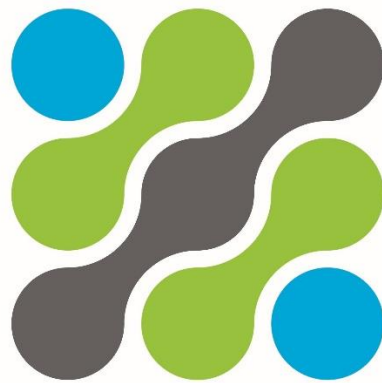


2023

Get Certified

Certified Professional Engineering Surveyor

Stay Certified



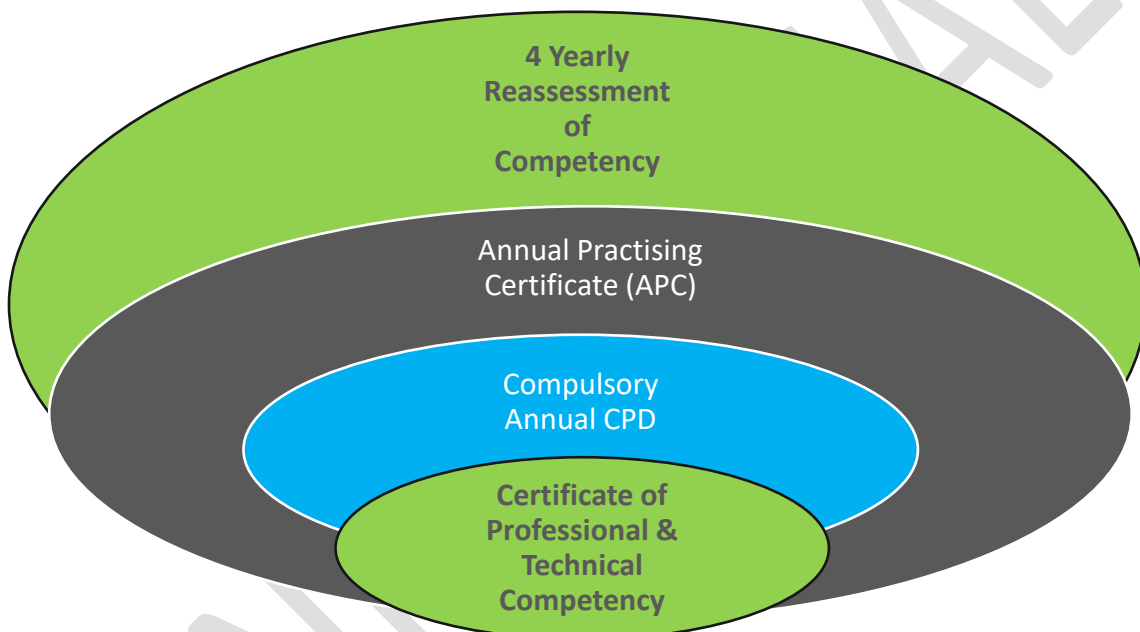
**Survey
and Spatial
New Zealand**
TĀTAI WHENUA

Author: J ALBISTON – Copyright Survey &
Spatial New Zealand
6/26/2023

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Certification Framework Purpose & Vision

‘To provide a recognised professional pathway for members at all levels by developing, implementing, and maintaining, a Certification Framework and Programs, with clear eligibility criteria, a public register and mandatory CPD, supported by a robust renewal process and quality management system (QMS).’



Key Goals

- To achieve a commitment across S+SNZ membership to an agreed set of professional best practice standards and ethics
- To provide professional certification that all members can pathway into
- To meet the criteria and standards required by Local and Territorial Authorities
- To provide advanced competency for those who choose to specialise

