

Terms of Reference

for

**Supply, installation, testing, commissioning and
operation maintenance services of the online
continuous sensors with data logger and telemetry for
groundwater monitoring at the selected schools of
Nagpur Municipal Corporation, Nagpur, Maharashtra**

under

**‘Accelerating climate action through the promotion of Urban
Low Emission Development Strategies (Urban-LEDS II)’**

**ICLEI South Asia,
New Delhi, India**

**Tender Reference no.: ICLEI/Urban LEDS II/Nagpur/2021-22 Date:
27/09/2021**

UN-HABITAT

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European Union. The views
expressed on this document
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reflect the official opinion of
the European Union.



About the project:

The Nagpur Municipal Corporation and the Nagpur Smart and Sustainable City Development Corporation Limited (NSSCDCL), with support from ICLEI-Local Governments for Sustainability, South Asia (ICLEI South Asia) and UN-Habitat are implementing a project on 'Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban-LEDs II)' in Nagpur funded by European Commission. This project aims to reduce greenhouse gas emissions and support the climate actions at local level by the promotion of Urban Low Emission Development Strategies (Urban LED) in cities/towns of emerging economies (Brazil, Colombia, India, Indonesia and South Africa) and Least Developed Countries (Bangladesh, Lao PDR and Rwanda). This objective is aligned with the implementation of the Paris Agreement under the UNFCCC.

Background

Nagpur city spatially covers an area of 217.10 sq.km and accommodates population of 2.4 million (as of the 2011 census). The city receives average annual rainfall of 1161.54 mm. Due to recent socio-economic changes, urban population growth and urbanization have seen spatial expansion within administrative regions demanding more water. In this rapid urban transition scenario faced by Nagpur, the natural and managed public urban green space such as lakes, drainage basins of Nag and Pili River, urban forests, institutional green spaces, parks, playgrounds, and gardens are under tremendous pressure of destruction and degradation in terms of natural recharge allowing percolation of runoff.

With this background, city is interested to use artificial recharge techniques to enhance its ground water level. As a baseline assessment of Nagpur City, the groundwater potential zones have been demarcated and divided into five categories very poor, poor, moderate, high, and very high regions with respect to natural recharge. Also, promoting rainwater harvesting and artificial recharge enhancing ground water table of the city are key issue sought by NSSCDCL and ICLEI South Asia for Nagpur City. ICLEI South Asia has conducted various on-field surveys and tests to assess the potential for augmentation of local water resources through ground water (shallow/ deep) recharge/aquifer recharge and rain water harvesting at Nagpur city and identified potential sites for artificial recharge of ground water. The two NMC owned schools (Sant Kabir School and Netaji Nagar School) located in ABD area of Nagpur Smart City have been selected for the pilot implementation.

The pilot project includes two major components: construction of the groundwater recharge structure (already in progress) and online monitoring of groundwater levels and quality parameters. It is proposed to monitor ground water level and few more quality parameters with the help of IoT based/online sensors with remote communication to develop the data base and assess the impact of rain water harvesting systems in future. For this purpose ICLEI South Asia invites contractors/firms/vendors to bid for the proposed Supply, installation, testing,

commissioning and operation maintenance services of the online continuous sensors for groundwater monitoring at the selected pilot sites.

Details	Timelines
Date of Publishing the RfP on the ICLEI South Asia website	28 th September, 2021
Last date for submission of bid documents	5 th October, 2021
Notification to the successful bidder	8 th October, 2021

Details of the consultancy services:

- A. **Task:** Supply, installation, testing, commissioning and operation maintenance services of the online continuous sensors with data logger and telemetry for groundwater monitoring at the selected schools of Nagpur Municipal Corporation, Nagpur, Maharashtra under the project Urban-LED S II
- B. **Locations:** 1. **Sant Kabir Marathi Primary School**, Dharam Nagar, Bharatwada, Nagpur, Maharashtra 440035, (Google location: <https://goo.gl/maps/cD5tVkbudGHiSVfr5>) and
 2. **Netaji Nagar School** in Nagpur Bharat Nagar Primary School, Neta Ji Nagar, Mangaldeep Colony, Near Sai Mandir, Behind Water Tank, Pardi, Nagpur, Maharashtra 440035 (Google location: <https://goo.gl/maps/8GcqCqW6pHEPRcRj9>)
- C. **Overall Scope of the Work:** Supply, installation, testing, commissioning and operation maintenance services of the online continuous sensors with data logger and remote communication for groundwater monitoring at two (2) ground water recharge sites as a pilot initiative. The system should be capable to monitor ground water level, conductivity and temperature as mandatory parameters along with total suspended solids and pH as optional parameters. The data shall be made available using telemetry and accessible on the user interface using credentials.

D. Site Description:

Sr	Particulars	Sant Kabir School	Netaji Nagar School
1	About the site	The school building is considered for roof top rainwater harvesting. Three borewells are proposed at this premises; pumping well, recharge well and observation well. The	This school consists of two buildings; main building and unutilized building. Both buildings are considered for roof top rainwater harvesting. Two borewells are proposed in the premises; recharge well and observation well, on the

		pumping and recharge wells are proposed on the front side of the school and observation well is proposed on the backside of school.	front side of the school at the distance of 10 meters each. Recharge trenches are also considered in the premises to collect the rainwater runoff from the ground.
2	Type of sensors required	Submersible/CTD probe/equivalent with Barometric Pressure correction for individual sensor	
3	Bore well depth	50 to 75 meters	
4	Bore well application	Observation well within 10 meter radius of recharge well and pumping well	
5	Bore well diameter	150 mm with complete casing	
6	Site Conditions	Range of: Ambient Temperature: -5 °C to 55 °C Humidity: 5 – 90 % Altitude: 0-1500 meter	
7	Range of water column	0 – 100 m	
8	Mounting of data logger	Weather and vandalize proof enclosure with locking arrangements for instrument protection to be mounted on wall /on ground	
9	Power source	Preferred: Battery operated If not grid connected electricity is available from the school building within 60m. In that case bidder should consider enclosing the sensor wire in ½ inch GI pipe under the ground/wall.	
10	Security	Both the schools are located in sparse locality having intermittent security only in a day time	



