In the Matter of the Chartered Professional Engineers of New Zealand Act 2002 **Appeal 10/14**

AND

In the matter of an appeal to the Chartered Professional Engineers Council pursuant to Section 35

From

Mr V
Appellant

Against a decision of

IPENZ (as the Registration Authority under the Chartered Professional Engineers of New Zealand Act 2002)
Respondent

Decision of the Chartered Professional Engineers Council
Dated 29 September 2014

The Legislation

1. Mr V appeals against an assessment by the Registration Authority being a decision of a Competence Assessment Board of the Registration Authority refusing his registration as a Chartered Professional Engineer (CPEng).

2. That right of appeal is contained in s35 of the Act and s37 of the Act sets out the scope of this Council's jurisdiction which is to deal with the matter by way of rehearing. For that purpose we have been provided with the complete file of the Registration Authority which has been paginated.

3. Under s8 of the Chartered Professional Engineers Act 2002 ("the Act") the Registration Authority must register a person if he or she, amongst other matters, satisfies the Registration Authority that he or she meets the minimum standards for registration contained in the Rules.

4. The Rules are the Chartered Professional Engineers of New Zealand Rules (No.2) 2002 ("the Rules"). The Rules were enacted pursuant to s40 of the Act as regulations.

5. Under the Rules minimum standards for registration as a Chartered Professional Engineer are set under Rule 6:

> *"6 Minimum standard for registration as chartered professional engineer*
>
> *(1) To meet the minimum standard for registration, a person must demonstrate that he or she is able to practise competently in his or her practice area to the standard of a reasonable professional engineer.*
>
> *(2) The extent to which the person is able to do each of the following things in his or her practice area must be taken into account in assessing whether or not he or she meets the overall standard in subclause (1):*
>
> *(a) comprehend, and apply his or her knowledge of, accepted principles underpinning—*
>
> *(i) widely applied good practice for professional engineering; and*
>
> *(ii) good practice for professional engineering that is specific to New Zealand; and*
>
> *(b) define, investigate, and analyse complex engineering problems in accordance with good practice for professional engineering; and*
>
> *(c) design or develop solutions to complex engineering problems in accordance with good practice for professional engineering; and*
>
> *(d) exercise sound professional engineering judgement; and*
>
> *(e) be responsible for making decisions on part or all of 1 or more complex engineering activities; and*
>
> *(f) manage part or all of 1 or more complex engineering activities in accordance with good engineering management practice; and*
>
> *(g) identify, assess, and manage engineering risk; and*
>
> *(h) conduct his or her professional engineering activities to an ethical standard at least equivalent to the code of ethical conduct; and*

(i) recognise the reasonably foreseeable social, cultural, and environmental effects of professional engineering activities generally; and

(j) communicate clearly to other engineers and others that he or she is likely to deal with in the course of his or her professional engineering activities; and

(k) maintain the currency of his or her professional engineering knowledge and skills.

6. Relevant to the interpretation of Rule 6 is Rule 7:

For the purposes of rule 6,—

***complex engineering activities** means engineering activities or projects that have some or all of the following characteristics:*

(a) involve the use of diverse resources (and, for this purpose, resources includes people, money, equipment, materials, and technologies):

(b) require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering, and other issues:

(c) have significant consequences in a range of contexts:

(d) involve the use of new materials, techniques, or processes or the use of existing materials, techniques, or processes in innovative ways

***complex engineering problems** means engineering problems that have some or all of the following characteristics:*

(a) involve wide-ranging or conflicting technical, engineering, and other issues:

(b) have no obvious solution and require originality in analysis:

(c) involve infrequently encountered issues:

(d) are outside problems encompassed by standards and codes of practice for professional engineering:

(e) involve diverse groups of stakeholders with widely varying needs:

(f) have significant consequences in a range of contexts:

(g) cannot be resolved without in-depth engineering knowledge.

7. The overriding consideration is that expressed in Rule 6(1) that is that a Chartered Professional Engineer should be able to practise competently in his or her practice area to the standard of a reasonable professional engineer.

8. The matters listed in subsection 2(a) to (k) *must be taken into account* in making an overall assessment required by Rule 6(1). However the Rules do not provide for a mandatory "pass mark" for these matters, and nor could they. Ultimately, taking the matters in (6)(2) into account, an objective decision still needs to be made as to whether an applicant meets the overall standard prescribed in Rule (6)(1).

