LIMITED TENDER ENQUIRY (FINANCIAL BID ONLY)

HIGH-RESOLUTION ORTHO IMAGERY (ORI), DSM & DTM GENERATION (FLOODPLAIN MAPPING – MULTI-PACKAGE PROJECT)
UTTAR PRADESH

Issued under Empanelment Master Order S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 /752025/1/2026-Store-SGO dated 07 January 2026

Mode: Limited Tender Enquiry (LTE)
Platform: Central Public Procurement Portal (CPPP)

Bid Structure: Single Cover – Financial Bid Only

Eligibility: Restricted to firms empanelled under S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 /752025/1/2026-Store-SGO dated 07 January 2026in Service Categories 1 to 5 (Aerial / UAV / LiDAR-based Survey Services)

Minimum Eligible Class: As per S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 /752025/1/2026-Store-SGO dated 07 January 2026Empanelment Classification (Class B and above)

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SECTION 1: INTRODUCTION

1.1 Background and Context

This Request for Proposal (RFP) is issued in continuation of the Empanelment Order No. **S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 dated 07 January 2026** issued by Survey of India (SoI), wherein firms were empanelled based on their technical capability, equipment, manpower, and relevant experience for various geospatial service categories.

The empanelment under S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 establishes a pool of technically qualified firms for undertaking geospatial survey and mapping works. The empanelment process was based solely on technical qualification, and no financial evaluation was carried out at that stage.

In accordance with the provisions of the Empanelment Order, project-specific financial bidding is to be undertaken separately by the concerned Geospatial Directorate for allocation of work among empanelled firms.

1.2 Purpose of this RFP

The purpose of this RFP is to invite financialbids only from eligible empanelled firms for execution of geospatial survey and data generation work as defined in this document.

No technical bid is invited under this RFP.

The technical qualification of firms, as established under Empanelment Order S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 , shall be treated as final and binding, and shall not be re-evaluated.

1.3 Scope of Work under this RFP

This RFP pertains to the generation of high-resolution geospatial datasets, including:

- Ortho Rectified Imagery (ORI) of ≤ 5 cm GSD
- Digital Surface Model (DSM)
- Digital Terrain Model (DTM) (hydrologically correct, geoid-referenced)

The scope is **output-based**, and bidders are responsible for:

- Selection of suitable platform and sensor (UAV / manned aerial / LiDAR / hybrid)
- Survey planning, acquisition, processing, and delivery
- Meeting all accuracy, quality, and compliance requirements defined in this RFP

1.4 Eligibility of Bidders

Participation in this RFP **is** restricted to firms empanelled under Empanelment Order S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 in the following service categories:

- **Category 1:** Drone Services for ORI and DSM
- **Category 2:** Drone Services for 3D City Model
- **Category 3:** Drone Services for Terrain Survey using LiDAR
- **Category 4:** Manned Aerial Services for ORI and/or Terrain Survey using LiDAR

- **Category 5:** Manned Aerial Services for 3D City Model and/or Terrain Survey using LiDAR

Firms empanelled under one or more of the above categories may participate, provided they are capable of meeting the output specifications defined in this RFP.

1.5 Nature of Bidding and Governing Framework

This RFP represents a project-specific financial bidding stageunder the S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 empanelment framework.

- Empanelment Order S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 governs eligibility and technical qualification
- This RFP governs scope of work, execution requirements, deliverables, evaluation, and payment

In case of any ambiguity:This RFP shall prevail for all execution-related matters, while S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 shall prevail for empanelment and eligibility-related matters.

1.6 Platform-Neutral and Output-Based Approach

This RFP adopts **a** platform-neutral and output-based approach**.**
Bidders are free to deploy:

- UAV-based systems
- Manned aerial platforms
- LiDAR or optical sensors
- Hybrid approaches

However, selection of methodology shall be the responsibility of the bidder, and final outputs must strictly conform to the specifications defined in this RFP**.**

Failure to meet specified requirements shall result in rejection and rework at the Contractor's cost.

1.7 Project Execution Philosophy

The project is structured on the following principles:

- Package-based execution aligned to hydrological and geographic units
- End-to-end responsibility of the Contractor
- Strict quality control through designated QC platform
- Acceptance based solely on compliance with defined specifications
- Payment linked to successful QC acceptance of deliverables

2.1 Issuance under Empanelment Order

This Request for Proposal (RFP) is issued under Empanelment Order No. S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 dated 07 January 2026 issued by Survey of India.

Firms have already been technically evaluated and empanelled under S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 based on capability, equipment, manpower, and experience. This RFP is issued only to such empanelled firms.

2.2 Financial Bid Stage

This RFP represents **a** project-specific financial bidding stage.

- No technical bid is invited
- No technical evaluation shall be carried out

Technical qualification of empanelled firms:
shall be treated as final and binding

2.3 Scope of Work (Output-Based Specification)

Scope includes generation of:

- ORI (≤ 5 cm GSD)
- Planimetric accuracy ≤ 10 cm
- DSM (≤ 20 cm vertical accuracy)
- DTM (≤ 20 cm vertical accuracy)

The specification is output-based, and the bidder shall be responsible for selection of appropriate:

- Platform
- Sensor configuration
- Processing methodology

to achieve the required accuracy and quality standards.

2.4 Platform-Neutral but Controlled Execution

A platform-neutral approach is adopted. While multiple platform types are permitted across different packages, each individual package shall be executed using a single consistent platform, sensor configuration, and processing workflow.

The following are permitted:

- UAV / RPAS
- Manned aerial platforms
- Optical sensors and/or LiDAR
- Hybrid configurations

However, the following shall apply:

1. ORI shall be derived only from optical imagery
2. Entire package shall be executed usingsingle consistent acquisition and processing methodology

3. Mixing of platforms or inconsistent acquisition within a packageshall not be permitted without approval

4. All execution shall conform totechnical requirements specified in Section 4

Failure Clause
Failure to meet specifications shallrequire re-acquisition / reprocessing at Contractor's cost

2.5 Governing Framework

- S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 governs:
  - Eligibility
  - Empanelment
- This RFP governs:
  - Execution
  - Scope
  - Deliverables
  - Payment

Interpretation Clause
- In case of conflict between Sections, the order of precedence shall be:
  Section 4 → Section 5 → Section 7 → Annexures.
- This RFP shall prevail forexecution-related matters

2.6 Bid Submission Requirements (Financial Bid Only)

Bidders shall submit their bids in Single Cover (Financial Bid Only) mode through the CPP Portal.

The following documents shall be mandatorily uploaded by the bidder. Non-submission of any required document may render the bid liable for rejection.

2.6.1 Mandatory Documents

(a) Financial Bid (BOQ)

• Duly filled and signed BOQ in the prescribed format
• Package-wise unit rate (₹/Sq Km) and total cost
• No conditional pricing permitted

(b) Bidder Declaration

– Acceptance of all RFP terms and conditions
– No deviation from technical specifications

(c) Empanelment Confirmation

• Self-declaration confirming valid empanelment under S-74/752025/1/2026-Store-SGO dated 07 January 2026
• Indicating service category (1–5) under which bidder is empanelled

(d) Financial Bid Capacity (FBC) Declaration

• Self-declaration confirming that:
– Bidder has adequate financial and operational capacity
– No over-commitment beyond permissible limits

(e) Undertaking on Resource Deployment

• Undertaking confirming:
– Availability of required UAV / aerial platforms
– Availability of processing infrastructure
– Commitment to meet package-wise timelines

(f) Non-Blacklisting / Integrity Declaration

• Declaration that:
– Bidder is not blacklisted/debarred by any Government agency
– No conflict of interest exists

(g) Authorization (if applicable)

• Board Resolution / Power of Attorney authorizing signatory

2.6.2 Format and Submission Conditions

• All documents shall be:
– Digitally signed (where applicable)
– Legible and complete

• Bidders shall ensure:
– No blank fields in BOQ
– No conditional statements
– No alteration of BOQ format

2.6.3 Prohibited Submissions

The following shall not be submitted:

• Any technical proposal or methodology document
• Any additional technical credentials or brochures
• Any document seeking to alter technical scope

Submission of such documents shall not be considered and shall not influence evaluation.

2.6.4 Clarification

The Authority may seek clarification only for:

• Minor discrepancies
• Arithmetic errors

No change in quoted rates shall be permitted at any stage.

2.6.5 Bid Completeness

A bid shall be considered complete only if:

• All mandatory documents are submitted
• BOQ is properly filled
• Declarations are provided

Incomplete bids shall be liable for rejection without further consideration.

