



Strengthening Operational Capacity of the Department of Land
Records and Surveys (DLR&S) for Digital Survey Project
(1st Revised)

Department of Land Records and Surveys
Ministry of Land

Terms of Reference (ToR)

For

Selection of Consulting Firm for Conducting Digital Land
Survey for Preparing Digital Cadastral Map about 77,837 Acres
of Land in 02 Upazilas (Araihazar and Rupganj) of Narayanganj
District.

Package No. SD - 23



1. The Background

The Ministry of Land is responsible for land management all over Bangladesh. For this purpose, the Department of Land Records and Surveys (DLR&S) under the Ministry of Land is continuously preparing and updating Record of Rights (mauza maps and khatian) in the country. Today's world is governed mostly by using science & technology at every stage of life. The modern Land Survey and Management System is also dependent on information and communication technology (ICT). Bangladesh has a goal to serve prompt, dependable, transparent and accurate land information to its people. To achieve this goal, the land survey and management system of Bangladesh needs to be digitalized.

To maintain digital land administration and management system in the whole country, Ministry of Land needs to complete a Digital Cadastral Survey (DCS) all over the country. A project is going to be implemented by the Department of Land Records and Surveys (DLRS) for digital cadastral surveying of 32 upazila under 05 districts and development of its capacity for digital surveying. The 2 upazilas of Narayanganj district under this package are Araihasar and Rupganj. Total estimated land area is 77,837 acres under 310 Mouzas.

2. Objectives of the Services

For conducting the digital land survey (mauza) using modern equipment and technology like Survey Grade Drone/UAV with RTK, GPS/GNSS with RTK and ETS (Electronic Total Station), online database for mauza map with dynamic updating system etc. by the land survey company/firm/JVCA (National, Lumpsum).

3. Scope of Work

A. Targeted area of scope of work of the assignment:

The 2 upazilas of Narayanganj district under this package are Araihasar and Rupganj. Total estimated land area is 77,837 acres under 310 Mouzas. Upazila wise area of land is as follows:

District	upazila	Mouza	Present Mouza Map/Sheet	Mouza Map/Sheet after Survey (Predicted)	Land area (acres)
1	2	3	4	5	6
Narayanganj	Araihasar	179	227	908	41560
	Rupganj	131	156	624	36277
Total	2	310	383	1532	77,837

N: B: Actual survey area, upazila, map sheet and draft khatian may be more or less.



- viii. 20 mm thick cement -sand plaster (1:4) on the exposed RCC & 150mm below Ground Level.
- ix. Engraving of pillar ID numbers & office name to be touched in black. The words and numbers to be engraved in English. All digits & letters should be of 50 mm height & 10 mm line thickness or real.
- x. Two (2) coats of weather resistance white exterior paint on the exposed plaster.
- xi. After construction side filling of the pillar must be done by sand.
- xii. Curing every pillar after 6 hours of casting and continued minimum 15 days.

3. **GNSS observation:** For determining the coordinates of the newly constructed GCP's, GPS/GNSS Dual Frequency Receiver will need to be used following the Static Method. Previously established nearest SoB Geodetic Control points will be used as reference point.
4. **GNSS Data Processing:** For the calculation of its Geographic Coordinates and Projected Coordinates following the given parameters, the collected data needs to be processed using data processing software.

