Cost of Tender Document Rs 1500/-

सत्यमेव जयते

TENDER DOCUMENT
for
"Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 24 No. of Water Level & Meteorological stations (WL&MS) and Meteorological Stations (MS) under Narmada & Tapi Basin Organisation of CWC, Gandhinagar"

NIT No.: CWC/12/2016-17/MD/GNR

Certified that this tender document contains 101 Pages including this page but excluding CPWD's General Condition of Contract

TO BE SUBMITTED BY: 16/11/2016(Up to 16:00 hrs.)

TECHNICAL BID TO BE OPENED ON: 17/11/2016 (At 11:00hrs.)

Narmada & Tapi Basin Organization, CWC, Gandhinagar

Executive Engineer, Mahi Division, CWC, Gandhinagar

October- 2016

Narmada & Tapi Basin Organization

Central Water Commission

Gandhinagar

Name of work:- Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06 nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra & Daman &Dui (UT) " on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.

E- Tender No.	CWC/12/2016-17/MD/GNR
Estimated cost put to tender	Rs. 2,97,55,422.00
Earnest Money Deposit	5,95,110.00
Date & Time of Pre-bid Meeting	28/10/2016 at 11.00 Hrs
Last date & Time of submission of E-Tender	16/11/2016 up to 16.00 Hrs
Date & Time of opening of Technical bid	17/11/2016 at 11.00 Hrs
Cost of Tender Document	Rs. 1500/-

List of Contents

CHECK LIST

Please tick the appropriate column.

SL. NO.	DOCUMENT	ENCLOSED	
		YES	NO
1.	Signed Covering Letter of Bidder		
2.	Original Tender Document including Schedule of Quantities and Financial Tender Format (Table ï A, Table ï B, Table ï C & Table - D) duly signed on each page		
3.	Earnest Money Deposit in form as specified in Tender document		
4.	Whether Unit Rate of Items quoted in both Figure and Words		
5.	Whether Gross Amount of Tendered Value quoted in both Figure and Words		

Government of India
Central Water Commission
Mahi Division
3rd Floor, Narmada Tapi Bhawan, Sector-10 A, Gandhinagar.
Phone No. 079-23239509 Fax No. 079-23239509

NOTICE INVITING E-TENDER

NIT No: CWC/12/2016-17/MD/GNR date

The Executive Engineer, Mahi Division, CWC, 3rd Floor, Narmada Tapi Bhawan, Sector-10 A, Gandhinagar , Phone No. 079-23239509 Fax No. 079-23239509 invites item rate online e-tenders on behalf of President of India, comprising of technical and financial bids from Original Equipment Manufacturer (OEM)} and authorized dealers for the work ñ**Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06 nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra & Daman &Dui (UT)** " on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.

Estimated Cost put to tender (Rs.)	Earnest Money Deposit (Rs.)	Cost of Tender Document (Rs.)	Period of completion (days)
2,97,55,422.00	@2% of Estimated cost put to tender i.e. Rs. 5,95,110.00	1500.00	180days

1. **Last date of submission of on lineTender is 16/11/ 2016 up to 16.00 Hrs.**
2. **Pre–bid conference will be held at** 11:00 hrs on 28/10/2016 **in the office of** the Chief Engineer, NTBO, CWC at Conference hall, 1st Floor, Narmada Tapi Bhawan, Sector 10A, Gandhinagar.
3. **Technical bids will be opened at 11.00 Hrs on 17/11/ 2016**

1. The interested tenderers shall download the tender document and other details from the website http://eprocure.gov.in/cppp/, the Central Public Procurement Portal of Government of India or TCIL's e- tendering portal www.tcil-india-electronictender.com.The same is also available at tender page on the CWC website at http://www.cwc.nic.in. However, their tenders shall only be accepted on receipt of the cost of tender document as specified before submission of the tender document. The Tender cost shall be paid through A/C payee Demand Draft (non - refundable) drawn on any scheduled bank in favour of the **Executive Engineer, Mahi Division, CWC, Gandhinagar payable at Gandhinagar .**

Sd/-
Executive Engineer
For & on behalf of President of India

CENTRAL WATER COMMISSION

(Press Notice)

Notice Inviting e-Tenders

The Executive Engineer, Mahi Division, CWC, Gandhinagar invites on behalf of President of India online item rate e-tenders on behalf of president of India, comprising of technical and financial bids for following work(s):-

NIT No.	Name of Work	Estimated cost put to tender	Earnest Money Deposit	Period of completion	Last Date and Time of submission of on line bid
CWC/12/ 2016-17/ MD/GNR	Supply, Installation, Testing, Commissioning and Maintenance of real ï time data acquisition network at 24 No. of Water Level & Meteorological stations (WL&MS) and Meteorological Stations (MS) under Narmada & Tapi Basin Organisation of CWC	Rs.2,97,55,422/-	Rs.5,95,110/-	180 days	16/11/2016 up to 16.00 Hrs

The bid forms and other details can be obtained from the **website http://eprocure.gov.in/cppp or www.tcil-india-electronictender.com**.The same is also available at tender page on the CWC website at **http://www.cwc.nic.in**

Sd/-
Executive Engineer
For & on behalf of President of India

GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION
Mahi Division

NOTICE INVITING TENDER

The Executive Engineer, Mahi Division, CWC, Gandhinagar, invites, on behalf of President of India, item rate e-tenders comprising of technical and financial bids from Original Equipment Manufacturer (OEM) and authorized dealers for the work of **"Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06 nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra & Daman &Dui (UT) "** on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.

The estimated cost put to tender is 2, 97, 55,422.00 **/-** (Rupees Two Crore ninety seven lakh fifty thousand for hundred twenty two **only**).This estimated cost, however, is given merely as a rough guide.

1. Only Original Equipment Manufacturers (OEM), their authorized dealers/ representatives, Indian representative of foreign manufacturers having sufficient experience acting singly or in consortium with other such manufacturers/ dealers, having sufficient experience of satisfactory execution of similar works, shall be eligible to quote for the works. Similar works are defined as those works involving installation of equipments/ sensors of the same type of technology in the field of hydro meteorological observations integrated with data acquisition and satellite and GSM based transmission systems in real time basis. The tenderers shall produce proof from the appropriate authorities of having satisfactorily completed similar works during the last seven years (ending on the last day of the month previous to the one in which the tenders are invited), where the systems installed by them are working satisfactorily and the same could be inspected. The bidder shall have to fulfill the following criteria of satisfactory execution of works as given below:

    1.1 Three similar works, each of value not less than 40% of the estimated cost put to tender,

    Or

    1.2 Two similar works, each of value not less than 60% of the estimated cost put to tender,

    Or

    1.3 One similar work of value not less than 80% of the estimated cost put to tender, during the last seven years (ending on the last day of the month previous to the one in which the tenders are invited), where the systems installed by them are working satisfactorily for two year.

    And

1.4 Having annual turnover equivalent to estimated cost in INR of this tender in any of the last three years. Copies of audited balance sheets of the company shall be provided with the technical tender.

And

1.5 Having successfully installed and satisfactorily maintained automatic data acquisition system and real time data transmission system for at least two years during last seven years as in para 1.1, 1.2 and 1.3 above.

And

1.6 If any bidder has executed similar works in CWC during the past seven years, then a performance certificate from concerned CWC office should be provided.

2. Prospective bidder may apply singly or in a consortium with other partners, each one being an Original Equipment Manufacturer (OEM) or an Authorized Agent/ representative/ subsidiary having sales and full service facilities located in India. For authorized dealers, the submission of a certificate to the effect from the OEM being represented by him shall be obligatory. The period of validity of the dealership certificate issued by OEM to the authorized dealer and certificate of assured supply of equipment during the warranty and AMC period is to be ensured by the OEM.

3. In case of a consortium, the agreement in original between various partners will be submitted with the bid clearly identifying the parts and components of the system for which the concerned partner is responsible for execution. However, each of the partners of the consortium will be jointly responsible for execution and completion of the works.

4. One of the partners of the consortium will be identified in the agreement, mentioned in point no. 3 above, as a lead partner and will be authorized to execute the contract with the Engineer In-charge. All financial transactions and liabilities shall rest with the lead partner only.

5. The qualifying criteria will be applicable to each of the partners of the consortium with scope of works limited to the extent for which the concerned partner is responsible as a member of the consortium.

6. In case of consortium of manufacturers, authorized dealers, contractors for the major components of the works, such as satellite based real time data transmission (telemetry), etc. the qualifying criteria will be applicable to each partner separately for the specific component of the project which are to be the direct responsibility of the partner.

7. Agreement shall be drawn with the successful bidder on prescribed Form No. CPWD-8 which is available as Government of India Publication; Bidder shall quote his rates as per various terms and conditions of the said form, which will form part of the agreement.

8. The time allowed for carrying out the works shall be 180 days from the 30thday after the date of written orders to commence the works.

9. The site for the work shall be made available.

10. **The NIT and tender can be downloaded from TCIL's e-tendering portal with URL https://www.tcil-india-electronictender.com or www.cwc.gov.in or www.eprocure.gov.in. However, in order to be able to participate in the tender, it is mandatory to download official copy of tenders from https://www.tcil-india-electronictender.com**

11. The tenderers downloading the tender document from website shall enclose the cost of tender

document, i.e., **Rs. 1500/-** in the form of A/C payee Demand Draft (non - refundable) drawn on any scheduled bank in favour of the Executive Engineer, **Mahi Division, CWC, Gandhinagar** payable at **Gandhinagar** well in time before the submission of online Tender.

12. Tenders, in two bid system, containing technical bid with earnest money and the other containing financial bid will be received online by the Executive Engineer, **Mahi Division, CWC, Gandhinagar** (hereinafter called Engineer in-charge) **online up to 16.00 hours on16/11/ 2016** only and technical bid will be opened online by the Engineer in-charge or his authorized representative on **17/11/2016 at 11.00 hours** for preliminary inspection of requisite documents of each bid. However detailed technical examination shall be carried out subsequently. Only those tenders, which are successful in technical evaluation, shall be considered further for financial evaluation. The date and time for opening of financial bids shall be intimated to bidders, which shall successfully clear the technical evaluation.

13. The technical bid shall include all the relevant technical literature, brochures. Operation & maintenance manual, circuit diagrams and other documents supporting the technical competence of the offers and shall indicate by proper cross referencing with such supporting documents as to how the specification requirements are being met by their offer. Any additional information requested by the Engineer in-charge during the course of evaluation of the technical and financial bid shall be supplied within the time limits set by the Engineer in-charge.

14. The tender shall be accompanied by Earnest Money, (unless exempted) of Rs.5,95,110.00 /- (**Rupees Five lakh ninety five thousand one hundred and ten** only) as Demand Draft drawn on a Scheduled Bank in favour of Executive Engineer, Mahi Division, CWC Gandhinagar, or in any other forms as per **CPWD works manual** 2014 clause 19.4**(i)** Cash up to 10,000 **(ii)** Treasury challan **(iii)** Deposit at call Receipt of a scheduled Bank guaranteed by the RBI **(IV)** Banker's cheque of a scheduled Bank **(v)** Fixed Deposit receipt (FDR) of a Scheduled Bank. (**(a) A part of earnest money is acceptable in the form of bank guarantee also. In such cases 50% of earnest money or Rs. 20 Lakh whichever is less. will have to be deposited in shape prescribed above and balance can be accepted in form of bank Guarantee issued by a scheduled bank (b) It should be ensured that the FDR is pledged in favour of the Engineer in-charge. It is the tenderer's own interest to keep the FDR valid as long as it is required).** Tenderer exempted from depositing earnest money in individual cases, shall attach with the tender an attested copy of the letter exempting him from depositing earnest money and shall produce the original when called upon to do so. If the technical bid of the tenderer does not contain specified earnest money the tender will be summarily rejected and their financial bid shall not be opened. No further communication shall be entertained in this regard.

    The contractor, whose bid is accepted, will be required to furnish performance guarantee of 5% (Five percent) of the tendered amount with in the period specified in Schedule ôFô This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Bankerôs cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank (in case guarantee amount is less than Rs. 1, 00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any scheduled bank or the State Bank of India in accordance with prescribed form. In case contractor fails to deposit the said performance guarantee within period as indicated in Schedule ôFôincluding the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.

15. The details of the work are given under the Schedules, Special Conditions of Contract, Scope

of Work and Technical Specification

16. Detailed information pertaining to the works shall be open for inspection by the tenderers at the office of the Executive Engineer Mahi Div, CWC Gandhinagar. Intending Tenderers are advised to inspect and examine the locations where the telemetry system is to be installed and their surroundings, at his own cost, and satisfy themselves before submitting their tenders (as far as practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their subsequent work at these sites. The remote site has to transmit the data to the existing Modelling centre at **Gandhinagar, Surat & Bhusawal** for respective remote stations & FFM Directorate, Central Water Commission, R.K.Puram, New Delhi, for all remote stations, routed through the existing VSAT arrangement at CWC Delhi or ERS at any other location,. Tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any mis-understanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and other factors having a bearing on the execution of the work.

17. The competent authority, on behalf of the President of India, does not bind itself to accept the lowest or any other tender, and reserves right to itself the authority to reject any or all the tenders received without assigning any reason. All the tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected. The competent authority on behalf of the President of India reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rates quoted.

18. The tenderer who wants work preference shall clearly indicate, so, in financial bid along with copy of the document based on which such claim is made. The competent authority reserves its right to allow to the Central Government Public Sector Enterprises a purchase preference with reference to the lowest valid price bid as per Government of India rules prevalent on the date of opening of bid.

19. All tenders, in which any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be summarily rejected.

20. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be summarily rejected by the Engineer in-charge**.**

21. The tenderer shall not be permitted to tender for works in the CWC Circle responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer of the concerned Circle, and Sub divisional Engineer / Junior Engineer (all inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Water Commission or in the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD & GR). Any breach of this condition by the tenderer would render his tender liable to be rejected.

22. No Engineer of Gazetted rank or other Gazetted officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the previous permission of the Government of India in writing. This contract is liable to be cancelled, if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractorôs service.

23. The tender for the works shall remain open for acceptance for a period of one hundred twenty (120) days from the due date of submission of tenders. If any tenderer withdraws his tender before the aforesaid period or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

24. This Tender/Bid Document comprises of the following parts:

- Notice Inviting Tender CPWD Form- 6
- Additional Instruction to Tenderers
- CPWD Form - 8
- Scope of Work
- Special Conditions of Contract (SCC)
- Additional conditions of contract during Maintenance Period(AMC)
- Technical Specifications
- Drawings

25. A Pre ï bid conference will be held at 11:00 hrs on 28/10/2016 in the office of the Chief Engineer, NTBO, CWC, Gandhinagar at conference hall, 1st Floor, Narmada Tapi Bhawan, Sector-10 A, Gandhinagar. The representatives of the tenderer who wish to participate in the tender and their associates (not exceeding a group of 4 persons) shall be eligible to participate in the conference and take part in the discussions. A potential tenderer may send, by 16.00 hrs. of 28/10/2016, the issues in writing on which clarifications are required. All the queries and clarifications required by them shall be submitted in writing duly signed preferably prior to the convening of the conference and in any case not later than 1 hour after the conclusion of the conference. Only written requests will be responded in the amendments/ clarifications issued by the department after the pre-bid conference. All responses to the clarifications will be supplied to all the bidder without identifying the individual tenderer who raised the request. For the bidders purchasing the tender documents subsequent to the issue of the clarifications, the same shall be supplied with the tender documents and no additional queries/ clarifications will be entertained. The clarifications issued shall be treated as amendments to the tender requirements

26. In this conference, the clarifications, if any, required by any prospective bidder on the tender documents would be discussed. If, for any reason, whether at its own initiative or in response to a clarification requested by the prospective bidder, the department modifies the tender documents by an amendment, the same will be sent to all prospective tenderer who have received the tender document.

27. This Notice Inviting Tender shall form a part of the contract document. The successful tenderer

/ contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, should sign the contract agreement consisting of:-

a) The Notice inviting tender, all the documents including General Conditions and Special Conditions of contract, technical specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender and the rates quoted online at the time of submission and acceptance thereof together with any correspondence leading thereto.

b) Standard C.P.W.D. Form-8

Executive Engineer,
Mahi Division
CWC, Gandhinagar

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ADDITIONAL INSTRUCTIONS TO TENDERERS

1) At any time prior to the deadline for submission of bids, the department may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, modify the bidding documents by amendment in writing, which will be binding on all the Tenderers.

2) The bid prepared by the Tenderer, as well as all correspondence and documents relating to the bid exchanged by the Tenderer and the department shall be written in English language. Supporting documents and printed literature furnished by the Tenderer may be in another language provided they are accompanied by an accurate translation of the relevant passages in the English language in which case, for purposes of interpretation of the Bid, the translation in English Language shall govern.

3) All corrections/ cuttings/over writings in the tender document shall be initialled by the Tenderer.

4)The technical bid prepared by the Tenderer shall comprise the following components:

a) Technical specifications of the offered equipment with comparison sheet with the specifications as required in the tender documents. The specifications of the equipment shall include the brand name and manufactures details for each component;

b) All the terms and conditions clearly indicating variation, if any, with tender requirements;

c) Documentary evidence to establish that the Tenderer is eligible to bid and is qualified to perform the contract if the bid is accepted:

d) Documentary evidence to establish that the goods and ancillary services to be supplied by the Tenderer are as per specifications and conform to the bidding documents;

e) Earnest Money Deposit in prescribed form; and

f) Original tender with schedule of quantities without any pricing information.

g) The Bio-data of the Engineers / Technicians in-charge of the work during execution as well as maintenance

h) ñOnly such type of equipment or its upgrades shall be quoted which are working satisfactorily at least for the last two yearsò. The Tenderer will furnish the definite proof to this effect from the user.

6) The financial bid shall comprise the following components:

a) Schedule of Quantities and Financial Bid Format duly completed

7) **Bids shall be submitted online only at TCIL website URL https://www.tcil-india-electronictender.com.Tenderer/Contractor are advised to follow the instructions provided in the 'Instructions to the Contractor/Tenderer for the e-submission of the bids online through TCIL portal. The tender notice is also available at www.eprocure.gov.in and www.cwc.nic.in**

For the evaluation and submission purpose only online bid is permissible. However, the bidder are requested to submit the hard copies of the bids in the office of Executive Engineer, Mahi division, CWC Gandhinagar, on or before opening e-tender, that would only be for reference, and cannot be construed as a substitute of online bid.

8) Intending tenderers are advised to visit again TCIL website URL https://www.tcil-india-electronictender.com,and CWC website www.cwc.nic.in and CPPP website https://eprocure.gov.in at least 1 day prior to closing date of submission of tender for any corrigendum /amendment

9) Evaluation of Bids: Initially only the Technical Bids shall be opened and evaluated. If the bidder meets the qualifying criteria as specified in the bid document, and the solution offered by him meets the requirement of the tenderer, then the bidder shall be shortlisted for financial evaluation. Otherwise the bidder would be rejected at this stage itself.

The date and time of opening of the financial bids shall be fixed subsequently and intimated to the technically qualified bidders in advance. The bidder whose bid is in order and evaluated to be financially lowest, after considering any loadings that are decided at the technical evaluation stage, shall be considered for negotiations(not involving financial aspects) for award of the contract.

Please Note: 1. Bidders are requested to submit their technical bids with all the supporting documents in the above order only for the purpose of technical evaluation. Those bids not meeting this criterion shall be summarily rejected.

2. Wholly owned subsidiary can include the experience of its parent company.

10) The prices quoted shall be F.O.R. destination and inclusive of all duties and taxes including Custom Duty, Octroi, VAT, service tax, Entry and Other taxes etc. and no additional amount on the quoted prices shall be paid on account of such duties, taxes and Octroi etc.

11) Fixed price. Prices quoted by the Tenderer shall be fixed during the validity period of the Contract and not subject to variation on any account. A Tender submitted with an adjustable price quotation is liable to be treated as non-responsive and rejected.

12) Prices shall be quoted in **Indian Rupees only**.

13) The Tenderer shall furnish, as part of its Tender, documents establishing the eligibility and conformity to the bidding documents of all goods and services, which the Tenderer proposes to supply under the Contract.

14) The documentary evidence of conformity of the goods and services to the tender documents may be in the form of literature, drawings and data, and shall consist of:

a. A detailed description of the essential technical and performance characteristics of the goods.
b. A list giving full particulars, including available sources and current prices of spare parts, special tools, etc. necessary for the proper and continuing functioning of the goods for a period of ten years, following commencement of the use of the goods by the Department, and
c. An item-by-item comments on the departmentôs technical specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the technical specifications.

15) For purposes of the comments to be furnished, the Tenderer shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers designated by the department in its technical specifications are intended to be descriptive only and not restrictive. The Tenderer may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates, to the departmentôs satisfaction, that the substitutions ensure substantial equivalence to those.

16) In order to be eligible for bidding, in addition to other conditions, the prospective bidder shall, demonstrate successfully, at his own cost. Satisfactory performance of sensors bubbler type water level sensor and

tipping bucket rain gauge as per directions of the Engineer in Charge.

17) Tenders from Agents/dealers, without proper authorization from the manufacturer, shall be treated as non-responsive.

18) Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail. If the contractor does not accept the correction of errors, its tender will be rejected.

19) The department will evaluate and compare tender which have been determined to be substantially responsive and the financial tender shall be opened only of the Tenderers whose technical bids are found acceptable. The date and time shall be fixed subsequently and intimated to the technically qualified Tenderers in advance.

20) The evaluation of Financial Bids shall include:

a. The cost of equipment including the taxes, octroi, levies etc. as applicable at final destination and installation, testing, commissioning, maintenance and training and any other services essential for completion of works;
b. Cost of extra spares/consumables as specified in the tender document and Technical specifications para 16.0; and
c. Cost of Annual Maintenance Contract for all the equipment including replacement of defective material for next five (5) years beyond warranty period.

21) The Tenderer shall not contact the Department on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the Tenderer wishes to bring additional information to the notice of the Department, it should do so in writing.

22) An affirmative determination will be a prerequisite for award of the work to the contractor.

23) The department reserves the right at the time of contract award to increase or decrease by up to **20% the quantity of goods and services** originally specified in the Schedule of Quantities & Financial Bid Format without any change in unit price or other terms and conditions.

23) Attention of the tenderers is drawn to the Clause 1 and Clause 1(A) of Standard Contract Conditions under CPWD Forms 7/8 regarding the deduction of security deposit.

24) SPECIAL INSTRUCTIONS TO BIDDERS BY TCIL FOR E - TENDERING

The Special Instructions (for e-Tendering) supplement ôInstruction to Biddersô, as given in these Tender Documents. Submission of Online Bids is mandatory for this Tender.

E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Now, the Government of India has made e-tendering mandatory. Contractors/ Vendors will be the biggest beneficiaries of this new system of procurement. For conducting electronic tendering, Central Water Commission has decided to use the portal https://www.tcil-indiaelectronictender.com through TCIL, a Government of India Undertaking. This portal is

based on the worldôs most ósecureô and óuser friendlyô software from Electronic Tender®. A portal built using Electronic Tenderôs Software is also referred to as Electronic Tender System® (ETS).

Benefits to tenderers are outlined on the Home-page of the portal.

