ENGINEERS
AUSTRALIA

Stage 1 Competency Assessment Booklet

Guide to Eligibility for Membership

November 2019

ENGINEERS AUSTRALIA

Stage 1 Competency

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Contents

Introduction

Engineers Australia is the peak organisation representing the engineering profession. Many organisations and employers require that engineers are eligible for membership with Engineers Australia. To be eligible for membership you need to demonstrate what is known as Stage 1 competency. The easiest way to demonstrate Stage 1 competency is through the completion of an engineering qualification that is accredited or recognised by Engineers Australia.

This guide is for persons seeking recognition as being eligible for membership with Engineers Australia who do not hold engineering qualifications that are already accredited or recognised by Engineers Australia. Examples include:

- Candidates holding Australian engineering qualifications that have not been accredited or approved by Engineers Australia.
- Candidates holding engineering qualifications from overseas countries which are not recognised under the Washington, Sydney, or Dublin Accords or through a Memorandum of Understanding for the formal recognition of qualifications.
- Candidates holding post-graduate engineering qualifications while the undergraduate degree is engineering-related.

The online application process requires that supporting documentation is prepared for uploading as a series of files. This Guide provides the details of the required content.

Successful assessment of eligibility for membership does not satisfy immigration requirements. A separate guide is available for overseas residents seeking assessment by Engineers Australia of their engineering qualifications for the purpose of immigration to Australia under the Skilled Migration Program:
www.engineersaustralia.org.au/For-Migrants/Migration-Skills-Assessment

Mandatory Requirements

It is mandatory to demonstrate that adequate underpinning engineering knowledge has been obtained. This knowledge is most easily obtained as part of an initial engineering qualification.

Engineers Australia supports the highest standards in the engineering profession. Candidates holding non-engineering qualifications or qualifications in fields related to engineering should take note that their qualifications and experience, while providing the basis for a satisfying career in the engineering field, may not meet these standards.

If there is a shortfall in the underpinning engineering knowledge base, then bridging the educational gap is difficult to demonstrate with work experience alone. In most cases additional formal educational study would be required.

The Engineering Team

Engineers Australia recognises three engineering occupational categories within the engineering team in Australia.

- Professional Engineer – underpinned by a 4-year Bachelor of Engineering degree or a 5-year Engineering Masters
- Engineering Technologist – underpinned by a 3-

year Bachelor of Engineering Technology degree or Bachelor of Engineering Science degree

- Engineering Associate – underpinned by a 2-year Advanced Diploma or Associate Degree in Engineering

There is a further category of Affiliate. This category relates to those who do not hold any engineering qualification and have an active interest in contributing to the engineering profession.

The characteristics of each of the engineering occupational categories are defined by the role descriptions in Appendix A. You will find the Stage 1 competency standard for each occupational category at www.engineersaustralia.org.au/Membership/Occupational-Categories

Within the standards, the competencies and the elements of competency represent the engineering profession's expression of the knowledge and skill base, engineering application abilities, and professional skills, values and attitudes that must be demonstrated at the point of entry to practice.

The Competency Standards

Competency is the ability to perform activities within an occupation to standards expected and recognised by employers and the community.

There are three stages of competency:

- Stage 1 is the level of competency needed for entry to practice as a qualified member of the engineering team. This typically corresponds to completion of an accredited or recognised engineering qualification
- Stage 2 is the level of competency expected of an experienced engineering practitioner and is the requirement for Chartered membership of Engineers Australia. Stage 2 assessment is outside the scope of this Guide
- Stage 3 is the level of competency of leadership and management. Stage 3 assessment is outside the scope of this Guide.

This document, The Eligibility for Membership Guide, is only concerned with the Stage 1 Competency Standards.

Stage 1 competency means you have a thorough understanding of the body of engineering knowledge relevant to your occupational category (Professional Engineer, Engineering Technologist, or Engineering Associate); and the ability to apply this knowledge to representative problems and situations.

Overall, Stage 1 competency is made up of three components:

- Competency 1: Knowledge Base
- Competency 2: Engineering Ability
- Competency 3: Professional Attributes

Each competency describes a particular area of performance and is comprised of elements.

The elements are the necessary components of activities which make up the competency. Details of the elements are different for each of the three occupational categories. To be assessed as Stage 1 competent you must demonstrate each element in an overall sense.

Each element has a set of indicators which provide a guide to the level of performance and allow a judgment to be made on whether the element of competency has been achieved. These indicators describe and list the ways in which the element would typically be demonstrated and assessed.

While it is expected that every element will be achieved, assessment is made on a holistic basis and it is not expected that every Indicator will be met.