Sant Kabir School



Netaji Nagar School

E. Detailed Scope of Work:

Selected bidder has to undertake following tasks for both the schools:

Sr	Task	Details
1	Supply, installation, testing and commissioning	Supply and installation of two sets of groundwater monitoring stations at Saint Kabir School and Netaji Nagar School located at Nagpur City for continuous monitoring of ground water level, conductivity and temperature as mandatory parameters along with total suspended solids and pH as optional parameters. This task also includes calibration, data validation and commissioning of the sensors according to local situation. The system should be provided with a suspension bracket , Well enclosure /canopy and junction boxes (if required) allowing secure installation within the Piezometers' headwork, including appropriate cable mounting accessories to allow the sensor to be adjusted to the required depth. All the instruments should be installed at secure place as specified by ICLEI South Asia and NMC/NSSCDCL with appropriate shade with locking



		arrangement, vandalism protection, grounding and lightning protection to be provided locally by the Bidder.
2	Data logging and sharing services	<p>The true / validated data from both the locations shall be transmitted to the Central Server located at command and control centre of Nagpur smart city. The same should be available for remote communication through User Interface (UI) using credentials and data security system.</p> <p>Supplying Software/tool/dashboard/User interface for online visualization of data in real time on time-series plots and providing data storage space on cloud along with data downloading/report generation facility. The bidder must include cost of such facility, recharge of SIM cards/GSM module/license and all other associated cost of data sharing, visualization and report generation for a period of minimum 3 years and ensure seamless functioning during this time.</p>
3	Comprehensive Annual maintenance (CAMC) - Bidder shall be responsible for seamless functioning of the sensors and overall system to showcase data output including replacement of all the consumables	<p>All activities pertaining to installation, data services, operation and maintenance including all the parts/material/instruments of this system shall be maintained by the bidder during the warranty and <u>CAMC period of not less than two (2) years.</u> During this period bidder has to acquire, manage, operate and maintain a data collection, storage and dissemination system to support the seamless functioning.</p> <p>Bidder shall appoint/contract with the local service provider to address the issues and will be responsible for replacing any of the faulty/non functioning part/material/instruments of the system committing seamless operation of the sensors, data loggers, telemetry and data sharing.</p>

F. Technical specifications

Parameter	Specification
General	
Material	Stainless Steel (SS-316) or other better corrosion resistant material
Ingress Protection/environmental rating	1. IP68 with all sensors and cable attached or equivalent 2. Drift-resistant sensors, long-lasting battery power, and corrosion-resistant design support long-deployments. Active and passive antifouling systems would be added benefit.
Reproducibility	0.1% full scale or better
Long terms stability	0.1% Full scale and should ensure long term stability with minimum field calibration requirements
Over-voltage Protection	Should include lightening, over-voltage and surge protection
Mandatory parameters	
Temperature Sensor	
Temperature ranges	Operational: 0 to 50° C
Accuracy & resolution	Accuracy: $\pm 0.1^{\circ}$ C. Resolution: 0.01° C or better
Units of measure	Celsius and Fahrenheit
Level Sensor	
Level Sensor Type	Piezoresistive or equivalent
Burst Pressure	Maximum 2x range; burst > 3x range
Accuracy & resolution	Accuracy: $\pm 0.2\%$ Resolution: 0.005% FS or better
Units of Measure	Pressure: psi, kPa, bar, mbar, mmHg, inHg, cmH ₂ O, inH ₂ O. Level: in, ft, mm, cm, m
Electrical conductivity Sensor	
Range	0 to 100,000 μ S/cm
Accuracy	$\pm 1.0\%$
Resolution	0.1 μ S/cm



Temperature correction	With inbuilt temperature correction
Pressure Rating	Up to 100m
Optional parameters	
Total Suspended Solids (TSS)	
Sensor Type	TSS Probe
Range (mg/L)	10 mm: 0 - 2,000 (mg/L) or as per specifications
Sampling Time (minimum)	10 seconds
Storage Temp.	-20 to 60°C (-4 to 140°F)
pH Measurement	
Range	0-14pH.
Calibration	Simple multipoint calibration
Temperature correction	Internal temperature compensation.
Accuracy	0.1pH
Allied instruments	
Communicator	
Power supply	Preferred: Internal Battery else external grid power 230±10% V AC
Operating temperature	-5 to +50 °C (32 to 122 °F)
Storage temperature	-10 to +60 °C (14 to 140 °F)
Ingress Protection rating	IP65 or equivalent
Battery	
Battery location and availability	The battery should be easy to replace, and easily available in the local market. It must be placed in a water resistant (IP65 or equivalent) enclosure
Battery life and replacement	Battery supplied power- by standard lithium/alkaline batteries for operation time of not less than one year. The replacement of batteries during warranty and CAMC period would be responsibility of the bidder, at bidder's cost.
Energy management	The system must have integrated energy management system using free programmable time slots for measurement and transmission to minimize power consumption.



Data logger and storage	
Atmospheric Pressure correction	In case of Non-venter pressure sensor, data logger should be applied Atmospheric Pressure correction automatically
Data Logger Input	Level sensor, Conductivity sensor , Temperature sensor as mandatory parameters and pH , TSS as optional parameters
Resolution of Measurement	16-bit ADC with +/- 1 LSB accuracy
Measuring interval and measuring modes	Should be programmed to store data from 1 minute one reading to 24hours one reading with future start option.
Settling up Time	<30 minutes after submersion
Recording Capacity	Shall store data of at least 6 months with least measuring interval
Memory Type	Non-Volatile flash memory of at least 8 MB and expandable upto minimum 1 GB using USB/SD Card
Power Supply	Should be equipped with lithium or alkaline battery pack, giving at least 2 years operation with minimal replacement requirement. Battery must be replaceable in the field. Replacement of batteries must be readily available in India.
Battery Voltage Monitoring	Monitoring and transmission of Battery Voltage level
Data logger Location	Data logger should be located on top (on ground surface or wall mounted).
Built in clock	Accurate to ± 1 minute per year
Displayed Time Resolution	1 second
Over-voltage Protection	Should include lightening, over-voltage and surge protection
Protection	IP68 with Impact Resistant for Water level sensor IP65 (for data logger) with Impact Resistant
Port for configuration	One serial port for communication with laptop for programming
Ports for telemetry	Port for communication with GSM & GPRS telemetry
Operating System	Windows software for system configuration / communication
Licenses	All required licenses shall be included
Real time clock	Time synchronization facility shall be provided with IST
Accessories	Serial cable and adaptor if required along with all



