“Graduate Name”

Executive Summary

Surveyor Framework

Survey Project Abstracts

CER 1 –

CER 2 –

CER 3 –

***Unit 1: Personal Qualities***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 1.1 Possess a tertiary qualification in surveying**  Applicants will need to demonstrate that they:   1. Have completed a course of study of at least three years fulltime duration acceptable to the Surveyors Board of Queensland or have been previously registered as a Surveyor by the Surveyors Board of Queensland   *Refer to the notes column of the Competency Framework* |  |  |  |  |
| **S 1.2 Are professional in their dealings with the public**  Applicants will need to demonstrate that they:   1. Have not conducted themselves in a manner that erodes the public confidence in the profession   *An absence of contrary evidence will be sufficient* |  |  |  |  |
| 1. Have not been unfair or unethical in their dealings with the public   *An absence of contrary evidence will be sufficient* |  |  |  |  |
| **S 1.3 Know and comply with published ethical codes**  Applicants will need to demonstrate that they:   1. Understand and can explain the Surveyors Board of Queensland’s *Code of Practice for Surveyor* |  |  |  |  |
| **S 1.4 Keep their knowledge and skills current**  Applicants will need to demonstrate that they have made themselves aware of changes in surveying practice through activities such as:   1. Attending continuing professional development events |  |  |  |  |
| 1. Reading literature relevant to surveying practice |  |  |  |  |
| **S 1.5 Know what limitations apply to their work**  Applicants will need to demonstrate that they:   1. Can describe the regulation of surveying in Queensland |  |  |  |  |
| 1. Have not undertaken work beyond limits of personal skills and expertise   *An absence of contrary evidence will be sufficient* |  |  |  |  |

***Unit 2: Collection of Data and Measurement***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 2.1 Collect data by measurement**  Applicants will need to demonstrate that they:   1. Use adequate redundant measurements to validate data |  |  |  |  |
| 1. Ensure measurements are legally traceable – Note: EDME baseline adequate   *Successful completion of EDME baseline comparison is required* |  |  |  |  |
| 1. Evaluate the various measurements methods and procedures available   *Evidence of a variety of measurement methods in a variety of circumstances will be sufficient evidence* |  |  |  |  |
| 1. Assess the effectiveness of the measurement method adopted   *Evidence of a variety of measurement methods in a variety of circumstances will be sufficient evidence* |  |  |  |  |
| **S 2.2 Search and acquire existing data**  Applicants will need to demonstrate that they are able to:   1. Extract required information from relevant geographic and land information records, survey data bases, and general information depositories |  |  |  |  |
| **S 2.3 Can use and maintain GNSS surveying instruments**  Applicants will need to demonstrate that they are able to:   1. Define coordinates systems likely to be encountered by GNSS users and calculate GNSS coordinates |  |  |  |  |
| 1. Discuss the principles of GNSS observations |  |  |  |  |
| 1. Make observations using a GNSS receiver |  |  |  |  |
| 1. Explain GNSS observations techniques, and calculate and evaluate levels of accuracy associated with GNSS observations |  |  |  |  |
| 1. Identify error sources in GNSS observations, and explain the uses and critical factors of differential GNSS techniques |  |  |  |  |
| 1. Output GNSS observations in existing local co-ordinate systems including ground based systems |  |  |  |  |
| **S 2.4 Apply quality assurance principles**  Applicants will need to demonstrate that they are able to:   1. Comply with an accepted quality assurance program |  |  |  |  |
| 1. Rectify non-compliance with quality standards |  |  |  |  |

