Tender No. SID/Gangtok/2020-21/03 Dated: 30.05.2020

भारत सरकार

GOVERNMENT OF INDIA

जल शक्ति मंत्रालय

Ministry of Jal Shakti

जल संसाधन नदी विकास और गंगा संरक्षण विभाग

Department of Water Resources, River Development and Ganga Rejuvenation

केंद्रीय जल आयोग

Central Water Commission

सिक्किम अन्वेषण मंडल, गान्तोक

Sikkim Investigation Division, Gangtok

TENDER DOCUMENT

(E-PROCUREMENT MODE)

FOR

"Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 9 Nos. Snow gauging & meteorological stations (SG&MS) in SIKKIM" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals, civil construction work, with a comprehensive warranty of two years and maintenance for eight years after the expiry of the warranty period.

[Two Envelopes with e-Bidding]

Contents

Sl. No.	Title	Page No.
	Technical Bid Document	
1.	Check List	**ii**
2.	e- Notice Inviting Tender	**1-6**
3.	Invitation for Bids	**7-8**
4.	**Section 1** -Instruction to Bidders (ITB)	**9-22**
5.	CPWD - 8	**23-24**
6.	Bid and Contract for the Supply of Materials (CPWD-9: Part-1)	**25-26**
7.	Schedules	**27-29**
8.	Scope of work	**30-32**
9.	Map showing Tentative Locations of SG&MS	**33**
10.	**Section 2** – Special Conditions Of Contract	**34-46**
11.	Additional conditions of contract During maintenance period (CMAC)	**47-49**
12.	Schedule Of Quantities	**50-51**
13.	Technical Specifications	**52-81**
14.	**Section 3** - Bidding Forms	**82-89**
15.	**Section 4** - Contract Forms	**90-96**
	Financial Bid Document	
16.	Schedule of Quantities and Rates (Schedule -F) (CPWD-9: Part-2)	**97-98**

CHECK LIST

Please tick the appropriate column.

SL. NO.	DOCUMENT	ENCLOSED	
		YES	NO
TECHNICAL BID			
1.	Dated Covering Letter of Bidder		
2.	Distributorship / Dealership certificate from the manufacturer, if the bid is submitted by authorized dealer/ representative		
3.	List of clients to whom supply of similar type of hydro- meteorological equipment has been made including the value of supply order and the present status of the order.		
4.	Prescribed Earnest Money Deposit in form of Demand Draft/FDR.		
5.	Technical Schedules-T duly filled in and signed with Company/Firm's Seal on each page		
6.	Printed literature on all the equipment/items giving specifications and details of accessories.		
7.	Original Technical Bid Document dully filled in and signed on each page		
8.	Copy of exemption certificate of EMD		
FINANCIAL BID			
9.	Whether quoted prices are FOR at SID, Gangtok		

It shall be ensured that the above 'Check List' is duly and completely filled in without leaving any item of Check List un-filled.

GOVERNMENT OF INDIA
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation
Central Water Commission
Sikkim Investigation Division, Tadong, Gangtok, Sikkim 737102

Ph.: 03592-231887,271059 Email: eesid-cwc@gov.in ***https://eprocure.gov.in/eprocure/app***
Fax: 03592-231887

e- Notice Inviting Tender

The Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok (Sikkim) on behalf of President of India invites online e-tenders through the website ***https://eprocure.gov.in/eprocure/app*** under ***Two-bid*** system from experienced manufacturers and authorized dealers for the following works in Sikkim on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipments, hardware, software and peripherals, civil construction work, with a comprehensive maintenance:

NIT for Tender No.	SID/Gangtok/2020-21/03 Dated 30.05.2020
Cost of Tender Document	Rs. 1500/- to be deposited online through NEFT/RTGS in the Bank Account of SID, CWC, Gangtok as per the account details given in the tender document.
Name of the Item/Goods/Service	**"Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 9 nos. Snow Gauging & Meteorological Stations (SG&MS) in SIKKIM" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals, civil construction work, with a comprehensive warranty of two years and maintenance for eight years after the expiry of the warranty period**
Estimated Cost	**Rs. 3,04,66,730/-**
Earnest Money Deposit (EMD)/Bid Security	Amount: Rs. **6,10,000/-** Validity: 120 days to be deposited online through NEFT/RTGS in the Bank Account of SID, CWC, Gangtok as per the account details given in the tender document.
Start date of free download of bid document through e-procurement Portal https://eprocure.gov.in/eprocure/app	30.05.2020 at 11.00 hrs.
Last date for seeking clarification if any	22.06.2020 upto 17:00 hrs

(online only i.e. through e-mail)	
Date and Time of Pre-Bid meeting and Venue	25.06.2020 at 11:00 Hrs in the O/o Chief Engineer, Teesta and Bhagirathi - Damodar Basin Organisation, GE-2, Sector – III, Salt Lake, Kolkata:700106 (West Bengal)
Last date & time for submission of online bid through e-procurement Portal (https://eprocure.gov.in/eprocure/app)	04.07.2020 at 17.00 hrs.
Date & time for opening of technical bid (online) through e-procurement Portal (https://eprocure.gov.in/ eprocure/app)	**07.07.2020 at 11.00 hrs.**
Date & time for opening of financial bid (online) through e-procurement Portal (https://eprocure.gov.in/ eprocure/app)	To be notified later.
Validity period of Bid	**120 days from opening of bid**
Delivery Period of the items / Goods	The time allowed for carrying out the works shall be 180 days from the 30th day after the date of written orders to commence the works.
E-Tender inviting authority Designation and Address at which documents are to be submitted in hard copy	Executive Engineer, Sikkim Investigation Division, Central Water Commission, Tadong, Gangtok-737102. Phone No: 03592-231887, 271059 Fax No :03592-231887 Email: eesid-cwc@gov.in

1. Bid Documents can be downloaded from CWC website **http://cwc.*gov.in*** or from the Central Public Procurement Portal **https://eprocure.gov.in/eprocure/app** free of cost.

2. Bidders should enroll/register in the e-procurement module of Central Public Procurement Portal through the website **https://eprocure.gov.in/eprocure/app** for participating in the bidding process.

3. Bidders should also possess a valid Digital Signature Certificate (DSC) of Class III for online submission of bids.

4. Bids received on CPP portal (**https://eprocure.gov.in/eprocure/app)** only will be considered. Bids in any other form sent through sealed cover/email/post/fax etc. will be rejected.

5. Any change/corrigendum/extension of opening date in respect of this tender shall be issued through **CPP Portal** only and no press notification will be issued in this regard. Bidders are therefore requested to regularly visit our **CPP Portal** for updates.

6. The amount for cost of tender document of Rs. 1500/- and Earnest Money Deposit (EMD)/Bid Security of Rs. 6,10,000/- through online (NEFT/RTGS) in Bank Account of Sikkim Investigation Division, CWC, Gangtok as per the details given below :

Bank Name: STATE BANK OF INDIA
Branch : Main Branch, M.G Marg, Gangtok, Sikkim - 737101
Branch Code : 000232
IFSC Code: SBIN0000232
MICR Code : 737002002
Account Number : 30646488411
Name of Account : Executive Engineer, SID, CWC, Gangtok

The bidder should upload the scanned copy (.pdf) of the proof of transaction for the same having clearly mentioning the Transaction ID, Date of transaction, along with Technical bid document.

8. The original copies of documents as mentioned in clause 15.7 of ITB and proof of submission of Cost of Tender Document/EMD/Bid Security or a copy of exemption certificate of EMD(NSIC/MSME), valid up to the bid validity period for the items tendered should be submitted to the office of the Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok on or before 07.07.2020 at 10.00 hrs by personally or through post or courier. The bid will be opened if those documents received by office (SID, CWC) within stipulated date and time. Other bids will not open and it will be treated as rejected.

9. On opening date, the bidder can login and see the bid opening process. After opening the bids, he/she will receive the competitor bid sheets.

10. The bidders should upload the scanned copy of duly signed full bid documents (.pdf) along with compliance report/statement.

11. Only Original Equipment Manufacturers, their authorized dealers acting singly or in consortium with other such manufacturers/ dealers, having sufficient experience 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 based transmission systems. The tenderers shall produce proof from the appropriate authorities of having satisfactorily completed similar works during the last ten years, where the systems installed by them are working satisfactorily and the same could be inspected.

12. A prospective bidder may apply singly or in a consortium with other partners each one being an Original Equipment Manufacturer (OEM) or an Authorized Agent/ 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.

13. 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.

14. One of the partners of the consortium will be identified in the agreement, mentioned in point no. 12 above, as a lead partner and will be authorized to execute the contract with the purchaser. All financial transactions and liabilities shall rest with the lead partner.

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

16. In case of consortium of manufacturers, authorized dealers, contractors for the major components of the works, such as telemetry, etc. the qualifying criteria will be applicable to each partner separately for the specific portion of the project which are to be the direct responsibility of the partner.

17. Agreement shall be drawn with the successful bidder on prescribed Form 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.

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

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

20. The tenderers shall enclose with the technical bid of the tender document the Income-Tax clearance certificate and a definite proof from the appropriate authorities of **having satisfactorily completed at least one similar work during the last ten years and the installations at the specified work are functioning satisfactorily**.

21. The technical bid shall include all the relevant technical literature, brochures 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 purchaser during the course of evaluation of the technical and financial bid shall be supplied within the time limits set by the purchaser.

22. The details of the work are given under the Schedules, Special Conditions of Contract, Scope of Work and Technical Specification.

23. Detailed information pertaining to the works will be open for inspection by the tenderers at the office of the office of the Executive Engineer, SID, CWC, Gangtok. 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 data to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC, Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects. A tenderer shall be deemed to have full knowledge of the site whether he inspects 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 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 at his own cost. 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. No extra claim shall be entertained in this regard.

24. The tenderer who wants purchase 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.

25. 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 sign the contract consisting of:-

    a) The Notice inviting tender, all the documents including General Conditions and Special Conditions of contract, technical specifications, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

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

26. A pre–bid conference chaired by the Superintending Engineer, Investigation Circle, CWC, Gangtok shall be held at **11:00 hrs on 25.06.2020** in the O/o Chief Engineer, Teesta and Bhagirathi-Damodar Basin Organization, GE-2, Sector–III, Salt Lake, Kolkata:700106 West Bengal. All the queries and clarifications required by the prospective bidders shall be submitted in writing duly signed preferably prior to the convening of the meeting and in no case not after conclusion of the conference. Only written requests, which are found suitable for response from the Chairman of the pre bid conference, will be responded for the amendments/ clarifications issued by the purchaser after the pre-bid conference. The clarifications issued shall be treated as amendments to the tender requirements and shall be annexed to the tender. In this conference, the clarifications, if any, required by any prospective tenderer on the bidding documents would be discussed. If, for any reason, whether at its own initiative or in response to a clarification requested by the prospective tenderer, the purchaser modifies the bidding documents by an amendment, the same will be notified in the web site in the form of amendment, if required. The modifications/amendments if any shall be put on e-procurement portal and CWC website http://www.cwc.gov.in after the pre-bid conference. The Tenderers have to confirm the same from the e-procurement portal and CWC website before submitting their tenders.

27. The intending bidder, in case of Prime Equipment Manufacturers shall upload a self-declaration on their letter-head as PDF file in Cover-I (Technical bid) of e-tender, along with the tender documents, confirming that they are regularly manufacturing, supplying, installing, testing & commissioning of the similar equipment for the last **2 years.**

28. The intending bidder, in case of Authorized Distributor/ Authorized Dealer shall possess valid authorized Distributorship /Dealership license from Original Equipment Manufacturers. The bidder shall enclose the copy of the same as PDF file in Cover-I of the e-tender while submitting the bid.

29. **The bidder must ensure to quote his/her item rate bid in the attached Bill of Quantity (BoQ) (Financial Bid) in Excel Format only**.

30. All the tender documents (Technical & Financial bid) to be uploaded as per this tender are to be digitally or duly signed by the bidder.

31. The contractors who are blacklisted are barred to take part in the tendering process.

32. All the communications with respect to the tender shall be addressed to:

Executive Engineer,
Sikkim Investigation Division,
Central Water Commission,
Near Khang-ree Petrol Pump,
Tadong, Gangtok-737102.
Phone No.: 03592-231887,271059
Fax No. :03592-231887,
Email : eesid-cwc@gov.in

List of Documents to be scanned and uploaded within the specified date and time i.e. period for bid submission:

COVER – I (Technical Bid)

i. A scanned copy of proof of transaction against Cost of Tender Document EMD/Bid security. Bidders claiming exemption of Cost of Tender document/EMD/Bid security, should provide documentary proof of their being registered as NSIC/MSE (indicating the terminal validity date of their registration) for the **items tendered** and the same shall be scanned and uploaded**.** If such a certificate is not submitted before date of opening of technical bids, for the items tendered, the bid will be treated as non-responsive and shall be rejected.

ii. Certificate of Registration for GST.

iii. Latest income tax clearance certificate along with PAN in the name of Firm and not in the individual name should be submitted along with E-Tender.

iv. OEM certificate/ Authorized Distributor/ Authorized Dealer shall possess valid authorized Distributorship /Dealership license from Original Equipment Manufacturers

v. Duly signed full tender documents (.pdf) along with compliance report/statement.

vi. Scanned documents as per clause 5.2 & 15.3 of ITB.

COVER – II (Financial Bid)

i. Bill of Quantities (BoQ)

Executive Engineer,
Sikkim Investigation Division,
Central Water Commission,
Gangtok, Sikkim.

Copy for kind information to:-

1. Superintending Engineer (C), T&BDBO, CWC, Kolkata.
2. Superintending Engineer, Investigation Circle, CWC, Gangtok.
3. Accounts Branch, Sikkim Investigation Division, CWC, Gangtok.
4. Notice Board, Sikkim Investigation Division, CWC, Gangtok.
5. Central Public Procurement Portal (https://eprocure.gov.in/eprocure/app)
6. Web Portal of Central Water Commission (http://cwc.gov.in/tenders)

GOVERNMENT OF INDIA

INVITATION FOR BIDS (IFB)

NIT No.:**I/19774/2020** Dated: 29.05.2020

1. Bidders are advised to note the minimum qualification criteria specified in the Bidding Documents in order to qualify for the award of the Contract.
2. The **Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok** invites bids electronically from eligible bidders for ***the following works***. The Bidders may submit Bids for all of the goods and services.