Instructions
Tender Bidding Methodology: Single Stage Envelope

Broad Outline of Activities from Bidder's Perspective:

Procure a Digital Signing Certificate (DSC)
Register on Electronic Tendering System® (ETS)
Create Marketing Authorities (MAs),
Users and assign roles on ETS
View Notice Inviting Tender (NIT) on ETS
For this tender -- Assign Tender Search Code (TSC) to a MA
Download Official Copy of Tender Documents from ETS
Clarification to Tender Documents on ETS
Query to Central Water Commission (Optional)
View response to queries posted by Central Water Commission
Bid-Submission on ETS
Attend Public Online Tender Opening Event (TOE) on ETS
ï Opening of relevant Bid-Part
Post-TOE Clarification on ETS (Optional)
ï Respond to Central Water Commission Post-TOE queries
Attend Public Online Tender Opening Event (TOE) on ETS
Opening of relevant part (i.e. Financial-Part)
(Only for Technical Responsive Bidders)
Participate in e-Reverse Auction on ETS

For participating in this tender online, the following instructions are to be read carefully. These instructions are supplemented with more detailed guidelines on the relevant screens of the ETS.

Digital Certificates

For integrity of data and authenticity/non-repudiation of electronic records, and to be compliant with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC). Also referred to as Digital Signature Certificate (DSC), of Class 2 or above, issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer http://www.cca.gov.in].

Registration

To use the Electronic Tender® portal https://www.tcil-india-electronictender.com, vendors need to register on the portal. Registration of each organization is to be done by one of its senior persons who will be the main person coordinating for the e-tendering activities. In ETS terminology, this person will be referred to as the Super User (SU) of that organization. For further details, please visit the website/portal, and click on the óContractor Organizationô link under óRegistrationô (on the Home Page), and follow further instructions as given on the site. Pay Annual Registration Fee as applicable.
After successful submission of Registration details and Annual Registration Fee, please contact TCIL/ETS Helpdesk (as given below), to get your registration accepted/activated.

Important Note: To minimize teething problems during the use of ETS (including Registration process), it is recommended that the user should peruse the instructions given under óETS User-Guidance Centreô located on ETS Home Page, including instructions for timely registration on ETS. The instructions relating to óEssential Computer Security Settings for Use of ETSô and óImportant Functionality Checksô should be especially taken into cognizance.

Please note that even after acceptance of your registration by the Service Provider, to respond to a tender

you will also require time to complete activities related to your organization, such as creation of users, assigning roles to them, etc.

TCIL/ ETS Helpdesk Telephone/ Mobile Customer Support (0930 hrs to 1800 hrs, Monday to Friday except on gazetted holidays): +91-1126202699 (Multiple lines) Emergency Support Mobile Numbers: +919868393775, 9868393717, 9868393792 E-mail ID ets_support@tcil-india.com

Some Bidding related Information for this Tender (Bid)

The entire bid-submission would be online on ETS (unless specified for Offline Submissions). Broad outline of submissions are as follows: Submission of Bid-Parts/ Envelopes Single-Part Submission of information pertaining Bid Security/ Earnest Money Deposit (EMD), Submission of digitally signed copy of Tender Documents/ Addendum Submission of General Terms and Conditions (with/ without deviations), Submission of Special Terms and Conditions (with/ without deviations).

Special Note on Security and Transparency of Bids

Security related functionality has been rigorously implemented in ETS in a multidimensional manner. Starting with 'Acceptance of Registration by the Service Provider', provision for security has been made at various stages in Electronic Tender's software. Specifically for Bid Submission, some security related aspects are outlined below: As part of the Electronic EncryptedÊ functionality, the contents of both the óElectronic Formsô and the óMain-Bidô are securely encrypted using a Pass-Phrase created by the Bidder himself. Unlike a ópasswordô, a Pass-Phrase can be a multi-word sentence with spaces between words (e.g. I love this World). A Pass-Phrase is easier to remember, and more difficult to break. It is recommended that a separate Pass Phrase be created for each Bid-Part. This method of bid-encryption does not have the security and data-integrity related vulnerabilities which are inherent in e-tendering systems which use Public-Key of the specified officer of a Buyer organization for bid-encryption. Bid-encryption in ETS is such that the Bids cannot be decrypted before the Public Online Tender Opening Event (TOE), even if there is connivance between the concerned tender-opening officers of the Buyer organization and the personnel of e-tendering service provider.

CAUTION: All bidders must fill Electronic FormsÊ for each bid-part sincerely and carefully, and avoid any discrepancy between information given in the Electronic FormsÊ and the corresponding Main-Bid. For transparency, the information submitted by a bidder in the Electronic FormsÊ is made available to other bidders during the Online Public TOE. If it is found during the Online Public TOE that a bidder has not filled in the complete information in the Electronic FormsÊ , the TOE officer may make available for downloading the corresponding Main-Bid of that bidder at the risk of the bidder. If variation is noted between the information contained in the Electronic FormsÊ and the óMain-Bidô, the contents of the Electronic FormsÊ shall prevail. Alternatively, the Buyer organization reserves the right to consider the higher of the two pieces of information (e.g. the higher price) for the purpose of short-listing, and the lower of the two pieces of information (e.g. the lower price) for the purpose of payment in case that bidder is an awardee in that tender.

Typically, óPass-Phraseô of the Bid-Part to be opened during a particular Public Online Tender Opening Event (TOE) is furnished online by each bidder during the TOE itself, when demanded by the concerned Tender Opening Officer.

(Optional Text in EBI, depending upon the decision of the Buyer organization): Additionally, the bidder shall make sure that the Pass-Phrase to decrypt the relevant Bid-Part is submitted to Buyer Organization Name in a sealed envelope before the start date and time of the Tender Opening Event (TOE).

OR

Additionally, the bidder shall make sure that the Pass-Phrase to decrypt the relevant Bid-Part is submitted into the ôTime Locked Electronic Key Box (EKB)ô after the corresponding deadline of Bid Submission, and before the commencement of the Online TOE. The process of submission of this Pass-Phrase in the ôTime Locked Electronic Key Boxô is done in a secure manner by first encrypting this Pass-Phrase with the designated keys provided by the Buyer organization. There is an additional protection with SSL Encryption during transit from the client-end computer of a Contractor organization to the e-tendering server/ portal. Public Online Tender Opening Event (TOE) ETS offers a unique facility for ôPublic Online Tender Opening Event (TOE)ô. Tender Opening Officers, as well as, authorized representatives of bidders can simultaneously attend the Public Online Tender Opening Event (TOE) from the comfort of their offices. Alternatively, one/ two duly authorized representative(s) of bidders (i.e. Contractor organization) are requested to carry a Laptop with Wireless Internet Connectivity, if they wish to come to Buyer Organization Name office for the Public Online TOE. Every legal requirement for a transparent and secure ôPublic Online Tender Opening Event (TOE)ô, including digital counter-signing of each opened bid by the authorized TOE Event (TOE)ô, including digital counter-signing of each opened bid by the authorized TOE officer(s)in the simultaneous online presence of the participating biddersô representatives, has been implemented on ETS.

As soon as a Bid is decrypted with the corresponding ôPass-Phraseô as submitted online by the bidder himself (during the TOE itself), salient points of the Bids (as identified by the Buyer organization) are simultaneously made available for downloading by all participating bidders. The tedium of taking notes during a manual ôTender Opening Eventô is therefore replaced with this superior and convenient form of ôPublic Online Tender Opening Event (TOE)ô. ETS has a unique facility of ôOnline Comparison Chartô which is dynamically updated as each online bid is opened. The format of the chart is based on inputs provided by the Buyer for each Bid-Part of a tender. The information in the Comparison Chart is based on the data submitted by the Bidders. A detailed Technical and/ or Financial Comparison Chart enhance Transparency. Detailed instructions are given on relevant screens. ETS has a unique facility of a detailed report titled ôMinutes of Online Tender Opening Event (TOE)ô covering all important activities of ôOnline Tender Opening Event (TOE)ô. This is available to all participating bidders for ôViewing/ Downloadingô. There are many more facilities and features on ETS. For a particular tender, the screens viewed by a Contractor will depend upon the options selected by the concerned Buyer.

Other Instructions

For further instructions, the vendor should visit the home-page of the portal https://www.tcil-india-electronictender.com, and go to the User-Guidance Centre. The help information provided through ôETS User-Guidance Centreô is available in three categories ï Users intending to Register / First-Time Users, Logged-in users of Buyer organizations, and Logged-in users of Supplier organizations. Various links (including links for User Manuals) are provided under each of the three categories. Important Note: It is strongly recommended that all authorized users of Contractor organizations should thoroughly peruse the information provided under the relevant links, and take appropriate action. This will prevent hiccups, and minimize teething problems during the use of ETS.

SIX CRITICAL DO'S AND DON'TS FOR BIDDERS

Specifically for Contractor organizations, the following 'SIX KEY INSTRUCTIONS for BIDDERS' must be assiduously adhered to:

1. Obtain individual Digital Signing Certificate (DSC or DC) well in advance of your first tender submission deadline on ETS

2. Register your organization on ETS well in advance of the important deadlines for your first tender on ETS viz. ôDate and Time of Closure of Procurement of Tender Documentsô and ôLast Date and Time of Receipt of Bidsô. Please note that even after acceptance of your registration by the Service Provider, to

respond to a tender you will also require time to complete activities related to your organization, such as creation of users, assigning roles to them, etc.

3. Get your organization's concerned executives trained on ETS well in advance of your first tender submission deadline on ETS

4. Submit your bids well in advance of tender submission deadline on ETS (There could be last minute problems due to internet timeout, breakdown, et al)

5. It is the responsibility of each bidder to remember and securely store the Pass Phrase for each Bid-Part submitted by that bidder. In the event of a bidder forgetting the Pass Phrase before the expiry of deadline for Bid-Submission, facility is provided to the bidder to óAnnul Previous Submissionô from the Bid-Submission Overview page and start afresh with new Pass-Phrase(s)

6. ETS will make your bid available for opening during the Online Public Tender Opening Event (TOE) óONLY IFô your óStatus pertaining Overall Bid-Submissionô is óCompleteô.

For your record, you can generate and save a copy of óFinal Submission Receiptô. This receipt can be generated from 'Bid-Submission Overview Page' only if the óStatus pertaining overall Bid-Submissionô is óCompleteô.

NOTE :
While the first three instructions mentioned above are especially relevant to first-time users of ETS, the fourth, fifth and sixth instructions are relevant at all times.

Minimum Requirements at Bidder's End
Computer System with good configuration (Min core i3, 3.4 GHz,4 GB DDR 3, 500GB HDD, Windows7 professional), Broad band connectivity, Microsoft Internet Explorer 6.0 or above, Digital Certificate(s).

.....X.....

GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION

STATE : Gujarat
ORGANISATION : Narmada & Tapi Basin Organisation,
CIRCLE : Hydrological Observation Circle
DIVISION : Mahi Division

Tender & Contract for Works:

Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06 nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra, Daman & Dui" on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.

To be submitted online up to 16.00 hours on **16/11**/2016 to the Engineer in-charge

To be opened online in presence of tenderer(s) or their authorized representatives who may be present at 11.00 hours on **17/11/2016** in the office of the Executive Engineer, Mahi Div, CWC Gandhinagar.

Issued to _____
(Contractor)

Signature of officer issuing the documents _____

Designation _____

Date of Issue _____

TENDER

I/We have read and examined the Notice Inviting Tender, Schedule A, B, C, D, E & F, Specifications applicable, Drawings & Designs, General Rules and Directions, General Conditions and Special Conditions of Contract, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule ÒFÓ viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions with such materials as are provided for, by, and in accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for one hundred twenty (120) days from the due date of submission thereof and not to make any modifications in its terms and conditions.

A sum of Rs.5,95,110.00 (**Rupees Five lakh ninety five thousand one hundred and ten only**) is hereby forwarded in cash /receipt treasury challan/deposit at call receipt of a schedule bank/fixed deposit receipt of a schedule bank/demand draft of schedule bank/bank guarantee issued by a schedule bank as earnest money. If I/We fail to commence work as specified, I/We agree that said President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money absolutely; otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, upto maximum of the percentage mentioned in Schedule ÒFÓ

A copy of earnest money in receipt treasury challan /deposit at call receipt of a schedule bank/fixed deposit receipt of a schedule bank/demand draft of schedule bank/bank guarantee issued by a schedule bank is scanned and uploaded **(strike out as the case may be)** as earnest money.

I/we have already furnished security to the President of India in lieu of earnest money and have deposited with the Executive Engineer, Mahi Division, CWC, Gandhinagar, a lump sum security of Rs**. .....**as earnest money in individual cases & I/We, therefore claim exemption in terms of the Bond executed by me/us and bearing no._____ dt.__/__/__ against the necessity of depositing earnest money in respect of the above tender for work. I/We agree that should the President of India or his successors in office decide to forfeit earnest money mentioned for this work, unless a sum equal to the earnest money is paid by us forthwith, the competent authority, for President of India may at his option recover it out of the deposit and in the event of deficiency, out of any other money due to me/us under this contract or otherwise.

I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

I/We agree that should I/we fail to commence the work specified in the above memorandum, an amount equal to the amount of the earnest money mentioned in the form of invitation of tender shall be absolutely forfeited to the President of India and the same may at the option of the competent authority on behalf of the President of India be recovered without prejudice to any other right or remedy available in law out of the deposit in so far as the same may extend in terms of the said bond and in the event of deficiency out of any other money due to me/us under this contract or otherwise.

Dated.....

Signature of Contractor
Postal Address

Witness:

Address:

Seal

Occupation

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of Rs. _____ (Rupees_____ _____)

The letters referred to below shall form part of this contract Agreement:

i)

ii)

iii)

For & on behalf of President of India

Signature.....

Dated..... Designation.....

SCHEDULES

SCHEDULE 'A'- Schedule of quantities (Enclosed at Table 1 & 2)

SCHEDULE 'B'- Not applicable
(Schedule of materials to be issued to the contractor)

SCHEDULE 'C' - Not applicable
(Tools and plants to be hired to the contractor)

SCHEDULE 'D' - Extra Schedule for specific requirement/document for the work if any**,** Additional Terms & Conditions, Special Conditions of Contract and Scope of work &Technical specifications.

SCHEDULE 'E' - Not Applicable
(Schedule of component of Materials, Labour etc. for escalation.)

SCHEDULE 'F'- Reference to General Conditions of Contract as applicable for Tenders invited under CPWD Form 7/8. :

Name of work: " Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06 nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra, Daman & Div" on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.

ia	Estimated cost of work put to tender	Rs. 2,97,55,422.00
ib	Earnest money	2% of Estimated Cost put to Tender i.e. Rs. 5,95,110.00
ii	Performance guarantee	5% of contract price
iii	Security Deposit	5% of contract price
	General Rules & Directions:	
	Officer inviting tender	Executive Engineer, Mahi Division, CWC, Gandhinagar
	Definitions:	Additional definitions as per conditions of contract clause 1
2(v)	Engineer-in-Charge	Executive Engineer, Mahi Division, CWC, Gandhinagar
2(viii)	Accepting Authority	Superintending Engineer, HOC, Gandhinagar
2(x)	Percentage on cost of materials and labour to cover all overheads and profits.	Not Applicable
2(xi)	Standard Schedule of Rates	CPWD -2014 & CWC-2012 (increase as per WPI)

2(xii)	Department	Central Water Commission	
9(ii)	Standard CPWD Contract Form	CPWD Form-8 as amended from time to time	
	Clause 1		
i.	Time allowed for submission of Performance Guarantee from date of issue of letter of acceptance.	30 Days	
ii	Maximum allowable extension beyond the period (provided in i)above	15 days	
	Clause 2		
	Authority for fixing Compensation under clause 2	Superintending Engineer, HOC, CWC, Gandhinagar	
	Clause 2 A		
	Whether Clause 2 A is applicable	No	
	Clause 5		
	Number of days from date of issue of letter of acceptance for reckoning date of start of work	30 Days	
Milestones		As per table given below:	
Sl. No.	Description of Mile stone (Physical)		Time allowed in days (from the reckoning date of start)
1	Supply of telemetry equipments		60 days
2	Completion of civil works at sites		90 days
3	Installation and witness Commissioning of telemetry equipments		90 days
4	Commissioning of the whole system		180 days
	Time allowed for execution of work	180 Days	
	Clause 6 & 6A	Separate measurement and verification procedure as defined in clause No.15 in Special conditions of contract Enclosed.	
	Clause 7		
	Payment on intermediate certificate	Separate procedure as defined at clause No. 16 in Special Conditions of Contract.	
	Clause 10 A	Applicable	
	Clause 10 B(ii)	As defined in clause 16, sub clause 16.3 in special conditions of contract enclosed.	
	Clause 10CA	Not applicable	

	Clause 10 CC	Not applicable	
	Clause 11	Applicable	
	Specifications to be followed for execution of work	As per Scope of Work and Technical Specifications etc	
	Clause 12	Applicable for civil works. For equipment and accessories Deviated quantities of individual sensors shall be permitted to the extent of 20% of the total quantities of the specific type of sensors assessed by the Contractor and agreed in the contract. Change orders and amendments to be governed by clauses18 & 19 of Special Conditions of contract.	
	Clause 16	As per clause 4.1 & 7,12, 21, 22 & 23 of Special Conditions of contract. The sub-standard work shall not be accepted.	
	Clause 18	Applicable	
	Clause 36		
	Minimum qualifications &experience required for Principal Technical Representative	For works with estimated cost put to tender more than	
		Rs.10 Lakh for civil work	Graduate Engineer or retired AE possessing at least Recognized Diploma
		Rs. 5 Lakh for Elect/Mech. Works	
		For works with estimated cost put to tender More than Rs. 5 Lakh but less than Rs.10 lakh for Civil work	Recognized Diploma holder
		More than Rs. 1 Lakh but less than Rs. 5 Lakh for Elect/Mech. works	Recognized Diploma holder
		Discipline to which the Principal Technical Representative should be long	Electronics & Telecommunications
		Minimum experience of works	5 Years
	Recovery to be effected from the contractor in the event of not fulfilling provision of clause 36	Rs. 20,000/- per month for Graduate Engineer. Rs. 15,000/- per month for diploma holder.	
	Clause 42	Not applicable	

Note:- All the other clauses of the GCC of CPWD shall be applicable which have not been mentioned above. The special condition of contract will supersede the clauses of GCC and shall be treated as final.

SCOPE OF WORK

The contractor shall be required to provide all of the following services:

i. The Executive Engineer, Mahi Division, CWC, Gandhinagar, invites, on behalf of President of India, item rate two bid system e-tenders comprising of technical and financial bids from Original Equipment Manufacturer (OEM) and authorized dealers for the work of **"Supply, Installation, Testing, Commissioning and Maintenance of real time data acquisition network at 18 nos. water level & meteorological stations (WL&MS) and 06Nos meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra, Daman & Div" "** on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period. Total **24** No. of stations are to be installed

ii. Performing on-site assembly, start-up of the supplied Goods and supervision.

iii. Clearances and obtaining approvals/ permissions from various Govt. agencies for supply of goods/ works and for operation of all the satellite transmission/ wireless equipment with necessary assistance from the department for obtaining such clearances.

iv. Supply of tools required for assembly and /or maintenance of the supplied Goods/ works.

i. Supply of detailed operations and maintenance manual in original along with four (4) copies of each for each appropriate unit of supplied Goods/ works.

vi. In addition the Supply of spares to be procured by the department (Refer Table-B).

vii. Training of the Departmentôs personnel at the stations to be decided by the department.

viii. Provision of Warranty services after handover of the entire system for a period of 2 years

ix. Performance or supervision or maintenance and/or repair/replacement of the supplied Goods for a period of 5 years beyond warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract. **It is further clarified that spares @ minimum 10 % of the parts likely to be needed for repairs during the Warranty / AMC shall be kept by the contractor in the stores of the department.**

x. Integration of the installed systems/remote sites with the existing VSAT Link at Modelling Centers at **Gandhinagar, Surat & Bhusawal** & FFM Directorate, CWC, New Delhi & ERS at Delhi or ERS at any other location, duly addressing the compatibility issues, if any, with successful data transmission to the CWC Modelling center at **Gandhinagar, Surat & Bhusawal**. The compatibility issues that would arise and their smooth resolution have to be assessed and ensured by the Contractor. The tenderer is advised to check & ascertain compatibility issues that would arise in transmission of data to existing Modelling Centers at **Gandhinagar, Surat & Bhusawal** & ERS, Delhi by checking its concerned specifications, at his own cost, before submitting the tender, to avoid any problem in this regard. It is the full responsibility of the vendor to ensure data communication up to Modelling center through suitable integration with existing system, and ensure data

communication.

The requisite hardware for ERS and Modelling center is already in place, and not a part of the present tender. However, it is clarified that the successful bidder shall be fully responsible (except for the hardware issues beyond the scope of the present tender) for transmission of the data from ERS Delhi to Modelling centers at **Gandhinagar, Surat & Bhusawal** for their respective sites, and FFM Dte. CWC, New Delhi for all sites. The bidders are therefore advised to visit the ERS and Modelling centers mentioned above, to ensure full compatibility of their data formats with the existing systems.

xi. In case of any conflict arising in interpretation of any Para of NIT, the decision of the Accepting Authority shall be final & binding.

xii. In case of Bubbler type water level sensor, the liability of Contractor is to design and construct the Terminal Block and carry the layout of HDPE pipe, Orifice tube & anchorage in such a manner that it will not wash out, expose to open surface (so that may not remain prone to vandalism) till the force majeure, which has been defined in the Force Majeure clause above. The liability of Engineer Incharge on this account is nil except in case of Force majeure.

.....x.....

SPECIAL CONDITIONS OF CONTRACT

Table of Clauses

1. Definition:

In this Contract, the following terms shall be interpreted as indicated

ñ**The Contract**:ò means the agreement entered into between the Department and the Contractor, as recorded in the Contract Form signed by the parties, including all amendments, attachments and appendices thereto and all documents incorporated by reference therein.

"The Contract Price" means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations.

"The consignee" means the incharge JE of the site concerned and Sub Divisional Engineer of the concerned Sub Division on behalf of Engineer in-charge.

"The Goods" means all of the equipment, machinery and / or other materials which the

Contractors are supposed to supply, to the Department under the contract.

"The Services" means those services ancillary to the supply of the Goods / works, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, warranty, annual maintenance and other such obligations of the Contractor covered under the contract.

"The Department" means Central Water Commission through Executive Engineer, **Mahi Division**, CWC, Gandhinagar for & on behalf of President of India.
"The Tenderer/ Bidder/ Contractor/ Vendor/ Contractor" means the individual or firm supplying the Goods/ performing the works and Services under this contract.

"The Project Site" where applicable, means the place or places named in Conditions of Contract.

"Remote Station/Site" as listed in the schedule of requirements (Table 2) where the sensors, data logger and transmission facilities are to be installed.

"Modelling Centre" the office location where the data transmitted by the remote sites is to be received using VSAT network.

"Day" means calendar day.

2. Applications: These conditions shall supplement / modify the General Conditions of the Contract.

3. Country of Origin

3.1 For purposes of this Clause, ñOriginò means the place where the Goods were mined, grown, or produced, or from which the services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.2 The origin of Goods and Services is distinct from the nationality of the Contractor.

4. Standards

4.1 The Goods supplied/ Works executed under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to latest Bureau of Indian Standards. Such standards shall be the latest issued by the concerned institution.