9. The Registration Authority has recast the Regulations into a summary of 12 Elements. It is helpful to refer to these elements since that is what the Registration Authority refers to in its assessments, though we note that the actual test is the that listed in Rule 6(1). A copy of the elements, 1-12 is attached as Appendix A[1]

Background

10. The Appellant applied to the Registration Authority seeking registration as a Chartered Professional Engineer in the practice field of fire engineering on 6 May 2013.

11. The application was detailed and accompanied by a number of additional documents:

    (a) A competence assessment self review. This document in turn refers to a number of work examples;

    (b) CPD records since 2009;

    (c) Certificates of Membership;

    (d) 5 detailed work examples with supporting documentation being assessments for:

        (i) the D Building, a new build;

[1] (being a copy of an extract from the Registration Authorities published document CA30)

(ii) the Uprights Building, the upgrade of an existing building to include for the storage of combustible goods;

(iii) P Homestead, the refurbishment of an historic homestead;

(iv) Y R Building, an assessment of a building for the storage of combustible materials;

(v) S Apartments, a new build of apartments.

12. The Appellant's assessment followed the process set out in the Rules and he was ultimately advised on 11 March 2014 that the CAB had declined his application for registration at its meeting on 5 March 2014.

13. The Assessment panel prepared a report in support of its position (page 421 to 426) which overall found that registration as CPEng should be declined. Specifically the Assessment Panel found that the Appellant did not "demonstrate competence" so as to meet the standard of Rule (6)(1) in the following elements: 1, 3, 4, 5, 7, 11 and 12.

14. The CAB took this report into account in coming to its decision to decline registration.

15. In determining this appeal the Council can make any decision that the Registration Authority could have made.

16. The Registration Authority found that the Appellant was deemed to have demonstrated competence in elements 2, 6, 8, 9, and 10 and it was a common position on the appeal.

17. None of the members of the appeal panel are fire engineers. To assist with deliberations the appeal panel determined that it wished to have the benefit of an opinion from a Chartered Professional Engineer who specialised in fire engineering. To that end Mr Anthony Walker was appointed by the appeal panel as an independent expert to review the documentation and to provide a report on whether, in his opinion, the

Appellant met the standard of a reasonable chartered professional engineer. Mr Walker's letter of instruction and his report was made available to the Appellant and the Registration Authority a week before the hearing commenced.

Element 1 (Rule 6(2)(a)(i))

(a) comprehend, and apply his or her knowledge of, accepted principles underpinning—

(i) widely applied good practice for professional engineering.

18. As a default position the Registration Authority first considers if an applicant has a Washington Accord degree or equivalent qualification. The appellant does not. Therefore an assessment has to be made. We note that it is not a pre-requisite that a Chartered Professional Engineer actually has any formal qualifications and one can become Chartered on the basis of experience alone.

19. Mr V has a New Zealand Certificate in Engineering he obtained in 1978 (page 43). In 1987 he was admitted as an Engineering Associate practicing mechanical engineering (page 46). In 1999 he was admitted as a Registered Engineer under the old Engineers Registration Act (page 44). He became a member of IPENZ in 1999 (page 41).

20. We note that in becoming a member of IPENZ in 1999 an assessment must have been made of the Appellant's competence at that stage and he must have been deemed then to have had the equivalent of a Washington Accord degree – although we note that the process in 1999, prior to the passing of the Act, may not have been as robust as it is now.

21. In 1995 he became a member of the Society of Fire Protection Engineers USA by examination and provision of work experience examples. We note that there were no alternatives to obtaining professional recognition as a fire engineer in 1995 in New Zealand other than by becoming a member of this Society. This was un-contradicted.

22. The Appellant provided us with detailed evidence of his work history in which he has practiced as a fire protection engineer for 39 years the last 26 of which have been in his own practice.

23. He supported this evidence with reference to the documentation (in particular pages 27-31).

24. In response to this Mr Wastney stated that the evidence of the Appellant was a statement of fact and that the Registration Authority had no dispute with it.

25. From the material submitted by the Appellant, Mr Walker's opinion was that he comprehended and applied accepted principles underpinning widely applied good practice expected of a professional fire engineer. We accept that opinion.

26. The evidence we have outlined, and our overall view of the other elements, particularly those relating to complex engineering activities and problems, satisfies us that the Appellant understands and satisfies the requirements of element 1 (Rule 6(2)(a)(i)).

Element 11 (Rule 6(2)(k))

(k) maintain the currency of his or her professional engineering knowledge and skills.