Sl. No.	Description of goods	Quantity	Location	Delivery period
1.	**Establishment of Remote Station Type SG&MS - E Type (Rainfall, Snow precipitation, snow depth, snow density/ snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works alongwith data transmission as per tender document.**	4	Sites under Sikkim Investigation Division, CWC, Gangtok	180 days
2.	**Establishment of Remote Station Type SG&MS - E Type (Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works alongwith data transmission as per tender document.**	5		
3.	**Comprehensive annual maintenance charges including replacement of material & consumables for 8 years after warranty period of 2 years (for Sl.No. 1 and 2) alongwith data transmission as per tender document.**	1 job		8 years
4.	**Spare Parts**	Set		
5.	**5 Trainings in each of the three modules (both for remote station and Modelling Centre) for officers & staff, as per the tender document.**	1 job		10 years

3. The Bidding Document is available online and can be downloaded free of cost by logging on to the website ***http://cwc.gov.in*** *or* ***https://eprocure.gov.in/eprocure/app***. The bids are to be submitted online through the e-procurement portal only (***https://eprocure.gov.in/eprocure/app***). Bids submitted manually will not be accepted. The bidders would be required to register in the website "***https://eprocure.gov.in/eprocure/app"***.
4. For submission of the Bid, the Bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorized by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may obtain the same from the website: ***https://eprocure.gov.in/eprocure/app.***
5. Bids must be accompanied by proof of submission of Cost of Tender Document/Bid Security/EMD for the stated amount and in the form specified in the Bidding Document.

The Bid Security / EMD shall be valid for forty-five (45) days beyond the original validity period of the Bid. Bids should be valid for 120 days after date of opening of bids. Procedure for submission of Bid Security is described in Para 7 below.

6. Bids must be submitted on ***https://eprocure.gov.in/eprocure/app*** on or before **17:00 hrs on 04.07.2020** and will be opened online on **07.07.2020** at **11:00 hrs**. Record of bid opening will be electronically shared with bidders. If the office happens to be closed on the date of opening of the Bids as specified, the Bids will be opened on the next working day at the same time and venue. Any bid or modifications to bid (including discount) received outside e-Procurement System will not be considered. The electronic bidding system would not allow late submission of bids.

7. The Bidders are required to submit specified **original documents as per clause 15.7 of ITB including proof of submission of original Bid Security through NEFT/RTGS** to Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok at the address given below before the date and time specified for opening of the Bids on **07.07.2020** by **10:00 hrs** by registered post/speed post/courier or by hand, failing which the Bids will be declared non-responsive and will not be opened.

8. Other details can be seen in the bidding documents. The Purchaser shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, the Purchaser shall not be liable for any information not received by the bidder. It is the Bidder's responsibility to verify the website for the latest information related to the Bid.

Name and address of Purchaser

Executive Engineer
Sikkim Investigation Division,
Central Water Commission
Near Khang-ree Petrol Pump,
Tadong, Gangtok, Sikkim.
Email : eesid-cwc@gov.in
Phone No: 03592-231887, 271059, Fax No : 03592-231887

Section 1 - INSTRUCTION TO BIDDERS (ITB)

A. General

1. Scope of Bid

1.1 The Purchaser, namely ***Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok*** issues these Bidding Documents for the supply of Goods and Related Services as specified. The name and identification number of this procurement is SID/Gangtok/**2020-21/03 dated 30.05.2020.**

2. Source of Funds

2.1 The expenditure to be incurred for this intended purchase will be met from the funds available with the purchaser named in the Schedule of Quantities, hereinafter referred to as "the purchaser" i.e. **Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok.**

3. Eligible Bidders

3.1 A Bidder shall not have a conflict of interest. All bidders found to have conflict of interest shall be disqualified. This invitation for online bids is open to all suppliers, who fulfill the eligibility criteria as well as the Qualification criteria, incorporated in this document.

4. Amendment of online bidding documents

4.1. At any time prior to the deadline for submission of online bids, the purchaser may, for reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the online bidding documents by amendment.

4.2. The Amendment will be notified on the CPP portal as corrigendum. Bidders may check the CPP portal for corrigendum, if any. No separate notification will be sent to Bidders by email /Fax / Phone etc. in this regard.

4.3 In order to provide the prospective bidders with reasonable time in which to take the amendment into account in preparing their online bids, the purchaser may, at its discretion, extend the deadline for the submission of online bids and other allied time frame having linkage with that deadline.

B. Preparation of Bids

5. Documents Comprising the Bid

5.1 The Bid shall comprise Two Parts, namely the **Technical Part** and the **Financial Part**. These two Parts shall be submitted simultaneously.

5.2 The **Technical Part of Bid** shall comprise the following:

(a) Letter of Bid – Technical Part in accordance with ITB Clause 6 which shall, inter-alia, comprise the following;

i. 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.

ii. A detailed description of the essential technical and performance characteristics of the goods.

iii. An item-by-item comments on the department's 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. 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 department's satisfaction, that the substitutions ensure substantial equivalence to those mentioned in tender.

iv. Acceptance letter of all the terms and conditions clearly indicating variation, if any, with tender requirements. Conditional tenders shall not be accepted and shall summarily rejected.

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

vi. 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;

vii. The Bio-data of the Engineers / Technicians in-charge of the work during execution as well as maintenance. ''Only such equipment or its upgrades shall be used which are working satisfactorily at least for the last two years''. The Tenderer will furnish the definite proof to this effect from the users.

(b) Bid Security in accordance with ITB 13;

(c) Written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 14.2;

(d) Documentary evidence in accordance with ITB Clause 10 that the Goods and Related Services conform to the Bidding Documents;

(e) Documentary evidence in accordance with ITB Clause 11 establishing the Bidder's qualifications to perform the contract.

(f) Manufacturer's Authorization in accordance with ITB Clause 11.1 (a), on the form provided in Section 3;

(g) Performance Statement of supplies of similar goods made during the last 3 years, in accordance with ITB 11.2;

(h) List of Goods & Related Services indicating Bidder's offered delivery period.

(i) Affidavit confirming correctness of information and documents submitted with the Bid, as per format given in Section 3;

(j) Printed literature of all the equipments, accessories and items being offered against this bid enquiry giving full specifications and details. The bidder shall clearly bring out technical deviations, if any, in specifications of the equipment, accessories and items being offered vis–a–vis specifications given in the bid documents, in the prescribed schedule in the 'Technical Bid Document'

(k) Technical Bid document will be downloaded, duly filled in as required and signed by the bidder with Firm's seal on each page before uploading to the site.

5.3 The **Financial Part of Bid** shall comprise the following:

(a) **Bill of Quantities (BoQ)** (using the Schedule uploaded with the bidding documents) wherein the rates shall be entered online.

6. Letter of Bid and Bill of Quantities

6.1 The Bidder shall submit the **Letter of Bid – Technical Part**, and **Bill of Quantities (BoQ)** using the forms furnished in Section 3, Bidding Forms. The forms must be completed without any alterations to the text. All blank spaces shall be filled in with the information requested.

7. Alternative Bids

7.1 Alternative bids shall not be considered.

8. Bid Prices and Discounts

8.1 Price Schedules shall conform to the requirements specified below.

8.2 All lots (Contracts) and items must be listed and priced separately in the Price Schedules.

8.3 The price to be quoted in the Financial Part (Bill of Quantities) shall be the total price of the Bid, including any discounts offered.

8.4 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected.

8.5 If so specified in ITB 1, bids are being invited for individual lots (contracts) or for any combination of lots (packages). Prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot.

8.6 Prices shall be quoted as specified in the Bill of Quantities included in Section 3, Bidding Forms as stated below:

(i) **(a) For domestic goods:** The price of the Goods quoted shall comprise of base price EXW, GST and Charges for transportation, Insurance and other charges up to the final destination. (as per BoQ)

(b)* For imported goods**: The price of the Goods quoted shall comprise of base price EXW, GST, customs duty and any other taxes as applicable and Charges for transportation, Insurance and other charges up to the final destination i.e. sites under jurisdiction of ***Executive Engineer, Sikkim Investigation Division, Central water Commission, Gangtok.

(ii) Other taxes which will be payable on the Goods if the contract is awarded to the Bidder; and

(iii) The price for inland transportation, insurance, and other local services required to convey the Goods to their Final Destination (Project Site), namely sites under the jurisdiction of ***Executive Engineer, Sikkim Investigation Division, Central water Commission, Gangtok*.**

(iv) Price for Related Services, if any.

9. Currencies of Bid

9.1 The Bidder shall quote in ***Indian Rupees*** only **in BoQ**.

10. Documents Establishing the Conformity of the Goods and Related Services

10.1 To establish the conformity of the Goods to the Bidding Documents, the Bidder shall furnish as part of its Technical Part of Bid, the documentary evidence that the Goods conform to the technical specifications and standards specified .

11. Qualifications of the Bidder and Documentary Evidence

11.1 The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall be submitted as part of its Technical Part of Bid, to establish to the Purchaser's satisfaction:

(a)

(i) Only Original Equipment Manufacturers, their authorized dealers acting singly or in consortium with other such manufacturers/ dealers, having sufficient experience of similar works, shall be eligible to quote for the works. Similar works are defined as those works involving installation of equipment/ sensors of the same type of technology in the field of hydro meteorological observations integrated with data acquisition and satellite based transmission systems. The tenderers shall produce proof from the appropriate authorities of having satisfactorily completed similar works during the last ten years, where the systems installed by them are working satisfactorily and the same could be inspected.

(ii) A prospective bidder may apply singly or in a consortium with other partners each one being an Original Equipment Manufacturer (OEM) or an Authorized Agent/ 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.

(iii) 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.

(iv) One of the partners of the consortium will be identified in the agreement, mentioned in point no. iii above, as a lead partner and will be authorized to execute the contract with the purchaser. All financial transactions and liabilities shall rest with the lead partner.

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

(vi) In case of consortium of manufacturers, authorized dealers, contractors for the major components of the works, such as telemetry, etc. the qualifying criteria will be applicable to each partner separately for the specific portion of the project which are to be the direct responsibility of the partner.

(vii) that supplies for any particular item in each schedule of the bid should be from one manufacturer only. Bids from agents offering supplies from different manufacturers for the same item of the schedule in the bid will be treated as non-responsive.

(b) that the Bidder meets the following qualification criterion:

The bidder shall have completed satisfactorily at least three similar works of supply, installation, testing & commissioning of Hydro-meteorological equipment during last five years each of value not less than **Rs.121.87 lakhs.**

Or,

The bidder shall have completed satisfactorily at least two similar works of supply, installation, testing & commissioning of Hydro-meteorological equipment during last five years of value not less than **Rs.182.80 lakhs.**

Or,

The bidder shall have completed satisfactorily at least one similar work of supply, installation, testing & commissioning of Hydro-meteorological equipment during last five years of value not less than **Rs. 243.73 lakhs.**

11.2 The tenderers shall enclose with the technical bid of the tender document the Income-Tax clearance certificate and a definite proof from the appropriate authorities of having satisfactorily completed at least one similar work during the last ten years and the installations at the specified work are functioning satisfactorily using the Proforma for Performance Statement included in Section 3.

11.3 The bidder shall be either manufacturer or authorized dealer or authorized representative of Foreign Firms manufacturing Hydro-meteorological equipment and located in India

11.4 Financial Capability:

The bidder's annual turnover shall be not less than **Rs. 304.66 Lakhs** during last 3 years. The Bidder shall furnish documentary evidence that it meets the financial capability.

12. Period of Validity of Bids

12.1 Bids shall remain valid for the period of **180 days** after opening of the bids. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

13. Bid Security

13.1 The Bidder shall furnish as part of its Technical Part of Bid, a Bid Security/EMD, in original for an amount of **Rs. 6,10,000/-** in favour of "***Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok."*** through online (NEFT/RTGS) in Bank Account of Sikkim Investigation Division, CWC, Gangtok as per the details given below :

Bank Name: STATE BANK OF INDIA
Branch : Main Branch, M.G Marg, Gangtok, Sikkim - 737101
Branch Code : 000232
IFSC Code: SBIN0000232
MICR Code : 737002002
Account Number : 30646488411
Name of Account : Executive Engineer, SID, CWC, Gangtok

The bidder should upload the scanned copy (.pdf) of the proof of transaction for the same having clearly mentioning the Transaction ID, Date of transaction, along with Technical bid document. **The Bid Security / EMD shall be valid for forty-five (45) days beyond the original validity period of the Bid.**

13.2 If a Bid is not accompanied by a substantially responsive Bid Security / EMD, it shall be rejected by the Purchaser as non-responsive.

13.3 Bid Security / EMD of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the contract and furnishing the Performance Security pursuant to ITB 33.

13.4 The Bid Security / EMD may be forfeited:

(a) If any tenderer withdraws his tender before the expiry of the validity period, or before the issue of letter of Intent, whichever is earlier, or make any modification 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 earnest money absolutely. This provision would naturally apply only to the lowest tenderer once the earnest money of all the tenderers except those of the lowest is refunded as per provisions under para 19.5(1).

(b) if a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder;

or

If contractor fails to furnish the prescribed performance security in accordance with ITB 33 within the prescribed period,

the earnest money is absolutely forfeited to the President automatically without any notice.

(c) In Case of forfeiture of earnest money as prescribed in (a) and (b) above, the tenderer shall not be allowed to participate in the retendering process of the work.

(d) if the successful Bidder fails to:

i. sign the Contract in accordance with ITB 32; or

ii. Furnish a performance security in accordance with ITB 33

14. Preparation and Signing of Bid

14.1 The Bidder shall prepare the Bid as per details given in ITB 15.

14.2 The Bid shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of Power of Attorney and shall be submitted with the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature.

14.3 Corrections, if any, in the bid can be carried out by editing the information before electronic submission on CPP Portal *https://eprocure.gov.in/eprocure/app*

C. Submission and Opening of Bids

15. Electronic Submission of Bids, and Submission of Original Documents

15.1 Bids, both Technical and Financial Parts, shall be submitted online on the e-Procurement Portal **(CPP Portal)**. Detailed guidelines for viewing Bids and submission of online Bids are given in the **CPP Portal**. Any Bidder can log on to this **CPP Portal** and view the IFB and details of Works/Goods for which Bids are invited. However, every Bidder has to enroll/ register in the **CPP Portal**, and should have valid Digital Signature Certificate (DSC) in the form of smart card/e-token obtained from any Authorized Certifying Agency. The Bidder should register in the **CPP Portal** using the relevant option available. Then the Digital Signature registration has to be done with the e-token, after logging onto the website. The Bidder can then log in the **CPP Portal** through the secure login by entering the password of the e-token & the user id/ password chosen during registration.

The Bidder should go through the Bidding Document carefully and submit the specified documents, along with the Bid otherwise the Bid may get rejected.

15.2 The Bidder shall submit Bid in two separate online folders **simultaneously**, i.e. Folder 1, for the **Technical Part** and Folder 2 - for the **Financial Part**.

15.3 **The 'Technical Part of Bid'** submitted online by the Bidder shall comprise the following documents and the Bidder shall upload scanned copies of these documents with the Bid.

