Noakhali Greentech Solar Energy

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Noakhali Greentech Solar Energy Ltd

Bangladesh

Topography Survey
Technical Specifications

September 2024

Report Details

Prepared for:	Noakhali Greentech Solar Energy Ltd.
Client Contact:	Mr. Towhidul Haque
Report Distribution	
SgurrEnergy:	Mr. Yadneshwar Joshi
Report Classification:	Confidential

	Name	Job-Title	Signature
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Amendment Records

Revision Number	Date	Purpose of Revision	Summary of Amendments
A1	22 Aug 2024	Internal Draft	Draft for internal review
B1	23 Aug 2024	Client Submission	-
B2	06 Sept 2024	Client Comments	-
B3	12 Sept 2024	Client Comments	Client Submission

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List of tables

1 Introduction

It is proposed to conduct a topographical survey for Solar PV Plant at Noakhali, Bangladesh.

This document herein presents the technical specification for conducting the topography survey.

Table 1 - Project Details

Property	Description
Site Co-ordinates	22°46'26.85"N, 91°0'9.82"E (Centre Point)
Region, Country	Upzila –Sadar, district – Noakhali, Bangladesh
Nearest Airport	Dhaka International Airport, 200km
Altitude	5m A.S.L.
Approx. Plant Area (acres)	39

2 Purpose

This specification covers the requirement of drone survey for 10MWac Solar power plant at Noakhali, Bangladesh. The scope of services is broadly mentioned as below.

The service provider shall acquaint himself by a visit to site and all relevant data & information as may be necessary shall have to be obtained/collected by the bidder. Any additional work, services which are not mentioned, but are required to make the execution complete in every respect in accordance with the technical specification and for safe, trouble free and efficient operation shall be considered under the scope of this specification.

3 Objectives

To Plan and carry out detail survey of the identified location(s) as identified from the Desktop and initial field study.

a. Establish DGPS points for performing aerial survey.

b. Aerial Survey (Drone Survey) of the area. Validated Raw files for Its horizontal and vertical accuracy. Post Process raw data with desired planimetric accuracy, Ortho Images, DEM, DSM & Land base Features.

4 Scope of Work

The bidder is responsible for conducting a topographical survey of the specified site using drone technology to create detailed 3D photogrammetry maps. This includes mobilizing all necessary equipment, providing onsite manpower, technical supervision, and securing all required survey permissions from relevant departments.

The survey will use high-resolution drone imagery to capture plot boundaries, public roads, and adjacent buildings with precision to meet project timelines. The bidder must obtain all necessary survey permissions, security clearances, and government approvals. The client will authorize the survey but will not handle legal issues; the bidder must manage permissions and ensure the client and its officers are indemnified against any legal claims.

The bidder will analyze and interpret the collected data to produce topographical survey maps and 3D photogrammetry maps in the required formats. The survey must cover the entire plot area and extend a minimum of 50 meters beyond the plant boundary, including any additional areas required for detailed engineering purposes.

The scope of work includes:

- Establishing true north on the drawing using Differential GPS (DGPS), with improved accuracy from Mobile Station measurements
- Marking Ground Control Points (GCPs) on concrete or masonry with coordinates and reduced levels, and establishing one benchmark
- Creating contour maps with spot levels in AutoCAD, ensuring contours are continuous and not exploded
- Capturing all significant manmade and natural features, such as roads, pathways, buildings, trees, and water bodies, along with their attributes
- Identifying structures or vegetation outside the boundary that may cause shadowing within the plant boundary
- Detailing sizes, elevations, bearings, alignments, and coordinates of prominent features, including cross-section and longitudinal profiles of relevant structures
- Referencing all levels to authentic Mean Sea Level (MSL) and nearby benchmarks established by national survey authorities
- Establishing Temporary and Permanent Bench Marks (PBMs), including 5 PBMs with specific dimensions, securely fixed and inscribed with all necessary information
- Placing PBMs in convenient positions and protecting them for future verification
- Identifying all project site corners with coordinates and conducting spot level surveys, contouring, and clearing as needed
- Providing ground levels and elevations with coordinates in Excel/.csv format
- Clearly labeling and describing all CAD layers for topographic and boundary data
- Including topographical features such as land use, land cover, and structures in the AutoCAD layout, with separate layers for various features
- Measuring bed levels of water bodies from the ground survey and including the maximum water level in the layout
- Noting and plotting unusual ground conditions or formations
- Providing the layout with grids and coordinates in Universal Transverse Mercator (UTM) format, based on the WGS 84 reference system, or geolocated
- Supplying color photos of significant topographical features
- Providing a Google Earth KMZ/KML file indicating topographical features and plant boundaries
- Delivering drone photos and videos of the site, including a 3D video for ease of viewing
- Furnishing DSM and DTM files with specified resolutions, Orthomosaic Maps, and clearing vegetation heights for accurate DTM. Providing drone images in JPEG format if the survey is conducted by drone

- Providing digital elevation models with accurate stream and feature data
- Adhering to relevant environmental, health, and safety standards during the survey
- Ensuring survey equipment calibration certificates are current and not older than 6 months

5 Work Process

- Accurate survey of boundaries for proposed land
- Contour-lines (Isolines) every 0.25m contour interval and spot levels at 2.5 m interval for project area including 50 meter outside periphery also included in the deliverables
- All levels shall be referenced to authentic MSL and nearest Benchmarks established by nearest Authorized benchmark for example GTS. In case nearest railway station exists close to site, its approximate distance to Project site & Platform MSL shall also be noted down
- Survey basepoints: Required at least 4-5 with clear pictures of the basepoints and accurate UTM and geographical coordinates. Permanent benchmarks/pillars shall be constructed at boundary of the plot with reference from Authorized benchmark
- Points taken in absolute coordinates, referenced to Geographical North
- Provide complete detail of any stream (natural or man-made) including its all major and minor tributaries
- Identification and details of following relevant objects:
    - Surface bedrocks
    - Overhead Electrical Lines: post position, diameter and height, and line path
    - Relevant trees throughout the perimeter (those that are a potential source of shadows) and within the plot
    - Existing wetlands, water-streams, natural drainage paths, etc., either dry or wet.
    - Existing water, gas or electricity conduits, either underground or above surface.
    - Buildings adjacent to the plot boundaries