Wider Goals

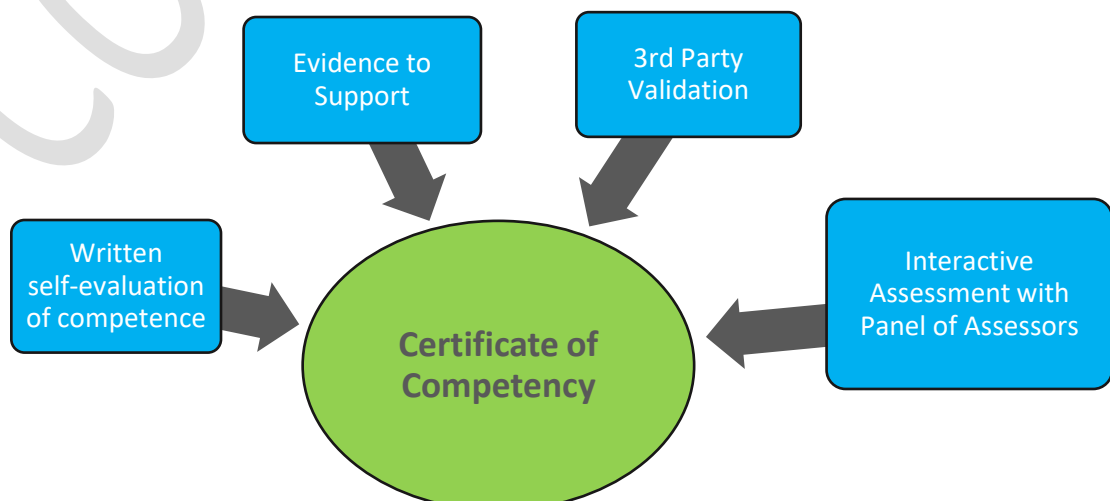
- To set and uphold standards in education, competency, and ethical behaviour
- To enhance public understanding of the role the surveying and spatial sector plays in New Zealand and beyond.

Get Certified: The Process



Get Certified – The Assessment of Competency

The Assessment has 2 parts. Part A (General Professional Competence) and Part B (Technical Competence) both have their own set of competencies. These competencies are assessed in 4 different ways as follows:

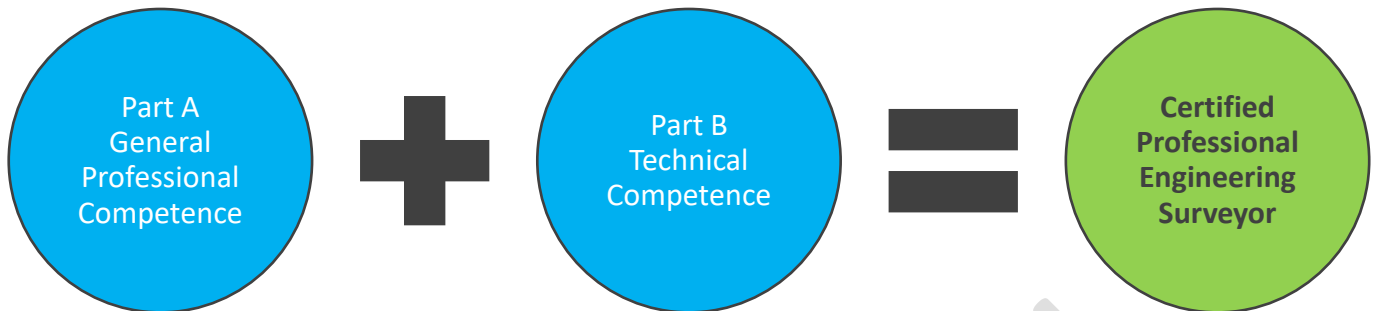


Stay Certified: Annual Practising Certificate (APC) and Annual CPD

An **Annual Practising Certificate (APC)** is issued upon payment of fees, and where there is a **current Annual CPD Certificate** and **current relevant Certificate(s) of Competency**. As part of annual renewal of the APC, candidates are required to sign an **Annual Commitment to Ethics and Professional Practice Statement**. Certified Professional Engineering Surveyors OR Certified Professional Land Development Engineers who practice without a current **Annual Practising Certificate (APC)** may be referred to a professional conduct committee and subject to a disciplinary process.