(i) **Letter of Bid – Technical Part** as per format given in Section 3;

(ii) **Bid Security** in accordance with ITB 13;

(iii) **Delivery Period Offered**: List of Goods & Related Services indicating Bidder's offered delivery period;

(iv) **Authorization:** Power of Attorney of signatory of Bid in accordance with ITB 14.2;

(v) **Manufacturer's Authorization** in accordance with ITB 11.1 (a), on the form provided in Section 3;

(vi) **Affidavit** confirming correctness of information and documents submitted with the Bid in accordance with ITB Clause 5, on the form provided in Section 3;

(vii) **Performance Statement** of supplies of similar goods made during the last 3 years, in accordance with ITB 11.2;

(viii) **Compliance of Goods and Related Services with Technical Specifications and Standards**: Documentary evidence in accordance with ITB Clause 10;

(ix) **Qualifications of the Bidder**: Documentary evidence of Bidder's qualifications to perform the Contract in accordance with ITB 11.1; and

(x) **Authorized address and contact details** of the Bidder having the following information:

Name of Firm
Address for communication
Telephone No.(s):
Office Mobile No.
Facsimile (FAX) No.
Electronic Mail Identification (E-mail ID)

15.4 The Technical Part of Bid shall not include any financial information related to the Bid price. Where material financial information related to the Bid price is contained in the Technical Part of Bid, the Bid shall be declared non-responsive.

15.5 **The Financial Part of Bid** submitted online by the Bidder shall comprise the following:

(a) Bill of Quantities (BoQ) (using the Schedule uploaded with the bidding documents) **wherein the rates shall be entered online.** Upon entry of unit rates for all the items, total Bid Price would be calculated automatically by the System and displayed.

15.6 All documents are required to be signed digitally by the Bidder. The System generates a Unique Bid Identification Number, time stamped as per server time, as an acknowledgement for Bid submission.

15.7 **Submission of Original Documents**

Bidders are required to submit the following documents in original to the Purchaser's office.

(i) The bidder should upload the scanned copy (.pdf) of the proof of transaction for submission of the **Bid Security / EMD**, clearly mentioning the Transaction ID, Date of transaction, along with Technical bid document. **A copy of exemption certificate of EMD(NSIC/MSME), valid up to the bid validity period for the items tendered is required if bidder is claiming exemption from submission of Bid Security/EMD.**

(ii) Affidavit confirming correctness of information and documents submitted with the Bid, using the Format given in Section 3

These original documents should be received by the Purchaser **before the date and time fixed for opening of Technical Part of Bids i.e. upto 07.07.2020 at 10:00hrs** either by registered/speed post/courier or by hand,

failing which the Bid will be declared non-responsive, and will not be opened. Hard copies of Bids or any other documents are not required to be submitted.

15.8 Any Bid or modifications to Bid (including discount) received outside the e-Procurement System (**CPP Portal)** shall not be considered.

15.9 **Bids submitted manually or by Telex, or Cable or by Fax will be rejected as non-responsive**

16. Deadline for Submission of Bids

16.1 Bids must be uploaded online no later than the **04.07.2020 at 17:00 hrs**. A Bidder may modify its Bid any number of times by using the appropriate option for Bid modification on the e-Procurement Portal, before the deadline for submission of Bids. For Bid modification and consequential re-submission, the Bidder is not required to withdraw its Bid submitted earlier. The last modified Bid submitted by the Bidder within the deadline for bid submission shall be considered as the Bid. The modification and consequential re-submission of Bids is allowed any number of times.

16.2 A Bidder may withdraw its Bid by using the appropriate option for Bid withdrawal, before the deadline for submission of Bids. However, if a bid is withdrawn, re-submission of the Bid is allowed.

17. Late Bids

17.1 The electronic bidding system would not allow any late submission of Bids after due date and time as per server time

18. Public Opening of Technical Parts of Bids

18.1 The Purchaser shall open Technical Parts of all Bids online in the Purchaser's office, on **07.07.2020 at 11:00 hrs**, and this can also be viewed by the Bidders online**.** The Financial Parts of the Bids shall remain unopened in the e-Procurement System, until the evaluation of the Technical Parts of the Bids.

In the event of the specified date of Bid opening being declared a holiday for the Purchaser, the Bids will be opened at the appointed time and location on the next working day.

18.2 In all cases, original documents submitted as specified in ITB 15.7 shall be first scrutinized, and Bids that do not comply with the provisions of ITB 15.7 will be declared non-responsive and will not be opened.

18.3 The Purchaser shall prepare a record of the Technical Part Bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification.

The Technical Part Bid opening summary will be uploaded on the e-Procurement Portal (**CPP Portal).**

18.4 Only Technical Parts of Bids that are opened at Bid opening shall be considered further for evaluation.

D. Evaluation of Bids

19. Confidentiality

19.1 Any effort by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and post qualification of the bids or contract award decisions may result in the rejection of its Bid.

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

20. Clarification of Bids

20.1 To assist in the examination, evaluation, comparison and post-qualification of the bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder in respect to its Bid and that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing.

E. Evaluation of Technical Parts of Bids

21. Evaluation

21.1 The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself.

21.2 A substantially responsive Bid is one that conforms to all the terms, conditions, and specifications of the Bidding Documents without material deviation, reservation, or omission.

21.3 Evaluation of Technical Parts of Bid with respect to documents and information furnished in the Bid pursuant to ITB Clause 15.3 shall be taken up. The Purchaser will determine whether each Bid (a) has been properly signed and supported by the Power of Attorney in favour of the signatory of the Bid; (b) is accompanied by the Bid Security/EMD of requisite amount and validity in the approved form; (c) meets the eligibility criteria defined in ITB Clause 3; (d) Delivery Period offered meets the specified requirements; and (e) has furnished details of compliance with Technical Specifications.

21.4 Bids from Agents, without proper authorization from the Manufacturer and without proper agreement to furnish the manufacturer's guarantee/warranty, shall be treated as non-responsive.

21.5 Bids offering delivery beyond the stipulated delivery will be treated as non-responsive.

21.6 General conditions of Contract stipulate payment schedule offered by Purchaser. If the Bid deviates from that schedule the Bid will be treated as non-responsive.

21.7 If a bid is not substantially responsive to the Bidding Documents, it shall be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.

21.8 The Purchaser shall determine, to its satisfaction, whether all eligible Bidders, whose Bids have been determined to be substantially responsive to

the bidding document, meet the Qualification Criteria specified in ITB Clause 11.1.

21.9 **The bidders those who are technically qualified, technical demonstration of the goods (at any site under the jurisdiction of the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok or at O/o the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok) by the bidders is compulsory to verify the technical competency of the goods before opening of their financial bids, as per terms and conditions of the bid document. The information will be communicated by this office to the technically qualified bidders for their technical competency for demonstration of the goods. (It is applicable for a given type of goods and the same will be decided by the Purchaser)**

22. Notification of Result of Evaluation of Technical Parts

22.1 Only Bids that are both substantially responsive to the bidding document, and meet all Qualification Criteria shall qualify for opening of the Financial Parts of their Bids.

22.2 Evaluation of Technical Parts of Bid will be completed by the Purchaser, and a list will be drawn up of the qualified bidders whose Financial Part of Bids will be eligible for opening.

22.3 Purchaser shall notify, online, the summary of technical evaluation giving details of those Bidders who have failed to meet the Qualification Criteria and/or whose

Bids were considered non-responsive to the requirements in the bidding document, advising them as under:

(a) That their Technical Part of Bid failed to meet the requirements of the bidding document; and

(b) That their Financial Part of the Bid shall not be opened.

22.4 The result of evaluation of the Technical Parts of Bid shall also be made public on e-Procurement Portal.

22.5 The Purchaser shall notify in writing those Bidders whose Technical Parts of Bids have been evaluated as substantially responsive as under:

(a) their Bid has been evaluated as substantially responsive to the bidding document and met the Qualification Criteria;

(b) their Financial Part of Bid will be opened online; and

(c) notify them of the date and time of the online opening of the Financial Parts of the Bids

F. Public Opening and Evaluation of Financial Parts of Bids

23. Opening of Financial Parts of Bids

23.1 The financial bids shall be opened online on the CPP portal on the notified date. All the bidder's names, the Bid prices, the total amount of each bid, including any other details can be viewed online at the time of financial bid opening.

23.2 The electronic summary of the bid opening will be generated by online. The Purchaser will also prepare minutes of the Bid opening, including the information disclosed and upload the same for viewing online

24. Correction of Arithmetical Errors

24.1 The e-Procurement System automatically calculates the total amount from unit rates and quantities. The System also automatically populates the amount in words from the amount in figures and therefore there is no scope of discrepancy and need for arithmetic correction

25. Evaluation of Financial Parts of Bids

25.1 During the detailed evaluation of Financial Parts of Bid, the substantial responsiveness of the Bids will be further determined with respect to those bid conditions i.e. Bill of Quantities (BoQ). The Purchaser shall confirm that the following documents are in accordance with the requirements specified in the bidding document. If any of these documents or information is missing, the offer shall be rejected.

(a) Bill of Quantities (BoQ) in accordance with ITB Clauses 6, 8 & 9.
(b) 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;
(c) Cost of essential spares/consumables as specified in Technical specifications para 16.0, required for running & maintenance of all the equipments for two years; and
(d) Cost of Comprehensive Annual Maintenance Contract for all the equipment including replacement of defective material for next eight (8) years beyond warranty period of two years.

25.2 If a Bid is not substantially responsive, it will be rejected by the Purchaser, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation

26. Determination of Evaluated Bid prices

26.1 The Purchaser shall evaluate each Bid that has been determined, up to this stage, to be substantially responsive.

26.2 To evaluate a Bid, the Purchaser shall only use all the factors, methodologies and criteria defined in ITB Clause 26.3. No other criteria or methodology shall be permitted.

26.3 To evaluate a Bid, the Purchaser shall consider the following:

(a) Bids will be evaluated for the combined cost of all the items mentioned in BoQ and the Contract will be awarded to the lowest evaluated (L1) Bidder.

(b) Evaluated price shall be arrived up to Final Destination **(i.e. SID, CWC, Gangtok)** at by adding (i) price of Goods quoted EXW including GST (ii) other taxes, if any, payable on the Goods (iii) price for inland transportation, insurance, and other local services required to convey the Goods to their Final Destination and (iv) price for Related Services, if any.

27. Comparison of Bids

27.1 The Purchaser shall compare all substantially responsive bids evaluated in accordance with ITB Clause 26.3 to determine the lowest evaluated Bid.

28. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids

28.1 The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders.

G. Award of Contract

29. Award Criteria

29.1 The Purchaser shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

30. Purchaser's Right to Vary Quantities at Time of Award

30.1 At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified, Schedule of Requirements, provided the variation does not exceed **20%** and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Documents.

31. Notification of Award; Publication of Award & Recourse to unsuccessful Bidders

31.1 Prior to the expiration of the period of bid validity, the Purchaser shall issue **'Letter of Intent'** to notify the successful Bidder, in writing, that its Bid has been accepted. Thereafter on submission of Performance Security (as per ITB 33) by the successful bidder, the Purchaser shall issue **Work Order** enclosing therewith the Contract Agreement Form duly filled in for getting it signed by the selected Bidder. The Purchaser shall enclose with Notification of Award, the Contract Agreement Form duly filled in for getting it signed by the selected Bidder.

31.2 Until the formal Contract is prepared and executed, the notification of award shall constitute a binding Contract.

31.3 The Purchaser shall publish on its website.**https://eprocure.gov.in/ eprocure/ app** the results identifying the Bid and lot numbers and the

following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of Bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

31.4 Upon the successful Bidder's furnishing of the Performance Security in accordance with ITB Clause 33 and signing the Contract Agreement Form pursuant to ITB Clause 32, the Purchaser will promptly notify each unsuccessful Bidder through CPP portal.

32. Signing of Contract

32.1 The successful Bidder shall sign with date, the Contract Agreement Form sent by the Purchaser pursuant to ITB 31.1, and return it to the Purchaser within 15 days of the date of receipt of the Notification of Award.

33. Performance Security

33.1 Within **fifteen (15) days** of the receipt of Notification of Award from the Purchaser, the successful Bidder shall furnish the Performance Security in the form specified in Section 4 in favour of "**Executive Engineer, Sikkim Investigation Division, CWC, Gangtok"**. The bidders may see the name of the winning Bidder and the names of unsuccessful bidders on CPP Portal.

33.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the EMD/Bid Security in accordance with ITB 13.4.

34. Other Instructions

1. Not more than one E-Tender shall be submitted by one contactor or contractors having business relationship. Under no circumstance will father and his son(s) or other close relations who have business relationship with one another (i.e when one or more partner(s)/director(s) are common) be allowed to E-Tender for the same contract as separate competitors. A breach of this condition will render the E-Tenders of both parties liable to rejection.
2. E-Tenderer who has downloaded the E-Tender from Central Public Procurement Portal (CPPP) website https://eprocure.gov.in shall not tamper/modify the E-Tender in any manner. In case if the same is found to be tempered/modified in any manner, E-Tender will summarily be rejected and EMD would be forfeited.

CPWD-8

GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION

STATE	SIKKIM
ORGANISATION	TEESTA BASIN ORGANISATION
CIRCLE	INVESTIGATION CIRCLE
DIVISION	SIKKIM INVESTIGATION DIVISION

Tender & Contract for Works

Tender for the work of "**Supply, Installation, Testing, Commissioning and Maintenance of real-time data acquisition network at 9 Nos. Snow gauging & meteorological stations (SG&MS) in Sikkim**" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals including civil construction work, **with a comprehensive warranty of two years and Comprehensive Annual maintenance for eight years after the expiry of the warranty period**.

To be submitted up to 17.00 hours on 04.07.2020 to Executive Engineer, Sikkim Investigation Division, Gangtok, Sikkim.

To be opened online in presence of tenderer(s) or their authorized representatives who may be present at 11.00 hours on 07.07.2020

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 Executive Engineer, SID, CWC, Gangtok within the time specified in Schedule 'F', 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 opening thereof and not to make any modifications in its terms and conditions.

A sum of **Rs. 6,10,000/-** is hereby deposited online through NEFT/RTGS in bank Account of SID, CWC, Gangtok with transaction no……, as earnest money. If I/We, fail to commence the work specified, I/we agree that the said Executive Engineer, SID,

CWC, Gangtok or his successors in office shall without prejudice to any other right or remedy, 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, up to maximum of the percentage mentioned in Schedule 'F'.