Eligibility for Membership with Engineers Australia

To be eligible for membership in any of the three occupational categories, you must demonstrate that you have the competencies needed to enter practice as a qualified member of the engineering team. This is what is known as Stage 1 competency.

This may be demonstrated in one of the following ways:

Recognised Qualification

If you hold an engineering qualification which has been accredited, recognised or approved by Engineers Australia, then you are immediately eligible for membership. The benchmark qualifications are:

- Professional Engineer: 4-year Bachelor of Engineering degree or 5-year Engineering Masters
- Engineering Technologist: 3-year Bachelor of Engineering Technology or Bachelor of Engineering Science degree
- Engineering Associate: 2-year Advanced Diploma or Associate Degree in Engineering.

You may find a list of accredited programs on our website at www.engineersaustralia.org.au/About-Us/Accreditation

If you hold an accredited qualification, you may apply directly for membership online at www.engineersaustralia.org.au/membership/join

If you hold a qualification other than in engineering and have an active interest in contributing to the engineering profession, then you can apply directly to Affiliate online at www.engineersaustralia.org.au/membership/join

Mutual Recognition Agreements

Engineers Australia has Mutual Recognition or Mutual Exemption Agreements with professional engineering bodies in a number of other countries. If you are a Member of an engineering body with which Engineers Australia has a mutual recognition agreement, you may be suitable to apply for membership with Engineers Australia. You may submit an application for membership through a Mutual Recognition Agreement at www.engineersaustralia.org.au/Membership/Membership-Benefits/MRA-Benefits

As a condition under the agreements, formal academic qualifications must be acceptable to both parties in accordance with the Washington, Sydney or Dublin Accords. Where the academic qualifications are not acceptable under the International Engineering Alliance, the applicant may be asked to submit a Stage 1 Competency assessment application.

In case of doubt, please inquire through the Member Assessment Team at www.engineersaustralia.org.au/Contact-Us

International Engineering Alliance Accords

Recognition of substantially equivalent international qualifications under the Washington, Sydney or Dublin Accords is based on similar in-depth examination by overseas professional bodies. More information is available at https://www.ieagreements.org/

If your qualification has been accredited by a Signatory of one of these accords, and you have graduated since the date of the Signatory becoming a member, then you may apply directly for membership at www.engineersaustralia.org.au/membership/join

Making an Application

General

Preparing and submitting an eligibility for membership application allows your engineering Stage 1 competency to be assessed. You will need to supply your personal details and to upload supporting documentation.

You will need to apply for recognition in the Professional Engineer or Engineering Technologist or Engineering Associate category. ***However, the outcome of the assessment is never guaranteed. You may be offered another category (including that of Affiliate) or found not to be eligible for any category.***

On the basis of the information contained in your application, an Assessor appointed by Engineers Australia will assess whether you have demonstrated eligibility for membership and Stage 1 competency. The assessment is made on a holistic basis, taking into account all your qualifications and experience as described in your application.

You are expected to have demonstrated each element of competency in an overall sense, but it is not expected that you will have demonstrated every indicator within each element.

Occasionally, a candidate may be asked to provide more information or to attend an interview with one or more assessors. In the majority of cases, assessment is based on the report as submitted. Engineers Australia reserves the right to seek confirmation of particular information. It may, for example, seek confirmation from your university, college or other educational institution that the details of your qualification/s are correct. Those who verify your CV may also be contacted.

Once your application has been assessed you will be advised by email of the outcome. The outcome will advise your eligibility for membership with Engineers Australia and in which membership category. If your application has not been successful in your nominated category, you will be provided with reasons for this outcome.

Material Required

Supporting files to be uploaded should preferably be in PDF format. Scanned documents should be clear, in colour and with a resolution of at least 300 dpi. Each individual file should preferably be smaller than 5Mb, with a maximum 10 Mb.

The required material includes:

a. Passport size photograph
b. Photo Identification
c. A verified Curriculum Vitae

d. Evidence of your English language competency

e. Documentation of all your qualifications, both testamur and transcripts (original language and English translation)

f. Three career episode reports describing learning experiences through which you personally developed and demonstrated Stage 1 competencies, as set out in the competency standard for your occupational category

g. The Summary Statement of your competencies

Photo Identification

All applications must upload:

- A passport size photograph (taken in the last 6 months)

- A copy of their passport bio-data page or Australian driver's licence. Where a passport or Australian driver's licence is not available, a copy of your birth certificate or other official identity document may be acceptable in lieu.