5. Use of Contract Documents and Information Inspection and audit by the Government of India

5.1 The contractor shall not, without the Engineer in-chargeôs prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the President of India in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall

extend only so far as may be necessary for purposes of such performance.

5.2 The contractor shall not, without the Engineer in-chargeôs prior written consent, make use of any document or information enumerated in Clause 5.1 except for purposes of performing the contract.

5.3 Any document, other than the contract itself, enumerated in Clause 5.1 shall remain the property of the Department and shall be returned (all copies) to the department on completion of the Contractorôs performance under the contract if so required by the Engineer in-charge.

5.4 The contractor shall permit the authorized representative of the Engineer in-charge to inspect the contractorôs accounts and records relating to the performance of the contractor and to have them audited by auditors appointed by the Engineer in-charge Department if so required by the Engineer in-charge Department

6. Patent Rights: The contractor shall indemnify the Engineer in-charge against all third party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in India.

7. Inspections and tests

7.1 The Engineer in-charge or its representative shall have the right to inspect and / or test the Goods to confirm their conformity to the contract specifications at no extra cost to the department. The technical specifications shall specify what inspections and tests the Engineer in-charge requires and where they are to be conducted. The Engineer in-charge shall notify the contractor in writing, in a timely manner, of the identity of any representatives retained for these purposes. TA/DA of the inspection team will be borne by the department.

7.2 The inspections and tests may be conducted on the premises of the Contractor or its subcontractor(s), at point of delivery, and / or at the Goodsô final destination. If conducted on the premises of the Contractor or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors authorized by Engineer in-chargeôs at no charge to the department.

7.3 Should any inspected or tested Goods, fail to conform to the specifications, the Engineer in-charge may reject the Goods and the contractor shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Department.

7.4 The Engineer in-chargeôs right to inspect, test and, where necessary, reject the goods after the goodsôarrival in the Departmentôs country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the Engineer in-charge or its representative prior to the Goods shipment from the country of origin. Nothing shall in any way release the Contractor from any warranty or other obligations under this contract.

7.5 The inspection of the Goods shall be carried out by the Inspectors (Engineer in-charge or his authorized representatives) to check whether the Goods are in conformity with the technical specifications attached to the contract agreement and shall be in line with the inspection/test procedures laid down in the Technical Specifications. Complete hardware and software as specified in the contract should be supplied, installed and commissioned

properly by the contractor prior to commencement of acceptance tests.

7.6 In the event of the software failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which the Engineer in-charge reserves the rights to get the software replaced by the contractor at no extra cost to the department.

7.7 Before the goods and equipment are taken over by the Department, the Contractor shall supply operation and maintenance manuals together with drawings of the goods civil works and equipment. These shall be in such detail as will enable the Department to operate, maintain, adjust and repair all parts of the works as stated in the technical specifications.

7.8 The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the Technical specifications.

7.9 Unless and otherwise agreed, the goods and equipment shall not be considered to be completed for the purpose of taking over until such manuals and drawings have been supplied to the Department.

7.10 For the System software & other Softwareûs, the Contractor shall provide complete and legal documentation of hardware, all subsystems, operating systems, compiler, system software and the other software. The Contractor shall also provide licensed software for all software products, whether developed by it or acquired from others. The contractor shall also indemnify the Engineer Incharge against any levies/penalties on account of any default in this regard.

7.11 Acceptance Certificates: On successful completion of acceptability test, receipt of deliverables etc, and after the Department is satisfied with the working on the system, the acceptance certificate will be issued as under:

7.11.1 Acceptance Certificate for a Remote station shall be issued on successful completion of site acceptance tests specified at 13.0 of the technical specifications by the official/officers appointed by Engineer in- charge.

7.11.2 Acceptance Certificate for the whole work shall be issued on receipt of acceptance certificates of all the remote stations, successful completion of all acceptance tests, handing over of all documentation pertaining to the work as specified at 14.0 of Technical specifications and after conduction of training programme as specified at 17.0 of Technical specifications and hand over of component of spares for the organization to the designated representative of the Engineer in-charge.

7.12 The training as specified in the Technical specifications for each hardware and software component installed shall be provided to the personnel designated by the Engineer in-charge (15 ï 20 nos trainee.) to enable them to effectively operate the total system. The training shall be conducted on the dates mutually agreed upon and within six months from the date of acceptance of the work. The expenditure of training programme shall be borne by the contractor.

8. Packing

8.1 The contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract.

The packing shall be sufficient to withstand, without limitation, rough handling during transit, and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination and the absence of heavy handling facilities at all points in transit.

8.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in clause 8.3, and in any subsequent instructions ordered by the Engineer in-charge.

8.3 Packing Instructions: Each package will be marked on three sides with proper paint/indelible ink with the following:

i) Project; (ii) Contract No.; (iii) Country of Origin of Goods; (iv) Contractorõs Name; (v) Packing List Reference number.

9. Transportation & Delivery

9.1 The Contractor is required under the Contract to transport the Goods to a specified place of destination defined as project site. Transport of Goods to such place of destination including insurance, shall be arranged by the Contractor, and the related cost shall be included in the Contract Price.

9.2 Arrangement for secure storage of the goods at designated location near the project site prior to installation shall be responsibility of the Contractor. The Department may, if available, provide such unsecured accommodation as may be available for the purpose on a specific request from the contractor. Watch & ward of the same has to be arranged by contractor at his expenses.

9.3 Delivery of the Goods shall be made by the Contractor in accordance with the terms specified by the Department in the Notification of Award.

9.4 Contractor shall be responsible till the entire stores ordered for arrive in good condition at destination and are installed, tested and commissioned.

10. Site preparation and installation

10.1 The Engineer in-charge will provide details of the installations sites before the scheduled installation date to allow the Contractor to perform a site inspection and construction of suitable civil structures before the installation of the hardware

10.2 The location of telemetry tower and sensors for snow parameters, meteorological sensors and rainfall will be decided by the respective Engineer in-charge depending on the site etc.

10.3 The contractor should complete the required works at the site for proper installation of the equipment before receipt of the equipment

11. Incidental Services

The contractor shall be required to provide any or all of the following services:

i. Performance or supervision of the on-site assembly and/or start-up of the supplied Goods.

ii. Furnishing of appropriate hardware, system design and programming services required for development and /or maintenance of the supplied goods.

iii. Furnishing of detailed operations, repair and maintenance manual for each appropriate unit of supplied Goods .

iv. Performance or supervision or maintenance and/or repair/replacement of the supplied Goods, for a period of five (05) years beyond two (02) years of warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract during AMC period.

v. Software updates and bug fixing services for the software originally developed by the Contractor during the period of two (02) years of warranty and subsequent maintenance of five years. For the third party software packages supplied, the updates shall be provided during the warranty period as well as during AMC period.

vi. Training of the Department's personnel, in assembly, start-up, operation, maintenance and/or repair of the supplied Goods at the stations to be decided by the Engineer in-charge.

vii. The travel, boarding, lodging and other payment to his staff for erection, installation and maintenance at the sites shall be the responsibility of the Contractor.

12. Spare parts

12.1 The Contractor is required to provide any or all of the following materials, notifications and information pertaining to spare parts manufactured or distributed by the Contractor.

a) Such spare parts as the Department may elect to purchase from the Contractor, providing that this election shall not relieve the Contractor of any warranty obligations under the Contract; and

b) In the event of termination of production of the spare parts;

i. Advance notification to the Department of the pending termination, in sufficient time, to permit the Department to procure needed requirements; and

ii. Following such termination, furnishing at no cost to the Department, the blue prints, drawings and specifications of the spare parts, if requested.

12.2 The Contractor shall carry sufficient inventories to assure ex ï stock supply of consumables and spares in the country. Contractors shall ensure the availability of after sales service for a period of at least ten years including warranty period.

12.3 The spare parts being procured as a part of this tender are only for the benefit of the department, for his own use. The same shall not be available for use by the Contractor during any fault in warranty period. It shall be the sole responsibility of the contractor to maintain his own set of spares for fulfilling the warranty/ AMC requirements. **It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC atleast @ 10% in the stores of the Executive Engineer, Mahi Division, Gandhinagar, to be used for fulfilling the obligation during warranty / AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the Department. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.**

13. Warranty

13.1 The Contractor warrants that the Goods supplied for execution of works under the contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The contractor further warrants that all Goods supplied for execution of works and all civil works undertaken under this Contract shall have no defect, arising from design, materials, or workmanship or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods for the works in the conditions prevailing in the country of final destination.

13.2 This warranty for the whole system, in respect of stations which have been accepted as a part of the acceptance certification, shall remain valid for twenty-four (24) months from the date of issue of final acceptance completion certificate. The contractor shall, in addition, comply with the performance guarantees specified under the contract. If, for reasons attributable to the contractor, these guarantees are not attained in whole or in part, the contractor shall, make such changes, modifications, and /or addition to the goods or any part specified in the contract at its own cost and expense and to carry out further performance tests in accordance with Clause 7 as above.

13.3 The Engineer in-charge will promptly notify the contractor in writing of any claims arising under this warranty.

13.4 In addition the Engineer Incharge will notify Contractor of any errors and malfunctions, which occur and noticed when equipment are in use, by fax/telephone/e-mail/ whats app / special messenger directly or through his Service Engineer(s) at his office address during normal working hours or at their residence after normal office hours and/or on holidays. However, it will be the whole responsibility of the contractor to keep watch on functioning of the telemetry station through ERS/Modelling center and shall have to take immediate action to ensure proper functioning of the system without waiting for the logging of the complaint from department side.

13.5 The Contractor shall ensure proper functioning of all equipment installed at all the remote stations and satisfactory data transmission from all the remote stations and data receipt at the existing CWC Modelling centre at **Gandhinagar, Surat & Bhusawal**, routed through the existing CWCôs Delhi or ERS at any other location, by the existing VSAT arrangement.

13.6 The maximum response time for a complaint from any of the destination specified in the schedule of requirements, i.e., time required for contractorôs maintenance engineers to restore the data acquisition from the remote station after a request SMS/ fax /e-mail is made or letter is written shall not exceed 96 hours. Upon receipt of such notice, the Contractor shall, visit the site and shall initiate repair or initiate replacement the defective Goods use in the works or parts thereof, without cost to the Department within (96) hours. However, it will be the whole responsibility of the contractor to keep watch on functioning of the telemetry station through ERS/Modelling center and shall have to take immediate action to ensure proper functioning of the system without waiting for the logging of the complaint from department side from the time of down of any station.

13.7 A remote site shall be treated as faulty if it fails to respond or if it transmits erroneous data during three consecutive pre-programmed observation cycles. The decision of Engineer-in-Charge about errors in data shall be final and binding. If a remote site continues to remain "fail" for more than Twelve (12) hours in excess of the maintenance time schedule

of 96 hours. The contractor is liable to pay penalty @ Rs. 5000/- per Day/ remote site. **In case of partial failure, penalty would be imposed on pro-rata basis on parameter (rainfall/ water level) being transmitted**. The Day for the purpose of penalty shall be taken as failure period of Twenty four (24) hours or part thereof for a particular remote site.

13.8 If the Contractor fails to replenish the equipment or fails to return the equipment after satisfactory repairs within 90 days from date of equipment collected from site for repairs, In such case penalty @ Rs. 1500/- per Day/ item shall be applicable.

13.9 If the Contractor, having been notified, fails to remedy the defect(s) within the time specified in clauses 13.7 to 13.8 the Engineer Incharge may proceed to take such remedial action as may be necessary, at the contractorôs risk and expense as specified in clause 13.7 to 13.8 and without prejudice to any other rights which the Engineer Incharge may have against the contractor under the contract.

13.10 The amount of penalty as indicated in the above clauses will be subject to maximum 10% of the amount of the work order for the cost of equipment including installation, but excluding cost of AMC. The amount of penalty will be recovered from balance 10% amount withheld for Security Deposit/ Performance Guarantee during warranty or from any payment due to contractor. The Department may also proceed to take such remedial action as may be necessary, at the Contractorôs risk and expense and without prejudice to any other rights which the Department may have against the Contractor under the Contract.

13.11 The authority to review the penalty shall be Superintending Engineer, Hydrological Observation Circle, **CWC, Gandhinagar.**

13.12 The bidder should have online system of lodging and monitoring of the complaints regarding functioning of the telemetry system.

14 Maintenance Service

14.1 Free maintenance services for equipment as well as civil works and other related accessories like cables etc. shall be provided by the contractor during the period of two (02) years of warranty. After warranty period, annual maintenance and repairs of the entire system (comprising of those components and group of remote stations forming part of the acceptance certificate) consisting of equipment and civil works including supply of spares etc. for next sixty (60) months beyond warranty period will be done by the contractor on quarterly blocks basis in addition as specified in T&C of AMC.

14.2 To handle the complaints, Contractor shall set up appropriate site office equipped with all requisite infra structural facilities at his own cost and notify its office and residential addresses to the Engineer Incharge within 15 days from the date of signing this contract.

14.3 Contractor shall provide services of an original manufacture certified engineer having Diploma/Degree in Electronics, at respective site offices. They should have sufficient experience of working upon and troubleshooting with the equipment installed. They should ensure the receipt of data from remote site and will check its correctness with manual data wherever possible, on weekly basis to concerned SDE/JE of this office, so as to ensure the receipt of data on regular basis.

14.4 The Annual maintenance charges shall be quoted year-wise for the entire period of five years following warranty period of two years.

14.5 The Annual maintenance charges during any year shall be payable on pro-rata basis on the basis of actual quantities of components being covered under AMC.

14.6 The Engineer Incharge, reserves the right to terminate the contract in full or in part at the end of any of the two-year blocks.

14.7 Without limiting the generality of the foregoing, Licenser further represents and warrants:

14.8.1 That the Hardware and Software shall not be abnormally end or provide invalid or incorrect results as a result of date data, specifically including date data which represents or references different centuries or more than one century.

14.8.2 That the Hardware and Software shall manage and display data involving dates, including single century formulas and multi-century formulas, and will not cause an abnormally ending scenario within the application or generate incorrect data.

14.9 **It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC atleast @ 10% in the stores of the department, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the department. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.**

14.10 The bidder should have online system of lodging and monitoring of the complaints regarding functioning of the telemetry system.

14.11 Additional Conditions during Warranty & AMC period:

14.11.1. The Permanent Termination Block (PTB), Bubbler Chamber and its sensor(BCS), Orifice tube (OT), HDPE pipe, etc. of the Telemetry system will remain submerged in the river water either in part or full during the monsoon period. They would be subjected to high velocity water currents and severe erosive action of the silt material. As such, all of them or part thereof could wash off or get damaged or stop functioning for whatsoever reason. The contractor shall replace or repair them at no cost including all spares and consumables during the Warranty/ AMC period and make the Telemetry system fully functional. Any silt deposited above PTB/ BCS shall be removed by the contractor periodically, for which no extra payment shall be made to contractor.

14.11.2. The above conditions are not limited to monsoon period only. Any damage occurring during the non-monsoon period to the PTB, BCS, OT, HDPE pipe etc. by the river water shall be made good by the contractor including their replacement during the AMC/ Warranty period.

14.11.3. Any damage to OT and HDPE pipe of the Telemetry system due to any act of vandalism shall be made good by replacement by the contractor free of cost during the period of AMC/ warranty for which spares/ consumables will be provided by department.

14.11.4. In addition the Contractor shall make suitable arrangement to ensure that its representative mandatorily visit each telemetry station once in a month and submit a certified report of matching telemetry data with the manual data, which shall be duly certified by the concern JE/SDE.

14.11.5. Dismantling and re-installation of any Telemetry equipment of any site for whatsoever reason will be done free of cost by the Contractor as per the direction of Engineer-in ï charge.

14.12 The maximum acceptable difference between manual gauge reading of CWC, wherever available, and the telemetry reading is ± 0.1 % FSO of water level and manual rainfall reading of CWC wherever available, and telemetry Rainfall reading is ± 2.0 mm of ORG(Daily total RF) reading. however, in exceptional case i.e flood duration, the criteria for the maximum acceptable difference between manual gauge reading of CWC, wherever available, and the telemetry reading shall be considered upto ± 10 cm by the Engineer Incharge. The decision regarding allowing this criteria of the Engineer Incharge shall be final in this regard.

15 **Measurement**

15.1 The measurements shall be carried out as per procedure.

15.2 Engineer-in charge shall designate an SDE/Junior Engineer in respect of each Station who will be responsible for recording the measurements and forwarding the same to Engineer-in-charge.

15.3 The Junior Engineer shall acknowledge the receipt of Goods subject to further verification and settlement at the time of installation at site by way of signing the delivery challan in triplicate and shall handover two copies of the same to Contractor.

15.4 The Contractor shall transport required goods for installation at project site and shall unpack and get the individual components, equipment, consumables and spares verified in terms of their numbers and quantities by the Junior Engineer.

15.5 The Contractor shall carry out all civil, mechanical, electrical, electronic and fabrication work at Project site and shall get the quantities of major items of work recorded in the measurement books of the Junior Engineer.

15.6 The Contractor shall also demonstrate performance of the installation as a whole at the project site in a mutually agreed manner so as to enable the Junior Engineer to fill up the check list provided by the Engineer-in-charge for ensuring acceptable performance of the project site.

15.7 The SDE/Junior Engineer shall issue an Acceptance Certificate in respect of each of the project site on demonstration by the Contractor towards satisfactory acquisition of the data by the DCU from all the sensors and satisfactory storage of the same in its internal memory. The performance of the solar panel and battery pack shall also be included in the Acceptance Certificate.

15.8 The Engineer-in-charge shall issue a Completion Certificate in respect of each station on demonstration of satisfactory acquisition, transmission and receipt of data from all the remote stations at Modelling center server for a continuous period of 7 days and completion of all training modules and handover of all documentation.

15.9 The records generated at para 15.3 to 15.8 shall be provided by the Junior Engineer to Engineer-in-Charge after ôTest checkô by the SDE up to 50% of the value of work as per CPWD Works Manual, for releasing the payments against such measurements as per

Stages provided in the payment clause.

15.10 Before releasing the payment the Executive Engineer should test check 10% of the measurements recorded by his subordinates for RCC works as per CPWD Work Manual.

16 Payment

The method and conditions of payment to be made to the Contractor under this Contract shall be as follows.

16.1 Payment shall be made in Indian Rupees only. The payment will be released through a crossed account payee cheque/demand draft in favor of the contractor drawn on SBI, Gandhinagar.

16.2 Payment shall be made for executed work and services excluding AMC.

16.3 **Ten (10) %** of contract price excluding AMC charges mobilization advance against bank guarantee. The said bank guaranty shall be released only **after** successful completion of 2 years of Warranty as well 5 years of AMC**.**

16.4 **Fifty Five (55)** % of the Contract price excluding AMC charges shall be paid after the issue of completion certificate, i.e., complete installation including civil works at all sites, including establishing of connectivity between existing Modelling centre at Gandhinagar, Surat & Bhusawal and FFM Directorate, CWC, Delhi & successful link between sites, ERS Delhi and VSAT at **Delhi & Jaipur** based on successful completion of Site Acceptance Test as per para 11.4 of Technical specification of Contract this document.

16.5 **Balance Thirty Five (35)** % of the Contract price excluding AMC charges shall be paid @ 5% every year AFTER each year of successful running of contract including 2 years of warranty and 5 years of AMC.

16.6 Payments for annual maintenance services and service tax at the prevailing rates as agreed shall be paid in equal quarterly installments and after successful maintenance of the system during the quarter.

16.7 Deductions from the bill:

16.7.1 Security Deposit shall be deducted as per Clause 1 and Clause 1(A) of Standard/General Contract Conditions under CPWD Forms 7/8.

16.7.2 The Income tax as applicable shall be deducted at source from the bill as per admissible rate.

16.7.3 Certificate on account of taxes payable/paid to the Government shall be given to the contractor.

16.7.4 No other certificate for claiming any other tax exemptions shall be given.

16.7.5 The contractor shall be responsible for payment of all taxes and levies as per prevailing Govt. rules. A declaration in this regard is required to be submitted by the Contractor before release of payment

17. Prices

Prices payable to the contractor as stated in the contract shall be firm and not subject to adjustment during the performance of the contract, i.e., warranty period (2 years) + AMC period (5 years). Prices quoted shall be inclusive offal of all taxes and duties levied at the country of origin or in India.

18. Change Orders

The Engineer in-charge, may at any time, by a written order given to the Contractor, make changes within the general scope of the contract in any one or more of the following:

18.1 Drawings, designs, or specifications, where Goods to be furnished under the contract are to be specifically manufactured for the Department.

18.2 The method of shipment or packing;

18.3 The place of delivery; and / or

18.4 The Services to be provided by the Contractor.

18.5 If any such change causes an increase or decrease in the cost of, or the time required for, the contractorôs performance of any provisions under the contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this clause must be asserted within thirty (30) days from the date of the Contractorôs receipt of the change order.

19 **Contract Amendments:**

Subject to Clause 18, no variation in or modification of the terms of the Contract shall be made except by written amendment agreed and signed by the parties.

20 Assignments

The contractor shall not assign, in whole or in part to the other firm/person, its obligations to perform under this Contract, except with the Engineer Incharge, prior written consent.

21 Sub-contracts

Sub-contracts must comply with the provisions of Clause 3 of General Conditions of Contract**.**

22. Delays in the contractor's Performance

22.1 Delivery of the Goods / Execution of works and performance of Services shall be made by the Contractor in accordance with the time schedule prescribed by the Engineer Incharge in the Schedule of Requirements.

22.2 If at any time during performance of the Contract, the Contractor should encounter conditions impeding timely delivery of the Goods/ execution of works and performance of

Services, the Contractor shall promptly notify the Engineer Incharge in writing of the fact of the delay, itõs likely duration and its cause(s). As soon as practicable after receipt of the Contractorõs notice, the Engineer Incharge shall evaluate the situation and may at its discretion extend the Contractorõs time for performance, with or without liquidated damages,

22.3 Except as provided under Clause 25, a delay by the Contractor in the performance of its execution of works obligations shall render the Contractor liable to the imposition of liquidated damages pursuant to Clause 23 unless an extension of time is agreed upon pursuant to Clause 22.2 without the application of liquidated damages.

23 Liquidated Damages

Subject to Clause 25, if the Contractor fails to deliver/ execute work any or all of the Goods/ execute work or to perform the Services within the period(s) specified in the Contract, the Engineer Incharge shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified of the delivered price of the delayed Goods Works or unperformed Services for each week or part thereof delay until actual delivery/ execution of works or performance, up to a maximum deduction of the percentage specified .Once the maximum is reached, the Engineer Incharge may consider termination of the Contract pursuant to Clause 24. The applicable rate is 1.5% per month of delay computed on per day basis and the maximum deduction is 10% of the contract price.

24. Termination for Default

24.1 The Engineer Incharge, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor, may terminate this Contract in whole or in part.

24.1.1 If the Contractor fails to deliver/ execute any or all of the Goods/ Works within the period(s) specified in the Contract, or within any extension thereof granted by the Department pursuant to Clause 22.2.

24.1.2 If the Contractor fails to perform any other obligation(s) under the contract.

24.1.3 If the Contractor, in the judgment of the Engineer Incharge, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause:

ñCorrupt practiceò means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

ñFraudulent practiceò means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Department, and includes collusive practice among Tenderers (prior to or after tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the Department of the benefits of free and open competition.