C. Cadastral Survey:

1. **Drone / UAV:** Capturing Aerial images for creating orthophoto mosaic map which will be geometrically corrected of the mauza using Survey Grade Drone/UAV with RTK in the open area of the mauza.
2. **Digitization of orthophoto map:** For making the plot boundary, individual plot area calculation and the integration of orthophoto with the cadastral map, the orthophoto should be vectorized/digitized by using 3D stereo plotter.
3. **Spatial adjustment:** Spatial adjustment of orthophoto mosaic map with the GPS/ GNSS observation of Ground Control Points (GCPs) with the help of cross-hair target point;
4. **Spatial adjustment of mauza map:** Last published digitized and geo-referenced mouza maps (Supplied by Land Zoning Project, Ministry of Land) should be adjusted by the help of Ground Control Points (GCP's) of its coordinate value.
5. **Electronic Total Station:** Collection of cadastral data by Electronic Total Station (ETS) from the areas covered by trees and other obstacles.
6. **Cadastral Data Processing:** For the preparation of mauza map, the collected cadastral data should be processed using cadastral data processing software.
7. **Cadastral Map preparation:** To prepare a complete digital cadastral mauza map with the compilation of vectorized/ digitized orthophoto and ETS data.
8. **Topology building and polygon:** After preparing a complete digital cadastral mauza map with the compilation of vectorized/ digitized orthophoto and ETS data the topology building of the map and the polygon should be checked and counted.
9. **Fixing of Mouza boundary:** Every mouza boundary should be fixed with the comparison of latest survey map with the collaboration of the GoB officials.
10. **Ground Truthing / Field check:** Before finalizing the mauza map, all plots in the map are to be checked with area and dimension on the ground and correct if needed.
11. **Parcel numbering:** Every parcel (dag) should be numbered starting from north-west corner of the map and ending to south-east corner.
12. **Creating Map database:** Digital mauza map database should be created upazila wise.
13. **Area calculation:** To calculate area of parcel polygon on the projected coordinate using the parameters as described in Parameters: Coordinate System Technical specification serial no. 6 a.
14. **Map editing:** While making the records by the GoB officials the map should be edited according to the measurement of the survey (if needed) up to post attestation junch stage.



- 15. Khanapuri-cum-Bujharat:** The consulting firm will conduct the Khanapuri-cum-Bujharat (primary record writing) using its own manpower with the help of DLR&S and project personnel. DLR&S and project personnel will supervise the whole activities throughout the survey operation to ensure proper execution
- 16. Plot index:** To create plot index file comparing with previous and present parcel (plot) numbers.
- 17. Legal Basis:** At every stage of the survey, Firm must follow the Acts, Rules, Regulations, General instructions (GI) and Manuals of DLRS.

D. Seminar/ Workshop:

Organizing Seminar / Workshop to sensitize the stakeholders: 5 nos. (2 nos. National Level & 3 nos. Local Level) (Maximum 50 participants in each workshop) (honorarium and TA & DA of Guests & Participants, and other expenditures are followed by Govt. circular and budget will be approved by DLR&S). All expenditures will be borne by the selected Firm(s).

4. Tentative Implementation Process of Survey:

4.1 Geodetic Survey by GPS/GNSS:

SI No.	Items	Days Required (Tentative)
01.	To identify the location of the Ground Control Pillars in the survey area	01 month
02.	Construction of Ground Control Pillars (GCP's)	03 months
03.	GNSS observation (Data Collection)	03 months
04.	GNSS baseline processing and network adjustment	15 days

4.2 Image Data collection by Drone/UAV:

SI No.	Items	Days Required (Tentative)
01.	Air signal mark to be made on just vertically above the constructed GCP pillar, capturing aerial images for creating orthophoto mosaic map and Geo-reference or spatial adjustment of orthophoto mosaic map.	-
02	Vectorizing/ Digitizing the orthophoto map for making plot boundary	-

4.3 Cadastral Survey by ETS:

SI No.	Items	Days Required (Tentative)
01.	Collection of cadastral data by ETS from areas which are covered by the trees and other obstacles	-
02.	Process the collected cadastral data using data processing software	-
03.	To prepare a complete digital cadastral mauza map with the compilation of vectorized/digitized orthophoto and ETS data	-
04.	Geo-referencing and Spatial adjustment of previous mauza	-



SI No.	Items	Days Required (Tentative)
	map and deliver in shape file format	
05.	To create plot index file comparing with previous and present plot numbers	-
06.	To calculate area of plot polygon on projected coordinate	-

