

Survey of Pakistan
Technical Evaluation Committee-II
Rawalpindi

Technical Evaluation of Software for data development using Aerial Photography using UAV including Workstation

Sl#	Work Component	Specification	M/S Sandhu Engineering & Trading Company
			Software Package: AGI Metashape Software
1	Photogrammetric Triangulation	<ul style="list-style-type: none"> a) Processing of various types of imagery: aerial (nadir, oblique) & close-range, Multispectral Imagery b) Auto calibration: frame (incl. fisheye, spherical & cylindrical cameras) c) Multi camera projects support 	<ul style="list-style-type: none"> i. Processing of various types of imagery: aerial (nadir, oblique) & close-range, Satellite imagery, Multispectral Imagery ii. Auto calibration: frame (incl. fisheye, spherical & cylindrical cameras) iii. Multi-camera projects support iv. Scanned images with fiducial marks support
2	Ground Control Points: High Accuracy Surveying	<ul style="list-style-type: none"> a) GCPs import to control accuracy of the results. b) Ground Control Point Management: creating, importing and changing projections. c) Can adjust the point cloud to a single or couple GCPs if no more are available. d) Coded/non-coded targets auto detection for fast GCPs input. e) Scale bar tool to set reference distance without implementation of positioning equipment. 	<ul style="list-style-type: none"> i. GCPs import for georeferencing and control over the accuracy of the results. ii. Support Ground Control Point Management: creating, importing and changing projections iii. Coded/non-coded targets auto detection for fast GCPS inputs iv. Scale bar tool to set reference distance without implementation of positioning equipment.
3	Point Cloud Management. Editing and Classification	<ul style="list-style-type: none"> a) Elaborate model editing for accurate results. b) Geo-references the point cloud to photo GPS data. c) Point's classification to customize geometry reconstruction. d) LAS export to benefit from classical point data 	<ul style="list-style-type: none"> i. Elaborate model editing for accurate results. ii. Automatic multiclass points classification to customize further geometry reconstruction. iii. Import/Export, LAS data to benefit from classical point data processing workflow. iv. Project scaling for accurate scale representation.

		<p>processing workflow</p> <p>e) Project scaling for accurate scale representation.</p>	<p>v. Lidar data Support.</p> <p>vi. Aerial LiDAR point attributes support.</p> <p>vii. External registration support for laser scans.</p> <p>viii. Marker-based alignment of Laser scan -visualization in model view.</p> <p>ix. Ground point's classification for LiDAR data.</p>
4	Digital Terrain, Surface and Elevation Model: Extraction/ Export	<p>a) Digital Surface and Terrain Model - depending on the project.</p> <p>b) Covert models to contour lines to user defined interval</p> <p>c) Supported for Geo-referencing based on user friendly parameters: EXIF Meta data/flight log: GPS/GCPs data</p> <p>d) 5x times Zoom in-out capacity for analysis</p> <p>e) Can crop entire models to selection</p> <p>f) Levels out the terrain by averaging height values of the selection points.</p> <p>g) Levels out the terrain by the maximum selection point height.</p>	<p>i. Digital Surface and Terrain Model - depending on the project.</p> <p>ii. Geo-referencing based on EXIF metadata/flight log, GCPs data</p> <p>iii. EPSG registry coordinates system support: WGS84, UTM etc.</p> <p>iv. Configurable vertical datum based on geoids undulated grids.</p> <p>v. DEM: editing, break line drawing, fill tools.</p>
5	3D Model Generation and Texturing	<p>a) Various scenes: archaeological sites, artifacts, buildings, interiors, people, etc.</p> <p>b) Direct upload Sketch fab resource and export to various popular formats.</p> <p>c) Photorealistic textures: Realistic texture for 3D mesh.HDR and multi file support</p>	<p>i. Various scenes: archaeological sites, artifacts, buildings, interiors, people, etc.</p> <p>ii. Direct upload Sketch fab resource and export to various popular formats.</p> <p>iii. Photorealistic textures: Realistic texture for 3D mesh.HDR and multi file support</p> <p>iv. Support for Hierarchical tiled model generation: City Modelling preserving the original image resolution for texturing</p> <p>v. Panorama Stitching: 3-D reconstruction for data captured from the same camera position, 360° panorama stitching for one camera station data</p>