24.2 In the event the Department terminates the Contract in whole or in part, pursuant to Clause 24.1, the r Department may procure, upon such terms and in such manner as it deems appropriate, Goods/Works or services similar to those undelivered and the

contractor shall be liable to the Engineer Incharge for any excess costs for such similar Goods/ Works or Services. However, the contractor shall continue performance of the Contract to the extent not terminated.

25 Force Majeure

25.1 Notwithstanding the provisions of Clause 22, 23 and 24, the Contractor shall not be liable for forfeiture of performance security liquidated damages or termination for default if and to the extent that its delay in performance or other failure to perform the obligations under the Contract is the result of an event of Force Majeure.

25.2 For purposes of this Clause, ñForce Majeureò means an event beyond the control of the Contractor and not involving the Contractorôs fault or negligence and not foreseeable. Such events may include but are not restricted to, acts of the Engineer Incharge in its sovereign capacity, wars or revolutions, fires, epidemics, quarantine restrictions, and freight embargos.

25.3 If a Force Majeure situation arises, the Contractor shall promptly notify the Engineer Incharge in writing of such condition and the cause thereof. Unless otherwise directed by the Engineer Incharge in writing, the Contractor shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek, all reasonable alternative means for performance not prevented by the force Majeure event.

25.4 For an instance of floods, Force Majeure shall be considered only in case the river level CROSSES the designated highest historically recorded Flood Level (HFL) for that site.

25.5 In case of Force Majeure, the telemetry system will be made operational by the Contractor within 30 days of receiving a work order from the Engineer Incharge. The rates of spare parts will be as per the rates quoted by the Contractor in his bid document, and the rates shall remain valid throughout the contract period. The rates of civil works will be as per the rates quoted /approved in work order.

26. Termination for Insolvency

The Engineer Incharge may at any time terminate the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Contractor, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Engineer Incharge.

27. Termination for Convenience:

27.1 The Engineer Incharge, by written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Departmentôs convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective.

27.2 The Goods that are complete and ready for shipment within thirty (30) days after the Contractorôs receipt of notice of termination shall be accepted by the Engineer Incharge at the Contract terms and prices. For the remaining Goods, the Engineer Incharge may elect:

27.2.1 to have any portion completed and delivered at the Contract terms and prices; and/ or

27.2.2 to cancel the remainder and pay to the Contractor as agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Contractor.

28 Resolution of disputes

28.1 The Engineer Incharge and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them and or in connection with the Contract.

28.2 If, after thirty (30) days from the commencement of such informal negotiations, the Engineer Incharge and the Contractor have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified. These mechanisms may include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed national forum.

28.3 Settlement of disputes

The Sub-Section V ñArbitration and laws etc.òof the General Conditions of the contractor works as stated below shall be applicable to this contract / agreement also: Except where otherwise provided for in the contract, all questions and disputes relating to the meaning of the specifications, designs, drawing and instructions herein before contained in this contract or as quality of the workmanship or materials used or arising out of the terms & conditions of the contract whether during the progress of the supply/work or after the completion or abandonment thereof, at to the sole arbitration of the person nominated and appointed by the Superintending Engineer concerned in respect of the contracts entered for and on behalf of the President of India. The parties of the contract agree that it will be no objection to any such appointment that the sole arbitrator so appointed is originally referred being transferred or having vacated his office or being unable to act for any reason whatsoever, Superintending Engineer concerned as aforesaid at the time of such transfer, vacation of office or inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the contract. Such person as and when appointed shall proceed with the reference from the stage at which it was left by his predecessor in accordance with the rules, regulation and the law of the land, It is also a term of this contract that no person other than a person appointed by the Superintending Engineer concerned as aforesaid should act as Arbitrator and if any reason that is not possible, the matter is not to be referred to arbitration at all. It is also the term of the contract that the party invoking the arbitration clause shall specify the dispute(s) to be referred to the arbitration under this contract together with amount(s) claimed in respect of each such dispute(s) or difference(s). In an arbitration invoked at the instance of either party to the contract, the Arbitrator would be free to consider the counterclaims of the other party or even though they are not mentioned in the reference to arbitration. Subject as aforesaid, the provisions of the Arbitration and conciliation Act 1996 (No 26 of 1996) or any statutory modification or re-enactment thereof and rules made there-under and for the time being in force shall apply to the arbitration proceeding under this clause.

29. Governing Language

The Contract shall be written in the English language. The version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language.

30. Applicable Law

The contract shall be interpreted in accordance with the laws of the Department's country, unless otherwise specified.

31. Notices

31.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by mail, fax and confirmed in writing to the other party's address specified.

31.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

.....x.....

Annexure-I

ADDITIONAL CONDITIONS OF CONTRACT DURING MAINTENANCE PERIOD (AMC)

1. SCOPE OF WORK DURING MAINTENANCE PERIOD:

a) The maintenance services to be provided by the contractor under this contract shall be for entire system, in accordance with the terms and conditions laid down in the contract, of the telemetry equipment / system, all accessories and attachments of the equipment / systems installed at Remote Stations as per the details given in Tables 1 and 2 of the tender document including providing of all required consumables, additional spare parts, repair of the defective equipment or units/parts thereof, orientation of antenna whenever required due to any change(s) in position of the satellite and imparting training to the officers of the Central Water Commission about operation, repair and maintenance of telemetry system.

b) Contractor shall maintain his site office at appropriate central location, equipped with all requisite infrastructural facilities at his own cost and notify its office and addresses to the Engineer-in-charge, to handle the complaints.

c) Contractor shall provide services of an original manufacture certified engineer having Diploma/Degree in Electronics & Telecommunications, to the satisfaction of Engineer Incharge. The site engineer should have sufficient experience of working upon and troubleshooting with the equipment installed. He should ensure the receipt of data from remote site, and check its correctness by comparing with manual data wherever possible on weekly basis to SDE/JE of this office, so as to ensure the receipt of data on regular basis.

d. Engineer in-charge shall notify Contractor of any errors and malfunctions, which occur and noticed when equipment are in use, by fax/telephone/e-mail/special messenger directly or through his Service Engineer(s) at his office address during normal working hours or at their residence after normal office hours and/or on holidays. However, it will be the whole responsibility of the contractor to keep watch on functioning of the telemetry station through ERS/Modelling center and shall have to take immediate action to ensure proper functioning of the system without waiting for the logging of the complaint from department side from the time of down of any station.

e. Contractor shall provide maintenance services to the Department at Data Acquisition Sites (DAS) and correct the defect(s) reported by the Engineer in-charge within a period of 96 hours on receipt of the complaint.

f. The Contractor shall ensure proper functioning of all equipment installed at DAS and satisfactory data transmission from all DAS and data receipt at the existing CWC's Delhi or ERS at any other location, by utilizing the spare parts available at designated places and by providing additional spare parts for which no additional cost will be paid by the Department. Such designated locations will be mutually agreed at the time of commencement of work.

a) The Contractor shall, at his own cost, carry out repair of the defective equipment or parts thereof, to the satisfaction of the Engineer Incharge and return the equipment after satisfactory repair within 30 days from the date of written complaint/request made. All charges towards collection, transportation of defective equipment, return of equipment after repair including cost of repair defective equipment or parts thereof, shall be borne by the Contractor and no charges on this account shall be paid by the Engineer Incharge.

b) It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC atleast @ 10% in the stores of the Department, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the Department. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.

i. The Permanent Termination Block (PTB), Bubbler Chamber and its sensor(BCS), Orifice tube (OT), HDPE pipe, etc. of the Telemetry system will remain submerged in the river water either in part or full during the monsoon period. They would be subjected to high velocity water currents and severe erosive action of the silt material. As such, all of them or part thereof could wash off or get damaged or stop functioning for whatsoever reason. The contractor shall replace or repair them at no cost during the Warranty/ AMC period and make the Telemetry system fully functional. Any silt deposited above PTB/ BCS shall be removed as & when required by the contractor for which no additional cost will be paid by the Department.

j) The above conditions are not limited to monsoon period only. Any damage occurring during the non-monsoon period to the PTB, BCS, OT, HDPE pipe etc. by the river water shall be made good by the contractor including their replacement during the AMC/ Warranty period.

k) Any damage to OT and HDPE pipe of the Telemetry system due to any act of vandalism shall be made good by replacement by the contractor free of cost during the period of AMC/ warranty for which spares/ consumables will be provided by the CWC at the scheduled rate.

l) The Contractor shall make suitable arrangement to ensure that its representative mandatorily visit each telemetry station once in a month and submit a certified report of matching telemetry data with the manual data wherever applicable.

m) Dismantling and re-installation of any Telemetry equipment of any site for whatsoever reason will be done free of cost including manpower by the Contractor as per the direction of Engineer-in ï charge.

n) The maximum acceptable difference between manual gauge reading of CWC, wherever available, and the telemetry reading is 0.1% of FSO of water level and for TBRG $\pm$2 mm .(of daily ORG total RF) However, in exceptional case i.e. flood duration, the criteria for the maximum acceptable difference between manual gauge reading of CWC, wherever available, and the telemetry reading shall be considered upto ± 10 cm by the Engineer in-charge. The decision regarding allowing this criteria of the Engineer in-charge shall be final in this regard

2. PENALTY CLAUSE:

Upon receipt of notification of defect in the system from Engineer Incharge/ his authorized representative, if Contractor fails to take immediate corrective measures to rectify the defect, within the stipulated maximum response time stated above, the contractor is liable to pay penalty for unsatisfactory performance of maintenance services, in accordance with the criteria laid down below:

a. A remote site shall be treated as faulty if it fails to respond or if it transmits erroneous

data during three consecutive pre-programmed observation cycles. The decision of Engineer-in-Charge about errors in data shall be final and binding. If a remote site continues to remain "fail" for more than Twelve (12) hours in excess of the maintenance time schedule of 96 hours. The contractor is liable to pay penalty @ Rs. 5000/- per Day/ remote site. **In case of partial failure, penalty would be imposed on pro-rata basis on parameter (rainfall/ water level) being transmitted**. The Day for the purpose of penalty shall be taken as failure period of Twenty four (24) hours or part thereof for a particular remote site.

The maximum limit of the total penalty in a year on this account shall be limited to the 50% of the value of maintenance contract for corresponding year.

b) The contractor shall ensure all that all the compatibility issues, if any that may arise are addressed successfully while integrating the installed remote stations with the existing CWCôs Delhi or ERS at any other location, and satisfactory receipt of data at the CWCôs existing Modelling center at Gandhinagar, Surat, Bhusawal & FFM Directorate, CWC, Delhi, if still no data is received at CWCôs existing Modelling center at Gandhinagar, Surat, Bhusawal & FFM Directorate, CWC, Delhi through the CWCôs existing Delhi or ERS at any other location,, it will be treated as ñfailò and if such a failure continues for more than 48 hours , the contractor is liable to pay a penalty as specified above. The penalty shall not be imposed in case of force majeure.

The maximum limit of the total penalty in a year on this account shall be limited to the 50% of the value of maintenance contract for corresponding year.

c) If the Contractor fails to rectify the defects or fails to return the equipment after satisfactory repair within the permitted time frame, the contractor shall be liable to pay the penalty at the rates indicated in clauses 2 (a) and 2(b) of this contract. The period of penalty shall be calculated from the time effective from the time of expiry of the time schedule allowed for fault rectification.

d) The authority to impose the penalty is the Engineer Incharge and the authority to review and finalize the penalty is the Superintending Engineer concerned.

e) The total penalty in a year shall be limited to the value of maintenance contract.

3. TERMS OF PAYMENT:

a) Any taxes and/or other Governmental levies as applicable or becoming applicable later due to or under any law shall be deducted from the bill.

b) The maintenance and repair cost due to force majeure shall be paid quarterly, on satisfactory performance of maintenance services..

c. Payment shall be made in Indian Rupees only. The payment will be released through a crossed account payee cheque /demand draft in favor of the contractor drawn on SBI, Gandhinagar.

4. OTHER TERMS AND CONDITIONS:

a. Renewal of agreement

This agreement could, thereafter, be renewed for successive periods as mutually decided from time to time.

b. Access to Department's site/Contractor's office & Records relates to past experience of such equipment in India.

The Junior Engineer/authorized representative of Engineer-in-Charge shall provide free access to the sites where the defect has occurred. E.g. Remote Station equipment may be under lock & key for which the Junior Engineer/authorized representative of Engineer-in-Charge shall make sure that free access to such sites are made available for necessary actions at contractorôs end. He will also arrange for the security clearance, wherever required in advance to ensure that contractorôs engineers get the access to site immediately.

c) **Spares/ Equipment**

Excluding the above mentioned spares/equipment maintained by the Department any import/purchase of any of such components as required during the maintenance, shall be the sole responsibility of the contractor. If the contractor fails to repair the equipment/spare due to non-availability of the spare /technological changes the same may be replaced by the contractor with equivalent equipment / spare of same specification and reputed make with prior permission of Engineer-in- charge and the costs involved in this process shall be borne by the contractor. On-returning of the defective spares/equipment after due repair beyond stipulated time as specified above shall attract the penalty as per clause-2 of this contract.

d) Consumables

Contractor shall be responsible for, providing & replacement of consumable items like DCP Batteries, Batteries of UPS, cables, orifice tubes, HDPE pipe, silica gel, connectors and other similar items.

e) Periodical routine services

Periodical routine services viz. Pre and Post monsoon calibration shall also be done by the Contractor at each site. Reports in this regard shall be submitted to the Engineer incharge by 15th May and 31st December respectively each year, and these reports shall be mandatory for release of payment of AMC. If the contractor fails to calibrate data acquisition stations as per schedule specified above, the contractor is liable to pay penalty of Rs. 20,000/- per station in each case. Apart from the above, the bidder has to make the site visit for maintenance as defined in this document and as & when required, as per the site requirements.

f) Change of Satellite

i. Changes required for realigning the system at central stations and remote stations due to the change in operating satellite for this project shall be done by the Contractor at his own cost. Equipment required to undertake this change will be arranged by Contractor. The Contractor shall have to realign the system for any no. of changes in satellite position during the contract period and no additional payment will be paid to contractor on account of multiple times of realignments.

ii. The contractor is responsible for managing the activities of its personnel or subcontracted personnel and will hold itself responsible for any misdemeanors.

iii. The contractor will treat as confidential all data and information about the Department, obtained in the execution of his responsibilities, in strict confidence and will not reveal such information to any other party without the prior written approval of the Department.

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SCHEDULE OF QUANTITIES

TABLE 1

Sl. No.	Name of Item	Total in Numbers
1	Establishment of Remote Station Type WL&MS Water Level and Rainfall measurement, including all civil, mechanical and fabrication works along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi using existing V-SAT network complete in all respects. The break-up of type of sensors and civil works in respect of the total stations, is as below:	18
2	Establishment of Remote Station Type MS Rainfall measurement, including all civil, mechanical and fabrication works along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi using existing V-SAT network complete in all respects. The break-up of type of sensors and civil works in respect of the total stations, is as below:	6
3.a*	Number of Concrete Tower installations (For bubbler type WL sensor & TBRG)	8
3.b*	Number of Fixing arrangement for installation of Radar type water level sensor on existing structure, viz. road bridge/ any other existing water structure.	12
3.c*	Number of installations in existing building	4
4	Data down Loading Machine	8
5	Comprehensive annual maintenance charges including replacement of material & consumables for 5 years after warranty period of 2 years along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi complete in all respects.	As per items as Sl. No. 1 & 2 above
6	Spare parts (As detailed in Table 'B')	1 Set
7	Training (both for remote station and Modelling Centre) for officers & staff, topics including O&M of equipment, Data Observations, Consistency check and Data Validation (**Maximum acceptable difference between manual gauge reading, wherever available, and the telemetry reading shall be ± 1 cm of water level, while that for rain gauge shall be ± 2mm).**	3 nos. at each station per year of warranty as well as AMC

***The bidder may quote unit cost for civil works for all three categories, so as to enable flexibility of shifting from one category to other during execution.**

TABLE 2

Details of Remote Stations to be installed under Mahi & Tapi Divisions**, CWC**

Sl.No.	Station Name	District/State	River Basin	Station Type
Under Mahi Division, CWC, Gandhinagar				
1	Sapawada	Mehasana/ Gujarat	Rupen	WL & MS (Bubbler type WL sensor)
2	Kamalpur	Patan/ Gujarat	Banas	WL & MS (Radar type WL sensor)
3	Borwa	Ratlam/ Madhya Pradesh	Mahi	WL & MS (Bubbler type WL sensor)
4	Sohagpura	Pratapgarh/ Rajasthan	Mahi	WL & MS (Bubbler type WL sensor)
5	Mahi Project, Labriya	Dhar/ Madhya Pradesh	Mahi	WL & MS (Radar type WL sensor)
6	Khandiovari	Udaipur/ Rajasthan	Mahi	WL & MS (Bubbler type WL sensor)
7	Amarpura	Udaipur/ Rajasthan	Mahi	WL & MS (Bubbler type WL sensor)
8	Jaisamand Reservoir	Udaipur/ Rajasthan	Mahi	WL & MS (Radar type WL sensor)
9	Moras	Sirohi/Rajasthan	Banas	MS (Rainfall)
10	Nandia	Sirohi/Rajasthan	Banas	MS (Rainfall)
11	Una	Gir Somnath/Gujarat	Machhundri	MS (Rainfall)
12	Mahudi	Sabarkantha/Gujarat	Sabarmati	MS (Rainfall)
13	Machkoda	Sabarkantha/Gujarat	Sabarmati	MS (Rainfall)
Under Tapi Division, CWC, Surat				
14	Mahuva	Surat/ Gujarat	Purna	WL & MS (Radar type WL sensor)
15	Gadat	Surat/ Gujarat	Ambica	WL & MS (Radar type WL sensor)
16	Durvesh	Thana/ Maharashtra	Vaitarna	WL & MS (Radar type WL sensor)
17	Motinaroli	Surat/ Gujarat	Kim	WL & MS (Radar type WL sensor)
18	Chanwada	Vadodra/ Gujarat	Narmada	WL & MS (Radar type WL sensor)
19	Varai	Silvassa/ Daman& Dui (UT)	Damanganga	WL & MS (Radar type WL sensor)
20	Prakasha	Tapi/ Gujarat	Tapi	WL & MS (Radar type WL sensor)
21	Kakrapar	Tapi/ Gujarat	Tapi	WL & MS (Radar type WL sensor)
22	Gavachi	Tapi/ Gujarat	Tapi	WL & MS (Radar type WL sensor)
23	Uchhal (Chandapur)	Vyara/ Gujarat	Tapi	WL & MS (Bubbler type WL sensor)
24	Nizer	Tapi/ Gujarat	Tapi	MS (Rainfall)

FINANCIAL BID FORMAT

Table-A

(The rates may be quoted in Indian Rupees only)

Sl. No.	Name of Item	Quantity	Rate in Rs	Amount in Rupees	
				In Figures	In Words
1	Establishment of Remote Station Type WL&MS Water Level and Rainfall measurement, including all civil, mechanical and fabrication works along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi using existing V-SAT network complete in all respects.	18			
2	Establishment of Remote Station Type MS Rainfall measurement, including all civil, mechanical and fabrication works along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi using existing V-SAT network complete in all respects.	6			
3	Data down Loading Machine (one machine each for respective consignee)	8			
4	Comprehensive annual maintenance charges including replacement of material & consumables for 5 years after warranty period of 2 years along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi complete in all respects.	As per items as Sl. No. 1 & 2 above			
5	Spare parts (As detailed in Table "B")	1 Set			
6	Training (both for remote station and Modelling Centre) for officers & staff as per provided details.	3 nos. at each station			
			Total Cost of Bid		

Table-B
Details of Spares and Consumables
(Rates may be quoted in Indian rupees only)

Sl. No.	Spare Name/Description	Quantity	Rate in Rupees	Amount in Rupees
1	INSAT Transmitter	3 sets		
2	Satellite Antenna	3 sets		
3	TBRG	3 sets		
4	Bubbler type Water level sensor with all accessories	1set		
5	Radar type Water level sensor with all accessories	2 sets		
6	Solar panel assembly	3 sets		
7	Nozzle and / bubbler tube	2 nos/ 300m		
8	HDPE pipe	300 m		
Total Cost for Spares and Consumables in Rs.				

Table-C
Comprehensive annual maintenance charges
(Rates may be quoted in Indian rupees only)

Sl. No.	Item	Unit	Rate per year				
			1st yr	2nd yr	3rd yr	4th yr	5th yr
1	Comprehensive annual maintenance charges for WL&MS Station including replacement of material & consumables for 5 years after warranty period of 2 years along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, CWC, Sewa Bhawan, New Delhi complete in all respects.	Per Station					
2	Comprehensive annual maintenance charges for MS Station including replacement of material & consumables for 5 years after warranty period of 2 years along with data transmission from remote site to CWC existing Delhi or ERS at any other location, to existing Modelling Centre at Gandhinagar, Surat & Bhusawal and FFM Directorate, CWC, Sewa Bhawan, New Delhi complete in all respects.	Per Station					

Table –D

Sr No.	Item of works	Unit	Rate in Rs. (In Fig. and words
1	Unit cost of Civil Works for construction of concrete tower with removable steel ladder (ladder also in scope of the contractor), as per drawing enclosed as Drg.	Per Site	
2	Unit cost of Civil Works for fixing arrangement for installation of Radar type water level sensor on existing structure, viz. road bridge/ any other existing water structure.as per drawing enclosed as Drg.	Per Site	
3	Unit cost for Civil Works for construction of a site housed in an existing building	Per Site	

TECHNICAL SPECIFICATIONS

1. GENERAL

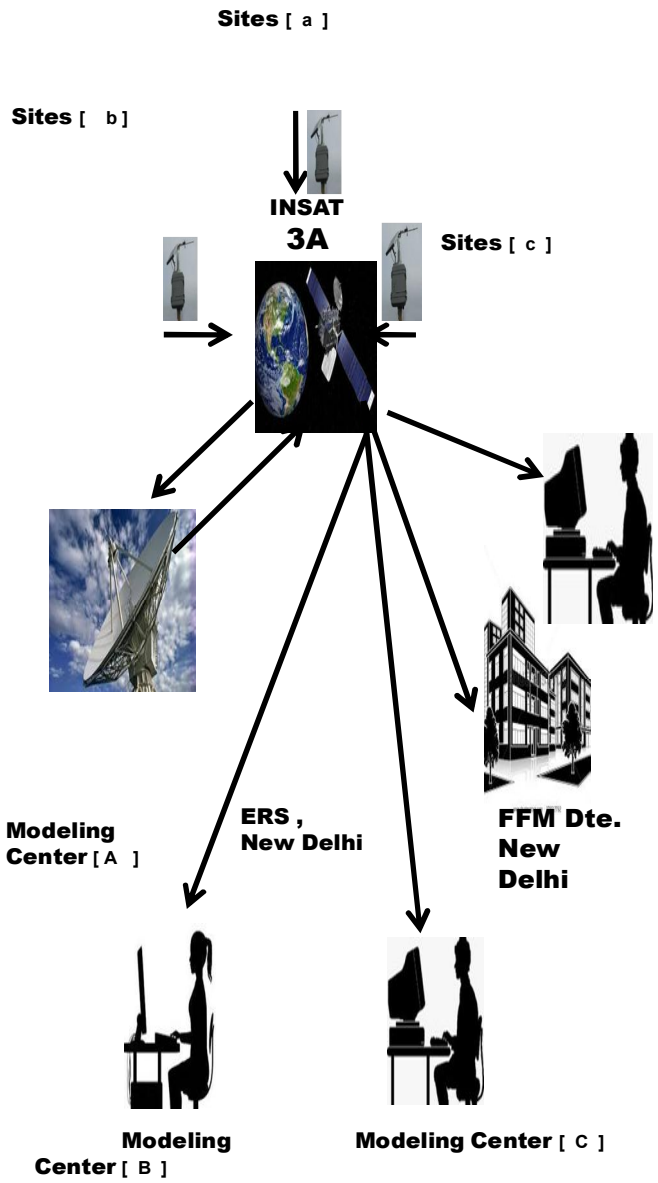
The Technical Specification covers the Contract for the installation of telemetry system in different sites in **Narmada & Tapi Basin Organisation, CWC, Gandhinagar** as specified including Earth Receiving Station, which shall be able to receive data from INSAT/Kalpana (INSAT 3A) data relay transponder as well as DRT of future SAT systems, instrumentation and associated Data Collection Units (DCUs). Further, the transmission should also be in GSM mode, allowing receiving of data from remote DCU to the specified mobile numbers.