Section 3: Work Packaging Strategy

3.1 Package Structuring of Area of Interest (AOI)

The Area of Interest (AOI) for this project has been divided into geographically contiguous and hydrologically coherent packages based on river systems and floodplain extents.

3.1.1 The packages under this RFP are as follows:

Package-wise Area of Interest (AOI)

Sl. No.	Package ID	Description	Area (Sq. Km.)	Time line for completion and submission of deliverables (in days)
1	Package–1	Demarcation of flood plain zone of Pahunj River from Dongri Bandh in Jhansi to confluence of Sindh River in Jalaun	1877	150
2	Package–2	Demarcation of flood plain of Ishan and Kali River tributaries of River Ganga within UP State	1743	150
3	Package–3	Demarcation of flood plain of Tamsa River tributary of River Ganga within UP State	845	90
4	Package–4	Demarcation of flood plain zone of Bijnor & Muradabad of Gaagan River	223	45
5	Package–5	Demarcation of flood plain zone of River Sukhnai in Jhansi	301	60
6	Package–6	Demarcation of flood plain of Aami River tributary of River Rapti within UP State	1762	150

The packages defined above constitute the scope of work under this RFP. The area indicated against each package shall be treated as the basis for financial bidding, evaluation, and award.

Each package represents:

- A contiguous and hydrologically consistent survey area
- A single unified photogrammetric block
- A complete execution and deliverable unit

Package sizes are based on hydrological and geographic considerations and are not uniform. Bidders shall plan deployment of resources accordingly.

The timelines specified for each package shall cover the complete cycle of execution, including survey planning, mobilisation, ground control establishment, data acquisition, processing, submission on the QC platform, rectification, and final acceptance.

The Contractor shall deploy adequate resources to ensure completion within the stipulated

timelines. Failure to adhere to the specified timelines shall be treated as contractual non-performance and may attract appropriate action as per the provisions of this RFP.

The Authority reserves the right to add, modify, or reorganize packages based on project requirements.

3.1.2 Provision for Additional Packages

The Authority reserves the right to:

• Add additional packages of similar nature during the course of the project
• Modify or extend existing AOIs based on project requirements

Such additional packages shall:

• Follow the same technical specifications, QC framework, and payment conditions
• Be offered to empanelled bidders through appropriate procurement mechanism

Inclusion of additional packages shall not entitle the Contractor to any automatic right of award.

3.2 Single Block / Unified Processing Requirement

Package boundaries defined above shall be strictly adhered to and shall not be altered or subdivided by the Contractor

Each package shall be executed and processed asa single integrated survey block / dataset Accordingly:

- Fragmentation of final deliverables is strictly prohibited.

  Sub-block processing may be adopted for operational feasibility, provided that final outputs are delivered as a seamless and unified dataset in accordance with Clause 4.5.1.
- All data within a package shall:
  - Maintain geometric continuity
  - Maintain radiometric consistency
  - Be processed through a **single unified workflow**

3.2.1 Methodology Consistency Clause

For each package:A single consistent acquisition and processing methodology shall be adopted

- Mixing of:
  - Platforms (UAV + aircraft)
  - Sensors (inconsistent configurations)
  - Processing workflows

within a package shall not be permitted, unless explicitly approved by the Authority.

3.3 Bidding for Packages

Bidders may quote for one or more packages as defined in Clause 3.1.1

Bidders shall quote separately for each package.

Partial bidding within a package shall not be permitted.

3.4 Deployment and Parallel Execution Requirement

In case of award of multiple packages:The Contractor shall deploy independent survey teams, platforms, and processing resources for each package.Sequential execution of multiple packages using shared resourcesshall not be permitted.

3.5 Timeline Enforcement

Each package shall be governed by its own defined timeline.

Delays arising from inadequate resource deployment, poor planning, or operational inefficiencies on the part of the Contractor shall not be considered as valid justification for extension of time and may attract action under the applicable contractual provisions of this RFP.

3.6 Award Limitation and Capacity Control

The Authority reserves the right to:

- Limit the number of packages awarded to any bidder
- Allocate packages based on:
    - Financial Bid Capacity (FBC)
    - Deployment capability
    - Execution feasibility

to ensuretimely and quality execution across all packages.

3.7 Independent Execution and Payment Units

Each package listed in Clause 3.1.1 shall be treated as:

• An independent execution unit
• An independent QC unit
• An independent payment unit

All QC, acceptance, and payment processes shall be carried out package-wise.

3.8 Alignment with Technical Requirements

Execution of each package shallfully comply with all technical specifications and requirements defined in Section 4
including:

- Accuracy requirements
- QC and reflight conditions
- Data consistency requirements
- QC platform submission and acceptance

4. Detailed Scope of Work and Execution Requirements

4.1 Scope of End-to-End Responsibility

The Contractor shall be responsible for complete end-to-end execution of survey and data productionfor each assigned package, covering all activities required to deliver final outputs conforming to this RFP.
This shall include:

- Survey planning and preparation
- Ground control establishment and validation
- Aerial data acquisition
- Data processing, modelling, and adjustment
- Generation of ORI, DSM, and DTM
- Quality control, validation, and documentation
- Submission, rectification, and final acceptance through QC platform

4.1.1 Responsibility Fixation

The Contractor shall be solely responsible for:

- Completeness of coverage
- Accuracy of outputs
- Consistency across the dataset
- Compliance with all specifications, timelines, and standards

No activity required to achieve final outputs shall be considered outside scope, optional, or subject to interpretation.

4.2 AOI Definition and Survey Planning

The Contractor shall prepare a detailed Survey Plan, which shall include:

- AOI boundary validation against:
    - Ground conditions
    - Administrative limits
- Terrain classification (urban / rural / vegetation / mixed)
- Platform and sensor selection
- Flight planning (grid design, overlap, altitude)
- Logistics and deployment planning
- Risk assessment and mitigation

Terrain classification shall:

guide flight design, GCP density, and processing strategy

Survey execution shall commence only afterapproval of Survey Plan by the Authority**.**

Survey Plan approval shall include validation of deployment strategy, platform selection, and compliance with Section 4.10.

Deployment plan, including number of platforms, teams, and daily coverage capacity, shall be submitted as part of Survey Plan and shall be subject to approval by the Authority.

Survey Plan shall strictly conform to the package boundaries defined in Clause 3.1.1 and shall not propose any subdivision or alteration

The Contractor shall propose sub-block processing strategy (if required) as part of the Survey Plan, including:

• Sub-block layout
• Overlap strategy

• Integration methodology

The same shall be subject to approval by the Authority.

4.2.1 Corridor-Based Survey Planning

For river floodplain packages:

Survey planning shall ensure:

• Continuous coverage along the river corridor
• Adequate buffer coverage on both sides of river
• Avoidance of segmentation across river stretches

Entire river stretch within a package shall be treated as a single integrated survey unit.GCP layout plan (with map) shall be submitted and approved prior to survey execution.

4.3 Ground Control and Validation Framework

The Contractor shall establish a robust control framework comprising:

- Ground Control Points (GCPs)
- Independent Check Points (ICPs)

4.3.1 GCP/ICP Distribution

- Minimum GCP density:
  5 per 100 sq km, increased for urban/complex terrain
- Coverage:
  - Edges, corners, and interior areas
- ICPs:
  - Mandatory
  - Independent of GCPs

4.3.2 Survey and Accuracy Requirements

GCP/ICP shall:

- Be established using GNSS or equivalent survey methods
- Be clearly identifiable in imagery
- Be accuracy-validated prior to processing

In addition to the minimum GCP density specified, the Contractor shall ensure that GCPs are distributed in a manner that supports stable block adjustment and sub-block integration.

The following shall apply:

• Each processing sub-block (if adopted) shall have a minimum of 4 well-distributed GCPs
• GCPs shall be located at:
o Corners of sub-block
o Central region of sub-block
• Adjacent sub-blocks shall have overlapping GCP influence to ensure seamless integration

The Contractor shall ensure that:

• GCP distribution is not clustered
• Control is sufficient to avoid geometric distortion and vertical inconsistency
• Terrain complexity (riverbanks, vegetation, elevation variation) is considered in GCP placement

The Authority may require additional GCPs in:

• Complex terrain
• River corridors

• Areas prone to distortion

Inadequate GCP distribution leading to:

• Block instability
• Accuracy failure
• Sub-block mismatch

shall result in rejection and reprocessing at Contractor's cost.

