GEOSPATIAL ENGINEERING COMPETENCIES

Geospatial Information Management

The management and manipulation of geospatial information, supported by the understanding of the methods of capture, organisation, analysis, display and dissemination, as well as the infrastructure and technologies necessary for the optimal use of this information in an engineering context.

GEGIM01		**Competency**	**Source Data Validation** When considering where data has come from (the source) take the following into consideration:				
				Date of assessment			
	Optimum Standard		**Activity Details**	A	K	E	B
ITEM	**TECHNICAL MEMBER**	**MEMBER**					
A	E	B	Recognise and respect existing standards/specifications that are appropriate to the data set being validated and would support the delivery of the task reporting errors or improvements to the standards/specifications e.g. PAS, ISO, client guides, client specific specifications.				
B	E	B	Understanding of techniques and technologies used to capture source data e.g. scanner type, camera, total station, GNSS, mobile mapping, GPR, pipe lasers, interferometry, InSAR, single/multi beam echo sounding etc.				
C	E	B	Ability to evaluate the quality of source data (Variance, Standard Deviation, accuracy statements, statistical reports).				
D	E	B	Understand the limitations of use.				
E	E	B	Analyse and assess external (3rd party) validation.				
F	E	B	Interrogate and evaluate metadata.				

GEGIM01: Source data validation	
Name of Supervisor	Name of Applicant
Supervisor's signature	Date

GEGIM02		**Competency**	**Source Data preparation** Prepare the source data using the activities below in readiness for manipulation.				
				Date of assessment			
	Optimum Standard		**Activity Details**	A	K	E	B
ITEM	**TECHNICAL MEMBER**	**MEMBER**					
A	E	B	The ability to spot erroneous data for example poor residuals and how to resolve the error.				
B	E	B	Undertake complex data fusion e.g. combining datasets of differing types, whilst respecting data standards where appropriate.				
C	K	E	Techniques and limitations of point cloud registration (Cloud to Cloud, Spheres, Targets, SLAM).				
D	E	B	Transformation of data to a common or user defined coordinate system.				
E	E	B	Application and understanding of scale factor.				

GEGIM02: Source Data preparation	
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GEGIM03		**Competency**	**Data Manipulation**				
				Date of assessment			
	Optimum Standard		**Activity Details**	A	K	E	B
ITEM	**TECHNICAL MEMBER**	**MEMBER**					
A	E	B	Conversion of data from 2D to a 3D model and visa-versa.				
B	E	B	Ability to choose an appropriate method of data abstraction/manipulation and understand the impact this has on the deliverables e.g. re-sampling of geospatial data.				
C	E	B	Interoperability of data sets and implications of converting between formats (Revit, TIN, Mesh, Grid, LAS, LAZ ASCII, 3Ds max, etc).				
D	E	B	Ability to extract features from manipulated data.				
E	E	B	Understanding of data cleaning methodologies e.g. use of filters.				
F	K	E	Understanding of data compression technologies e.g. Octree, Pyramid etc.				

GEGIM03: Data manipulation	
Name of Supervisor	Name of Applicant
Supervisor's signature	Date

GEGIM04		Competency	Quality reporting				
				Date of assessment			
	Optimum Standard		Activity Details	A	K	E	B
ITEM	TECHNICAL MEMBER	MEMBER					
A	B	B	Understand the difference between accuracy and precision. Relative or absolute. This must be cross referenced in the experience report.				
B	K	E	Generation of metadata as per recognised national standards and rulesets that support the origin, output and transmission of compliant spatial data (geospatial data standards) pertinent at the time of application.				
C	K	E	Creation of metadata in relation to BIM.				
D	E	B	Apply correct version control and ensure a robust and systematic approach.				

GEGIM04: Quality reporting	
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Supervisor's signature	Date

GEGIM05		**Competency**	**Visualisation** Produce two or more of the following:				
				Date of assessment			
	Optimum Standard		**Activity Details**	A	K	E	B
ITEM	**TECHNICAL MEMBER**	**MEMBER**					
A	Two at E rest at K	Two at B rest at K	3D model mesh.				
B			Thematic models.				
C			Augmented reality.				
D			Photogrammetric model.				
E			BIM compliant model.				
F			Cloud based visualisation (WFS, WMS, web share).				
G			Other (describe activity)				

GEGIM05: Visualisation	
Name of Supervisor	Name of Applicant
Supervisor's signature	Date

GEGIM06		**Competency**	**Use of ICT**				
				Date of assessment			
	Optimum Standard		**Activity Details**	A	K	E	B
ITEM	**TECHNICAL MEMBER**	**MEMBER**					
A	E	B	Sharing and storing of geospatial data. for example, SFTP, Dropbox, cloud hosted web service.				
B	E	B	Understand the importance of data security and sharing, including adherence to GDPR.				
C	K	E	Data exchange technologies and standards e.g. IDE, IFC.				
D	K	E	Understanding the use of Database Management Systems (DBMS), e.g. relational, object orientated, spatial.				

GEGIM06: Use of ICT	
Name of Supervisor	Name of Applicant
Supervisor’s signature	Date