Curriculum Vitae

You must upload a verified Curriculum Vitae (CV) covering your complete employment experience from the completion of your undergraduate studies to date. If you are a graduate, your CV may cover any industry placement undertaken as part of undergraduate studies. The CV may also include engineering experience gained prior to your current qualification or concurrently with it.

Whilst your CV may include non-engineering employment, for each engineering appointment you have held, please include:

- Name, location and contact details of your employing organisation

- Dates and duration of your employment in this appointment

- Title of the position you held

- Your defined role and responsibilities

Your CV should be no more than three A4 pages. Verification of your CV must cover at least the last three years of your engineering employment. If you have less than three years of engineering work experience, then please provide verification of what you have completed.

Documentary evidence of employment used for career episodes must be provided.

Each stage of your CV must be verified by a responsible Engineer, preferably a Member or Fellow of Engineers Australia. The following statement must be added to the CV and signed by the verifier:

"I verify that this is a true statement of the career history of (candidate's name) during the period (date) to (date)."

This statement must be accompanied by the printed name, address, phone number and status of the Verifier, with their membership number if applicable.

The verification may be confirmed by Engineers Australia.

If you cannot provide a verified CV due to overseas employment, a reference letter from your previous employer is acceptable. Such letters should be provided on the company's letterhead and clearly indicate the employment period, position held, and main responsibilities.

If the letter is not in English, please provide copies of both the English translation and original document.

If, in exceptional circumstances, you cannot provide verification of employment for all or part of the last three-year period, you must upload a properly witnessed Statutory Declaration stating that the information contained in your CV is true and correct. Please refer to Appendix D for an appropriate form. Engineers Australia reserves the right, in its absolute discretion, not to accept a Statutory Declaration.

English Language Competency

Engineers Australia considers it vital for members of the engineering team to be able to communicate effectively in both written and spoken English. Engineers Australia will normally accept your English language competency if:

- You are a native speaker of English;
- You have successfully completed an undergraduate engineering qualification, a master's degree or PhD program from a country where the official language is English: Australia, New Zealand, USA, UK, Ireland, and Canada (excluding Quebec);
- You have worked in engineering in Australia (as detailed in your CV) and your engineering employer has provided a statement (on company letterhead) that you are competent in English in the workplace.

If one of these statements applies to you, please provide and upload a statement to this effect. These statements may be confirmed by Engineers Australia.

If none of the above statements apply, then you must provide a valid test report (taken within the last 2 years at the time of submission) from either IELTS, TOEFL, or PTE showing the required English language competency which is:

	IELTS™	TOEFL iBT®	PTE Academic
Listening	6	12	50
Reading	6	13	50
Writing	6	21	50
Speaking	6	18	50

- **IELTS** (International English Language Testing System) assessment showing that you have achieved a minimum score of 6.0 in each of the four modules of speaking, listening, reading and writing, in either the General Training or the Academic modules of IELTS
- **TOEFL** (Test of English as a Foreign Language) assessment showing that you have achieved a minimum score of 18 in speaking, 12 in listening, 13 in reading and 21 in writing
- **Pearson PTE** Academic test showing that you have achieved a minimum score of 50 in each of the four modules of speaking, listening, reading, and writing.

Qualification Details

You must upload clear copies of the original testamur (certificate) of your degree, diploma, certificate, or certificates of other contributing qualifications, together with the associated academic transcripts showing courses, subjects or units studied and the results gained in each. If you have more than one qualification that you believe is relevant, please provide the above details for each one.

Where your qualifications are not in English, you must upload copies of both the original language document and an English translation. The documents must be translated by a professional translator with the name and contact details of the translator provided on the English language version.

If your current name is not the same as on the original documents, or if different spellings of your name are

used over your documentation, then you must upload evidence of your name change or a statutory declaration stating that the variation of your name all designates one and the same person.

Career Episodes

The purpose of the career episodes is to demonstrate to the Assessor that your underpinning engineering knowledge for entry to the profession has been:

- Consolidated and
- Applied appropriately to confirm the Stage 1 competencies

You should prepare and upload three career episodes describing engineering experiences through which you believe you developed and demonstrated Stage 1 competency.

Before starting, you should read the competency standard for your chosen occupational category.

Choose three major learning experiences that you believe are able to demonstrate the range of competencies for your occupational category. A substantial project or design exercise, for example, may have required you to demonstrate many different competencies, and could be a very suitable basis for one of your career episodes.

After you have completed each career episode, indicate in your summary statement which elements of competency it enabled you to demonstrate.

You should not try to write separately about each element of competency, nor is it expected that each career episode will demonstrate all elements of competency. Rather, you should aim to ensure that your career episodes, taken together, cover all the elements.

