

Digitization and Indexing of Aerial Photos

1. BACKGROUND

IBD&DSA, Survey of India (SOI), Department of Science & Technology, New Delhi invites eligible and reputed bidders to submit offer for the RFP titled “**Digitization and Indexing of Aerial Photos**” work on the terms of reference contained in this tender document. The Project will be of 03 months.

IBD&DSA has a huge repository of aerial negatives, diapositives and bromide prints of different seasons ranging from 1944 to 2008 at different scale varying from 1:6000 to 1:60,000. Such data plays a vital role in monitoring and managing land cover in sectors like forestry, agriculture, urban land use management besides being helpful in settling legal litigations or carrying out research like in environmental change study. Hence creating catalogue of these datasets captured during aerial surveys which provides detailed visual information becomes imperative for making maximum use of them for generating accurate maps, conducting spatial analysis etc.

Each aerial photography task is identified by unique Specification Number [say 1710-A]. *Specification number is unique number with reference to a particular aerial photography mission. Each Specification number has one or even more photo index representing the photo footprints and flight plan. The Unit rate in the BoQ shall be per Specification number and not per photo index. One sample photo index is attached at Appendix-I for ready reference.*

There are about 1500 Specification Numbers. Each specification number has one or even more photo index. The metadata of each aerial photo is contained in photo index. The meta data include survey season, scale of photography, project name, run number, photo number, focal length, sortie number etc. These photo index also contains footprint of each aerial photo. Without proper digitization and indexing, the photo cannot be effectively used for catering to the demand of aerial photos for various applications such as land cover assessment, change detection, and resource management.

The digitization and indexing of each photo in a photo index will not only conserve the valuable visual data but will also create a systematic and accessible database for supporting better decision-making and resource management in the relevant sectors.

2. OBJECTIVE: GENERATING METADATA OF AERIAL PHOTOS

The primary objective of this project is to digitize and index each photo of each flight in the photo index of a Specification Number to create a precise and organized geospatial dataset. This dataset will serve as a critical tool for conserving the images and facilitating photo/map indexing for photo index. By accurately georeferencing, segmenting, and attributing the photo, the project aims to

ensure that the foot prints are preserved in a manner that allows for easy retrieval, analysis, and application in aerial photo cataloguing and its metadata generation.

3. SCOPE OF WORK

The Bidder has to execute the following tasks as part of this tender mandate. Sol will provide input data as scanned copy of cloth mounted photo index of the Specification Numbers for digitization and indexing of each photo as per the information available in the photo index. The brief scope under this project is as mentioned below but not limited to the following Services:

- I. Input data collection and verification**
- II. Georeferencing of scanned photo index**
- III. Layer Creation and Attribute Assignment**
- IV. Polygon Segmentation and Indexing**
- V. Mosaicking of photo index**
- VI. Quality Assurance**
- VII. Comprehensive Reporting**

4. DETAILED SCOPE OF WORK:

This project aims to digitize and index the photo index containing footprint of aerial photos captured during aerial survey. The bidder has to study each and every photo index carefully before digitization to ensure precise geospatial data capturing, resulting in accurate and usable map index.

The Bidder will collect the input data from the Client. The Data has to be accurately geo referenced to align with the ground coordinates using spherical co-ordinates shown in the photo index. The Bidder must ensure seamless edge matching with adjacent images for continuous spatial alignment across the entire dataset.

The Creation of GIS Layers and Attribute Assignment should consist of following layers

Point Layer: The Bidder shall digitize the center points or Principal Points of each Photo and attribute them with unique identifiers (Run No and flight Line).

Line Layer: The Bidder will capture vertical lines at a 90-degree angle from the center points to the image edges, mirror these lines downward, and connect them to form a Center Line representing the flight path/Runs.

Polygon Layer: The Bidder shall connect the edges of vertical lines to create polygons, which will then be segmented based on predefined intervals (e.g., 0-10, 10-20, 20-30).

There is a requirement of Segmentation of Polygons. The Bidder shall subdivide the polygons into equal parts according to the predefined segments. Each segment must be attributed with relevant identifiers corresponding to its segment interval. Each and every segment to be attributed with

Unique Number

There should data base schema to be developed consisting of the following but not limited to Photo Specification, Photo Season, Scale of Photography, SORTIE No, Date of SORTIE, RUN No, RUN SUB No, LENS No, Calibrated Focal Length, Area etc.

There should be a team for Quality Assurance and Data Indexing for conducting comprehensive quality checks to verify the accuracy and integrity of the georeferenced data and digitized layers. The bidder has to ensure at least data accuracy > 80%.

The Bidder shall index the final layers in a spatial database to facilitate organized storage, easy retrieval, and subsequent analysis.