4.4 Flight Planning and Data Acquisition

The Contractor shall undertake aerial data acquisition ensuring:

- Complete AOI coverage
- Consistent acquisition parameters across entire block
- Absence of:
    - Data gaps
    - Shadows
    - Distortions

4.4.1 Flight Planning Parameters

Flight planning shall ensure:

- ≥80% forward overlap
- ≥70% side overlap
- Uniform GSD:**≤ 5 cm**
- Stable and consistent flight geometry

For complex terrain or dense urban areas additional overlap and/or cross-flight shall be adopted.

4.4.2 Environmental Constraints

Data acquisition shall not be carried out under:

- Cloud cover
- Haze
- Low visibility
- High wind or adverse weather

4.4.3 Reflight Trigger (Acquisition Stage)

The following shall mandatorily trigger reflight:

- Data gaps
- Shadow effects
- Poor overlap
- Inconsistent acquisition

4.5 Photogrammetric Processing and Block Adjustment

The Contractor shall perform:

- Image alignment and photogrammetric processing
- Block adjustment
- Dense point cloud generation
- Surface modelling

4.5.1 Block Integrity Requirement

The Contractor shall ensure that each package is processed and delivered as a single geometrically and radiometrically consistent dataset.

For operational feasibility, processing may be carried out in multiple sub-blocks, subject to the following conditions:

• Sub-blocks shall be designed as logically continuous segments of the AOI

• Adequate overlap shall be maintained between adjacent sub-blocks
• All sub-blocks shall be integrated through a common control framework (GCPs)
• Final outputs shall be seamlessly merged to form a unified dataset

The Contractor shall ensure that:

• No seamlines, discontinuities, or edge mismatches are visible in final deliverables
• No vertical or horizontal offsets exist across sub-block boundaries
• Radiometric consistency is maintained across the entire package
• Terrain continuity is preserved, especially for DTM outputs

Submission of fragmented or non-integrated datasets shall not be accepted.

Final acceptance shall be based on seamless, unified, and consistent output for the entire package, irrespective of internal processing approach.

4.5.2 Adjustment Quality
Block adjustment shall ensure:

- RMSE:**≤ 1 pixel**
- Geometric consistency across block
- No distortions or discontinuities

4.6 Generation of DSM and DTM

4.6.1 DSM Requirements
DSM shall:

- Represent all surface features
- Be free from:
    - Noise
    - Spikes
    - Artefacts

4.6.2 DTM Requirements
DTM shall:

- Represent bare-earth terrain
- Be derived using:
    - Classification
    - Filtering algorithms
- Remove:
    - Vegetation
    - Buildings
- Preserve:
    - Terrain continuity
    - Breaklines (if generated) shall be submitted as vector dataset (Shapefile/GeoPackage) representing critical terrain features such as river banks, embankments, and slope discontinuities.

4.7 Generation of Ortho Rectified Imagery (ORI)
ORI shall:

- Be seamless across entire block
- Have no visible seamlines
- Have no geometric distortions

4.7.1 Quality Requirements

- No building lean or displacement
- Accurate geometric correction

- Uniform radiometric balancing
- Consistent tonal quality

4.7.2 Source Requirement
ORI shall be derived fromoptical imagery only**.**

4.8 Accuracy Requirements and Validation
The Contractor shall ensure:
- Planimetric accuracy:**≤ 10 cm RMSE (ICP-based)**
- Vertical accuracy (DTM):**≤ 20 cm RMSE(ICP-based)**

Vertical Accuracy and Datum Compliance:

Accuracy assessment of elevation data shall be carried out on ellipsoidal heights derived during photogrammetric processing.

The Contractor shall ensure that:

• Vertical accuracy (RMSE Z) of ellipsoidal DTM shall be ≤ 20 cm, validated using Independent Check Points (ICPs)

The Survey of India shall provide the Geoid Model (latest GEIODAS or officially notified equivalent) for the project area.

The Contractor shall:

• Apply the provided Geoid Model to convert ellipsoidal heights to orthometric heights
• Generate final DTM (bare-earth terrain) referenced to the geoid (Mean Sea Level)

Final deliverable for all applications, including hydrological modelling, shall be:

• Orthometric DTM referenced to Survey of India Geoid Model

The Contractor shall submit:

• Ellipsoidal DTM (for validation purposes)
• Geoid-referenced orthometric DTM (final deliverable)

DTM generation shall ensure sufficient spatial resolution to capture micro-topography, drainage paths, and terrain gradients required for hydrological modelling.

Any error in geoid application or inconsistency in vertical referencing shall result inrejection of deliverables. Systematic vertical bias across AOI shall not be permitted, even if RMSE criteria are met.

Vertical accuracy shall be assessed on ellipsoidal heights, while final deliverables shall be referenced to orthometric heights derived using Survey of India Geoid Model.Ellipsoidal heights shall be used solely for accuracy validation, while orthometric heights shall constitute the final deliverable for all applications.DTM generation shall ensure sufficient spatial resolution to capture micro-topography, drainage paths, and terrain gradients required for hydrological modelling.

4.8.1 Validation Requirements
- Accuracy shall be:
    - Verified using ICPs
    - Statistically evaluated
    - Documented in reports

4.9 Quality Control, Re-flight and Rectification

4.9.1 Internal Quality Control

The Contractor shall performComplete internal QC prior to submission.

4.9.2 Re-flight Conditions

Re-flight shall be mandatory in case of:

- Data gaps
- Poor overlap
- Cloud/shadow interference
- Accuracy failure
- QC rejection

4.9.3 Documentation Requirements

The Contractor shall maintain and submit:

- Processing logs
- Accuracy reports
- QC reports

4.9.4 Raw Data Management

- Raw data shall:
    - Be preserved
    - Be submitted when required

4.10 Operational and Deployment Requirements

4.10.1 Deployment Planning Requirement

The Contractor shall determine and deploy adequate number of survey platforms and teams for each package, based on:

- Package area
- Terrain complexity
- Acquisition constraints
- Timeline requirements

The deployment plan shall:
ensure completion of data acquisition and deliverables within stipulated timelines without compromising quality.

4.10.2 Minimum Productivity Benchmark (UAV-Based Execution)

For UAV/RPAS-based execution:
Each UAV platform shall achieve a minimum productivity of10 sq km per day per UAV (net effective survey area).

4.10.3 Minimum Deployment Norm (Area-Based)

For UAV-based execution, minimum deployment shall be:
Atleast 1 UAV system per 300 sq km of package area, rounded up to the next integer

Illustrative Deployment Requirement

Package Area	Minimum UAVs Required
Up to 300 sq km	1 UAV
301 – 600 sq km	2 UAVs
601 – 900 sq km	3 UAVs
901 – 1200 sq km	4 UAVs
>1200 sq km	Proportionately higher

4.10.4 Timeline Compliance Clause

The Contractor shall ensure:Total deployed capacity (UAVs / aerial systems) is sufficient to complete the package within the specified timeline.The above deployment norm represents the minimum requirement. Contractor shall deploy additional resources, if required, to meet the stipulated timelines.

Failure to meet timeline due to:

- inadequate deployment
- improper planning

shall be treated ascontractual non-performance.

4.10.5 Platform-Neutral Deployment Clause

For packages executed using:

- Manned aerial platforms
- LiDAR-based systems

The Contractor shall ensureequivalent or superior daily coverage and efficiency, consistent with timeline requirements.

4.10.6 Multi-Package Deployment Requirement

In case of award of multiple packages: The Contractor shall deploy independent and dedicated survey teams and platforms for each package**.**Sequential deployment across packagesshall not be permitted.

4.10.7 Enforcement Clause

The Authority shall:

- Verify deployment adequacy during Survey Plan approval
- Monitor execution progress

Persistent under-deployment may result in:

- Reallocation of packages

- Invocation of contractual provisions

4.10.8 No Compromise Clause

Under no circumstances shall:

- Reduced deployment
- Weather delays
- Resource constraints

be used to justify or compromise in accuracy, coverage, or QC compliance.

Deployment plan demonstrating compliance with this clause shall be submitted as part of Survey Plan (Section 4.2).

Deployment compliance shall be verified during Survey Plan approval stage.

4.11 Compliance, Security and Regulatory Requirements

The Contractor shall ensure:

- Compliance with DGCA and applicable regulations
- Data security and confidentiality
- Data integrity and backup

4.12 Acceptance, Verification and Enforcement

4.12.1 QC Platform Submission

All deliverables shall be uploaded on the designated UPGD QC Platform.