I/we have already furnished security to the President of India in lieu of earnest money and have deposited with the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok a lump sum security of **Rs. 6,10,000/-** 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 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 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:

भारत सरकार
GOVT. OF INDIA
केन्द्रीय जल आयोग
CENTRAL WATER COMMISSION
सिक्किम अन्वेषण मंडल
SIKKIM INVESTIGATION DIVISION

CPWD-9 (Part -1)

BID AND CONTRACT FOR SUPPLY OF MATERIALS

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF SUPPLIERS

1. Bid Documents shall state the supplies to be made as well as the date & time for submitting and opening Bids, the time allowed for carrying out the work, the amount of the 'Performance Guarantee' to be deposited by the successful Bidder. The copy of complete bid documents and other details required in connection with the work, signed for the purpose of identification by the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok shall be open for inspection by the Bidders at the office of the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok on all working days between 10:00 hrs to 17:00 hrs (IST).

2. Any person/firm who submits a Bid shall fill up all the prescribed bidding schedules and rates. Bids, which propose alteration, in the works specified in the said form of invitation to Bid or in the time allowed for carrying out work or which contain any other condition of any sort shall be liable to rejection.

3. The Executive Engineer, Sikkim Investigation Division, CWC, Gangtok or his duly authorized representative shall open Bids in the presence of Bidders who may wish to be present at the time of opening. As bids are invited on two envelopes system, only Technical Bids shall be opened on the date & time prescribed in the bid documents. Financial Bids of only those bidders, who are found technically qualified based on evaluation of technical bids, shall be opened on date & time decided by the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok.

4. The Executive Engineer, Sikkim Investigation Division, CWC, Gangtok shall have the right to reject all or any of the Bids without assigning any reason and shall not be bound to accept the lowest Bid.

5. A pre–bid conference chaired by The Superintending Engineer, Investigation Circle, CWC, Gangtok shall be held at 11:00 hrs on 25.06.2020. in O/o Chief Engineer, Teesta and Bagirathi - Damodar Basin Organisation, GE-2, Sector – III, Salt Lake, Kolkata:700106 West Bengal. The representatives of the tenderer who have purchased the tender documents with a letter of authority shall be eligible to participate in the conference and take part in the discussions. All the queries and clarifications required by them shall be submitted in writing duly signed preferably prior to the convening of the meeting and in no case not after conclusion of the conference. Only written requests, which are found suitable for response from the Chairman of the pre bid conference, will be responded for the amendments/ clarifications issued by the purchaser after the pre-bid conference. All responses to the clarifications will be notified on the website in the form of amendment, if required. The clarifications issued shall be treated as amendments to the tender requirements and shall be annexed to

the tender. In this conference, the clarifications, if any, required by any prospective tenderer on the bidding documents would be discussed. If, for any reason, whether at its own initiative or in response to a clarification requested by the prospective tenderer, the purchaser modifies the bidding documents by an amendment, the same will be notified on the website https://eprocure.gov.in/eprocure/app after the pre-bid conference. The Tenderers have to confirm the same from the website before submitting their tenders.

6. The receipt of an accountant or clerk for any money paid by the Supplier shall not be considered as an acknowledgement of payment to the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok and the Supplier shall be responsible for ensuring that he produces a receipt signed by the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok or a duly authorized cashier.

7. All Packages of SG&MS Equipment received from successful bidder after award of work shall be opened only in the presence of supplier.

8. 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.

SCHEDULES

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

SCHEDULE 'B' - Not applicable

SCHEDULE 'C' - Not applicable

SCHEDULE 'D' - Additional Conditions of Contract and Technical specifications.

SCHEDULE 'E' - Not Applicable

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 9 nos Snow gauging & meteorological stations (SG&MS) in Sikkim" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals including civil construction work, **with a comprehensive warranty of two years and Comprehensive Annual maintenance for eight years after the expiry of the warranty period**

1.	Earnest money	Rs. 6,10,000/-
2.	Performance guarantee	5% of Contract value
3.	Security Deposit	5% of Contract value
	General Rules & Directions:	
4.	Officer inviting tender	Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok-737102. Phone No: 03592-231887, 271059 Fax No :03592-231887 Email: eesid-cwc@gov.in
	Definitions:	Additional definitions as per conditions of contract Clause 1
5.	Engineer-in-Charge	Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok-737102. Phone No: 03592-231887, 271059 Fax No :03592-231887 Email: eesid-cwc@gov.in
6.	Accepting Authority	Executive Engineer, SID, CWC, Gangtok
7.	Percentage on cost of materials and labour to cover all overheads and profits	Not Applicable
8.	Standard Schedule of Rates	Not Applicable
9.	Department	Central Water Commission
10.	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	15 Days
ii.	Maximum allowable extension beyond the period (provided in i)	15 days

	above		
	Clause 2		
	Authority for fixing Compensation under clause 2	Superintending Engineer, Investigation Circle, CWC, Gangtok.	
	Clause 2 A		
	Whether Clause 2 A is applicable		
	Clause 5		
	Number of days from date of issue of letter of acceptance for reckoning date of start	30 Days	
	Milestones		
	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 Not applicable	Not applicable	
	Clause 10 B(ii) Not applicable	Not applicable	
	Clause 10C(a) Not applicable	Not applicable	
	Clause 10 C(c) Not applicable	Not applicable	
	Clause 11		
	Specifications to be followed for execution of work	Enclosed Technical Specifications	
	Clause 12	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 clauses 18 & 19 of Special Conditions of contract.	
	Clause 16	As per clause 4.1 & 7.3 of Special Conditions of contract. The sub-standard work shall not be accepted	
	Clause 18	Not applicable	
	Clause 36		
	Minimum qualifications & experience required for Principal Technical Representative	For works with estimated cost put to tender more than	
		Rs. 10 Lakhs for civil work	Graduate or retired AE possessing at least recognized Diploma
		Rs.5 Lakhs for Elect/ Mech Works	
		For works with estimated cost put to tender More than Rs. 5 Lakhs but less than Rs.10 lakhs 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	Electronics & Telecommunications

		Representative should belong	
		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 Rs. 15,000/- per month for diploma holder	
	Clause 42	Not applicable	

SCOPE OF WORK

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

i. Supply, Installation, Testing, Commissioning including all civil, mechanical, electrical/electronic works of real - time data acquisition network at various stations under the Executive Engineer, Sikkim Investigation Division, CWC, Gangtok and also establishment of Satellite based telemetry and associated systems. (Refer Table 2)

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 and for operation of all the satellite transmission/ wireless equipment with necessary assistance from the purchaser for obtaining such clearances.

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

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

vi. Supply of mandatory spares (Refer Table-B).

vii. Training of the Department's personnel at the stations to be decided by the purchaser.

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 8 years beyond warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract.

x. Integration of the installed systems/remote sites with the VSAT Link at Modeling Center at SID, CWC Gangtok & 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 Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, New Delhi. The compatibility issues that would arise and their smooth resolution have to be assessed and ensured by the supplier. The tenderer is advised to check & ascertain compatibility issues that would arise in transmission of data to Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, New 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 modeling center through suitable integration with existing system, and ensure data communication. **The spectrum charges shall be bear by the tenderer.**

The compatibility with the existing ERS and modeling center is also a part of the present tender. However, it is clarified that the successful bidder shall be fully responsible for transmission of the data from ERS Delhi to Modeling Centers at SID, CWC Gangtok and FFM Dte., CWC, New Delhi, for all sites. The bidders are therefore advised to visit the ERS, existing modeling center, to ensure full compatibility of their data formats with the existing systems.

Functional description of Earth receiving Station (ERS)

One Number Earth Receiving station (ERS) has already been installed at New Delhi in the office premises of Executive Engineer (YBO), Kalindi Bhawan, B-5, Tara Cresent Road, Qutub Institutional Area, New Delhi-16. The ERS is working in TDMA model and receiving the data from various type of stations in the network and sending the same to respective modeling centers as configures by the users. The ERS computer will also be connected in a closed user group stabilized through a V-SAT network in CWC.

Functional Description of Modeling Centers

The Modeling Centers will receive hourly data on real time basis from the Earth Receiving Station (ERS) through VSAT, store all data on a server and shall be able to provide required data on demand for formulating flood forecast. It shall be able to transmit flood forecasts and other information formulated at Divisional and Sub - Divisional control rooms as per requirement. Modeling center are equipped with Flood forecasting software packages for formulation of the flood forecasts and the data file received shall be directly usable by the package.

The contractor shall integrate data received from remote sites with the software/RDBMS in the modeling centers for receipt of data in useful format in the center. All necessary software development and supply shall be provided by the contractor.

Custom computer applications will be required for the assembly of the data from the ERS into the database server located at the same center and assembly and transmission of the basin specific sub-set of data to the concerned Modeling Center Server through the VSAT link. The transmission frequency will match with a specified time lag between the collection of the data at the ground station and the transmission through the VSAT link. Bidder will have to provide appropriate computer software for the purpose at the ground station as well as the modeling center wherever required.

The data collected by the ERS from various DCUs will be decoded and stored in a database on the ERS server. The database structure shall be designed by the contractor in such a way that all the information received from any DCU, including error messages and alarms etc. is stored in the database at ERS. The collected data shall also be organized in separate files one each for every modeling center pertaining to every hour and shall be transmitted by VSAT based network to the concerned Modeling center server.

Another package operating at the modeling center server will store the received data in a local RDBMS and will also prepare a data file for the flood forecasting software implemented at the modeling center for issue of flood forecast.

The bidder will have to provide the data in a CSV file with a known layout and also integrate the same in a database located at the modeling center.

The contractor shall provide the necessary ORACLE latest version with 5 user license RDBMS package at the modeling center.

The software modules proposed shall be demonstrated for the desired performance to the entire satisfaction of the purchaser. For the purpose of

bidding, the contractor will submit a framework of the development that they want to undertake and include key screen shots of the forms and dialogs indicating the approach proposed.

All systems shall be free from errors caused by misinterpretation of any times and dates. All dates will use the Gregorian calendar.

The contractor shall supply a full interactive online help and tutorials for the package provided by them. In addition, a full documentation for maintenance of the software code shall also be provided.

It is clarified that the successful bidder shall be fully responsible for transmission of the data from ERS Delhi to Modeling Centers at SID, CWC Gangtok and FFM Dte. CWC, New Delhi for all sites under SID, CWC, Gangtok. The bidders are therefore advised to visit the ERS and Modeling Centers at SID, CWC Gangtok mentioned above, to ensure full compatibility of their data formats with the existing systems.

Integration of the installed systems/remote sites with the existing CWC ERS at Delhi duly addressing the compatibility issues, if any, with successful data transmission to the CWC modelling centre at Gangtok. The compatibility issues that would arise and their smooth resolution have to be assessed and ensured by the supplier. The tenderer is advised to check & ascertain compatibility issues that would arise in transmission of data to ERS, Delhi by checking its concerned specifications, at his own cost, before submitting the tender, to avoid any problem in this regard.

Setup of VSAT link between CWC ERS at Delhi and Modelling centre at Gangtok through SCPC connectivity along with SATELLITE bandwidth.

xi. In case of any conflict arising in interpretation of any para of NIT, the decision of the Executive Engineer, SID, CWC, Gangtok shall be final & binding.

MAP SHOWING TENTATIVE LOCATIONS OF SG&MS

SECTION 2 : SPECIAL CONDITIONS OF CONTRACT

Table of Clauses

1. Definitions
2. Application
3. Country of Origin
4. Standards
5. Use of Contract Documents and Information, Inspection and audit by the GOI
6. Patent Rights
7. Inspections and Tests
8. Packing
9. Transportation and delivery
10. Site Preparation and installation
11. Incidental Services
12. Spare parts
13. Warranty
14. Maintenance Service
15. Measurement
16. Payment
17. Prices
18. Change Orders
19. Contract Amendments
20. Assignments
21. Sub contracts
22. Delay in Contractor's Performance
23. Liquidated Damages
24. Termination for Default
25. Force Majeure
26. Termination for Insolvency
27. Termination for Convenience
28. Resolution of Disputes
29. Governing Language
30. Applicable Law
31. Notices

1. Definition:

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

"The Contract: means the agreement entered into between the Purchaser 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 Goods" means all of the equipment, machinery and / or other materials which the Contractors are required to supply to the Purchaser under the contract.

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

"The Purchaser/Purchaser/Department" means Central Water Commission through Executive Engineer, Sikkim Investigation Division and any other specifically designated Officers of Central Water Commission purchasing the Goods.

"The Tenderer/Bidder/Contractor" means the individual or firm supplying the Goods 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 i.e, O/o Executive Engineer, CWC, Gangtok.

"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, "Origin" 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 under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods' country of origin. 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 Purchaser's 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 Purchaser 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 Purchaser's 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 purchaser and shall be returned (all copies) to the purchaser on completion of the Contractor's performance under the contract if so required by the purchaser.

5.4 The contractor shall permit the authorized representative of the Purchaser to inspect the contractor's accounts and records relating to the performance of the contractor and to have them audited by auditors appointed by the Purchaser if so required by the Purchaser.

6. **Patent Rights**: The contractor shall indemnify the purchaser 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 the Purchaser's country.

7. **Inspections and tests**

7.1 The purchaser 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 purchaser. The technical specifications shall specify what inspections and tests the purchaser requires and where they are to be conducted. The purchaser 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 purchaser.

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 Good's 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 at no charge to the purchaser.

7.3 Should any inspected or tested Goods, fail to conform to the specifications, the purchaser 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 purchaser.

7.4 The purchaser's right to inspect, test and, where necessary, reject the goods after the goods' arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the purchaser 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 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 hardware and 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 purchaser reserves the rights to get the equipment replaced by the contractor at no extra cost to the purchaser.

7.7 Before the goods and equipment are taken over by the Purchaser, 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 Purchaser 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 Purchaser.

7.10 For the System software & other Software's, 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 purchaser 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 purchaser is satisfied with the working on the system, the acceptance certificate will be issued as under:

7.12 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 concerned AEE/AE/JE.

7.13 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 19.0 of technical specifications and hand over of component of spares for the organization to the designated representative of the Engineer-in-charge.

7.14 The training as specified in the Technical specifications for each hardware and software component installed shall be provided to the personnel designated by the Purchaser (15-20 nos.) 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 supply. The expenditure of training programme shall be borned by the supplier.

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 Purchaser.

8.3 Packing Instructions: The Contractor will be required to make separate packages for each Consignee. 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) Contractor's 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 Purchaser 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 Purchaser 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 Site 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 tools required for assembly and/or maintenance of the supplied Goods;

iv. Furnishing of detailed operations and maintenance manual for each appropriate unit of supplied Goods;

v. Performance or supervision or maintenance and/or repair/replacement of the supplied Goods, for a period of eight years beyond warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract;

vi. Software updates and bug fixing services for the software originally developed by the Contractor during the period of warranty and subsequent maintenance of eight years. For the third party software packages supplied the updates shall be provided during the warranty period.

vii. 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 purchaser.

viii. 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 - stock supply of consumables and spares in the country. Contractors shall ensure the availability of after sales service for a period of at least fifteen years including warranty period.