27. We turn to continuing education and element 11 next because it follows naturally from Element 1.

28. The Appellant gave evidence of his CPD undertaken in previous years (pages 33-40).

29. Mr Walker was of the view that the type and number of courses undertaken by the Appellant was sufficient for a reasonable professional fire engineer to maintain current competence.

30. There was no dispute as to the CPD undertaken by the Appellant. The Registration Authority was concerned as to how the Appellant

demonstrated in his application how he applied the information from the courses and showed learning outcomes.

31. We were taken to a number of work examples by Mr V were he had applied learning outcomes.

32. He attended a BRANZ B-Risk workshop on 26 March, which was then in turn used on the work examples one and two that he provided.

33. There was also general discussion about the courses that Mr V undertook. Mr Walker's opinion was that the courses were appropriate for a Chartered Professional Engineer, and in response to a question from Mr Wilson he did not consider that there were any material omissions from the CPD record.

34. We consider that the Appellant's CPD is appropriate to the level of a Chartered Professional Engineer.

35. We consider that the real proof of the application of the CPD undertaken falls to be considered under Elements 3, 4, 5 and 7 and the work examples provided to substantiate the Appellant's in depth engineering knowledge. It is to that which we now turn, and consider these elements together.

Element 3 (Rule 6(2)(b))

(b) define, investigate, and analyse complex engineering problems in accordance with good practice for professional engineering.

Element 4 (Rule 6(2)(c))

(c) design or develop solutions to complex engineering problems in accordance with good practice for professional engineering.

Element 5 (Rule 6(2)(e))

(e) be responsible for making decisions on part or all of 1 or more complex engineering activities.

Element 7 (Rule 6(2)(g))

(g) identify, assess, and manage engineering risk.

36. As this hearing progressed it was made clear by the Registration Authority that what it considered key to this appeal was the question of what standard a reasonable engineer had to meet to in order to be Chartered. That "acid test" is not so much the general competency issues contained within element 1, and to some extent element 11, but is framed by the need to understand complex engineering and provide solutions taking that into account.

37. The Registration Authority admitted that at times it struggles with the issue of what is an appropriate level of complexity to judge an applicant against. It considers that in traditional disciplines complexity is well understood, and reasonably well defined. That in turn makes it easier to determine whether an applicant satisfies these elements or not. So, for example, within structural engineering, there is a good understanding of what the profession considers to be a complex structure and there are defined parameters for what falls within that realm. In turn it is therefore much easier to determine a structural engineers level of knowledge of complex engineering activities and problems that arise.

38. Specialist areas can be difficult. The Registration Authority considers, and we agree, that fire engineering is a specialist area that presents a number of challenges when it comes to determining what is complex.

39. First, the knowledge of a fire engineer needs to encompass many other engineering disciplines, even though they may not be a specialist in these areas. For example on any project a fire engineer could encounter issues relating to engineering issues associated with electrical, structural, process, mechanical, and security systems. These have to be understood at some level by a fire engineer.

40. Second, fires are random and are not repeatable events in the way that, for example, a structural failure can be replicated in a laboratory. It therefore makes it very difficult to analyse failure so as to present case studies or other material in order to define the level of complexity that should apply.

41. The Registration Authority submitted that it considered the following issues as being relevant to complexity for fire engineering:

(a) Breadth;

We consider this to encompass the following elements of Rule 7 and the definition of Complex Engineering Activities:

(a) involve the use of diverse resources (and, for this purpose, resources includes people, money, equipment, materials, and technologies):

(b) require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering, and other issues:

(c) have significant consequences in a range of contexts:

(b) First Principles;

We consider this to encompass the following elements of Rule 7 and the definition of Complex Engineering Problems:

(a) involve wide-ranging or conflicting technical, engineering, and other issues:

(b) have no obvious solution and require originality in analysis:

(g) cannot be resolved without in-depth engineering knowledge.

(c) Conflicting constraints.

We consider this to encompass the following elements of Rule 7 and the definition of Complex Engineering Problems:

(e) involve diverse groups of stakeholders with widely varying needs:

(f) have significant consequences in a range of contexts:

42. The Registration Authority made its assessment (page 353). The assessment discusses the work that the Appellant did. It concluded that the Appellant met the level of an engineering technologist and not a Chartered Professional Engineer.

43. The Appellant, took us through the work examples that he provided.

44. The Appellant noted that the assessor had previously reviewed one of the work sample designs as a part of the building consent process and not noted any issue with solution. It is unclear why the assessor raised technical concerns with that design during the assessment process.