You must describe work you have actually performed yourself and write in the first person singular (I ...) to make your personal contribution very clear.

A total of 1500 words should be enough for each career episode and you should not exceed 2000 words for each.

When writing about a team project, you should describe the project overall, but you must also describe the specific part you played personally, how it contributed to the overall objective, what you actually did, and what competency or competencies you believe this demonstrates.

Number each career episode and each paragraph within it so that you can refer to them later in the summary statement. For example, paragraph 3 in Career Episode 2 would be referred to as CE2.3.

As you write your career episodes, ask yourself continually: How can the Assessor, reading my application, be satisfied that I have actually demonstrated Stage 1 competency? The Assessor will expect that you, in your series of career episodes will have covered every element of competency. You must try to show that you have demonstrated each element in an overall sense. In judging whether or not you have demonstrated each element, the Assessor will rely on the indicators for that element as a guide. Remember always that you must write about your personal performance. It is not enough to say that a project or unit of study in which you took part covered certain competencies. You must describe what you did yourself, as an individual.

Formulae, tables, photographs and drawings are no substitute for a concise description of individual activity and their relationship to the Stage 1 Competencies.

Remember that Stage 1 competency requires:

- The acquisition of appropriate engineering foundation knowledge
- The ability to apply this knowledge to problems and situations within your occupational category

Engineers Australia needs to be satisfied that you have both. Your career episodes should focus on the application of your knowledge.

Refer to Appendix B for an example of a career episode.

Career episodes relating to engineering employment

It is expected that career episodes are based on experience gained in engineering employment. The career episode should describe the application of your engineering knowledge with the intention to demonstrate competency which has been consolidated through work performed in engineering employment.

Each career episode should be based on a project or a piece of work you have worked on or are currently working on, detailing particular problems you were required to solve.

You need to ensure that the section of your CV relating to your chosen example is verified.

You must write about what you actually did, indicating what elements of competency you believe you demonstrated, and how you did so. You should identify any particular problems encountered and problem-solving techniques you used. The Assessor must be able to identify the contribution you made personally to the project or task, particularly if the contribution was of a novel or critical nature. You must write in the first person singular, describing what you actually did and how this demonstrates the competencies claimed. A mere listing of your responsibilities or a position description will not be accepted.

Please ensure that each work-based career episode includes:

- Introduction
  - Dates and duration of the project or appointment you are writing about
  - Name of employing organisation and location of worksite
  - Title of the position you occupied
  - Background, nature and objectives of the overall engineering project
  - Nature of your particular work area
  - An organisation chart highlighting your position
- Personal performance
  - Detailed description of the work you performed personally
  - Technical details of the work
  - How you applied your engineering knowledge and skills
  - The tasks delegated to you and how you went about accomplishing them
  - Any particular engineering problems you encountered and how you solved them
  - Strategies you devised, including any original or creative design work
  - How you worked with other team members

- Summary

- Your view of the overall project (brief summary)
- How well the project succeeded in meeting its goals and requirements
- How your personal role contributed to the project

Career episodes for those recently graduated

Recent graduates may have difficulty in providing career episodes related to engineering employment. In that case, career episodes may be based on experience gained in obtaining your qualification.

A career episode based on your experiences during your educational program should focus on the most advanced pieces of work you have done, the knowledge you needed in order to perform that work, and the abilities you needed in order to apply your knowledge in an engineering context.

Project work is likely to be one of the best ways of illustrating your knowledge and abilities.

It may be useful to describe what you found most challenging, and how you developed the ability to meet these challenges. It is not enough to say simply that a particular unit of study covered the competencies required. You must explain one or more pieces of work that you performed (during your studies or after), how you performed it, and how you believe it demonstrates the knowledge or competency in question. It is important to indicate which units of study contributed to the knowledge you needed in order to perform the work.

Summary Statement

Following your career episodes, you will be asked to provide a summary statement, identifying each element of competency and indicating where you have addressed it.

You need to analyse your career episodes to ensure you have addressed all the competency elements for the nominated category.

The results of your analysis will be demonstrated in your summary statement. The summary statement cross references the competency elements with the particular paragraph in your career episode where each element occurs. To do this you will need to number the paragraphs in your career episodes.

Refer to Appendix C for summary statements in your nominated category.

Please note that only one summary statement is required for all three episodes.

Plagiarism

Career episodes must be based on work conducted personally by you and must be written entirely in your own words. Presenting work conducted by others as your own and/or using other people's words (templates, Career Episodes, online sources, etc.) is considered plagiarism and is a violation of Engineers Australia's Code of Ethics www.engineersaustralia.org.au/sites/default/files/resource-files/2017-01/codeofethics2010.pdf. This carries significant penalties including the rejection of the application, imposition of a 12, 24, or 36-months ban.

