Putli Ghar	225	GSR	200	N.A.	80
29	Shakti Nagar	112.5	15	100	N.A.	50
30	Ginnori OHT	900	18	300	N.A.	125
31	Goal Reservoir	22500	N.A.	350	N.A.	350
32	Ansal Reservoir 1	22500	N.A.	300	N.A.	300
33	Ansal Reservoir 1	22500	N.A.	400	N.A.	400
34	Kotra OHT (New)	2250	N.A.	300	N.A.	200
35	Platinum Plaza OHT	2250	N.A.	300	N.A.	200
36	Nehru Nagar OHT	2250	N.A.	300	N.A.	200
37	MACT GSR/Sump	3405	N.A.	500	N.A.	250
38	Jawahar Chauk	900	15	300	N.A.	125
39	Saraswati Nagar	450	15	150	N.A.	100

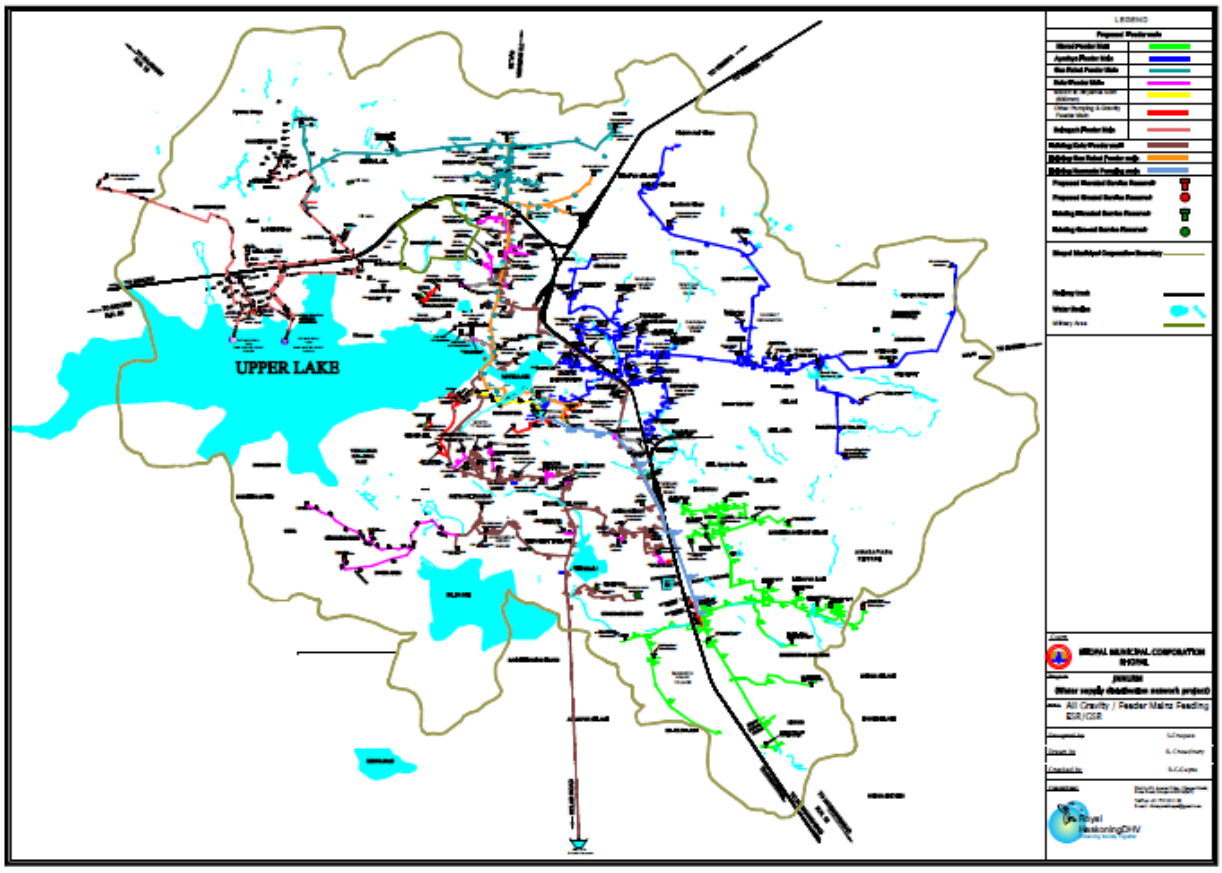
S.N	Name of the	Capacit	Stagin	Dia of pipe		Diameter of
40	Mandi Tank	227	N.A.	250	N.A.	80
41	Slater House	227	N.A.	200	N.A.	80
42	New Subhash Nagar	227	N.A.	200	N.A.	80
43	Subhash Nagar Tank 2	341	N.A.	250	N.A.	80
44	Padmanabh Nagar Tank	341	18	150	N.A.	80
45	Ashok Vihar	454	N.A.	150	N.A.	100
46	Ashoka Garden	227	N.A.	100	N.A.	80
47	Panjabi Bagh Sump Tank	159	18	150	N.A.	50
48	Mandi Tank	1362	18	250	N.A.	150
49	Subhash Naar	1362	N.A.	300	N.A.	150
50	Chand Bad	500	N.A.	300	N.A.	100
51	Naveen Nagar	900	N.A.	300	N.A.	125
52	Char Imli OHT	908	N.A.	300	N.A.	125
53	Bagheera OHT	908	N.A.	250	N.A.	125
54	E-2 Arera Colony sump Tank	908	N.A.	300	N.A.	125
55	E6 Arera Colony	1362	15	300	N.A.	150
56	Janta Tank	1362	18	300	N.A.	150