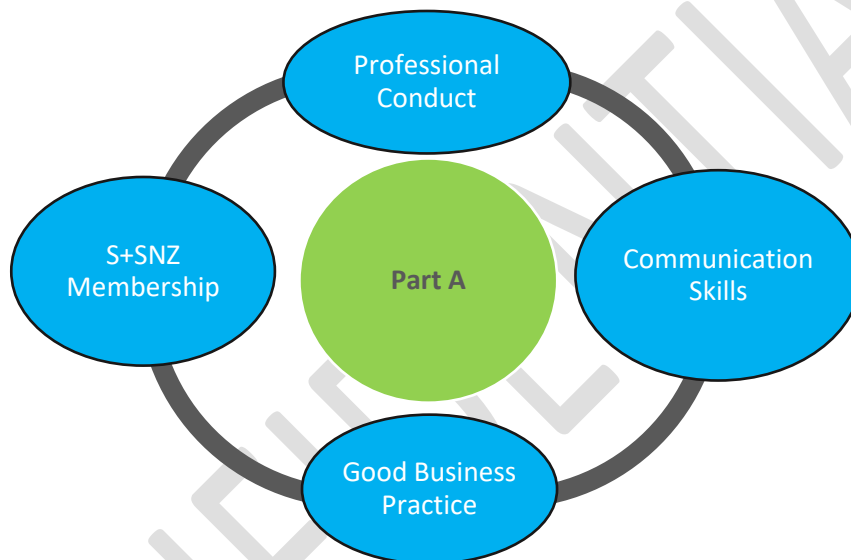
Stay Certified: 4 Yearly Cycle

Overview: S+SNZ Certified Professional Engineering Surveyor



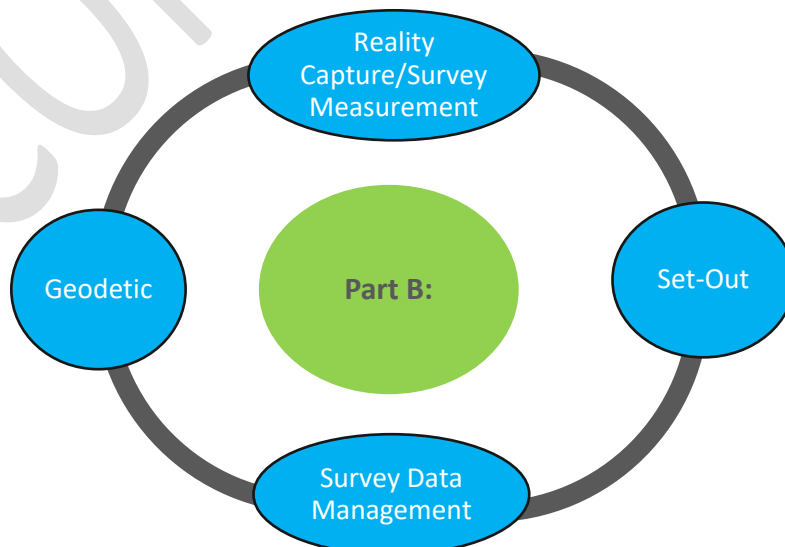
Part A: General Professional Competence

Part A is the assessment of General Professional Competence. It assesses competence in the following areas:



Part B: Technical Competence

Part B is the assessment of Technical Competence in Engineering Surveying. It assesses competence in the following areas:



Certification of Professional Engineering Surveying Competence

Purpose Statement

The Certification of Professional Engineering Surveying Competence is formal recognition by Survey and Spatial New Zealand of those who have been assessed against a defined set of professional and technical competencies which meet standards and technical sign off criteria required by Private and Public Asset Owners, Territorial and Local Authorities and other such Entities.

The Annual Practising Certificate as a **Survey and Spatial New Zealand Certified Professional Engineering Surveyor** sets a quality benchmark for the industry to maintain public confidence across the following areas:

- Earthworks, Erosion and Sediment Control
- Access, Roding and Transportation
- 3 Waters (Stormwater Management, Wastewater Management, Potable Water)
- Utilities (Energy and Communication)
- Construction (Residential, Infrastructure, Commercial)

Competence Standard

This Certification recognises prior learning and current competency to the standard required to sign (but not limited to):¹