4.12.2 Observation Handling

The Contractor shall:

- Address all QC observations
- Reprocess and re-upload data

4.12.3 Final Acceptance

Final acceptance shall be granted only upon successful QC clearance on the platform.

4.12.4 Authority Verification

Independent QC verification by Authority shall be binding for execution and compliance purposes.

4.12.5 Enforcement Clause

Any deviation from specifications shall result in rejection and rework at Contractor’s cost.

5. QC Platform Integration and Acceptance Framework

5.1 Mandatory Digital Submission

All deliverables under this RFP shall bemandatorily submitted through the designated UPGD Web-Based QC Platform.

Submission of deliverables through any other modeshall not be considered valid for quality control or acceptance.

5.2 Scope of Submission

The Contractor shall upload the following on the QC Platform:

- ORI datasets
- DSM and DTM datasets
- GCP and ICP data
- Processing outputs and reports
- Accuracy validation reports
- QC self-certification

All submissions shall conform to:

- Prescribed formats
- Naming conventions
- Data structure requirements

5.3 QC Workflow

Quality Control shall be conducted through the platform in the following stages:

1. Data Upload by Contractor
2. Automated validation checks (format, coverage, completeness)
3. Technical QC by Authority
4. Issuance of observations
5. Rectification and re-upload by Contractor
6. Final QC clearance

5.4 Observation Handling and Re-Submission

The Contractor shall:

- Address all QC observations raised on the platform
- Reprocess and re-upload datasets as required

All rework shall be carried outat no additional cost to the Authority.

5.5 Binding Nature of QC

Quality Control carried out through the QC Platform shall be binding for execution purposes. Independent QC verification by the Authorityshall prevail over Contractor's internal QC.

5.6 Final Acceptance

Final acceptance of deliverables shall be grantedonly upon successful QC clearance recorded on the QC Platform.
Acceptance outside the platformshall not be valid.

5.7 Payment Linkage

Release of payment shall be strictly governed by Section 6 (Payment Terms).

Stage 1 payment shall be limited to validated and complete submission suitable for QC processing.

Stage 2 and Stage 3 payments shall be released only upon final acceptance recorded on the QC Platform.

Partial or provisional submissions shall not qualify for any payment.

5.8 Data Responsibility and Infrastructure Requirement

The Contractor shall ensure:

- Availability of adequate infrastructure
- Sufficient bandwidth and storage

large dataset uploads.

Indicative data volume may be up to ~50 GB per sq km.

This is provided for planning purposes only and shall not form basis for any claim.

Failure to upload within timelinesshall not be accepted as a valid delay justification**.**

5.9 Integration with Section 4

All QC processes under this clause shall be read in conjunction with:

- **Section 4.9 (Quality Control and Reflight)**
- **Section 4.12 (Acceptance and Enforcement)**

6. Deliverables

6.1 Deliverables

The Contractor shall generate and submit the following deliverables for each package:

(a) Ortho Rectified Imagery (ORI)
(b) Digital Surface Model (DSM)
(c) Digital Terrain Model (DTM) – Bare Earth Elevation Model
(d) Ground Control Points (GCP) and Independent Check Points (ICP) datasets
(e) Processing Reports and Accuracy Reports
(f) Metadata and documentation

All deliverables shall be complete, consistent, and conform to the specifications defined in this RFP.

6.2 Coordinate Reference System and Datum

All deliverables shall be provided in a consistent and clearly defined coordinate reference system.

Horizontal Reference:

• WGS 84 datum or as specified by the Authority
• Projection system as defined in Survey Plan approval

Vertical Reference:

• Ellipsoidal heights referenced to WGS 84 shall be generated during processing
• Final deliverables shall include orthometric heights derived using the Survey of India Geoid Model .

The Contractor shall ensure:

• Consistency of horizontal and vertical datums across the entire package
• No mixing of datums within or across datasets

6.3 Hydrologically Correct Terrain Model

DTM shall be free from artificial sinks, spikes, and discontinuities that adversely affect hydrological flow modelling.

Hydrological consistency may be validated through terrain continuity checks and flow-path verification during QC.

The Contractor shall ensure:

• Removal of vegetation, buildings, and above-ground features
• Preservation of natural terrain continuity
• Correct representation of drainage paths, slopes, and flow direction
• Absence of artificial depressions or spikes

DTM shall be suitable for:

• Floodplain delineation
• Hydraulic modelling
• Terrain analysis

6.4 Elevation Deliverables

The Contractor shall provide elevation datasets in the following forms:

(a) Ellipsoidal Heights:
• Referenced to WGS 84 ellipsoid
• Used for internal validation and traceability

(b) Orthometric Heights:
• Derived using Survey of India Geoid Model
• To be used as primary elevation dataset for all applications

Both datasets shall:

• Be consistent and traceable
• Maintain accuracy thresholds specified in this RFP

6.5 Geoid Model Application

The Contractor shall apply the Survey of India Geoid Model (latest available version) for conversion of ellipsoidal heights to orthometric heights.

The Contractor shall:

• Clearly document geoid model used
• Maintain transformation consistency across AOI
• Submit transformation parameters and methodology

Any inconsistency in vertical referencing shall:

result in rejection of deliverables.

6.6 Vertical Accuracy and Datum Compliance

Vertical accuracy and datum compliance shall be governed by Clause 4.8 of this RFP

6.7 Primary Geospatial Deliverables

6.7.1 Ortho Rectified Imagery (ORI)

The Contractor shall deliver:

- Seamless orthomosaic imagery for entire AOI
- If tiled delivery is adopted, tiles shall:

  • Maintain seamless continuity across tile boundaries
  • Not introduce seamline artefacts or radiometric variation
  • Conform to a uniform grid index system approved by the Authority

Requirements:

- Ground Sampling Distance (GSD): ≤ 5 cm
- No seamline visibility
- No geometric distortion
- No building lean or displacement
- Uniform radiometric balance

Format:

- GeoTIFF (preferred) or equivalent standard format
- Tiled and indexed (if required for large datasets)
- Projection: As specified by Authority

6.7.2 Digital Surface Model (DSM)

DSM shall represent:

- Terrain + vegetation + built-up features

Requirements:

- Free from noise, spikes, or artefacts
- Continuous and gap-free

- DSM shall be free from voids (NoData cells). Any gaps shall be corrected through appropriate interpolation or re-acquisition.

  Final deliverables shall be gap-free (0% voids) after correction..

Format:

- Raster datasets shall be provided as:

  • GeoTIFF with proper georeferencing
  • Float format (for elevation values)
- DSM grid resolution shall comply with Clause 6.7.4 (≤ 0.20 m).

6.7.3 Digital Terrain Model (DTM)

DTM shall represent:

- Bare-earth terrain

Requirements:

- Removal of vegetation and structures
- Preservation of terrain continuity
- Vertical accuracy ≤ 20 cm RMSE
- DTM shall be free from voids (NoData cells). Any gaps shall be corrected through appropriate interpolation or re-acquisition.

  Final deliverables shall be gap-free (0% voids) after correction.

Format:

- Raster datasets shall be provided as:

  • GeoTIFF with proper georeferencing
  • Float format (for elevation values)
- Consistent resolution

6.7.4 Grid Resolution of DSM and DTM

DSM and DTM shall be derived from the same source dataset and processing framework to ensure consistency in spatial alignment and elevation reference. The Contractor shall generate DSM and DTM products at uniform grid spacing consistent with source data resolution and intended application

The following minimum specifications shall apply:

• Digital Surface Model (DSM):
Grid spacing shall not exceed 0.20 m

• Digital Terrain Model (DTM):
Grid spacing shall not exceed 0.50 m

The Contractor may generate elevation models at finer resolution; however, no coarser resolution than specified above shall be accepted.

All grids shall:

• Be continuous and free from voids
• Maintain consistent resolution across each package
• Be aligned to a common coordinate grid system
• Preserve terrain characteristics required for hydrological modelling

Resampling or artificial upscaling of coarser datasets shall not be permitted.

