GUJARAT INFORMATICS LIMITED
(A Government of Gujarat Company)

GUJARAT INFORMATICS LIMITED
Block No. 2, 2nd Floor, Karmayogi Bhavan,
Sector-10 A, Gandhinagar 382 010
Phone No: 079 - 23256022

Bid for Selection of Agency for Supply, Installation/System Integration, Commissioning, Maintenance, Training and Operation of Continuously Operating Reference System Network. DGNSS Rover, Controller and Surveying Accessories for updating and Maintenance of GIS based Maps on behalf of Settlement Commissioner and Director of Land Record, Revenue Department, Govt. of Gujarat, Gandhinagar.

Tender No. HWT210120608

Pre-bid Meeting: 31.01.2020 at 1500 hours

Last Date of Submission of Bid: 14.02.2020 till 1500 hours

Last Date of Submission of Bid Processing Fees & EMD: 14.02.2020 till 1500 hours

Date of Opening of Technical Bid: 14.02.2020 at 1700 hours

Bid Processing Fee: Rs. 17,700/-

Introduction

Gujarat Informatics Limited (herein after referred to as "GIL"), on behalf of Settlement Commissioner and Director of Land Record, Govt. of Gujarat, Gandhinagar (herein after referred to as the "Purchaser") intend to invite offers through e-Tendering route for Selection of Agency for Supply, Installation/System Integration, Commissioning, Maintenance, Training and Operation of Continuously Operating Reference System (CORS) Network. DGNSS Rover, Controller and Surveying Accessories for updating and Maintenance of GIS based Maps on behalf of Settlement Commissioner and Director of Land Record, Revenue Department, Govt. of Gujarat, Gandhinagar. (Tender No. HWT210120608).

The selected agency will have to Supply, Install and maintain the supplied hardware and software as per the scope defined in this bid for the contract period.

Proposal in the form of BID are requested for the items/services in complete accordance with the documents to be uploaded as per following guidelines.

Bidder shall submit their bids on https://www.gil.nprocure.com.

The bidder will have to submit **Nonrefundable Bid Processing Fees of Rs. 17,700/- & Earnest Money Deposit (E.M.D.) of Rs. 40,00,000/- (Refundable)** on or before date & hours of submission of bid in a sealed cover at GIL office with the heading **"Bid processing Fees & EMD for E-tender no HWT210120608 for Selection of Agency for Supply, Installation/System Integration, Commissioning, Maintenance, Training and Operation of Continuously Operating Reference System Network. DGNSS Rover, Controller and Surveying Accessories for updating and Maintenance of GIS based Maps on behalf of Settlement Commissioner and Director of Land Record, Revenue Department, Govt. of Gujarat, Gandhinagar."**

- **Bid processing fees** must be in the form of **Demand Draft** in the name of **"Gujarat Informatics Ltd."** payable at Gandhinagar along with the covering letter.

- **EMD** as mentioned above, shall be submitted in the form of Demand Draft **OR** in the form of an unconditional Bank Guarantee **(which should be valid for 9 months from the last date of bid submission)** of any Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative Banks and Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the G.R. no. EMD/10/2019/50/DMO dated 01.11.2019 (https://financedepartment.gujarat.gov.in/Documents/DMO_2317_01-Nov-2019_375.pdf) issued by Finance Department or further instruction issued by Finance department time to time; in the name of "Gujarat Informatics Ltd." payable at Gandhinagar (as per prescribed format given at Annexure A) and must be submitted along with the covering letter.

  Please affix the stamp of your company on the overleaf of demand draft.

Note: Failing to submit physical covers of EMD and Bid Processing Fees at GIL on or before the last date & time of submission as given in this bid, may lead to the rejection of the bid.

The Bid Processing Fees & EMD Section and Eligibility Section will be opened on the specified date & time in the presence of the committee members and representatives of the bidders who choose to attend. The representative will be held responsible for all commitments made on behalf of the bidder and that will be considered valid for all further dealings related to this tender process.

Once quoted, the bidder shall not make any subsequent price changes, whether resulting or arising out of any technical/commercial clarifications sought regarding the bid, even if any deviation or exclusion may be specifically stated in the bid. Such price changes shall render the bid liable for rejection.

In addition to this bid, the following sections uploaded are part of Bid Documents.

The summary of various activities with regard to this invitation of bids are listed in the table below:

1	Bid Reference Number	**Tender No. HWT210120608**
2	Date of Pre-Bid Meeting	**31.01.2020 at 1500 hours**
3	Venue of Pre-Bid Meeting	**Office of Settlement Commissioner and Director of Land Records, Sector-14, Gandhinagar**
4	Last Date & Time for Submission of Bids electronically on https://www.gil.nprocure.com	**14.02.2020 till 1500 hours**
5	Date & Time of Opening of Bids (Un-priced Bids)	**14.02.2020 at 1700 hours**
6	Field Demonstration (Field demonstration will be arranged for qualified agencies after 5 to 6 days after opening of technical bids.	**At Dindayal Institute of Survey & Revenue Administration, KH-5, Sector-14, Gandhinagar, Gujarat.**
7	Date & Time of Opening of Commercial Stage	Will be intimated to the qualified bidders at a later date.
8	Venue of Opening of Bids	**Gujarat Informatics Limited** Block No. 2, 2nd Floor, Karmayogi Bhavan, Sector-10A, Gandhinagar 382 010
9	Bid Processing Fees (Non-refundable)	**Rs. 17,700/-** (Seventeen Thousand Seven Hundred)
10	Earnest Money Deposit (E.M.D.)	**Rs. 40,00,000/-**
11	GIL Contact Person	DGM (Tech.), GIL

Note: Please specify Tender Number in all your correspondence.

SECTION I

Eligibility Criteria for the bidder:

1. The bidder should have minimum annual average turnover of Rs. 10 Crore in modern survey instrument and technology business for each of the last three financial years as on 31st March 2019. The copies of Audited Annual Accounts/Balance Sheet along with Profit & Loss Account and CA Certified Statement for last three financial years as on 31st March 2019 shall be attached along with the bid**. (Form no. E-1)**

2. OEM should have minimum annual average turnover of Rs. 100 Crore for each of the last three financial years as on 31st March 2019. The copies of Audited Annual Accounts/Balance Sheet along with Profit & Loss Account and CA Certified Statement for last three financial years as on 31st March 2019 shall be attached along with the bid**. (Form no. E-2)**

3. The bidder must have one office in Gujarat. Please upload the copies of any two of the following: Property Tax Bill of last year / Electricity Bills of last one year / Telephone Bills of last one year / VAT Registration / CST Registration / Valid Lease Agreement. **(Form no. E-3). In case, bidder does not have office in Gujarat, bidder should give undertaking to open office in Gujarat within 45 days from the date of purchase order.**

4. The bidder/OEM should have experience of supply /installations and maintenance of minimum 3 sites/CORS projects with at least 30 CORS Base Stations cumulatively in last 3 years as on bid submission date. **(Form no. E-4)**

5. Bidder must ensure that the warranty support & service should be available up to delivery locations to provide repairing cum replacement services of faulty equipment within 48 hrs. Bidder is required to provide the name, address & contact details of the authorized service center for providing warranty support & repairing cum replacement service up to delivery locations. **(Form no. E-5)**

6. The bidder must be Authorized Dealer/ Distributor/ Re-seller or should be authorized by its OEM to quote this bid. Please upload the copy of Authorization Certificate on OEM letter head, OEM Malicious Code Certificate, Country of origin, Dispatch Details along with packing List and Airway bill must be provided, Supplied items Launching Year Product launched not before 5 years from bid date. Products launched before 5 years are not eligible. (Bidding product detail sheet; **Form E-7**) and signed by authorized signatory for the item(s) to be offered in this bid. **(Form no. E-6)**

7. Warranty assured by bidders should be reflected on OEMs website/portal (please upload OEM undertaking letter)

8. No consortium will be allowed. The bidder must meet all the eligibility criteria by self.

9. Bidder should not be blacklisted by any Ministry of Government of India or by any State Government of India or any of the Government PSUs at the time of bidding. Self-Declaration / Certificate / affidavit mentioning that the Bidder is not blacklisted as per the clause should be submitted.

Note:

1. All the details and the supportive documents for the above mentioned items should be uploaded in eligibility section in the bid.

2. Bidders who wish to participate in this bid will have to register on https://gil.nprocure.com. Further bidders who wish to participate in online bids will have to procure Digital Certificate as per Information Technology Act 2000 using which they can sign their electronic bids. Bidders can procure the same from (n) code solutions – a division of GNFC Ltd., or any other agency licensed by Controller of Certifying Authority, Govt. of India. Bidders who already have a valid Digital Certificate need not procure a new Digital Certificate.

SECTION II

General Terms & Conditions:

1. The last date of submission of bid on the website https://gil.nprocure.com is **14.02.2020 up to 1500 Hrs.** No physical bids will be accepted under normal circumstances. However, GIL reserves the right to ask the bidders to submit the bid (other than commercial bid) and/or any other documents in physical form.
2. The bid is non-transferable.
3. The Bidder may quote only one option (i.e. only one product can be quoted) against each item. Bidders are required to mention make & model of the product. (Do not write "OEM" against items as bidders are expected to give make & model of the product).
4. The bidder will have to supply, install/demonstration, maintain, and provide operational training and commissioning for supplied hardware, software and peripherals and carry out necessary integration at end user location across the Gujarat State.
5. If in any case the quoted Item is not available in the market, the bidder will have to supply Higher Version/replacement of that Item in the quoted cost in the same time duration with prior approval of Purchaser. No "End of Life / End of Support" product should be quoted to minimize such instances. (Make & Model quoted by the bidder should be available till the bid validity, duly supported for spares/OEM support for warranty period for 6 years).
6. The Bidder shall bear all the costs associated with the preparation and submission of its bid, and GIL in no case will be responsible or liable for these costs, regardless of conduct or outcome of bidding process.
7. Technical specifications indicated are minimum specification. Bidder may quote for better solution. The bidder should provide following with the technical bid:
    - Make & Model
    - Name of Manufacturer
    - Technical Literature
    - Manufacturer's Data Sheet.
    - Compliance statement from the OEM of the product (with duly signed and stamped)
8. The bidder has to upload the compliance letter on its letter head duly signed by the authorized signature & other supporting documents as asked for in the bid in scanned format. Failing to submit the same or non-compliance/deviation from any bid terms and conditions, eligibility criteria or technical specifications may result in rejection of the bid.
9. The Bidder has to examine all instructions, forms, terms, conditions and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the biding documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
10. Amendment of Bidding Documents (Corrigendum)
    - **10.1.** At any time prior to the deadline for submission of bids, GIL may, for any reason, whether its own initiative or in response to the clarification request by a prospective bidder, modify the bidding documents.
    - **10.2.** The corrigendum will be published on website https://gil.nprocure.com & www.gil.gujarat.gov.in.
    - **10.3.** In order to allow prospective bidders reasonable time to take into consideration the amendments while preparing their bids GIL, at its discretion, may extend the deadline for the submission of bids.
11. Bid Currency - Prices shall be quoted in Indian Rupees only. Payment for the supply of equipments as specified in the agreement shall be made in Indian Rupees only.

12. The bidder will have to submit Bid Processing Fees (Non refundable) of **Rs. 17,700/-** & Earnest Money Deposit (E.M.D.) of **Rs. 40,00,000/-** (Rupees Forty Lac only) (Refundable) on or before the last date & hours of submission of bid in a sealed cover at GIL office with the heading "Bid processing Fees & EMD for E-tender no **HWT210120608** for Selection of Agency for Supply, Installation/System Integration, Commissioning, Maintenance, Training and Operation of Continuously Operating Reference System (CORS) Network. DGNSS Rover, Controller and Surveying Accessories for updating and Maintenance of GIS based Maps on behalf of Settlement Commissioner and Director of Land Record, Revenue Department, Govt. of Gujarat, Gandhinagar. (Tender No **HWT210120608**).

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  Please affix the stamp of your company on the overleaf of demand draft.

  Note: Failing to submit physical covers of EMD and Bid Processing Fees at GIL on or before the last date & time of submission as given in this bid, may lead to the rejection of the bid.

13. In case of non-receipt of Bid processing fees & EMD as mentioned above in your bid will be rejected by GIL as non-responsive.

14. Unsuccessful bidder's E.M.D. will be returned as promptly as possible after the expiration of the period of bid validity OR upon the successful Bidder signing the Contract, and furnishing the Performance Bank Guarantee as prescribed by GIL, whichever is earlier.

15. In exceptional circumstances, GIL may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. Bidder may refuse the request without forfeiting its E.M.D. A Bidder granting the request will not be permitted to modify its bid.

16. **The Successful bidder has to submit Performance Bank Guarantee @ 10 % of total order value within 15 days from the date of issue of Purchase order for the duration of contract period + extra 3 months from any Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative Banks and Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the** G.R. no. EMD/10/2019/50/DMO **dated 01.11.2019 (https://financedepartment.gujarat.gov.in/Documents/DMO_2317_01-Nov-2019_375.pdf) issued by Finance Department or further instruction issued by Finance department time to time. The draft of Performance Bank Guarantee is attached herewith.**

17. Successful Bidder will have to sign the contract upon receiving the confirmed purchase order with the purchaser(s) within 15 working days from the date of confirmed purchase order. (The draft is attached herewith).

18. The successful Bidder's E.M.D. will be returned upon the Bidder signing the Contract, and furnishing the Performance Bank Guarantee as per bid terms and offer of inspection of the ordered material.

19. The E.M.D. may be forfeited at the discretion of GoG / GIL, on account of one or more of the following reasons:

(a) If a Bidder withdraws its bid during the period of bid validity.
(b) If Bidder does not respond to requests for clarification of their Bid
(c) If Bidder fails to co-operate in the Bid evaluation process, and
(d) In case of a successful Bidder, if the Bidder fails:
  (i) To sign the Contract as mentioned above or

(ii) To furnish performance bank guarantee as mentioned above or

(iii) If the bidder is found to be involved in fraudulent practices.

20. Termination for Default:

20.1. The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Bidder. Bidder will be given notice/cure period of 30 days, after that purchaser will terminate the Contract in whole or part after:

a) If the bidder fails to deliver any or all of the Goods as per the delivery schedule mentioned in the bid, or within any extension thereof granted by the Purchaser or

b) If the Bidder fails to perform any other obligation(s) under the Contract/Purchase order.

c) If the Bidder, 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 of influence the action of a public official in the procurement process or in contract execution.

"Fraudulent practice: 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 Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the purchaser of the benefits of free and open competition;"

20.2. In the event the Purchaser terminates the Contract in whole or in part, pursuant to Clause 20.1 above, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Bidder shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Bidder shall continue the performance of the contract to the extent not terminated.

21. If the successful bidder fails to submit the Performance Bank Guarantee & sign the Contract Form within prescribed time limit, the EMD of the successful bidder will be forfeited. GIL also reserves the right to blacklist such bidder from participating in future tenders if sufficient cause exists.

22. Price shall be inclusive of all freight, forwarding, transit insurance, installation, warranty and maintenance charges period for 6 years.

23. Prices shall be in Indian Rupees. The prices shall strictly be submitted in the given format. Quoted prices shall be inclusive of all taxes except GST. The tax components like GST as applicable shall be mentioned separately in the respective columns.

24. Late Bids: The bidder will not be able to submit the bid after final submission date and time.

25. Modification and Withdrawal of Bids

25.1. The Bidder may modify or withdraw its bid before the due date of bid submission.

25.2. No bid will be allowed to be modified subsequent to the final submission of bids.

25.3. No bid will be allowed to be withdrawn in the interval between the deadline for submission of bids and the expiry of the bid validity. Withdrawal of a bid during this interval will result in the forfeiture of bidder's E.M.D.

26. Bids will be opened with the buyer's private digital key in the presence of Bidder's representatives, who choose to attend. The Bidder's representatives who are present shall sign a register/attendance sheet evidencing their attendance. The representative will be held responsible for all commitments made on behalf of the bidder and that will be considered valid for all further dealings related to this bid process. In the absence of the bidder(s), the Tender Committee may choose to open the bids as per the prescribed schedule.

27. The Bidder's names, Bid modifications or withdrawals, discounts and the presence or absence of relevant E.M.D. and such other details as GIL/GOG officer(s) at their discretion, may consider appropriate, will be announced at the opening.

28. Evaluation of the Bids:

After the closing time of submission, GIL/GoG committee will verify the submission of Bid Processing Fees & EMD as per bid terms and conditions. The eligibility criteria evaluation will be carried out of the responsive bids. The technical bids of the bidders who are complying with all the eligibility criteria will be opened and evaluated next. GIL will seek clarifications if required on eligibility & technical section during the evaluation process.

The price bid will be opened of the bidders whose technical bids are fully complied and who have scored 60% in technical evaluation. Only without tax values will be considered for financial evaluation.