	accessories and fixing units etc.
Data Records	1,80,000 (Minimum)
Data logs	>40
Fastest output rate	1 per second
Computer Interface	The Logger must be capable of connection to a computer via USB2.0/USB 3.0 and supply should include the necessary interface cables.
Output	SDI-12, RS-485 or compatible with data logger
File Format	The format of the data downloaded by communication interface shall be in standard CSV/JSON and by dashboard/software in CSV/PDF format with time series.
Installation	The system should be provided with a suspension bracket , Well enclosure /canopy & junction boxes (if required) allowing secure installation within the Piezometers' headwork, including appropriate cable mounting accessories to allow the sensor to be adjusted to the required depth.
Direct Read Sensor Cable	The cable shall have following features: <ul style="list-style-type: none"> • Strength members for good longitudinal stability of cable • The cable and contacts should be fixed or quick connect
Wireless Communication (<u>not mandatory but will be an added benefit</u>)	Data logger should have a Bluetooth/WiFi connectivity to a smart device with data security protection
GSM / GPRS Transmitter	
Transmission System	GPRS/edge-based data transmission system
Performance	Data Reception availability of 95% or better
Communication Direction	Utilize GPRS network for two-way connection with FTP server
Transmission trigger	Data collection to be triggered by interrogation from Data Center, or by event-based transmission triggered by remote site
Power Saving	Ability to disable interrogation system in order to save power at remote site
Communication Protocol	Capable for data transmission to execute HTTP Post or FTP to transmit data to the Data Center

Accessories	All associated equipment, including Antenna all cables and mounting hardware
Software	
Operating System) Data Visualization - Time series Graphs and reports)	Windows software for system configuration, transfer and analysis of data to computer
Version	English language version
License	All required licenses included
Parameters	All the mandatory parameters, time series and locations are must. Battery health status and function of setting threshold will be the added benefit
Data Services	
Data collection performance	Bidder should ensure seamless data and responsible for <ul style="list-style-type: none"> Real-time data collection, transfer, process, storage and display. Capability to transmit the data through GSM/GPRS in the standard CSV format.
Data maintenance	All activities pertaining to installation, data services, Operation & maintenance at the sensor location as well as user interface/dashboard will be maintained by the bidder during the warranty and maintenance period.
Storage system	Storage of all data and regular reports in the proper manner and easy to access. This data will be backed up in such a way that it is not possible to lose data e.g. during network issues.

G. Time frame:

Deliverables	Timeline
1- Installation and commissioning of online monitoring system [all hardware components]	20 days
2- Software/tool/dashboard with real-time data sharing	5 days
3- Training to local operator and submission required documents	5 days

H. Payment Schedule:

Instalment	Task
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First instalment (40% of the installation and commissioning):	At the time of signing the contract and submission of performance security deposit of 10% of the total installation and commissioning amount (excluding taxes) along with invoice
Second instalment (60% of the installation and commissioning):	Satisfactory completion of all the tasks mentioned in this Terms of References (Section 'E' and 'F') to the satisfaction and acceptance by ICLEI – SA and NMC/NSSCDCL.
Third/last instalment (100% of the Comprehensive Annual Maintenance Contract)	Satisfactory submission of all the required documents like SOP, O&M manual etc and acceptance by ICLEI – SA and NMC/NSSCDCL of the same Submission of performance security deposit of 40% of the CAMC amount for the period of at least 2 years.
Both the performance security deposits shall be returned by ICLEI South Asia upon successful completion and acceptance of the completed work and the contract period of the respective tasks.	

I. Qualification and experience

Sr.	Eligibility criteria	Document and proof of eligibility
1.	<p>The bidder may be one of the following entities:</p> <p>a) Individual (Tax payer of India)</p> <p>b) Company (registered under Companies Act, India)</p> <p>c) Authorized Distributor/ Authorized Dealer</p> <p>Subject to,</p> <p>1) The bidder shall be able to facilitate or attend maintenance works during performance guarantee/CAMC period</p> <p>2) Joint Venture is not allowed, however, subcontracting is allowed excluding the core task</p>	<p>1) Registration Certificate as a proof of existence</p> <p>2) OEM certificate (shall provide license/certificate for the same)</p> <p>3) Valid authorized Distributorship/Dealership license from Original Equipment Manufacturers</p>

2.	The bidder must have adequate qualification and experience of supply, installation, testing and commissioning of in-situ, online Ground water monitoring.	The bidder shall provide minimum 3 work orders/work completion letters of similar tasks undertaken within last 3 years (Details of similar work previously carried out mentioning: Beneficiary, Capacity of Installation, Contract Value, Date of Commencement, Date of Commissioning, Contact details with telephone numbers of the beneficiary along with the performance certificate issued by the clients.
3.	The minimum turnover of the bidder should be above Rs. 30 Lac per year	1. Balance sheets of last 2 years, audited by certified Chartered Accountant or ITR filed for last 2 years. 2. A copy of valid PAN and GST

J. Proposal submission: Details required in a bid document are as follows.

Technical Bid	<ol style="list-style-type: none"> 1. Credentials of organization and/or individual 2. Details of at least 3 similar projects implemented by the organization/individual with documentary proof for the same 3. Registration certificate 4. Tender Submission Form (Annexure I, III and IV) 5. Brochure and technical specifications of the sensors and allied instruments
Financial bid	<ol style="list-style-type: none"> 1. Financial bid for tasks listed in the Section 'E and F' and Annexure II of this tender document. The total cost should include implementation, logistical, per diem costs and all the taxes whichever applicable. (Bill of Quantities form – Annexure II) 2. Financial details of the organization to prove eligibility 3. PAN or TIN number details 4. Audited accounts statements and/or ITR for last 2 years
Note	<ol style="list-style-type: none"> 1. All Technical and Financial bids should be in English. The financial bid should be in accordance with the State Government Schedule of Rates. Financial bid should include all costs including taxes, transport, labour, etc. and should be all inclusive. 2. Bidders are encouraged to visit the site before submission of

