



# **GEOSPATIAL ENGINEERING COMPETENCIES**

## **Specialist Land Surveying**

The measurement, definition and portrayal, either digitally or graphically in the form of maps or plans, of the physical features of, and the structures on the earth's surface. The ability to understand engineering design information and from this, provide dimensional control for all stages of construction work.

GELS01		Competency	Ability to undertake topographic surveys				
			Date of assessment				
Optimum Standard			Activity Details	A	K	E	B
ITEM	TECHNICAL MEMBER	MEMBER					
A	K	B	Site reconnaissance, survey methodology and risk assessment (see also GEN11B)				
B	E	B	Use of appropriate survey control stations and measurements e.g. closed, well-conditioned traverse				
C	E	B	Use and understanding of GNSS surveying techniques: <ul style="list-style-type: none"> <li>- Modes of GNSS positioning (static, post-processed kinematic, local base station RTK, Network RTK, Precise Point Positioning) and their application e.g. survey control, detailing, setting out</li> <li>- Role of base stations, baseline lengths, session durations</li> <li>- Error sources and mitigation: orbits and clocks, ionosphere, troposphere, multipath, antenna phase centres, geometry effects, interference</li> <li>- Post-processing and analysis of GNSS data</li> <li>- Quality control of GNSS-based positions</li> <li>- Multi-GNSS: benefits and limitations</li> </ul>				
D	E	B	Height control – use of different methods of establishing heights e.g. levelling, GNSS				
E	E	B	Use of a variety of methods of capturing topographic survey information				

GELS01 continued		Competency	Ability to undertake topographic surveys				
			<b>Date of assessment</b>				
		Optimum Standard		<b>Activity Details</b>			
ITEM	TECHNICAL MEMBER	MEMBER	A				
F	E	B					Data capture and feature coding. Recording of survey information
G	K	K					Electronic tapes/handheld measuring devices
H	E	B					Appropriate on-going checking procedures e.g. levels, total stations, EDMs and tapes
GELS01: Ability to carry out topographic surveys							
Name of Supervisor				Name of Applicant			
Supervisor's signature				Date			

GELS02		Competency	Use and understanding of surveying instruments			
			Date of assessment			
Optimum Standard			Activity Details			
ITEM	TECHNICAL MEMBER	MEMBER				
A	E	B				
B	E	B				
C	A	K				
D	E	B				
E	E	B				
F	E	B				
G	E	B				
H	E	B				
GELS03: Use and understanding of surveying instruments						
Name of Supervisor			Name of Applicant			
Supervisor's signature			Date			

GELS03		Competency	Application of geometric principles				
			<b>Date of assessment</b>				
		Optimum Standard		<b>Activity Details</b>			
ITEM	TECHNICAL MEMBER	MEMBER	A				
A	E	B					
B	E	B					
C	E	B					
D	E	B					
E	E	B					
GELS03: Application of geometric principles							
Name of Supervisor			Name of Applicant				

GELS04	Competency		Ability to use ICT in surveying				
				Date of assessment			
Optimum Standard			Activity Details	A	K	E	B
ITEM	TECHNICAL MEMBER	MEMBER					
A	E	B	Transfer of survey data between instrument and computer				
B	E	B	Electronic processing of coordinate geometry data including geometric networks				
C	E	B	Use and manipulation of digital ground models				
D	E	B	CAD - general principles, structure, layering, UCS				
GELS04: Ability to use ICT in surveying							
Name of Supervisor			Name of Applicant				
Supervisor's signature			Date				