S.N	Name of the	Capacit	Stagin	Dia of pipe		Diameter of
57	Shahpura Hills 2	454	N.A.	200	N.A.	100
58	Shahpura Chhawani	2043	GSR	400	N.A.	200
59	Saket Nagar	681	18	200	N.A.	125
60	Shakti Nagar OHT	454	15	200	N.A.	100
61	Panchwati OHT	227	15	150	N.A.	80
62	Gautam Nagar OHT	1362	18	300	N.A.	150
63	Kasturba Nagar	113.5	GSR	150	N.A.	50
64	Kasturba Nagar	227	GSR	150	N.A.	80
65	Viklang Punarwas	2000	N.A.	350	N.A.	200
66	Kokta Anand Nagar Patel	2500	N.A.	500	N.A.	200
67	Ratnagiri Sump	1400	N.A.	350	N.A.	150
68	Sonagiri Sector B	1000	N.A.	350	N.A.	150
69	Hathai Khera	900	N.A.	200	N.A.	125
70	Sonagiri OHT Sector B	300	N.A.	100	N.A.	80
71	Bharat Nagar Ground	3000	N.A.	500	N.A.	250
72	Indrapuri Sector B	1000	N.A.	350	N.A.	150
73	Indrapuri OHT-1	300	N.A.	150	N.A.	80
74	Sonagiri Sector A	300	N.A.	150	N.A.	80

S.N	Name of the	Capacit	Stagin	Dia of pipe		Diameter of
75	Housing Board office	2000	N.A.	400	N.A.	200
76	Atal Nehru Nagar (New)	1000	18	300	N.A.	150
77	Shabri Nagar (Old)	200	16	100	N.A.	80
78	Housing Park (Old)	200	16	100	N.A.	80
79	Gas Rahat 1300 Quarter (White Quarter) (old)	200	15	100	N.A.	80
80	Chandbadi (New)	1000	18	300	N.A.	150
81	Bluemoon (New)	1000	18	300	N.A.	150
82	Karond Squre (New)	1000	15	300	N.A.	150
83	Gas Rahat Near (D.W.) (Old)	225	15	150	N.A.	80
84	Rasuli Near ward office	200	15	150	N.A.	80

15 Annexure- 5 Water Supply Network

(This diagram has been provided for reference. The actual layout can be provided to the Bidder, whenever he requires during the bidding period.)


UPPER LAKE