Technical Evaluation Criteria:

Technical Specification evaluation criteria (100 Marks)

Particulars	Average	Marks	Moderate	Marks	Advance	Marks
Reference Station						
Number of Channels	450 or Higher	5	550 or Higher	7.5	650 or Higher	**10**
Position update Rate	1Hz to 20 Hz	5	Up to 50 Hz	7.5	Up to 100 Hz	**10**
Ingress Protection (IP)	IP65	5	IP67	7.5	IP68	**10**
NavIC (IRNSS) Constellation	-	5	L-Band	7.5	L-Band & S-Band	**10**
Rover Receiver						
Number of Channels	450 or Higher	5	550 or Higher	7.5	650 or Higher	**10**
Position update Rate	1Hz to 5 Hz	5	Up to 10 Hz	7.5	Up to 20 Hz	**10**
Ingress Protection (IP)	IP65	5	IP67	7.5	IP68	**10**
NavIC (IRNSS) Constellation	-	5	L-Band	7.5	L-Band & S-Band	**10**
Controller						
Integrated Display with both hard and soft Keyboard (size)	4.5 inch to 5.5 Inch	5	5.6 inch to 6.5 Inch	7.5	6.6 Inch to 8 Inch	**10**
Ingress Protection (IP)	IP65	5	IP67	7.5	IP68	**10**
					Total	**100 Marks**
					Cut Off Marks	**50 Marks**

Project Experience and Field Demonstration (100 Marks)

Sr. No	Evaluation Criteria	Marks System	Maximum Marks
Past Experiences and Technical Expertise– 50 Marks			
1	Previous Similar Project Experience supplying, installation and commissioning of CORS Network(RTK) system including Software, hardware with all accessories	The Bidder/OEM should have prior experience in supplying, installation and commissioning of CORS Network(RTK) system including Software, hardware with all accessories a) At least 3 CORS projects with minimum 30 reference stations cumulatively ; - 10 Marks b) At least 4 CORS projects with minimum 40 reference stations	**50**

		cumulatively; - 30 Marks c) More than 4 CORS projects with minimum 80 reference stations cumulatively; -50 Marks	
The Maximum marks allocated by department technical committee for demonstration of systems: 50 Marks			
1	In order to secure maximum marks in this category by each bidder, they also need to demonstrate the complete features/ capabilities of their offered equipment/system. To facilitate this, department has kept demonstration criteria non-restrictive and completely open for bidders to justify and practically prove in the field before the authorities, the full features/capabilities of their offered equipment/system. Bidders may submit in writing to the department before demonstrating that what they are going to demonstrate, how they will demonstrate (methodology) and advantages of the special/additional features/capabilities (if any) which are mentioned or may not be mentioned in the tender specifications. Similarly, after completion of demonstration, bidder may submit explicitly in writing the exercise of demonstration conducted including the methodology and specific features/ capabilities shown/demonstrated. • Offered methodology during demonstration – 10 Marks • Additional features offered during demonstration -10 Marks		**20**
2	Field demonstration of CORS, Rover, Controller, Relevant Software and Accuracy.	The Bidder/OEM Should demonstrate Instrument Accuracy in Various Survey methods. (accuracy according to specified technical Specification) a) Static Survey -5 Marks b) Fast Static Survey-5 Marks c) Real Time Kinematics-5 Marks d) GPRS/Network RTK -15 Marks	**30**
		Total	**100 Marks**

Total 200 Marks: 100 (Technical Specification) + 50 (Relevant Experience) + 50 (Field Demonstration)

Total 200 Marks/2= 100 Marks (For Calculation of technical weightage)

Note: Minimum 60 marks out of 100 marks in technical evaluation required to qualify for the financial bid opening.

Normalized Technical Score (Tn) = 100 x Tb / Tmax
Where Tb= Score obtained by bidder, Tmax= Maximum score obtained by any of the bidders.

28.1. Technical Bid Evaluation:

Technical Bid will be assigned a technical score (Tn) out of 100 Marks by the Committee at the evaluation in the commercial process.

28.2. Financial Bid evaluation:

The Commercial bid of those bidders who qualify in the technical evaluation (obtained minimum 60 marks out of 100) will only be opened. All other Commercial bids will not be opened. The Financial bid of the technically qualified bidders will be evaluated. The financial score of a bidder 'Fb' will be assigned to the bidder. 'Fb' will be the total financial quote made by the bidder

Fn = normalized financial score for the bidder under consideration

Fb = commercial quote for the bidder under consideration
Fmin = commercial quote of the lowest evaluated financial proposal

The lowest evaluated Financial Proposal (Fmin) will be given the maximum financial score (Fn) of 100 points. The financial scores (Fn) of the other Financial Proposals will be calculated as per the formula for determining the financial scores given below:

Normalized Financial Score (Fn) = 100 x Fmin / Fb

28.3. Final Evaluation of Bid

The Technical bid shall have a weighted at 70% in the overall evaluation of the bid and the Commercial bid shall have a weighted at 30% in the overall evaluation. Proposals will be ranked according to their combined technical (Tn) and financial (Fn) scores using the weights (T = 0.70 the weight given to the Technical Proposal; P = 0.30 the weight given to the Financial Proposal; T + P = 1). The final evaluation will be based on Final Score which shall be calculated as shown below:

Final Score (S) = Tn x T + Fn x P

The bidder achieving the highest combined technical and financial score will be invited for negotiations for awarding the contract. In case of a tie where two or more bidders achieve the same highest combined technical and financial score, the bidder with the higher normalized technical score will be invited first for negotiations for awarding the contract.

29. As per the provision in Electronics & IT/ITeS Start-up Policy Resolution No. ITS/10/2015/5284/IT dated 6th June, 2016 issued by Department of Science & Technology OR As per Govt. of India Gazette notification no. GSR 34 (E) dated 16th January 2019 or as amended time to time; in e-Governance project undertaken by Government Departments or its Boards, Corporations or parastatal bodies getting grants from the Government, the chosen solution provider or system integrator will pass on job work or will outsource part of the work of a value ranging between 5% to 10% of the contract value to the eligible start-ups and to students of shortlisted Technical Colleges in Gujarat. In such arrangements, the responsibility of meeting SLAs (Service Level Agreements) will continue to belong to the solution provider or the system integrator.

30. The bidder will have to offer the inspection in the manner as decided by GIL before delivering to the respective site or at customer sites. The cost of the same has to be borne by the supplier. Any deviation found in the specification of the produced goods from the bid specification will lead to the cancellation of the order, forfeiture of EMD/PBG and prohibition in the participation in the future purchase of Government of Gujarat. GIL/GoG will not be responsible for any time delay which may arise due to any deviation from the bid technical specification found at the time of inspection and the bidder has to deliver and install the ordered goods within prescribed time limit. At the time of inspection, bidder is required to produce OEM's confirmation on OEM's letter head for back to back warranty support as per tender terms & conditions.

31. The Indenter's right to inspect, test and, where necessary, reject the Goods after the Goods arrival at Customer Site 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.

32. **Delivery & Installation**: Within **60 working days** from the date of purchase order at respective site / locations across the Gujarat State. The delivery location details are available at SECTION VIII.

33. In case of successful bidder is found in breach of any condition(s) of bid or supply order/work order, at any stage during the course of supply / installation or warranty period of 6 years, the legal action as per rules/laws, shall be initiated against the successful bidder and EMD/PBG shall be forfeited, besides debarring and blacklisting the bidder concerned for the time period as decided by Govt., for further dealings with GoG.

34. Bid validity will be of **180 days after the date of financial bid opening**. A bid valid for shorter period shall be rejected as non-responsive. **If required, GIL may extend the bid validity for further period from the date of expiry of bid validity in consultation with the successful bidder.**

35. Bidders are required to quote all items including optional add-ons as well. Incomplete bids will be treated as non-responsive and will be rejected.

36. The successful Bidder will be required to co-ordinate with software vendor and/or do liasioning with other service provider to achieve the end-to-end connectivity. This also includes OS configuration with respect to LAN/WAN technologies implementation.

37. Scope of Work:

Objective

The objective of this RFP is to invite agency to propose and establish Continues operating reference station (CORS) for Network RTK using Continuously Operating DGNSS Reference Receivers in the Gujarat State. The RFP intends to setup the complete system with CORS, Control Centre, Communication links and Rovers operating in Network RTK mode using VRS technology. This system will eventually become the backbone of infrastructure development and modernization in Gujarat State. The Government of Gujarat is looking at the system which is scalable, future ready for expansion and have provision to be used for other application like atmospheric research (for IPWV), seismic studies etc. apart from the cadastral application. The Settlement Commissioner of Land Records on behalf of Government of Gujarat invites technical and commercial proposals for the establishment of CORS system in said geography.

Background

The state of Gujarat has total area of 1.96 Lakh sq. km. which is undergoing the resurvey activity over entire geography since 2010 under Digital India Land Records Modernization Program-DILRMP of Government of India. Gujarat has been one of the first states to proactively carry out the modernization of their Land Records to provide fast and quality service to its citizens and ensuring the rights of owners over their land. To maintain the data created using the resurvey activity and carry out the survey for updating and maintenance in future, the department of land records has proposed the establishment of CORS technology for Real-time Network RTK system in the Gujarat State.

The Settlement Commissioner of Land Records, Gujarat State on behalf of Government of Gujarat is inviting the technical and commercial proposal from agency experienced in DGNSS technology to establish Real Time CORS network and processing center in State. The RFP document also includes the maintenance and operation of Network for 6 (Six) years from the date of installation and commissioning.

The department of Land Records is using WGS84 datum and UTM projection system for their maps. The Gujarat state falls in two UTM zones UTM Zone 42N and UTM Zone 43N which makes it difficult to work in areas which are closer to zone boundaries. The proposed system should be able to understand the coordinate system and should provide flexibility to establish a new grid system for the entire state. The system should also be able to use the existing data in UTM projection in case if department wishes to use their old projection system instead of new grid system

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Network RTK using CORS- technology has been a huge success in various countries where it has is being used for multiple applications. Real time processing of network reference data is able to provide much more valuable information than just reference observations for RTK positioning.

The established network should be able to provide 2 to 5 centimeter of accuracy using DGPS rover. The rover should be lightweight, portable handheld units. The system should generate corrections on GPS L1, L2, GLONASS L1, L2, Galileo, Compass (BeiDou) and should be upgradable track and provide corrections on NavIC (IRNSS) whenever the systems are functional.

Scope of Work

- Carry out feasibility study of the area before designing the network. The feasibility study should include the study of ionosphere, troposphere, terrain and the locations where DGNSS receivers can be installed and maintained for 6 years.
- Designing the state of art network for Gujarat State. The design should include monumentation, power supply including AC, DC and optional Solar panels, Communication facility using broadband or GSM/GPRS service on dual SIM modem, router, Safety cabinet and security of the complete installation. The solution should have remote monitoring of hardware and it should be able to handle more than 100 to 150 CORS data and the application should be capable of handling at least 2000 users and 1000 concurrent users.

- Supply and installation of state of art CORS network of 50 stations covering the entire region of Gujarat State by taking into consideration factors such as coverage, distribution, topography, environmental factors and utilities. Each monument should have details inscribed on brass plate as approved by the department.
- Supply and installation of the latest technology operation room at Department of Land Records Gandhinagar to run the installed DGNSS Network and monitoring these stations and the users with the capabilities of troubleshooting. Data storage and servers adequate to run more than 100 to 150 stations and supporting 2000 rovers simultaneously, The vendor should also provide customer care number at the control center for technical troubleshooting and grievances.
- Supply of state of art software to run CORS stations with capabilities of subscription service for different options of services such as RTK, Post Processing (PP/Static Survey) and Post Processing Kinematics (PPK) etc. with add on application for all available services as well services to run on mobile devices (Android/ iPhone or iPad) as a services to customers with billing options.
- Complete delivery maintenance package for the newly installed DGNSS network system.
- Comprehensive final acceptance test program in operating the newly installed DGNSS network system.
- Supply of 150 rovers GPS/GLONASS handheld receivers with state of the art technology to achieve 2 cm to 5 cm of accuracy in real time using the newly installed DGNSS network system.
- Bidders have to ensure for the integration/compatibility with the application of indenting department.

Concept of DGNSS RTK Network and CORS Technology

The concept of Network RTK system shall utilize at least three reference stations from a local DGNSS network to estimate the spatially correlated errors (ionosphere, troposphere and orbit) within the network coverage area. The estimated errors shall be calculated in the processing centre using sophisticated network algorithm and to be distributed to users in the form of network corrections. Applying these corrections shall improve rover's positioning accuracy substantially.

The CORS concept is based on the concept of having a network of DGNSS reference stations continuously connected via data links to a control centre. A computer at the control centre continuously gathers the information from all receivers, and creates a living database of Regional Area Corrections.

These are used to create a Virtual Reference Station, situated only a few meters from where any rover is situated, together with the raw data, which would have come from it. The rover interprets and uses the data just as if it has come from real reference station. The resulting performance improvement of RTK is dramatic. Overview of architecture for network based positioning is illustrated in Figure 1.

The implemetation of a Network-RTK system shall be based on Virtual Reference Station (VRS) concept. The VRS is an imaginary, unoccupied and located only a few meters from the RTK user. Observations data shall be created for this VRS from the data of surrounding reference stations (DGNSS permanenet reference stations) as though they had been observed on that position by a GPS receiver.

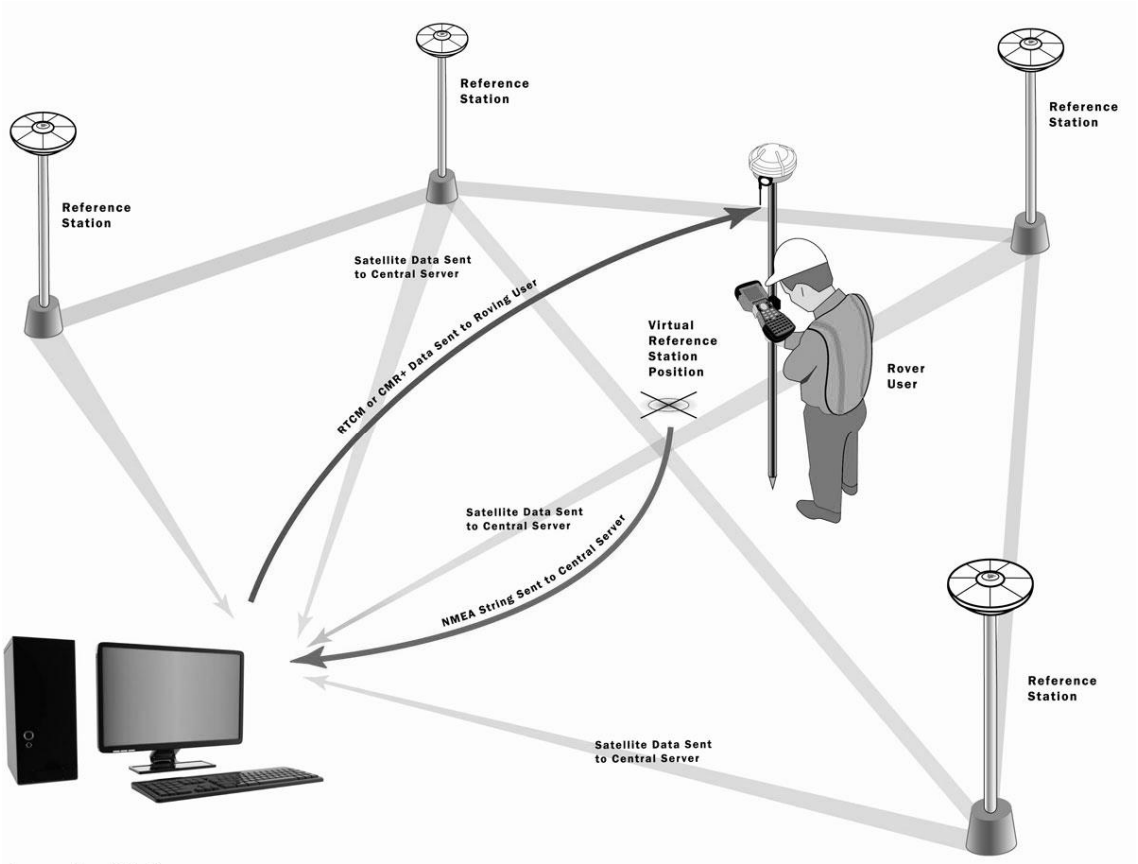

Figure 1: The architecture of Network-RTK

Project Implementing Phases

Setup of the DGNSS Network system shall be executed in five phases:

Phase I

A feasibility study along with assessment of network and power supply requirement, of the identified locations and additional proposed locations need to be carried out. Detailed study report with planning of equipment installation needs to be submitted as an aid to the designing of the network.

Phase II

A control centre for the Network RTK system shall be installed. It consists of installing and configuring hardware and software for data processing, manipulations, operation controlling and monitoring of each station.

Phase III

Design of the network based on the feasibility study should be implemented. DGNSS infrastructure shall be established at the selected government buildings throughout the project area. The DGNSS receivers, antenna, network devices and power backup utilities shall be installed and linked back to control centre.

Phase IV

Establishment of monitoring center of CORS network. Final Acceptance Test on the Network RTK system shall be conducted. Precise coordinates and multipath analysis for each DGNSS CORS station in the network shall be determined as well.

Phase V

Finally, upon the completion of the Network RTK system installation, system training shall be held for system administrators and selected user groups.

Note: The proposal should not be limited to RFP details given. Vendors are welcome to suggest and propose various option and available technology. The vendors should include the design of each

components and configuration of complete system for the purpose of qualitative comparison with other bidders. The vendors are requested to include the world standard in setup of the Network RTK system. The vendors and their proposals will be rejected in case a substandard configuration or proposed practices are offered.

System Design, Configuration and Components

System Design

The proposed Network RTK system shall comprise of three main parts:

i. The CORS installations

ii. A Control centre

iii. Users applications

All parts are linked via internet connection. The proposed architecture of a Network RTK system is shown in Figure 2.