Review and Appeal of Decision

If you believe your assessment outcome is not appropriate, then you may request that your application be reassessed. There are two avenues to have your application reassessed; a review or an appeal. The request for a review or an appeal must be accompanied by the relevant fee which can be found at www.engineersaustralia.org.au/Membership/Assessment-Of-Qualifications-And-Competencies
Fees will be refunded if the outcome is in your favour, but not if the original decision is upheld.

Review

The normal process for a review is for your application to be re-examined by another Assessor. You can make a request for a review within three months of the date of the original assessment outcome letter.

Your request for review should set out the basis on which you believe the outcome is inappropriate and be addressed in writing to

The Manager
Review/Appeal
Engineers Australia
11 National Circuit
Barton, ACT 2600

For those decisions still remaining in dispute, a formal appeal process is available.

Appeal

The process of an appeal requires an Appeal Committee to be convened. You can make a request for an appeal within six months of the date of the original assessment outcome letter.

If you apply for an appeal, then you should understand that all necessary documentation from your file will be forwarded to the Appeal Committee. Under Australian Privacy Legislation your permission is required for this to happen. Your signature on your letter applying for an appeal will be taken as denoting your consent for your file documents to be forwarded to the Appeal Committee.

Your request for appeal should set out the basis on which you believe the outcome is inappropriate and addressed in writing to:

The Manager
Review/Appeal
Engineers Australia
11 National Circuit
Barton, ACT 2600

Checklist

- ☐ 1. Passport size photograph – head and shoulders photograph with a resolution of 1200 x 1600 pixels in vertical orientation
- ☐ 2. Prime identification document
  - ☐ – Current passport bio-data page (only page including photo and name) or
  - ☐ – Current or valid Australian driver's licence
- ☐ 3. Verified Curriculum Vitae
- ☐ 4. Statement or evidence of English language competency
  - ☐ – IELTS test report or
  - ☐ – TOEFL test report or
  - ☐ – PTE test report or
  - ☐ – Academic Testamurs completed from an English-speaking country or
  - ☐ – Letter from an Australian employer
- ☐ 5. Academic testamurs (degree certificates)
- ☐ 6. Complete and official academic transcripts, showing courses, subjects or units studied and results gained in each (include any recognition of prior learning)
- ☐ 7. Official English translations of above documents where applicable
- ☐ 8. Three career episodes demonstrating applications of all elements of competency
- ☐ 9. Summary statement for the nominated category
- ☐ 10. Fee for assessment

The preference is for documents to be in PDF format. Scanned documents should be clear, in colour and with a resolution of at least 300 dpi. Each individual file should preferably be smaller than 5Mb with a maximum of 10Mb.

Fees

Fees associated with the eligibility for membership application can be found at www.engineersaustralia.org.au/Membership/Assessment-Of-Qualifications-And-Competencies

Appendix A

Defining the Engineering Team – Role Description

The Professional Engineer

The benchmark Stage 1 qualification for professional engineers is the 4-year Bachelor of Engineering degree or 5-year Engineering Master's.

Professional Engineers are responsible for engineering projects and programs, for bringing knowledge to bear from multiple sources to develop solutions to complex problems and issues, for ensuring that technical and non-technical considerations are properly integrated, and for managing risk as well as sustainability issues.

Professional Engineers have a particular responsibility for ensuring that all aspects of a project are soundly based in theory and fundamental principle, and for understanding clearly how new developments relate to established practice and experience and to other disciplines with which they may interact. One hallmark of a professional is the capacity to break new ground in an informed, responsible and sustainable fashion.

Professional Engineers must demonstrate Stage 1 competencies that involve all of the following:

Knowledge and skill base

- Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline
- Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline
- In depth understanding of specialist bodies of knowledge within the engineering discipline
- Discernment of knowledge development and research directions within the engineering discipline
- Knowledge of contextual factors impacting the engineering discipline
- Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline

Engineering application ability

- Application of established engineering methods to complex engineering problem solving
- Fluent application of engineering techniques, tools and resources
- Application of systematic engineering synthesis and design processes
- Application of systematic approaches to the conduct and management of engineering projects

Professional and personal attributes

- Ethical conduct and professional accountability
- Effective oral and written communication in professional and lay domains
- Creative, innovative and pro-active demeanour
- Professional use and management of information
- Orderly management of self and professional conduct
- Effective team membership and team leadership

Professional engineers may lead or manage teams appropriate to these activities.