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6	Georeferenced Orthomosaic Export	<ul style="list-style-type: none"> a) Generating & editing georeferenced orthomosaic GIS-compatible b) Support for various resampling algorithm, DEM from other source c) Support user defined pixel size during rectification d) Multichannel Ortho mosaic generation e) GeoTIFF format; .KML file to be located on Google Earth. f) Export in blocks for huge projects. g) Color/geometric/dynamic correction for homogeneous texture 	<ul style="list-style-type: none"> i. Geo-referenced orthomosaic: GIS-compatible, GeoTIFF format; .KML file to be located on Google Earth. ii. Export in blocks for huge projects. iii. Color/geometric correction for homogeneous texture iv. Inbuilt ghosting filter to combat artifacts due to moving objects v. Custom planar and cylindrical projection options for close range projects vi. Multichannel Ortho mosaic generation & user defined vegetative indices (NDVI etc) calculation and export
7	Measurements: Distances, Areas, Volumes	<ul style="list-style-type: none"> a) Inbuilt tools to measure areas, lengths and volumes in both 2D and 3D. b) To perform more sophisticated metric analysis 	<ul style="list-style-type: none"> i. Inbuilt tools to measure distances, areas and volumes in both 2D and 3D. ii. To perform more sophisticated metric analysis the products of photogrammetric processing can be smoothly transferred to external tools thanks to variety of export formats
8	Export/Import	<ul style="list-style-type: none"> a) Export georeferenced point clouds in different format such as LAS, xyz, poly formats b) Export 3D mesh with textures in .obj and .ply file formats. c) Export DEM to .obj .tif and Orthophoto to .tif file formats. 	All format data export/import support
9	Network Processing (Optional)	<ul style="list-style-type: none"> a) Distributed calculations over a computer network to use combined power of multiple nodes for huge data sets processing in one project. 	<ul style="list-style-type: none"> i. Distributed calculations over a computer network to use combined power of multiple nodes for huge data sets processing in one project.
10	Authorization		<ul style="list-style-type: none"> i. Authorization of AgiSof LLC developer & Manufacturer based at 19105, 64 A room 55-N Kirochanya st, St. Petersburg Russia.

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Workstation for Field Use - 06			
11	System	Branded	Dell Mobile Precision Workstation 5680
12	Operating System	Window 11 Pro (64 bit)- Latest or better	Window 11 Pro (64 bit) English
13	Processor	13 th Gen Intel Core I 9-139000H vPro Enterprise (24 MB Cache, 14 Cores upto 5.4 GHz	Intel Core I 9-139000H vPro Enterprise (24 MB Cache, 14 Cores, 20 threads, 2.6- 5.4 GHz Turbo, 45W)
14	RAM	>64 GB LPDDR5, 6000 MT/s integrated dual channel	> 64 GB (2x32 GB) LPDDR5, 6000 MT/s integrated dual channel
15	Hard Drives	4 TB, M 2 2280, PCIe NVMe, Gen 4, SSD Class 40	4 TB, M 2 2280, PCIe NVMe, Gen 4, SSD Class 40
16	Graphic	NVIDIA RTX 2000 Ada Generation 8 GB GDD R 6	NVIDIA RTX 2000 Ada Generation 8 GB GDDR 6
17	LED	16"	16" FHD+non touch, 1920x1200, 60Hz, 500 nits WLED, 100% DCI-P3, Low BL w/IR Cam
18	Accessories	<ul style="list-style-type: none"> a) Input output support compatible b) Power supply and cables c) Wireless Key Board, mouse d) Manuals 	<ul style="list-style-type: none"> i. 6 Cell, 100 Wh long life cycle (3 years warranty), E5 Power Cord, 165 W E5 Type C Power Adapter ii. US English Backlight Key Board with finger print reader iii. Manual- English iv. Intell AX 211, 2x2 MIMO, 2400 Mbps, 2.4/5/6 GHz, wifi 6/6E (Wifi 802.11ax) Bluetooth v. EPEAT 2018 Registered (Gold) vi. FHD IR CMRA, Express Sign-In, Intelligent Privacy, Camera, Microphone etc
Workstation (Fixed)			
19	System	Branded	Del Precision 7960 Tower Workstation (Fixed Station)
20	Operating System	Window 11 Pro (64 bit)- Latest or better	Windows 11 Pro for Worksation (6 core plus), English