13. Warranty

13.1 The Contractor warrants that the Goods supplied 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 and all civil works undertaken under this Contract shall have no defect, arising from design, materials, or workmanship (except when the design and / or material is required by the Purchaser's specifications) or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods 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 signing of the Complete Acceptance Certificate after successful completion of the Completion Acceptance Test. 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 purchaser shall promptly notify the contractor in writing of any claims arising under this warranty.

13.4 The purchaser 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.

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 modelling center at SID, CWC Gangtok, routed through the existing CWC's ERS at Delhi 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 contractors 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 or parts thereof, without cost to the Department within 96 hours.

13.7 A remote site shall be treated as faulty if it fails to respond or 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 12 hours in excess of the maintenance time schedule of 96 hours. The contractor is liable to pay penalty @ Rs. 2000/- per Day/ remote site. The Day for the purpose of

penalty shall be taken as failure period of 24 hours or part thereof for a particular remote site.

13.8 The Contractor shall, at his own cost, carry out repair of the defective equipment or parts thereof, to the satisfaction of the Purchaser 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 Purchaser.

13.9 If the Contractor fails to replenish the spares or return the equipment after satisfactory repairs within 90 days from date of complaint made, this will be considered as failure of a remote stations and @ Rs. 5000/- per Day/ item shall be applicable.

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

13.11 If the Contractor fails to rectify the defects or fails to return the equipment after satisfactory repair within the permitted time frame, he shall be liable to pay the penalty at the rates indicated in clauses 13.7 to 13.9 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 / return of the equipment after satisfactory repair.

13.12 The amount of penalty as indicated in the above clauses will be subject to maximum 10% of the tendered amount. The amount of penalty will be recovered from balance 10% amount withheld [clause 16 (ii) (d)]/Security Deposit/ Performance Guarantee during warranty. The Department may also proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Department may have against the Contractor under the Contract.

13.13 The authority to review the penalty shall be Superintending Engineer, Investigation Circle, CWC, Gangtok.

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 warranty. After warranty period, Comprehensive 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 96 months will be done by the contractor on quarterly blocks basis.

14.2 Contractor shall set up a site office at Gangtok equipped with all requisite infra structural facilities at his own cost and notify its office and residential addresses to the Executive Engineer, to handle the complaints 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 Gangtok. He should have sufficient experience of working upon and troubleshooting with the equipment installed.

14.4 The Comprehensive Annual maintenance charges shall be quoted for a block of two consecutive years for the entire period of eight years following warranty period of two years.

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

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

14.7 If during operation, the real minimum time between failures (MTBF) of any piece of equipment or component thereof does not prove to be more than 90% (ninety percent) of the specified MTBF, the contractor shall replace the unit component with another of at least the same performance quality at no cost to the purchaser.

14.8 It is expected that the average downtime of an item will be less than half of the maximum downtime (i.e. defined as number of days for which an item of equipment is not usable because of inability of the contractor to repair it). The maximum downtime for any item is taken as 30 days. In case an item is not usable beyond the stipulated maximum downtime the contractor will be required to arrange for an immediate replacement of the same till it is repaired. Failure to arrange for the immediate repair/ replacement will be liable for penalty of Rs. 2000/- per day per item which shall be recovered from the security deposit/performance guarantee. The maintenance Services shall be governed by the "Additional conditions of contract during maintenance period" enclosed at Annexure –I"

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

14.9.1 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.

14.9.2 That the Hardware and Software shall manage and manipulate 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.

15. Measurement

15.1 The measurements shall be carried out as per procedure.

15.2 Engineer-in charge shall designate a 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, equipments, 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 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 centre 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 for releasing the payments against such measurements as per Stages provided in the payment clause.

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/draft in favour of the Contractor drawn on State Bank of India, Gangtok.

16.2 Payment shall be made for Goods and services excluding CMAC.

16.3 Twenty (20) % of the Contract value excluding CMAC charges on receipt of Goods.

16.4 Forty (40) % of the Contract value excluding CMAC charges shall be paid after the completion of the installation including civil works at site.

16.5 Twenty (20%) of the Contract value excluding CMAC charges shall be paid after integration with existing VSAT at Gangtok and successful link between sites, ERS Delhi and existing VSAT at Gangtok.

16.6 Ten (10) % of the Contract value excluding CMAC charges shall be paid after one snow season (October to March).

16.7 The remaining Ten (10) % of the Contract value excluding CMAC charges shall be released after the completion of warranty period.

16.8 Payments for Comprehensive Annual maintenance services and service tax at the prevailing rates as agreed shall be paid in equal quarterly instalments and after successful maintenance of the system during the quarter. Payment for the training, if any, conducted successfully during the quarter, shall be paid proportionately at the end of the quarter in which the trainings taken place.

16.9 Deductions from the bill:

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

16.9.2 The Income tax as applicable shall be deducted at source from the bill.

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

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

16.9.5 The contractor shall have to produce copy of deposited VAT/Sales tax and Entry tax as applicable for materials supplied along with self declaration in this regard before release of the payment by the department.

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) + CMAC period (8 years). Prices quoted shall be inclusive of all taxes and duties levied at the country of origin or in India.

18. Change Orders

The Purchaser 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 Purchaser;

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 contractor's 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 Contractor's receipt of the Purchaser's 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 Purchaser's prior written consent.

21. Sub-contracts

21.1 The Contractor shall notify the Purchaser in writing of all sub-contracts awarded under this contract if not already specified in the tender. Such notifications, in the original tender or later, shall not relieve the contractor from any liability or obligation under the contract.

21.2 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 and performance of Services shall be made by the Contractor in accordance with the time schedule prescribed by the Purchaser in the Schedule of Requirements.

22.2 If at any time during performance of the Contract, the Contractor or its subcontractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Contractor shall promptly notify the purchaser in writing of the fact of the delay, it's likely duration and its cause(s) As soon as practicable after receipt of the Contractor's notice, the purchaser shall evaluate the situation and may at its discretion extend the Contractor's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of the Contract.

22.3 Except as provided under Clause 25, a delay by the Contractor in the performance of its delivery 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 any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the purchaser 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 or unperformed Services for each week or part thereof delay until actual delivery or performance, up to a maximum deduction of the percentage specified . Once the maximum is reached, the purchaser may consider termination of the Contract pursuant to Clause 24. The applicable rate is 1.5% per month and the Maximum deduction is 10% of the contract price.

24. Termination for Default

24.1 The Purchaser, 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 any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser 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 Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause:

"Corrupt practice" 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.

"Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, 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 Purchaser of the benefits of free and open competition.

24.2 In the event the Purchaser terminates the Contract in whole or in part, pursuant to Clause 24.1, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or services similar to those undelivered and the contractor shall be liable to the Purchaser for any excess costs for such similar Goods 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 it's 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, "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable. Such events may include but are not restricted to, acts of the Purchaser 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 Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser 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.

26. Termination for Insolvency

The Purchaser 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 Purchaser.

27. Termination for Convenience:

27.1 The Purchaser, 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 Purchaser's 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 Contractor's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser 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 purchaser 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 Purchaser 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 "**Arbitration and laws etc**." of the General Conditions of the contract for 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 to the quality of the workmanship or materials used on the supply or arising out of the terms & conditions of the contract whether during the progress of the supply or after the completion or abandonment thereof, at to the sole arbitration of the person nominated and appointed by the Chief Engineer, T&BDBO, CWC, Kolkata in respect of the contracts entered for and on behalf of the President of India. The parties of the contract agree there 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, Chief Engineer, T&BDBO, CWC, Kolkata 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 Chief Engineer, T&BDBO, CWC, Kolkata 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 Purchaser'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.

Annexure-I

ADDITIONAL CONDITIONS OF CONTRACT DURING MAINTENANCE PERIOD (CMAC)

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 equipments / 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 and maintenance of telemetry system.

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

c) Contractor shall provide services of a original manufacture certified engineer having Diploma/Degree in Electronics & Telecommunications, at Gangtok. He should have sufficient experience of working upon and troubleshooting with the equipment installed.

d) Purchaser 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.

e) Contractor shall provide maintenance services to the Purchaser at Data Acquisition Sites (DAS) and correct the defect(s) reported by the Purchaser, within a period of 96 hrs 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 ERS at Delhi 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 Purchaser. Such designated locations will be mutually agreed at the time of commencement of work.

g) The Contractor shall, at his own cost, carry out repair of the defective equipment or parts thereof, to the satisfaction of the Purchaser 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 Purchaser.

2. PENALTY CLAUSE:

Upon receipt of notification of defect in the system from Purchaser, 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 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 12 hours in excess of the maintenance time schedule of 96 hours. The contractor is liable to pay penalty @ Rs. 2000/- per Day/ remote site. The Day for the purpose of penalty shall be taken as failure period of 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 CWC's ERS at Delhi and satisfactory receipt of data at the CWC's existing modelling centre at Gangtok. If still no data is received at CWC's existing modeling centre at Gangtok through the CWC's existing ERS at Delhi, it will be treated as "'fail" and if such a failure continues for more than 48 hours , the contractor is liable to pay a penalty as specified above. However, non-receipt of data at the existing CWC's ERS at Delhi due to any other failure not attributed to the installed remote stations or for any other reason beyond the control of the contractor, the penalty shall not be imposed.

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 replenish the spares or return the equipment after satisfactory repairs within 30 days from date of complaint made, this will be considered as failure of Remote Stations and a penalty @ Rs. 2000/- per day per item shall be applicable. The maximum penalty in a year, on this account, shall be limited to the 50% of the value of maintenance contract for corresponding year.

d) If the Contractor fails to rectify the defects or fails to return the equipment after satisfactory repair within the permitted time frame, he shall be liable to pay the penalty at the rates indicated in clauses 2.1, 2.2 and 2.3 above 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 / return of the equipment after satisfactory repair.

e) The authority to impose the penalty is the Executive Engineer, and the authority to review the penalty is the Superintending Engineer, Investigation Circle, CWC, Gangtok.

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

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 shall be paid quarterly, on satisfactory performance of maintenance services.

c) The payment shall be made by Account payee cheque/draft only in Indian Rupees.

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 Purchaser'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 contractors end. He will also arrange for the security

clearance, wherever required in advance to ensure that contractor's engineers get the access to site immediately.

c) Spares/Equipment

The mandatory as well as recommended spares/equipment available with the Department for maintenance as per list given in Table – B, shall be given free access to contractor to be used as standby. Excluding the above mentioned spares/equipment maintained by the Department any import/purchase of any of such components as required during the maintenance, the same shall also 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. Non-returning of the defective spares/equipment after due repair within 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 and including DCP Batteries, Batteries of UPS, cables, tubes, silica gel connectors and other similar items.

e) Periodical routine services

Periodical routine services shall be provided by the Contractor on quarterly basis in addition to pre-snow season and post-snow season services.

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

iv. 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.

SCHEDULE OF QUANTITIES

TABLE 1

<table>
<tr><th>Sl. No.</th><th>Name of Item (in more detailed form given in uploaded BoQ)</th><th>Total in numbers</th></tr>
<tr><td>1.</td><td>Establishment of Remote Station Type SG&MS - E Type
(<u>Rainfall,</u> Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC's existing ERS at Delhi to Modelling Centre, Gangtok complete in all respects.</td><td>4</td></tr>
<tr><td>2.</td><td>Establishment of Remote Station Type SG&MS - E Type
(Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC existing ERS at Delhi to Modelling Centre, Gangtok complete in all respects.</td><td>5</td></tr>
<tr><td>3.</td><td>Comprehensive annual maintenance charges including replacement of material & consumables for 8 years after warranty period of 2 years along with data transmission from remote site to CWC's existing ERS at Delhi to Modelling Centre, CWC, Gangtok complete in all respects. (S. No. 1 to 2)</td><td>8 Years</td></tr>
<tr><td>4.</td><td>Spare Parts
<table><tr><td>1.</td><td>Data recorder</td><td>1</td></tr><tr><td>2.</td><td>INSAT Transmitter</td><td>2</td></tr><tr><td>3.</td><td>Satellite Antenna</td><td>2</td></tr><tr><td>4.</td><td>Solar Panel assembly</td><td>2</td></tr><tr><td>5.</td><td>Mother Board for DCU</td><td>1</td></tr><tr><td>6.</td><td>Sensors for each parameter of Snow precipitation, rainfall, snow depth, snow density/ snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)</td><td>1</td></tr></table></td><td>1 set</td></tr>
<tr><td>5.</td><td>5 Trainings each in three modules (both for remote station and Modeling Centre) for officers & staff over a period of 10 years</td><td>1</td></tr>
</table>

TABLE 2
Details of Remote Stations

Sl. No.	Station Name	District/State	Station Type	Tentative location	
				Latitude	Longitude
1.	Kupup	**East Sikkim/Sikkim**	SG&M with RF	27.34194444	88.8417
2.	Nathang	**East Sikkim/Sikkim**	SG&M	27.29944444	88.8328
3.	Sarathang	**East Sikkim/Sikkim**	SG&M	27.37830556	88.8032
4.	17 Mile Katao	**North Sikkim/Sikkim**	SG&M with RF	27.67753333	88.7882
5.	Dambong	**North Sikkim/Sikkim**	SG&M	27.74607	88.7785
6.	Gurudongmar lake	**North Sikkim/Sikkim**	SG&M with RF	28.02575556	88.7097
7.	Thangu	**North Sikkim/Sikkim**	SG&M	27.90535	88.5281
8.	Yumesamdong	**North Sikkim/Sikkim**	SG&M with RF	27.91165556	88.7121
9.	Yumthang Valley	**North Sikkim/Sikkim**	SG&M	27.85136667	88.6931

TECHNICAL SPECIFICATIONS

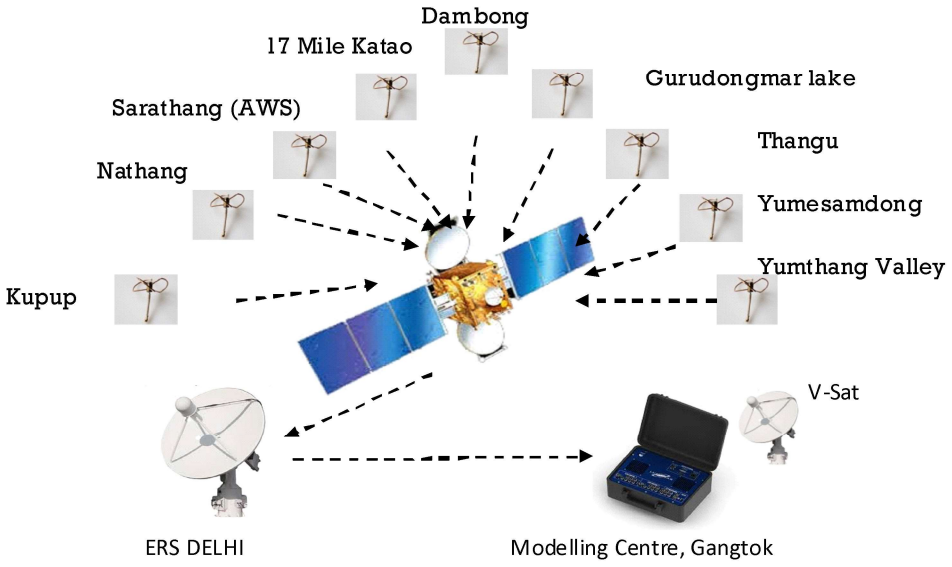
1. GENERAL

The Technical Specification covers the Contract for the installation of telemetry system in different sites in Sikkim 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 INSAT systems, instrumentation and associated Data Collection Units (DCU's). This shall include the design, manufacture, factory testing, delivery to site, installation (including the associated interface wiring/termination), commissioning and site acceptance testing, supply of mandatory spares, training and documentation. DCU's, Monitoring system hardware / software shall interface and be fully integrated and tested with the existing CWC's Earth Receiving Station (ERS) at 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 CWC's ERS at Delhi or ERS at any other location on a regular interval of 60 minutes (data will be measured every 15 minutes for snow sensor and every 20 minutes for other sensors and would be telemetered once in every hour). The ERS shall collect the field data so transmitted by the remote stations (snow-hydro-meteorological data), store it and then pass the data to Modelling Centre, Gangtok & FFM Directorate, CWC, New Delhi for flood forecast/snowmelt runoff forecast formulation and long term data storage. The remote station shall hold the data at least for 180 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 CWC's Modelling Centre at Gangtok & FFM Directorate, CWC, New Delhi through the existing CWC's ERS at Delhi or ERS at any other location on a continuous basis even in extreme weather conditions.