5. Estimated Deliverables:

SI	Deliverable Type	Deliverables	Time in Month	Milestone
1	2	3	4	5
1.	GCP coordinates and related data	1) GNSS observation data in RINEX format 2) Baseline processing report 3) Loop Closure report 4) 3D Network adjustment report 5) Geographic coordinates in WGS84 6) Projected coordinates in Cassini	As required	± 593 nos. (Primary- ± 31 nos. Second- ± 562 nos.)
2.	GCP Pillars	Constructed in-situ Primary and Secondary GCP Pillars		
3.	Image Capture	2.5 cm GSD, Min 75% Front Overlap, Min 60% Side Overlap.	As required	Targeted Area of this assignment
4.	Ortho Mosaic Map	Georeferenced and with spatial adjustments Drone captured orthophoto mosaic map (Softcopy TIF/TIFF format)	As required	Targeted Area of this assignment
5.	Georeferenced Previous Mauza Map	Georeferenced and spatial adjusted previous map (hardcopy and shapefile format softcopy)	As required	Previous Mauza map
6.1	Complete Digital Cadastral Mauza map with plot index and super imposed previous map and Database (Hardcopy and Softcopy)	Kistowar Stage (a) Complete Digital Cadastral Mauza map on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area (b) Plot Index of Mauza with plot area (c) Layer wise super imposed present and previous	Within 18 (Eighteen) months	Area of Mauza map



Sl	Deliverable Type	Deliverables	Time in Month	Milestone
1	2	3	4	5
		<p>Mauza Map (Hard copy & soft copy)</p> <p>(d) Cassini & UTM projected Mauza Map (Shape file and geodatabase)</p> <p>(e) Map Database (both in Cassini & UTM projection)</p>		
6.2	Corrected Complete Digital Cadastral Mauza map with plot index and supper imposed previous map and Database (Hardcopy and Softcopy)	<p>Khanapuri cum Bhujarat Stage</p> <p>(a) Corrected Complete Digital Cadastral Mauza map after Khanapuri cum Bujharat on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area</p> <p>(b) Corrected Plot Index of Mauza with plot area</p> <p>(c) Corrected Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy)</p> <p>(d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase)</p> <p>(e) Corrected Map Database (both in Cassini & UTM projection)</p>	As required	Area of Mauza map
6.3	Corrected Complete Digital Cadastral Mauza map with plot index and supper imposed previous map and Database (Hardcopy and Softcopy)	<p>Tashdik (Attestation) Stage</p> <p>(a) Corrected Complete Digital Cadastral Mauza map after Tashdik (Attestation) on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with</p>	As required	Area of Mauza map



SI	Deliverable Type	Deliverables	Time in Month	Milestone
1	2	3	4	5
		parcel number & area (b) Corrected Plot Index of Mauza with plot area (c) Corrected Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy) (d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase) (e) Corrected Map Database (both in Cassini & UTM projection)		
6.4	Corrected Complete Digital Cadastral Mauza map with plot index and supper imposed previous map and Database (Hardcopy and Softcopy)	Post-Tashdik Junch Stage (a) Corrected Complete Digital Cadastral Mauza map after post Tashdik (Attestation) on P-70 sheet map paper with 32" inch to a mile (or more if necessary) to a mile scale in shape file following DLRS mauza map format/template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area (b) Corrected Plot Index of Mauza with plot area (c) Corrected Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy) (d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase) (e) Corrected Map Database (both in Cassini & UTM projection)	Within 24 (twenty-four) months	Area of Mauza map
7	Seminars/ workshops	Seminars/ workshops.	As required	Mentioned in the scope of work, section 3 (D)



			(CGO2) or equivalent.
9.	Reference point for network adjustment of primary GCP	:	Nearest SoB Geodetic Control Points should be used as reference point for network adjustment of primary GCP
10.	Reference point for network adjustment of secondary GCP	:	Nearest SoB Geodetic Control Points and newly established primary GCP should be used as reference point for network adjustment of secondary GCP.
11.	Geographical Coordinate System	:	WGS84
12.	Projected Coordinate System	:	Cassini
13.	Loop closure tolerance		Loop miss closure will need to be checked of all the triangle/loop of GNSS net and the tolerance should be kept within 1ppm or 1.5 cm for primary GCP and 2ppm or 2.0 cm for secondary GCP.
14.	Output coordinates	:	a. Geographical Coordinates (Latitude, Longitude & ellipsoidal height) and b. Projected Coordinates (Northing, Easting, Elevation)