45. As the Appellant took us through his work examples Mr Walker made various comments on them and the complexity of the engineering involved. Mr Walker was of the view that the work examples presented had aspects that were identified as complex. Some projects may appear as simple, but the reality is that there are complex elements within them.

46. We attach as Appendix B to this decision Mr Walker's detailed schedule from his statement where he provided his opinion that the Appellant had attained a sufficient standard in relation to the particular elements with reference to the documents by page numbers.

47. The Appellant took the panel through his work examples and these were discussed over the course of some 2 hours during the hearing. We relied to some extent on Mr Walker's report, and on his presence as our expert appointed to independently review and comment on the evidence. As noted above (para 17), Mr Walker's report had been provided in advance to all parties.

48. The RA had no disagreement with what Mr Walker said regarding the fire engineering design process or the complexity associated with some acceptable solution designs.

49. We do not consider that the Appellant's work examples are the simple application of building code minima. In any event we are conscious of a point made by Mr Walker, which seems logical, that it is not necessarily the case that an alternative solution under the Building Code is automatically complex, nor that an accepted solution is necessarily non-complex. It also seems relevant to us that a problem can appear complex, but can actually be the application of standard process to achieve an outcome. We suspect that the assessor considered that much of the Appellant's work fell into this category.

50. On the submissions made to us, we are of the view that Mr V does understand and apply appropriate solutions to complex engineering problems and activities.

51. Besides Mr Walker's opinion, which we give considerable weight, what seems critical to us is how an applicant for Chartered Professional Engineer status exercises his or her engineering judgment in an appropriate way. Elements 3, 4, 5 and 7 all contain matters that require the applicant to apply a level of good practice or take responsibility or manage complex matters. That takes the sound application of good engineering judgment. That in turn takes us to element 12.

Element 12 (Rule 6(2)(d))

(d) exercise sound professional engineering judgement.

52. Element 12 is an integral part of the overall criteria set out in Rule 6(1) which is that a person must demonstrate that he or she is able to practise competently in his or her practice area to the standard of a reasonable professional engineer.

53. Sound engineering judgment can be assessed in a number of ways. It is not just the work examples that are presented by the applicant, though they obviously have a significant bearing on the assessment. We consider this can be shown by the familiarity of the applicant with his or her

subject matter, the ability to answer questions confidently and in detail, to instil in the assessors an appreciation that he or she has a sound knowledge of the subject matter and can discuss it not only with a view to the outcome that occurred, but what might have happened if other variables were introduced are all relevant. Mr V demonstrated this to the panel in his conduct during the hearing.

Findings

54. Ultimately, the test of competency is an objective one made by the people making the assessment.

55. We have undertaken that task, with the aide of the submissions from the Appellant, the Registration Authority and the independent evidence of Mr Walker.

56. In our assessment the Appellant meets the minimum standard for registration set out in rule 6(1).

57. We therefore set aside and quash the decision of the Registration Authority and direct that it admit the Appellant to the register of Chartered Professional Engineers from the date of this decision.

58. We further direct that the period of registration be for 6 years. We propose that the Appellant's practice area be described as:

Fire safety design using specific fire engineering analysis and computer modelling. Risk assessment. Peer review of fire safety designs. Construction observation. Commissioning of fire systems.

59. We understand that the Registration Authority and the Appellant were agreed on this description should he be admitted to the register. If this is not correct either party may notify us within 7 days and we will consider if any amendment to the description needs to be made. Similarly if any other consequential directions are required a request should be made within 7 days.

60. This Council has the discretion to award costs.

61. Neither party was legally represented and in those circumstances it would be abnormal to make a costs award for professional fees or time. However the Appellant has been successful in his appeal and if he wishes to make an application for disbursements associated with this hearing we will allow 14 days to make such an application.

62. The Council does consider that the Registration Authority should bear the costs of Mr Walker's report and it is ordered to reimburse the Council the sum of $5,250 (being the sum charged net of GST).

Dated this 29th day of September 2014

Signed By the Appeals Panel

Andrew Hazelton (Barrister & Solicitor)
Principal

Jon Williams CPEng, FIPENZ

Anthony Wilson ED*, BE(Civil), FIPENZ, FICE, FCIWEM, FIEAust, CPEng, IntPE(NZ)

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APPENDIX A to the decision of the
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Dated 29 September 2014

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APPENDIX B to the decision of the
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Dated 29 September 2014