***Note**: It is the responsibility of the surveyor to take care of any mishap which may occur due to failure of the drone. In addition to this, surveyor is also responsible for any accidental damage which may occur due to drone survey activities.*

6 Experience Benchmarks

- The Bidder must have completed at least three topographic surveys using drone technology in Bangladesh within the last five years, specifically for large-scale projects such as infrastructure development, urban planning, or land assessment
- Experience in dealing with the diverse topographical challenges unique to Bangladesh, including varying elevation, river systems, floodplains, and coastal areas, is essential
- Demonstrated knowledge of local topographic features and conditions, including river systems, floodplains, coastal areas, and urban environments in Bangladesh

- Ability to navigate compliance with local regulations and guidelines related to drone operations and surveying, including permissions from relevant authorities such as the Civil Aviation Authority of Bangladesh (CAAB)
- The team must include surveyors, GIS specialists, and drone operators with at least five years of experience in conducting topographic surveys in Bangladesh or similar environments
- The lead surveyor should have min. five-year experience in topographic and geospatial surveys using drone technology for large-scale projects
- Proficiency in using topographic data processing software and GIS tools adapted to the context of Bangladesh, including software for generating 3D models and maps
- The bidder should have the necessary drones, sensors, and technical personnel to execute the complete scope of work
- As evidence of qualification requirements (QR), the bidder shall submit the following in their bid:

– Name of the project

– Name of the client/purchaser

– Duration of execution

– Date of completion & order value

– User certificate/recommendation

– List of staff to be deployed for the job

7 Evaluation Categories and Weightage

Technical Expertise and Team Qualifications (30%)

- Assessment of the qualifications, certifications, and relevant experience of key personnel, particularly in the context of topographic surveys and drone technology in Bangladesh
- Specific experience of the team in handling complex topographic features, including elevation variations, river systems, and urban environments

Relevant Project Experience in Bangladesh (25%)

- Review of past projects in Bangladesh or similar geographies, highlighting experience in topographic surveys using drone technology for infrastructure projects, urban planning, or land assessments

Methodology and Approach (25%)

- Detailed evaluation of the proposed methodology, including drone flight plans, data collection strategies, topographic mapping approaches, and 3D modelling techniques suitable for the specific terrain in Bangladesh
- Assessment of the bidder’s understanding of local topographic challenges and their approach to addressing them

Project Management and Timeline (10%)

- Feasibility of the proposed timeline, considering the complexities of drone surveys and data processing

- Ability to manage the project within budget and time constraints while coordinating with local authorities and other stakeholders

Cost Proposal (10%)

- Assessment of the cost proposal's competitiveness and alignment with the project scope, considering local market rates and the complexity of the topographic survey

Compliance with RFP Requirements (Pass/Fail)

- Compliance with all RFP submission requirements, including adherence to regulations for drone operations, certifications, and acknowledgments of local site-specific conditions

8 Bid Timelines

The bidding process will follow a specific timeline and tasks, as outlined in the table below:

Sr No.	Task	Working Days
A	Release of the RfP	0
B	Bid Submission	A+5
C	Bid Evaluation	B+4
D	Issue of Letter of Award	C+3
E	Deliverable as per RfP	D+21

The bid timeline and task details provide a clear structure for the bidding process, ensuring transparency and fairness for all interested firms/organizations. The evaluation process and right to cancel clauses protect the interests of Noakhali Greentech Solar Energy Ltd in the procurement.

9 Submission Address

The proposal should be submitted by e-mail and related file transfer (as necessary) to the following address:

Towhidul Haque

Director & CEO

Noakhali Greentech Solar Energy Ltd

Address: Tower- 52, Level- 4, Road- 11, Block- C, Banani, Dhaka- 1213

towhid@greensolarenergy.com.sg saifur@greensolarenergy.com.sg

Printed copies of the proposal are not required.

Attachment - 1

Form of Proposal Letter

[*letterhead of the contracting firm*]

Towhidul Haque

Director & CEO

Noakhali Greentech Solar Energy Ltd

Address: Tower- 52, Level- 4, Road- 11, Block- C, Banani, Dhaka- 1213

Dear Sir,

Subject: [Abstract]

Proposal for: [Category]

Having examined the Request for Proposal (RfP) received for the provision of the Services for the above named Project, we, the undersigned, offer to perform and complete the whole of the Services in conformity with the said RfP and with all due diligence, efficiency and economy, in accordance with generally accepted techniques and practices commonly recognized by international professional bodies, and will observe sound management, technical and engineering practices and employ appropriate technologies and methodologies, for the total amount of:

Bangladesh Taka (BDT) [Amount numbers] in [Amount in words]

or such other sums as may be determined in accordance with the Contract.

We agree to abide by this proposal for the period of 30 calendar days from the submission date (or otherwise it can be extended upon mutual agreed timeline with the client) and it shall remain valid, open for acceptance and binding upon us and may be accepted at any time before the expiration of that period.

Unless and until the formal Agreement is prepared and executed, this proposal, together with your written acceptance thereof, shall constitute a binding Contract between us.

Name of Consultant

Signature of Consultant's Representative [Company Stamp]

Name of Signatory

Position/Title of Signatory

Date