21	Processor	G4 Workstation, Intel Xeon Gold 6226 R 2.9G, 16C/32T, 10,4 GT/s 22 M Cache 1 OR AMD Ryzen Threadripper PRO 5995WX (2567 MB) cache, 64 cores, 128 threads, 2.70 GHz to 4.55 GHz	Intel Xeon wS-3435X (45 MB Cache, 16 cores, 32 threads, 3.1 GHz to 4.7 GHz Turbo 270W), CPU Heat Sink up to 300 W Precision 7960 Tower 1400W FB NVMe/SATA chasis
22	RAM	128 GB LPDDR5, 6000 MT/s integrated dual channel or better	128 GB (4x32 GB) DDR5, 4800 MHz, RDIMM ECC Memory
23	Hard Drives	4 TB, M 2 2280, PCIe NVMe, Gen 4, SSD Class 40 or better + 8 TB Raid	4 TB, M 2 , PCIe NVMe, Class 40 Solid State Drive 8TB, 7200 RPM,3.5-inch, SATA, HDD, AG Enterprise Class
24	Graphic	NVIDIA RTX 4000 Ada Generation 1 GB GDD R 6	NVIDIA RTX A 4000 Ada Generation 16 GB GDD R 6, 7960T, 4 DP
25	LED	27 “or above 140 Hz or above 4:3 Ratio HD or above	Dell 27” Gaming Monitor- S2721HGF
26	UPS	Min 3 KVA or equivalent, with dry batteries	APC Smart UPS SRT 3000 VA with dry batteries
27	Accessories	a) Input output support compatible b) Power supply and cables c) Wireless Key Board, mouse d) Manuals	i. 6 Cell, 100 Wh long life cycle (3 years warranty), E5 Power Cord (UK), 165 W E5 Type C Power Adapter ii. Dell Pro Wireless Key Board and Mouse (US English) – KM 5221 W iii. Manual- English
28	Authorization		Exclusive Authorization of CNS Engineers for participating in Bid-DPWS and Software for sale support, warranty, after sale services and supply for spare parts
Other Mandatory Requirement			
28	Training	One month	One month on site training

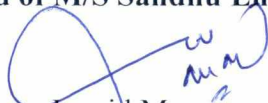
29	Repairing & Maintenance support	a) One year free, b) Service agreement for 2 years (extendable on performance)	i. One year after commission on site, defective parts/assemblies will be replaced by bidder free of charge within warranty period. ii. After sale and service guaranty of 2 years.
30	Documentation	All manuals in English Languages (both in hard & Soft formats)	


Analysis & Conclusion:


- i. **The only firm M/S Sandhu Engineering & Trading Company** has submitted the bid for Software and Workstation against bid requirement
- ii. The technical bid has been evaluated, is found complete, and covers all performance requirements.

Recommendation:

The bid of M/S Sandhu Engineering & Trading Company is technically complied, and recommended for further proceedings.


Junaid Memon
Assistant Director
Member (TEC-2)


Aftab Nazir Ahmad
Deputy Director
Member (TEC-2)


Muhammad Arshad Iqbal
Director (Ph & RS)
Chairman (TEC-2)