C. Ortho Mosaic Map Properties: 2.5 cm GSD

D. All activities are followed National and International Standard.

7. Methodology of Cadastral Survey:

a. Digital Cadastral survey: Cadastral survey will need to be done using Drone/UAV image (geometrically corrected Orthophoto) and direct data capturing method (using Electronic Total Station). Electronic Total Station should be 1 (one) second angular accuracy or better and of branded Trimble/Leica/ Topcon/ SOKKIA/ Stonex or equivalent.

- i. **Traverse Survey:** Before starting cadastral survey by Electronic Total Station (ETS), there are one or more traverse line should be carried out around the Mauza boundary. The traverse line should be started from two intervisible Ground Control Points (GCPs) and closed to other. The traverse closing error tolerance is 10 cm to 15 cm or 1:30,000 and it will be adjusted on the traverse points based on distance. If the closing error exceeds the tolerance, then the traverse survey must be done again.
- ii. **Point code:** Use DLR&S approved code library when capturing the field cadastral data.
- iii. **Measuring unit:** The measuring unit should be 'Meter'.

b. Mauza map georeferencing and spatial adjustment: Geo-referencing and spatial adjustment of mauza map sheets will need to be done using GIS software with collected values of sufficient Ground Control Points.



8. Standardized Data Structure with other projects/ initiatives of Ministry of Land:

As a unique ID/GEOCODE/Primary Key is used for collected data of the project so that it can be well connected with Data Application Programming Interface (API). Data Structure of all implementing projects of Ministry of Land like "Establishment of Digital Land Management System (EDLMS)", "National Land Zoning Project" and "Strengthening Operational Capacity of the Digital Survey Project" must be same. Unique ID/GEOCODE/Primary Key will be ensured when firm submit Inception Report.

9. Equipment and consumables:

- i. Survey Grade Drone/ UAV with RTK (Minimum- 02 nos.);
- ii. GPS/ GNSS receiver with RTK (minimum-04 nos.);
- iii. Electronic Total Station (1 second angular accuracy or better) – (Minimum- 15 nos.);
- iv. Work Station- (Minimum-05 nos.);
- v. Laptop- (Qty as required);
- vi. General Printer- (Qty as required);
- vii. Plotter/Map printer-(Minimum- 04 nos.);
- viii. Papers (A0, A3, A4, P-70 etc.) as per requirement and others etc.

10. Software:

- I. Drone/ UAV data processing software-Ajisoft and Pix 4D or similar;
- II. GPS/ GNSS data processing software- TBC, LGO, CGO2 or similar;
- III. Cadastral data processing software- ARCGIS or similar;
- IV. GIS software- ARCGIS or similar;

11. Issues related to Data Security, License and Copyright:

Ownership of the deliverables and all related matters will be under the following definitions and clauses:

- a) All Intellectual Properties (i.e raw data, deliverables, APIs, maps, softwares, source code and all other productions made under this contract) shall be transferred by the consulting firm to the client and will be regarded as the sole and exclusive property of client after commencement of the project.
- b) The client will be the sole owner of all the Intellectual Properties that shall come up from this project. Any beneficial interest, patent filing, commercialization, or similar tasks like source code will be done at the sole authority of the client. The consultant cannot use the Intellectual Properties in any of these tasks or similar.
- c) All deliverables of the assignments will be government property as per PPR-2008 and PPA-2006. No second- or third-party branding and ownership is allowed. The developed products convey logos and links of DLR&S, Ministry of Land and Project only. Backlink and branding in Code Comment is not allowed.



- d) The consulting firm cannot re-produce, share or use otherwise all the properties developed under this project.