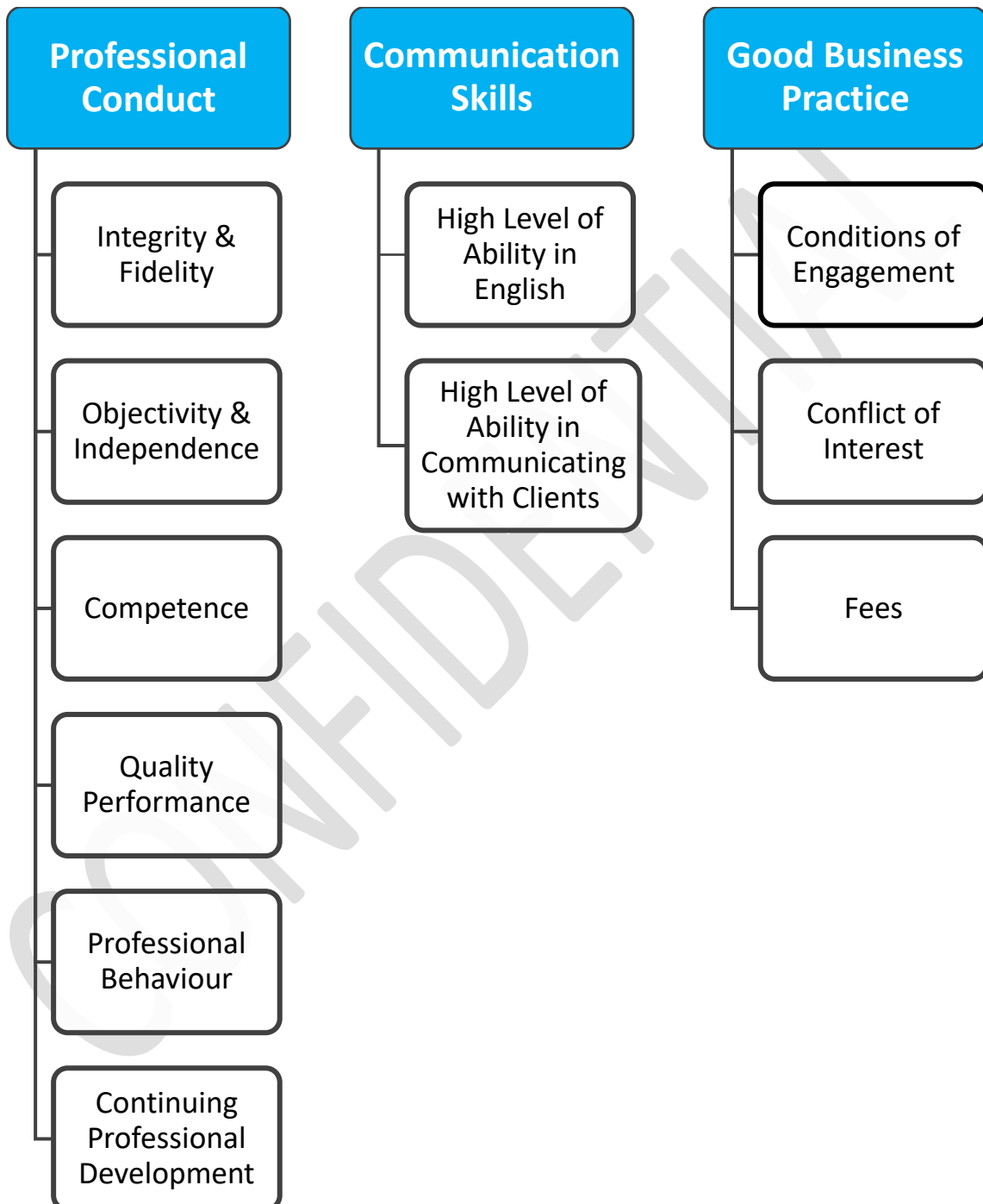
- A component of As-Built Drawings, verifying that the position (vertical and horizontal) of all features (including Stormwater and Wastewater) is a true and accurate representation of an XXX site/project.
- A Set-Out/Siting Certificate to confirm that buildings and other assets have been set out in terms of the consented plans.
- The Positional accuracy of a Monitoring system/regime
- That Material Quantity Calculations are accurate, and a true representation of the material(s) moved

¹ This Certification assesses to the standards required and recommended by (but not limited to): the LINZ Utility Location Standard, NZS 4404 (2010), the Health and Safety at Work Act 2015 and the Resource Management Act (RMA).