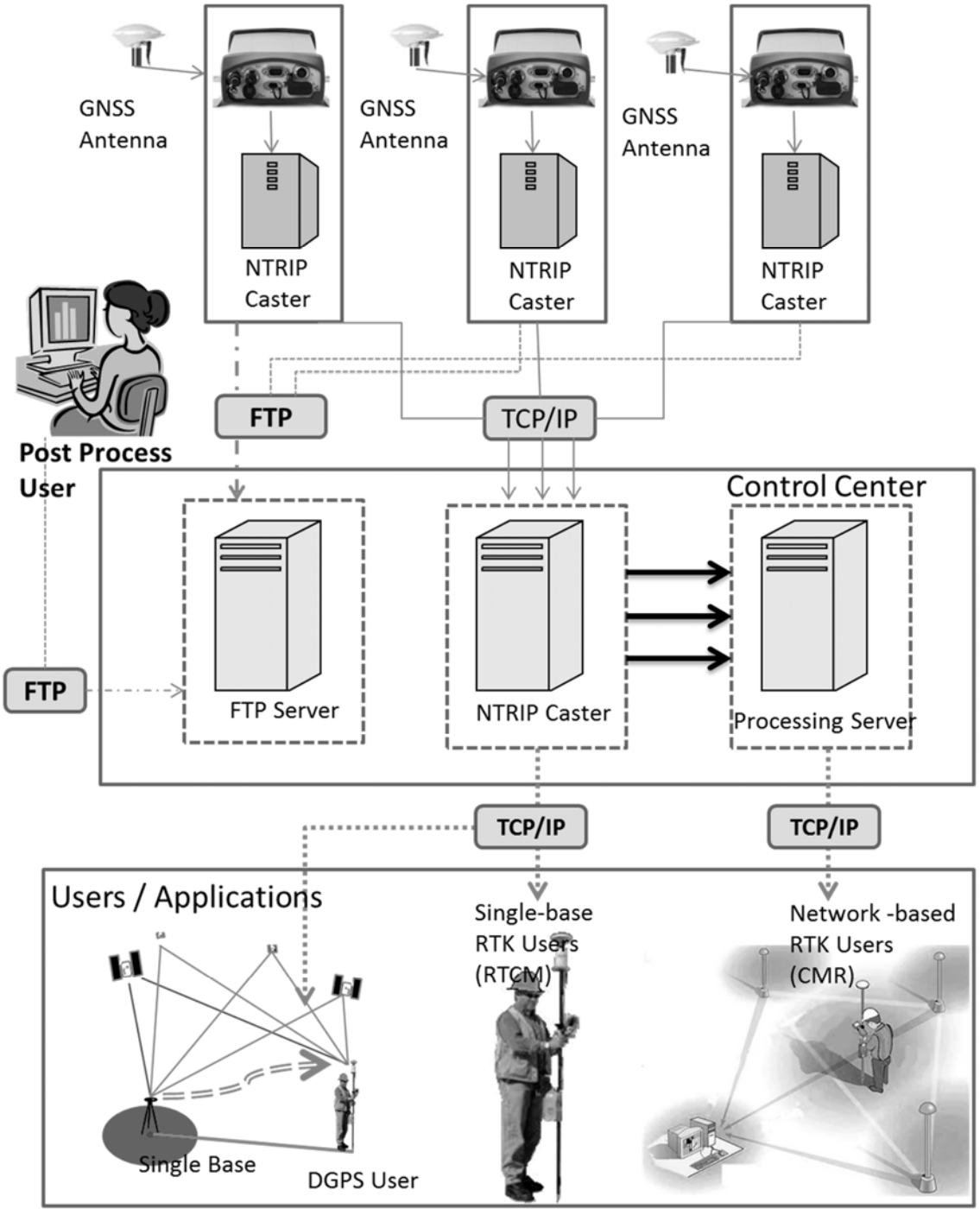

Figure 2: The proposed architecture of Network RTK system

System Configuration and Components

Control Centre

The functions of a Control centre shall be as follows:

i. To receive, process and disseminate DGNSS data.
ii. To archive DGNSS data from the CORS stations.
iii. To host Network RTK software.
iv. To manage and monitor the operation of the DGNSS stations in network.

The control centre will be setup at Gujarat State Data Centre at Gandhinagar. It will already have IT infrastructure, uninterrupted power supply and AC supply facility. The bidders supply only software, OS, DB software, Load Balancing software and other required software for control center. The application should

be able to host on x86 platform. The required computing power and storage will be provided in SDC by department. The supplied controller should also support Bhunaksha mobile application developed in android developed by NIC.

The application should be compatible with any open standard technology. The bidder has to quote and supply any OS and data base on open standard technology with 6 years of AMC/ATS support. The bidder has to envisage incremental licenses and AMC/ATS cost and the quote for the same in financial bid. Bidder may propose any edition. However, the support, update, upgrade and security will be the responsibility of Bidder.

Monitoring center for remote monitoring will be setup at Settlement Commissioner Office. The Agency would be responsible for supplying all required state of the art equipment for control room, as well as establishing and undertaking it. The Agency would be responsible for supplying uninterrupted power supply and AC facility for Monitoring center at Settlement commissioner office.

The monument for the CORS installation shall be artistically designed with optimum functionality to mount antenna and to accommodate a space/ room to house a receiver/ computer. Overall design of the monument shall represent the professionalism of the department.

DGNSS Continuously Operating Reference Station

Each DGNSS CORS base station shall adhere to the following set up:

I. Geodetic reference station grade DGNSS receiver
II. Latest Technology antenna
III. OEM Cable (Antenna to Receiver)
IV. Router/ Modem
V. Backup Power (Battery/Solar/invertor)
VI. Lightning Protector
VII. Enclosure (indoor/outdoor)
VIII. Cable Protector
IX. Civil works and fencing
X. OEM Accessories

Communication

All DGNSS CORS shall require reliable communications for data transmission. The options for communication shall include:

- LAN and 3G/4G Network router with auto switching capability will have to be provided by Agency.

It is essential that, each device server shall be connected with control centre with enough bandwidth in order to perform archiving, processing, dissemination and monitoring of the Network and Network RTK corrections in real time.

Hardware and Software Requirements

Specifications of the hardware and software shall be as follows. It has to be noted that the given specifications are for reference only and the supplier should propose the latest available technology.

a. DGNSS Receiver

1) The offered receiver must be capable of tracking minimum 25 satellites with up to 6 signals per satellite simultaneously. The offered receiver shall have 450+ physical channels to accommodate this tracking. Dynamic channel allocation is not an acceptable substitute for physical channels as it requires the receiver to cycle through channels and loads the CPU of the receiver. Multiple frequency, 450+ channel DGNSS receiver supporting the following simultaneous signal tracking:

Table 1: The DGNSS Signals tracked and recorded by the proposed hardware:

GPS	GLONASS	GALILEO	COMPASS (BeiDou)	NavIC (IRNSS)	SBAS	L-Band
1. L1 C/A 2. L2P 3. L2C 4. L5	1. L1 C/A 2. L1P 3. L2 C/A 4. L2P 5. L3 CDMA	1. L1 CBOC 2. E5A 3. E5B 4. E5AltBoc 5. E6	1. B1 2. B2 3. B3	1. L5 Upgradable to IRNSS S Band	1. L1 C/A 2. L5 3. Gagan	Any, Free Subscription

2) Receiver must be capable of tracking all satellites in view, even if unhealthy, to an elevation angle of 0°.
3) L1, L2 SNR in dB Hz referenced to a 20 Hz (or better) bandwidth SNR (amplitude) discretization should be better than 0.5% of full scale.
4) The offered receiver shall support RAIM (Receiver autonomous integrity monitoring) to detect and reject degraded signals to improve position quality.
5) When and if the DOD disables anti-spoofing, the receiver must be capable of tracking L1 and L2 phase and P code observables.
6) Receiver must support the ability to enable/disable code and carrier multipath rejection technology using a serial/IP command.
7) The offered receiver shall offer a minimum of two power inputs supporting both AC and DC operation with a minimum input power range of 10-30VDC.
8) The offered receiver shall support Power over Ethernet (PoE 802.3af) as a means of powering the receiver.
9) The offered receiver shall have power consumption less than 5 W while tracking satellites.
10) Power On and Power off voltages must be user configurable.
11) The offered receiver shall contain an internal battery and integrated internal battery charger. The internal battery shall be capable of operating the unit standalone for up to 15 hours.
12) Internal battery must be capable of operating as an internal battery backup system (UPS/Inverter) with user configurability to enable/disable this functionality.
13) Integrated charger must be user configurable based on input voltage to determine when to disable charger if voltage is too low.
14) Integrated charger must be user configurable to allow user the option of setting when the internal battery is charged. Battery charging modes required are to charge when ON or OFF, when ON, when OFF, and NEVER.
15) Support Power over Ethernet (PoE 802.3af) with user configurability to enable/disable this feature.
16) Integrated charger must be capable of charging from PoE input with user configurability to enable/disable this feature.
17) The receiver must automatically restart after loss of power and must power up in the same configuration when powered down (or loss of power).
18) The receiver front panel display must be capable of being turned off to preserve power.
19) The receiver shall offer an automatic shutdown and wakeup routine to allow the receiver to power down when not needed, and wake up at a predetermined time and continue the configured activity.
20) Support of logging rates from 50Hz to 600 seconds.
21) Must contain embedded (non-removable) memory with 16GB or higher of logging space.
22) In addition to the internal embedded memory, the receiver must have a source of removable media supporting up to 32 GB to 1TB of logging space.
23) Must support a minimum of 8 or higher independent and concurrent logging sessions.
24) Internally logged data shall have a file size of less than 1MB (unzipped) for a 24 hour, 15 second file to maximize storage capacity.
25) Must be capable of producing both RINEX and BINEX file formats internal to the receiver without the need for external tools/converters.
26) Must be capable of pushing logged and converted data files to three separate FTP servers.
27) Must be capable of sending logged and converted data files via email.

28) Receiver must support both a configurable ring buffer style memory deletion scheme as well as session specific "pools" with similar functionality. Additionally, data must be able to be protected from being overwritten in the case of an event.
29) Receiver must support the configurable input, output and logging of Met/Tilt measurements.
30) The receiver must have an integrated RJ45 connector (supporting both TCP/IP and UDP), two serial ports, USB, and an external frequency input.
31) A minimum of 10 unique TCP/IP ports. Unique meaning one multicast TCP/IP port (allows multiple connections) only counts as 1 TCP/IP port. Each port must be fully configurable independent of the other ports and outputs.
32) In addition to the 10 TCP/IP ports, the receiver shall support a minimum of 3 NTRIP Caster, 3 NTRIP Client, and 3 NTRIP Server ports.
33) Receiver must support data streaming on at least 10 TCP/IP ports supporting up to 50 connections.
34) NTP Client and NTP Server functionality.
35) Receiver must support IP filtering restricting IP packet access to and from the receiver for enhanced access control security based on individual IP addresses or subnets based on a user specified netmask.
36) A USB port supporting both Device and Host mode operation.
37) The receiver must support multiple Bluetooth connections.
38) The receiver must support FTP downloads as well as the FTP REST command.
39) The receiver must support the following streaming data types: CMR, RTCM v2.x, RTCM v3.x, BINEX, NMEA, and other type messages.
40) The offered receiver shall be capable of monitoring its own position and alerting via both graphical and email mean of any detected change in antenna position. The tolerance at which to send alerts shall be user configurable depending upon the solution type in use.
41) The receiver shall support email alerts for various functions such as tracking, power, reboots, logging, status, etc.
42) The receiver shall support on-board worldwide real-time precise point positioning (PPP), via both Internet Protocol (IP) and L-Band satellite delivery.
43) The receiver shall support dynamic domain name system (DDNS).
44) Receiver must implement a secure network connection (secure means via an encrypted, authenticated session) as well as provide various access levels to the receiver controls.
45) The offered receiver shall be small, Light Weight and Portable for easy carrying and handling weigh with an internal battery installed.
46) The offered receiver must be configurable in the field without the use of additional aids such as data collectors, computers, PDA type devices, or similar devices/technologies. This should be accomplished via a multi-line LCD style display with sufficient buttons to facilitate such configuration.
47) Receiver must meet the following environmental specification: Operating temperature: -40° C - + 65° C, Humidity: 100%, fully sealed, Shock: 1m drop to hard surface.
48) Receiver must have a Mean Time between Failure (MTBF) of at least 57,500 hours according to the Bellcore "Ground Benign" specifications.

b. DGNSS Antenna

The antenna should use the latest DGNSS technology available:
1. Chock Ring (With External radome) or Geodetic Class antenna with DM Element tracking the above mentioned signals
2. Technology which minimizes multipath signals (Multipath Mitigation)
3. Phase centre stability better than 2mm
4. Minimum tracking elevation =0 degree
5. Practical tracking elevation < 3 degree
6. Absolute calibration file from IGS must be available
7. Antenna shall operate in humidity, high winds and blowing rains
8. Temperature Range: -40° C - + 65° C
9. Humidity up to 100%
10. Shock rating MILDSTD-810-F
11. Vibrating rating MILDSTD-810-F

12. Antenna to receiver OEM cable up to 30m or higher (Low loss cable) In case more length is required the Agency should supply required length without the need for an in-line amplifier

c. DGNSS Antenna Cable OEM Quality

Coaxial cable for radio communications:
1. Impedance 50 ohm
2. Maximum frequency up to 10GHz
3. Loss at 1GHz, 20 degree C < 0.1 db/m

d. Control Centre Software

The software should support the required number of stations to cover the all districts of entire Gujarat State. The system should be able to accommodate more number of receivers to cover the entire state of Gujarat without any additional software and hardware requirement in control centre.

The Agency shall provide DGNSS hardware and software with proven compatibility between all components of the whole system.

Design and architecture of the software:

1. The DGNSS software must use the latest technology available:

- Client / Server Architecture
  - Must run automatically and continuously as a system service on server.
  - 32/64 bit operating system supported
  - Software services shall start automatically with other services when booting
  - The software must allow to be used with cloud platform.
- The software must support installation in virtual environments including Microsoft Hyper-V and VMWare
- Graphical User Interface
  - The client application shall have a GUI with typical Windows look and feel that controls the server
  - Easy to learn and use and self-explanatory panels, boxes windows and toolbars
  - Easily accessible for remote and on site system supervisors
  - Map view must include background maps for a better visibility of the network
  - Drag and drop for better configuration and organization of system setup in UI
- Three access levels for Administrators, User and Guest:
  - Shall have 3 access levels consist of Administrators, User and Guest
  - Administrator must have full control of software and receivers
  - Admin must be able to start and stop the various operations, create and change configuration, set parameters and modes etc.
  - One Admin shall be the support team of the Agency for remote maintenance
  - The Users security level allows the modification and configuration of operation relevant settings
  - Operators change log , all configuration changes must be logged in a database so the performed changes can be assigned to when and who did the change
  - The software shall have the capability to grant other interested parties viewer rights only (Guests)
  - Viewers should only be able to inspect the operation of the software, configuration parameters, system and receiver status etc.
  - Viewers should not be able to control the software and its operation

2. The DGNSS Software must perform the minimum tasks as described below:

- Controls DGNSS receivers, directly and remotely:

- The DGNSS software shall poll the receivers through an active connection and stream raw data as well as download data files without any interaction on local RTK and DGPS data that may be transmitted from reference stations to RTK rovers
- Remote firmware upgrades of the receivers must be possible using the software
- Communication between the server and the reference station receivers must have the flexibility to operate as:
  - Dial up modem
  - Internet, intranet, LAN/WAN (TCP/IP)
  - Streaming raw data from remote server shall be done either via:
    (i) Binary Raw data
    (ii) RTCM v3.x

- Configures the receiver internal and local RTK transmission using various channels. The DGNSS software must be able to perform the following receiver configuration:
  - General receiver settings
  - Satellite tracking parameters
  - Data logging parameters
- Downloads raw data, analysis, reformats, archives and distributes DGNSS data via FTP and web server. The DGNSS software must perform the following tasks automatically and periodically at user defined times and intervals
  - Retrieve primary logged data files
  - Check all downloaded data for completeness and retrieve missing data automatically from the internal receiver memory
  - Convert to RINEX or to Hatanaka compact RINEX
  - Perform splitting, appending and decimating data a required by Administrator
  - Archive files, Clean up files after user defined period of time for user defined file types based on two mechanisms; remaining free disk space and file age
  - Distribute files to FTP or WEB servers for easy access by the DGNSS user community
- Generates event log, alarms and warnings on receiver status, network status and data quality status. The DGNSS software shall perform the system monitoring and data control:
  - Monitors the various communication links and the operation of the entire system
  - Records critical events in the system SQL database and Windows event log.
  - Checks the completeness of all data downloaded from the reference station receivers
  - Generates warnings and e mail messages to selected supervisors if any unexpected events occur
  - Watchdog support for automated restart of services in case of failure
- Distributes single RTK corrections to field users via various distribution channels
- The DGNSS software shall provide access to the following communication channels:
  - Provisional dial up via individual land line modems
  - Provisional dial up via cellular GSM/GPRS modems and multiplexer
  - Provisional external radio modem support in case of single base RTK
  - Internet, Intranet, LAN/WAN (TCP/IP) or with Mobile cellular GPRS or Wi-Fi using RTCM standard NTRIP 1.0 and NTRIP 2.0
- The DGNSS software shall also provide the following real time product configuration:
  - Settings for RTK transmission format
  - Settings for DGPS transmission format
  - Management of automatic site selection depending of the rovers position
  - Rovers position will be received in NMEA format
  - Creation and management of multiple real time products (independent rate and format)
- Manages and controls end user access to the different file products services via web server. The DGNSS software shall provide the following user management services:
  - Clients can register online

- Once registration is accepted by the admin, clients can access the web server services according to their specific authorization
- Data can be requested as necessary for specific needs by simply selecting the required time interval, data rate, file format and stations.
- Easy station selection either by individual station or graphically from a map
- Virtual data files can be generated by entering the required time interval, data rate, file format and position.
- All download transactions are logged so can easily use for final billing
- Charges for data downloads can be configured by the administrator
- User management control is independent from the network processing operation
- Subscription and contracts are predefined and customizable; renewals of subscription are managed and monitored automatically
- Clients can preview what their likely data cost will be.