The scope includes the design, manufacture, factory testing, delivery to site, installation (including the associated interface wiring/termination), commissioning and site acceptance testing, supply of spares, training and documentation. DCU's, Monitoring system hardware / software shall interface and be fully integrated and tested with the existing CWCôs Earth Receiving Station (ERS) at Delhi and existing modelling centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, New Delhi. The functional requirements are given below in respect of each major component of the system. The contractor shall ensure that the fundamental requirements enunciated hereunder are not compromised.

2 OVERVIEW OF THE SYSTEM

Each remote station will transmit data to the existing CWCôs Delhi or ERS at any other location, on a regular interval of 30 minutes, store it and then pass the data to Modelling data storage. The remote station shall hold the data at least for 270 days and shall record the latest data by replacing the oldest one. The remote stations shall be able to collect the data from the instrumentation/sensors and transmit these to the CWCôs Modelling center at Gandhinagar, Surat & Bhusawal & FFM Directorate, New Delhi as the case may be through the existing CWCôs ERS at Delhi on a continuous basis even in extreme weather conditions.

The existing ERS will receive the satellite messages from the remote stations and store in a raw file. The ERS will provide path to the Modelling center VSAT link. The VSAT link will then transfer the raw file to the respective Modelling center at & FFM Directorate, New Delhi as the case may be in respect of remote stations under jurisdiction of respective Modelling center.



Figure

Schematic Diagram showing proposed telemetry network.

2.1 Classification Of Remote Stations

Remote stations are to be established in 12 river Basins.

Sl. No.	Type of Station	Sensors (including satellite data transmitters)
1	WL&MS type	Establishment of Remote Station Type WL&MS Type (Water Level Sensor and Rainfall).
2	MS type	Establishment of Remote Station Type MS Type (Rainfall).

Each station shall have appropriately configured Data Collection Unit (DCU) along with necessary communication facilities such that they are compatible and integrated with the existing system at ERS Delhi.

Each station shall be fully automatic and shall only require routine maintenance and inspection. Readings of the parameters (water level, rainfall, snow and other meteorological parameters) shall be automatically transmitted to the CWC existing Earth Receiving Station at Delhi at predefined intervals.

2.2 Functional Description of Remote Stations

2.2.1 Water Level and meteorological - (WL&MS)

These stations will measure the water level as well as rainfall.

2.2.2 Meteorological - (MS)

These stations will measure the rainfall.

3. EQUIPMENT ARRANGEMENT

Remote station shall be equipped with all necessary equipments to measure water level and rainfall, including tubing in case of bubbler type, as well as all Peripherals including the following:

- Data Collection Unit mounted inside an enclosure which will house the following items.
  - Data recorder logger
  - INSAT transmitter
  - Battery Power
  - Pre wiring and configuration
  - Solar panel charger regulator
  - Connector interfaces with Surge suppression on all channels as well as INSAT transmitter
- Concrete tower as per Drawing 1 (alternatively, where walled enclosure is available, the same can be mounted on the wall), for DCU, Solar Panel & INSAT antenna etc.
- Civil works for Concrete tower (wherever applicable)/ mounting of radar type water level sensor, or bubbler type water level sensor ï as the case may be.

- Wire-mesh fencing and gate with lock
- Antenna cables.
- Power cables.
- Grounding and lightning protection

All necessary hardware required for the system to operate properly.

4.0 INSTRUMENTATION AND DATA ACQUISITION HARDWARE AND SOFTWARE

4.1 General Specification/ features

4.1.1 It is imperative that all instrumentation, other equipment shall operate effectively with the DCUôs and the DCUôs in turn shall operate effectively with the satellite equipment and other systems of ERS. In addition, the input/output protocols of individual items of equipment (gauges/snow stakes, DCU's, solar power arrangements, etc) shall interface accurately. For this purpose, the interfaces between the sensors and the DCU, DCU and transmission equipment are to be ensured to be compatible and trouble free.

4.1.2 The specific electrical, electronic and mechanical design parameters mentioned in case of individual sensors are indicative of a typical design and variations therein can be considered provided the output, resolution, accuracy and ruggedness against environment are not compromised in any manner. In such cases where the Contractor proposes to deviate from the specifications a full technical justification shall be provided. The Engineer Incharge is not bound to accept such justification.

4.1.3 It shall be the Contractors responsibility to ensure that the installation is robust and shall continue to work in extreme weather conditions.

4.1.4 Reliability of operation during normal and extreme weather conditions is imperative.

4.1.5 The sensors and all accessories and facilities shall be fully compatible with the data acquisition and transmission system. The sensors and DCUôs shall form a complete automated data acquisition storage and transmission system.

4.1.6 In case of any of the sensors, the equipment is supplied with certain optional features which are required to be ordered separately and are not included as a part of the offer; the same shall be clearly mentioned in the bid along with the functions of such features. The Engineer Incharge shall be provided with all necessary information which shall enable him to take an informed decision at the time of entering into the contract as to the ordering any such feature or otherwise.

4.1.7 The Contractor shall enclose technical literature in respect of all the sensors being quoted. The features which are mentioned in the literature but are not being quoted as a part of the current system shall be clearly brought out in the bid. In the event of failure of the Contractor to explicitly mention any such exclusion, it shall be taken as inclusion of all features mentioned in the bid as a part of the supply and the Contractor shall have to provide all such features/ accessories without claim of extra cost to the Department.

4.1.8 All accessories, tools and fixtures required for installation and dismounting/ remounting of the equipment shall be treated as a part of the supply for each type of sensors. One such kit shall be supplied.

4.1.9 Contractor shall give general layout of all the installations including all civil works for types of stations and materials including that for the equipment at the time of bidding. Afterwards, the successful Contractor shall furnish the details of all the mounting arrangements, including civil works. Variations in typical designs shall be submitted with drawing and design calculations and shall have to be got approved from the concerned Engineer ï in ï charge before commencement of work and any changes suggested by the Engineer ï in ï charge shall be agreed to. Indian Standard codes of practice shall be followed for all civil works and mounting arrangements.

4.1.10 The security arrangement provisions for sensors installed in the open ground like wire-mesh fencing, locking etc. shall also be provided by the Contractor.

4.1.11 Security of installed equipments against theft and vandalism shall be the responsibility of the Contractor till successful installation, commissioning, and two stages of site acceptance testing.

4.1.12 All fixings shall be non-corrodible.

4.1.13 The Contractor has to specify how the calibration will be carried out and has to use his own calibration equipment during the period of warranty and AMC.

4.1.14 Wherever the DCU or any of the instruments is mounted at a height of 2 meters or higher from floor or ground level, folding Aluminum Ladders of good quality also have to be provided.

4.2 Rainfall Measurements

i. Rainfall shall be measured using the tipping bucket raingauge and shall be able to record cumulatively.

ii. The rain gauge shall be of such a design that it operates reliably and accurately under the prevailing environmental and weather conditions.

iii. It shall be noted that some sites are prone to cyclonic winds.

iv. The rain gauge shall be easy to operate and maintain.

v. The rain gauge shall be supplied with the accessories as needed for effective deployment.

vi. All materials on the rain gauge, regardless of the protective layer(s), shall be non-corrosive (e.g. galvanized or paint coated iron is not acceptable).

vii. Sheet material shall not be part of the rain gauge.

viii. The bucket design shall be inherently symmetrical, e.g. of molded thermoplastic material.

ix. All materials on the rain gauge that are exposed to sunlight shall be UV radiation resistant.

x. The rain gauge shall be sturdy and shall withstand exposure to extreme climatic conditions.

xi. The rain gauge shall withstand attack by fungi, insects, rodents and other small creatures. Wind screens for rain gauges are not required.

xii. The rain gauge shall have a smooth and permanent surface finish to minimize evaporation losses.

xiii. The height of the rain gauge shall be small enough to allow the collector opening to be installed at standardized heights in compliance with WMO standards.

xiv. The minimum expected operational lifetime shall be 15 years without loss of functioning.

xv. All openings of the rain gauge except the collector shall be covered with net to protect against any insects entering inside.

xvi. Appropriate surface treated and corrosion proof mounting bolts with nuts and washers shall be supplied.

xvii. The data logger shall feature in-built lighting protection.

xviii. The rain gauge shall have leg adjusters to set the rim horizontally.

xix. A spout filter shall prevent ingress of insects and debris.

xx. A certified calibration test document shall be part of the delivery.

xxi. The rain gauge will have eye piece and adjustable legs of tipping bucket mechanism for proper horizontal alignment of the rain gauge.

xxii. IMD certification required.

Technical Specifications of Automatic Rain Gauge Stations

i. Rainfall shall be measured using the tipping bucket method and shall be able to record cumulative rainfall.

ii. A spout filter shall prevent ingress of insects and debris.

iii. IMD/WMO certification is required for each TBRG.

Feature	Value
Site Conditions	
Ambient Temperature	From -20 to +60 deg centigrade
Humidity	5 to 100 %
Altitude	0 to 2500 meter
Sensor	
Sensor Type	Tipping Bucket type with Reed Switch
Capacity	250 mm/hour or better
Resolution	0.5 mm or better
Accuracy (Intensity)	2 % or better, ±2 mm of total daily RF observed manually from SRG/ORG.
General Features	
Output Interface	SDI12/ RS 485 / / 4-20 mA / Compatible with Data logger

Power Supply	12 V DC or switch rated for 12 VDC
Material	Corrosion Resistance Metal (Stainless steel or Aluminum)
Enclosure	NEMA 4
Tools	Complete tool kit for operation and routine maintenance
Manuals	Full Documentation and maintenance manual in English
Accessories	Sensor Mounting support, cables and other accessories as required

4.3(a) Water Level Measurement: Bubbler ï Pressure Transducer type measurement of water level

FUNCTIONAL REQUIREMENT: To measure the water level.

Technical Specifications:

The equipment offered should conform to the following technical Specifications: **Maximum acceptable difference between manual gauge reading, wherever available, and the telemetry reading shall be ± 0.1 FSO of water level.** In exceptional case i.e. flood duration, shall be considered upto ± 10 cm.. The decision regarding allowing these criteria of the Engineer Incharge shall be final in this regard.

Bubbler:

Feature	Value
Site Conditions	
Ambient Temperature	From -20 to +60 deg centigrade
Humidity	5 to 100 %
Altitude	0 to 2500 meter
Sensor	
Sensor Type	Continuous bubbling system and non-submersible transducer
Range	15/30 PSI
Resolution	0.0001 psi or better
Accuracy	0.1 % FSO
Output Interface	SDI-12 / 4-20 mA / RS485, compatible with Data logger
Power Supply	11 to 15 V DC
Average current Draw	<15mA based on 1 bubble per second
Purge	Manual line purge
Bubble Rate	Programmable 30ï 120 bubbles per minute
Desiccators	The bubbling mechanism and the non-submersible transducer must be equipped with a desiccating system to keep system from malfunction for a period not less than one year.

General Features	
Tools	Complete tool kit for installation and routine maintenance
Manuals	Full documentation and maintenance instructions in English
Accessories	Sensor Mounting support, cables and other accessories as required
(*) Enclosure	NEMA4 or IP65
Others	The Orifice pipes should be of UV resistant material. Further, adequate anchorages be provided for tying the orifice tube to the ground, so as to be robust against damage by erosion.
Minimum Installation level : For installation of Bubbler, the level could be ascertained by the method :(However, the decision of the Engineer In Charge would be final).	Wherever data is available, the nozzle level may be Average Lean Season water level of 10 years (in m) ï 0.5 m. In case of data not being available, or site specific issues, the decision of Engineer in charge would be final.

4.3(b) Radar Type Water Level Sensor

Measuring Range	up to 35m
Accuracy	$\pm$3mm
Beam Angle of antenna	10 to 15^0
Operating Temperature	-10^0 to 55^0
Operating Relative Humidity	0 to 100%
Rotation Range of mounting (a) Lateral Axis	$\pm 90^0$
(b)Longitudinal Axis	$\pm 15^0$
Type of protection with horizontal mounting	IP 67
Mounting/Installation Arrangements	Above HFL, below a bridge girder wherever available otherwise on a cantilever projection from a mast or pedestal made of structural steel or RCC with sufficient strength

5. DATA COLLECTION UNIT AND TRANSMISSION EQUIPMENT

5.1 Data logger Specifications

5.1.1 The system shall automatically collect the observations from attached sensors, process the same and store them into its memory as per the pre programmed procedure at every full hour UTC and data shall be transmitted to the INSAT-DRT in TDMA mode. Details of TDMA mode are provided in Para 5.3.

5.1.2 The DCU shall also continuously monitor the status of the instruments, power supply and

communications. In the event of failure of an instrument or disruption of any of the power sources, an alarm shall be sent back to the ERS.

5.1.3 The number of analog/digital/ SDI channels in the data logger must be compatible to the sensors being supplied and also for other monitoring systems for battery, solar panel etc. The DCU shall have at least 4 analog, 4 digital I/O channels and 2 SDI port for sensor integration. The DCU shall have RS232/ RS485 and USB port. The type and the number of extra channels provided in the data logger must be specified. Output interface for DCU shall be SDI 12/RS-485/4-20 mA

5.1.4 The sensor's signal conditioning unit should be an integral part of the system.

5.1.5 The system shall have provision to easily include and change the following information as mandatory requirements:

- Unique station identification code
- Time of observation
- Sensor identification.

5.1.6 The system shall have an integrated microprocessor based data acquisition and storage system having adequate hardware configuration and software support to serve as an interface between sensors and the communication link to perform tasks as stated in next paras.

5.1.7 Providing necessary electrical power to the sensors and conversion of electrical output signals from the sensors into engineering values based on calibration equations stored in the memory. Full compatibility with all types of sensors provided in the packages shall be mandatory.

5.1.8 Storage of observed data along with time for all the parameters in the memory. Memory capacity to retain at least 180 days data is required. Data shall be available even if the power supply to the system has failed (RAM Backup battery) for one year.

5.1.9 The stored data shall be retrievable via serial port to a PC/laptop and a PCMCIA card/ USB or any other compact and commercially available solid state memory device.

5.1.10 The system should be stand-alone and all programming functions/set-ups to be carried out through system keypad and display independent of a PC/Laptop.

5.1.11 The system should be capable of continuous updating of the values of sensed weather parameters and post processing the instantaneous values into average values over a specified period of time for transmission to the DCU earth station.

5.1.12 Management of data transmission to DCU earth station through satellite, which shall include formatting of transmitted data with necessary preambles, station ID codes, parity checks etc. as per transmission methodology for transmission through satellite channel, scheduling and operating the DCU transmitter automatically.

5.1.13 Management of DCU transmitter to optimize the battery consumption.

5.1.14 The system shall provide a complete health status of the battery, transmitter and other components.

5.1.15 The health data shall be stored as a log record and shall be capable of being retrieved and

displayed when required.

5.1.16 The system shall have in-built sensor simulation system options to conduct tests on the system for field installation, two-point calibration/re-calibration and maintenance of the sensors.

5.1.17 The system shall support the following functions:

- Easy programming set up.
- Multi tasking capability
- User friendly software programming.
- The system shall have self-diagnostic facility and be capable of displaying Station ID/ Sensor ID codes and messages on the display panel for general identification of the fault. It should have facility to monitor these codes and other health status through an external lap top/ PC.
- Setup shall be organized in a tree of menus and sub-menus. Protection of setup parameters and data through password should be supported by the system. In addition, the DCP shall support the manual entry of data through keypad and its display.
- Data including the setup and program files shall be transferable from the system via a serial port to PC and SD card or other suitable memory device and vice versa.

5.1.18 The system shall have self-diagnostic facility and be capable of displaying Station ID/Sensor ID codes and messages on the display panel for general identification of the fault. Facility to monitor these codes and other health status through an external lap top/PC.

5.1.19 Setup shall be organized in a tree of menus and sub-menus. Protection of setup parameters and data through password should be supported by the system.

5.1.20 Data including the setup and program files shall be transferable from the system via a serial port to PC and PCMCIA card/ USB or other suitable memory device and vice versa.

5.1.21 The DCU shall be housed in a weather proof and temper proof housing of NEMA 4 type enclosure of steel or fiber glass (to be quoted separately). In case of steel enclosure the housing shall have 16 gauge steel body and 14 gauge door, external mounting feet, seams continuously welded, rolled lip around door to exclude liquids, oil resistant gasket, Hasp and staple for padlocking, grey polyester powder coating inside and outside. In case of fiber glass enclosure the housing shall have molded fiber glass reinforced material, resist corrosion, seamless foam-in-place gasket, detachable mounting feet, molded drip seals, type 216 stainless steel, quarter turn latch.

5.1.22 Electronics units should have EMI protection and Enclosed in IP 65 enclosure.

5.1.23 The data logger shall be programmable locally via laptop PC.

5.1.24 The surge suppression in form of fuse or other appropriate device shall be provided for all interfaces to protect the data logger from surges emanating from the sensors.

5.1.25 The DCU shall have a WI-FI connectivity for remote access for configuration and setup of DCU using smart phone or laptop.

5.2 Technical Specifications

5.2.1 GSM / GPRS Modem

FUNCTIONAL REQUIREMENT: To transmit data

DESIGN REQUIREMENTS: The equipment offered should conform to the following technical Specifications:

Feature	Value
Ambient Site Conditions	
Operating Temperature	From -20 to +60 deg centigrade
Performance	Data Reception availability of 95% or better
Form factor	The Transmitter should either be integral part of data logger specified above, or it should be supplied as independent unit compatible with supplied data logger
Specific Features	
Communication Direction	Utilize GPRS network for two-way TCP/IP (INTERNET) connection
VPN protocol	Radio to utilize VPN protocol
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	Data transmission to execute HTTP Post or FTPS to transmit data to the Data Center
Accessories	All associated equipment, including Antenna all cables and mounting hardware
Antenna features	
Frequency range	900 MHz: 824-960 MHz/1800MHz:1710-1880 MHz
Impedance	50 ohms
VSWR	≤ 2.0
Radiation	Omni-directional
Operating temperature	-20 to + 60 degrees Celsius
Connector	SMA adaptable to GSM/GPRS modem
Cable length	As required

5.2.2 : INSAT Radio

FUNCTIONAL REQUIREMENT: To transmit data

DESIGN REQUIREMENTS: The equipment offered should conform to the following technical Specifications:

Feature	Value
Operating Temperature	From -20 to +60 deg centigrade
Environment Relative Humidity	5 to 100 %
Career Frequency	402 - 403 MHz
Carrier Settability	In steps of 100 Hz from 402.0 MHz to 403.0 MHz
Modulator	PCM/BPSK
Data coding	NRZ(L)
Output Power	3-10 W, user settable
Data Bit Rate	4.8 kbps
Frequency Stability	
a) Long term	Transmit frequency inaccuracy including aging of oscillator should not exceed ± 400 Hz per year. Oscillator/synthesizer should have provision to adjust for the long term drift
b) for temperature	± 1 ppm or better (-40 to +55°C)
Signal Bandwidth	6.0 KHz maximum or better
Output Power	3-10 W (settable)
Power Stability	±1 dB
Spurious	-60 dB or better
Harmonics	-40 dB or better
Antenna cable	LMR 400 grade or better
Performance	Data Reception availability of 99% or better
Form factor	The Transmitter should either be integral part of data logger specified above, or it should be supplied as independent unit compatible with supplied data logger
Operating power	Switched 12V D.C controlled by data logger.
Yagi Antenna	
Polarization	LHCP or RHCP, switchable in field
Gain	Minimum 11 dbi or better
Center Frequency	402-403 MHz

Mounting	Proper mounting and Pointing arrangement for 360 degree azimuth and elevation adjustment
Operating Wind speed	250 kmph
Wind Survival	300 kmph
Material	Rust-proof and Oxidation-proof
Specific Features	
Satellite System	INSAT Radio System to be Used on the INSAT Satellite operated by ISRO
Certification	Certificate of acceptance required by ISRO and/or IMD as part of the bid package
Demonstration in India	Demonstrated use of the satellite radio with at least 200 radios in current operation in India using INSAT
Accessories	All associated equipment, including GPS, GPS Antenna, INSAT Antenna, all cables and mounting hardware

5.2.3 Specification of Data Logger

Feature	Value
Site Conditions	
Ambient Temperature	From -20 to +60 Degree C
Humidity	5 to 100 %
Altitude	0 to 5000 meter
Sensor Interface	
Analogue Inputs	1 Analogue Input Channels
Analog inputs	4 to 20 mA ; 100% over-range withstand
SDI Port	One SDI-12 Interface port
Digital Inputs	1 Digital Channels, bidirectional
Pulse Input	1 Input for Rain Gauge impulse
Input - Output Interfaces	
Data Transfer	USB stick option for Data transfer
Port for Configuration	One Serial Port (RS232) for communication with Laptop for programming
[1]Port for Telemetry	2 Ports for Communication with Telemetry (GSM / VSAT / INSAT) Device

	(See Note 1 Below)
[2]Display Port	Optional port for connecting external display screen for Data in running text**(See Note 2 Below)**
Computer Software	
Operating System	Windows software for system configuration / communication
Version	English language version
Licenses	All required licenses included
Analog to digital converter	
Resolution	16 bit or better
Conversion Accuracy	± 1 LSB
Sample Intervals	1 sec. to 24 hr. in 1 second increments (user selectable)
General Features	
Flash memory	Non-volatile Flash memory that can one store one year of data and expandable to a minimum of 1GB.
Resolution	A/D resolution ≥16 bit
Recording Interval	Individual recording intervals for each sensor/parameter
Firmware Operating System	Multi-tasking operating system - must log data and transmit at same time
Display	Inbuilt Digital Display for viewing current data and setting values
Power Supply	Power supply 12V DC, low current drain (quiescent ≤10.0mA)
Battery Voltage	Monitoring of battery voltage level
Internal battery	Internal battery backup for clock, Lithium Battery, storage: 2 years
Charge controller	Internal or External
User Permissions	Different user levels, system of user rights / passwords, access restricted to authorized personnel
Internal clock	Internal clock with drift less than 2 seconds per year or using GPS
Keypad	Keypad for displaying or transferring data to memory stick, configuration of data-logger and sensors

Real-Time Clock	GPS synchronised
System integrity	System integrity check procedures
Enclosure	for wall-mounting in a shelter / enclosure with IP65 (NEMA 4) protection or better
Accessories	Serial cable + adaptor (if required) for notebook connection. All accessories (fixing units, etc.) as required
Tools	complete tool kit for installation and routine maintenance giving full detail(number of pieces and type)
Manuals	full documentation and maintenance instructions in English (1 copy per station).