	<p>bid.</p> <p>3. Soft copy of the tender document (technical and financial) should be mailed to ICLEI South Asia on the contact details mentioned in this document within deadline as 05th October 2021.</p> <p>4. Qualified individuals/organizations should send cover letter, technical and financial proposals (in separate envelopes but both in a single envelope) to the contact information provided in this document in hard copy. Please send your application with “In-Situ online Ground Water Monitoring at Nagpur under Urban LED S II” in the subject line and on a sealed envelope.</p> <p>5. The bidder shall acquaint with the work and working conditions at site and locality. No claim shall be entertained on this issue after the bid has been submitted.</p> <p>6. The hard copy of bid document shall reach to the above mentioned address not later than 2 days from the last date of submission of bid document, provided the bid has been submitted through email before the due date of submission</p> <p>7. Bid Validity: All bids submitted shall remain valid for a period of 30 days from the time of submission. Any bids submitted for a lesser duration will be disqualified.</p> <p>8. Notification of selected contractor: Only the successful/shortlisted contractor(s) would be notified by 08th October 2021.</p>

K. Contact information

For bid submission (Email/soft copy)	For bid submission (Courier/hard copy)
<p>i) Soumya Chaturvedula, Deputy Director, ICLEI South Asia, Email: soumya.chaturvedula@iclei.org</p> <p>ii) Nikhil Kolsepatil, Manager (Energy & Climate), ICLEI South Asia, Email: nikhil.kolsepatil@iclei.org</p> <p>iii) Bhaskar Padigala, Deputy Manager (Energy & Climate), ICLEI South Asia, Email: bhaskar.padigala@iclei.org</p>	<p>Bhaskar Padigala, Deputy Manager (Energy & Climate), ICLEI South Asia, C-3, Green Park Extension, New Delhi-110016, India Tel: +91-11-49747200 Fax: +91-11-49747201 Email: bhaskar.padigala@iclei.org Website: https://southasiaoffice.iclei.org</p>
<p>For local information and queries: Shardul Venegurkar</p>	

Senior Project Officer, Nagpur
ICLEI – South Asia
Email: shardul.venegurkar@iclei.org
Contact number: 7276293919

L. Instructions to Bidder

- 1 Bidder A Bidder shall not have a conflict of interest. All bidders found to have conflict of interest shall be disqualified.
- 2 Corrupt and Fraudulent Practices The ICLEI South Asia requires compliance with its policy in this regard
- 3 Documents Comprising The Bid shall comprise of Two Parts, namely the Technical Part and the Financial Part, to be submitted simultaneously.
- 4 Letter of Bid and Price Schedules The Bidder shall submit the Letter of Bid – Technical Part, and Price Schedules using the forms furnished in Annexure I to IV - Bidding Forms. The forms must be completed without any alterations to the text. All blank spaces shall be filled in with the information requested.
- 5 Alternative Bids Alternative bids shall not be considered.
- 6 Bid Prices and Discounts Price Schedules shall conform to the requirements specified below:
 - a) All lots (Contracts) and items must be listed and priced separately in the Price Schedules.
 - b) The price to be quoted in the Financial Part shall be the total price of the Bid, including any discounts offered and taxes.
 - c) Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected.

Prices shall be quoted as specified in the Price Schedule included in Annexure II – BoQ as stated below:

(i) Prices:

- (a) For domestic goods: the price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable), including Goods and Services Tax (GST)
 - (b) For imported goods: the price of the Goods quoted EXW shall be excluding GST but including customs duty and any other taxes as applicable.
 - (ii) Other taxes which will be payable on the Goods if the contract is awarded to the Bidder; and
 - (iii) The price for inland transportation, insurance, and other local services required to convey the Goods to their Final Destination (Project Site), namely Nagpur city.

Price for Related Services (civil and electrical works), if any.

- 7 Currencies of Bid The Bidder shall quote in Indian Rupees only in BoQ.

- 8 Documents Establishing the Conformity of the Goods and Related Services To establish the conformity of the Goods to the Bidding Documents, the Bidder shall furnish as part of its Technical Part of Bid, the documentary evidence that the Goods conform to the technical specifications and standards specified at Annexure IV. - Technical specifications of this ToR.

- 9 About Manufacturer's Authorization and prior experience The documentary evidence of the Manufacturer's Authorization and prior experience to perform the contract, if its bid is accepted, shall be submitted as part of its Technical Part of Bid, to establish to the Purchaser's satisfaction:
 - (i) that if a Bidder that does not manufacture or produce the Goods it offers to supply, it shall submit with its Bid the Manufacturer's Authorization and confirmation to provide Manufacturer's warranty/guarantee for the goods along with the supply, on the form included in Annexure III. The Bidder has the option to furnish the said Authorization from the Authorized Dealer or Distributor in which case, the Form provided in Annexure III may be modified by the Bidder suitably. However, if the Bidder itself is an Authorized Dealer or Distributor, it may submit Certificate evidencing this position – in lieu of Manufacturer's Authorization.

- (ii) that supplies for any particular item in each schedule of the bid should be from one manufacturer only. Bids from agents offering supplies from different manufacturers for the same item of the schedule in the bid will be treated as non-responsive.
- 10 Testing commissioning and training
Testing, commissioning and training, if any, should be undertaken by the bidder within 30 days from the commissioning of the system at Nagpur. It would be opened to the competent authority to take serious action against the service provider, if timely action is not taken.
- 11 Earnest Money Deposit (Security deposit) as performance guarantee
The selected bidder shall furnish as part of agreement and acceptance of work order, EMD/security deposit in original for an amount of Ten percent (10%) with validity of 3 months for the installation and commissioning work.
EMD/security deposit in original for an amount of Forty percent (40%) with validity of minimum 2 years or Comprehensive AMC period.
- EMD/security deposit should be in the form of Demand Draft issued by a nationalized bank in favour of “*ICLEI South Asia*” payable at New Delhi. The two EMD/security deposits shall be returned as promptly as possible upon satisfactory performance of all agreed tasks during the two periods mentioned above.
- The EMD/security deposit may be forfeited:
If a Bidder withdraws its Bid after awarding the work order; or any extensions thereto provided by the Bidder; or if the successful Bidder fails to satisfactorily complete the scope of this ToR.
- 12 Preparation and Signing of Bid
The Bid shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of Power of Attorney and shall be submitted with the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature.
- 13 Confidentiality
Any effort by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and post qualification of the bids or contract award decisions may result in the

rejection of its Bid.