12. Setting Up Local Office and Building Public Awareness:

To effectively facilitate the Digital Land Survey and raise public awareness, the selected firm must adopt a comprehensive approach that includes local presence and targeted community outreach. The following steps are recommended:

- a) **Setting Up Local Offices:** Establish well-equipped offices in relevant Upazilas with basic facilities (furniture, computers, internet, printers, etc.) and clear signage about the Digital Land Survey, outlining how residents can benefit or get involved.
- b) **Public Awareness Building:**
- i. **Posters:** design and put up sufficient informative posters in key locations, public gathering spots, busy areas, and high-traffic areas to maximize visibility and impact. The design must be approved by the client before implementation.
 - ii. **Billboards:** Place sufficient billboards in key locations, public gathering spots, busy areas, bus stoppage, launch ghat and high-traffic areas with bold messages, QR codes for more information, and contact details for local offices and helplines. The design must be approved by the client.
 - iii. **Union Parishad Meetings:** Organize community consultations to explain the survey's objectives, gather feedback, and promote active participation, with the support of public representatives, local influencers and stakeholders. Use multimedia tools to simplify technical details and ensure clear communication. At least one meeting should be conducted in each union parishad.
 - iv. **Leaflet Distribution:** Design, print, and distribute sufficient simple, concise leaflets in public spaces (markets, government offices, educational institutions, hospitals, bus terminals, launch ghats, and other public places), explaining the survey process, benefits, details of surveys, etc. along with contact information. The design must be approved by the client.
 - v. **Miking:** The consultant must conduct public announcements, including miking, both before and during the survey operation to ensure community awareness and participation.
- c) **Collaboration with Local Influencers and Stakeholders:** Engage local public representatives (e.g., Union Parishad Chairpersons and members), stakeholders (such as teachers and religious figures), and organizations (including NGOs, farmer groups, and women's associations) to enhance outreach and raise public awareness effectively.
- d) **Audio-Visual Clip/Documentary:** The selected firm will create a 60-90 second audio-visual clip to raise public awareness about the Digital Land Survey, focusing on its purpose, process, the responsibilities of landowners, and the benefits. The clip must be visually appealing, culturally relevant, and easy to understand, using animations, infographics, and real-life footage. It should include a clear call to action and provide contact details for support. The video will be designed for effective distribution across social media platforms, local TV channels, and community events. It must be approved by the client.



13. Other Conditions:

The Vendor will have to manage the Map data in the following manner:

All types of data should be maintained in a single map database server software platform (ARCGIS Server enterprise version/ QGIS/Open Source GIS/ or any other GIS Software platform where:

- a) All types of Pillar Coordinate data will be maintained in a separate layer
- b) All Ortho mosaic Image will be maintained in a separate layer
- c) Vectorized data extracted from Ortho mosaic Image will be maintained in a separate layer
- d) Coordinate data collected using Electronic Total Station will be maintained in a separate layer
- e) Final Map layer (extracted and super imposed cadastral data from both orthomosaic image and Electronic Total Station) will be maintained in a separate layer
- f) Existing Mouza Map digitized data will be maintained in a separate layer
- g) After finalizing the cadastral maps given plot number; the map data layer will be maintained in a separate layer.

14. Key and Non-Key Personnel Requirements

The minimum required qualification and experience of the Key and Non-Key Professional staffs are as follows:

SI-No	Position	No of Personal	Minimum Qualification, Experience & Responsibilities
01.	Team Leader	01	<p>Qualification & Experience: Masters in Geography or GIS or RS&GIS or Geo-Informatics or Urban and Regional Planning or Civil Engineering or Computer Science or Computer Science & Engineering or Information Technology (IT) or Management Information Systems (MIS) from any recognized educational institutions with minimum 15 (fifteen) years of proven professional experience in Cadastral Survey, GIS database creation & management, large scale master planning, Urban Planning and project management fields.</p> <p>Team Leader having different academic qualifications but with excellent track records and proven professional experiences in the respective fields mentioned above may be considered.</p> <p>Responsibilities:</p>