6.8 Ground Control and Validation Data

6.8.1 GCP Data

The Contractor shall provide:

- Coordinates of all Ground Control Points (GCPs)

Details:

- Point ID
- Latitude / Longitude / Elevation
- Survey method used
- Accuracy details

6.8.2 ICP Data

The Contractor shall provide:

- Independent Check Point (ICP) dataset

Details:

- Clearly identified as independent from GCPs
- Used for accuracy validation

6.9 Processing and Quality Documentation

The Contractor shall submit:

6.9.1 Processing Report

Including:

- Survey methodology
- Platform and sensor used
- Flight parameters
- Processing workflow

6.9.2 Block Adjustment Report

Including:

- Adjustment statistics
- RMSE values
- Control point residuals

6.9.3 Accuracy Report

Including:

- ICP-based accuracy assessment
- Horizontal RMSE
- Vertical RMSE
- Statistical summary

6.9.4 QC Self-Certification

Contractor shall certify:

- Compliance with all RFP specifications
- Completion of internal QC

6.9.5Metadata

Metadata shall mandatorily include:

• Coordinate reference system (horizontal and vertical)
• Geoid model used
• Acquisition date and time
• Platform and sensor details
• Processing software and version
• Grid resolution (DSM/DTM)
• Accuracy summary (RMSE values)

Incomplete metadata shall result in rejection.

6.10 Raw and Intermediate Data (Conditional Submission)

The Contractor shall:

- Preserve all raw and intermediate datasets

These shall be:
submitted upon demand by the Authority
including:

- Raw imagery
- GNSS logs
- Intermediate processing outputs

6.11 Data Structure and Format Compliance

All deliverables shall:

- Follow prescribed:
    - Folder structure
    - Naming conventions
    - Metadata standards
- Be compatible withUPGD QC Platform ingestion requirements.

Non-compliant datashall be rejected at submission stage.

6.12 Submission Mode

All deliverables shall beuploaded on the UPGD QC Platform.
Physical submission (if required):

- Shall be supplementary only
- Shall not substitute digital submission

6.13 Completeness Requirement

A package shall be considered complete only when:

- All deliverables listed above are submitted
- QC observations (if any) are resolved
- Final acceptance is granted on QC Platform

6.14 Responsibility Clause

The Contractor shall be responsible for:

- Accuracy and completeness of all deliverables
- Consistency across datasets
- Compliance with all specifications

Incomplete or inconsistent deliverablesshall be treated as non-submission.

SECTION 7: PAYMENT TERMS

7.1 General Principle

Payment under this RFP shall bemilestone-based and strictly linked to deliverables validated and accepted through the UPGD QC *Platform.*
No payment shall be released:

- For incomplete submissions
- For datasets failing QC validation
- Outside the QC platform framework

7.2 Payment Structure (Package-wise)

Payment for each package shall be released in the following stages:

7.2.1 Stage 1 – Data Submission (20%)

Payable upon:

- Complete upload of all deliverables for the package on the UPGD QC Platform, including:
    - ORI
    - DSM
    - DTM
    - GCP/ICP datasets
    - Processing and accuracy reports
- Successful ingestion of data on the platform
- Verification that:
    - Coverage is complete
    - No major data gaps exist
    - Data is in prescribed format and structure

Important Condition:

Stage 1 payment shall be released only if:submission is complete, coherent, and suitable for QC processing.

Partial, fragmented, or inconsistent submissionsshall not qualify for payment**.**

Stage 1 payment does not imply technical acceptance of deliverables.

7.2.2 Stage 2 – Final QC Acceptance (70%)

Payable upon:

- Successful completion of QC process
- Resolution of all observations raised by the Authority
- Validation of:
    - Planimetric accuracy (≤ 10 cm RMSE)
    - Vertical accuracy (DTM ≤ 20 cm RMSE)
- Final acceptance recorded on the UPGD QC Platform

7.2.3 Stage 3 – Final Closure and Documentation (10%)

Payable upon:

- Submission of:
    - Final processing reports
    - Accuracy reports
    - QC compliance certificate
- No pending observations or deficiencies
- Formal closure of package

7.3 No Advance Payment

No advance payment shall be made under this RFP.

7.4 No Payment at Data Acquisition Stage

Completion of aerial data acquisition shallnot qualify for any payment.
No claim shall be admissible on the basis of:

- Flying completion
- Raw data availability
- Partial progress

7.5 Payment Safeguards

7.5.1 No Payment for Non-Compliant Data

No payment shall be made for:

- Rejected datasets
- Data failing QC validation
- Incomplete or inconsistent submissions

7.5.2 Rework at Contractor’s Cost

All reprocessing, reflight, or corrections required due to:

- Data gaps
- Poor acquisition
- Accuracy failure
- QC rejection

shall be carried outat Contractor’s cost without any additional payment.

7.5.3 Package-wise Payment

Each package shall be:

- Evaluated independently
- Paid independently

Non-performance in one packageshall not affect payment for another compliant package.

7.6 Protection Against Non-Performance and Abandonment

7.6.1 Contractor Liability

Even after release of Stage 1 payment, the Contractor shall remain fully responsible for:

- Completion of all remaining work
- Meeting accuracy and quality standards
- Compliance with all RFP conditions

7.6.2 Performance Security

Performance Security shall:

- Remain valid till final acceptance of all packages
- Be liable for invocation in case of:
    - Non-performance
    - Abandonment
    - Persistent non-compliance

7.6.3 No Exit Without Completion

The Contractor shall not:

- Abandon work after partial completion
- Refuse to carry out rework

Failure to complete work shallattract appropriate contractual action including recovery and blacklisting.

7.7 Payment Conditions

Before release of any payment, the following shall be ensured:

• QC status as per applicable stage
• No pending critical observations
• Submission of required documentation
• No recoveries or penalties pending

Payment shall be released only upon submission of invoice corresponding to the accepted milestone and completion of all pre-release conditions.

7.8 Integration with QC Platform

All payments shall be based onQC status recorded on the UPGD QC Platform.

Platform records shall be binding for execution and compliance purposes.

7.9 Dispute Resolution Basis

In case of any dispute related to:

- Data quality
- Submission completeness
- Acceptance

The following shall be treated as primary evidence:

- QC Platform records
- Submitted reports and logs

8. Evaluation Methodology for Multi-Package Bidding

The evaluation methodology ensures fairness, competition, and optimal resource utilisation.

8.1 Package-wise Independent Evaluation

Evaluation shall be carried out package-wise for the packages listed in Clause 3.1.1independently on L1 (lowest evaluated cost) basis
Accordingly:

- Financial bids shall be compared package-wise
- A bidder may be L1 in one or more packages
- Arithmetic corrections in financial bids, if required, shall be carried out by the Authority and shall be binding on the bidder.

8.2 Multiple Package Award

A bidder may be considered for award ofone or more packages, subject to:

- Financial Bid Capacity (FBC)
- Deployment capability
- Operational feasibility

Financial Bid Capacity (FBC) shall be determined based on bidder's Average Annual Turnover (AAT), ongoing commitments, and class eligibility under S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 . The Authority may adopt a capacity validation approach consistent with Government procurement best practices to ensure proportional allocation.

8.3 Combined Allocation in Government Interest

Notwithstanding package-wise L1 determination:
The Authority reserves the right to award packages in such combination that results in:

- overall lowest cost to Government**,** and
- timely and efficient execution

8.4 Capacity-Based Rationalisation

While determining final award:
The Authority may:

- Limit number of packages to a bidder
- Reallocate packages among bidders

based on:

- Financial Bid Capacity (FBC)
- Available resources
- Past performance

8.5 No Automatic Right of Award

Being L1 in a packageshall not automatically guarantee award
Award shall be subject to:

- Capacity verification
- Compliance with all RFP conditions

8.6 No Claim for Reallocation

Bidders shall not:

- Claim award of all packages where they are L1
- Challenge allocation made in overall project interest

8.7 Tie-Breaking

In case of identical L1 rates:

- Preference may be given based on:
    - Higher capacity
    - Faster execution capability

SECTION 9: ADDITIONAL TERMS & CONDITIONS (ATC)

9.1 Eligibility and Participation Clause

Participation in this RFP is restricted tofirms empanelled under Empanelment Order S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026 dated 07 January 2026for relevant service categories.

No fresh technical evaluation shall be undertaken.

Verification of empanelment statusshall be carried out by the Authority from official records.

9.2 Non-Reopening of Technical Evaluation

The technical qualification of empanelled firmsshall be treated as final and binding.
The Authority shall not:

- Seek additional technical documents
- Conduct technical scoring
- Undertake re-evaluation

except for verifying empanelment validity.

9.3 Output-Based Specification Clause

This RFP follows anoutput-based and performance-based specification framework
Accordingly:

- No restriction is placed on:
    - Platform
    - Sensor
    - Methodology

provided thatfinal deliverables meet all specified accuracy and quality criteria.

