Centre for Management Development (CMD)

(An Autonomous Institution under Government of Kerala)
Thycaud, Thiruvananthapuram
Kerala, India, Pin-695014

EMPANELMENT REFERENCE

INVITATION FOR EXPRESSION OF INTEREST (EoI) FOR EMPANELMENT OF AGENCIES

Centre for Management Development (CMD) invites EOI from interested agencies for empanelment for undertaking **Drone and Light Detection & Ranging (LiDAR) survey for various linear infrastructure projects in Kerala.**

This EOI Document contains the details of qualification criteria, submission requirement, brief objective & scope of work and evaluation criteria etc.

Important Deadlines

Last Date & Time of EoI Submission : 02.07.2018 up to 17.00 hrs.

Sealed envelope marked to the captioned address, containing EOI may be submitted mentioning "EOI for Drone and Light Detection & Ranging (LiDAR) survey for linear infrastructure projects" on the top cover:

"The Director,
Centre for Management Development (CMD)
Thycaud, Thiruvananthapuram
Kerala, India, Pin-695014"

The scanned copy of the EoI may also be send to the email: *cmdappraisal@gmail.com*

Applicants meeting the qualification criteria may be invited for presentation / proposal and demo before the selection committee as designated by CMD. Bid Document will be subsequently issued to the short-listed applicants only for award of works. For any clarifications, please contact us in the email: cmdtvm@dataone.in

The Director
Centre for Management Development (CMD)
Thycaud, Thiruvananthapuram
Kerala, India, Pin-695014

Note: CMD or any of its designates reserves the right to cancel this request for EoI and/or invite afresh with or without amendments, without liability or any obligation for such request for EoI and without assigning any reason. Information provided at this stage is indicative and CMD reserves the right to amend/add further details in the EoI.

EXPRESSION OF INTEREST FOR SLECTION OF AGENCY FOR DRONE AND LIGHT DETECTTION AND RANGING (LiDAR) SURVEY FOR LINEAR INFRASTRUCTURE PROJECTS

1. BACKGROUND

CMD wishes to engage the services of a surveying agency who has experience in conducting engineering surveys with expertise and experience in the infrastructure field and has capability in following:

- Terrestrial survey using LiDAR
- Conducting Aerial Survey using drones
- Compilation of aerial & terrestrial survey data
- Submission of survey data in prescribed format

The tentative scope of work is as follows

- Carry drone survey for an area of approx. 20sqkm as an input for surveys and alignment planning for roads and highways.
- Carry out LiDAR survey for an area of approx. 10 sq. km. as an input for detailed alignment planning and preparation of DPR for roads and highways.
- Compiling of the drone and LiDAR survey complete for the linear infrastructure project
- Submission of the survey data both combined and separate as per the format prescribed

The total area may change during the execution of the project.

2. Eligibility Criteria

The following eligibility criteria may be adhered to while submitting the EOI

1. The firm should be partnership firm under registrar of firms or a company incorporated under the Indian Companies Act 1956/2013.
2. The Applicant must have a valid GST registration in India
3. The Application can be submitted by a single firm or a consortium of maximum of two numbers of firms. However, in the event the application is made as a consortium, none of the consortium partner is eligible to associate with any other application, singly or as a partner
4. The firm (or one of the consortium partner) should have experience in conducting surveys as per the specification mentioned below and should have surveyed at least 20 sq. km. of area using drone and 50 km. (linear) using LiDAR since incorporation.
5. The firm (or one of the consortium partner) shall have a minimum turnover of at least 20 Lakh / year on an average for the past three financial years.

3. Documents to be Submitted

The following documents shall be submitted by the interested agencies for evaluation

i. Documentary evidence for registration of the firm
ii. GST Certificate / Copy of PAN Card

iii. Summary of Survey conducted, clearly indicating the name of client, type of survey, total area/length covered and output generated
iv. One sample demo of the survey output previously delivered by the firm(s) in CD/DVD/Portable media/Webshare link. The agency may be called to make a presentation on the output before the committee if shortlisted.
v. List (including number), numbers & detailed technical specification of the equipment owned by the firm (s) which could be engaged for the assignment in the event the work is awarded to the agency
vi. Certificate of ownership / or certificate of arrangement for hire of the equipment
vii. Annual Statements of Accounts for the last three financial years

4. Technical Specification

3-D Scanning (LiDAR): Guidelines on Scanning

The broad guidelines to be followed by the surveying agency whilst undertaking 3-D scanning in the areas of interest are as follows: -

i. The scans shall have adequate coverage to enable modelers to correctly develop a 3-D BIM. There must be enough overlap between two scans such that displacement errors are avoided, resulting in good capturing of the frames, placing of the scan, transformation and registration.
ii. Only **colour scans** are to be undertaken.
iii. The scan should capture very clearly a detailed image of all objects in the area under scan with exact dimensions, depth, natural colours and other details. Object boundaries are to be acquired with 5-millimetre accuracy.
iv. The scans undertaken should result in a dense Point Cloud Data or Water Tight Mesh once the registration is complete.
v. The Scan Ratio of 1:1 is to be used.

Deliverables from Terrestrial Scanning:

Registered Colored Scanned data in RCP and RCS format compatible in correctly developing 3-D BIM.

DRONE DETAILS

The UAV to be used should have the following features.

- Obstacle sensing range: 0.6 - 23 feet (0.2 – 7m).
- Lenses: FOV 84° 8.8 mm/24 mm (35 mm equivalent) f/2.8 - f/11 auto focus at 1 m - ∞
- Camera Quality - 20 Mp or more | GPS tracking system & Data Resolution: 4K

Guide Lines for Drone Scanning

i. Agencies which may use fully autonomous equipment shall be preferred. Such equipment be able to undertake fully autonomous data capture with inbuilt dual frequency RTK (Real time kinematic) GPS such that the equipment should be able to auto geotag the data accurately without ground control points (GCPs)
ii. Aerial video and images are to be taken for whole length including right of way (ROW).
iii. All the photos and videos should be precisely geo referenced by GPS and Glonass.
iv. System should be capable of recording running video in speed range of 20-25 Km/Hr.
v. Oblique aerial videography to be done with an angle of 45 degree to 30 degree or as per best practices (for best results).
vi. High Resolution digital camera capable of collecting GPS and glonass Geo-tagged 4K quality video and high-resolution image fitted on 3-axis gimble (pitch, roll, yaw) to be used for stable and clear data acquisition quality.
vii. Very low altitude flight height of about 20-100m as per requirement should be used for clear details capture. Height and angle of recording can be raised for special locations.

Guide Lines on Video Quality

i. Raw video should be of 4K resolution with geo tagging.
ii. Should be clear and sharp in detail.
iii. No inconsistencies should be there in tone and density between adjacent video tiles.
iv. GSD of 2.5 cm/pixel will be given.
v. High resolution Ortho to be given which will be sharable on webshare links.

Deliverables from Drone Survey

i. Video in MP4 format.
ii. ORTHOMOSIAC - .tif; .jpeg; .obj - The aerial imagery taken shall resulting in high resolution (2-3 cm/pixel) accurately geo-tagged (3-5 cm accurate) orthophoto. The result should able be used for compatible for further manually/semi-automatically removed to producing a digital terrain model (DTM)
iii. CONTOURS - .dfx; .dwg; .shp – The survey should be able to generate contours as per the scale required and denote elevation or altitude and depth on map.
iv. UAV generated 2D Maps in TIFF format
v. Point cloud in LAS version 1 or 2 – with each data point consisting of X, Y, Z coordinates in any desired projection system (WGS 84 by default) and should be easily importable to CAD based work and BIM Compatible