The Engineering Technologist

The benchmark Stage 1 qualification for engineering technologists is the 3-year Bachelor of Engineering Technology or Bachelor of Engineering Science degree.

Engineering Technologists normally operate within broadly defined technical environments and undertake a wide range of functions and responsibilities. They are often specialists in the theory and practice of a particular branch of engineering technology or engineering-related technology (the technology domain), and specifically in its application, adaptation or management, in a variety of contexts.

Engineering Technologists must demonstrate Stage 1 competencies that involve all of the following:

Knowledge and skill base

- Systematic, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the technology domain
- Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the technology domain
- In depth understanding of specialist bodies of knowledge within the technology domain
- Discernment of knowledge development and research directions within the technology domain
- Knowledge of engineering design practice and contextual factors impacting the technology domain
- Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline

Engineering application ability

- Application of established engineering methods to complex engineering problem solving
- Fluent application of engineering techniques, tools and resources
- Application of systematic engineering synthesis and design processes
- Application of systematic approaches to the conduct and management of engineering projects

Professional and personal attributes

- Ethical conduct and professional accountability

- Effective oral and written communication in professional and lay domains
- Creative, innovative and pro-active demeanour
- Professional use and management of information
- Orderly management of self and professional conduct
- Effective team membership and team leadership

Engineering Technologists may lead teams appropriate to these activities. When in a senior role they may even be responsible for employing professional engineers and other specialists where appropriate.

The Engineering Associate

The benchmark Stage 1 qualification for engineering associates is the 2-year Advanced Diploma or Associate Degree in Engineering.

Engineering Associates focus on the practical implementation of engineering work or the conduct of engineering operations, and the application of recognised standards and codes of practice in familiar and unfamiliar situations.

Engineering Associates must demonstrate Stage 1 competencies that involve all of the following:

Knowledge and skill base

- Descriptive, formula-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the practice area
- Procedural level understanding of the mathematics, numerical analysis, statistics,
and computer and information sciences which underpin the practice area
- In depth practical knowledge and skills within the specialist sub-disciplines of the practice area
- Knowledge of contextual factors impacting the engineering discipline
- Understanding of the scope, principles, norms accountabilities and bounds of contemporary engineering practice in the practice area

Engineering application ability

- Application of established technical and practical methods to the solution of well-defined engineering problems
- Application of technical and practical techniques, tools and resources to well defined engineering problems
- Application of systematic design processes to well defined engineering problems
- Application of systematic project management processes

Professional and personal attributes

- Ethical conduct and professional accountability
- Effective oral and written communication in professional and lay domains
- Creative, innovative and pro-active demeanour
- Professional use and management of information
- Orderly management of self and professional conduct
- Effective team membership and team leadership

Engineering Associates may lead or manage teams appropriate to these activities. When in a senior role they may even be responsible for employing professional engineers and other specialists where appropriate. In Australia the term 'para-professional' is frequently used to describe the engineering associate occupation.

Appendix B

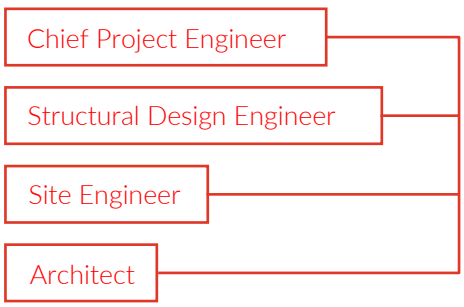
Career Episode Example

This example career episode is intended to give Stage 1 applicants an overview of the type and style of documentation required. It is not used as a mechanism of comparison or moderation against other career episodes.

Career episode 1: Construction of a new medium rise building in XXXX

CE1.1 This career episode deals with my involvement in the construction of Building XXX located at XXX in NSW while working as Structural Design Engineer for XXX. Our office was commissioned by the head office to complete several complicated elements of the structure. My role in this project was to complete the majority of the detailed design of the complex suspended ground floor slab. I undertook this project in July 2009 and the construction is due to be completed in April 2012.

CE1.2 The organisational structure for the engineering project at the time was as shown below:



CE1.3 After being briefed on the project by the chief project engineer, my first task was to break down the entire floor system into an ordered set of discrete designable elements such as slabs, bands and transfer beams. Next, I used the RAPT computer program to carry out the detailed design of each of the forty or so elements. This involved measuring the span, dimensions and loading on each element and entering this data to model it in the program. My aim was to make the models as accurate as practicable, while still allowing for the opportunity to incorporate future changes.

