SAGI - Survey Accuracies and Specifications (SAS) - Topo 2015

Paragraph	Description	**SAS Level 1** Low Accuracy	**SAS Level 2** Mid to Low Accuracy	**SAS Level 3** Medium Accuracy	**SAS Level 4** Medium to High Accuracy	**SAS Level 5** High Accuracy
	Description	Level 1 surveys only require the use of a GPS and using long base lines (5-10km). The long base lines will alter the accuracy surveyed points.	Level 2 surveys require the use of a GPS to establish control a by using shorter base lines (2-5 km's) and having some sort of a network control. The shorter base lines will increase the accuracies of the surveyed points. Total station only being used to survey infill points where the GPS loses fix.	Level 3 surveys require the use of a GPS to establish the horizontal position of control by using short base lines (0-2 km's) and having some sort of a network control. Static observations for more than 10 minutes can be used for longer base lines (2-8 km's). The shorter base lines and levelled benchmarks will increase the accuracies of the surveyed points. Total station only being used to survey infill points where the GPS loses GPS fix.	Level 4 surveys require the use of a GPS to establish the horizontal position of control by using a double polar from two short base lines (0-2 km's) and having some sort of a network control. Static observations for more than 15 minutes can be used for longer base lines (2-8 km's) but must be part of a well establish network of control. All benchmarks must be levelled by means of a two way levelling run with at least a digital level. The shorter base lines and levelled benchmarks will increase the accuracies of the surveyed points. Total station must be used on tarmac surfaces or where high accuracy points are required. TMH11 typically falls within this category.	Level 5 surveys require the use of a Total Station to establish the horizontal position of control in a network traverse. All benchmarks must be levelled by using at least a digital level with a double levelling run. The total station and levelled benchmarks will increase the accuracies of the surveyed points. Total station must be used to survey all high accuracy points.
1	Connection to National Geodetic System (NGS)	1 Connection	1 Connection + 1 additional per 5km's and use of Geiod Model	2 Connections + 1 additional per 3km's and use of Geiod Model	2 Connections + 1 additional per 2km's and use of Geiod Model	3 Connections + 1 additional per 500 metres and use of Geiod Model
2	Benchmark Frequency (estimation)	1 or 2 BM per site, or 1 BM every 2000m	2 BM per site, or 1 BM every 1000m	2-3 BM per site, or 1 BM every 500m	2-4 BM per site, or 1 BM every 300m	1 BM/Target every 50-100m
3	Benchmark Horizontal Position (estimation)	Global < 0.20m Relative < 0.05m	Global < 0.10m Relative < 0.05m	Global < 0.08m Relative < 0.03m	Global < 0.05m Relative < 0.02m	Global < 0.02m Relative < 0.01m
4	Benchmark Height (estimation)	Global < 0.50m Relative < 0.10m	Global < 0.20m Relative < 0.05m	Global < 0.10m Relative < 0.03m	Global < 0.02m Relative < 0.010m	Global < 0.010m Relative < 0.005m
5	Reflective Target (Y,X,Height) (estimation)	Not applicable	Not applicable	Not applicable	Not applicable	Global < 0.02m Relative < 0.005m
6	Tachy Points (Y,X,Height) (estimation)	Global < 0.50m Relative < 0.05m	Global < 0.20m Relative < 0.05m	Global < 0.10m Relative < 0.04m	Global < 0.05m Relative < 0.03m	Global < 0.02m Relative < 0.005m
7	Frequency of Points (estimation)	Every 100m or at profile changes	Every 25m, 25x25m grid, survey all features and break lines	20x20m grid, survey all features and break lines	10x10m grid on hard surfaces otherwise 20x20m grid, survey all features and break lines	(5-10)x(5-10)m grid, survey all features and break lines
8	Engineering Applications	General profile surveys, flood line surveys, river cross sections	Profile surveys, low order tachy surveys (rural storm water, stockpiles, borrow pits, river cross sections), detail flood line surveys	General tachy surveys (gravel roads, urban storm water, stockpiles, borrow pits, water pipelines and general as-built surveys)	High order tachy surveys (sewer, surfaced roads, railway lines), lower order scanning (point clouds), general structural surveys (culverts, column positions) and accurate as-built surveys	Accurate scanning (point clouds), monitoring, accurate structural surveys, runway surveys
9	Suggested Outputs (varies for different projects, see notes below)	Survey report, control list and spreadsheet of points surveyed	Survey report, control list, tachy code list, drawing (specify output), PDF print and electronic DTM (specify output)	Survey report, control list, tachy code list, drawing (specify output), PDF print and electronic DTM (specify output)	Survey report, control list, tachy code list, drawing (specify output), PDF print and electronic DTM (specify output)	Survey report, control list, tachy code list, drawing (specify output), PDF print and electronic DTM (specify output)
10	Equipment and methods	GPS Rover and Base (strong radio)	GPS Rover and Base and a Total Station (5")	GPS Rover and Base, Total Station (3-5") and a Level	GPS Rover and Base, Total Station (3") and a Digital Level/Precise Level	Total Station (0.5-3"), Scanner and a Digital/Precise Level
11	Minimum Qualifications of surveyor	Registered Technician (Diploma) under the supervision of a registered Technologist or Professional Surveyor	Registered Technician (Diploma) under the supervision of a registered Technologist or Professional Surveyor (cadastral work can only be done under the supervision of a registered Professional Land Surveyor).	Registered Technician (Diploma) under the supervision of a registered Technologist or Professional Surveyor (cadastral work can only be done under the supervision of a registered Professional Land Surveyor).	Registered Technician (Diploma) with at least 2 years experience under the supervision of a registered Technologist or Professional Surveyor (cadastral work can only be done under the supervision of a registered Professional Land Surveyor).	Professional Surveyor with prior experience in the field required or under the guidance of someone that has at least 2 years experience.

Definitions:

Global Accuracy: Global accuracy refers to the difference between any two points relative to each other throughout the length/size of the project.

Relative Accuracy: Relative accuracy refers to the difference between two points nearest to each other.

Electronic DTM: Electronic DTM refers to a triangulated DTM that has been correctly and fully triangulated and has break lines where there is a change in the topography.

National Geodetic System: The National Geodetic System refers to all of the national integrated control systems and refers to Trig Beacons, Town Survey Marks (TSM), National Land Levelling Datum (LLD), National Road Benchmarks (NRB) and TrigNet Base Stations.

Notes:

Suggested Outputs: Be specific in your request for quotation, with regards to the format in which you require your electronic dtm (Civil Designer, ModelMaker, 3D breaklines, etc) as well as the format in which your require your drawing (AutoCad dwg, AllyCad drg, Civil Desinger dr4, etc).

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