9.4 Single Methodology per Package Clause

For each packagea single consistent acquisition and processing methodology shall be adopted
Mixing of:

- Platforms
- Sensors
- Processing workflows

within a package shallnot be permitted without prior approval.

9.5 No Advance and Controlled Payment Clause

No advance payment shall be made.
No payment shall be released at:

- Data acquisition stage
- Partial progress stage

Payment shall belinked to QC platform-based acceptance only.

9.6 QC Platform Binding Clause

All deliverables shall be submitted on the designated QC platform.

Quality Control conducted through the platformshall be binding for execution and compliance purposes.

Platform records shallconstitute official evidence for acceptance and payment.

9.7 Reflight and Rework Responsibility Clause

All reflight, reprocessing, and corrections required due to:

- Data gaps
- Accuracy failure
- QC rejection

shall be carried outat Contractor's cost without additional payment.

9.8 No Claim for Methodology Clause

The Contractor shall not:

- Raise claims based on:
    - Chosen methodology
    - Platform limitations
    - Resource constraints

Responsibility for achieving outputsshall rest solely with the Contractor.

9.9 Package-Based Execution and Payment Clause

Each package shall be treated as:

- Independent execution unit
- Independent QC unit
- Independent payment unit

Performance in one packageshall not influence acceptance of another.

9.10 Financial Bid Capacity (FBC) Clause

Allocation of packages shall be subject to:
Financial Bid Capacity (FBC)
The Authority reserves the right to:

- Limit award quantity
- Ensure bidder capacity is not overstretched

9.11 Right to Limit or Split Work

The Authority reserves the right to:

- Split the work
- Limit number of packages per bidder
- Reallocate packages

to ensuretimely and quality execution.

9.12 Data Ownership Clause

All data generated under this RFPshall be the property of the Authority.
The Contractor shall:

- Not use data for any other purpose
- Not share data without approval

9.13 Data Security and Confidentiality Clause

The Contractor shall ensure:

- Secure storage and transmission
- Protection against unauthorized access

Any breach shallattract contractual and legal action.

9.14 Delay and Non-Performance Clause

Delays due to:

- Poor planning
- Inadequate resources
- Contractor inefficiency

Shallnot be accepted as valid reasons.
The Authority may:

- Impose penalties
- Invoke performance security

9.15 No Deviation Clause

No deviation from:

- Technical specifications
- QC requirements
- Deliverable standards

shall be permitted.
Any deviationshall result in rejection and rework.

9.16 Final Authority Clause

Decision of the Authority regarding:

- QC
- Acceptance
- Reflight
- Payment

shall befinal and binding.

9.17Vertical Reference Compliance Clause

All elevation datasets shall be compliant with the vertical datum specified in this RFP.

Deliverables not conforming to geoid-referenced orthometric heights shall be rejected.

No claim shall be admissible on account of incorrect datum usage.

9.18 Dispute Minimisation Clause

In case of dispute, the following shall be treated asprimary and binding evidence

- QC platform records
- Accuracy reports
- Submitted documentation

9.19 Audit Compliance Clause

This procurement is conducted in accordance with:

- GFR 2017
- CVC guidelines
- Government procurement norms

The structure of:

- Empanelment (S-74/752025/1/2026-STORE-SGO DATED 07 JANUARY 2026)
- Financial bidding (this RFP)

is adopted to ensurefair competition, transparency, and efficiency.

9.20 No Right to Award Clause

Participation in this RFPdoes not guarantee award of work.
The Authority reserves the right to:

- Accept or reject any bid
- Cancel the RFP

without assigning reasons.

9.21 Blacklisting and Integrity Clause

The Contractor shall:

- Maintain integrity and fairness

Any instance of:

- Misrepresentation
- Fraud
- Collusion

shall lead toblacklisting and legal action.

9.22Force Majeure Clause

Force majeure conditions shall be governed as per standard Government contract provisions.
Annexures: In case of inconsistency between main RFP and Annexures, the provisions of the main RFP shall prevail, except where Annexures explicitly define technical thresholds or decision logic.
Annexure A: QC rejection thresholds (accuracy, gaps, artifacts)
Annexure B: Acceptance Test Protocol (ATP)

Annexure C: Reflight Matrix
Annexure D: BID SUBMISSION CHECKLIST (FINANCIAL BID ONLY)

ANNEXURE A: QC CHECKLIST & REJECTION THRESHOLDS

A.1 Purpose

This Annexure definesobjective quality control criteria, acceptance thresholds, and rejection conditionsfor all deliverables submitted under this RFP.
These criteria shall formthe sole basis for acceptance, rejection, reflight, and payment decisions.

A.2 General Acceptance Principle

A dataset shall be accepted only if:

- All parameters meet defined thresholds
- No critical defects exist
- Data is complete and consistent

Failure in any critical parametershall result in rejection or mandatory rework.

A.3 ORI (Orthomosaic) QC Criteria

Parameter	Acceptance Threshold	Rejection Condition
GSD	≤ 5 cm	> 5 cm
Seamlines	Not visible	Visible seamlines
Geometric Accuracy	≤ 10 cm RMSE	> 10 cm
Building Lean	Not permitted	Any visible lean
Radiometric Quality	Uniform	Color mismatch / tonal variation
Distortion	None	Warping / misalignment
Data Gaps	0%	Any gap > 0.5% area

A.4 DSM QC Criteria

Parameter	Acceptance Threshold	Rejection Condition
Surface Continuity	Continuous	Breaks / voids
Noise / Artefacts	Minimal	Spikes / noise
Completeness	100% coverage	Missing data
Consistency	Uniform	Patch inconsistency

A.5 DTM QC Criteria

Parameter	Acceptance Threshold	Rejection Condition
Vertical Accuracy	≤ 20 cm RMSE	> 20 cm
Terrain Continuity	Continuous	Breaks
Feature Removal	Vegetation/buildings removed	Residual structures
Artefacts	None	Noise / spikes

Vertical Accuracy Check:

• RMSE Z (Ellipsoidal Heights) ≤ 20 cm

Vertical Datum Consistency:

• Orthometric DTM correctly derived using SoI Geoid Model
• No mixing of ellipsoidal and orthometric heights

Rejection Criteria:

• RMSE Z > 20 cm
• Incorrect geoid application
• Inconsistent vertical referencing

Grid Resolution Check:

DSM:
• ≤ 0.20 m grid spacing

DTM:
• ≤ 0.50 m grid spacing
Rejection Criteria:
• Coarser grid than specified
• Variable grid spacing within package
• Resampled or artificially interpolated grids

A.6 GCP / ICP QC Criteria

Parameter	Acceptance Threshold	Rejection Condition
GCP Density	≥ 5 per 100 sq km	Below minimum
ICP Independence	Fully independent	Overlapping with GCP
Survey Accuracy	As per GNSS standard	Unverified
Distribution	Even coverage	Clustered / uneven

Sub-block GCP adequacy:

• Minimum 4 GCPs per sub-block
• Proper spatial distribution

Rejection:

• Insufficient or poorly distributed GCPs

A.7 Coverage & Completeness Criteria

Parameter	Acceptance Threshold	Rejection Condition
AOI Coverage	100%	Missing areas
Overlap	≥80% forward, ≥70% side	Below threshold
Shadow / Cloud	≤ 2%	> 2%
Data Gaps	0%	> 0.5%

While minor gaps up to 0.5% may be permitted at preliminary stage, final accepted deliverables shall be completely gap-free (0% voids).