From the time of bid opening to the time of Contract Award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.

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| 14 | Technical literature | The bid should accompany detailed technical literature and leaflets of the equipment quoted. No deviations from the above mentioned specifications leading to the impact on overall quality would be accepted. Any deviation between the equipment offered and the literature supplied should be clearly specified. |
| 15 | Evaluation | <p>The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself.</p> <p>A substantially responsive Bid is one that conforms to all the terms, conditions, and specifications of the Bidding Documents without material deviation, reservation, or omission.</p> |
| 16 | Consumable items | Specification of all expendable/consumable items shall be provided in a technical bid/document. |
| 17 | Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids | The Purchaser 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. |
| 18 | Award Criteria | The Purchaser shall award the Contract to the Bidder whose offer has been determined best evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily. |
| 19 | Purchaser's Right to Vary Quantities at Time of Award | At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in this ToR without any change in the unit prices or other terms and conditions of the Bid and the Bidding Documents. |

Other terms and conditions

1. **Testing of equipment:** If required, the equipment shall be tested at Nagpur and at appropriate site for full range operation of sensor during the presence of purchaser representatives.
 - i. Full range testing of the water level sensors should be arranged at appropriate site. The logistic arrangements for such testing should be made by the bidder.
 - ii. All material supplied or used for the project shall be in accordance with National Standards. Officials from ICLEI South Asia and/or local government authority can inspect the materials being used for the implementation work and any material found defective or below standards would have to be replaced by the service provider at own cost.
 - iii. ICLEI South Asia would not be liable to pay any costs of material/labour/transport/other for any below standard material used for implementation.
2. **Essential accessories:** A complete list of items supplied as essential accessories may be furnished. Battery supplied with the sensors and data logger should be easily available in Indian Market.
3. **Variations during implementation:** If during implementation, the service provider and ICLEI South Asia deem it necessary to undertake any task or implement any works that were not envisaged at the time of contract signing but are crucial for successful implementation of the contract and it has been verified that the service provider did not intentionally hide such a requirement or the task is not arising due to incompetence or inexperience of the service provider, then in such cases, an amendment to the contract would be required for the project as an annexure. The costing for this additional task shall be as per the item wise costs quoted by the service provider at the time of bidding and the total amount of such variation cannot exceed 20% of the total contract value.
4. **Safety and surveillance:** The following measures need to be taken by the service provider:
 - I. Provision of safety equipments like boots/shoes, gloves and jackets for workers
 - II. Provision of all equipment and solutions/items required for maintaining adequate cleanliness and hygiene standards, to the satisfaction of ICLEI South Asia and local government authority.
 - III. Service provider is fully responsible for the safety and security of the



equipments/material stored temporarily at construction site. ICLEI – SA and/or NMC/NSSCDCL authorities should not be held responsible for any damage/loss to the equipments/material in any manner and no claim will be entertained thereafter.

IV. Eco-friendly or local material should be used wherever possible without any compromise with quality of the structure. The same should be informed to ICLEI South Asia.

5. **Labour and Material:** All labour required for the completion of the task would be provided by the service provider in accordance with the laws of the land.
- a. Any incidents that occur on site or with the labour during the course of the contract would be the liability of the service provider alone. ICLEI South Asia and local government authority would not have any liability in such case
 - b. Service provider's supervisor should visit the site at least once a week to ensure smooth and safe working during implementation and at least once a month during maintenance phase.
 - c. All labour or manpower involved in the project by the service provider should be above 18 years of age
 - d. The service provider shall in respect of labour employed by him or his/her sub- service provider complies with or cause to be complied with the Service provider Labour Regulation in regard to all matters provided therein.
 - e. Any loss of material or accidents or loss of life during the course of the contract would be the sole responsibility of the service provider.
 - f. Any accidents or damages caused to users or any other person from structures/systems created under the projects would be the liability of the service provider alone. ICLEI South Asia or NMC/NSSCDCL would have no legal or financial bindings for the incidents or any implications arising out of the incident
 - g. Service provider has to make his own arrangement for power and water required for implementation work. Any other terms for water tanker or electricity supply or generator will not be accepted.
 - h. The service provider shall maintain safety of workers on site and should provide the appropriate safety equipment and gears for the same. No

additional costs for this can be charged to ICLEI South Asia

- i. The Service provider shall indemnify and keep indemnified ICLEI South Asia and local government authority against:
 - i. Any claim arising out of third party loss/ damage to life or property caused by/ during execution of the work.
 - ii. Any claim arising out of loss/ damage to the workmen engaged by the service provider during execution of the work.
 - iii. Any claim due to non-compliance of applicable PF/ Labour laws, ESI regulations etc.
 - iv. Any claims arising from any accidents or emergency situations related to labour or residents, arising from the project, during the course of the tender or afterwards
 - j. Drinking water, food and other requirements for the labour shall be met by the service provider.
 - k. The compliance of the Safety and Health provisions are of utmost importance to ICLEI South Asia. The service providers must note that ICLEI South Asia will take a serious view of any noncompliance report of safety norms and standards. ICLEI South Asia has a right to order stoppage of work till rectification is carried out for all safety norms and standards.
 - l. Provision of First Aid Kit should be ensured on site during the entire implementation period.
 - m. Service provider may arrange for regular medical check-ups of his/her labour during the execution phase. To maintain health and hygienic conditions for labour is the sole responsibility of the service provider, including COVID-19 safety and precautions. The service provider will have to adhere to COVID-19 directives and guidelines of the State and NMC.
 - n. Information on emergency contact numbers and details shall be provided to labour supervisor by the Service provider
6. **Quality Control:** Officials from ICLEI South Asia or NMC/NSSCDCL would undertake regular inspection of the site work during implementation phase as

well as during performance guarantee/AMC period.