The Bidder shall provide a detailed report outlining the methodology, processes, and results, including any challenges encountered and how they were addressed.

Deliverables: The bidder has to provide the final shapefile showing footprint for each aerial and their attribute table containing all the information.

Project Timeline: The project has to be completed within 03 months timeframe. However, bidder is free to suggest the timeline in the technical proposal.

Price Bid:

The Price Bid Format is given below, and Bidders are required to fill this up correctly with full details:

Name of the company: Address: Bid Name: Bid Number:						
S.No.	Description	Unit	Unit Rate (INR)	GST (%)	GST (INR)	Total (INR)
1	Digitization and Indexing of Aerial Photos of the Cover Plot of scale 1:25,000 or larger	Per specification number				
2	Digitization and Indexing of Aerial Photos of the Cover Plot of scale 1:25,000 or smaller	Per specification number				

5. PRE-QUALIFICATIONS CRITERIA:

The bidder is required to bid on its own and no consortium is allowed to meet the required PQ / TQ criteria. Below are the pre-qualification criteria for Bidder.

Note:

Compliance to below criteria is mandatory and if bidders do not meet any of these Criteria, their technical proposals will not be considered for further evaluation.

Pre-qualification Criteria		
Sr No	Minimum Qualifications Criteria	Documentary proof to be submitted
1	<p>The Bidder should be –</p> <ul style="list-style-type: none"> • A company incorporated under the Indian Companies Act, 2013 or any other previous company law as per section 2 (20) of the Indian Companies Act 2013/ Partnerships Firm registered under the Limited Liability Partnerships or Partnership Act • Registered with the GST Authorities • The company should have a valid PAN number. 	<ul style="list-style-type: none"> • Certificate of Incorporation; and • GST Registration certificate issued by GSTN authorities (copy) • PAN Card (copy)
Financial Stability		
2	Bidder's minimum required AVERAGE annual turnover for the last three (3) Financial Years shall be INR 50 Lakhs	Financial Statements or statutory auditor certificate or certificate from Company Secretary of Bidder specifying the turnover & net worth for the specified year.
Certifications		
3	The Bidder should have ISO 9001:2015,	Valid copy of the Certificates:
Project Experience		
4	The bidder should be in the field of Geospatial Data processing using Industrial Grade S/W, Photogrammetric related Services (Acquiring Aerial/ Satellite imagery and Processing using Photogrammetric S/W), GIS creation, analysis, database management and providing GIS services to Central & State Govt. Departments & Organizations	Work orders/Completion Certificate

5	Bidder must have experience of at least one service contract for GIS Mapping Project / Map Digitization & Geo-referencing Project / Mapping through Satellite Image/ Drone Data/ Aerial Data etc. having a minimum value of Rs 30 Lakhs over the last 5 years OR at least two service contracts having a minimum value of Rs. 20 Lakhs each over the last 5 years.	Work orders and Completion Certificate
Office Location		
6	The Bidder should have an office locally present in Delhi NCR	Office lease agreement / GSTN Certificate or Undertaking to open an office within 15 days of award of the contract
Others		
7	The Bidder should not have been banned/ Black listed by any Central/ State Govt. and public sector Organization and nay court of law or under a declaration of ineligibility for corrupt and fraudulent practice during the submission and evaluation of the RFP	Self-attested Undertaking

6. TECHNICAL QUALIFICATION CRITERIA:

Sr No	Evaluation Criteria	Max Marks	Supporting Document
1	<p><u>Bidder Capability</u></p> <p>The bidder should be in the field of Geospatial Data processing using Industrial Grade S/W, Photogrammetric related Services (Acquiring Aerial/ Satellite imagery and Processing using Photogrammetric S/W), GIS creation, analysis, database management and providing GIS services to Central & State Govt. Departments & Organizations</p> <p>1) No of projects executed: More than 10 = 10 Marks 2) 5-10=5Marks 3) less than 05 = 2 Marks</p>	10	Work orders/Completion Certificate