- The DGNSS software shall also provide automatic station quality control and network quality control:
  - Possibility to graphically view the station health status on the web server
  - Possibility to represent ionosphere and tropospheric residuals
- Manages and control end users access to the different real time services. The DGNSS software shall provide the following user management services
  - Central management of user database with registration of new real time users with different levels of authentication and authorization
  - Registration of real time users and authentication using
    - Username/password in case of ftp/ web access of files products
    - Field phone number
    - NTRIP user name and password in case of NTRIP based services
  - Possibility for one user to access real time services by using one or several channels with the same registration
  - Authorizations based in an individual list of real time products for each registered user
  - Mobile browser support, micro browser on mobile devices can be used to display network status messages in the field
  - Possibility to define a time expiry data for any license
  - Possibility to define a maximum number of licenses per user account
- The DGNSS software shall also provide the following minimum information for accounting at beneficiaries
  - General log file monthly based with the following information
    - Name of user
    - Date and time of connection type of real time services required
    - Length of connection
  - Possibility to generate an invoice based on these information and users registration information
  - Possibility to deactivate / reactivate individual users account temporarily
- The DGNSS software shall also provide the following minimum information so that to provide individual auditing:
  - Detailed log file for all user connection including the following information for each connection in HTML format
    - Name of user
    - Date and time of connection
    - Type of real time services required
    - Length of connection
    - Status of rover at each change
    - Termination of connection
  - This information is intended for auditing purpose for the beneficiaries

- The DGNSS software shall apply Ocean tide loading and earth tide loading
- The DGNSS software shall correct the remote receivers and stream raw data without any interaction on local RTK and receiver configuration and provide the following features:
    - Processing kernel should apply the zero difference based algorithms for the global real time adjustment of the network for better reliability and robustness
    - Use of all stations available within the network to compute a model of distance dependent errors and to compute corrections designed to compensate for these errors
    - The following network RTK standard method should be supported
        - concept of VRS
        - MAC
        - FKP
    - Use of minimum cut off angle of 10 degree or more
    - Use of DGNSS predicted ephemeris from the University of Bern and IGS as well as broadcast ephemeris
    - Possibility to split the network in clusters so that to have either a central or a distributed installation (for provisional backup or redundancy)
    - Allows the Network RTK solution to be valid even outside the polygon of reference stations up to 20km
    - The software must use individual reference stations velocities in the network processing
    - The software package must use DCB files in ionosphere modelling
    - The software must be able to calculate the TEC(Total Electron Content) and Ionosphere Scintillation in real time
    - The software should also derive IPWV (Integrated Perceptible Water Vapour) in atmosphere in real time
- The DGNSS software shall generates Network RTK and DGPS corrections for end users following different services levels
- The Agency should support BeiDou (Compass) ,Galileo and NavIC (IRNSS) in the Network and the software should be able to process the data whenever the constellations are ready over the Indian region
- The DGNSS software shall generate different type of corrections to allow different kind of services:
    - DGPS corrections in RTCM v2.x format
    - RTK corrections in various standard format (RTCM v2.x, RTCM v3.x)
    - Single RTK corrections from specific stations
    - Single RTK corrections from nearest station (needs to receive user's position via NMEA string)
    - Network RTK individual corrections using RTCM standard VRS concept
    - Individual Network RTK corrections are given either in RTCM v2.x or RTCM v3.x format
    - Automatic selection of best call for Network RTK corrections using the RTCM standard MAC corrections based on user's position. It means that a group of users working in the same area will receive the same corrections
    - All real time corrections shall be given in the international recognized standard called RTCM. RTCM messages in version 2.x and 3.x only are allowed. Any deviations to this standard is not recommended
- The network software should allow multiple small networks within the mesh of receivers as per users choice
- The network software should also be able to handle different zones of UTM and supply corrections accordingly to the zone
- The software package must offer to distribute make the following data available to user and /or administrators in the field using mobile apps for Apple iOS and Android operated Tablets and mobile phone:
    - Reference station activity including but not limited to:
        - Sky-plot

- Tracked and solved satellites
- PDOP
- Remaining residuals of Ionosphere and Tropospheric modelling

- Data subscription
  - Usage of data services
  - Expiry date of subscription
  - Date, time and length of sessions
- System Administration
  - Software activity and health status
  - Connected users and solution station of RTK users
  - Windows Service operation and remote restart functionality for services

DGNSS Rover Hardware

The DGNSS rover should be able to get 2 cm to 5 cm of accuracy with the following hardware solutions.

i. Multi frequency handheld portable DGNSS rover (Detail Specification Attached)
ii. Existing DGNSS Receivers with the department of Land Records, Gujarat Handheld DGNSS Rover Specification

- Should at least support GPS L1,L2,L5 and GLONASS L1, L2 in network RTK solution environment
- Should have software functionality required for normal RTK operations like Stake out, Feature coding, Area subdivide and calculation, site calibration, active background maps, linked files, support for laser distance meter etc.
- The handheld rover should be able to provide 25 cm of accuracy in network RTK without any external antenna to allow user to carry out survey activity with ease
- A customized pole should be supplied in case of precise fast static measurement in field
- The rover should have at least 5MP or higher inbuilt camera for documentation
- Should have inbuilt slot for memory expansion (8GB or higher required) and inbuilt SIM card slot for network RTK corrections
- Should have minimum of 1 GB or Higher RAM
- Update rate 1Hz to 20 Hz

Additional Hardware Requirement

During the warranty period of 6 years, all receiver firmware shall be updated. It is strongly recommended that equipment must be upgraded and /or replaced as the technology changes. Equipment changes should however be minimized as they have the potential of resulting in a change in position. If data quality decreases the receiver equipment shall be replaced/ upgraded.

Specifications of DGNSS Antenna for CORS

Antenna Type: Latest technology antenna of high quality geodetic type to mitigate multipath effects.
Antenna Phase Centre (APC): Antenna must have a valid international DGNSS service (IGS/NGS) type absolute antenna calibration

Antenna Reference Point: The antenna reference point is the external measurement point of the antenna and must have a prescribed offset from APC as part of IGS/NGS antenna calibration

Antenna Orientation: The antenna must be oriented to True North
Antenna Vibration corrections due to strong winds: Should be taken in to consideration. It is advisable to detect the vibration due to strong winds and appropriate measures should be taken by the Agency.

Environmental: Weatherproof and corrosion resistant

The antenna radome shall be able to be exposed to extreme weather conditions. Material used shall be free from corrosion due to effect of temperature variation, humidity and salinity.

Specifications for Antenna Cable:

Cable Protection: The antenna cable should be protected from weather, pest and fire using suitable tube. Antenna cable connectors should be sealed for protection against water infiltration
Cable Tension: Tension in the antenna cable should be avoided, particularly at the interfaces with the receiver and antenna

Lightning Protection: A grounded lightning arrestor can be placed in the antenna cabling between DGNSS antenna and receiver in lightning prone areas

Cable Type: The type of antenna cable used should be sufficient for the length of the integrated cable run between antenna and receiver, including some spare length

Additional Software requirement

The Operating system required for each computer server shall be the latest version of Windows server or Linux server. All software shall be updated regularly with the latest available version during the course of maintenance period as stipulated in the maintenance contract.
Network transport of RTCM via IP system shall have adopted for data streaming and disseminations over the internet. The system software shall consist of the following elements:
1. Sources Software: to allow for DGNSS data streams at a specific IP location in Network RTK system. DGNSS data stream from receivers which act as a source
2. Server Software: to transfer the data streams from source to Caster Software. Modern DGNSS receivers has this functionality built in otherwise server software can do similarly by manual data pull.
3. Caster software: It is the major system component operates for data dissemination and users authentication
4. Clients Software: to access data streams of desired sources software on the caster software. The client software usually is integrated in modem roving receivers
The software should also have advance multipath analysis module to generate reports and monitor the changes in the multipath effect at each site. The software should also process baseline in real time continuously and should inform the user in case there are changes in the coordinates of antenna at any site instantaneously. It should also have post processing functionality to process long baselines up to 500km or more.

Maintenance Contract

A maintained contact shall be required to facilitate hardware and software maintenance. The maintenance contract shall at least consist of the following elements:
i. The contract shall cover maintenance period of 6 years
ii. Necessary replacement of hardware components
iii. Regular updating of all software with the latest version available
iv. Provider shall bear for all maintenance costs.
The maintenance contract shall be effective from the date of delivery/ installation.

On-Site Installation Requirement

Each CORS site and entire network should be high quality and at least lifetime of 15 years. The Agency shall design the entire network including each CORS site in such a way that critical volume of space around the antenna should remain undisturbed. Power and internet outages should be taken into consideration though they are infrequent and short lived.
Special emphasis by the department will be given on the standard of the material used for entire installation including steel, concrete grade, hardware quality and workmanship of the Agency. Each monument and server room installation should be neat, elegant and professional as per international

standards. No loose connection or hanging cables will be tolerated in the entire setup. The Agency should communicate the certified design of each monument and server room to the department with safety standards. The sites for the installations have not been decided yet. The Agency has to propose the site according to their solution with designs of each proposed monument in their technical proposal. Department desires to install at least 5 base stations on ground, remaining base stations may be installed based on site requirement.

The monument can be of following type:

1. Roof Based

2. Ground Based

Figure 3: A typical Installation

The above figure shows a typical installation with antenna, Radome, solar panels, enclosure with batteries, antenna, router/modem, cables, charge controller, lightning arrestor, electrical earthing and safety fencing. The Agency has to construct/install a world class monument that should last for at least 15 years. The solar panels should be installed at angle depending upon the geography of the region to get the maximum solar incidence.

UNAVCO guidelines should be followed considering the conditions in Gujarat. Proper enclosures should be provided with each installation for keeping batteries, router/ modem, receiver. The enclosure should have lock and should be firmly mounted on ground/wall or concrete pillar. The quality of enclosure, battery, solar panels, cables, charge controller and router/ modem should not be compromised by the Agency. Sub-standard material or component shall be rejected by the department.

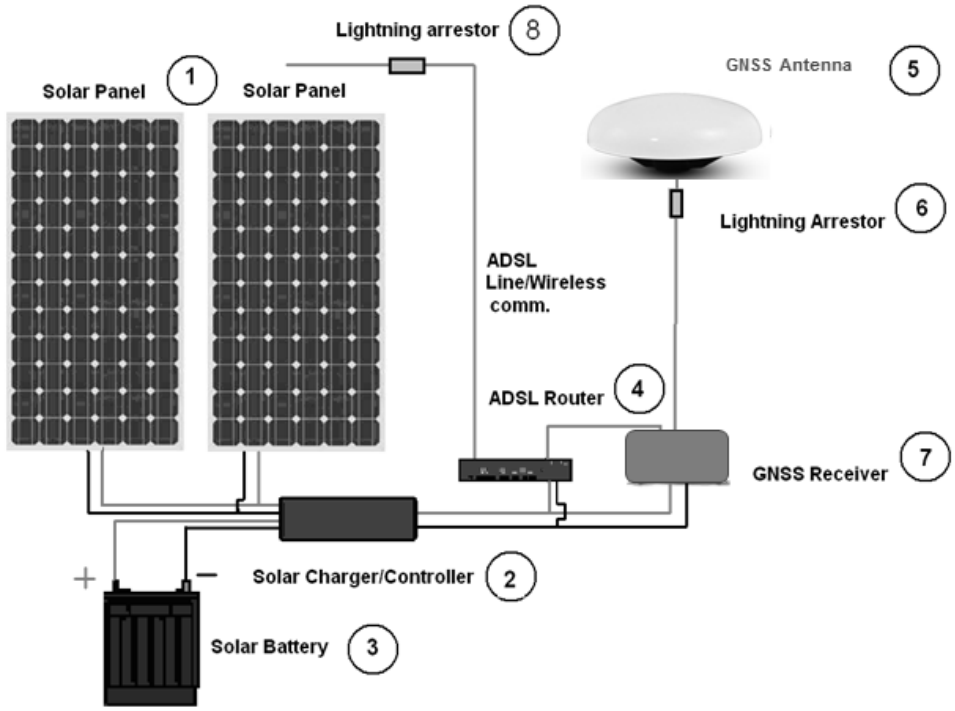

Figure 4: DGNSS Schematic Diagram (optional)

Figure 5: Enclosure with Solar Panel (Source: UNAVCO)

Antenna Mount

A device must exist between the monument and the antenna that allows: 1. the antenna to be levelled and oriented to north; ii. If the antenna is changed, the new APC must return t the exact same pint in 3-D space as the previous APC, or the change in position between the mark and the APC must be measure to within 1mm.

If the antenna is simply attached to the threaded rod when it is replaced the new antenna may not return to the same 3-D position or may be oriented differently. Both events would require a new position to be computed, which is undesirable. The antenna must be levelled to within 0.15 degree or 2.5mm/meter. Tribrach adaptors are not permitted because there is no mechanism of which we are aware to lock the adjustable wheels in place.

Orienting Antenna

The antenna must be oriented to true north using the convention of aligning the antenna cable attachment point, unless the antenna has a different inscribed North point. Remember that declination is the angle between magnetic north and true north. All antenna phase centre patters assume an oriented antenna and phase centre values can differ between north and east by up to a centimetre.

Antenna Cable

The antenna cable should not be under tension and should be safe from rodents and other hazards on site. Looping the first section of cable next to the antenna and attaching it to the mount can best avoid the problem of tension. If the cable is not encased in conduit, the care should be taken that it will not move around and be damaged. Take particular care at any point where the cable is subjected to increased friction. Typical DGNSS antenna cables have a signal loss of 9db/30m at 1GHz. Total loss for installed length of cable munt be 9db or less implying a maximum OEM cable length of 30m. If a longer cable is needed then a lower loss OEM cable must be used.
The antenna cable should directly connect to the receiver and antenna, no connectors should be inserted. The junction point of the antenna cable and antenna after the two have been connected should be sealed with waterproof material. Site operators are strongly recommended to insert a lightning arrestor in the antenna cable between the antenna and the receiver with its own independent ground. The arrestor should be located on the outside of the building at or near egress pint of the cable into the building. This should protect the receiver in the event of lightning strike on or near the antenna.

Quality Control Requirement

To ensure the data quality the following verifications shall be made on a daily basis using TEQC to check the quality of the incoming 24hrs RINEX files decimated to 15 seconds epochs. The following statistics must be calculated and recorded MP1, MP2, o/slp, IODslp. The TECQ statistics shall be supplemented with those obtained by forming the ionosphere free linear combination of L1, L2 phases by the method of double differences. This is the method used to calculate daily site coordinates. The combination performance measured shall be used to recommend equipment upgrades for prospective or existing sites whose data underperform compared to its established peers. In addition these results shall be used to search for systematic errors in the network such as a tendency for a model of receiver or antenna to underperform when compared to its peers.

Coordinate Determination for the Network

Coordinates of DGNSS CORS stations must be determined precisely using scientific software in geocentric ITRF reference frame and must be entered into the server software. This exercise has to be done periodically to detect the changes in the coordinates.

Pre-installed data quality assessment

An initial data acquisition process must be carried out to test data from a proposed CORS site and should be analysed for multipath effect, the ratio of available to recorded observations, the number and length of loss of lock or cycle slip events, and the variation of SNR of satellite signals.
Pre and post multipath analysis shall be carried for each CORS in order to identify possible station dependent errors caused by signal multipath. The report should be provided to department from time to time.

System testing

System testing must be done from time to time and report should be provided to the department. The test should be done at two levels
1. Administrator level which includes

i. Data streams from each DGNSS station
ii. Network connections availability
iii. UPS/Inverter functionality
iv. Data dissemination for user's application

2. User level testing

The proposed system must be able to support the network RTK users. However the system can also support single based RTK and DGPS users. In addition the system shall be able to provide necessary data for post processing.

General Requirements

1. The control centre should be located in Gujarat State Data Centre and Remote Monitoring at Settlement Commissioner Office in Gandhinagar
2. The Agency should establish the control centre as per internal standards with proper power connections, air conditioning, security system and appropriate hardware to support 100-150 CORS station along with at least 2000 users and 1000 concurrent users in field.
3. The system should be intelligent to give alarm in case of any disturbance at any CORS site.
4. Each CORS station shall be installed at the suitable site selected permanent government building or premises. This is to ensure that full facilities shall be provided in terms of continuous power supply, internet line, telephone line and accessibility. (Department offices Building Provisional List Attached)
5. The Agency should also establish an email I'd and telephone number for customer care for the users in field.
6. A dedicated portal for network system must be established for the department to control the day to day dissemination n of the services to the users. User ID system shall be set up for registration purpose in support of the on line transactions dealing.
7. A complete standard operating procedure must be created for system usage and similar manual to be provided on portal for the users to register and pay the bills against the usages.