Existing VSAT link between Modelling Centre, CWC, Gangtok and CWC's ERS at Delhi or ERS at any other location is to be used by the supplier (if required a separate VSAT link is to be arranged by the supplier for the same).



2.1 Classification of Remote Stations

Remote stations are to be established throughout Teesta Basin

Sl. No.	Type of Station	Sensors (including satellite data transmitters)
1	SG&MS– E Type	Rainfall and/or Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments(AWS).

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 or ERS at any other location.

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

2.2 Functional Description of Remote Stations

2.2.1 Snow Depth and Precipitation (SG&M)

These stations will measure the snow depth and snow precipitation / rainfall, snow density / snow water equivalent as well as other meteorological parameters such as relative humidity, ambient air temperature, solar radiation (pyranometer), sunshine, wind speed, wind direction and evaporation.

3. EQUIPMENT ARRANGEMENT AT SNOW FALL / SNOW DEPTH AND ALL WEATHER REMOTE STATIONS (TYPE SG&M)

Remote station shall be equipped with all necessary equipment to measure Snow precipitation / rainfall, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, Sunshine and Wind Instruments (AWS), including tubing 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

- Mast (tripod) to mount DCU at the site (alternatively, where walled enclosures available, the same can be mounted on the wall).
- Mast (tripod) for solar panel & INSAT antenna. Mast can be shared with the DCU mast also.
- Conduit for Snow gauge
- Civil works for mast and Snow gauge
- Wire-mesh fencing and gate with lock

- Mounting stand for Snow gauge will be mounted at WMO Specification 0.8 to1m above ground.
- Antenna cables.
- Power cables.
- Grounding and lightning protection

All necessary hardware required for the system to operate properly.

In addition, the following shall be provided.

Appropriate mast (tripod) for mounting the sunshine, wind speed and wind direction, snow sensors etc. The mast should be capable of withstanding cyclonic wind speeds and sustaining weight of snow without any damage or shifting of mounting of the instruments.

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 DCU's and the DCU's 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 supplier proposes to deviate from the specifications a full technical justification shall be provided. The Purchaser is not bound to accept such justification.

4.1.3 It shall be the Suppliers 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 DCU's 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 purchaser 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 purchaser.

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 – in – charge before commencement of work and any changes suggested by the Engineer – in – 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 equipment 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 CMAC.

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 Aluminium Ladders of good quality also have to be provided.

4.2 Rainfall Measurements

i. Rainfall shall be measured using the tipping bucket method 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 noncorrosive (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 moulded 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. IMD certification required

4.2.1 Tipping bucket Rain gauge specification

Base material	:	Durable and rigid of cast metal, moulded thermoplastic, FRP or Equivalent. Conforming to WMO standards
Collector material	:	Durable and rigid of thick metal, FRP or Equivalent. Galvanized iron sheet is not permitted
Rim material	:	Gun metal / brass or equivalent
Collecting funnel	:	200 mm internal diameter
Bucket size	:	0.5 mm equivalent rainfall
Depth from rim	:	< 175 mm
Weight	:	> 75 N
Range	:	0 – 100 mm
Resolution	:	0.5 mm
Accuracy	:	+2% of reading
Rainfall intensity	:	Up to 1023 mm/hr

Tip detector	:	Reed switch
Output	:	Pulsed output to DCU

4.3 Snow Measurements

4.3.1 Ultra Sonic Snow Depth

Sonic Ranger 50 KHz Module with connector, wire cable, mounting system, Transducer maintenance kit & mounting arm

a) Temperature Range : -50^0C to $+50^0$C or better
b) Accuracy : 0.25% of the range
c) Resolution : 1.3 mm

4.3.2 High Precipitation Snow Gauge

This unit should provide the amount of snow precipitation. It should be rugged enough against Snow Bridge and should have no heating assembly.

a) Capacity : Up to 75 cm
b) Glycometh solution 60% Methanol and 40% Ethylene Glycol : 12 Gallons
c) Teflon Tapes for sealing : 02 with each
d) Plastic tapes for sealing : 02 with each
e) Accuracy : 0.5% full scale from -40^0 C to + 50^0C
f) Sensitivity : 0.5 mm of precipitation
i) Protection : Built in for overflow
j) Output Connector : Compatible with the system

4.3.3 Snow Density/ Snow Water Equivalent

The sensor shall be capable of measuring snow density of the fresh snow precipitated and snow water equivalent also

- The instrument shall be according to appropriate standards set by WMO, ISO or ISI equivalent
- Supplier shall clearly specify the standard adopted
- The sensors shall be unaffected by condensation and should be resistant to airborne pollution

All the instruments & sensors should work properly in the range -40^0 C to + 50^0 C

4.4 Meteorological Parameters (AWS)

4.4.1 Air Temperature

The instrument shall provide electrical output signal proportional to the ambient air temperature. All parts shall be made of corrosion resistant material. It shall be unaffected by condensation and should be resilient to air borne pollution. The instrument shall be according appropriate standards set by WMO, ISO or BIS equivalent. Supplier shall clearly specify the standard adopted.

Sensor type : Platinum resistance or better or equivalent
Operational Range : -5^0 C to + 60^0C

Accuracy	: Within ± 0.1^0 Celsius in the entire working range
Resolution	: 0.1^0C
Response time	: 10 Seconds or lesser
Self aspirated	: To ensure continuous supply of air free from turbulence, water droplets and Radiation
Accessories	: All accessories for mounting the instrument e.g. special cross arm clamps or flag, if any, shall be provided.

The sensor shall be unaffected by condensation and should be resistant to airborne pollution.

4.4.2 Relative Humidity

Range	: 0 – 100% RH
Accuracy	: +3% or better
Resolution	: 1%
Sensor type	: Capacitive/ solid state
Response time	: 10 Seconds or lesser

4.4.3 Wind Speed and Direction

Wind Speed sensor with speed recording instrument shall provide electrical output proportion at the relative incident wind. All parts shall be made of corrosion resistant material. The instrument shall be according to appropriate standards set by WMO, ISO or BIS equivalent. Supplier shall clearly specify the standard adopted.

Wind direction sensor with recording equipment shall provide electrical output proportional to the direction of flow. True north direction shall be considered as reference direction. All parts shall be made of corrosion resistant material. The instrument shall be according to appropriate standards set by WMO, ISO or BIS equivalent.

Sensor Type	: Ultrasonic (no moving part)
Range	: 0-60 m/s for speed & 0-360 degrees for direction or better
Accuracy	: Better than 1% full scale
Resolution	: 0.1 m/s for speed and +5 degree for direction
Response time	: Less than 1 second lag in operating range
Threshold	: Less than 1 m / sec.
Averaging	: To be introduced in DCU customizable by user
Mounting	: All accessories for mounting the instrument e.g. special cross arm clamps or flag if any shall be provided.

4.4.4 Solar Radiation

The recorder is required to measure global solar radiation. The sensor made up of multi-junction copper thermopile. The instrument must be temperature compensated. Fitter domes should be replaceable for different transparency wave length range. The

instrument shall be installed for best performance. The sun shine recorder and cards shall comply with IS7243-1974/WMO standards.

Threshold	: 120 W/m_2 of direct solar irradiance
Sensor	: Photo sensor/pyro-electric sensor
Methodology	: Alternate shading of sensor to account for sky radiation
Resolution	: 1s of an hour
Spectrum range	: 400nm to 1100 nm
Response time	: 100 μs
Stability	: Better than 2% over a year period
Temperature dependence	: Better than ± 2% in the ambient range
Error due to changing	: Less than ± 3% declination
Output	: High for Sunshine (5 V)
	Low for No Sunshine (0 V)

4.4.5 EVAPORATION

The evaporation gauge sensor shall measure the evaporation rate from the surface and transmit the data. The instrument shall be properly encased to ensure uninterrupted working in exposed weather conditions. The material shall be of durable nature, properly machined and finished. The evaporimeter should be exposed to atmosphere as per specification/ standards set by WMO/ ISO,/BIS equivalent etc. The pan shall comply with IS: 5973-1970.

Pan Specification:

Operating temperature	: -5 to 60 degree Celsius.
Diameter of the pan	: 1.2 m or more.
Accuracy	: +/- 1%
Accessories	: As required for complete installation of the sensors and Equipment
Measuring Cylinder	
Material	: Clean cast seamless acrylic plastic tubing or brass sheet.
Platform	: Rot resistant timber treated with creosote or other Effective Wood preservative.
Graduation	: In milliimetre.

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. In-depth details of TDMA technique will be provided during the Design Review Committee Meeting which will be held with the successful bidder.

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. At least four additional analog and digital channels each, extra RS-232, RS-485 and SDI -12 channels must be available to interface other types of sensors. The type and the number of extra channels provided in the data logger must be specified.

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 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.

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. In addition, the DCU shall support the manual entry of data through keypad and its display.

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 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 moulded fiber glass reinforced material, resist corrosion, seamless foam-in-place gasket, detachable mounting feet, moulded 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 DCU shall be located in a place specified by the Purchaser at each site and shall be generally one meter above Highest Flood Level (HFL) attained at that site. The DCU at each site shall be located in such a way it is easily approachable even in floods.

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

5.1.25 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.

5.1.26 Numerical Specifications:

I.	Slots / Ports	: PCMCIA and USB (preferable)
II.	Data Memory	: 4 MB minimum
III.	Operating Temperature	: -10^0 C to $+60^0$ C
IV.	Power Consumption	: < 2 mA quiescent
V.	Analog inputs : 4 to 20 mA	: 100% over-range withstand
VI.	Analog to digital converter	
	Resolution	: 16 bit or better
	Conversion Accuracy	: ± 1 LSB
VII.	System clock	
	Stability Long-term	: 1 ppm/year or better
	Stability (Temperature)	: 3 ppm or better from -40°C to 55°C
VIII.	Battery Backup (internal)	: Lithium Battery, storage: 2 years
IX.	Real-Time Clock	: GPS synchronized
X.	Watchdog Timer	: System Reset upon microprocessor failure
XI.	Sample Intervals	: 1 sec. to 24 hr. in 1 second increments (user selectable)
XII.	Keypad	: 1 no.

XIII.	Visual display	: 16 Character X 2 lines or more, alphanumeric LED/LCD to operate in temp. range -10°C to +55°C
XIV.	Power consumption	: Average over an hour shall be less than 0.5 A at 12V D.C. including that of sensors, GPS and transmitter.
XV.	Power Supply :	
	Battery	: Single 12V chargeable maintenance-free battery 65 AH capacity
	Charge controller	: Internal or External

5.2 DCU Transmitter & Antenna

The system transmitter should be an internal component of DCU. It should have necessary hardware and software to receive data from the data logger and transmit in TDMA mode as mentioned in para 5.3 The transmitter should have the capability to handle data transmission to the DRTs located on any of the INSAT series of satellites as given under para 5.4 The selection of frequency and mode of transmission shall be through software settings only. No hardware changes for switching from one satellite DRT to another are desirable.

5.2.1 Transmitter features

i.	Carrier Frequency Band	: 402.0 MHz - 403.0 MHz Carrier frequency 402.658 MHz
ii.	Carrier Settability	: In steps of 100 Hz from 402.0 MHz to 403.0MHz
iii.	Modulator	: PCM/BPSK
iv.	Data bit rate	: 4.8 KBPS (User selectable)
v.	Data coding	: NRZ(L)
vi.	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	: ± 1ppm or better (-40^{0}C to +55^{0}C)
vii.	Signal Bandwidth	: 6.0 KHz maximum or better1
viii.	Output Power	: 3-10 W (settable)
ix.	Power Stability	: ±1 dB
x.	Spurious	: -60 dB or better
xi.	Harmonics	: -40 dB or better
xii.	Environmental Operating Temperature	: -40°C to +55°C
xiii.	Environmental Relative Humidity	: 0 to 100% RH for outdoor equipments
xiv.	Operating power	: Switched 12V D.C controlled by data logger.