A.8 Processing & Block Integrity Criteria

Parameter	Acceptance Threshold	Rejection Condition
Block Processing	Entire package delivered as a unified and seamless dataset	Fragmented or non-integrated dataset
Adjustment Accuracy	RMSE ≤ 1 pixel	RMSE > 1 pixel
Tiling Artefacts	None	Any visible tiling artefacts
Dataset Continuity	Seamless across entire AOI	Disjoint or discontinuous dataset
Sub-block Integration (Horizontal)	No horizontal mismatch across sub-block boundaries	Any horizontal offset between sub-blocks
Sub-block Integration (Vertical - DTM)	No vertical discontinuity in DTM	Any elevation discontinuity across sub-blocks
ORI Seamline Integrity	No visible seamlines in orthomosaic	Visible seamlines or tonal mismatch
Radiometric Consistency	Uniform tonal balance across AOI	Radiometric inconsistency across sub-blocks

Additional Enforcement Criteria
• Sub-block processing (if adopted) shall result in a fully integrated final dataset
• Integration shall ensure geometric, radiometric, and elevation consistency across entire package

Rejection Criteria
• Any visible seam, mismatch, or offset across sub-block boundaries
• Any horizontal or vertical inconsistency affecting dataset integrity
• Any artefact impacting terrain continuity or hydrological usability

A.9 QC Platform Compliance

Parameter	Acceptance Requirement	Rejection Condition
Upload Format	As specified	Non-compliant
Data Structure	Correct	Incorrect
Metadata	Complete	Missing
QC Status	Accepted	Pending / rejected

A.10 Reflight Decision Matrix

Reflight shall be mandatory in case of:

Condition	Action
Data gaps > 0.5%	Reflight
Accuracy failure	Reflight
Cloud/shadow > 2%	Reflight
Overlap deficiency	Reflight
QC rejection	Reflight

A.11 Classification of Defects

A.11.1 Critical Defects (Immediate Rejection)

- Accuracy failure
- Missing data
- Block fragmentation
- Major distortion
- GCP/ICP non-compliance

A.11.2 Major Defects (Rework Required)

- Radiometric inconsistency
- Minor artefacts
- Partial seamline visibility

A.11.3 Minor Defects (Acceptable with Observation)

- Cosmetic issues
- Non-critical tonal variation

A.12 Acceptance Rule

A dataset shall be:

Accepted if:

- No critical defects
- Major defects resolved
- QC status = Accepted

Rejected if:

- Any critical defect exists
- Repeated failure after rework

A.13 Linkage with Payment

- Only **accepted datasets** shall qualify for payment
- Rejected datasets:
  shall not be paid for
- Rework:**at Contractor's cost**

A.14 Final Authority Clause

The decision of the Authority based on:

- QC platform results
- Validation reports shall be binding for execution and compliance purposes.

Annexure B: Acceptance Test Protocol (ATP)

ANNEXURE B: ACCEPTANCE TEST PROTOCOL (ATP)

B.1 Purpose

This Acceptance Test Protocol (ATP) defines:**the structured procedure for validation, testing, and acceptance of deliverables**
submitted under this RFP.

The ATP shall ensure that:

- Deliverables meet all technical specifications
- QC is carried out systematically
- Acceptance decisions are objective and traceable

B.2 Scope of ATP

ATP shall apply to:

- ORI (Orthomosaic)
- DSM (Digital Surface Model)
- DTM (Digital Terrain Model)
- GCP / ICP datasets
- Processing and accuracy reports

B.3 ATP Workflow Overview

The acceptance process shall followSubmission → Validation → QC → Observation → Rectification → Final Acceptance.

B.4 Stage-Wise Acceptance Process

B.4.1 Stage 1: Data Submission and Ingestion

Objective:

To verify completeness and system compatibility of submitted data

Activities:

- Upload of all deliverables on QC Platform
- Verification of:
    - File format
    - Naming convention
    - Folder structure

- Data completeness

Acceptance Criteria:

- Data successfully ingested
- No missing files
- AOI coverage appears complete

Outcome:

Status	Action
Pass	Move to Stage 2
Fail	Resubmit required

B.4.2 Stage 2: Preliminary Technical Validation

Objective:

To ensure dataset is suitable for QC processing

Activities:

- Visual inspection of:
  - Coverage completeness
  - Major gaps
  - Obvious distortions
- Basic checks:
  - Overlap adequacy
  - Data continuity

Acceptance Criteria:

- No major gaps (>0.5%)
- No major distortions
- Data suitable for QC

Outcome:

Status	Action
Pass	Move to Stage 3
Fail	Reflight / reprocessing required

B.4.3 Stage 3: Detailed QC Evaluation

Objective:
To evaluate the dataset against the quality thresholds specified in Annexure A.
Activities:
• ORI QC:
  o GSD validation
  o Seamline inspection

- Distortion check
- Radiometric consistency

• DSM QC:
  - Surface continuity
  - Noise / artefact assessment
• DTM QC:
  - Terrain correctness
  - Removal of vegetation and built-up features
  - Terrain continuity

- Verification of grid resolution: Validation of DSM and DTM grid spacing
  Consistency check across entire AOI

• Vertical Datum Verification:
  - Validation of geoid correction applied to derive orthometric heights
  - Cross-check of elevation consistency across the entire AOI
• Block QC:
  - Verification of single block processing
  - Absence of tiling artefacts
  - Seamless continuity across the dataset

Acceptance Criteria:
• All parameters meet thresholds defined in Annexure A
• No critical defects are present
• Vertical datum consistency is ensured across the dataset

Outcome:

Status	Action
Pass	Move to Stage 4
Fail	Rectification required

B.4.4 Stage 4: Accuracy Validation
Objective: To validate positional and vertical accuracy of the submitted datasets using Independent Check Points (ICPs).

Activities:
• **Horizontal Accuracy Validation:**
  - Assessment of ORI / planimetric accuracy using ICPs
  - Computation of horizontal RMSE
• **Vertical Accuracy Validation:**
  - Assessment of elevation accuracy using ICPs
  - Computation of RMSE Z on ellipsoidal heights
• **Elevation Datum Validation:**
  - Verification of geoid-based transformation from ellipsoidal heights to orthometric heights
  - Cross-consistency check of geoid-referenced orthometric DTM
  - Confirmation that final DTM is referenced to the SoI-provided Geoid Model
• **Statistical Evaluation:**
  - Evaluation of ICP residuals
  - Review of accuracy report and computation methodology

Acceptance Criteria:

• Horizontal accuracy shall be ≤ 10 cm RMSE
• Vertical accuracy of ellipsoidal DTM shall be ≤ 20 cm RMSE Z

• Orthometric DTM shall be correctly derived using the SoI-provided Geoid Model
• No vertical datum inconsistency shall exist across the package

Outcome:

Status	Action
Pass	Move to Stage 5
Fail	Reprocessing / correction / reflight as applicable

B.4.5 Stage 5: Observation and Rectification Cycle

Objective:

To resolve deficiencies identified during QC

Activities:

- Observations raised on QC Platform
- Contractor performs:
    - Reprocessing
    - Reflight (if required)
    - Re-upload

Requirements:

- All observations must be resolved
- Revised datasets must meet all criteria

Outcome:

Status	Action
Pass	Move to Stage 6
Fail	Repeat cycle

B.4.6 Stage 6: Final Acceptance

Objective:

To confirm compliance and formally accept deliverables

Acceptance Criteria:

- All QC parameters satisfied
- All observations resolved
- QC status marked as **"Accepted"** on platform

Outcome:

Status	Action

Status	Action
Accepted	Payment eligible
Rejected	Rework required

B.5 Rejection Conditions

Deliverables shall be rejected if:

- Accuracy thresholds are not met
- Data gaps exceed limits
- Distortions or artefacts exist
- Block integrity is violated
- Repeated failure after rectification

B.6 Iteration Control

- Number of QC cycles shall be:
  limited and monitored

- Repeated failures may result in:
  - Penalty
  - Contractual action
  - Performance evaluation impact

B.7 Documentation Requirements

At final acceptance, Contractor shall submit:

- Final processing report
- Accuracy report
- QC compliance certificate
- Change / revision log

B.8 Authority Control Clause

The Authority shall:

- Conduct independent QC
- Override contractor submissions
- Take final decision on acceptance

B.9 Linkage with Payment

- Only **Stage 6 (Final Acceptance)** shall trigger:
  major payment release (as per Section 6)

- Partial stages:
  do not qualify for full payment

B.10 Digital Record and Audit Trail

All ATP stages shall be:
recorded on QC Platform
These records shall serve as:

- Official acceptance record
- Audit evidence
- Dispute resolution basis

Annexure C: Re-flight Matrix

ANNEXURE C: REFLIGHT STANDARD OPERATING PROCEDURE (SOP) & DECISION MATRIX

C.1 Purpose

This Annexure defines:**clear and non-negotiable conditions under which re-flight, reprocessing, or rejection shall be applied**for datasets generated under this RFP.

The objective is to:

- Eliminate subjectivity in QC decisions
- Ensure uniform enforcement across all packages
- Prevent acceptance of sub-standard data

C.2 Applicability

This SOP applies to:

- UAV / Aerial data acquisition
- ORI, DSM, and DTM outputs
- All stages of QC and acceptance

In case of any conflict between Annexure A and Annexure C, the decision logic defined in Annexure C shall prevail.