38. Deployment of Software

Agency must deploy the solution at the places specified by department at the time of the contract and ensure smooth running of that solution. Agency needs to provide all the necessary things like CD media, etc. at every deployment site across the Gujarat for assuring minimum down time of the system.

39. Hosting Application (State Data Center)

The Software/Database will be hosted in State Data Center as per provisions provided by Department of Science & Technology. State Data Center will provide computing infrastructure on x86 platform. SDC will provide the entire required infrastructure such as servers, GSWAN (Gujarat State Wide Area Network) connectivity and internet connectivity etc.

The Agency has to develop the application/software compatible with x86 platform. However, the Agency is required to provide the software (server operating system and database software) for actual running the application on x86 platform with 6 years of AMC/ATS, provide the software/application and database support with 6 years of O&M period and also perform the software and other related installation / configuration at SDC. SDC will provide required SSL Security Certificate. The Application shall work on centralized architecture, in which application and database, both shall be hosted on central servers in State Data Centre (SDC). Selected Agency is required to propose the required IT hardware/server infrastructure (computer power, storage, minimum number of Cores, Memory etc.) or other hardwares, such case SDC/Department will purchase suggested hardware/server separately.

As a part of technical bid, the detail BoM required is to be proposed as below:

Sr. No.	Item	Minimum Specification required	Quantity	Remarks (If any)

The required compute power and storage will be provided by SDC. However agency has to provide required Server OS, Database and other licenses.

40. Training to all the system users

The Selected Agency shall provide training support to department personnel all the offices across Gujarat. Conduct professional training in two phases by the certified trainer. The trainer will be interviewed by the department to ensure the competence.

In this the target users are trained on the system. Hardware installation, demonstration, operation, software/system training, hands on training are provided along with the required documentation. Transfer of latest technology through professional training for the department staff during designing, installation, operation and maintenance of the newly installed hardware/software system. Transfer of latest technology program through professional training for the department staff during designing, installation and the operation and basic maintenance of the newly installed hardware/software system. Standard Operating Procedure training for user groups on the operation of the newly installed hardware/software system. The logistic for the trainer will be arranged by the Agency. However the logistic for the trainee will be arranged by the Department.

Deliverables
The following list of deliverables is expected from the agency during the entire period of operation:

1. Delivery report on feasibility study of the proposed site to be endorsed by the government prior to the designing the system.
2. Delivery of detailed system design of the completely state of art network system
3. Delivery and installation of Hardware and software on all selected sites
4. Delivery and installation of the latest technology remote operation room at Settlement Commissioner and Director of Land Records office,Sector-14, in Gandhinagar to run the network and monitoring the stations and the users with the capabilities of the troubleshooting. Data storage and servers adequate to run the number of stations proposed and the future expansion as well without any additional changes in the server software and hardware. The software to run these stations should have capability of subscription services for different options of services such as RTK, post processing with add-on applications for all available services as well services to run on mobile devices as a service to customers with billing options. The monitoring room should include the supplying and installation of latest technology 65” or above size LED displaying units. One LED should display the station location, analysis and other utilities to be used by the administrator.
5. delivery of complete drawings, manuals and other documents which are necessary for operation and maintenance including system architecture, settings at each locations, server configuration, detailed installation report, assumptions, schematic diagram, description and connections of each component etc.
6. Conduct Final acceptance report
7. Training to department users.
8. Deliver user guide manuals in English and Gujarati Language and other SOP documents and design document for the entire project.
9. Delivery of Approximately 150 rovers which should be compatible with the network and should complied with the specifications in this RFP document.

41. Solution

This RFP document presents the requirement for installation and operation of RTK network based on CORS technology in entire state of Gujarat. The proposed architecture, installations, configuration and components of the system have been outlined. The cost effective yet reliable network system is expected to support various users requirement with the latest modern space based surveying and positioning technology.
The Agency is expected to propose a full system in accordance to this RFP but not limited to its contents. A latest and state of art technology in all aspects shall be welcomed. Any additional requirement not mentioned in this RFP and if the contractor feels that it is necessary to aid the network establishment is

most welcomed to be proposed ad included in their proposal. The contractor will be invited to present their solution in details along with the schematic diagram of each component of the system and its usage before the opening of financial bid. In case the tender committee find that a particular contractor has not been able to show the strength in technical proposal than presentation will be rejected. It is requested that all the prospective vendors/ contractors shall take each part of this document seriously to propose the world class technology for the establishment of the RTK Network.

42. Warranty/AMC (Comprehensive 6 years)

42.1. Warranty: Comprehensive onsite warranty of 6 Years from the date of installation of procured equipments.

42.2. All the CORS System, surveying equipment along with their peripherals & accessories (including third party items) and all the software applications including Server Operating System, database amongst other not explicitly mentioned hereunder shall have to be covered by a warranty for 6 years after the date of successful installation and commissioning at site.

42.3. Warranty assured by agency should be reflected on OEMs website/portal

42.4. Warranty period will include preventive as well as corrective maintenance.

42.5. In case of any defect in any of the surveying equipment along with their peripherals & accessories (including third party items) during Warranty period, the supplier shall arrange to replace/repair the defective part at his cost and ensure that the equipment and peripherals are in ready to use state throughout the contract.

42.6. Bidder must ensure that the warranty support & service should be available up to delivery locations to provide repairing cum replacement services of faulty equipment within 48 hrs.

42.7. If any equipment becomes faulty for 3 times in one month during the warranty period, the bidder shall replace the same with new equipment of same or higher capability without any additional cost to the purchaser.

42.8. If any manufacturing or other technical defects are found within the warranty period, the same will have to be replaced or rectified free of cost by the bidder.

42.9. Maintenance service: Free maintenance services shall be provided by the Bidder during the period of warranty.

42.10. In case, bidder does not provide satisfactory support & does unwarranted delay in providing warranty support, Government offices reserves right to repair the equipment at risk & cost of the bidder.

43. Manpower Requirements

The Selected Agency would be required to deploy one onsite Project Manager (1) to monitor and manage the successful operationalization of the hardware/software systems during entire project period of 6 years at the main office, Gandhinagar. The Project Manager given in the proposal will be treated as final or may be resource with better or higher qualifications and experience shall be provided.

- Resource deployed for the project should fluent in Gujarati/Hindi language
- By providing the suitable reasons, the Agency may seek the permission from department for replacing the resource deployed with the equivalent resource during the project period. The decision of department will be final and binding.
- Project Manager must be a full time employee of the Agency

Sr.	Expertise / Skill	Minimum Qualifications
1	Project Manager (1)	▪ Should have an overall experience of 3 years or above and expertise in the field of implementation, administration and maintenances of CORS network.

If department required more resources then Agency has to deploy on the same rate quoted in financial bid.

The calendar of Government of Gujarat will be applicable for administrative purposes.

Note: Manpower Requirements would be changed in the future as per the requirements of the Project.

44. Project timeline (2 months)

The work schedule for the project is listed in Table below. The total project duration is 2 months:
T: LOI acceptance Date

Sr. No	Milestones	Completion Timeline
1	Phase 1: Detailed feasibility study and designing	T + 7 days
2	Phase 2: Control centre implementation	T + 20 days
3	Phase 3: Construction of Monumentation	T + 40 days
4	Phase 4: Supply all hardware/software, Installation, Testing, Analysis and running the system	T + 55 days
5	Phase 5: System Training for System Administrator and Field Training	T + 60 days
6	Warranty/AMC for 6 years.	From the date of Completion of installation : 6 years

45. Payment Terms: Payment for Goods and Services shall be made by Purchasing Department in Indian Rupees as follows:

60% payment of total project value for successfully Delivery of RTK DGPS systems, Survey Systems, software, hardware with accessories.

20% payment of total project value for RTK DGPS systems, Survey Systems, software, hardware with successful installation & commissioning and acceptance of the Department.

10% payment of total project value after providing Successful Training to the department users.

10% payment of total project value divided equally each year in Warranty/AMC period of 6 years.

1. GIL reserves the right to change any bid condition of any item even after inviting the bids, with/without prior notification.
2. GoG / GIL's Right to accept any Bid and to reject any or all Bids – GoG / GIL reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to awarding the Contracts, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for such decision.
3. The quantity mentioned in the bid are estimated based on the receipt of the requirement from Indenting Department. The quantities may decrease up to 50% of the bid quantity or increase up to 30% of the bid quantity within the period of the bid validity, depending upon the change in the requirements/grants available with the purchaser(s), which shall be binding to the bidder.
4. **Limitation of Vendor's Liability:** Vendor's cumulative liability for its obligations under the contract shall not exceed the contract value and the vendor shall not be liable for incidental, consequential, or indirect damages including loss of profit or saving.
5. All correction/addition/deletion shall require authorized countersign.
6. Force Majeure Shall mean and be limited to the following:
   a) Fire, explosion, cyclone, earthquake, flood, tempest, lightening or other natural physical disaster;
   b) War / hostilities, revolution, acts of public enemies, blockage or embargo;
   c) Any law, order, Riot or Civil commotion, proclamation, ordinance, demand or requirements of any Government or authority or representative of any such Government including restrictive trade practices or regulations;
   d) Strikes, shutdowns or labor disputes which are not instigated for the purpose of avoiding obligations herein, or;
   e) Restrictions imposed by the Government or other statutory bodies which prevents or delays the execution of the order;

f) Any other circumstances beyond the control of the party affected;

The BIDDER shall intimate Purchaser by a registered letter duly certified by the local statutory authorities, the beginning and end of the above causes of delay within seven (7) days of the occurrence and cessation of such Force Majeure Conditions. In the event of delay lasting over two months, if arising out of causes of Force Majeure, Purchaser reserves the right to cancel the order.

Delivery & Installation period may be extended due to circumstances relating to Force Majeure by the Purchaser. Bidder shall not claim any further extension for delivery & installation or completion of work. Purchase / GoG shall not be liable to pay extra costs under any circumstances.

The BIDDER shall categorically specify the extent of Force Majeure conditions prevalent in their works at the time of submitting their bid and whether the same have been taken in to consideration or not in their quotations. In the event of any Force Majeure cause, the BIDDER shall not be liable for delays in performing their obligations under this order and the delivery dates can be extended to the BIDDER without being subject to price reduction for delayed deliverables, as stated elsewhere.

It will be prerogative of Purchaser / GoG to take the decision on force major conditions and Purchaser decision will be binding to the bidder.

46. Penalty Clause

45.1. Penalties for delay in delivery and installation:

a) If the bidder fails to deliver and install the requisite hardware and software within 60 working days from the issue of the confirmed purchase order, then a sum equivalent to one percent (1%) of the total contract value shall be deducted from the payment for each calendar week of delay or part thereof. The amount of penalties for delay in delivery and installation of hardware/software shall be subject to a maximum limit of 10% of the total contract value.

b) Delay in excess of 5 weeks (after due date of delivery and installation) will be sufficient to cause for termination of the contract. In that case the Performance Bank Guarantee of the bidder will be forfeited.

c) In case, the selected bidder does not supply the ordered items for any reason, he will be liable to pay the difference amount to the purchaser, over and above the Performance Guarantee, which indenter departments\Boards\Corporations have to pay to the next or other selected bidder for purpose of the said items.

45.2. Operational / Warranty period Penalties:

a) During warranty period of 6 years, if the complaint is not resolved within 48 hrs, the penalty of Rs. 500 per day will be levied. However, if the complaint is not resolved within 7 days then from 8th day till 14th day, the penalty would be levied @ 150% and from 15th day onwards the penalty @ 200% of the above rates would be levied. The amount of penalty will be recovered from the Performance bank guarantee during warranty period.

b) The amount of Operational/Warranty period Penalty shall be subject to a maximum limit of 10% of the total contract value.

c) Successful bidder should submit the Performance Bank Guarantee @ 10% of total order value for the duration of warranty period (6 years) + extra 3 months as per bid requirements. In any case, bidder is required to maintain 10% PBG at all time during the period of contract. In case of any penalty claimed from the submitted PBG during the contract period, the successful bidder is required to submit the additional PBG of the amount equal to the penalty claimed for the duration up to the validity of original Bank Guarantee. For example, "X" amount of penalty will be claimed during the 5th month of contract period, then bidder is required to submit the additional PBG of "X" amount for the period of 34 months i.e. 39 months - 5 months.

Implementation Phase

Sr. No.	SLA Parameter	Description	Target	Liquidated damages

<table>
<tr><td></td><td>Delay in any of the project milestones</td><td>As per Project Timelines</td><td>< 7 days</td><td>Liquidated damages will be levied as per the following table:<table><tr><th>Delay in Project milestones</th><th>Liquidated damages as % of the value of the value of the Phase/milestone to which the deliverable pertains</th></tr><tr><td>> 7 day &<= 10 days</td><td>0.5%</td></tr><tr><td>> 10 days &<= 15 days</td><td>1%</td></tr><tr><td>> 15 days &<= 17 days</td><td>2%</td></tr></table>For each additional day after 17 days, liquidated damages of 1% will be levied as additional liquidated damages</td></tr>
<tr><td>2.</td><td>Training</td><td>Feedback to be taken from all attendees</td><td>>75% of training audience to give a satisfactory or above rating (per training)</td><td>In case session is rated Satisfactory or Excellent by more than 50 percent but less than 75 percent attendees, then the Agency has to take the training session again and will be paid only 50 percent of the per training cost.
In case session is rated Satisfactory or Excellent by less than 50 percent attendees, then the Agency has to take the training session again and will be paid only twenty five percent of the per training cost.
No payment would be due for re-training session.
Training documents and video graphic should be submitted separately.</td></tr>
</table>

Warranty period (6 years)

Availability

<table>
<tr><th>Sr. No.</th><th>SLA Parameter</th><th>Description</th><th>Target</th><th>Liquidated damages</th></tr>
<tr><td></td><td>Availability of all functionalities of the Supplied Software and Hardware</td><td>Availability of all functionalities for at least 99.6% of time measured on monthly basis
Note: This SLA will apply for non-availability of one or more modules e.g. if two modules/ functionalities are not available at the same time, they would be</td><td>>=99.6%</td><td>Liquidated damages will be levied as per the following table:<table><tr><th>% Availability</th><th>Liquidated damages as % of the Quarterly payments during Operations & Maintenance Phase</th></tr><tr><td><99.6% &>=99%</td><td>1% *{(99.6 –Achieved SLA)/99.6}*100</td></tr><tr><td>< 99% &>= 98%</td><td>2% *{(99 –Achieved SLA)/99}*100</td></tr><tr><td>< 98% &>= 97%</td><td>4% *{(98 –Achieved SLA)/98}*100</td></tr></table>For each additional drop of 1% in performance below 97%, 3% of Quarterly payment of Operations & Maintenance will be levied as additional liquidated damages.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>considered as one for the availability SLA calculation.</td><td></td><td></td></tr>
<tr><td></td><td>Availability of Resources</td><td>Availability of required resources at Main office, Gandhinagar etc. Attendance record to be maintained by Agency</td><td>>= 95%</td><td>Liquidated damages will be levied as per the following table:
<table>
<tr><td>% Availability</td><td>Liquidated damages as % of the Quarterly payments during Operations & Maintenance Phase</td></tr>
<tr><td><95% &>=92%</td><td>0.5%</td></tr>
<tr><td>< 92% &>= 90%</td><td>1%</td></tr>
<tr><td>< 90% &>= 87%</td><td>2%</td></tr>
</table>
For each additional 1% non-availability of resources 2% of Quarterly payment of Operations & Maintenance will be levied as additional liquidated damages.
The attendance will be maintained by the agency and monthly attendance details will be shared with Department.</td></tr>
</table>

46. The Clarifications if any should be submitted in writing to GIL at least on or before 3 days of pre-bid meeting date. Thereafter the clarifications received from the bidders will not be entertained

Your bid should be submitted on website **https://gil.nprocure.com** on or before **15:00 Hours, 14.02.2020**

Proposals after due time period will not be accepted.

The Technical Bids will be opened on **14.02.2020 at 17:00 Hours at GIL, Block No. 2, 2nd Floor, Karmayogi Bhavan, Sector-10 A, Gandhinagar** in the presence of the committee members and representatives of the bidders, who have submitted valid bids. Only one representative from each bidder will be allowed to attend the tender opening. The representative will be held responsible for all commitments made on behalf of the bidder and that will be considered valid for all further dealings related to this tender process.

Please address all queries and correspondence to

Vivek Upadhyay, DGM (Tech.),
Gujarat Informatics Limited,
Block No. 2, 2nd Floor, Karmayogi Bhavan,
Sector-10A, Gandhinagar 382 010
Phone No. 079-23259239
E-mail: viveku@gujarat.gov.in, amitp@gujarat.gov.in

Fax / Email should be followed by post confirmation copy.