CE1.4 After reassessing the specified design criteria, I realised that the reinforcement cover I had used did not satisfy fire resistance and durability requirements. However, because each design element was already set up as a computer model, it was simple enough to change the covers and make the necessary design modifications. To ensure the clarity of the design to others, I documented and ordered the calculations and computer output in a lever arch file, including summary pages and assumptions used.

CE1.5 Throughout the design process, it was my responsibility to produce, order and maintain all the design documentation including computations and reinforcement drawings. I arranged the calculations, numbering approximately 1000 pages, based on the site grid system. The RAPT output for each element designed was sorted in this system, with summary pages of input and conclusions provided for each. I clearly outlined content pages and the design concepts and philosophies at the front of the documentation, while also including sections for superseded computations and verification documentation.

CE1.6 I considered various design possibilities. In one particular possibility, due to the height difference in the external ground level to the internal

slab finished level, it was required to provide retaining walls. Providing retaining walls was a cost-effective solution compared to importing fill to raise the external ground level. I introduced concrete ramps and steps to the entrance. I undertook the concrete design to satisfy Australian standards AS 3600. Whilst I was checking the drawings, I noticed that some area in the added mezzanine floor was created as part of the structural system and redundant. I was convinced that this area was necessary for the structural framing and that in future, it had a potential to be used as extra storage space. I performed design checks for the related structural elements for a storage-imposed load. This exercise avoided any anticipated potential risk.

CE1.7 It was also my task to draw up and update the reinforcement drawings. I produced a sample mark-up which was checked by the chief project engineer and the clients to ensure an acceptable format for the rest of the drawings. After we issued this sample mark-up, the chief project engineer went on several weeks holiday, which left me with the task of managing the timing and production of the rest of these drawings, with minimal supervision from the department manager. Using the original design computations as my basis, I drew up all the detailed reinforcement plans. This approach allowed me to check and verify the computations as I went and update the drawings accordingly.

CE1.8 Altered drawings were revised and reissued as a next revision, in many cases with copies of relevant calculations to show reasoning. During this time the rest of my workload was light so, apart from one or two difficult areas, I took the chance to push the drawings ahead and have the first revisions largely ready before time. Whilst in the middle of this process, the client advised us that the pile capping drawings needed to be issued earlier than anticipated, so I diverted more of my time and resources to this task in order to get the drawings and documentation ready by the deadline. Key documentation met this deadline, with supporting section drawings being delivered a few days later.

CE1.9 The client was concerned about the deflection under load of the suspended ground floor slab. I discussed my computer model results with the client and demonstrated that the design case deflections were acceptable. I also showed that changing the design to provide less deflection would significantly increase construction costs.

CE1.10 Another engineer completed an independent verification of the ground floor structure. I then went through and addressed all the issues raised, making changes where necessary. The head office also reviewed and directed many queries to our chief project engineer. I was then given the task of reviewing and addressing many of these issues and providing responses. The reviewed design was provided to the client who advised that the design brief had been met.

CE1.11 Apart from my design activities, my participation in this project involved health and safety considerations, planning, obtaining approvals and communicating effectively with stakeholders.

By coincidence, a couple of months later I was on holiday in this capital city and I used this opportunity to contact the head office and organise a site visit with one of their engineers. At the time they were constructing the basement and foundations, so not much of my design had been built yet. However, the experience was still very valuable to see the site and discuss my designs with the site engineer to unearth any problems and methods he believed things could have been done better.

Appendix C

Summary Statement – Professional Engineer

These are the competency units and elements for Professional Engineer. These elements must be addressed in the summary statement.

Competency element	Paragraph number in the career episode where the element is demonstrated	A brief summary of how you have applied the element
PE 1 Knowledge and Skill Base		
PE 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline		
PE 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline		
PE 1.3 In depth understanding of specialist bodies of knowledge within the engineering discipline		
PE 1.4 Discernment of knowledge development and research directions within the engineering discipline		
PE 1.5 Knowledge of contextual factors impacting the engineering discipline		
PE 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline		
PE 2 Engineering Application Ability		
PE 2.1 Application of established engineering methods to complex engineering problem solving		
PE 2.2 Fluent application of engineering techniques, tools and resources		
PE 2.3 Application of systematic engineering synthesis and design processes		
PE 2.4 Application of systematic approaches to the conduct and management of engineering projects		
PE 3 Professional and Personal Attributes		
PE 3.1 Ethical conduct and professional accountability		
PE 3.2 Effective oral and written communication in professional and lay domains		
PE 3.3 Creative, innovative and pro-active demeanour		
PE 3.4 Professional use and management of information		
PE 3.5 Orderly management of self and professional conduct		
PE 3.6 Effective team membership and team leadership		

Summary Statement – Engineering Technologist

These are the competency units and elements for Engineering Technologist. These elements must be addressed in the summary statement.