Note 1: The data logger should have atleast 2 ports for data transmission via telemetry devices (GSM / VSAT / INSAT). Both telemetry systems should work simultaneously for redundancy. The type of port required for telemetry device may be different (Serial, RS 485, RS 232, RJ-45 etc) and proposer may offer multiple models having different combination of ports.

Note 2: The port for attaching external display device to show data as running text is optional. The proposer may offer two different models, with or without port for display device.

5.2.4 Certification

Transmitter and data logger must have certification from IMD for functional operation through INSAT/Kalpana satellites for either TDMA type of transmission technique.

5.3 Details **of Existing Earth Receiving Stations and ISRO Satellite System**

5.3.1 Features of ISRO TDMA transmission

Features of ISRO TDMA transmission scheme are provided for general guidance. However international norms applicable for TDMA may be followed.

- Total number of DCU that could be accommodated in a single carrier is 1800.
- By including CRC in the data frame, data validity could be ensured.
- With preserving BCH coding of SID, data quality could be checked and valid data retrieved even for the bad CRC.
- By preserving present SID (Station Identification Code) structure of IMD, SID for all users of DRT could be standardized. The SID consists of 21bits (9 bits for user type, 2 bits for priority, and 10 bits for Platform ID).
- With Forward error correction convolution coding, better data quality is ensured.
- With one repeat transmission, reliability of data reception is improved

1	CRC CODE GENERATION	Polynomial; CRC-CCITT-16 $X^{16}+X^{12}+X^{5}+1$
2	DATA SCRAMBLING	Polynomial: $1+X^{-1}+X^{-15}$ Initial State: 6959 (Hex)
3	CONVOLUTION ENCODING	Convolution Coding ½ Rate, Constraint Length K=7 Polynomial: G1=133(Octal), G2=171(Octal)
4	HEADER DETAILS	CR: 192 Symbols (all '0's) BTR: 64 Symbols (all '1's) UW: 64 Symbols (07EA CDDA 4E2F 28C2 (Hex)) Note: UW transmitted with LSB first of every byte, starting from 07EA. (See Fig.1)
5	RF DATA ENCODING	Differential coding (NRZ-L) is done for the entire burst (Preamble and the convolution coded bits) before RF modulation.

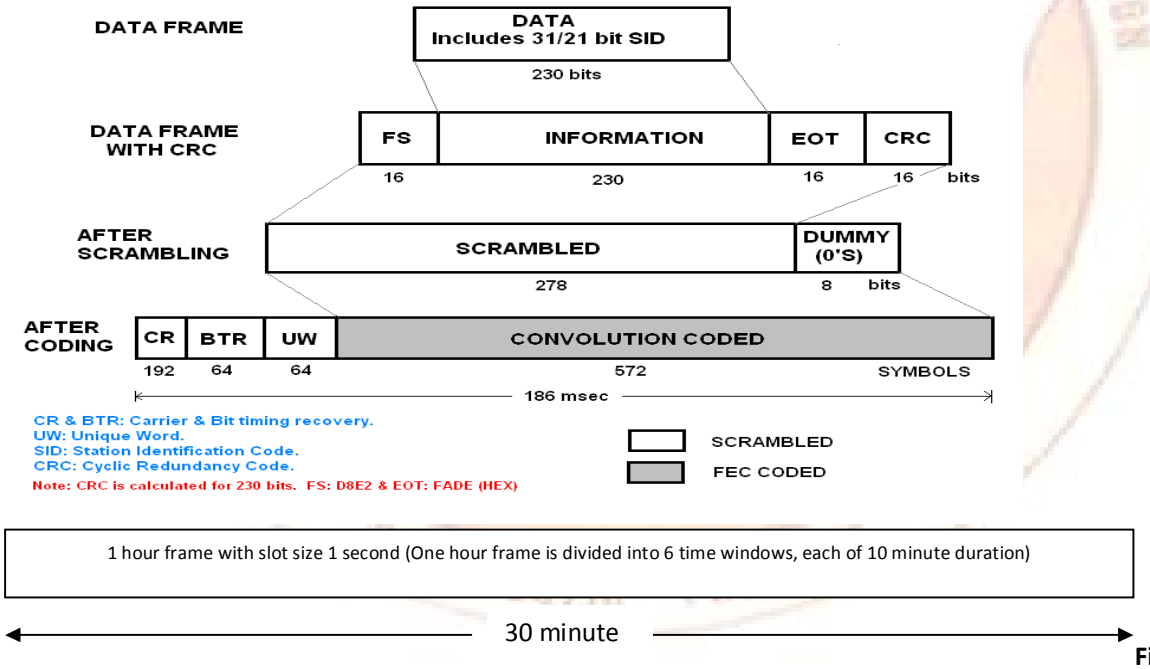


Fig 1: Burst Transmission Format for TDMA Technique (4800 Symbols/sec.)

Fig 2: TDMA Transmission Frame Format

Fig.1 may be referred to. CRC is calculated for 262 bits which include FS and EOT. It is then scrambled. 1byte, all '0's is added with the scrambled bits, after which the entire bits are convolution coded. Preamble (CR, BTR and UW) is appended with the convolution coded bits. The resulting bits are then differential coded and transmitted.

The system should have flexibility to accommodate more number of carrier channels by suitable changes in the TDMA transmission scheme.

Additional details, if required, will be provided at the time of the design review meeting which will be held with the successful tenderer. However, it should be ensured by the tenderer that the system configuration is flexible and accommodate more than 30 sensors without any additional cost.

5.3.2 INSAT DRT Specifications

For the purpose of data transfer from field DCU to Data Receiving Earth Station at New Delhi, the Data Relay Transponder (DRT) on the different INSAT/ KALPANA-1 series of satellites shall be used and the specifications given below shall be treated as standard to be adhered by the offered telemetry system.

SATELLITE	**KALPANA-1 (74^0 E)**	**INSAT-3A (83^0E)**	**INSAT-3D (82^0E)**
RECEIVE FREQ. BAND	402.65 - 402.85Mhz	402.65 - 402.85Mhz	402.10 - 402.50Mhz
TRANSMIT FREQ. BAND	4500-4510Mhz band 4506.05Mhz	4500-4510Mhz band 4506.05Mhz	4500-4510Mhz band 4506.05Mhz
RECEIVE G/T	-19db/deg.K	-19db/deg.K	-19db/deg.K
MAX.EIRP	24dBW peak	24 dbW peak	24 dbW peak
C-BAND EIRP for RECEIVE FLUX DENSITY	2.0dBW for –146 dBW/m2	2.0 dbW for –146 dbW/m^2	2.0 dbW for –146 dbW/m^2
REC.POLARISATION	RHCP	LHCP	LHCP
TRANSMIT POL	LINEAR	LINEAR	LINEAR
FREQ.TRANSLATION ERROR	$\pm$ 40Khz over life $\pm$ 6Khz over 1 month	$\pm$ 40Khz over life $\pm$ 6Khz over 1 month	$\pm$ 40Khz over life $\pm$ 6Khz over 1 month

Data Relay Transponder (DRT) onboard INSAT 3D will have a receiving frequency band of 402.3 MHz $\pm$ 200 KHz.

5.3.3 Channel Specifications for TDMA transmission format

Table below gives the present AWS parameters and their identification code used in the TDMA transmission format.

Sl.No.	Channel No.	Identification Code	Parameter
1	1	0000 (:0)	Instantaneous sampled value of air temperature in deg C at the end of every full hour UTC.
2.	2.	0001(:1)	Water level sampled at end of every full hour IST
3	4	0100(:4)	Wind speed in knots (3 minute vector averaging prior to full hour UTC).
4	5	0101(:5)	Wind direction in degrees (3 minute vector averaging prior to full hour UTC).
5	7	0111(:7)	Instantaneous value of RH at the end of every full hour UTC.
6	10	1110(:14)	Duration of bright sunshine since last 20 UTC. Reset to zero at 20 UTC. (Global radiation will be transmitted in this slot instead of duration of sunshine.
7	Cal1	:C1	Battery voltage (volts)
8	Cal2	:C2	Hourly rainfall (rounded off to next higher integer).

5.3.4 SPECIFICATIONS OF EXISTING EARTH RECEIVING STATION EQUIPMENTS

Details of Earth Receiving Station Antenna

i.	Reflector size	:	3.8 meters
ii.	Reflector type	:	Solid fiber glass material
iii.	Mount Design	:	Polar mount/ any other suitable design (TBS)
iv.	Feed Mount	:	Prime focus feed
v.	Feed type	:	Linear
vi.	Input frequency (for feed)		4.5 to 4.8 GHz
vii.	G/T	:	31.7 dB /°K
viii.	Operating frequency	:	4500- 4800 MHz
ix.	Gain	:	≥43 dB

x.	Polarization	:	LHCP / RHCP selectable
xi.	Elevation Adjustment Range	:	0-90°(Coarse & fine adjustment) Angles to be engraved on the antenna
xii.	Azimuth Adjustment Range	:	0-360°(Coarse & fine adjustment) Angles to be engraved on the antenna
xiii.	Wind loading : a) Operational	:	100 KMPH or better
xiv.	b) Survival	:	175 KMPH or better
xv.	Operating rainfall rate	:	100mm/hr and water proof.

Features of LNA

Frequency range	:	4500 ï 4800 MHz
Bandwidth	:	300 MHz(typical)
Noise temperature	:	Ò50 °K (45 °K typical)
(Ambient Temp. 25°C)		
Gain	:	≥ 60 dB
Gain ripple	:	Not more than ±0.5 dB (Over entire 300 MHz pass band)
Max. RF input	:	-50 dBm composite
Max. RF input with no damage	:	0 dBm CW in pass band
Input / Output VSWR (4.5 GHz to 4.8 GHz)	:	1.2 : 1
Operating Temperature	:	-10 to 55 ^{o}C
Humidity	:	0-100 per cent with condensation

Features of Synthesized Down Converter

The general features are listed below.

RF input	:	4500 – 4800 MHz
IF output range	:	Compatible to Demodulator Input (May be 100-180 MHz)
RF input level	:	-55 dBm typical
IF output level	:	+20 dBm at 1 dB compression
Frequency stability over time	:	+/- 1 x 10^{-9} / day
Frequency stability over temperature	:	+/- 1 x 10^{-8} / day

5.4 Lightning Protection

The entire unit has to be adequately protected against lightning and build of static charges. The lightning rod should protrude 1 m above the highest point (Antenna) and should be placed in the centre of the pole. The mast should be electrically grounded by

following as per CPWD earthing procedures. As a part of the maintenance, the earthing equipment shall be inspected on a yearly basis for its conductivity and effectiveness. Such inspection shall be carried out in the pre-monsoon period and any faults noticed shall be rectified.

5.5 Earthing For Equipment

The electrical grounding for all other electronic and electrical equipment should be done by following standard CPWD procedure. The earthing for the equipments should be done separately and should have a minimum distance of 2.5 meter from the earthing done for lightning rod. In no case both the earths should be done in the same earthing rod.

As a part of the maintenance, the earthing equipment shall be inspected on a yearly basis for its conductivity and effectiveness. Such inspection shall be carried out in the pre-monsoon period and any faults noticed shall be rectified.

6 SOLAR POWER SUPPLY WITH BATTERY BACKUP

6.1 Solar Power Supply

Solar Panel mounting hardware designed to allow a great variety of attachment methods and accommodate a variety of mounting surfaces. They may be used to mount a module on a horizontal or vertical surface, on surfaces at angles between horizontal and vertical and on metal or wooden poles. Attachment methods include bolts, lag bolts, u ï bolt brackets and stainless steel hose clamps.

The Solar power supply shall be mounted on the roof of site buildings where existing. The Contractor shall optionally supply a pole ï mounted arrangement including a standard pole and necessary foundation and fixing arrangements.

The location of solar power installation shall be indicated by the concerned engineerï in ï charge of each DCU.

In order to guard against frequent theft of solar panels the mounting device shall be so designed as to make the solar panel detachable as and when required. It is intended to store the solar panel during the night hours as well for longer durations in the non-monsoon period and the arrangement should be designed in such a way that the arrangement is sturdy and capable of handling frequent disconnecting and re connections. The power supply shall primarily function through a set of sealed maintenance free rechargeable batteries capable of preventing deep discharge.

The following features shall be supplied by the Contractor in addition to the technical information being provided by him as part of the bid. Any options available in respect of any of the features shall be clearly brought out with recommendations for a specific option selection.

Typical Peak power
Voltage at Peak power
Current at Peak power
Minimum at Peak power
Short-Circuit current
Open-circuit current
Wind load
Impact reliability

6.2 Batteries

The batteries required for the equipment above shall be maintenance free, rechargeable sealed batteries with the following features:

Overcharge and deep discharge protection
Leak-proof
Easy handling ï no special shipping container required
Long service life
Excellent recharge ability

One battery pack shall be provided for each DCU. The batteries pack provided shall have adequate capacity to sustain the maximum sized DCU configuration of sensors and telemetry equipment for a period of 60 days of continuous operation at the frequency of one observation per hour per sensor and one transmission per hour on a 24-hourly basis. This capacity shall be available at the end of second year of continuous operation.

The necessary housing and configuration of the batteries shall be furnished in detail by the bidder/Contractor.

The battery pack shall also include arrangements of charging through a standard 220 V AC domestic power supply outlet and also from solar panels established as above. The normal supply to the DCU equipment shall be from battery pack only.

The battery pack shall have audio and visual alarms for overcharging and deep discharging conditions. The charge level shall also be indicated on the front panel of the pack.

The sealed construction shall allow trouble-free, safe operation in any position. The battery case shall be high-impact, with sufficient resistance to shock, vibration, chemicals and heat.

7 TELEMETRY LINK CALCULATIONS

The bidders shall submit the detailed telemetry link calculations for the system proposed in the offer. The calculations shall show the end quality objectives proposed to be fulfilled. The following information shall be mandatorily supplied.

(The values have been incorporated for 4504.2 MHz downlink and 402.75 MHz uplink frequencies. Need to be modified for the present downlink frequency 4506.05 MHz and uplink carrier frequency to be allotted, for Kalpana-1, INSAT 3A/ 3D….G/T etc….

Sl.No	Link Budget with INSAT	TDMA
1	Bit rate (R)	2.4 Kbps (33.8 dB-Hz)
2	Transmission rate	4.8 Kbps (with half rate coding)
3	Required BW for PCM/PSK (1.2R)	5.7 KHz (37.6 dB-Hz)
	Downlink	
4	Frequency	4504.2 MHz
5	EIRP(S/C) for single AWS at BOL	2.4 dBW
6	Slant range	36,000 km

7	Free Space Loss	-195.8 dB
8	G/T of Ground Receive System	22.5 dB/°K (3.8 m HUB)
9	Boltzmannôs Constant	-228.6 dBW / °K/Hz
10	C/No downlink	58.3 dB Hz
	Quality Objective	
11	Bit Error Probability	10^{-5}
12	Energy per bit to Noise density ratio (Eb/No)	7.0 dB for BPSK (Taking Viterbi decoding gain)
13	Implementation margin	2.0 dB
14	Effective Eb/No	9.0 dB
15	Effective C/No	42.8 dB
16	Degradation due to downlink	0.2 dB
17	Link margin	2 dB
18	C/No uplink	45 dB
	Uplink	
19	Uplink carrier frequency	402.75 MHz
20	Free space loss	-177 dB
21	G/T space craft	-19 dB / °K (min)
22	Boltzmannôs constant	-228.6 dBW / °K/Hz
23	C/No uplink	45 dB
24	AWS EIRP	12.4 dBW
25	AWS Transmit power	1.4 dBW with 11 dB antenna gain
26	Data bit rate	2.4 Kbps (half rate)
27	Carrier modulation	PCM-BPSK (0° and 180°)
28	Data coding	PCM (NRZ-L)
29	Frequency stability	+/- 1 ppm/year (0°C to +50°C)
30	Transmit signal bandwidth	6 KHz minimal
31	AWS EIRP	12.4 dBW min.
32	Transmission duration	186 msec
33	Transmit power	5 W (Max.)
34	Antenna gain	11.0 dB (min)
35	Antenna polarization	Left / Right hand circular polarization (field selectable)

8 Other Equipment

8.1 Data downloading machine specifications:

1	Processor	**Intel Core™ i7**
2	Graphics	DDR3 Graphics memory capacity 4 GB, Graphic processer NVIDIA GeForce 920M
3	Memory	16GB Dual Channel DDR3L 1600MHz (8GBx2)
4	Hard disk	2 TB 5400 rpm (min.) SATA
5	Display	15.6-inch HD (1366 x 768) Truelife LED-

		Backlit Display
6	Resolution	1366 x 768WXGA
7	Video Controller	Integrated GMA 900 series with 128 MB Share Memory
8	Wireless Connectivity	Integrated wireless Intel 802.11a/b/g, Integrated Bluetooth
9	DVD Writer speaker	Integrated DVD writer 8x and Integrated Stereo
10	Key Board	Key Board with Touch pad
11	Expansion Port	4 USB, 10/100 Ethernet card, RGB or video or VGA, PCMCIA/PCI Express slot, Microphone, Stereo Headphone & other standard features.
12	Operating System & Software	Microsoft Windows 8.1, MS Office 2010 and Norton/McAfee/e- Antivirus Software latest version & other software. All software with media and with licensed updation equal to the warranty period of the entire network
13	Power Supply	230V, 50 Hz AC Supply with rechargeable Battery Pack comprising of Li-ION battery Suitable for approx. 4 hrs. Operation complete with battery charger/adaptor.
14.	Carry Case	To be provided of superior quality.
Note: Data downloading machines (desktops) shall be of branded make (Preferably Dell or H.P)		

9. Civil Works for Housing DCU and Associated Instrumentation

9.1 All civil and accommodation works shall be provided including safe, secure (as required at each location),weatherproof enclosures for equipment (NEMAIV enclosure), bases and foundations, all fixings and supports (above and below river water level) (all fixings to be non- corrodible). Necessary security fittings and fixtures at all DCU sites and any necessary cable / wireless data transmission links, are to be provided by the Contractor.

9.2 There can be three possible Civil Works, based on the site-specific requirement:

a. Concrete Tower as per Drawing ï 1 and 2, with removable ladder. In this case, the water level sensor (radar/ bubbler) shall be located appropriately, and Rainfall Recorder, DCU as well as all related equipment shall be housed on the Tower top.

b. Same as above, except that instead of concrete tower, the equipment is mounted on a mast of atleast 10 m, high. Suitable animal proof security fencing (7 m x 7 m x 1.8m high) and lockable gateway to sites

c. Instead of concrete tower or mast, the equipment is housed on an existing structure, in which case elaborate safety features as mentioned in b. above may not be required.

d. In case of Bubbler type water level sensor, the liability of Contractor is to design and construct the Terminal Block and carry the layout of HDPE pipe, Orifice tube & anchorage in such a manner that it will not wash out, expose to open surface (so that may not remain prone to vandalism) till the force majeure, which has been defined in the Force Majeure clause above. The liability of Engineer Incharge on this account is nil except in case of Force majeure.

Though the tentative requirement of civil works is brought out by the Engineer Incharge in the schedule of requirement, however, the bidder may quote unit rate cost for civil works(item wise) for each of the above three categories, so as to enable flexibility to the Engineer Incharge for shifting from one type to another during execution.

10. FIELD TROUBLE SHOOTING EQUIPMENT

The contractor shall supply adequate field trouble shooting equipments along with a description of utility of each of the equipment proposed. The trouble shooting tools may include hammer, spanner set, files, multi-meter, inclinometer, adjustable wrench, Allen keys, screw drivers, & calibration kit for each set of TBRG, etc.

11. TESTING AND ACCEPTANCE

11.1 Factory Acceptance Testing

The contractor shall specify factory acceptance tests in respect of each component of the system namely Sensors, DCUs, and its major sub-assemblies wherever relevant as a part of the technical bid. The contractor shall also mention the acceptability ranges of the test parameters for acceptance at factory level. The programme for factory acceptance testing shall also be intimated in advance.

The Department or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the Department. The Department shall notify the Contractor in writing in a timely manner of the identity of the representatives retained for these purposes.

Factory Acceptance Test results shall be retained as part of the project QA record and the same shall be supplied to the Department.

After successful completion of Factory Acceptance Tests for any section of the Works, the Engineer Incharge shall approve that section of the Works for delivery to site. Any such approval shall in no way relieve the Contractor of any of his obligations under the Contract.

The factory acceptance testing shall include the complete system being fully tested using simulation techniques where applicable to demonstrate its compliance with the Specification. The test shall allow for the connection of analogue inputs, digital inputs etc. to enable the overall performance and suitability of the software to be tested.

The Engineer Incharge, at its discretion may waive off the witnessing of the tests but

the records of the tests shall be provided duly authenticated by the contractor.

11.2 System Integration Testing

The contractor shall specify System integration tests proposed to be carried out as a part of the technical bid. The tests shall be such that the performance of the system as a whole commencing from the sensors and extending to the real time data receipt at the existing CWCôs modelling centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, New Delhi gets involved in the test plan. The System integration tests may be carried out after completion of factory acceptance of the individual component. All those components that do not pass the system integration tests and undergo modifications shall be passed again through factory acceptance testing before using them for repeat system integrating tests.

If any software errors are found, they shall be recoded and the code shall be amended. The test shall then be repeated.

System Integration Test results shall be retained as part of the project QA record and shall be made available to the Engineer Incharge for his inspection if he so requires. If any errors are found in the Test Procedure or Result Sheets, they shall be corrected and resubmitted to the Department for approval.

11.3 Site Acceptance Protocol

In order to facilitate the site acceptance of the system by the Engineer ï in ï charges, the Contractor should give a list of deliverables for each site to the respective sites as well as to the headquarters. The list shall be verified by the concerned JE/SDE authorised by the Engineer Incharge and accordingly will give a verification report whether all deliverables have been delivered properly at the site.

For site acceptance test, the Contractor should give a check ï list of all components and their functions. This check list shall be decided in consultation with the **Engineer Incharge .** This checklist shall indicate the tests to be conducted at the site and the results that are expected for each and every component that are to be installed at the site. This check list will have to be provided to each and every site one month before the installation begins.

11.4 Site Acceptance Tests (SAT) for Remote Stations

The site acceptance test will be conducted by the **Engineer Incharge** or any other person nominated by the **Engineer Incharge**, at its option. Site acceptance test shall be carried out in two stages. The first stage of acceptance will be based on preliminary inspection of the equipment supplied with respect to the required and supplied components such as sensors, DCU with the weatherproof enclosures, batteries(charger/regulator), gauge apparatus with enclosures and sensors, INSAT transmitter, INSAT satellite antennae, solar panel and mounting hardware, including all associated accessories.