***Unit 3: Development Surveys***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 3.1 Setout minor works**  Applicants will need to demonstrate that they are able to :   1. Read, interpret and understand design and construction plans |  |  |  |  |
| 1. Set out works |  |  |  |  |
| 1. Communicate results to client, construction staff and other consultants |  |  |  |  |
| 1. Use adequate redundant measurements to validate data |  |  |  |  |
| **S 3.2 Perform topographic surveys**  Applicants will need to demonstrate that they have:   1. Completed a variety of topographic surveys that were fit for purpose using terrestrial and GNSS instruments.   *Descriptor (i) requires evidence that the applicant has completed detail surveys that:*   * *Have an adjusted network of stations connected to a reference framework (e.g. co-ordinated control or cadastral marks);* * *Involve surveys of irregular surface levels and breaklines; and locating a range of artificial and natural features;* * *Require creation of a digital terrain model and contours;* * *Require compilation of supplementary data from other sources (e.g. plotting underground services from records);*   *Generate output formats (e.g. digital files, PDF) to suit the project brief and demonstrates understanding of design requirements.* |  |  |  |  |
| 1. Use adequate redundant measurements to validate data |  |  |  |  |
| 1. Accurately described the origin of datums and other explanatory notes |  |  |  |  |
| **S 3.3 Survey and calculate volumes and quantities**  Applicants will need to demonstrate that they:   1. Collect topographic data at appropriate accuracy and density for volume purpose |  |  |  |  |
| 1. Calculate and report volumes to an accuracy justified by the measurement method |  |  |  |  |
| **S 3.4 Know and apply occupational health and safety requirements**  Applicants will need to demonstrate that they:   1. Can describe the requirements of occupational health and safety legislation in Queensland that is pertinent to their work environment   See *Coal Mining Safety and Health Act 1999*  *Mining and Quarrying Safety and Health Act 1999*  *Work Health and Safety Act 2011, Transport & Operation Act (Road Use Management) 1995 (as a way of explanation, it refers to the Manual for Uniform Traffic Control Devices which is required* |  |  |  |  |
| 1. Use occupational health and safety procedures that comply with the relevant legislation   See *Coal Mining Safety and Health Act 1999*  *Mining and Quarrying Safety and Health Act 1999*  *Work Health and Safety Act 2011, Transport & Operation Act (Road Use Management) 1995 (as a way of explanation, it refers to the Manual for Uniform Traffic Control Devices which is required* |  |  |  |  |

***Unit 4: Process Field Measurements***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 4.1 Can detect errors in existing data and field observations.**  Applicants will need to demonstrate that they are able to:   1. Identify errors in data that is supplied by other parties |  |  |  |  |
| 1. Use quality assurance processes to ensure that errors are detected and eliminated |  |  |  |  |
| **S 4.2 Understands the accuracy of existing data and creates new data with appropriate accuracy.**  Applicants will need to demonstrate that they are able to:   1. Determine the accuracy and reliability of data   *Descriptor i requires an assessment of data that may be influenced by the knowledge of its age, what equipment was or may have been used, what was the purpose of collecting it, datums and control used etc.* |  |  |  |  |
| 1. Define the limitations of collected data   *Descriptor ii requires an understanding of the limitations of equipment and methods used and accuracies required for the task at hand.* |  |  |  |  |
| **S 4.3 Can combine existing data with new survey data**  Applicants will need to demonstrate that they:   1. Are able to deduce or estimate the accuracy limitations of existing data sets |  |  |  |  |
| 1. Do not use data sources of insufficient accuracy in survey products |  |  |  |  |
| **S 4.4 Can produce plans that are accurate, legible and useful**  Applicants will need to demonstrate that they are able to:   1. Use a computer aided drafting package to produce paper plans |  |  |  |  |
| 1. Produce sketches that are fit for purpose   *Descriptor (ii) requires evidence that the applicant produces plans for set out operations that accurately and unambiguously identify the marks placed and their relation to works to be constructed.* |  |  |  |  |
| **S 4.5 Can produce electronic models and plans**  Applicants will need to demonstrate that they are able to:   1. Use a computer aided drafting package to produce electronic plans   *Descriptor (i) requires evidence that the applicant produces plans where the plan information is accurately and unambiguously ordered to prevent misinterpretation by other parties.* |  |  |  |  |
| 1. Create digital models of physical surfaces |  |  |  |  |
| 1. Attach attribute information to a digital model |  |  |  |  |
| 1. Transfer files between various formats |  |  |  |  |