5.2.2 Antenna features

i. The bidder shall ensure compatibility of the antenna in the entire system and also ensure achievement of objectives given in the telemetry link calculations to be provided by the bidder.

ii. The antenna should not allow accumulation of rain water, there by degrading its performance.

iii. The antenna shall have a proper mounting and pointing arrangement suitable for transmission to any one of INSAT satellites based DRTs (located anywhere in the geostationary arc from 45^0 E to 115^0 E longitude). The bidder shall also provide suitable templates and fixtures/tools for reorienting of the antenna towards any satellite by the field personnel as and when required.

iv. Proper lightning and surge protection shall be provided to protect all the equipment connected to the antenna from atmospheric hazards. This arrangement shall be in addition to the general arrangement already covered under general scope of the work.

v. Antenna to be designed with an optimum size so that it could be easily transported to remote and inaccessible places. Mounting of antenna should take care of Azimuth and Elevation changes. Systems have to operate in harsh and saline conditions and adaptable to tropical conditions.

vi. The following technical features shall be supplied by the bidder in addition to the technical information being provided by him as part of the bid.

a.	Polarization	: LHCP and RHCP (Switchable in field)
b.	Gain	: Minimum 11 dBi or better
c.	Center frequency	: 402.50 MHz
d.	3dB Beam width	: 40^0
e.	VSWR	: 1.2 : 1
f.	Impedance	: 50 ohms
g.	Axial Ratio	: To be specified by bidder
h.	Operating wind speed	: 250 kmph
i.	Wind Survival	: 300 kmph
j.	Material	: Rust-proof and oxidation-proof for use in coastal and saline areas
k.	Connector type	: To be specified by bidder
l.	Mounting	: Should have engraved elevation angle marking
m.	Operating temperature	: -40°C to +55°C
n.	Operating Relative Humidity	: 0 to 100% RH
o.	Weight	: Light weight
p.	Size	: Small, portable
q.	Operating rain rate	: 100 mm/hr and water proof

5.2.3 Certification

Transmitter and data logger must have certification from IMD for functional operation through INSAT/Kalpana satellites for either TDMA or PRBS (Pseudo Random Burst Sequence) type of transmission technique.

5.3 Time Division Multiple Access (TDMA) Scheme

Each TDMA type of transmitting system shall have a unique GPS synchronized time of transmission which must be stamped on the body of the system by the manufacturer. The burst data format is shown in Fig (1). However, CRC is added to the data frame and half rate convolution coded. It is then appended with CR & BTR preamble and UW and transmitted in TDMA mode. Burst duration is 186 milli sec.

The TDMA frame format is shown in Fig (2). TDMA technique is an open loop system with timing derived from GPS receiver which is part of AWS. TDMA frame duration is one hour. The one hour frame is divided into 6 time windows, each of 10 minute duration. Each AWS is assigned 1 second time slot in any of the 10 minute slot and the repeat transmission is after 10 minutes, which falls in the next time slot.

The one second frame is worked out taking into account the following details:

- 20 millisecond differential propagation delay over coverage area.
- RTC clock accuracy around 1 millisecond per day
- GPS receiver updates RTC once every twenty four hours to conserve battery power of AWS.
- GPS receiver accuracy of less than 1 microsecond
- Guard time required in the present burst receiver at Hub station.

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 AWS 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** $\mathbf{X^{16}+X^{12}+X^5+1}$
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.

5.	RF DATA ENCODING	Differential coding (NRZ-L) is done for the entire burst (Preamble and the convolution coded bits) before RF modulation.

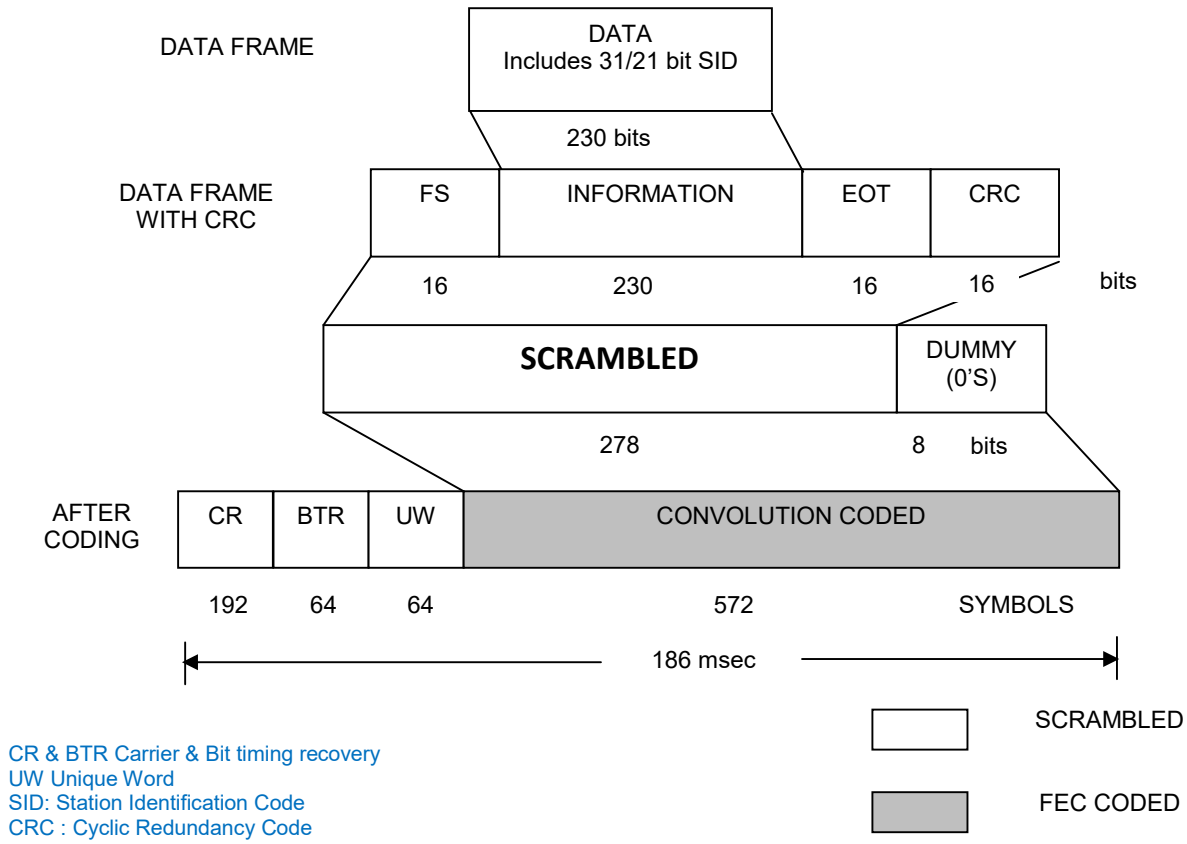


Fig. : TDMA Transmission Frame Format

Fig. 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.

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

5.4 INSAT DRT Specifications

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

SATELL ITE	**KALPANA-1 74₀ E**	**INSAT-3A 83₀E**	**INSAT-3D 82₀E**

SATELL ITE	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.EI RP	24dB W peak	24dB W peak	24dB W peak
C-BAND EIRP for RECEIVE FLUX DENSITY	2.0dBW for – 146 dB W/m^2	2.0dBW for – 146 dB W/m^2	2.0dBW for – 146 dB W/m^2
REC.POLARISATION	RHCP	LHCP	LHCP
TRANSMIT POLARISATION	LINEAR	LINEAR	LINEAR
FREQ.TRANSLATION ERROR	±40Khz over life ±6Khz over 1 month	±40Khz over life ±6Khz over 1 month	±40Khz over life ±6Khz over 1 month

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

5.5 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	4	0100(:4)	Wind speed in knots (3 minute vector averaging prior to full hour UTC).
3	5	0101(:5)	Wind direction in degrees (3 minute vector averaging prior to full hour UTC).
4	7	0111(:7)	Instantaneous value of RH at the end of every full hour UTC.
5	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.)
6	Cal1	:C1	Battery voltage (volts)
7	Cal2	:C2	Hourly rainfall (rounded off to next higher integer)

5.6 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.

5.7 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 metre 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

6.4 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 – 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 – mounted arrangement including a standard pole and necessary foundation and fixing arrangements.

The location of solar power installation shall be indicated by the concerned engineer– in –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 reconnections.

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

6.5 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 – 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. SPECIFICATIONS OF EXISTING EARTH RECEIVING STATION EQUIPMENT

All components of the earth receiving station should be compatible with TDMA transmission techniques. Accordingly equipment required for reception and processing the data may be provided. The whole system shall have complete redundancy.

Detailed specifications of the equipment required like down converter, demodulator, processing software will be discussed at the time of Design Review Meeting with the successful bidder.

A general overview of the ERS is given below:

7.1 General Features

Earth Receiving Station Antenna size	:	3.8 meters or lesser diameter.
LNA Frequency range	:	4500 – 4800 MHz
Synthesized Down Converter	:	As per SFC4200AC-Band Synthesized Frequency Down converter.
Features of Digital Receiver / BPSK Demodulator	:	As per PSM-500 IF Satellite Modem.

8 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 dB W
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	Boltzmann's Constant	-228.6 dB W / °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	Boltzmann's constant	-228.6 dB W / °K/Hz
23	C/No uplink	45 dB
24	AWS EIRP	12.4 dB W
25	AWS Transmit power	1.4 dB W 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 dB W min.
32	Transmission duration	186 m sec
33	Transmit power	5 W (Max.)
34	Antenna gain	11.0 dB (min)
35	Antenna polarisation	Left / Right hand circular polarization (field selectable)

9.0 Civil Works for Housing DCU and Associated Instrumentation

All civil and accommodation works shall be provided including safe, secure (as required at each location), weatherproof enclosures for equipment (NEMA IV enclosure), bases and foundations, all fixings and supports (above and below river water level) (all fixings to be non- corrodible), the masts shall be of at least 9.0 mts, suitable animal proof security fencing and lockable gateway to sites, security fittings and fixtures at all DCU sites and any necessary cable / wireless data transmission links.

10.0 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 equipment supplied shall be of such nature that the purchaser can setup own trouble shooting team.

11.0 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, VSAT 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 Purchaser. The Department shall notify the Supplier 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 purchaser.

After successful completion of Factory Acceptance Tests for any section of the Works, the Purchaser shall approve that section of the Works for delivery to site. Any such approval shall in no way relieve the Supplier 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 purchaser, 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 CWC's modelling center at Gangtok 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 Purchaser 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 Purchaser for approval.

11.3 Site Acceptance Protocol

In order to facilitate the site acceptance of the system by the site – in – 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 site – in–charge and accordingly will give a verification report whether all deliverables have been delivered properly at the site.

For site acceptance test, the supplier should give a check – list of all components and their functions. This check list shall be decided in consultation with the department (Purchaser). This check list 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 purchaser or any other person nominated by the purchaser, 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 supplier shall maintain necessary log in respect of the results of the tests to establish to the entire satisfaction of the purchaser, the successful completion of the test specified. An average data acquisition efficiency of 99.5% 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 supplier to the representative of the purchaser.

11.5 Complete Acceptance Test

The test shall involve testing of all equipments installed at the remote stations with the existing CWC's modelling center at Gangtok 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 center.

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 30 days operating on 24 X 7 basis and incorporation of the data into the data base set up at the existing modelling center at Gangtok.

12.0 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 center prior to final handover.

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.

13.0 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, Comprehensive Annual maintenance and repairs of the entire system including supply of spares, etc., for the next eight years will be done by the Supplier. Purchaser at his will have the option to extend the Comprehensive Annual Maintenance Contract (CMAC) on same terms and conditions after the end of eighth year Comprehensive 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 equipment suppliers.

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 Supplier for repair, as appropriate. The Supplier shall operate a module repair and replacement scheme.

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

14.0 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 number of spare parts is fixed on the basis of ensuring a minimum availability at CWC, Gangtok for rapid swapping in case of a major malfunction which cannot be rectified at the site.

The following mandatory spare parts for the equipment that are essential and critical to the operation of the system with low downtime shall be supplied. For computing the numbers, the fractions are to be always rounded off to the next higher integer value.

Spare	No.
Data recorder with INSAT transmitter	1
INSAT Transmitter	2
Satellite Antenna	2
Solar panel assembly	2
Mother Board for DCU	1
Sensors for each parameter of Snow precipitation / rainfall, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)	1 set

Procurement of these mandatory spare parts by the purchaser does not waive of the warranty/maintenance responsibilities of the Supplier. The supplier has to ensure the availability of spares in order to run the system for 15 years. However, the supplier is required to maintain inventory in India covering the warranty period as well as CMAC period.

The spare parts supplied by the Supplier 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 Purchaser's 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.

15.0 SPECIFICATION FOR CABLING AND CONNECTING

i. 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 Galvanised 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 armoured 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 Galvanised 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 purchaser 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 purchaser 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.

16.0 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 colour, 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 metal work 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 Supplier 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 Supplier shall be responsible for the disposal off site of 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 Supplier shall not allow water to lie anywhere on the site. Where water is encountered in excavation operations, it shall be disposed of to a suitable area away from the works 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 500 mm to the top of the pipes. For pipes carrying

water under pressure, or for pipes laid with a water load above, this depth shall be increased to 900 mm.

iii. Where trench excavations encounter obstructions in the ground conditions (eg. hard rock or major tree roots), the obstruction shall be by passed 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), deposited in 300 mm layers and compacted at each layer.

iv. Backfilling to a highway 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 minimise the danger of collapse, and all voids formed behind the supports shall be carefully filled and compacted.

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 reuse, the Supplier shall provide replacement units of similar texture, colour, 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 Supplier 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 Supplier 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 cementitious content of any concrete shall be between 350 kg/m3 and 400 kg/m3, with a maximum free water / cementitious content ratio of between 0.45 and 0.50. The mix and strength of such concrete shall not be inferior to M20.

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

iii. The nominal size of concrete aggregate shall be from 6mm to 20 mm.

iv. The Supplier 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 colour 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 Supplier's 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 discolouration. Any projections shall be removed and the surfaces made good. For finishes to surfaces not formed by formwork, the concrete shall be levelled and screeded 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 colour of the concrete.

16.3.3 Reinforcement and other built-in items

i. Reinforcement and other built in items (such as pipes and sleeves) shall be firmly supported in position and of sufficient strength to secure against displacement during the concrete pour.

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 50 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. Top soil shall then be placed to a level flush with the surrounding ground surface.

16.4.3 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 bevelled 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.