Summary of Competencies for Engineering Surveying Part A – General

Professional Competence:

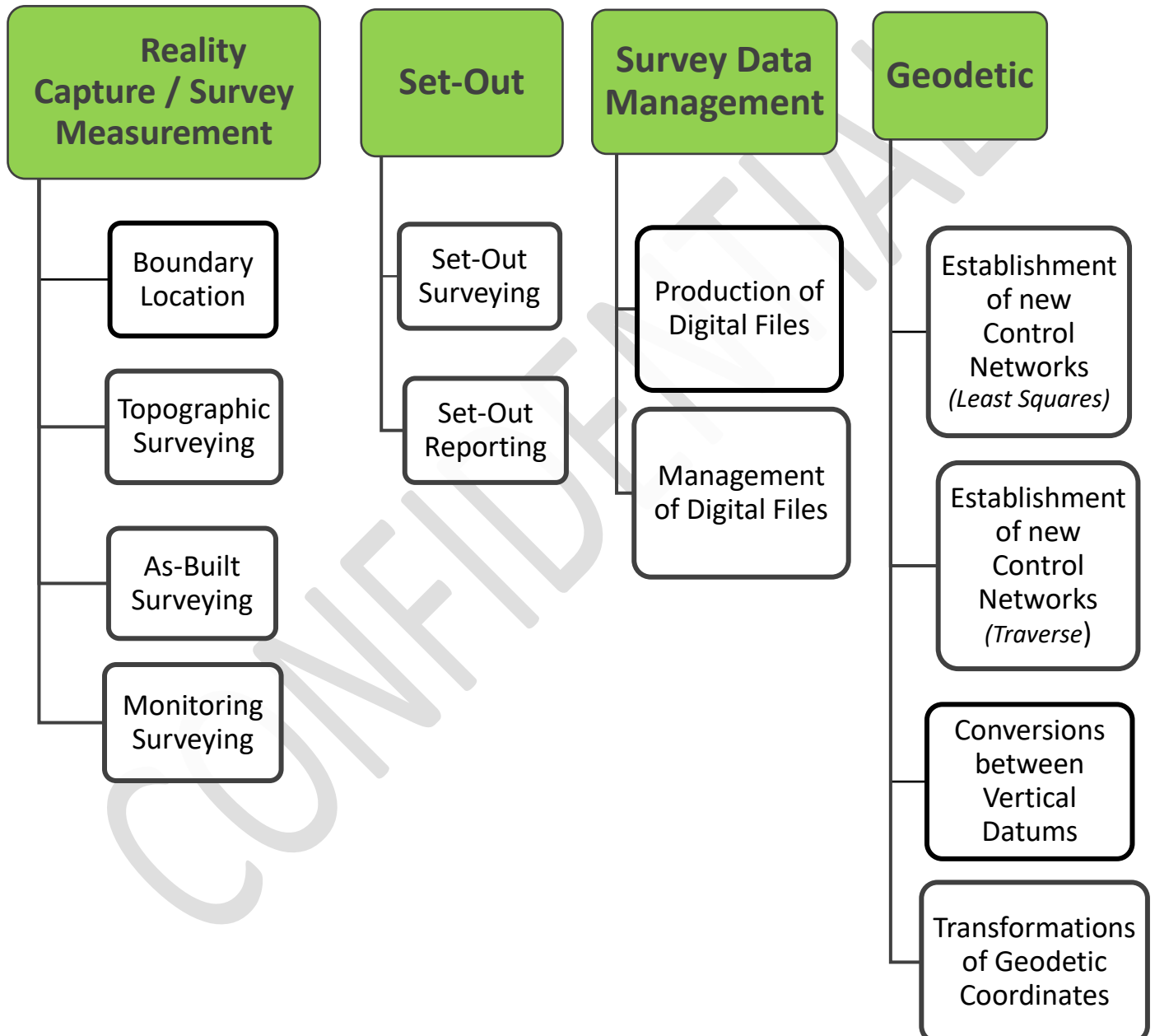
Certified Professional Engineering Surveyors must have a foundational knowledge & understanding of + commitment & ability to the following:



Summary of Competencies for Engineering Surveying Part B – Technical

Competence:

Certified Professional Engineering Surveyors must have a sound ability in & solid foundational knowledge of the following:



Competencies for Engineering Surveying Part A: General Professional Competence

Professional Conduct, Communication Skills, and Good Business Practice ²

1. Professional Conduct

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the commitment and ability to maintain and act in accordance with the following standards of professionalism within area of expertise or specialisation.