***Unit 5: Communication***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 5.1 Communicate effectively**  Applicants will need to demonstrate that they are able to:   1. Communicate effectively, orally and in writing |  |  |  |  |
| 1. Issue clear, accurate instructions to subordinates |  |  |  |  |
| 1. Successfully use electronic communications technologies |  |  |  |  |
| **S 5.2 Can speak effectively at meetings**  Applicants will need to demonstrate that they are able to:   1. Explain surveying matters in comprehensible and unambiguous language at small meetings of allied professions |  |  |  |  |
| **S 5.3 Prepare reports**  Applicants will need to demonstrate that they are able to:   1. Prepare logical and coherent reports for the benefit of surveyors, other professions and clients |  |  |  |  |
| **S 5.4 Certify data**  Applicants will need to demonstrate that they are able to:   1. Write certificates that are accurate and limited to areas of their professional competence   *When called upon will be able to:*   1. *Understand and explain the accuracy and reliability of data to be certified.* 2. *Understand and explain the responsibilities of data certification.* 3. *Apply effective validation procedures.* 4. *Effectively identify and manage risk associated with certification* |  |  |  |  |
| **S 5.5 Provide advisory services** Applicants will need to demonstrate that they are able to:   1. Provide sound advice to clients and fellow professionals on surveying and land management matters at an appropriate level of detail. |  |  |  |  |

***Unit 6: Survey Control***

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| **Elements / Descriptors** | **Evidence** | **Documents** | **Graduates Comments** | **Assessors Comments** |
| **S 6.1 Use geodetic reference systems**  Applicants will need to demonstrate that they are able to:   1. Use appropriate geodetic datums and map projections |  |  |  |  |
| 1. Perform geodetic calculations of traverses and intersections using geographic coordinates |  |  |  |  |
| 1. Perform geodetic calculations of traverses and intersections using UTM grid coordinates |  |  |  |  |
| 1. Transform three dimensional coordinates between systems and between datums, with the aid of suitable software, to the required level of accuracy |  |  |  |  |
| **S 6.2 Integrate survey control** Applicants will need to demonstrate that they are able to:   1. Describe and comply with the regulation of surveying and mapping infrastructure in Queensland   See *Survey and Mapping Infrastructure Act 2003* |  |  |  |  |
| 1. Find and recognise evidence of previous surveys   *Descriptor (ii) refers to evidence of previous cadastral, engineering and mining surveys.* |  |  |  |  |
| **S 6.3 Establish, measure and adjust horizontal survey control**  Applicants will need to demonstrate that they are able to:   1. Establish project control networks using GNSS and terrestrial measurements   *Descriptor (i) requires a static / fast static GNSS network establishing multiple new stations separated by a substantial distance. If there is no significant terrestrial measurements involved in the first survey a second survey (of lesser complexity) using terrestrial methods is required. The second control survey can refer to control provided for Cadastral, Engineering or Mining Surveys and can be braced networks, closed loops, longitudinal or underground control. The applicant should demonstrate an understanding of the survey methods applied and their limitations* |  |  |  |  |
| 1. Evaluate and adjust measurements by appropriate adjustment methods   *Descriptor (ii) refers to knowledge of the assumptions inherent in the adjustment methods available* |  |  |  |  |
| 1. Use adequate redundant measurements to validate data |  |  |  |  |
| 1. Mathematically adjust survey networks by the method of least squares using computer software packages |  |  |  |  |
| 1. Analyse and critically evaluate the adjustment |  |  |  |  |
| **S 6.4 Establish, measure and adjust vertical survey control**  Applicants will need to demonstrate that they are able to:   1. Perform precise level measurements   *Descriptor (i) precise levelling can refer to any levelling operation where techniques that comply with the lowest level quality detailed in SP1 are used and the requisite quality demonstrated.* |  |  |  |  |
| 1. Identify the effects of curvature and refraction on levelling and apply this knowledge to trigonometrical levelling |  |  |  |  |
| 1. Identify the equipment and methods used in precise levelling and the sources of error and the techniques to minimise their effects |  |  |  |  |