SI-No	Position	No of Personal	Minimum Qualification, Experience & Responsibilities
			<p>(i) Lead the team and provide strategic guidelines for timely implementation of the service;</p> <p>(ii) Coordination and supervision of the technical and administrative inputs to ensure time and quality of the work;</p> <p>(iii) Preparation for the work program, consultation with the Procuring Entity;</p> <p>(iv) Consultation with the stakeholders and take necessary action; and</p> <p>(v) Maintain close coordination and consultation with the Procuring Entity for service execution.</p>
02.	Deputy Team Leader	01	<p>Qualification & Experience: Masters in Geography or GIS or RS&GIS or Geo-Informatics or Urban and Regional Planning or Civil Engineering or Computer Science or Computer Science & Engineering or Information Technology (IT) or Management Information Systems (MIS) from any recognized educational institutions with minimum 10 (ten) years of proven professional experience in Cadastral Survey, GIS database creation & management, large scale master planning, Urban Planning and project management fields.</p> <p>Deputy Team Leaders having different academic qualifications but with excellent track records and proven professional experiences in the respective fields mentioned above may be considered.</p> <p>Responsibilities:</p> <p>(i) Lead the team and provide strategic guidelines for timely implementation of the service;</p> <p>(ii) Coordination and supervision of the technical and administrative inputs to ensure time and quality of the work;</p> <p>(iii) Preparation for the work program, consultation with the Procuring Entity;</p>



SI-No	Position	No of Personal	Minimum Qualification, Experience & Responsibilities
			(iv) Consultation with the stakeholders and take necessary action; and (v) Maintain close coordination and consultation with the Team Leader, Procuring Entity for service execution.
03.	GIS Specialist	01	<p>Qualification & Experience: Masters in Geography or GIS or RS&GIS or Geo-Informatics or Urban and Regional Planning or BSc. in Civil Engineering or Computer Science or Computer Science & Engineering or Information Technology (IT) or Management Information Systems (MIS) from any recognized educational institutions with minimum 5 (five) years of proven professional experience in GIS related activities/ projects.</p> <p>GIS Specialist having different academic qualifications but with excellent track records and proven professional experiences in the respective fields mentioned above may be considered.</p> <p>Responsibilities: (i) To prepare digital mauza map of the area from collected cadastral data (Drone/UAV & ETS data); (ii) Scan and digitize the mauza map and digitize the orthophoto; (iii) To geo-reference the previous mauza map; (iv) To prepare, supervise, manage and monitor GIS Digital database.</p>
04.	GIS Database Administrator	01	<p>Qualification & Experience: Bachelor in Geography or GIS or RS&GIS or Geo-Informatics or Computer Science/ Computer Science & Engineering/ Information Technology (IT)/ Database Administration/ Management Information Systems (MIS) from any recognized educational</p>



SI-No	Position	No of Personal	Minimum Qualification, Experience & Responsibilities
			<p>institutions. 10 (ten) year's practical experience on Database design and RDBMS. 5 (five) years' experience on 'Spatial Database design & administration. Professional Certificate on Database Administrator from IBM/Microsoft/Oracle or equivalent international organization should be required.</p> <p>GIS Database Administrator having different academic qualifications but with excellent track records and proven professional experiences in the respective fields mentioned above may be considered.</p> <p>Responsibilities: (i) Review the technical issues for the architecture, design and implementation of all software database to be built for the project and prepare the necessary documents for implementation and monitor the progress; (ii) Database admin user planning and user management.</p>
05.	RS & Photogrammetric Expert	01	<p>Qualification & Experience: Masters in Geography or GIS/RS&GIS Geo-informatics or Urban and Regional Planning or BSc. in Civil Engineering/ Computer Science & Engineering/ Computer Science/ Information Technology (IT)/Management Information Systems (MIS) from any recognized educational institutions with minimum 5 (five) years of proven professional experience in GIS related activities/projects.</p> <p>RS & Photogrammetric Expert having different academic qualifications but with excellent track records and proven professional experiences in the</p>