SECTION III

Minimum Technical Specification

A. Establishment of Continuously Operating Reference Stations (CORS), Supply, Installation and Commissioning CORS (DGNSS Base) with required components (With 6 years onsite Warranty)

A.1 Differential Global Navigation Satellite System (DGNSS), DGNSS Receiver Technical Specification (Qty 50) (Roof Based installation: 45 qty, Ground Based installation: 05 qty)

Specification	Characteristics	Specifications
RECEIVER FEATURES & FUNCTIONS	**Receiver Type**	**Base**
	Measurements Specification	Low noise GNSS code and carrier phase measurement
	Mode of Processing	Static & Fast Static, Real Time Kinematic (RTK), Both Static & Fast Static and Real Time Kinematic (RTK)
	"RTK processing (hint: Network RTK Correction - All Commonly available industry standard Network Solution)"	Both Single Base RTK Correction & Network
	Receiver Antenna	**External**
	Antenna calibration:	Antenna calibrated by IGS/NGS (National Geodetic Survey)
	Antenna Type	Choke Ring (with external radome)/ Geodetic Class Antenna with DM Element
	Multi-path Mitigation for Receiver Antenna	Yes
	Supported positioning signal bands for the Antenna	L1,,L2,L5,G1,G2,G3,E1, E5ab,E6,B1,B2,B3
	Phase centre Accuracy Phase centre Repeatability	Less than 2 mm
	Minimum Tracking elevation	0 degree
	Minimum independent and concurrent data logging sessions	8 to 12
RECEIVER POSITIONING PERFORMANCE & ACCURACY (RMS)	Differential GPS (DGPS) Accuracy Horizontal: Vertical:	 25 cm + 1 ppm 50 cm+ 1 ppm
	High Precision / Long Observation Static Accuracy Horizontal: Vertical:	 3 mm + 0.1 ppm, 5 mm + 0.4 ppm
	Static and Fast Static Accuracy - Horizontal: Vertical:	 3 mm + 0.5 ppm, 5 mm + 0.5 ppm

	Real-Time Kinematic (RTK) Accuracy - Horizontal:Vertical:	8 mm + 1 ppm,15 mm + 1 ppm
GNSS TRACKING SIGNALS	Receiver Tracking Signals (Hint: Select applicable Signals only)	**GPS** - L1,GPS - L1 C/A,GPS - L2,GPS - L2C,GPS - L2 P, GPS - L5, **GLONASS -** L1, GLONASS - L2, **C/A,GLONASS** - L2P,GLONASS - L3, **NAVIC (IRNSS) L5, Upgradable to IRNSS L5 and S band** **Galileo:**- L5,Galileo - E1,Galileo - E5 a,Galileo E5 b,Galileo - E5 ab,Galileo- E6, **BeiDou** - B2,BeiDou - B3, *NavIC (IRNSS) Constellation preferable (L & S-Band)
	Number of Channels	450 or higher *** (a.450 or higher, b. 550 or higher ,c. 650 or higher)**
	Position Update Rate	1Hz to 20 Hz or higher ***(a. 1Hz to 20 Hz, b. Up to 50 Hz, c. Up to 100 Hz)**
	SBAS Support	GAGAN
POST PROCESSING SOFTWARE / ON-BOARD SOFTWARE FEATURES	On-Board Software Features	Support the configurable input, output and logging of Met/Tilt measurements, Web Interface for full control, Configuration and access management of receiver. Support remote configuration, Data retrieval and firmware upgrading, Secure Access via HTTPS, support IP filtering.
		control security, Support FTP downloads as well as the FTP Push command, NTRIP Caster, NTRIP Client and NTRIP Server functionality
COMMUNICATIONS	Communication Ports	USB,RS 232,Bluetooth, Combined LEMO, Wi-Fi / WLAN,RJ45,Mini/Micro/ "C Type" USB
	Communication Protocols	NMEA,RINEX,RTCM2.x, RTCM 3.x or Better
	Phone Modem Antenna	External Antenna
	Radio Modem Antenna	External Antenna
	External Data Links supported	GSM,GPRS,LTE,UMTS,H SDPA,ADSL,UHF
RAM / STORAGE	Data Storage Medium	Internal/Removable, External / Memory Stick
	Internal / Removable Storage Capacity	16 GB or Higher
	External / Removable Storage Slot	SD / Mini SD / Micro SD / SDHC /USB
	External Storage / Memory Stick Capacity Supported by Receiver	32 GB or higher
BATTERY	Power Source	Internal / Removable- Rechargeable Battery, External - Rechargeable Battery
	Chemistry of Battery	Li-ion, Ni-MH, Lead- Acid, SMF
	Capacity of Battery Volt, (Ah)	3.6V - 100V 3000 to 7000 mAh
	Battery Back Up Time	10-72 hrs

	Number of Batteries required for operation	1
	Number of Batteries to be Supplied	2 or higher
OTHER FEATURES & FUNCTIONS OF THE RECEIVER	Other Features & Functions	Base Station serves multiple Rovers, Base Station Compatible to Base / Rovers of other makes, Interchangeable /Configurable as Base or Rover, Provision to Indicate the Connectivity with Base Station, Multi-path Mitigation for Receiver and Antenna, All Control functions available with Receiver, Supporting both AC and DC operation (with a minimum input power range of 10-30 +VDC), Hot - Swappable b/w External and Internal Power Sources without affecting Data Recording
GENERIC	Size of Receiver (length x width x depth) (mm X mm X mm)	Compact, portable easily carrying and handling
ENVIRONMENTAL PARAMETERS	Minimum Operating Temperature	**-40° C (Optional)**
	Maximum Operating Temperature	**65° C (149° F) (Optional)**
	Minimum Storage Temperature	**65° C (149° F) (Optional)**
	Maximum Storage Temperature	**65° C (149° F) (Optional)**
	Non Condensing Humidity, Rh	**95%**
	Ingress protection	IP65 Certified waterproof/dustproof or better ***(IP65, b. IP 67, c.IP68)**
	Drop & Shock	**Withstand 1 meter drop onto hard surfaces**
ACCESSORIES (OEM)	Accessories - inclusive in the scope of supply	Serial Cable and other standard OEM Accessories
	Antenna Mount	Fix Base station installation with required Monumentation as on Field Tribrach with Optical Plummet and Adapter
	Hardware Installation	Outdoor/indoor wall mounted Enclosure with exhaust fan.(to prevent over heating)
	Length of suitable connecting Cable for Antenna (meters) - inclusive in the scope of supply	30 meter or higher (OEM Low loss cable without the need for an inline amplifier)
	Wire Coverings for Cable and Wire Protection	Metal Surface Raceway ChannelSize should be as per requirement Length: As per installation Site Requirement
	Uninterrupted Power Source	Inverter With minimum 24 Hour Backup
	Lightning Protector.	Lightning protector and the Geodetic Monument

INSTALLATION & COMMISSIONING & STC	Installation & Commissioning	with installation and commissioning
	STC of the product read, understood and agreed	YES
WARRANTY / TRAINING	On-site Warranty	**6 years**
	Training	**Installation, Functioning and operational training at site**
TEST REPORTS	Compliance to Dust test	MILSTD-810 G (optional)
	Compliance to Water Intrusion test	MILSTD-810 G (optional)
	Agreed to furnish OEM Test report to the Buyer on demand	Yes

A.2 Industrial Grade Modem/Router for Base Station Communication with Server (Qty: 50)

Form Factor	Compact rugged industrial grade form factor
Ethernet Ports	3 x LAN Gigabit Ethernet Ports 2 x WAN Gigabit PoE/PoE+ Ethernet Ports
LTE Connectivity	Should have minimum dual 4G LTE interface
LTE Bands	● Should support FDD LTE 1, 3, 5, 7, 8, 18, 19, 21, 28 bands. ● Should support TDD LTE band 38, 39, 40, 41 bands
Layer 2 Features	● Should support 802.1Q VLANs ● Should support MAC filtering ● Should support 802.1X ● Support Standard 802.1d Spanning Tree Protocol

Layer 3 Features	● Network Address Translation ● Dynamic Host Configuration Protocol (DHCP) server, relay, and client ● Access Control Lists (ACLs) ● IPv4 and IPv6 Multicast ● Should support RIPv1 and RIPv2 ● Open Shortest Path First (OSPF) ● Border Gateway Protocol (BGP)
IPv6	Should have IPv6 support
Operating temperature range	-40° to 60°C

A.3 DGNSS Integrated Rover including 2 battery, charger and other OEM Accessories (Qty: 150)

Characteristics	Specification Name	Specification Detail
RECEIVER POSITIONING PERFORMANCE & ACCURACY (RMS)	**Measurements Specification**	Low noise GNSS code and carrier phase measurement
	Differential GPS (DGPS) Accuracy Horizontal: Vertical:	25 cm + 1 ppm 50 cm+ 1 ppm
	High Precision / Long Observation Static Accuracy Horizontal: Vertical:	3 mm + 0.1 ppm, 5 mm + 0.4 ppm
	Static and Fast Static Accuracy - Horizontal: Vertical:	3 mm + 0.5 ppm, 5 mm + 0.5 ppm
	Real-Time Kinematic (RTK) Accuracy - Horizontal:Vertical:	8 mm + 1 ppm,15 mm + 1 ppm
RECEIVER FEATURES & FUNCTIONS	**Receiver Type**	Rover
	Interchangeable / Configurable as Base or Rover	Yes
	Base Station able to serve multiple Rovers	Yes
	Provision to Indicate the Connectivity with Base Station	Yes
	Mode of Processing	Static & Fast Static, RTK with Network RTK Correction

	RTK processing	Yes
	Built-in standalone L-band facility and satellite based correction	Yes
	Receiver Antenna	Integrated
	Multi-path Mitigation for Receiver Antenna	Yes
	Post Processing Software with free updates up to Warranty period inclusive in the scope of supply	Yes
	Compatible to Electronic Total Station (ETS) of Other Makes	Yes
	All Control functions available with receiver	Yes
RECEIVER TRACKING CAPABILITIES	Base Line Processing Range (Static)	500 Km or higher
	Number of Channels	450 or higher *** (a.450 or higher, b. 550 or higher ,c. 650 or higher)**
	Initialisation Time	40 seconds or less
	Maximum Position Update Rate	1 Hz or better ***(a.1 Hz to 5 Hz. b. up to 10Hz, c. up to 20 Hz)**
	Tilt Sensor	Yes,
	Tilt Position	tilted up to 15°
	Position Acquisition Method	Fix
GNSS TRACKING SIGNALS (RECEIVER)	GPS Tracking Signals (NAVSTAR)	L1,L1 C/A,L2,L2 C/A,L2E,L2P,L5
	GLONASS Tracking Signals	L1C/A, L1P, L2C/A, L2P, L3
	NavIC (IRNSS) Tracking Signals	L5, Upgradable to IRNSS S band
	Galileo Tracking Signals	E1, E5A, E5B, E5 AltBOC, E6
	BeiDou Tracking Signals	B1,B2,B3
	L-band tracking Signals	Yes
	SBAS Support	GAGAN
	*NavIC (IRNSS) Constellation preferable (L & S-Band)	

SUBSCRIPTION LICENSE FOR SATELLITE BASED CORRECTION	Subscription license for satellite based correction, inclusive in the scope of supply	NA
	If Yes, Validity of License period	NA
COMMUNICATIONS	Communication Ports	RS 232,Bluetooth,Combined LEMO,Wi-Fi / WLAN
	Communication Protocols	NMEA 0183,RINEX, RTCM 2.x, 3.x or Latest Version, BINEX
	Phone Modem Antenna	Internal Antenna or External Antenna
	Radio Modem Antenna	Internal Antenna or External Antenna
	Built-in Data Links - Phone & Radio Modems	GSM,GPRS,LTE,UMTS,HSDPA,UHF
RAM / STORAGE	Data Storage Medium	Internal
	Internal Storage Capacity	6 GB or higher
	External / Removable Storage Slot	Memory stick
	External / Removable Storage Card Capacity supplied with Receiver - inclusive in the scope of supply	8 gigabyte or higher
GENERIC	Weight of Receiver (including Battery)	Compact, portable easily carrying and handling
	Radio Power	1 Watt to 5 Watt Enable both function Receiving and Transmitting
	Additional Features of Receiver, if any	SBAS:L1C/A, L5 (optional)
BATTERY	Power Source	Internal - Rechargeable Battery
	Supports 12 V External Battery	Yes
	Chemistry of Battery	Li-ion
	Capacity of Battery Volt, (Ah)	**7.4 V** **3500 mAh or higher**

	Battery Back Up Time	6 hour or Higher
	Number of Batteries required for operation	1
	Number of Batteries to be Supplied	2
	Battery Chargers for Rechargeable Batteries (inclusive in the scope of supply)	Yes
	12 V Vehicle Charging Kit inclusive in the scope of supply	Yes
	Hot - Swappable b/w External and Internal Power Sources without affecting Data Recording	Yes
ENVIRONMENTAL PARAMETERS	Minimum Operating Temperature	**-40° C**
	Maximum Operating Temperature	**65° C (149° F)**
	Minimum Storage Temperature	**-40° C (-40° F)**
	Maximum Storage Temperature	**80° C (176° F)**
	Non Condensing Humidity, Rh	**100%**
	Ingress protection	IP65 Certified waterproof/dustproof or better ***(a.IP65, b. IP 67, c.IP68)**
	Drop & Shock	Withstand 1 meter drop onto hard surfaces
OEM ACCESSORIES	Stop and Go Pole supplied - inclusive in the scope of supply	Low weight Carbon pole: Length 2 Meter Quantity: 2 Nos. Per Rover Yes
	Clamp for Controller supplied - inclusive in the scope of supply	Yes Quantity: 2 Nos. Per Rover
	USB Data Transfer Cable - inclusive in the scope of supply	YES

	Power Cable, Connectors and Cables for Connecting to Car Batteries - inclusive in the scope of supply	YES
	Light Weight carrycase / Roll Over Trolley for Transporting Equipment and Accessories	YES
	List of Items and Quantity of each item included in the offer	All Standard OEM Accessories
WARRANTY / TRAINING	Warranty	**6 years**
	Training	**Installation, Functioning and operational training at Site**
TEST REPORTS	Compliance to Dust test	**MILSTD-810 G**
	Compliance to Water Intrusion test	**MILSTD-810 G**
	Agreed to furnish OEM Test report to the Buyer on demand	**Yes**

A.4 DGNSS Rover Controller (5" to 8" Display Controller with Battery, charger and required cables) (Qty: 150)

Characteristics	Specification Name	Specification Detail
COMPATIBLE MAKE / MODEL	Compatibility with GNSS Receiver	Yes
CONTROLLER SOFTWARE AND FEATURES	Field Software with free updates up to warranty period inclusive in the scope of supply Controller	Yes
	Allow Configurable Survey Style for Static Mode	Yes
	Allow Configurable Survey Style for Post - Processed Kinematic (PPK) Mode	Yes

	Allow Configurable Survey Style for Real - Time Kinematic (RTK) Mode	Yes
	Allow Configurable Survey Style for Standalone L- band Processing mode and satellite based correction	Yes
	Capable of Multi-tasking so that Multiple Operations can be Opened at a time, e.g., COGO, Stakeout, Point Manager etc.	Yes
	Datum and Projection Support and Support Grid Coordinates	Yes
	Graphical Support to Visualize Work while Working	Yes
	"Support Feature Coding with Attributes for GIS Data Collection, 3D Control coding possible for automatic plot creation "	Yes
	Support COGO Functionality and Able to Key in Lines, Sub Divide Lines and Creating Parallel Lines for Staking out Purpose	Yes
	User Friendly and Menu Driven for Easy Field Operation	Yes
	Able to Store GNSS Data Collected by the RTK System	Yes
	"Support Graphical Stakeout, for Points, Lines and DTM as well and Able to Perform Real Time"	Yes
	Able to Accept Background Maps in CAD and GIS Format (Online and Offline)	Yes
	Ability to Convert Grid to Ground and Vice Versa Conversion On board	Yes
INTEGRATED PERIPHERALS/ CONNECTIVITY	Camera	with
	Camera Capacity (MP)	5.0 or higher
	Flash	Yes
	Integrated GPS	Optional
	Integrated Compass	Yes
	Integrated Accelerometer	Yes
	Integrated Cellular Modem	Yes
RAM / STORAGE	Memory - RAM	8 GB
	Internal Storage Capacity	32 GB
DISPLAY / KEYPAD	Type of Display	LED
	Colour Display	Yes
	Touch Screen Display	Yes
	Sunlight-readable Display	Yes
	Display Resolution	WXGA
	Display Size(in inch)	5.0 to 8.0 Inch or External Display

		*** Integrated Display with both hard and soft Keyboard (size) *(a. 4.5 inch to 5.5 Inch, b. 5.6 inch to 6.5 Inch, c. 6.6 Inch to 8 Inch)**
	Keyboard	Full Alphanumeric hard keyboard or virtual keyboard is allowed but the digits should be large sized and should be visible in daylight
BATTERY	Power Source	Internal - Rechargeable Battery
	Controller Supports 12 V External Battery	No
	Chemistry of Battery	Li-ion
	Battery Back Up Time	8
	Number of Batteries required for operation	1
	Number of Batteries Supplied	2
	Battery Charger for Rechargeable Batteries inclusive in the scope of supply	Yes
	12 V Vehicle Charging Kit inclusive in the scope of supply	Yes
	Hot - Swappable b/w External and Internal Power Sources without affecting Data Recording	Yes
	OPERATING CONDITIONS	
	Minimum Operating Temperature	-30
	Maximum Operating Temperature	60
	Non Condensing Humidity, Rh	90
WARRANTY / TRAINING	Warranty	**6 years**
	Training	Installation, Functioning and operational training at Site
TEST REPORTS	Compliance to Dust test	MIL-STD-810 F, MILSTD-810 G, IEC-60529 or Equivalent Spec
	Compliance to Water Intrusion test	MIL-STD-810 F, MILSTD-810 G, IEC-60529 or Equivalent Spec
	Compliance to Vibration / Shock test	MIL-STD-810 F, MILSTD-810 G,

	Availability of Test Reports from Central Govt. / NABL approved / ILAC accredited Lab to prove conformity to the specification	Yes
CONTROLLER SOFTWARE AND FEATURES	Operating System	Windows or Android Based (windows 8,8.1 or higher, Android9 Pie or Higher)
INTEGRATED PERIPHERALS/ CONNECTIVITY	Connectivity	USB, RS232, Ethernet, Wi-Fi, Bluetooth, GSM,GPRS,LTE,
GENERIC	Weight (including Battery)	Compact, portable easily carrying and handling
	List of Items and Quantity of each item included in the offer	With OEM Accessories
OPERATING CONDITIONS	Ingress Protection	IP 65 or higher ***(a.IP65, b. IP 67, c.IP68)**

A.5 GPRS RTK Dynamic Control Software with Server Operating System and Database (Multi Base Control and Transmitted Correction with URL or Single Static IP)

Software	Application with Server OS and Database	Compatible with X86 Platform
Real Time Correction Transmitted Dynamic Control App	**Application Functions**	I). The software should support the required number of stations to cover the entire State of Gujarat. The system should be able to accommodate more number of receivers to add in the entire state of Gujarat without any additional software and hardware requirement in control centre. II). The software should be capable of handling and configuring GNSS reference stations for GPS(Navstar), GLONASS GALILEO, BeiDou, NavIC etc. III).Software should be able to handle receivers of different make and models of GNSS receivers. IV).The software should support automatic RINEX conversion based upon the user defined sampling interval and file length. At the same time the software should be able to store the data in (Reduced Volume Data and Save Storage Space) proprietary format. V).The software should be able to retrieve the data stored on the GNSS reference station as well as log data onto a server from the incoming data stream. In the event of real time communication/real time data transfer failure, the software should be able to download the missing data automatically, once the communication is restored.
		VI). The software should automatically generate the Quality Check Reports for the stations. VII).The software should provide an overview of all installed device in the system as well as health status information for all connected receivers, single station Real Time Output (RTO) modules and storage modules..
		The Supplier shall provide GNSS hardware and software with proven compatibility between all components of the whole system.