Competency element	Paragraph number in the career episode where the element is demonstrated	A brief summary of how you have applied the element
ET 1 Knowledge and Skill Base		
ET 1.1 Systematic, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the technology domain		
PE 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the technology		
ET 1.3 In depth understanding of specialist bodies of knowledge within the technology domain		
ET 1.4 Discernment of knowledge development within the technology domain		
ET 1.5 Knowledge of contextual factors impacting the technology domain		
ET 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the technology domain		
ET 2 Engineering Application Ability		
ET 2.1 Application of established engineering methods to broadly defined problem solving within the technology domain		
ET 2.2 Application of engineering techniques, tools and resources within the technology domain		
ET 2.3 Application of systematic engineering synthesis and design processes within the technology domain		
ET 2.4 Application of systematic approaches to the conduct and management of projects within the technology domain		
ET 3 Professional and Personal Attributes		
ET 3.1 Ethical conduct and professional accountability		
ET 3.2 Effective oral and written communication in professional and lay domains		
ET 3.3 Creative, innovative and pro-active demeanour		
ET 3.4 Professional use and management of information		
ET 3.5 Orderly management of self and professional conduct		
ET 3.6 Effective team membership and team leadership		

Summary Statement – Engineering Associate

These are the competency units and elements for Engineering Associate. These elements must be addressed in the summary statement.

Competency element	Paragraph number in the career episode where the element is demonstrated	A brief summary of how you have applied the element
EA 1 Knowledge and Skill Base		
EA 1.1 Descriptive, formula-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the practice area		
EA 1.2 Procedural level understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the practice area		
EA 1.3 In depth practical knowledge and skills within specialist sub-disciplines of the practice area		
EA 1.4 Discernment of engineering developments within the practice area		
EA 1.5 Knowledge of contextual factors impacting the engineering discipline		
EA 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the practice area		
EA 2 Engineering Application Ability		
EA 2.1 Application of established technical and practical methods to the solution of well-defined engineering problems		
EA 2.2 Application of technical and practical techniques, tools and resources to well defined engineering problems		
EA 2.3 Application of systematic design processes to well defined engineering problems		
EA 2.4 Application of systematic project management processes		
EA 3 Professional and Personal Attributes		
EA 3.1 Ethical conduct and professional accountability		
EA 3.2 Effective oral and written communication in professional and lay domains		
EA 3.3 Creative, innovative and pro-active demeanour		
EA 3.4 Professional use and management of information		
EA 3.5 Orderly management of self and professional conduct		
EA 3.6 Effective team membership and team leadership		

Appendix D

Statutory Declaration Example

Following is an example Statutory Declaration that could be used when verification of a CV cannot be obtained. I,

_____

_____

(Applicant's full name, address and occupation in BLOCK CAPITAL *letters)*

do solemnly and sincerely declare as follows:

- I am an applicant for an Eligibility for Membership (Stage 1 Competency) Assessment of Engineers Australia.
- I declare that it is not possible for me to provide independent verification of certain sections of my CV. This is due to the following circumstances which were beyond my control.

(State circumstances which prevent independent verification and/or the provision of written references, and the steps taken to retrieve the documentation)

_____

_____

_____

_____

I declare that the information given by me in relation to these sections in my attached application dated ____/____/____is accurate, true, correct and complete in all relevant details to the best of my knowledge and belief

I also declare that the relevant experience and level of professional responsibility claimed in the application and supporting documents provide a fair and balanced statement which may properly be taken into account by Engineers Australia in assessing my eligibility for membership.

I stand ready to respond to any reasonable requests of Engineers Australia for explanations or further information in relation to my application.

I make this solemn declaration by virtue of the Statutory Declarations Act 1959, and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing

the statements made in this declaration to be true in every particular. I am fully aware of the serious nature of making a Statutory Declaration or it has been explained to me.

Signed

_____

(Signature of declarant)

Declared at

_____

_____

(Place of the declaration)

On____/____/____

Before me

_____

(Signature of person before whom the declaration is made)

_____

_____

(Full name, qualification, and contact details (including address), in printed letters, of the person before whom the declaration is made)

This declaration must be witnessed and signed by an authorised person under the Statutory Declarations Act 1959 to witness statutory declarations. More information about Statutory Declarations is available at www.ag.gov.au/Publications/Pages/Statutorydeclarations.aspx

Engineers Australia membership number is acceptable identification for a member witnessing.