SI-No	Position	No of Personal	Minimum Qualification, Experience & Responsibilities
			<p>respective fields mentioned above may be considered.</p> <p>Responsibilities: (i) He/she should work under the Team Leader. (ii) He/she will supervise Drone/UAV data acquisition, registration, processing and maintaining output data quality.</p>
06.	Land Survey Expert	02	<p>Qualification & Experience: He/she should have a bachelor's degree from any recognized educational institute. At least 10 (ten) years' experience in organizing, formulating, monitoring, conducts and supervision of cadastral survey fieldwork plan. Experience in large scale land survey project will be given preference.</p> <p>Responsibilities: (i) He/she should work under the Team Leader. (ii) He/she will responsible formulation of cadastral survey field, workplan. Organizing, monitoring and supervision of field survey work.</p>
07.	Cadastral Mapping Expert	02	<p>Qualification & Experience: He/she should have a bachelor's degree from any recognized educational institute with at least 10 (ten) years' experience in cadastral survey activities. Experience in large scale land survey project will be given preference.</p> <p>Responsibilities: (i) He/she should work under the Team Leader. (ii) He/she will supervise cadastral survey activities.</p>
08.	Drone/UAV Pilot	02	<p>Qualification & Experience: Drone flight and operation must be in</p>



N: B:

- All the positions mentioned above (Key & Non-key Professionals except Local Labours) should be deployed for the entire contract period i.e 26 (Twenty-Six) months, if awarded.
- Relevant certificates of all the positions mentioned above (Key & Non-key Professionals except Local Labours) in support of education and experience issued from concerned authority should be submitted along with CVs.

15. Payment Schedule:

Task No.	Deliverables	Milestone	Percent of Payment
D1.	<ul style="list-style-type: none"> • Inception report with detailed work plan, staff deployment, equipment mobilization and local office setup. • 01 (one) national and 01 (one) local level seminar/workshop. 	Number of Staffs, equipment, offices set up, seminar/workshop.	10%
D2.	<ul style="list-style-type: none"> • Construction of Primary and Secondary GCP Pillars in selected ground points 	± 593 nos. (Primary- ± 31 nos. Second- ± 562 nos.)	10%
D3.	<ul style="list-style-type: none"> • GPS/GNSS based Ground Control Points observation of constructed Primary and Secondary GCP's 		
D4.	<ul style="list-style-type: none"> • Georeferenced and with spatial adjustments Drone Image captured orthophoto mosaic map (Softcopy TIF/TIFF format) • 01 (one) local level seminar/workshop. • Awareness programme/campaign, audio visual clip, postering, leaflets distribution, miking, setting up billboards etc. 	Total targeted Area of Mauza map	05%
D5	<ul style="list-style-type: none"> • Georeferenced and spatial adjusted previous map (hardcopy and shapefile format softcopy) 	Area of Mauza map	-
D6.1	Kistowar Stage (a) Complete Digital Cadastral Mauza map on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area	After Kistowar Stage	30% [N.B: Partial payment may be allowed based on the actual



Task No.	Deliverables	Milestone	Percent of Payment
	(b) Plot Index of Mauza with plot area (c) Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy) (d) Cassini & UTM projected Mauza Map (Shape file and geodatabase) (e) Map Database (both in Cassini & UTM projection)		progress (upon completion of mouza) of services. The payment will be calculated on a per-acre basis.]
D6.2	Khanapuri cum Bhujarat Stage (a) Corrected Complete Digital Cadastral Mauza map after Khanapuri cum Bujharat on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area (b) Corrected Plot Index of Mauza with plot area (c) Corrected Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy) (d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase) (e) Corrected Map Database (both in Cassini & UTM projection)	After Khanapuri cum Bhujarat Stage	25% [N.B: Partial payment may be allowed based on the actual progress (upon completion of mouza) of services. The payment will be calculated on a per-acre basis.]
D6.3	Tashdik Stage (a) Corrected Complete Digital Cadastral Mauza map after Tashdik (Attestation) on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area (b) Corrected Plot Index of Mauza with plot area (c) Corrected Layer wise supper imposed present and previous	After Tashdik Stage	05% [N.B: Partial payment may be allowed based on the actual progress (upon completion of mouza) of