The GNSS Software must perform the minimum tasks as	**Controls GNSS receivers remotely**	i) The GNSS software shall poll the receivers through an active connection and stream raw data as well as download data files without any interaction on local RTK and DGPS data that may be transmitted from Base stations to RTK rovers II) Remote firmware upgrades of the receivers must be possible using the software III) Streaming raw data from remote server shall be done either via: 1). Binary Raw data 2). RTCM 2.x v3.x IV) Communication between the server and the reference station receivers must have the flexibility to operate as: a). Internet, intranet, LAN/WAN (TCP/IP) or b). Mobile Cellular GPRS or Wireless technology using RTCM standard NTRIP Protocol c). Dial up modem d). RS232 (Serial Port)
	The GNSS software must be able to perform the following receiver configuration	i) General receiver settings II) Satellite tracking parameters III) Data logging parameters
	Downloads raw data, analysis, archives and distributes GNSS data	The GNSS software must perform the following tasks automatically and periodically at user defined times and intervals i). Retrieve primary logged data files II). Check all downloaded data for completeness and retrieve missing data automatically from the internal receiver memory III). The software should create the RINEX Products out of the raw data automatically which can be of variable length from a single raw data. IV). Distribute files for easy access by the GNSS user community
	Generates event log, alarms and warnings on receiver status	Network status and data quality status. The GNSS software shall perform the system monitoring and data control I). Monitors the various communication links and the operation of the entire system II). Records critical events in the system SQL database and Windows event log. III). Checks the completeness of all data downloaded from the base station receivers
	Distributes single RTK corrections to field users via various distribution channels	The GNSS software shall also provide the following real time product configuration i). Settings for RTK transmission format ii). Settings for DGPS transmission format

	The GNSS software shall also provide automatic station quality control and network quality control	i) Should include key quality and quantity information, which should include data completeness, satellite tracking, cycle slip, multipath and receiver clock. ii)Possibility to graphically view the station health status on the web server iii)Possibility to represent ionosphere and tropospheric residuals
	Manages and controls	I). Manages and control end users access to the different real time services like Number of user connected and their status. Possibility to deactivate / reactivate individual users account temporarily II). The GNSS software shall generates Network RTK and DGPS corrections for end users III). The bidder should support all satellite data like GPS, Glonass, NavIC, BeiDou and Galileo in the Network and the software should be able to process the data whenever the constellations are ready over the Indian region
	The GNSS software shall generate different type of corrections to allow different kind of services	a). DGPS corrections in RTCM v2.x format b). RTK corrections in various standard format (RTCM v2.x, RTCM v3.x) c). Single RTK corrections from specific stations d). Single RTK corrections from nearest station (needs to receive user's position via NMEA string) With the "multi-station" approach, the user should be automatically routed to the "best fit" reference station in the network that is closest to the field user's location. e). Network RTK individual corrections using RTCM standard VRS concept f). Individual Network RTK corrections are given either in RTCM v2.x or RTCM v3.x format g). All real time corrections shall be given in the international recognized standard called RTCM messages in version 2.x and 3.x only are allowed. Any deviations to this standard is not recommended
		The network software should also be able to handle different zones of UTM and supply corrections accordingly to the zone

B4: 65 " or Higher Professional LED Display (Qty: 1)
Diagonal Screen Size : 65" or higher
Panel Type : LED
Resolution : 1920 x 1080 or higher
Contrast Ratio : 1000:1 or higher
Input & Output : HDMI-2, , Audio in & out, 1 USB, RJ 45/RS 232
Power cable, HDMI Cable, Audio Video cable of required length
Audio: Two in -built speakers capable enough to cater a room
Remote Control with Batteries
should be certified for BIS
Brightness : 300 nits or higher
Display should run 16*7 without any problem.
Note : Agency will have to supply table top/wall mount Stand along with Display

B5: Computer Hardware (Qty: 1)		
1	Form Factor & System chassis	Micro ATX/ SFF System chassis with suitable power supply to sustain full load including possible future up gradations. Complete system should be energy star 6.0 compliant / BEE Star certified
	CPU	Intel® Core™ i5 Processor (9M Cache, 3.1 GHz) or higher
	Motherboard & chipset	Suitable chipset for above mentioned processor based motherboard
	Bus Architecture	Integrated onboard graphics, Total 2 no.s of PCI/PCIe slots,
	Memory	Min. 8 GB DDR4 @ 2400 MHz or higher RAM with 1 DIMM slot free. (Single Module Should be supplied)
	Hard disk	1000 GB or higher SATA hard disk with 7200 rpm
	Keyboard	USB or Ps/2 104 Keys keyboard
	Mouse	USB or PS/2 Two button scroll optical mouse with pad
	Ports	Total 4 USB port with at least 2 USB 2.0 port (min. 2 at front), VGA/HDMI/DP port, Microphone, Headphone OR Universal Audio Jack
	Networking features	Network Integrated Gigabit Ethernet controller
	O.S.	Pre-loaded 64-bit Microsoft Windows 10 Professional licensed software with latest updates and Restore/ Recovery CD/ Self Mechanism
	Data Recovery Software	Pre-loaded software tool that has provision for scheduled backup for restoring OS & data. Should have capability to take backup to external media. (Please specify name of Data Recovery Software)
	Optical Drive	8x or better Internal DVD Writer

	20” or higher wide screen LED Backlit based TFT Monitor	20” or higher wide screen LED Backlit based TFTs, Contrast Ratio – 1000:1 or better, Resolution – 1360 X 768 or better, TCO Displays 5.0 certified or better
	Certifications	RoHS, UL / CE / FCC or equivalent third party certification from reputed Agency, Windows 10 Certified
	Dust Cover	Dust Cover for CPU, Monitor
	Speakers	Internal / External Speakers Note: In case of external speakers, 1. Bidder will have to provide 2 no.s of Speakers (4W RMS or better). 1. It should not consume any PCI slot /USB port OR bidder will have to provide one extra PCI slot/USB port to operate speakers

SECTION IV

FINANCIAL BID FORMAT

#	Particulars	UoM	Quantity (a)	Unit Price with 6 Years Warranty (In Rs. Without tax) (b)	Total Price with 6 Years Warranty (In Rs. Without tax) (c=a*b)	Rate of GST (%)
(A)	**Establishment of Continuously Operating Reference Stations (CORS), Supply, Installation and Commissioning CORS (DGNSS Base) with required components (With 6 years onsite Warranty)**					
1.	DGNSS Receiver & Antenna for CORS Station with 2 Batteries and OEM Cable 30 Mt.	Nos	50			
2.	Industrial Grade Modem / Router for Base Station Communication with Server	Nos	50			
3.	DGNSS Integrated Rover including 2 Battery and charger	Nos	150			
4.	5" to 8" Display Controller with Battery, charger and required cables.	Nos	150			
5.	Network RTK Application (software) (Support with 150 Base Station & 2000 Users) with Operating System, DB Software and other required software.	Nos	1			
6.	Surveying Accessories per Rover (Carbon pole: quantity :2, Controller bracket:1, Bipod: 2)	Nos	150			
	Total (A)					
(B)	**CORS Base Station Installation**					
1	CORS Installation on Roof Based with Civil work, Fencing: Antenna Installation Kit, Cable Protector, Lightning Protector, indoor enclosure, inverter with battery and required accessories.	Nos	45 Base Station			
2	CORS Installation on Ground Based with Civil work, Fencing: Antenna Installation Kit, Cable Protector, Lightning Protector, outdoor enclosure, solar panel with	Nos	05 Base Station			

	charger/controller, battery and required accessories *As per international standard (UNAVCO)					
3	Project Manager for Monitoring Centre	Nos	01			
4	65" Monitoring LED Screen	Nos	01			
5	Computer Hardware	Nos	01			
Total (A) + (B)						

Note:

- **For Financial evaluation, Total (A) + (B) without taxes will be considered. All rates will inclusive 6 Years Warranty/AMC.**
- **The Bidder shall explicitly mention the applicable rate of tax.**
- **Supply and installation of the above mentioned materials should be carried out by the successful bidder at various locations across the Gujarat State.**
- **The above mentioned quantity of the item is indicative and for evaluation purpose only. However, at the time of order, the quantity may get change depending upon the requirements.**
- **Department has reserves the right to increase or decrease quantity of DGNSS Base and DGNSS Rover**

SECTION V

Bid Processing Fees & Earnest Money Deposit Details

Sr. No.	Item	Amount (In Rs.)	Name of the Bank & Branch	Demand Draft No.
1	Bid Processing Fees			
2	Earnest Money Deposit (E.M.D.)			

ELIGIBILITY CRITERIA

Form No. E1: Financial strength of the bidder

Financial Year	Turnover (Rs. In Crores)	Audited Accounts uploaded? (Yes/No)
2016-17		
2017-18		
2018-19		
Grand Total		

Note: Please fill this form and upload the Audited Annual Accounts / Balance Sheet along with Profit & Loss Account for the last three financial years.

Form No. E2: Financial strength of OEM

Financial Year	Turnover (Rs. In Crores)	Audited Accounts uploaded? (Yes/No)
2016-17		
2017-18		
2018-19		
Grand Total		

Note: Please fill this form and upload the Audited Annual Accounts / Balance Sheet along with Profit & Loss Account for the last three financial years.

Form No. E3: Office in GUJARAT

Sr. No.	Address	Contact Person	Contact Nos.	Email ID	Type of supporting document attached
1					
2					

Note: You may mention more than one office (if applicable) by adding multiple rows which may be added by "NUMBER OF ROWS TO ADD".

Form No. E4: Experience Details (Customer References)

Sr. No.	Name of the Organization	Contact Person	Contact telephone no. & Address	Date/Period of implementation	No. of DGNSS CORS Base stations	Type of Supporting Document attached
1						
2						
.						

Note: Please fill this form and submit the supporting documents for each customer reference in scanned format. Failing the same may lead to the rejection of the bid. You may add the customer references by adding multiple rows which may be added by "NUMBER OF ROWS TO ADD".

Form No. E5: Warranty Support & Service up to delivery locations

Sr. No.	Address	Contact Person	Contact Nos.	Type of supporting document attached
1				
2				

Note: You may mention more than one office (if applicable) by adding multiple rows which may be added by "NUMBER OF ROWS TO ADD".

Form No. E6: Authorization Letters

Item	Make & Model	Name of OEM	Authorization letter Submitted? (Yes/No)

Note: Please fill this form and upload the OEM Authorization Letter in scanned format.

Form No. E7: Bidding Product Details information Sheet

Sr. No	Description		Information
1	DGNSS Reference Station Base Receiver		
	a.	Bid Product Name	
	b.	Model/Version Number	
	c.	Launch Date and Year	
	d.	Country of origin	
	e.	Malicious code certificates	
2	DGNSS Reference Station Antenna		
	a.	Bid Product Name	
	b.	Model/Version Number	
	c.	Launch Date and Year	
	d.	Country of origin	
	e.	Antenna calibration reports of NGS or IGS	
3	GPRS RTK dynamic control Application (Software)		
	a.	Bid Product Name	
	b.	Model/Version Number	
	c.	Launch Date and Year with latest update date	
	d.	Country of origin	
	e.	Number of user working in simultaneous?	
	f.	Malicious code certificates	
4	integrated DGNSS Rover Receiver		
	a.	Bid Product Name	
	b.	Model/Version Number	
	c.	Launch Date and Year	
	d.	Country of origin	
	e.	Malicious code certificates	
	f.	Antenna calibration reports of NGS or IGS	
5	DGNSS Rover Controller		
	a.	Bid Product Name	
	b.	Model/Version Number	
	c.	Launch Date and Year with latest update date	
	d.	Country of origin	
	e.	Malicious code certificates	
6	4G LTE Dual Modem		

Form No. E8: Technical Proposal, Description of the Approach, Methodology for the solution proposed and Work Plan for Performing the Assignment

Proposed Solution

The bidder should be provide detailed description for all the parameters mentioned bellow.

- Understanding of the project (how the solution proposed is relevant to the understanding)
- Solution architecture conceptualized for the project. Meeting the department requirement
- Deployment
- Warranty and maintenance, facilities management
- Security architecture
- SLA management methodology
- Application deployment and testing Strategy
- Integration architecture with other system

Bidder also has to provide the following information as per the solution provided in the technical bid

Sr. No.	Proposed Solution (provide the Product Name or custom Built, in case of a new development)	Version & Year of Release	OEM	Feature & Functionalities	Whether the solution is in compliance	Reference in the submitted proposal (Please provide page number/section number/volume)

Form No. E9: Detail Bill of Material (BoM) regarding IT Infrastructure/hardware

As a part of technical bid, the detail BoM required is to be proposed as below:

Sr. No.	Item	Minimum Specification required	Quantity	Remarks (If any)

The required compute power and storage will be provided by SDC. However agency has to provide required Server OS, Database and other licenses.

Form No. E10: Relevant Project Experience in DGNSS/DGPS installation of the equipment

Name of department (with address contact persons and numbers		
Order value		Product information
Start Date:	Completion Date:	Order value:
Detailed Description of Projects:		

SECTION VI

Performa of Compliance letter/Authenticity of Information Provided

(On Non judicial Stamp paper of Rs. 100/- duly attested by the First class Magistrate/Notary Public)

Date:

To,
DGM (Tech.)
Gujarat Informatics Ltd.
Block No. 2, 2nd Floor,
Karmayogi Bhavan,
Sector-10 A, Gandhinagar

Sub: Compliance with the tender terms and conditions, specifications and Eligibility Criteria

Ref: Bid for Selection of Agency for Supply, Installation/System Integration, Commissioning, Maintenance, Training and Operation of Continuously Operating Reference System Network. DGNSS Rover, Controller and Surveying Accessories for updating and Maintenance of GIS based Maps on behalf of Settlement Commissioner and Director of Land Record, Revenue Department, Govt. of Gujarat, Gandhinagar.

Dear Sir,

With reference to above referred tender, I, undersigned <<Name of Signatory>>, in the capacity of <<Designation of Signatory>>, is authorized to give the undertaking on behalf of <<Name of the bidder>>.

We wish to inform you that we have read and understood the technical specification and total requirement of the above mentioned bid submitted by us on **DD.MM.YYYY.**

We hereby confirm that all our quoted items meet or exceed the requirement and are absolutely compliant with specifications mentioned in the bid document.

We also explicitly understand that all quoted items meet technical specification of the bid & that such technical specification overrides the brochures/standard literature if the same contradicts or is absent in brochures.

In case of breach of any tender terms and conditions or deviation from bid specification other than already specified as mentioned above, the decision of GIL Tender Committee for disqualification will be accepted by us.

The Information provided in our submitted bid is correct. In case any information provided by us are found to be false or incorrect, you have right to reject our bid at any stage including forfeiture of our EMD/ PBG/cancel the award of contract. In this event, GIL reserves the right to take legal action on us.