1.1 Foundational Knowledge and Understanding

1.1.1 A Foundational Knowledge and Understanding of Integrity and Fidelity including a commitment and ability to:

1.1.1.1 Behave with integrity in all professional and business relationships, with honesty, fair dealing, and truthfulness.

1.1.2 A Foundational Knowledge and Understanding of Objectivity and Independence including a commitment and ability to:

1.1.2.1 Be fair, impartial, and intellectually honest

1.1.2.2 Be objective – not allow prejudice or bias, conflict of interest or influence of others to override

1.1.2.3 Be and be seen to be, independent when undertaking certain types of engagements where real conflict exists.

1.1.3 A Foundational Knowledge and Understanding of Competence including a commitment and the ability to:

1.1.3.1 Perform work to the technical and professional standards expected

1.1.3.2 Have the necessary competence to perform all professional work undertaken

1.1.3.3 Be competent to actively supervise, and be responsible for, work undertaken by direct reports

1.1.3.4 Recognise professional or technical limitations, or inexperience

1.1.4 A Foundational Knowledge and Understanding of Quality Performance including a commitment and the ability to:

1.1.4.1 Perform professional work with due care and diligence

1.1.4.2 Ensure that all professional obligations are completed in a timely manner

1.1.4.3 Ensure that all professional obligations are carried out in accordance with the relevant technical and professional standards appropriate to that work

1.1.4.4 Develop, maintain, and apply systems of professional practice management and effective quality assurance to all aspects of professional work

1.1.5 A Foundational Knowledge and Understanding of Professional Behaviour including a commitment and the ability to:

1.1.5.1 Act in a manner consistent with the good reputation of the profession

1.1.5.2 Refrain from any conduct which might bring discredit to the profession

² Professional Conduct and Communication Skills are Points 8 and 9 from the Standards for Licensing Cadastral Surveyors 2020) (Professional Conduct also includes the Fundamental Principles from the Code of Ethics for S+SNZ Members set down in the S+SNZ Governance Manual) and Good Business Practice (Point 21.3 – A19-24 S+SNZ Policy - Conduct of Members)

- 1.1.5.3 Not place or be placed under any improper obligation
- 1.1.5.4 Refuse to accept any reward that cannot be publicly acknowledged
- 1.1.5.5 Respect the confidentiality of information which may be valuable or sensitive

1.1.6 A Foundational Knowledge and Understanding of Continuing Professional Development including a commitment and the ability to:

- 1.1.6.1 Maintain a well-directed, individualised annual CPD program that is relevant to professional, technical and/or management activities
- 1.1.6.2 Take up opportunities for further education in areas relevant to professional activities

1.2 Ability: Professional Conduct

Proof and attestation of the commitment and ability to maintain and act in accordance with the standards of professionalism required for Professional Conduct within area of expertise or specialisation MAY include:

- 1.2.1 Emails
- 1.2.2 References (which must include the origin of the references)
- 1.2.3 Client Feedback
- 1.2.4 Quality Assurance Documentation

2. Communication Skills

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards of communication within area of expertise or specialisation.

2.1 Foundational Knowledge and Understanding

2.1.1 A High Level of Ability in English including a commitment and the ability to:

- 2.1.1.1 Communicate clearly and concisely in English (minimum equivalent standard of IELTS 6.0 or entrance to University in New Zealand)
- 2.1.1.2 Write clear, logical, and unambiguous documents and reports to a professional standard that can be easily understood by the recipient

2.1.2 A High Level of Ability and Understanding of how to Communicate with Clients including a commitment and the ability to:

- 2.1.2.1 Keep each client fully informed and advised concerning progress of the engagement
- 2.1.2.2 Inform client of any action required of either the client or the client's other advisors
- 2.1.2.3 Provide further instructions or variation of instructions as appropriate under the circumstances

2.2 Ability: Communication Skills

Proof and attestation of the commitment and ability to maintain and act in accordance with the standards of professionalism required for Communication Skills within area of expertise or specialisation MAY include:

- 2.2.1 Email correspondence with a client(s)
- 2.2.2 References (which must include the origin of the references)
- 2.2.3 Client Feedback
- 2.2.4 Quality Assurance Documentation

3. Good Business Practice

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards of business practice within area of expertise or specialisation.