Task No.	Deliverables	Milestone	Percent of Payment
	<p>Mauza Map (Hard copy & soft copy)</p> <p>(d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase)</p> <p>(e) Corrected Map Database (both in Cassini & UTM projection)</p> <p>(f) Foreign Training</p>		<p>services. The payment will be calculated on a per-acre basis.]</p>
D6.4	<p>Post-Tashdik Junch Stage</p> <p>(a) Corrected Complete Digital Cadastral Mauza map after post Tashdik (Attestation) on P-70 sheet map paper with 32" inch to a mile (1:1980) (or more if necessary) to a mile scale in shape file following DLRS mauza map format/ template (Hard copy & soft copy) both in showing parcel number only and with parcel number & area</p> <p>(b) Corrected Plot Index of Mauza with plot area</p> <p>(c) Corrected Layer wise supper imposed present and previous Mauza Map (Hard copy & soft copy)</p> <p>(d) Corrected Cassini & UTM projected Mauza Map (Shape file and geodatabase)</p> <p>(e) Corrected Map Database (both in Cassini & UTM projection)</p> <p>(f) 01 (one) national level and 01 (one) local level seminar/workshop</p>	<p>After Post-Tashdik Junch Stage</p>	<p>05%</p> <p>[N.B: Partial payment may be allowed based on the actual progress (upon completion of mouza) of services. The payment will be calculated on a per-acre basis.]</p>
D7	<p>Final Report</p>	<p>Total Actual Area of Mauza map</p>	<p>10%</p>

16. Duration of the assignment:

The total duration of the assignment is 26 (Twenty-Six) months.



17. Experience, Resources and Delivery Capacity Required:

Consulting firms will be shortlisted based on the following criteria:

- (a) Having minimum 5 (five) years of experience in Mauza related data collection and map creation works i.e. digital cadastral survey/topographic survey/mauza map survey/land acquisition plan/ master plan (physical feature survey with cadastral map). In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion. Years will be counted backwards from the date of publication of REOI in the newspapers.
- (b) Having minimum 2 (two) years of specific practical experience with completion certificate in survey work by using drone technology for working in digital cadastral survey/topographic survey/mouza map survey/land acquisition plan/master plan (physical feature survey with cadastral map). In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion. Years will be counted backwards from the date of publication of REOI in the newspapers.
- (c) The firm must have standard/ modern GPS/GNSS with RTK, Electronic Total Station (ETS), Survey Grade Drone /UAV with PPK/RTK and data processing software. In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion.
- (d) Following valid and updated registrations, licenses and certificates should be enclosed:
 - i. Trade License, Certificate of Incorporation (if applicable), VAT Registration, TIN Certificate, Income Tax Payment Certificate, Audited Reports (if applicable), list of manpower etc.
 - ii. The firm must be registered by the Survey of Bangladesh (SOB). In the case of Joint Venture, at least any one of the firms of the joint venture must be registered by the Survey of Bangladesh (SOB).
 - iii. Drone flight and operation must comply with the Drone Registration and Flight Policy, 2020. Alongside Pilot license/certificate should be provided by CAAB or similar competent authority from home or abroad as per the above-mentioned Policy. In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion.
 - iv. Liquid Assets as Working Capital/Unconditional Credit Line facility shall be Tk. 05 (Five) crore. In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion.
 - v. The average annual turnover shall be minimum Tk. 02 (Two) crore over the last 03 consecutive financial years (i.e 2022-2023, 2021-2022, 2020-2021). In the case of Joint Venture, at least any one of the firms of the joint venture must meet this criterion.

[Note: Firms should submit sufficient relevant documents in support of experience, financial capacity, and other selection criteria]