Thanking you,

Dated this _____ day of_____YYYY

Signature: _____
(In the Capacity of) :_____
Duly authorized to sign bid for and on behalf of
_____

Note: This form should be signed by authorized signatory of bidder

Annexure A

Format of Earnest Money Deposit in the form of Bank Guarantee

Ref: Bank Guarantee No.
Date:

To,

DGM (Technical)

Gujarat Informatics Ltd.
Block No. 2, 2nd Floor,
Karmayogi Bhavan,
Sector-10 A, Gandhinagar

Whereas ---------- (here in after called "the Bidder") has submitted its bid dated ---------- in response to the Bid for Purchase of Differential Global Positioning System (DGPS) on behalf of Settlement Commissioner and Director of Land Record, Govt. of Gujarat
Tender No. HWT210120608 KNOW ALL MEN by these presents that WE ---------- ---------- ---------- having our registered office at ---------- ---------- - ---------- (hereinafter called "the Bank") are bound unto the Gujarat Informatics Limited in the sum of ---------- for which payment well and truly to be made to Gujarat Informatics Limited, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this ----------day of ---------- ----YYYY.

THE CONDITIONS of this obligation are:

1. The E.M.D. may be forfeited:
    a. if a Bidder withdraws its bid during the period of bid validity
    b. Does not accept the correction of errors made in the tender document;
    c. In case of a successful Bidder, if the Bidder fails:
        (i) To sign the Contract as mentioned above within the time limit stipulated by purchaser or
        (ii) To furnish performance bank guarantee as mentioned above or
        (iii) If the bidder is found to be involved in fraudulent practices.
        (iv) If the bidder fails to submit the copy of purchase order & acceptance thereof.
        (v) If the successful bidder fails to submit the Performance Bank Guarantee & sign the Contract Form within prescribed time limit, the EMD of the successful bidder will be forfeited. GIL also reserves the right to blacklist such bidder from participating in future tenders if sufficient cause exists.

We undertake to pay to the GIL/Purchaser up to the above amount upon receipt of its first written demand, without GIL/ Purchaser having to substantiate its demand, provided that in its demand GIL/ Purchaser will specify that the amount claimed by it is due to it owing to the occurrence of any of the abovementioned conditions, specifying the occurred condition or conditions.

This guarantee will remain valid up to 9 months from the last date of bid submission. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the OWNER/PURCHASER and further agrees that if this guarantee is extended for a period as mutually agreed between bidder & owner/purchaser, the guarantee shall be valid for a period so extended provided that a written request for such extension is received before the expiry of validity of guarantee.

The Bank shall not be released of its obligations under these presents by any exercise by the OWNER / PURCHAER of its liability with reference to the matters aforesaid or any of them or by reason or any other acts of omission or commission on the part of the OWNER/PURCHASER or any other indulgence shown by the OWNER/PURCHASER or by any other matter or things.

The Bank also agree that the OWNER/PUCHASER at its option shall be entitled to enforce this Guarantee against the Bank as a Principal Debtor, in the first instance without proceeding against the SELLER and not withstanding any security or other guarantee that the OWNER/PURCHASER may have in relation to the SELLER's liabilities.

Dated at _____ on this _____ day of _____YYYY.

_____

Signed and delivered by

_____

For & on Behalf of

Name of the Bank & Branch &
Its official Address

Approved Bank: All Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative & Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the G.R. no. EMD/10/2019/50/DMO dated 01.11.2019 (https://financedepartment.gujarat.gov.in/Documents/DMO_2317_01-Nov-2019_375.pdf) issued by Finance Department or further instruction issued by Finance department time to time.

SECTION VII

Performa of Contract-cum-Equipment
Performance Bank Guarantee
(To be stamped in accordance with Stamp Act)

Ref: Bank Guarantee No.
Date:

To
Name & Address of the Purchaser/Indenter
_____

_____

Dear Sir,

In consideration of Name & Address of the Purchaser/Indenter, Government of Gujarat, Gandhinagar (hereinafter referred to as the OWNER/PURCHASER which expression shall unless repugnant to the context or meaning thereof include successors, administrators and assigns) having awarded to M/s …… having Principal Office at …… (Hereinafter referred to as the "SELLER" which expression shall unless repugnant to the context or meaning thereof include their respective successors, administrators, executors and assigns) the supply of _____by issue of Purchase Order No…….. Dated …… issued by <<GoG Department>> for and on behalf of the OWNER/PURCHASER and the same having been accepted by the SELLER resulting into CONTRACT for supplies of materials/equipments as mentioned in the said purchase order and the SELLER having agreed to provide a Contract Performance and Warranty Guarantee for faithful performance of the aforementioned contract and warranty quality to the OWNER/PURCHASER, _____having Head Office at (hereinafter referred to as the 'Bank' which expressly shall, unless repugnant to the context or meaning thereof include successors, administrators, executors and assigns) do hereby guarantee to undertake to pay the sum of Rs._____(Rupees_____) to the OWNER/PURCHASER on demand at any time up to_____ without a reference to the SELLER. Any such demand made by the OWNER/PURCHASER on the Bank shall be conclusive and binding notwithstanding any difference between Tribunals, Arbitrator or any other authority.

The Bank undertakes not to revoke this guarantee during its currency without previous consent of the OWNER/PURCHASER and further agrees that the guarantee herein contained shall continue to be enforceable till the OWNER/PURCHASER discharges this guarantee. OWNER/PURCHASER shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee from time to time to extend the time for performance by the SELLER of the aforementioned CONTRACT. The OWNER/ PURCHASER shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the SELLER, and to exercise the same at any time in any manner, and either to enforce to forebear to enforce any covenants contained or implied, in the aforementioned CONTRACT between the OWNER/PURCHASER and the SELLER or any other course of or remedy or security available to the OWNER/PURCHASER.

The Bank shall not be released of its obligations under these presents by any exercise by the OWNER/PURCHAER of its liability with reference to the matters aforesaid or any of them or by reason or any other acts of omission or commission on the part of the OWNER/PURCHASER or any other indulgence shown by the OWNER/PURCHASER or by any other matter or things.

The Bank also agree that the OWNER/PUCHASER at its option shall be entitled to enforce this Guarantee against the Bank as a Principal Debtor, in the first instance without proceeding against the SELLER and not withstanding any security or other guarantee that the OWNER/PURCHASER may have in relation to the Seller's liabilities.

Notwithstanding anything contained herein above our liability under this Guarantee is restricted to Rs. _____ (Rupees _____) and it shall remain in force up to and including _____ and shall be extended from time to time for such period as may be desired by the SELLER on whose behalf this guarantee has been given.

Dated at _____ on this _____ day of _____YYYY.

_____
Signed and delivered by

_____

For & on Behalf of

Name of the Bank & Branch &
Its official Address

List of approved Banks

Approved Bank: All Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative & Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the G.R. no. EMD/10/2019/50/DMO dated 01.11.2019 (https://financedepartment.gujarat.gov.in/Documents/DMO_2317_01-Nov-2019_375.pdf) issued **by Finance Department or further instruction issued by Finance department time to time.**

CONTRACT FORM

THIS AGREEMENT made the _____ day of _____, YYYY ____ Between _____ *(Name of purchaser)* of _____ *(Country of Purchaser)* hereinafter "the Purchaser" of the one part and _____ *(Name of Supplier)* of _____ *(City and Country of Supplier)* hereinafter called "the Supplier" of the other part :

WHEREAS the Purchaser is desirous that certain Goods and ancillary services viz., _____ *(Brief Description of Goods and Services)* and has accepted a bid by the Supplier for the supply of those goods and services in the sum of _____ *(Contract Price in Words and Figures)* hereinafter called "the Contract Price in Words and Figures" hereinafter called "the Contract Price."

NOW THIS AGREEMENT WITHNESSETH 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 be deemed to form and be read and construed as part of this Agreement, viz.:

2.1 the Bid Form and the Price Schedule submitted by the Bidder;

2.2 terms and conditions of the bid

2.3 the Purchaser's Notification of Award

3 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.

4 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.

5 Particulars of the goods and services which shall be supplied / provided by the Supplier are as enlisted in the enclosed annexure:

TOTAL VALUE:

DELIVERY SCHEDULE:

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the

Said _____ (For the Purchaser)

In the presence of _____

Signed, Sealed and Delivered by the

Said _____ (For the Supplier)

In the presence of _____

SECTION : VIII Delivery Location Details

Sr. No	District	office Name
1	Kachchh	Superintendent Land Records
2	Banaskantha	Superintendent Land Records
3	Patan	Superintendent Land Records
4	Mahesana	Superintendent Land Records
5	Sabarkantha	Superintendent Land Records
6	Gandhinagar	DISRA
7	Ahmedabad	Superintendent Land Records
8	Surendranagar	Superintendent Land Records
9	Rajkot	Superintendent Land Records
10	Jamnagar	Superintendent Land Records
11	Porbandar	Superintendent Land Records
12	Junagadh	Superintendent Land Records
13	Amreli	Superintendent Land Records
14	Bhavnagar	Superintendent Land Records
15	Anand	Superintendent Land Records
16	Kheda	Superintendent Land Records
17	Panchmahal	Superintendent Land Records
18	Dahod	Superintendent Land Records
19	Vadodara	Superintendent Land Records
20	Narmada	Superintendent Land Records
21	Bharuch	Superintendent Land Records
22	Surat	Superintendent Land Records
23	Dang	Superintendent Land Records
24	Navsari	Superintendent Land Records
25	Valsad	Superintendent Land Records
26	Tapi	Superintendent Land Records
27	DevBhumi Dwarka	Superintendent Land Records
28	Morbi	Superintendent Land Records
29	Gir somnath	Superintendent Land Records
30	Botad	Superintendent Land Records
31	Arravali	Superintendent Land Records
32	Mahisagar	Superintendent Land Records
33	Chhotaudepur	Superintendent Land Records

- Installation of CORS base stations should be carried out according to feasibility report, which is prepared based on proposed locations.

Approximately Installation Location Details:

Sr.. No.	D_Name/ Location	Address	Latitude	Longitude
01	Kachchh Bhuj	Jilla Mojani Sewa Sadan,First Floor, opp.Reliance Mall,Bhuj-Kutch	23°.23'.76.13889"N	69°.66'.41.86111"E
02	Banaskantha Palanpur	Mojani Bhavan,Joravar Palace Compound,Near Head Post Office, Palanpur, Banaskantha	24°.16'.85.41667"N	72°.42'.46.47222"E
03	Patan Patan	Jilla Sewa Sadan,Opp.Prant Office,Patan	23°.85'.69.80556"N	72°.13'.37.36111"E
04	Mahesana	Bahumali Building,Block No.1,Mahesana	23°.60'.95.94444"N	72°.39'.32.13889"E
05	Sabarkantha Himatnagar	Survey Bhavan,Nyay Mandir Compound, Himatnagar	23°.60'.21.69444"N	72°.96'.17.58333"E
06	Gandhinagar	Dindayal Institute of Survey & Revenue Administration Gandhinagar,Near kh-5 Circle,Sector-14	23°.24'.12.75001"N	72°.63'.51.41667"E
07	Ahmedabad Dholka	Dholka	22°.73'.47.95126"N	72°.43'.64.45289"E
08	Surendranagar	Opp.T.V.Relay Kendra,Survey Bhuvan,2nd Floor, Surendranagar	22°.72'.49.36111"N	71°.62'.48.77778"E
09	Rajkot	Survey Bhavan,2nd Floor,Jamnagar Road, Rajkot.	22°.30'.79.97222"N	70°.79'.68.08333"E
10	Jamnagar	Sewa Sadan-3,Lal Banglow,Bahumali Bhavan,Jamnagar.	22°.48'.05.27778"N	70°.05'.04.08333"E
11	Porbandar	315,Jilla Sewa Sadan-1,Opp.Airport,Porbandar.	21°.64'.50.16667"N	69°.65'.60.50000"E
12	Junagadh	Bahumali Bhavan,Block No.1,First Floor,Opp.Saradar Garden,Junagadh.	21°.51'.68.36111"N	70°.44'.62.00000"E
13	Amreli	Rajmahel Compound,Survey Bahvan,First Floor,Amreli	21°.60'.51.25000"N	71°.21'.72.72222"E
14	Bhavnagar	G-12,Bahumali Bhavan,Bhavnagar.	21°.76'.88.33333"N	72°.13'.56.19444"E
15	Anand Khambhat	Khambhat	22°.31'.17.46772"N	72°.61'.80.87135"E
16	Kheda Nadisd	Above State Bank,Station Road,Nadiad,Kheda.	22°.69'.93.02778"N	72°.85'.67.88889"E
17	Panchmahal Godhra	Jilla Sewa Sadan,C Block,2nd Floor,Godhara,Panchmahal	23°.12'.73.77778"N	73°.60'.34.11111"E
18	Dahod	Survey Bhavan,Jilla Sewa Sadan,Sapadi,Dahod.	22°.87'.69.83333"N	74°.23'.28.72222"E
19	Vadodara	Kothi Tower Building,First Floor,Opp.Collector Office,Vadodara.	22°.30'.25.16667"N	73°.19'.53.83333"E
20	Narmada Rajpipla	Jilla Sewa Sadan,First Floor,Rajpipala	21°.86'.57.83333"N	73°.51'.58.75000"E
21	Bharuch	Behind K.U. Petrol Pump,Station Road,Bharuch.	21°.70'.96.16667"N	72°.99'.03.13889"E
22	Surat	C-Block,Sixth Floor,Bahumali Makan,Nanpura,Surat.	21°.18'.80.94444"N	72°.81'.12.66667"E

23	Dang Ahwa	Dang	20°.75'.98.13889"N	73°.68'.98.61111"E
24	Navsari	New Jilla Sewa Sadan,Kaliyavadi,Navasari.	20°.95'.14.47222"N	73°.05'.58.13889"E
25	Valsad	Jilla Mojani Sewa Sadan,Behind Circuit House,Halar Road,Valsad.	20°.60'.77.11111"N	72°.92'.91.58333"E
26	Tapi Vyara	Jilla Sewa Sadan Madhyasth kacheri sankul,Panvadi,Block No.3,Ground Floor,Vyara,Tapi.	21°.10'.06.58333"N	73°.39'.39.02778"E
27	D.Bhumi Dwarka Khambhaliya	Devbhumi Dwarka	22°.22'.47.36111"N	69°.67'.44.77778"E
28	Morbi	Sewa Sadan,First Floor,Room No.143,Lalbag,Samakanthe,Morabi.	22°.82'.61.02778"N	70°.84'.61.69444"E
29	Girsomnath Veraval	Prakash Complex,First Floor,Kolivadana Nake,Veraval Girsomnath.	20°.97'.34.55556"N	70°.41'.75.86111"E
30	Botad	Jilla Sewa Sadan,2nd Floor,A-24,Botad.	22°.18'.13.30556"N	71°.68'.18.50000"E
31	Arravali Modasa	Block No.A,2nd Floor,Jilla Sewa Sadan,Aravalli,Modasa.	23°.48'.79.11111"N	73°.30'.05.38889"E
32	Mahisagar Lunavada	Survey Bhavan,First Floor,Collector Kacheri Compound,Lunavada,Mahisagar.	22°.76'.86.52778"N	73°.62'.26.02778"E
33	Chhotaudepur	Jilla Sewa Sadan,Ground Floor,Room No.5,Chhotaudepur.	22°.31'.02.77778"N	74°.01'.82.91667"E
34	Banaskantha Vav	Banaskantha Vav Mamlatdar Office	24°.35'.98.11394"N	71°.51'.39.45571"E
35	D.bhumidwarka Kalyanpur	Kalyanpur	22°.00'.81.89986"N	69°.39'.97.53735"E
36	Surendranagar Patadi	Patadi-Dasada	23°.18'.92.48399"N	71°.79'.45.09413"E
37	Patan Santalpur-varahi	Varahi-Santalpur	23°.78'.88.91912"N	71°.44'.43.80616"E
38	Kachchh Rapar	Rapar	23°.56'.06.57695"N	70°.65'.77.70891"E
39	Kachchh Nakhtarana	Nakhtarana	23°.34'.37.74565"N	69°.27'.12.80608"E
40	Sabarkantha Vijaynagar	Vijaynagar Mamlatdar Office/City Survey office	24°.00'.98.18780"N	73°.35'.15.61980"E
41	Amreli Jafrabad	Jafrabad Mamlatdar office	20°.86'.73.61451"N	71°.35'.99.05686"E
42	Kachchh Bhachau	Bhachavu Malatdar office	23°.29'.39.90659"N	70°.35'.20.13604"E
43	Sabarkantha Lambdiya	Lambdiya Mamlatdar Office	24°.27'.47.84176"N	73°.06'.43.31681"E
44	Rajkot Gondal	Gondal Mamlatdar Office	21°.96'.99.94347"N	70°.79'.48.89369"E
45	Tapi Nizar	Nizar Office	21°.47'.71.55008"N	74°.19'.52.53209"E
46	Banaskantha Dhanera	Dhanera Office	24°.50'.54.12829"N	72°.02'.76.39795"E

47	Jamnagar Kalavad	Kalavad Municipality Office	22°.20'.60. 61164"N	70°.38'.17. 07769"E
48	Amareli Dhari	City Survey Dhari	21°.33'.11. 70000"N	71°.02'.93. 00000"E
49	Rajkot Jam Kandorna	Mamlatdar Jam Kandorna	21°.88'.37. 70000"N	70°.53'.61. 20000"E
50	Bhavnagar Mahuva	City Survey Mahuva	21°.09'.91. 60000"N	71°.76'.02. 20000"E

Location Map (Proposed DGNSS Base Station)