3.1 Foundational Knowledge and Understanding

3.1.1 A Foundational Knowledge and Understanding of Conditions of Engagement including a commitment and the ability to ensure:

- 3.1.1.1 Every engagement is properly constituted and acknowledged in writing, prior to commencement
- 3.1.1.2 Every acknowledgement contains the details of the instructions received, the date of commencement, the basis for the payment of fees and other matters appropriate to the circumstances
- 3.1.1.3 Variations to the conditions during the term of the engagement are confirmed in writing

3.1.2 A Foundational Knowledge and Understanding of Conflict of Interest including a commitment and the ability to ensure:

- 3.1.2.1 Any conflicting businesses or other interests which could be deemed to be prejudicial to the client are fully declared before accepting or proceeding with any engagement
- 3.1.2.2 Fees or other rewards from two or more sources for the same work are only accepted with full knowledge and consent of all parties

3.1.3 A Foundational Knowledge and Understanding of Fees including a commitment and the ability to ensure:

- 3.1.3.1 All fees charged are fair and equitable and reflect the extent and the circumstances of the work.

3.2 Ability: Good Business Practice

Proof and attestation of the commitment and ability to maintain and act in accordance with the standards of professionalism required for Good Business Practice within area of expertise or specialisation MAY include:

- 3.2.1 Email correspondence with a client(s)
- 3.2.2 References (which must include the origin of the references)
- 3.2.3 Client Feedback
- 3.2.4 Quality Assurance Documentation
- 3.2.5 Fee Proposals
- 3.2.6 Engagement Contracts
- 3.2.7 Terms of Trade / Condition
- 3.2.8 Variations

Competencies for Engineering Surveying Part B: Technical Competence

Reality Capture/Survey Measurement, Set-Out, Survey Data Management and Geodetic.

1. Reality Capture/Survey Measurement

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards.

1.1 Foundational Knowledge, Understanding and Abilities

Foundational Knowledge required for Reality Capture/Survey Measurement (topographic, as-built and monitoring surveys). To be able to:

- 1.1.1 Identify and solve practical survey problems, apply sufficient independent checks, adjust survey networks, eliminate material observational errors, and achieve the required measurement accuracies
- 1.1.2 Understand the various survey disciplines for measuring and collecting spatial data, apply the appropriate methods and technology, and understand the proper use, care and calibration of surveying instruments and the application of appropriate equipment (including GPS and Total Station) and techniques to different surveying situations.
- 1.1.3 Interpret historical survey data
- 1.1.4 Know when to have a boundary re-established by a Licensed Cadastral Surveyor (LCS)
- 1.1.5 Produce plans that reference the origin of map projections, horizontal coordinate systems and vertical datums, and selected relevant local datum reference point(s)
- 1.1.6 Identify and correctly apply the appropriate measurement, methods, equipment, and techniques to all tasks typically expected of a professional engineering surveyor, including achieving a specified outcome
- 1.1.7 Record, reduce, adjust, and document measurements and other survey observations accurately and unambiguously
- 1.1.8 Apply an appropriate quality assurance process when gathering and processing survey measurements
- 1.1.9 Describe the errors associated with the measurement technique used, understand their effects, and apply appropriate control techniques
- 1.1.10 Eliminate material measurement errors
- 1.1.11 Apply appropriate adjustment techniques to measurements and give a correct statistical interpretation of the errors and confidence levels
- 1.1.12 Competently undertake a wide range of data processing to produce deliverables in an appropriate format, for a specified purpose

1.2 Ability in Boundary Location

- 1.2.1 To be able to interpret cadastral survey data and cadastral survey datasets (plans) and perform the necessary calculations and field work to 'locate' (but not determine or re-establish) a boundary.