Second stage of site testing shall be undertaken for a period of 30 days following successful completion of witnessed commissioning to prove the equipment and the interconnecting cable installation and ensure that all operators are fully conversant with

the equipment and calibration procedures, methods of operation and all facilities provided by software. During the period of 30 days, there shall be no occurrence of any malfunction in any component necessitating replacement or repairs. No malfunction, partial or complete failure of any part of hardware or excessive heating of motors or other electro-mechanical equipment or bugs in the software should occur. All the software should be complete and no missing modules/sections will be allowed. The contractor shall maintain necessary log in respect of the results of the tests to establish to the entire satisfaction of the Engineer Incharge, the successful completion of the test specified. An average data acquisition efficiency of 95% for the duration of test period shall be considered as satisfactory. The testing schedule will be agreed to by both the parties during performance of contract. In this stage a regular comprehensive check of functioning of all the components will be made. On conclusion of site acceptance, all relevant documentation pertaining to the site shall be handed over by the contractor to the representative of the **Engineer Incharge**.

11.5 Complete Acceptance Test

The test shall involve testing of all equipments installed at the remote stations with the existing CWCôs modelling centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, New Delhi like server (hardware and software), data dissemination software, RDBMS and database for trouble free data transmission. This shall involve demonstration of non-interference with existing software packages already installed at the modelling station, if any. The testing shall also involve checking and demonstration of integration of all computers & peripherals supplied, local and wide area networks existing at the modelling centre.

After establishing above, the whole system shall be tested for completeness by demonstrating trouble free real time receipt of data from all the remote stations for a sustained period of 7 days operating on 24 X 7 basis and incorporation of the data into the data base set up at the existing modelling centre at Gandhinagar, Surat & Bhusawal & FFM Directorate, New Delhi.

12. Documentation

Detailed Operating and Maintenance manuals for the control system and other equipment supplied under the contract shall be provided. Four copies of draft manuals are to be provided prior to factory acceptance testing for approval and 2 copies each of the final manuals have to be given to modelling centre prior to final hand over.

The manuals shall detail in full the equipment supplied under this contract, including test certificates, and the software section shall be comprehensive and in sufficient detail to allow personnel to easily modify any setting or operational parameter.

The provision of all documentation is essential and shall be specific to this project.

13. Maintenance

All systems and equipment along with civil works and associated cables and accessories are to be supplied with a minimum of two years onsite warranty. After this time, annual maintenance and repairs of the entire system including supply of spares, etc., for the next five years will be done by the Contractor. Engineer Incharge at his will have the option to extend the Annual Maintenance contract (AMC)on same terms and conditions after the

end of five year Annual Maintenance Contract entered into at the time of tendering excluding the two years of warranty. Maintenance manuals and appropriate staff training will be required from the Contractor.

The maintenance efforts should be oriented towards minimization of the site downtime and minimizing the loss of real time data observations. The maintenance philosophy, which shall be adopted, shall generally be for fault-finding to card level and module replacement, with the faulty modules being either scrapped, if damaged beyond repair, or returned to the contractor for repair, as appropriate. The Contractor shall operate a module repair and replacement scheme.

The Contractor shall include details of how he proposes to meet the maintenance strategy with his tender.

14. Spare parts

Manufacturer shall provide a list of recommended spares. Spare should be such which cover most common fault and does not require replacement of complete assembly.

The contractor shall maintain spares requiring repairs / replacement during warranty or AMC atleast @ 10% in the stores of the Department, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the Department. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.

These spare parts kept in the stores of the department does not waive of the warranty/maintenance responsibilities of the Contractor. The Contractor has to ensure the availability of spares in order to run the system for 10 years. However, the Contractor is required to maintain inventory in India covering the warranty period as well as AMC period.

Apart from the above, the Department wishes to buy a few spare parts for his own use, the details of which have been specified in the schedule of requirement.

The spare parts supplied by the Contractor shall be identical functionally, electrically and mechanically, to the corresponding parts in the equipment supplied under the Contract and shall be suitably packed and clearly marked, ready for reception at the Departments stores. Any special handling instructions shall be clearly marked on the packages.

All components within equipment shall be of a type where replacements are readily available if required.

15. Specification for Cabling and connecting

The term cable shall always include necessary type of connectors at both the ends for connecting between two equipments. The connectors shall be properly anchored with protective sheathing of the cable in such a way that the loads due to pulling and twisting shall be borne by the protective sheathing and the conductors shall not be subjected to any stress.

ii. The connectors shall be so fixed on the individual components of the system that the metal/ plastic connector shall always transfer the loads due to pulling and twisting directly

to the protective body of the component and the internal interface cards / connections shall not be subjected to any load.

iii. Laying of necessary data and power supply cables connecting various components and embedding them or protecting them with necessary conduits.

iv. Wherever the cables are to be laid indoors and the length of the individual cable run exceeds 1 meter, the cable shall be housed in a protective conduit made of electrical supply grade conduit of appropriate diameter and the conduit shall be fixed with the wall at a height not less than 1 meter above the floor surface. Whenever the indoor cable is required to cross the floor, it shall be housed in a Galvanized Iron pipe of 12.5 mm internal diameter and the pipe shall be fixed to the floor with suitable protective covering to avoid tripping of personnel using the area or disturbance to the pipe due to such movement.

v. Wherever cables are to run through open ground including the public road and pathways, the cable shall be armored and shall be water ingress proof upto static water pressure of 5 kg/cm2. All joints made in cable shall also meet the water proofing criteria. In addition, the cable shall be protected by housing the same in 12.5 mm Galvanized Iron pipe embedded at a depth of not less than 1.5 meter below the ground surface with a warning brick on the same. A sketch of the cable layout with respect to the identifiable marks of the area shall be prepared and handed over to the Department for each such cable run on completion of the work of cable laying operation.

vi. The joints in the cable connecting between the sensor and data collection unit shall be avoided by measuring the appropriate length of the cable required and attaching the same in one piece. If the cable joints become necessary, prior permission of the Engineer Incharge shall be obtained before executing the same. The joint fabricated through a splicing and jointing kit shall be stronger than the parent cable.

vii. The cable carrying data and electrical power shall be housed separately in different conduits separated by adequate distance to prevent leakage currents. The data cables shall also be laid out in such a way that the data integrity is not compromised due to mutual interference.

16. CONSTRUCTION REQUIREMENTS AND WORKMANSHIP

16.1 Materials

16.1.1 Storage handling and use of materials

Materials and components shall be handled in such a manner as to avoid any damage or contamination, and in accordance with all applicable recommendations of the manufacturers.

16.1.2 Bricks

Bricks, blocks and tiles shall be regular and uniform in shape and color, and all of a similar size to the respective type.

16.1.3 Cement

Cement shall be factory produced by a reputable manufacturer, and stored in dry conditions

until required.

16.1.4 Mortar

Mortar shall be mixed only as and when required in the proportions of 1 part cement to 3 parts sand, with fresh, clean and clear water, until its colour and consistency are uniform. It shall be conveyed fresh as required for use, and used within 20 minutes of mixing.

Fine aggregates for mortar shall be washed natural sand or crushed natural stone, of a diameter of between 1 mm and 3 mm.

16.1.5 Timber

All timber used in the permanent works shall be well seasoned and free from bows or warps or significant knots.

16.1.6 Ferrous metalwork

Ferrous metalwork exposed to the outside shall be treated with a continuous coating of bituminous primer over the whole exposed area. Where the metalwork is of a decorative nature, it shall be primed and painted with paint suitable for external use.

16.1.7 Nut and bolts

i. Bolt lengths shall be sufficient to ensure that nuts are full-threaded when tightened in their final position, with two threads showing.

ii. Where bolting is incompatible with the material being fixed, suitable isolation washers and sleeves shall be used.

iii. Washers shall be provided under the head of the bolt and under the nut.

16.1.8 Natural stone

Natural stone shall be of durable quality, uniform in texture, and free from iron bands, spots, sand holes, flaws, shakes and other imperfections which would adversely affect its strength or appearance. The dimensions of stones shall be adequate for proper coursing and bonding.

16.2 Excavation, Backfilling and Reinstatement

16.2.1 Excavation

i. The Contractor shall carry out his operations in such a manner as to avoid damage to, or deterioration of the formation of excavations.

ii. The sides of excavations shall be adequately supported at all times.

iii. The Contractor shall be responsible for the disposal off all surplus excavated material, but no excavated material suitable for re-use shall be removed from the site. No surplus material shall be disposed of on the site.

iv. The Contractor shall not allow water to lie anywhere on the site. Where water is

encountered in excavation operations, it shall be disposed off to a suitable area away from the work site and so as not to inconvenience others. Any temporary sumps which are constructed for dewatering shall be backfilled at the end of operations, with material similar to that excavated.

16.2.2 Trenches

i. Trenches in rock for pipes up to 100 mm nominal bore shall be excavated to provide a minimum clearance of 100 mm around the outside of the pipe barrels and joints. For pipes with nominal bores exceeding 100 mm, the minimum clearance shall be 200 mm.

ii. Trenches for pipes shall be excavated to a sufficient depth to ensure a minimum cover of 900 mm to the top of the pipes.

iii. Where trench excavations encounter obstructions in the ground conditions (e.g. hard rock or major tree roots), the obstruction shall be bypassed by a separate trench enabling a straight line, or minimum suitable radius, between the pipe source and destination locations. The original trench shall be backfilled in a similar manner to other excavations as per the specification below.

16.2.3 Backfilling

i. Backfilling shall, where practicable, be undertaken immediately the specified operations preceding it have been completed. Backfilling shall not, however, be commenced until the works to be covered have achieved a strength sufficient to withstand all loading imposed thereon.

ii. Backfilling shall be undertaken in such a manner as to avoid uneven loading or damage.

iii. Filling material to the permanent works shall be of a granular type, without clay or siltatious material (a well assorted mixture of grain size between 2 mm and 40mm diameter) or the selected soil, deposited in 300 mm layers and compacted at each layer as per direction of Engineer in-charge.

iv. Backfilling to a road surface shall be compacted and completed such that the finished surface is of a level flush and comparable to the adjoining area, after any settlement has occurred. Where the surrounding surface is of a bituminous (tarmac) type, the backfilling shall be finished with similar.

v. Where the excavations have been supported and the supports are to be removed, these, where practicable, shall be withdrawn progressively as backfilling proceeds, in such a manner as to minimize the danger of collapse, and all voids formed behind the supports shall be carefully filled and compacted.

vi. Indication sign board along the layout of HDPE line at two or more places be erected to show the existence of the Govt. property.

16.2.4 Reinstatement

i. Kerbs, channels and edgings disturbed by the works shall be re-laid with existing units, provided they are not damaged. Where existing units are not suitable for re-use, the Contractor shall provide replacement units of similar texture, color, type and quality, consistent with those adjacent.

ii. The frames of all manholes and surface boxes shall be reinstated by bedding and hunching in mortar as specified. Chamber or frame tops shall be flush with the existing surface on all sides.

iii. On completion of work in unpaved land, the Contractor shall break up the surface of all land affected, to a depth of at least 300 mm, and clear stones and extraneous material greater than 50 mm in size before placing and raking topsoil of at least 300 mm in depth, to the finished surface level.

iv. The utmost care shall be taken to protect trees, crops and significant shrubs in the vicinity of the site area. Any that are damaged or killed shall be replaced with a new plant, or plants, of a similar species and type, in the area of the original.

v. Any existing services of pipes or cables shall be avoided if possible. Where temporary removal is required, the service shall be turned off, and an accurate location of the point or points of interception marked. The Contractor shall record these positions, depths, pipe and cable diameters and types of construction, and shall reinstate them to their previous standard, following construction of the new works. Backfill shall be to the standard specified above.

vi. The Supplier shall ensure that all pipes, whether new or reinstated, shall be clear of debris upon completion of the works.

vii. Embankments and other areas of fill shall be formed of suitable materials capable of normal compaction to form stable fill, deposited and compacted evenly as soon as practicable after excavation, in a maximum of 300 mm layers.

16.3 Concrete, formwork and reinforcement

16.3.1 Concrete

i. The mix and strength of such concrete shall not be inferior to M25 or as specified for the work.

ii. Calcium chloride or admixtures containing calcium chloride shall not be used in the production of concrete.

iii. The nominal size of coarse aggregate should be 20 mm.

iv. The Contractor shall not permit any cement to come into contact with water at a temperature above 60 degrees Celsius.

v. The concrete shall be mixed only as and when required, to a uniform color and consistency.

vi. Workability of fresh concrete shall be such that the concrete can be handled and placed without segregation, and, after compaction, can completely fill the formwork and surround all reinforcement and ducts.

vii. The quantity of water used shall not exceed that required to produce a concrete with appropriate workability to be placed and compacted in the required location. Water used in the concrete mix shall be fresh, clean and clear.

16.3.2 Formwork

i. Formwork shall be sufficiently rigid and tight to prevent loss of mortar from the concrete and to maintain the correct position, shape and dimensions of the finished work. It shall be so constructed as to removable from the cast concrete without shock or damage.

ii. The forms shall be capable of producing a consistent quality of surface.

iii. Where holes are required in forms to accommodate projecting reinforcement fixing devices or other built-in items, precautions shall be taken to prevent loss of mortar matrix.

iv. Formwork shall give access for the preparation of joint surfaces before the concrete has hardened.

v. Top formwork shall be provided to slopes 30 degrees of more from the horizontal.

vi. The Contractorûs method of constructing formwork shall allow for props to soffit forms to remain in position until the formwork is struck.

vii. Formwork shall be removed without shock to, or disturbance of, the concrete.

viii. Formwork to vertical or sloping surfaces shall not be removed until the concrete strength shall be sufficient to meet any wind loading upon the concrete likely to arise at the time when the formwork is removed. This shall be a period of least 2 days.

ix. The formwork for elevated slabs and beams shall remain in place for a minimum of 7 days.

x. All concrete surfaces shall have a fair finish, formed by formwork which is designed to produce a hard smooth surface with true, clean arises. Only minor surface blemishes shall be permitted and there shall be no staining or discoloration. Any projections shall be removed and the surfaces made good. For finishes to surfaces not formed by formwork, the concrete shall be leveled and screened with a wooden trowel, following which a fair finish shall be formed with firm pressure from a steel trowel, to produce a dense, smooth, uniform surface free from trowel marks.

xi. If any blemishes to the finished surface appear, they shall be made good with fresh, specially prepared cement and fine aggregate paste, whilst the concrete is still green where possible. After the concrete has been properly cured the faces shall be rubbed down to produce a smooth and even surface, making every effort possible to match the color of the concrete.

16.3.3 Reinforcement and other built-in items

i. Reinforcement shall be of HYSD/TMT (Fe415/500) variety manufactured by SAIL or its subsidiaries. Cover to all reinforcement shall be 25 mm or twice the dia. of bar whichever is greater.

ii. Non-structural connections for the positioning of reinforcement and other built in items shall be made with tying wire or other fixing device. Precautions shall be made to ensure that projecting end of tying wire or other fixing device or clips do not encroach into the concrete cover.

iii. All reinforcement and other built items shall be clean and free of rust or other debris bonding.

iv. Reinforcement shall be of HYSD/TMT variety manufactured by SAIL or its subsidiaries. Cover to all reinforcement shall be 25 mm.

v. Tie bolts for formwork shall be of the high tensile variety and shall be cast directly into the concrete. Only tie bolts which avoid embedding any metal parts permanently within 50 mm of the concrete surface shall be permitted. Voids remaining after the removal of all, or part of each tie bolt shall be filled flush with the surrounding concrete using a freshly prepared cement and fine aggregate paste. All such voids shall be prepared by removing surface laitance prior to filling to ensure bond is achieved

16.3.4 Placing of concrete

i. The interiors of all formwork shall be thoroughly cleaned out before any concrete is placed. The faces of the forms in contact with the concrete shall be clean and treated with a suitable releasing agent, where possible.

ii. Each batch of concrete shall be continuously and thoroughly compacted in its final position within 20 minutes of mixing. Sufficient compaction shall take place until the expulsion of air has virtually ceased, and in a manner which does not promote segregation of the ingredients, in order to avoid surface blemishes.

iii. Concrete to each discrete section shall be placed in one pour, or in a continuous fashion such that fresh concrete shall not adjoin concrete which has been in place for more than 30 minutes. If this does occur, concreting to this section shall be stopped until the placed concrete has set, but not hardened, and a construction joint shall be formed.

iv. The surface of any set concrete against which new concrete is to be cast, otherwise known as a construction joint, shall be free from water or loose debris and shall be roughened to the extent that the large aggregate is exposed but not disturbed. The joint surface shall be cleaned immediately before the fresh concrete is placed against it.

v. All measures shall be taken to keep the temperature of fresh concrete below 32 degrees Celsius, and to prevent excessive evaporation of surface water. This shall include placing, and constantly keeping moist with cold water, hessian (or similar coarse weave natural material) and spraying the surface with curing agents to aid temperature escape, as soon after the formwork had been removed as possible.

vi. Where a kicker is used, it shall be at least 70 mm high and shall be incorporated with the previous concrete.

vii. Concrete shall not be allowed to taper off to a thickness of less than 50 mm. Vertical joints shall be formed against a stop board suitably notched to accommodate the reinforcement. The top surface of each lift of concrete shall be straight and level, unless described otherwise in the contract.

16.3.5 Tolerance for concrete structures

Concrete structures in the final work shall have no abrupt irregularities which are, to an extent observable by eye. Subject to retaining the required concrete cover to reinforcement, other deviations from the surfaces described in the contract shall not deviate from line, level, vertically, cross sectional dimension or length by more than 10 mm.

16.4 Construction of pipe work

The cable runs along the ground for connecting the sensors to the DCU shall be made through the pipes of HDPE. The material and manufacturing quality of the pipes shall be as per relevant Indian Standards.

16.4.1 General

i. Suitable measures shall be taken to prevent extraneous material from entering pipes, and to anchor each pipe to prevent flotation or other movement before the Works are complete.

ii. Pipeline marker tape shall be laid between 100 mm and 300 mm above the pipe.

16.4.2 Pipe bedding and covering

i. In case of laying pipes for carrying the air tubing for the bubbler gauge, care should be taken to embed the pipe at a depth below the general profile of the river bank slope such that the same shall not be exposed on account of rainfall/ drainage induced gully erosion in the monsoons. Such depths shall be determined by the site in charge and the representative of the contractor.

ii. For making horizontal runs of embedded pipes, crossing open ground and/ or walk ways frequented by traffic or cattle, a layer of warning bricks shall be laid over the pipe before filling up the trench.

iii. Bedding for pipes shall be constructed by spreading and compacting granular bedding material of at least 100 mm thick over the full width of the pipe trench. After the pipes have been laid, additional material shall be placed and compacted equally on each side of the pipe. Where practicable, this shall be done in sequence with the removal of the trench supports.

iv. Bedding, hunching and fill material to pipe or cabling work shall be of a granular type, without clay or siltatious material (a well assorted mixture of grain size between 2 mm and 40 mm diameter).

v. After completion of the relevant operations, fill material shall be placed and compacted over the full width of the trench in layers not exceeding 150 mm before compaction, to a finished thickness of 250 mm above the crown of the pipes. Thereafter, layers shall be filled and compacted in 300 mm thicknesses, to 300 mm from the surrounding ground surface level. Topsoil shall then be placed to a level flush with the surrounding ground surface.

16.4.2 Pipe jointing

i. Pipe jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled. Care shall be taken to ensure that there is no ingress of grout or other extraneous material into the joint annulus after the joint has been made.

ii. Where pipes with flexible joints are required to be laid to curves, the deflection at any joint as laid shall not exceed three quarters of the maximum deflection recommended

by the manufacturer.

iii. Fusion welding joints in high density and medium density polythene shall be made only between pipes having the same physical characteristics. No fusion joints between pipes from dissimilar materials shall be made. When solvent welding HDPE pipes are jointed outside the trench, they shall not be lowered into place until the period recommended by the manufacturer for complete setting of the joints has elapsed. A pipe section containing a completed weld shall achieve the same strength characteristics as the parent pipe.

iv. Flanged joints shall be properly aligned before any bolts are tightened.

v. For weld jointing of steel pipes, the ends of the pipes shall be cut and prepared, and be free from fins, planar defects, tears and other surface defects, prior to welding. Cleaning to base metal shall extend for at least 25 mm from the end of the pipe on both internal and external faces.

vi. For cement mortar joints, the spigot of the pipe shall be entered into the socket of the last pipe laid until it bears on the back face of the socket, and it shall be centered in the socket. Two turns of tarred yarn shall then be caulked into the back of the socket and cement mortar shall be pressed into the joint to fill the socket and shall be beveled off at 45 degrees from the outside edge of the socket.

16.4.4 Pipe protection

i. Where concrete surrounds are provided to pipes, they shall be supported on precast setting blocks, the top face of each block being covered with two layers of compressible packing.

ii. Where pipes with flexible joints are used, any concrete protection shall be interrupted over its full cross section of each pipe by shaped compressible filler.

iii. Plastic pipes shall be wrapped with a layer of plastic sheeting before being surrounded by any concrete.

iv. Ferrous pipes shall be protected by a continuous coating of bitumen primer over the whole area to be protected.

16.4.5 Pipe cutting

Pipes shall be cut by a method which provides a clean, square profile, without splitting or fracturing the pipe wall, and which causes minimal damage to any protective coating.

16.5 Manholes

Manholes shall be constructed with steps, ladders or slabs aligned correctly, and of sufficient size to permit unrestricted access to workers.

TRAINING AND DOCUMENTATION

The contractor shall provide trainings at mutually agreed station under NTBO Gandhinagar as training modules as part of the tender given as under:

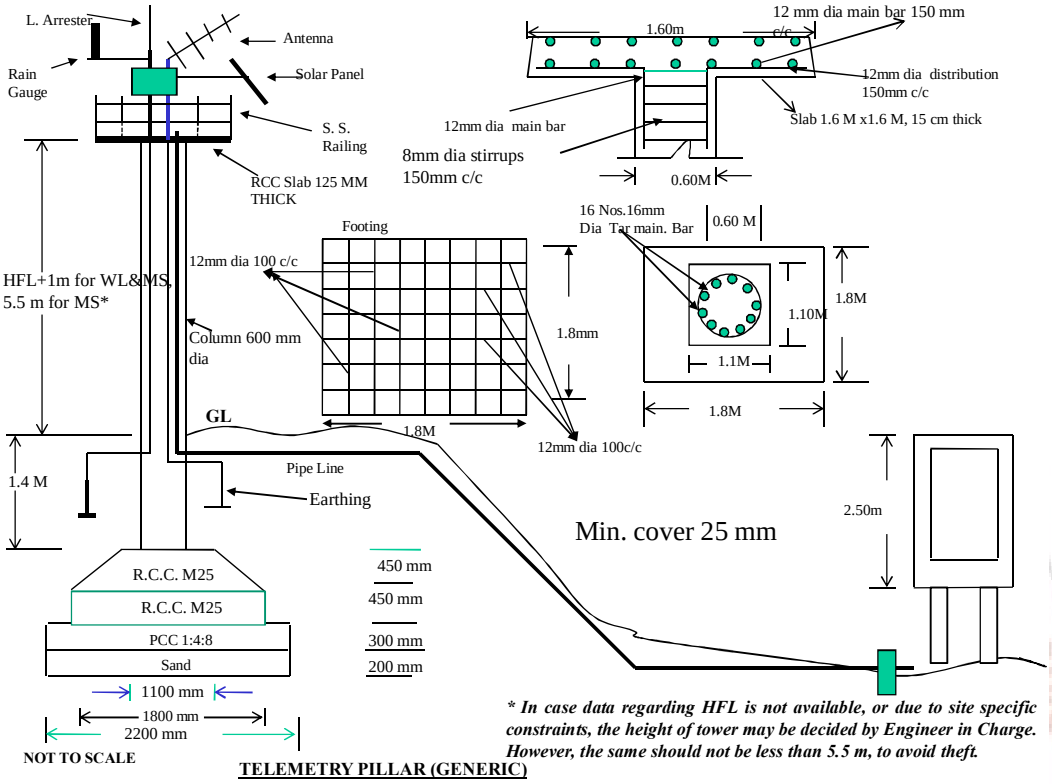
S. No.	Module Name	Target Group	Duration in days
1	Remote Station Management and Maintenance	All W/C staff located at Remote Stations	3
2	Trouble shooting of sensors at Site	Junior Engineers	3
3	Management of DCU through Laptop and Calibration of sensors	EE /AEE/SDE/JE	3

All aspects of the electrical, instrumentation and telemetry equipment being supplied shall be covered in the courses and full documentation shall be provided. The documentation and kits shall be got approved from Engineer Incharge in advance. The course shall provide detail documentation and shall ensure that the Engineer in-charge personnel shall be able to modify settings/parameters without reference back to the Contractor.
The places / sites where this training is to be given will be decided later by the Engineer Incharge.