Sr No	Evaluation Criteria	Max Marks	Supporting Document
2	<p><u>GIS Projects</u> Bidder must have experience of at least one service contract for GIS Mapping Project / Map Digitization & Geo-referencing Project / Mapping through Satellite Image/ Drone Data/ Aerial Data etc. having a minimum value of Rs 1 Crore over the last 5 years OR at least two service contracts having a minimum value of Rs. 50 Lakhs each over the last 5 years. 1) Single Projects Value: More than 5 Crore = 10 Marks 2) Single Projects Value: 2-5 Crore = 5 Marks 3) Single Project Value 50 Lakhs - 02 Crore = 2 Marks</p>	10	Work orders and Completion Certificate
3	<p><u>Bidder Experience</u> Bidder must have experience of at least one service contract for Map Digitization & Geo-referencing Project / Mapping through Drone Data/ Aerial Data etc. with area 1) More than 10000 SqKm Area = 10 Marks 2) 5000-10000 SqKm Area= 5 Marks 3) Less than 5000 SqKm Area = 2 Marks</p>	10	
4	<p><u>Quality Certification</u> 1) ISO 9001:2015(QMS), ISO 27001:2022, ISO 20000-2018 and CMMi3 - 10 Marks 2) Any three Certificates- 05 Marks 3) Any two Certificates - 02 Marks</p>	10	Valid copy of the Certificates:
5	<p><u>Financial Assessment & Turnover</u> AVERAGE annual turnover for the last three (3) Financial Years 1) INR greater than 5 Crore - 10 Marks 2) INR 3-5 Crore - 05 Marks 3) INR less than 03 Crore - 02 Marks</p>	10	Bidder to provide copy of Audited Balance Sheet

Sr No	Evaluation Criteria	Max Marks	Supporting Document
6	<u>Technical Proposal</u> Completeness of the proposal including Proposed Approach, Methodology, Workplan & Resource Plan, Timeline following parameters: 1) Understanding of scope- 05 Marks 2) Approach Methodology-10 Marks 3) Project team composition and completion timeline-05 Marks 4) PM and TM with valid PMP/Prince Certificate - 05 Marks	20	Technical Proposal to be submitted at the time of submission of the bid & presentation on company profile & experience of similar application, elaboration of the submitted technical proposal, methodology, workplan, timeline on similar application
7	Technical Presentation	30	Presentation Time would be maximum of 45 min + 15 min interactive session. An official email would be sent to the qualified bidder for showing the presentation who are qualifying in Pre-Qualification Criteria & Technical Proposal
		100	

7. **BID EVALUATION CRITERIA:**

Stage 1: Pre-Qualification

- I. Each of the Pre- Qualification conditions are MANDATORY. In case Bidder does not meet any one of the conditions, the bidder will be disqualified.
- II. Bidders would be informed of their qualification/disqualification based on the Prequalification criteria.

Stage 2: Technical Evaluation

- I. Technical Evaluation will be done only for the bidders who succeed in Stage 1.
- II. The bidders' technical solutions proposed in the bid document will be evaluated as per the requirements specified in the RFP and technical evaluation framework.

- III. Each Technical Bid will be assigned a technical score out of a maximum of 100 marks. Only the bidders who get a technical score of 70 or more will qualify for the commercial evaluation stage. Failing to secure minimum marks shall lead to technical rejection of the Bid and Bidder.

The Final Normalized technical score of the Bidder shall be calculated as follows:

- Normalized Technical score of the bidder = Technical score of the bidder / Score of the bidder with highest score X 100

Stage 3: Commercial Evaluation

- I. The commercial bids for the technically qualified bidders will then be opened on the notified date and time and reviewed to determine whether the commercial bids are substantially responsive. Bids that are not substantially responsive are liable to be disqualified at SOI discretion.
- II. The Normalized commercial score of the technically qualified bidders will be calculated, while considering the Commercial quote given by each of the Bidders in the Commercial Bid as follows: Normalized Commercial Score of the Bidder = Lowest Quote/Bidder's Quote X 100

Example:

Bidders	Bidder Quote	Calculation	Normalized Commercial Score
Bidder A	110	$(110/110) \times 100$	100
Bidder B	150	$(110/150) \times 100$	33.33
Bidder C	130	$(110/130) \times 100$	64.30
Bidder D	140	$(110/140) \times 100$	38.53

- III. The Bid price will include all taxes, duties, levies etc., excluding GST and all prices shall be quoted in Indian Rupees only. Bidder to quote their GST rates in the Techno Commercial part of the tender.
- IV. Any conditional bid would be rejected
- V. Errors & Rectification: Arithmetical errors will be rectified on the following basis:
- a) "If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected.
- b) If there is a discrepancy between words and figures, the amount in words will prevail."

Stage 4: Final Score Calculation (QCBS)

I. The final score will be calculated through Combined Quality Based System (QCBS) method based with the following weightage:

- a. Technical: 70%
- b. Commercial :30%

Final Score = (0.70xNormalized Technical score) + (0.30xNormalized Commercial Score)

II. The bidder with the highest Final score shall be treated as the Successful bidder (Rank -1 bidder).

III. In case, total combined score (Final Score) of two (2) or more bidders are exactly same, then the bidder scoring highest technical score would be considered as the successful bidder. If still there is a tie, then all the Rank one (R-1) bidders shall be asked to submit discount over previous quoted rate in a sealed envelope.