1.3 Ability in Topographic Surveying

- 1.3.1 To be able to capture and produce topographic plans (that include Council Asset records) by a variety of means and present them digitally

1.4 Ability in As-Built Surveying

1.4.1 To be able to capture and produce As-Built surveys that meets the required Territorial/Local Authority requirements (inclusive of the following)

- 1.4.1.1 Earthworks
- 1.4.1.2 Construction
- 1.4.1.3 Roading
- 1.4.1.4 Storm Water Systems (both piped and open channelled)
- 1.4.1.5 Wastewater systems
- 1.4.1.6 Water supply systems
- 1.4.1.7 Utilities (Energy and Communication)

1.5 Ability in Monitoring Surveying

1.4.1 To be able to undertake monitoring surveys and produce outputs as per the required accuracy and frequency specifications

2. Set-Out

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards

2.1 Foundational Knowledge and Understanding

Foundational Knowledge required for Set-Out. To be able to:

- 2.1.1 Understand and explain where Set-Out is used and describe how it is different from Reality Capture and Control.
- 2.1.2 Understand likely measurement error sources and their propagation
- 2.1.3 Read and correctly interpret construction plans
- 2.1.4 Set appropriate survey specifications from engineering contract documents
- 2.1.5 Place construction control in locations that will balance stability, on-going integrity, and safety with project needs
- 2.1.6 Undertake compliance checks on the spatial characteristics of the built environment to ensure they meet the relevant quality assessment criteria

2.2 Ability in Set-Out Surveying

2.2.1 To be able to produce Set Out plans (including control locations), showing set-out and control placed to ensure longevity (inclusive of the following)

- 2.2.1.1 Earthworks
- 2.2.1.2 Construction
- 2.2.1.3 Roading
- 2.2.1.4 Stormwater Systems (both piped and open channelled)
- 2.2.1.5 Wastewater systems
- 2.2.1.6 Water supply systems
- 2.2.1.7 Utilities (Energy and Communication)

2.3 Ability in Set-Out Reporting

2.3.1 To be able to produce Stake-Out reports of Set-Outs undertaken

3. Survey Data Management

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards.

3.1 Foundational Knowledge and Understanding

Foundational Knowledge required for Survey Data Management. To be able to:

- 3.1.1 Understand the basic principles of GIS management and operations
- 3.1.2 Read and correctly interpret construction plans
- 3.1.3 Develop systems for managing design and survey data revisions
- 3.1.4 Collect digital spatial data to provide a correct visual representation (2D and 3D) of topography, landforms, boundaries, and other spatially defined objects
- 3.1.5 Use CAD tools and systems for the effective delivery of collected survey data and the interpretation/preparation of design data for use in the field
- 3.1.6 Present spatial data correctly and unambiguously

3.2 Ability in the Production of Digital Files

- 3.2.1 To be able to produce a 3D client deliverable CAD file for set-out and as-built

3.3 Ability in the Management of Digital Files

- 3.3.1 To be able to produce a traceable management system that details revisions and shows how they are updated for use by the survey team

4. Geodetic

The competencies required to maintain public confidence and quality assurance in this section require proof and attestation of the ability to maintain and act in accordance with the following standards.

4.1 Foundational Knowledge and Understanding

Foundational Knowledge required for the Assessment of Geodetic Surveying. To be able to:

- 4.1.1 Demonstrate a clear understanding of vertical datums, their derivation, and the circumstances under which they may be used.
- 4.1.2 Demonstrate an understanding of horizontal datums (including scale factors), their derivation and their application.
- 4.1.3 Demonstrate an understanding of least squares adjustments, the terminology used, expected parameters, initial values, and expected outcomes.
- 4.1.4 Apply statistical and mathematical analysis and adjustments to:
 - 4.1.4.1 Undertake coordinate transformations and relate measurements to the appropriate geodetic reference systems and datums
 - 4.1.4.2 Create new horizontal and vertical survey observations
 - 4.1.4.3 Analyse existing geodetic control networks and
 - 4.1.4.4 Create new control networks,
 - 4.1.4.5 Convert between vertical datums and horizontal coordinate systems

4.2 Ability in the Establishment of New Control Networks – Least Squares

4.2.1 To be able to produce new survey control marks using Least squares

4.3 Ability in the Establishment of New Control Networks – Traverse

4.3.1 To be able to produce new survey control marks by Traverse

4.4 Ability in Conversions between Vertical Datums

4.4.1 To be able to do conversions between vertical datums

4.5 Ability in Transformations of Geodetic Coordinates

4.5.1 To be able to do transformations of coordinates (x,y or North/East) between geodetic datums (e.g. NZGD2000, NZGD1949)