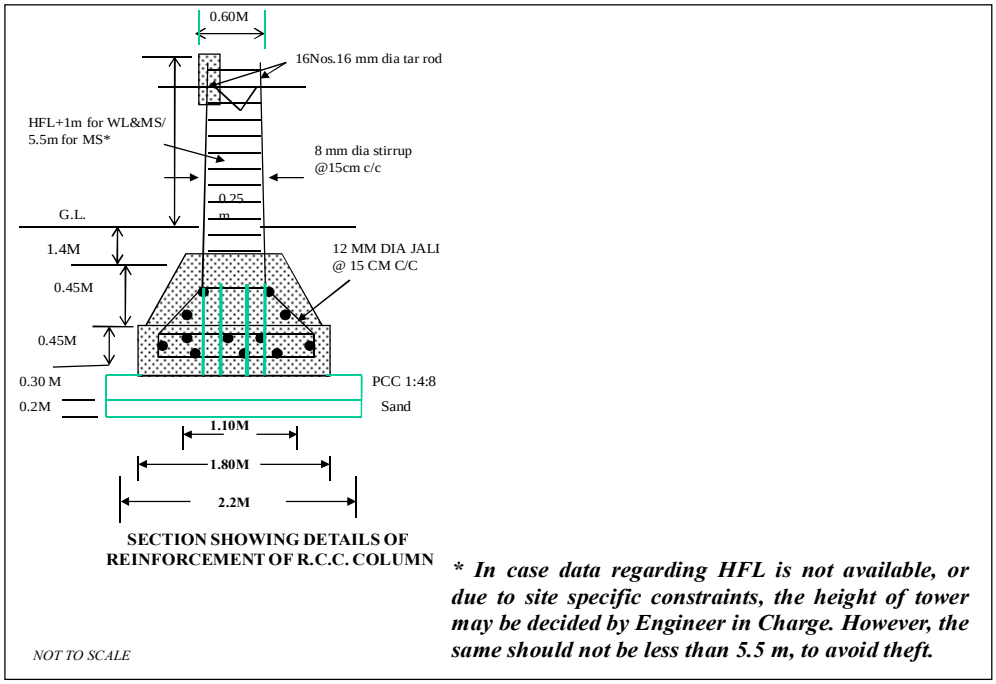
- All the specification for execution of civil works shall confirm to the relevant IS Code

.....x.....

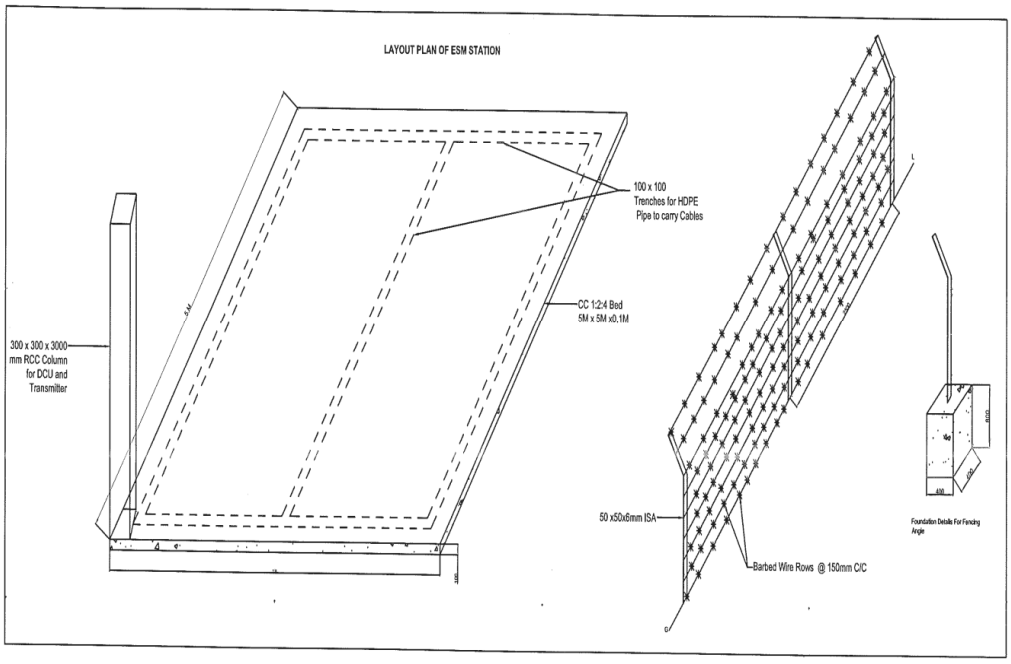
18. DRAWINGS :



Drawing 1 : Layout of a Concrete Pillar



Drawing 2: Layout of Concrete Pillar - details



Drawing – 3 – Layout Plan of Mast

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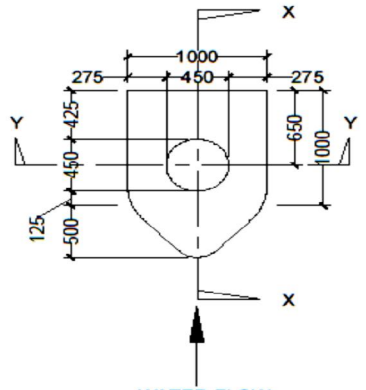
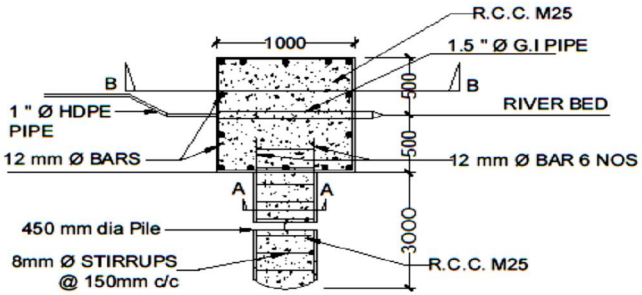


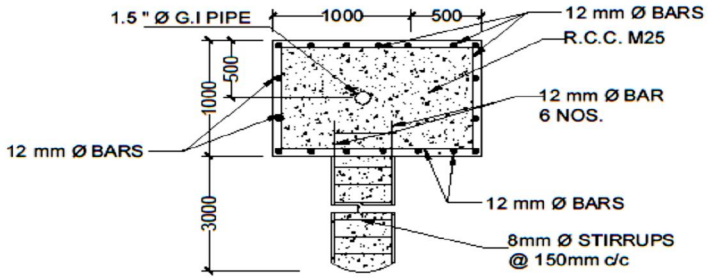
LAYOUT PLAN OF PILES



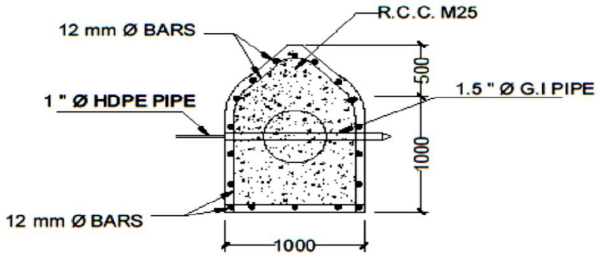
SECTION Y-Y

NOTES:

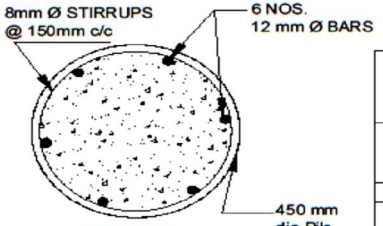
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. M25 GRADE CONCRETE SHALL BE USED.
3. CONCRETE COVER SHALL BE 40mm FOR TERMINATION BLOCK (PILE CAP) & 75mm FOR PILE..
4. SCALE-1:30, UNLESS OTHERWISE SPECIFIED.
6. All R.C.C. WORK SHOULD BE AS PER IS 456-2000



SECTION X-X

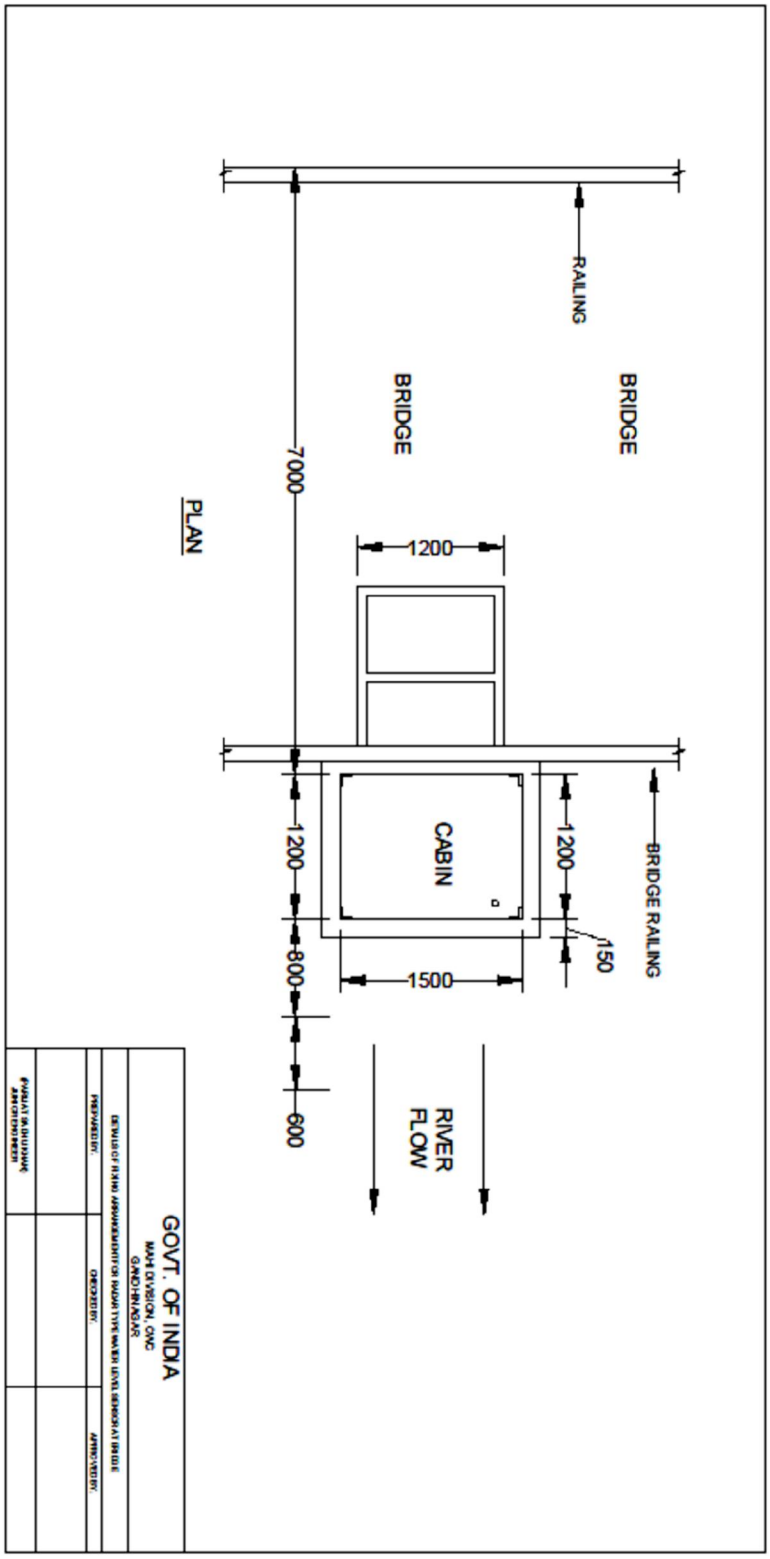


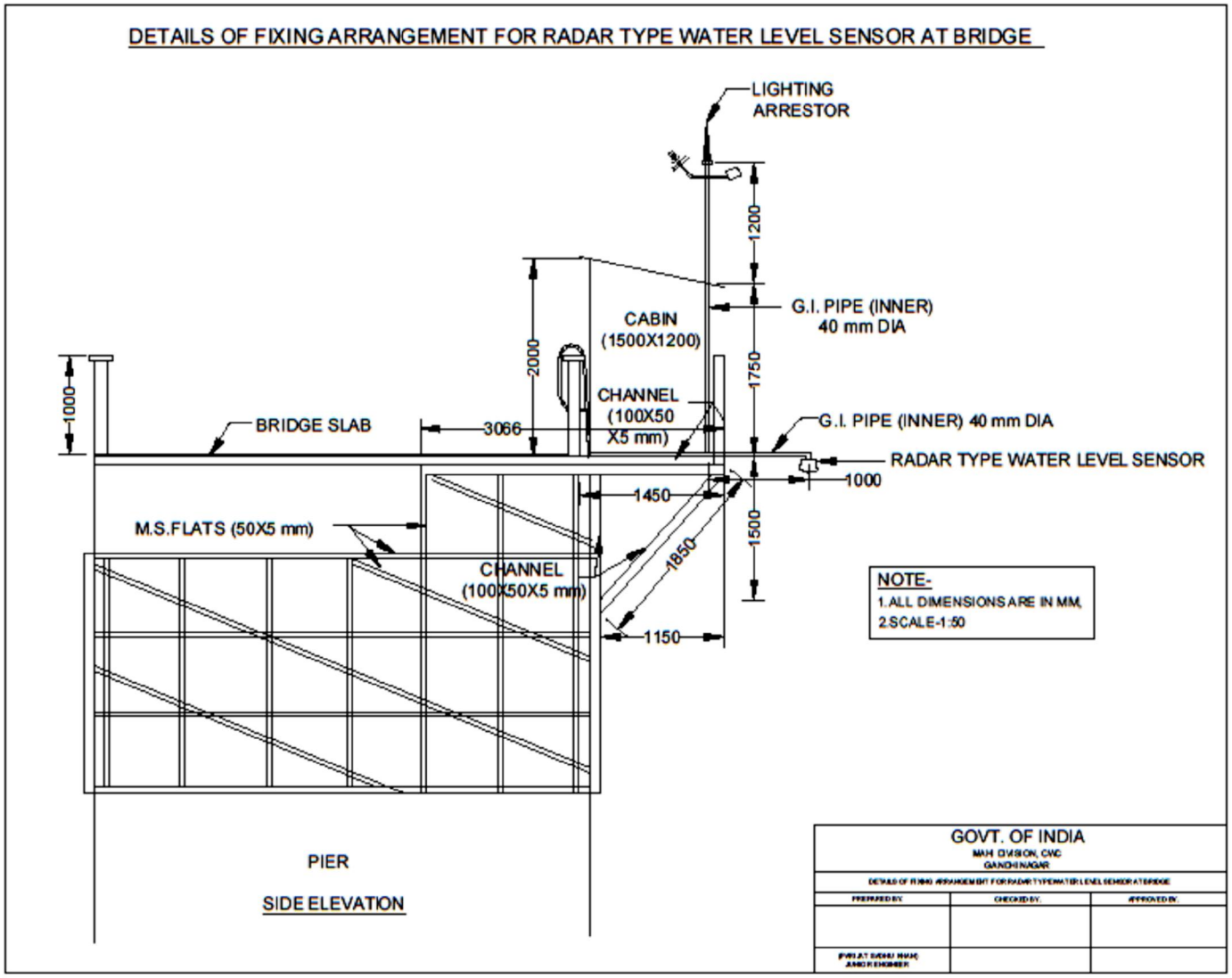
SECTION B-B



SECTION A-A
SCALE-1:10

GOVT.OF INDIA MAHI DIVISION, CWC GANDHINAGAR		
TEMINATION BLOCK		
PREPARED. BY	CHECKED. BY	APPROVED. BY
(PARIJAT SADHU KHAN) JUNIOR ENGINEER		


RAILING
BRIDGE
BRIDGE
7000
PLAN
1200
CABIN
1200
1200
BRIDGE RAILING
150
800
1500
600
RIVER
FLOW
GOVT. OF INDIA


DETAILS OF FIXING ARRANGEMENT FOR RADAR TYPE WATER LEVEL SENSOR AT BRIDGE
LIGHTING ARRESTOR
1200
G.I. PIPE (INNER) 40 mm DIA
CABIN (1500X1200)
2000
1750
1000
CHANNEL (100X50 X5 mm)
BRIDGE SLAB
3066
G.I. PIPE (INNER) 40 mm DIA
RADAR TYPE WATER LEVEL SENSOR
1000
1450
M.S.FLATS (50X5 mm)
1500
1850
CHANNEL (100X50X5 mm)
1150
NOTE-
1.ALL DIMENSIONS ARE IN MM.
2.SCALE-1:50
PIER
SIDE ELEVATION
GOVT. OF INDIA
MAH. DIVISION, CWC
GANDHINAGAR
PREPARED BY
CHECKED BY
APPROVED BY

INTEGRITY PACT

To be signed by the bidder and same signatory competent / authorised to sign the relevant contract on behalf of Govt. of India

INTEGRITY AGREEMENT

This Integrity Agreement is made at ..... on this ..... day of ..20.....

BETWEEN

President of India represented through *Executive Engineer, Mahi Division*, CWC, *Gandhinagar* (Hereinafter referred as the ñ**Engineer-in-charge**ò,which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/firm/Company)
through ..... (Hereinafter referred to as the
(Details of duly authorized signatory)

ñ**Bidder/Contractor**ò and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Engineer-in-charge has floated the Tender (NIT No. **CWC/12/2016-17/MD/GNR**) (hereinafter referred to as ñTender/Bidò) and intends to award, under laid down organizational procedure, contract for:

"Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 24 nos. water level & meteorological stations (WL&MS) and meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra & Daman & Dui " on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.ò

.

Here in after referred to as the ñ**Contract**ò.

AND WHEREAS the Engineer-in-charge values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as ñIntegrity Pactò or ñPactò), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Engineer-in-charge

1) The Engineer-in-charge commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Engineer-in-charge, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract,

demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

(b) The Engineer-in-charge will, during the Tender process, treat all Bidder(s) with equity and reason. The Engineer-in-charge will, in particular, before and during the Tender process, , provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.

(c) The Engineer-in-charge shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

2) If the Engineer-in-charge obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Engineer-in-charge will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.

2) The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:

a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.

b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non- submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Engineer-in-charge as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a wilful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**

5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

i) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Engineer-in-charge after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Engineer-in-charge.**

ii) **Forfeiture of Bid security/Performance Guarantee/Security Deposit**: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

iii) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Engineer-in-charge will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

i) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process

ii) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.

iii) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Engineer-in-charge may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

i) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Sub- contractors/sub-vendors.

ii) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

iii) The Engineer-in-charge will disqualify Bidders, who do not submit, the duly signed Pact between the Engineer-in-charge and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process

Article 6: Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 07 (seven) years after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the contract
been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, CWC.

Article 7: Other Provisions

i) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Head quarters of the Division** of the Engineer-in-charge, who has floated the Tender
ii) Changes and supplements need to be made in writing. Side agreements have not been made
iii) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution
iv) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.
v) It is agreed term and condition that any dispute or difference arising between the parties with regard

to the terms of this Integrity Agreement / Pact, any action taken by the Engineer-in-charge in accordance with this **Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.**

Article 8- LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

---------- (For and on behalf of Engineer-in-charge)

..... (For and on behalf of Bidder/Contractor)

WITNESSES:

1.----------
(signature ,name and address)

2.----------
(signature ,name and address)

Place:

Dated:

BANK GUARANTEE

BG Number:é é é é é é é é é

é é é é é é é é é .(Name of the Bank)

Issue Date:é é é é é é é é é ..
.é é é é é é (Name of the bank)

Form of Performance guarantee / Bank guarantee bond

To,
Executive Engineer,
Mahi Division,
Central Water Commission,
Gandhinagar

In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between Executive Engineer, Mahi Division, Central Water Commission, Gandhinagar and M/S ..... (herein after called "the said contractor(s)") for the work of Supply, Installation, Testing, Commissioning and Maintenance of real ï time data acquisition network at 24 nos. water level & meteorological stations (WL&MS) and meteorological stations (MS) in 12 river basins in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra & Daman & Dui " on turnkey basis for collection, transmission and processing of water level & meteorological data through satellite and GSM based telemetry and associated systems including all equipments, hardware, software and peripherals and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period. (Hereinafter called "the said agreement) having agreed to production of an irrevocable Bank Guarantee for Rsé é é é é .. (Rupeesé é é é é é é é é é é é é é é é é é .. only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. Weé é é é é é é é é é é é é é é é é (indicate the name of the Bank) (hereinafter referred to as the "Bank") hereby undertake to pay to the Government an amount not exceeding Rs 2,99,305/- (Rupees two lakh ninety nine thousand three hundred only) on demand by the Government.

2. We, the said Bank do hereby undertake to pay the amounts due and payable under this Guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rsé é é é é é .. (Rupees é é é é é é é é é é é é é é é é é .. only).

3. We, the said Bank, further undertake to pay to the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under, and the contractor(s) shall have no claim against us for making such payment.

4. We, the said Bank, further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement, and it shall continue to be enforceable till all the dues of the Government under or by virtue of the said

agreement have been fully paid, and its claims satisfied or discharged, or till the Engineer-in-charge, on behalf of the Government, certifies that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor(s), and accordingly discharges this guarantee.

5. We, the said Bank), further agree with the Government that the Government shall have the fullest liberty without our consent, and without effecting in any manner our obligations hereunder, to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s)

6. from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) , and to forbear or enforce any of the terms and conditions relating to the said agreement, and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

7. This Guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

8. We, the said Bank, lastly undertake not to revoke this Guarantee except with the previous consent of the Government in writing.

8. This Guarantee shall be valid up toé é é é é é é é . unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this Guarantee is restricted to Rsé é é é é é . (Rupeesé é é é é é é é é é é . only), and unless a claim in writing is lodged with us within expiry date of or extended date of expiry of this Guarantee all our liabilities under this Guarantee shall stand discharged.

Dated the ..... day of é é é é é é .
Foré é é é é é é é é é é é é é é

(Indicate the name of the Bank with seal)