- I. The officials will check the service provider's work and notify him/her for any defects that are found. The officials from ICLEI South Asia and/or NMC/NSSCDCL can visit the site at any time for inspection without prior notice and can instruct the service provider to search for a defect and to uncover and test any work that the official considers may have a defect.
 - II. If the official instructs the service provider to carry out a test not specified in the specification to check whether any work has a defect, all such test/tests shall be carried out by the service provider at his own cost and shall be deemed to be included in the rates given by service provider.
 - III. The official(s) from ICLEI South Asia and/or NMC/NSSCDCL can give notice to the service provider informing him/her of any defects after or during implementation and/or during maintenance phase. Every time notice of a defect is given, the service provider shall correct the notified defect within the length of time specified by ICLEI South Asia in the notice issued to the service provider for defect correction. If the service provider has not corrected a defect within the time specified in the notice, ICLEI South Asia will assess the cost of having the defect corrected, and the amount will be recovered from the service provider.
 - IV. Samples or details of items should be discussed (including specifications/brand/make) with ICLEI South Asia before ordering. If upon delivery without prior approval, the product is found below standards, the service provider would have to replace the same with good quality product, as per the satisfaction of ICLEI South Asia, at own costs.
 - V. Service provider shall bear all costs of any repairs/replacement of faulty material/items for the structures and systems created under the project within performance guarantee/AMC period that comes under the scope of work of the service provider. No additional costs for this would be entertained.
7. **Sub-contracting:** Except core task of this ToR other associated works like civil, electrical etc can be subcontracted. In any condition prior written approval is required for subcontracting any work related to this ToR. In case of subcontracting, the costs would have to be borne by the service provider and ICLEI South Asia shall not liable to pay any costs to the sub-contracted work. Management of the subcontractor would be the responsibility of the service

provider.

8. **Manuals:** All technical manuals, operation and maintenance manual in English language should be supplied in duplicate with the equipment. The bidder should arrange for appropriate training for the team of NMC/NSSCDCL users
9. **Tool kit and carrying case:** Calibration and tool kit and carrying case should be supplied with the equipment. Also a recommended list of spares may be given.
10. **Warranty:** **Warranty of minimum two years** from the date of installation and commissioning/acceptance of the equipment at NMC/NSSCDCL. Warranty shall include replacement of all unserviceable parts. If warranty of any parts cannot be provided the same may be clearly mentioned while submitting the technical bids. The bidder shall warrant that the stores to be supplied shall be new and free from all defects and faults. This warranty shall survive inspection or payment for /and acceptance of goods, but shall expire (except in respect of complaints notified prior to such date) twelve months after the stores have been taken over. The bidder should bear all charges at site including freight, insurance and other incidental charges and shall make replacement under warranty clause. Upon receipt of such notice of failure/breakdown/non-functioning, the Supplier shall, within 15 days, expeditiously repair or replace the defective Goods or parts thereof; at no cost to the Purchaser
11. **After sales service:** Minimum two years Comprehensive annual maintenance contract will be made with supplier. The terms, conditions and scope of after sales services, maintenance, repairs, replacement, installation, commissioning etc. should be indicated in the Bid.
12. **Manufacturer's/supplier's warranty certificate** and supplier's **factory inspection report:** Pre-dispatch inspection certificate issued by the purchaser's nominated inspection agency, if so specified.
13. **Inspections and Tests:** The inspections and tests shall be conducted by the Purchaser at the Goods final destination. The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser.
14. **Complaint Redressal:** The Service provider shall ensure that the work on site



should be conducted such that no construction or other works lead to any disturbance or complaints from neighbouring areas.

- i. Any complaints arising during the implementation phase would be the responsibility of the service provider and ICLEI South Asia or local government authority would not be liable to address these complaints. These complaints would be addressed by the service provider at his/her own costs.
 - ii. In case of any complaints related to quality or timing or other aspects of the work or material used for the project (by ICLEI South Asia), the service provider shall be liable to address the same within 48 hours of the complaint being informed to the service provider (verbally or in writing) at own cost. In case of failure to address complaints within the stipulated time, a written notice shall be sent to the service provider by ICLEI South Asia to resolve the complaint within a period of one week. In case of noncompliance to meet the terms of the notice, the service provider can be penalized or the contract can be terminated at ICLEI South Asia's discretion in accordance with 'Penalty and Termination of Contract' of this document.
15. The bidder shall be deemed to have carefully examined the work and site conditions'. In this regard, he/she will be given necessary information to the best of knowledge of ICLEI South Asia in consultation with NMC/NSSCDCL but without any guarantee to it.
 16. If bidder has any doubt as to the meaning of any portions of these general contract terms, or the scope of the work, or any other matter concerning the contract, he/she shall in good time, before submitting his tender, set forth the particulars thereof and submit them to the point of contact, as given in this ToR by email in order that such doubts may be clarified authoritatively before tendering. Once a tender is submitted, the matter will be decided according to the tender conditions in the absence of such authentic pre clarification.
 17. In case the winning bidder fails to indicate his intent to undertake the said work within the stipulated time of three (3) days and observe the formalities as above, the work order will be cancelled and the next bidder will be finalized by ICLEI South Asia in Consultation with NMC/NSSCDCL senior officials.
 18. ICLEI South Asia reserves all the rights to reject any proposal, and to terminate the selection process and reject all proposals at any time, without thereby incurring any liability to the affected applicant or any obligation to inform the

affected applicants of the grounds for such decision.

19. It should be noted that the service provider has to work in Nagpur – Nagpur Municipal Corporation (NMC) jurisdiction and hence instructions to bidders will be given by ICLEI South Asia in consultation with NMC/NSSCDCL officials.
20. The successful bidder shall also obtain necessary permissions from concerned government departments in coordination with NMC/NSSCDCL and ICLEI South Asia.
21. All data and information received from Nagpur Municipal Corporation and ICLEI South Asia for the purpose of this assignment are to be treated confidentially and are only to be used in connection with the execution of these Terms of Reference. The contents of written materials obtained and used in this assignment may not be disclosed to any third parties without written approval from ICLEI South Asia and NMC/NSSCDCL.
22. **Extension of date of completion:** On occurrences of any events causing delay as stated hereunder, the bidder shall intimate immediately in writing to ICLEI South Asia.
23. **Materials/Appliance at site:** Neither ICLEI South Asia nor NMC/NSSCDCL undertake any responsibility for supply of any materials/ equipment/ Appliance/ tool for site analysis to the bidder before installation. All materials/ equipment/ tools brought to site by the bidder shall be the responsibility of the bidder. NMC/NSSCDCL and ICLEI South Asia shall extend help as and when approached by the bidder to keep any materials/ equipment/ Appliance/ tool, however not liable for any loss, theft or damage due to fire or other cause, the responsibility for which shall lie entirely on the bidder.
24. **Final Inspection of Work:** NMC/NSSCDCL and ICLEI South Asia team shall jointly make final inspection of all work included in the contract/work order, or any portion thereof, or any completed structure forming part of the work of the contract, as soon as practicable after notification by the bidder that the work is completed and ready for acceptance.
25. **Settlement of Disputes:** ICLEI South Asia and the selected bidder shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract. If, after Seven (7) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either of the parties may give notice to the other party of its intention to commence arbitration, as hereinafter

provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. In case the conflict cannot be mutually sorted, the ICLEI South Asia's decision would be final and binding. This contract shall be governed by the laws of India. Bidder shall apply Indian law to the merits of any dispute or claim, without reference to rules of conflict of law. The courts at Delhi alone shall have the jurisdiction in this regard.

26. Termination: Termination for Default in the case of;

(a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:

(i) If the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser;

(ii) If the Supplier fails to perform any other obligation under the Contract; or

(b) In the event the Purchaser terminates the Contract in whole or in part,

In case the bidder is unable to perform as per the expectations of the project team and/or project cities, the contract of the service provider can be terminated based on mutual consent. In case of contract termination, the bidder would be paid on the basis of deliverables completed to the satisfaction of ICLEI – South Asia

27. Force Majeure: In case of extraordinary events under force majeure (Natural phenomena, including but not limited to abnormally bad weather, unprecedented flood and draught, earthquakes & epidemics, Political upheaval, strikes, lockouts, acts of any Government (domestic/foreign) including but not limited to war, properties, and quarantine embargoes) , the terms of contract can be redrafted through mutual consent. In such cases, none of the parties can be held liable under the Contract.

Annexure I: Letter of Bid –Technical Part

(To be printed on bidder's official letterhead)

Dated.....

To:
Executive Director,
ICLEI South Asia,
C-3, Lower Ground Floor,
Green Park Extension, New Delhi - 110016, India

Subject: Supply, installation, testing, commissioning and operation maintenance services of the online continuous sensors with data logger and telemetry for groundwater monitoring at Nagpur, Maharashtra under the project Urban-LEDS II.

Sir,
We, the undersigned, hereby submit our Bid, in two parts, namely:
(a) Technical Part; and (b) Financial Part

In submitting our Bid, we make the following declarations:

- a) **No reservations:** We have examined and have no reservations to the Bidding Documents;
- b) **Conformity:** We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the ToR document.
- c) **Ineligibility:** Our firm, its affiliates or subsidiaries—including any subcontractors or suppliers for any part of the contract - has not been declared ineligible by the Bank, or under Indian laws or official regulations;
- d) **Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- e) **Suspension and Debarment:** We have not been debarred from participation in bidding/removed from approved list (dealings suspended) by the Central or any State Government or by the World Bank.

If I/We fail to keep the proposal open as aforesaid or make any modifications in the terms and conditions of the proposal which are not acceptable to ICLEI South Asia or after signing of contract are unable to provide work or services to the satisfaction of ICLEI South Asia as per the terms of the contract and annexure documents, I/We agree that ICLEI South Asia shall without prejudice to any other right, be at liberty to forfeit earnest money absolutely. Should this proposal be accepted, I /We agree to abide by & fulfil all the terms conditions of aforesaid document and the annexure documents.

Yours faithfully,

Authorized Signature
Name and Title of Signatory _____

In the capacity of [*insert legal capacity of signatory*]

Name of Bidder /firm _____

Annexure II: Financial proposal submission form (Price in INR)

Sr.	Description of Goods/ Related services	Quantity	Unit	Delivery Date at the final destination	Country Of origin	Unit price	Total Price (Unit price X units)
Mandatory parameters (Level, Temperature and EC) and allied instruments							
1	e.g. Temperature sensor	2	number	Within 20 days from the work order	India		
2	e.g. Data loggers	2					
3	e.g. Civil and electrical work	2	Lump sum				
4	e.g. Software and UI with license	1	number				
5	e.g. Installation charges	2	Lump sum				
6	e.g. Comprehensive AMC	2	Years				
7							
8							
	Total						
	Add GST and other taxes						
	Gross total						
Optional parameters (TSS and pH)							
1.	e.g. Data logger to accommodate optional parameters	2	number	Within 20 days from the work order			
2.	e.g. TSS	2	number				
	Total						
	Add GST and other taxes						
	Gross total						

Annexure III: Manufacturer's Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Bidder shall include it in its bid in accordance with ITB Section.]

Date: _____

To:

**Executive Director,
ICLEI South Asia,
C-3, Lower Ground Floor,
Green Park Extension,
New Delhi - 110016, India**

WHEREAS

We [insert complete name of Manufacturer], who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder] to submit a bid the purpose of which is to provide the following Goods, manufactured by us [insert name and or brief description of the Goods], and to subsequently negotiate and sign the Contract.

We hereby extend our slandered guarantee and warranty in accordance with the goods supplied by the above firm.

Thanking you,

Signed: [insert signature(s) of authorized representative(s) of the Manufacturer]

Name: [insert complete name(s) of authorized representative(s) of the Manufacturer]

Title: [insert title]

Dated on _____ day of _____, _____ [insert date of signing]