17.0 TRAINING AND DOCUMENTATION

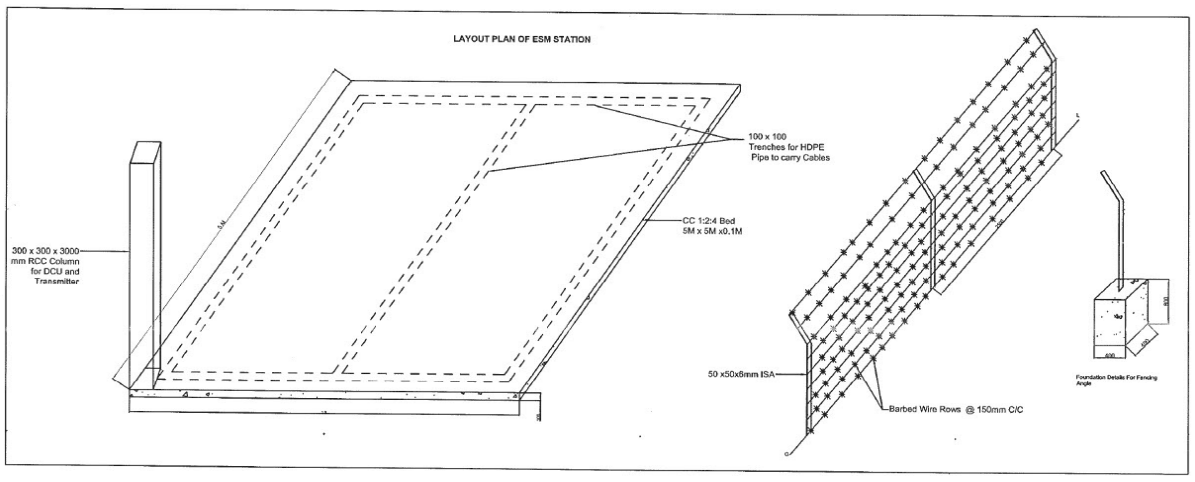
The contractor shall provide trainings as training modules as part of the tender given as under:

Sl. No.	Module Name	Target Group	Duration in days	Number of trainings
1.	Remote Station Management and Maintenance	All W/C staff located at Remote Stations	3	5
2.	Trouble shooting of sensors at Site	Junior Engineers	3	5
3.	Management of DCU through Laptop and Calibration of sensors	EE /AEE/SDE/JE	3	5

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 purchaser in advance. The course shall provide detail documentation and shall ensure that the Purchasers personnel shall be able to modify settings/parameters without reference back to the Supplier.

The timing and places / sites where this training is to be given will be decided during currency of the contract by the Purchaser.

18.0 DRAWINGS FOR INDICATIVE PURPOSE :



Section 3 – Bidding Forms

Table of Forms

Letter of Bid –Technical Part 83

Price Schedule (BoQ) 85

Manufacturer's Authorization.....87

Proforma for Performance Statement..... 88

Form of Affidavit for Correctness of Information and Documents..... 89

Letter of Bid –Technical Part

INSTRUCTIONS TO BIDDERS: PLEASE DELETE THIS BOX ONCE THE DOCUMENT HAS BEEN COMPLETED.

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.

Note: All italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.

Our Reference: No..... Dated.....

To:

The Executive Engineer,
Sikkim Investigation Division,
Central Water Commission,
Gangtok (Sikkim).

Subject: **Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 9 Nos. Snow gauging & meteorological stations (SG&MS) in SIKKIM" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals, civil construction work, with a comprehensive warranty of two years and maintenance for eight years after the expiry of the warranty period**

Ref : NIT No.:**I/19774/2020** Dated: 29.05.2020

Sir,

1. We, the undersigned, hereby submit our Bid, in two parts, namely:
   (a) Technical Part; and
   (b) Financial Part
2. In submitting our Bid, we make the following declarations:

(a) **No reservations:** We have examined and have no reservations to the Bidding Documents*;*

(b) **Conformity:** We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods and Related Services

(c) **Bid Validity Period:** Our bid shall be valid for the period of **120 days**, from the deadline fixed for the bid submission, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) **Performance Security:** If our bid is accepted, we commit to obtain a performance security in accordance with ITB Clause 33 and GCC Clause 11 for the due performance of the Contract.

(e) **Eligibility**: We meet the eligibility requirements and have no conflict of interest;

(f) **One Bid Per Bidder:** We are not participating in more than one bid in this bidding process;

(g) **Government owned entity:** We are not a government owned entity/ We are a government owned entity but meet the requirements specified in the World Bank's Guidelines referred to in ITB 3.1

(h) **Ineligibility:** Our firm, its affiliates or subsidiaries—including any subcontractors or suppliers for any part of the contract - has not been declared under Indian laws or official regulations;

(i) **Binding Contract**: We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

(j) **Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(k) **Suspension and Debarment**: We have not been debarred from participation in bidding/removed from approved list (dealings suspended) by the Central or any State Government.

(l) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of Collusion, Fraud and Corruption.

(m) **Prevention of Corruption Act:** We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely, "Prevention of Corruption Act 1988."

Yours faithfully,

Authorized Signature

Name & Title of Signatory _____

In the capacity of *[insert legal capacity of person signing the Letter of Bid]*

Name of Bidder _____

Address _____

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

Price Schedule (BoQ) FINANCIAL BID FORMAT
Table-A
(The rates may be quoted in Indian Rupees only)

Sl. No.	Name of Item	Quantity	Rate	Amount	GST	Total Amount	
						In figures	In words
1.	Establishment of Remote Station Type SG&MS - E Type (***Rainfall***, Snow precipitation snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	4					
2.	Establishment of Remote Station Type SG&MS - E Type (Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	5					
3.	Comprehensive annual maintenance charges for Sl. No. 1 and 2 including replacement of material & consumables for 8 years after warranty period of 2 years along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	8 Years					
4.	Spare Parts						
	1. **Data recorder** — **1**						
	2. **INSAT Transmitter** — **2**						
	3. **Satellite Antenna** — **2**						
	4. **Solar Panel assembly** — **2**						
	5. **Mother Board for DCU** — **1**						
	6. Sensors for each parameter of Snow precipitation, rainfall, snow depth, snow density/ snow water equivalent and Meteorological parameters consisting of — **1 set**	1 set					

Sl. No.	Name of Item	Quantity	Rate	Amount	GST	Total Amount	
						In figures	In words
	Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)						
5.	5 Trainings each in three modules (both for remote station and Modeling Centre) for officers & staff over a period of 10 years	1					
Total cost of Bid							

Table-B
Details of Spares and Consumables

S.No.	Spare Name/ Description	Quantity	Unit
1.	**Data recorder**	**1**	**Nos**
2.	**INSAT Transmitter**	**2**	**Nos**
3.	**Satellite Antenna**	**2**	**Nos**
4.	**Solar Panel assembly**	**2**	**Nos**
5.	**Mother Board for DCU**	**1**	**Nos**
6.	Sensors for each parameter of Snow precipitation / rainfall, snow depth, snow density/ snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)	**1**	**Set**

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

(This form may be uploaded as .jpg format in the Financial bid Cover)

Sl. No.	Item	Unit	Rate for Block of 2 Years				Total
			1st block	2nd block	3rd block	4th block	
1	Remote station Type SG&M ***with rainfall***	**Per four stations**					
2	Remote station Type SG&M	**Per five stations**					
Total comprehensive maintenance charges							

Manufacturer's Authorization

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

Date: *[insert date (as day, month and year) of Bid Submission]*
NIT No.:**I/19774/2020** Dated: 29.05.2020

To:

The Executive Engineer,
Sikkim Investigation Division,
Central water Commission,
Gangtok (Sikkim).

WHEREAS

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

We hereby extend our full guarantee and warranty in accordance with Clause 15 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

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

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

Title: *[insert title]*

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

PROFORMA FOR PERFORMANCE STATEMENT

[Reference: ITB 11.2]

Proforma for Performance Statement (for a period of last 3 years)

NIT No. **I/19774/2020**
Dated: 29.05.2020 Date of opening. **07.07.2020** Time **11:00 Hours**

Name of the Bidder _____

Order placed by (full address of Purchaser)	Order No. and date	Description and quantity of ordered equipment	Value of order	Date of completion of delivery		Remarks indicating reasons for late delivery, if any	Has the equipment been satisfactorily functioning? (Attach a certificate from the Purchaser/Consignee)
				As per contract	Actual		
1	2	3	4	5	6	7	8

Signature and seal of the Bidder

FORM OF AFFIDAVIT FOR CORRECTNESS OF INFORMATION AND DOCUMENTS SUBMITTED WITH BID

[Reference ITB 5]

[This affidavit should be on a non-judicial stamp paper of Rs.10/- and shall be attested by Magistrate/ Sub-Judge/ Notary Public]

I, …… (*name of the authorised representative of the Bidder*) solemnly affirm and state as under:

a. I hereby certify that all the information and documents furnished with the Bid submitted online in response to NIT No. **I/19774/2020** Dated:29.05.2020 issued by The Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok ***for*** **Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 9 Nos. Snow gauging & meteorological stations (SG&MS) in SIKKIM" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals, civil construction work, with a comprehensive warranty of two years and maintenance for eight years after the expiry of the warranty period** are true and correct.

b. *I hereby certify that I have been authorized by ……

…… (*The Bidder*) to sign on their behalf, the Bid mentioned in paragraph 1 above.

Deponent

Place: …….
Date: ……

* *This sub-paragraph is not applicable if the Bidder is an individual and is signing the Bid on his own behalf.*

Section 4 – Contract Forms

Table of Forms

1	NOTIFICATION OF AWARD	92
2	CONTRACT AGREEMENT	93-94
3	PERFORMANCE SECURITY (BANK GUARANTEE)	95

NOTIFICATION OF AWARD

[On letter head of the Purchaser]

..... [Date]

To:
[Name and address of the Supplier]

Subject: Notification of Award for Contract No. . . . . .

This is to notify you that your Bid dated …… ***[Insert date]*** ……for execution of the . . . . . ……***[Insert name of the contract and identification number]***

……for the Accepted Contract Amount of …… ***[Insert amount in numbers and words in Rupees]***, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by the Purchaser.

Contract Agreement to be executed is attached. You are requested to sign it with date and date and return it to the Purchaser within 15 days of the date of Notification of Award, along with the Performance Security for an amount of INR..... [Insert amount] ***equivalent to 5% of the Contract value]*** valid up to..... [Insert date] in one of the forms stipulated in the GCC.

This concludes the Contract.

Authorized Signature: _____

Name and Title of Signatory: …… **, Executive Engineer**

Name of Agency: **Sikkim Investigation Division**, **Central Water Commission, Gangtok.**

Attachment: Contract Agreement complete with Conditions of Contract

2. CONTRACT AGREEMENT

[The successful Bidder shall fill in this form in accordance with the instructions indicated] THIS CONTRACT AGREEMENT is made

the *[insert:**number**]* day of *[insert:**month**]*, *[insert:**year**]*.

BETWEEN

(1) ***The Executive Engineer, Sikkim Investigation Division, Central Water Commission, Gangtok (Sikkim)*** an Office under the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India. *[insert address of Purchaser]* (hereinafter called "the Purchaser"), and

(2) *[Insert name of Supplier]*, a corporation incorporated under the laws of *[insert: country of Supplier]* and having its principal place of business at *[insert: address of Supplier]* (hereinafter called "the Supplier").

WHEREAS the Purchaser invited bids for certain Goods and ancillary services, viz **Supply, Installation, Testing, Commissioning and Maintenance of real – time data acquisition network at 9 Nos. Snow gauging & meteorological stations (SG&MS) in SIKKIM" on turnkey basis for collection, transmission and processing of snow-hydrological & meteorological data through satellite based telemetry and associated systems including all equipment, hardware, software and peripherals, civil construction work, with a comprehensive warranty of two years and maintenance for eight years after the expiry of the warranty period** and has accepted a Bid by the Supplier for the supply of those Goods and Services at the Project Site, namely SID,CWC, Gangtok, for the sum of *[insert Contract Price in words and figures, expressed in Indian Rupees)]* (hereinafter called "the Contract Price").

[Purchase should insert a Table here giving complete details of Goods and Related Services, quantities ordered, their prices and the accepted delivery schedule.]

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract:

(a) This Contract Agreement

(b) The Purchaser's Notification of Award

(c) Letter of Bid and original Price Schedules

(d) General Conditions of Contract

(e) Technical Requirements (including Schedule of Requirements and Technical Specifications)

3. This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

4. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

5. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[insert the name of the Contract governing law country]* on the day, month and year indicated above.

For and on behalf of the Purchaser:

Signed: *[insert signature]*
in the capacity of **Executive Engineer, Sikkim investigation, Central Water Commission, Gangtok** *[insert title or other appropriate designation]*in the presence of *[insert identification of official witness]*

For and on behalf of the Supplier

Signed: *[insert signature of authorized representative(s) of the Supplier]* in the capacity of *[insert title or other appropriate designation]* in the presence of *[insert identification of official witness]*

Attachment: Contract Conditions
[Purchaser should attach the GCC]

3 Performance Security

(Bank Guarantee)

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: "Executive Engineer, Sikkim investigation Division, Central Water Commission, Gangtok" *[insert name and Address of Purchaser]*

Date: *_[Insert date of issue]*

PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _ *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant")has entered into Contract No. *[insert reference number of the contract]* dated *[insertdate]* with the Beneficiary, for the supply of _ *[insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*,[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

1

The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

This guarantee shall expire, no later than the …. Day of ……, 2… [2], and any demand for payment under it must be received by us at this office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[2] *Insert the date sixty days after the Completion Date of the Supply or Completion of Warranty in case Warranty is applicable. The Purchaser should note that in the event of an extension of this date for completion of the Contract or the Warrant obligations, the Purchaser would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Purchaser might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months]/[one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Schedule – F

(CPWD-9 : Part-2)

SCHEDULE OF QUANTITIES AND RATES/FINANCIAL QUOTE

(The rates may be quoted in Indian Rupees only)

Sl. No.	Name of Item	Quantity	Rate	Amount	GST	Total Amount	
						In figures	In words
1.	Establishment of Remote Station Type SG&MS - E Type (***Rainfall***, Snow precipitation snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	4					
2.	Establishment of Remote Station Type SG&MS - E Type (Snow precipitation, snow depth, snow density/snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS)) including all civil, mechanical and fabrication works along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	5					
3.	Comprehensive annual maintenance charges for Sl. No. 1 and 2 including replacement of material & consumables for 8 years after warranty period of 2 years along with data transmission from remote site to CWC's existing ERS at Delhi or ERS at any other location, to existing Modeling Centers at SID, CWC Gangtok & FFM Directorate, CWC, Sewa Bhawan, New Delhi using V-SAT network complete in all respects.	8 Years					
4.	Spare Parts **Data recorder** – **1** 2. **INSAT Transmitter** – **2** 3. **Satellite Antenna** – **2** 4. **Solar Panel assembly** – **2** 5. **Mother Board for DCU** – **1** 6. Sensors for each – **1**	1 set					

Sl. No.	Name of Item	Quantity	Rate	Amount	GST	Total Amount	
						In figures	In words
	parameter of Snow precipitation, rainfall, snow depth, snow density/ snow water equivalent and Meteorological parameters consisting of Temperature, Humidity, Evaporation, sunshine and Wind Instruments (AWS) **set**						
5.	5 Trainings each in three modules (both for remote station and Modeling Centre) for officers & staff over a period of 10 years	1 job					
Total							

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

(This form may be uploaded as .jpg format in the Financial bid Cover)

Sl. No.	Item	Unit	Rate for Block of 2 Years				Total
			1st block	2nd block	3rd block	4th block	
1	Remote station Type SG&M ***with rainfall***	**Per four stations**					
2	Remote station Type SG&M	**Per five stations**					
Total comprehensive maintenance charges							