C.3 Definitions

Term	Definition
Reflight	Fresh data acquisition over affected area
Reprocessing	Reworking existing data without new acquisition
Rejection	Dataset not acceptable; full or partial redo required

C.4 Decision Logic (Core Principle)

The decision hierarchy shall be:
Acquisition Error → Reflight
Processing Error → Reprocessing
Repeated Failure → Rejection

C.5 Reflight Decision Matrix

C.5.1 Data Acquisition Deficiencies

Issue	Threshold	Action
Data gaps	> 0.5% area	Reflight
Missing strips	Any	Reflight
Overlap deficiency	<80% / 70%	Reflight

Issue	Threshold	Action
Incomplete coverage	Any	Reflight

Sub-block Integration Failure:
Issue: Misalignment between sub-blocks
Action: Reprocessing → Reflight if persists

C.5.2 Environmental Conditions

Issue	Threshold	Action
Cloud cover	> 2%	Reflight
Shadow impact	Significant	Reflight
Haze / low visibility	Any affecting clarity	Reflight

C.5.3 Geometric and Accuracy Failures

Issue	Threshold	Action
Horizontal accuracy	> 10 cm RMSE	Reflight
Vertical accuracy	> 20 cm RMSE	Reflight
Block instability	RMSE > 1 pixel	Reprocessing → Reflight if persists

C.5.4 Radiometric and Image Quality Issues

Issue	Severity	Action
Radiometric mismatch	Moderate	Reprocessing
Severe tonal variation	High	Reflight
Blurring / motion	Any	Reflight

C.5.5 ORI Defects

Issue	Severity	Action
Seamline visibility	Minor	Reprocessing
Seamline distortion	Major	Reflight
Building lean	Any	Reflight
Misalignment	Any	Reflight

C.5.6 DSM / DTM Defects

Issue	Severity	Action
Noise / spikes	Minor	Reprocessing
Large artefacts	Major	Reflight
Incorrect terrain (DTM)	Any	Reprocessing → Reflight if persists
Missing terrain data	Any	Reflight

C.5.7 GCP / ICP Issues

Issue	Severity	Action
Insufficient GCP density	Below threshold	Re-survey + reprocessing

Issue	Severity	Action
ICP non-independence	Any	Re-survey
Incorrect coordinates	Any	Re-survey + reprocessing

C.6 Reprocessing Conditions

Reprocessing shall be permitted where:

- Data acquisition is correct
- Errors are limited to:
    - Radiometric balancing
    - Minor seamline corrections
    - Noise filtering
    - DTM classification

C.6.1 Reprocessing Limitation

Reprocessing shall not be permitted where:**root cause is acquisition-related**
In such cases:**re-flight shall be mandatory**

C.7 Rejection Conditions

Dataset shall be rejected if:

- Critical defects persist after reprocessing
- Re-flight fails to meet specifications
- Repeated QC failure (>2 cycles) occurs

C.7.1 Full Package Rejection

Entire package may be rejected if:

- Block integrity is compromised
- Systemic acquisition failure exists
- Multiple zones fail QC

C.8 Partial Re-flight Protocol

Where defects are localized:

- Only affected areas shall be re-flown
- Re-flown data shall:
    - Integrate seamlessly
    - Maintain block continuity

C.9 Time Compliance for Re-flight

Re-flight shall be completed within timelines specified by Authority, failing which delay provisions shall apply.

C.10 Cost Responsibility

All re-flight and reprocessing activities:**shall be carried out at Contractor's cost**
No additional payment shall be made.

C.11 QC Authority Control

The Authority shall:

- Decide reflight vs reprocessing
- Approve revised submissions
- Enforce rejection

Decision of Authority shall be binding for execution and compliance purposes.

C.12 Integration with ATP

This Annexure shall be read in conjunction with:

- **Annexure B (ATP Stages)**
- **Annexure A (QC thresholds)**

C.13 Linkage with Payment

- Re-flight stage:
  No additional payment
- Payment eligibility:
  Only after final acceptance

C.14 Documentation Requirement

Contractor shall maintain:

- Re-flight logs
- Reprocessing logs
- Change records

BILL OF QUANTITIES (BOQ) – FINAL TEMPLATE

BOQ Title:

Generation of ORI, DSM & DTM (Output-Based) – Package-wise

A. BOQ Structure (To be filled by Bidder):

BOQ: Package-wise Financial Bid

Sl. No.	Package ID	Description	Area (Sq. Km.)	Unit Rate (₹/Sq Km)	Total Cost (₹)
1	Package–1	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Pahunj River	1877	XXXX	XXXX
2	Package–2	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Ishan & Kali Rivers	1743	XXXX	XXXX
3	Package–3	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Tamsa River	845	XXXX	XXXX
4	Package–4	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Gaagan River	223	XXXX	XXXX
5	Package–5	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Sukhnai River	301	XXXX	XXXX
6	Package–6	Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)of Aami River	1762	XXXX	XXXX

Total Cost (₹) for each package shall be calculated as: Area (Sq. Km.) × Unit Rate (₹/Sq Km). Bidders shall quote Unit Rate for each package separately. Evaluation shall be carried out package-wise.Rates shall be deemed to include geoid application and vertical datum transformation.

B. Grand Summary

Description	Amount (₹)
Total Quoted Value (All Packages)	XXXXX
Taxes (if applicable)	XXXXX
Grand Total	XXXXX

C. BOQ Notes

C.1 Unit of Measurement

- The unit of measurement shall be:
  Per Square Kilometer (Sq Km)
- Payment shall be based on:
  accepted area after QC clearance

C.2 Scope Coverage

The quoted rate shall be **all-inclusive**, covering:

- Survey planning
- GCP/ICP establishment
- Data acquisition (UAV / Aerial / LiDAR)
- Data processing
- ORI, DSM, DTM generation
- QC compliance
- Reprocessing / reflight (if required)
- Data upload on QC platform

No separate payment shall be made for any of the above.

C.3 Output-Based Pricing

The BOQ is:**output-based, not activity-based**

Accordingly:

- Payment is **not linked to flying or data collection**
- Payment is **linked only to accepted deliverables**

C.4 No Variation for Methodology

Rates quoted shall remain **unchanged**, irrespective of:

- Platform used (UAV / aircraft)
- Sensor type (optical / LiDAR)
- Terrain conditions

No additional claim shall be admissible.

C.5 Package-wise Quoting

- Bidders may quote for:
  one or more packages
- Rate per Sq Km:
  shall be uniform within each package

C.6 Area Variation Clause
The area of each package shall be as defined in Clause 3.1.1.

No variation in package area shall entitle bidder to rate revision.

Payment shall be based on accepted deliverables corresponding to the defined package.

C.7 Conditional Bids Not Allowed

- Conditional pricing shall:
  lead to rejection
- Partial quoting within a package:
  not permitted

C.8 Arithmetic Consistency

- Total Cost = Area × Rate
- Any mismatch shall be corrected by Authority

C.9 Taxation

- Taxes shall be quoted separately (if applicable)
- Evaluation may be done on:
  Total cost basis

D. Standard BOQ Line Item (CPP Upload)

If single-line BOQ is required:
Item: Generation of ORI (≤5 cm GSD), DSM and DTM (≤20 cm accuracy)
Unit: Sq Km
Rate: ₹ _____ per Sq Km
Total Quantity: _____ Sq Km (Package-wise)
The quoted rate shall be deemed to include all risks, costs, and contingencies associated with achieving the specified deliverables. No claim for additional payment shall be entertained on any ground whatsoever.

ANNEXURE D: BID SUBMISSION CHECKLIST (FINANCIAL BID ONLY)

Sl. No.	Document / Requirement	Compliance (✓ / ✗)	Remarks
1	Duly filled Financial Bid (BOQ) in prescribed format (package-wise)	☐	
2	BOQ signed and stamped (if applicable)	☐	
3	No conditional pricing or deviation in BOQ	☐	
4	Self-declaration of participation under S-74 empanelment	☐	
5	Confirmation of empanelment under relevant Service Categories (1–5)	☐	
6	Financial Bid Capacity (FBC) Declaration	☐	
7	Undertaking on resource deployment and timeline compliance	☐	
8	Non-blacklisting / Integrity declaration	☐	
9	Authorization document (Board Resolution / Power of Attorney, if applicable)	☐	
10	All uploaded documents are legible and complete	☐	
11	No technical	☐	

	proposal / methodology document uploaded		
12	No additional unsolicited documents uploaded	☐	
13	BOQ format not altered in any manner	☐	
14	All entries in BOQ filled (no blanks)	☐	
15	Bid submitted through CPP Portal within stipulated timeline	☐	