Annexure IV: Technical Specifications

Parameter	Specification	Compliance <u>Yes/No or</u> <u>deviation if</u> <u>any</u>
General		
Material	Stainless Steel (SS-316) or other better corrosion resistant material	
Ingress Protection/envi ronmental rating	1. IP68 with all sensors and cable attached or equivalent 2. Drift-resistant sensors, long-lasting battery power, and corrosion-resistant design support long-deployments. Active and passive antifouling systems would be added benefit.	
Reproducibility	0.1% full scale or better	
Long terms stability	0.1% Full scale and should ensure long term stability with minimum field calibration requirements	
Over-voltage Protection	Should include lightening, over-voltage and surge protection	
Mandatory parameters		
Temperature Sensor		
Temperature ranges	Operational: 0 to 50° C	
Accuracy & resolution	Accuracy: $\pm 0.1^{\circ}$ C. Resolution: 0.01° C or better	
Units of measure	Celsius and Fahrenheit	
Level Sensor		
Level Sensor Type	Piezoresistive or equivalent	
Burst Pressure	Maximum 2x range; burst > 3x range	
Accuracy & resolution	Accuracy: $\pm 0.2\%$ Resolution: 0.005% FS or better	
Units of Measure	Pressure: psi, kPa, bar, mbar, mmHg, inHg, cmH ₂ O, inH ₂ O. Level: in, ft, mm, cm, m	
Electrical conductivity Sensor		
Range	0 to 100,000 μ S/cm	
Accuracy	$\pm 1.0\%$	
Resolution	0.1 μ S/cm	
Temperature correction	With inbuilt temperature correction	



Pressure Rating	Up to 100m	
Optional parameters		
Total Suspended Solids (TSS)		
Sensor Type	TSS Probe	
Range (mg/L)	10 mm: 0 - 2,000 (mg/L) or as per specifications	
Sampling Time (minimum)	10 seconds	
Storage Temp.	-20 to 60°C (-4 to 140°F)	
pH Measurement		
Range	0-14pH.	
Calibration	Simple multipoint calibration	
Temperature correction	Internal temperature compensation.	
Accuracy	0.1pH	
Allied instruments		
Communicator		
Power supply	Preferred: Internal Battery else external grid power 230±10% V AC	
Operating temperature	-5 to +50 °C (32 to 122 °F)	
Storage temperature	-10 to +60 °C (14 to 140 °F)	
Ingress Protection rating	IP65 or equivalent	
Battery		
Battery location and availability	The battery should be easy to replace, and easily available in the local market. It must be placed in a water resistant (IP65 or equivalent) enclosure	
Battery life and replacement	Battery supplied power- by standard lithium/alkaline batteries for operation time of not less than one year. The replacement of batteries during warranty and CAMC period would be responsibility of the bidder, at bidder's cost.	
Energy management	The system must have integrated energy management system using free programmable time slots for	



	measurement and transmission to minimize power consumption.	
Data logger and storage		
Atmospheric Pressure correction	In case of Non-venter pressure sensor, data logger should be applied Atmospheric Pressure correction automatically	
Data Logger Input	Level sensor, Conductivity sensor , Temperature sensor as mandatory parameters and pH , TSS as optional parameters	
Resolution of Measurement	16-bit ADC with +/- 1 LSB accuracy	
Measuring interval and measuring modes	Should be programmed to store data from 1 minute one reading to 24hours one reading with future start option.	
Settling up Time	<30 minutes after submersion	
Recording Capacity	Shall store data of at least 6 months with least measuring interval	
Memory Type	Non-Volatile flash memory of at least 8 MB and expandable upto minimum 1 GB using USB/SD Card	
Power Supply	Should be equipped with lithium or alkaline battery pack, giving at least 2 years operation with minimal replacement requirement. Battery must be replaceable in the field. Replacement of batteries must be readily available in India.	
Battery Voltage Monitoring	Monitoring and transmission of Battery Voltage level	
Data logger Location	Data logger should be located on top (on ground surface or wall mounted).	
Built in clock	Accurate to ± 1 minute per year	
Displayed Time Resolution	1 second	
Over-voltage Protection	Should include lightening, over-voltage and surge protection	



Protection	IP68 with Impact Resistant for Water level sensor	
	IP65 (for data logger) with Impact Resistant	
Port for configuration	One serial port for communication with laptop for programming	
Ports for telemetry	Port for communication with GSM & GPRS telemetry	
Operating System	Windows software for system configuration / communication	
Licenses	All required licenses shall be included	
Real time clock	Time synchronization facility shall be provided with IST	
Accessories	Serial cable and adaptor if required along with all accessories and fixing units etc.	
Data Records	1,80,000 (Minimum)	
Data logs	>40	
Fastest output rate	1 per second	
Computer Interface	The Logger must be capable of connection to a computer via USB 2.0/USB 3.0 and supply should include the necessary interface cables.	
Output	SDI-12, RS-485 or compatible with data logger	
File Format	The format of the data downloaded by communication interface shall be in standard CSV/JSON and by dashboard/software in CSV/PDF format with time series.	
Installation	The system should be provided with a suspension bracket , Well enclosure /canopy & junction boxes (if required) allowing secure installation within the Piezometers' headwork, including appropriate cable mounting accessories to allow the sensor to be adjusted to the required depth.	
Direct Read Sensor Cable	The cable shall have following features: Strength members for good longitudinal stability of cable The cable and contacts should be fixed	



	or quick connect	
Wireless Communication (<u>not mandatory but will be an added benefit</u>)	Data logger should have a Bluetooth/WiFi connectivity to a smart device with data security protection	
GSM / GPRS Transmitter		
Transmission System	GPRS/edge-based data transmission system	
Performance	Data Reception availability of 95% or better	
Communication Direction	Utilize GPRS network for two-way connection with FTP server	
Transmission trigger	Data collection to be triggered by interrogation from Data Center, or by event-based transmission triggered by remote site	
Power Saving	Ability to disable interrogation system in order to save power at remote site	
Communication Protocol	Capable for data transmission to execute HTTP Post or FTP to transmit data to the Data Center	
Accessories	All associated equipment, including Antenna all cables and mounting hardware	
Software		
Operating System) Data Visualization - Time series Graphs and reports)	Windows software for system configuration, transfer and analysis of data to computer	
Version	English language version	
License	All required licenses included	
Parameters	All the mandatory parameters, time series and locations are must. Battery health status and function of setting threshold will be the added benefit	
Data Services		
Data collection performance	Bidder should ensure seamless data and responsible for Real-time data collection,	



	transfer, process, storage and display. Capability to transmit the data through GSM/GPRS in the standard CSV format.	
Data maintenance	All activities pertaining to installation, data services, Operation & maintenance at the sensor location as well as user interface/dashboard will be maintained by the bidder during the warranty and maintenance period.	
Storage system	Storage of all data and regular reports in the proper manner and easy to access. This data will be backed up in such a way that it is not possible to lose data e.g. during network issues.	