8. DELIVERY SCHEDULE:

#	Parameter Timelines	Parameter Timelines	Description
1	Kick Off Meeting and Sign Off	T1 = T0 + 7 Days	Within 7 working days from the issuance of LOA/ PO
2	Resources alignment	T2 = T0 + 15 Days	Within 15 working days from the issuance of LOA/ PO
3	Final mosaiced data in .shp format	T3 = T2 + 75 Days	Two & a Half months from resource alignment

T0 is date of issuance of LOA/ PO

9. TERMS AND MODE OF PAYMENT:

Payment shall be made through electronic transfer in NEFT/RTGS subject to recoveries, if any, by way of liquidated damages or any other charges as per terms & conditions of the contract in the following manner:

- a. Payment to the Bidder will be made on a monthly basis (Calendar month) by the Service Consumer after deduction of applicable taxes and recoveries, if any, at the quoted rates as per the contract.
- b. The Bidder shall become entitled to payment after completion and acceptance of final deliverables as mentioned in the bid document.

c. The payment shall be made on a monthly basis for '**Digitization and Indexing of Aerial Photos**' subject to acceptance of the deliverables by the Employer as per the terms and condition of the document. Bill shall be generated for per approved specification number supplied by the Bidder for a particular month & bill shall be prepared as per contract terms.

e. The payment shall be released subject to certification by the Employer that services have been rendered satisfactorily. The acceptance test shall be carried out by the Employer according to principles and modalities laid down in the bid document, which shall form the basis of the certification mentioned.

f. The payments shall be made in Indian Rupees to the Bidder under this Contract.

10. DATA ACCEPTANCE:

During the contract period, a penalty shall be levied for the following cases:

a) The Employer shall give notice to the Bidder of any Defects within 07 working days of submission of data.

b) Every time notice of a Defect is given, the Bidder shall correct the notified Defect within the next 7 working days.

c) The delivery pertaining to the lot in which defects have been detected and/or which have failed the Acceptance Test, shall be returned to the Bidder for further QA. In effect, the Employer will pass responsibility to the Bidder to provide adequate and clear internal Quality Audits to identify the extent and cause of the problems so established. The acceptance report (Pass /Fail) shall be given by the Employer within 7 working days of each delivery/re-delivery of the data made by the bidder.

11. TERMINATION FOR DEFAULT:

- i. The Purchaser without prejudice to any other contractual rights and remedies available to it the Purchaser, may, by written notice of default sent to the supplier, terminate the contract in whole or in part, if the supplier fails to deliver any or all of the goods or fails to performant other contractual obligation(s) within the time period specified in contract, or within any extension thereof, if any, granted by the Purchaser. The Performance Security in such cases will be forfeited.
- ii. Unless otherwise instructed by the Purchaser, the supplier shall continue to perform the contract to the extent not terminated.
- iii. Termination for Insolvency: If the supplier becomes bankrupt or otherwise insolvent, the purchaser reserves the right to terminate the contract at any time, by serving written notice to the supplier without any compensation, whatsoever, to the supplier,

subject to further condition that such termination will not prejudice or affect the rights and remedies which have accrued and/or will accrue thereafter to the Purchaser.

12. TERMINATION FOR CONVENIENCE:

- i. The Purchaser reserves the right to terminate the contract, in whole or in part for its Purchaser's convenience, by serving written notice on the supplier at any time during the currency of the contract. The notice shall specify that the termination is for the convenience of the Purchaser. The notice shall also indicate inter alia, the extent to which the supplier's performance under the contract is terminated, and the date with effect from which such termination will become effective.
- ii. The goods and services which are complete and ready in terms of the contract for delivery and performance within thirty days after the supplier's receipt of the notice of termination shall be accepted by the Purchaser following the contract terms, conditions and prices. For The remaining goods and services, the Purchaser may decide:
 - To get any portion of the balance completed and delivered at the contract terms, conditions and prices; and /or
 - To cancel the remaining portion of the goods and services and compensate the supplier by paying an agreed amount for the cost incurred by the supplier towards the remaining portion of the goods and services

13. CONFIDENTIALITY CLAUSE:

- i. The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Supplier.
- ii. The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the performance of the Contract.
- iii. The above provisions of Confidential Information shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

- iv. The provisions of Confidential Information shall survive even after completion or termination, for whatever reason, of the Contract.

14. LIQUIDITY DAMAGE:

Except as provided under Force Majeure, if the Supplier fails to deliver any or all of the Goods/services by the Date(s) of delivery or perform the Related Services within the period specified in the Bill of Quantities, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the 0.01% of contract price per day or part thereof the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the 10% of the contract price. Once the maximum is reached, the Purchaser may terminate the Contract.

APPENDIX-I

