

IN THE MATTER OF	The Institution of Professional Engineers of New Zealand Rules
AND	The Institution of Professional Engineers of New Zealand Disciplinary Regulations
IN THE MATTER OF	A complaint by Mr Mike Stannard, Chief Engineer, Ministry of Business, Innovation and Employment
AND	A complaint by Mr Tim Elms on behalf of the families of the victims of the CTV building collapse
AGAINST	Mr David Harding CPEng MIPENZ IntPE(NZ)

DECISION OF THE DISCIPLINARY COMMITTEE

1. INTRODUCTION

- 1.1 IPENZ has received two complaints, one from Mr Tim Elms and the other from Mr Mike Stannard, about the professional conduct of Mr David Harding in relation to the CTV building in Christchurch. The CTV building collapsed during the 22 February 2011 earthquake with the loss of 115 lives.

The Elms complaint

- 1.2 In a letter addressed to the Chief Executive dated 17 October 2012, Mr Tim Elms made complaints against two members of IPENZ: Dr Alan Reay and Mr David Harding. Mr Elms' complaint was also made on behalf of 54 others, most of whom are relatives of those who died in the CTV building.
- 1.3 Mr Elms particularly wishes to complain that during the design period Mr Harding:
- Considered himself capable of undertaking the design of the CTV building when clearly he was not.*
 - Accepted the job with Alan Reay Consultants when he was sought out specifically to design the CTV building, when he had no multi-level building experience.*
 - Did not seek additional supervision or mentoring even when he realised that he was not capable of completing the design.*
 - Allowed numerous design defects that were not compliant with Bylaw 105, or with the applicable code provisions to remain in the final application for building consent without seeking a review of his work. Mr Elms contends these would have been picked up by review.*

- 1.4 Mr Elms alleges the most fundamental and important legal obligations Mr Harding faced were set out in clause 11.1.5(d) of the Christchurch City Bylaw –
- vii – Collapse shall be avoided.*
- viii – The probability of injury or loss of life shall be minimized.*
- 1.5 Mr Elms further alleges:
- a. *These requirements were not met.*
- b. *Mr Harding did not comply with at least three provisions of the 1986 version of the IPENZ Code of Ethics by –*
- i. Failing to provide the protection of life and safeguarding people.*
- ii. Failing to show commitment to community well-being.*
- iii. Failing to show any professionalism, integrity and competence.*

The Stannard complaint

- 1.6 On 11 December 2012 the Chief Executive of IPENZ received a complaint form signed by Mr Mike Stannard, Chief Engineer at the Department of Building and Housing, Ministry of Business, Innovation and Employment (MBIE).
- 1.7 Mr Stannard's complaint stated that while in the employment of Dr Alan Reay, Mr Harding performed the structural design of the CTV building which collapsed in the February 2011 earthquake killing 115 people. The Canterbury Earthquakes Royal Commission (Royal Commission) found that the structural design of the building was seriously deficient in multiple ways. Mr Harding lacked the knowledge and experience necessary to design buildings of this type but nevertheless did the work.
- 1.8 On 20 December 2012, Mr Stannard advised IPENZ Complaints Research Officer (CRO), Charles Willmot, *"Further to my complaint dated 10 December regarding the professional activities of Dr Reay and Mr Harding, I note that the majority of activity relevant to the complaint occurred prior to 2002 when the CPEng Act came into force. Consequently my complaint should be considered in regard to the breaches of the IPENZ Code of Ethics in place at the time the work was carried out."*
- 1.9 Mr Stannard relied on the information provided by the proceedings of the Royal Commission, and has provided no additional information in support of his complaint.
- 1.10 The Stannard complaint constitutes a complaint for the purposes of the IPENZ Disciplinary Regulations.

Initial Stages

- 1.11 Mr Harding was a professional Member of IPENZ at the time of his involvement in the design and construction of the CTV building. He continued to be a Member when the complaints were made in late 2012. However, his involvement significantly predates his 2006 registration as a chartered

professional engineer under the Chartered Professional Engineers of New Zealand Act 2002.

- 1.12 Accordingly, IPENZ has dealt with the complaints from Messrs Elms and Stannard under the Rules and Disciplinary Regulations which govern its relationship with its Members, and not the Chartered Professional Engineers of New Zealand Rules (No 2) 2002, which regulate the conduct of chartered professional engineers.
- 1.13 The Complaint Research Officer's (CRO) report dated 15 April 2013 was prepared by Mr Charles Willmot. The CRO recommended that the matter should be referred to an investigating committee.
- 1.14 The CRO's recommendation was adjudicated by a Chairperson of Investigating Committees (the Adjudicator), Dr Jeff Jones.
- 1.15 Given the findings of the Christchurch Earthquakes Royal Commission report, the Adjudicator did not believe that referring these complaints to conciliation, mediation or any other alternative dispute resolution process would be appropriate.
- 1.16 The Adjudicator was satisfied that there were no grounds to dismiss the complaints against Mr Harding. The Adjudicator concurred with the findings of the CRO set out in his report.
- 1.17 The Adjudicator's decision was that, pursuant to clause 9(e)(i) of the IPENZ Disciplinary Regulations the complaints against Mr Harding be referred to an investigating committee of competent structural engineers chaired by an experienced chairperson so that they can investigate the matter thoroughly and decide whether the complaint against Mr Harding should be dismissed or referred to a disciplinary committee.

2. INVESTIGATING COMMITTEE

- 2.1 An Investigating Committee was appointed on 3 May 2013 in accordance with Clause 42(1)(a) and (b) of the IPENZ Disciplinary Regulations. Subsequently, concerns were raised regarding a perceived conflict of interest with a committee member previously appointed.
- 2.2 Consequently on 2 August 2013 a revised Investigating Committee (IC) was established comprising:
 - Ir Peter McCombs CPEng, FIPENZ, IntPE(NZ) (Chair)
 - Mr Adam Thornton DistFIPENZ CPEng IntPE(NZ) (Member)
 - Mr Mike Cathie FIPENZ CPEng IntPE(NZ) (Member)
- 2.3 The business of the IC was conducted through email and face-to-face meetings. The IC also held an interview with Mr Harding and Mr Kirkland, counsel for Mr Harding, in Wellington on 15 August 2013.
- 2.4 The Investigating Committee was of the opinion that Mr Harding did not breach the code of ethics in respect of the disclosure of limits of competence test, which in this case would be the knowledge of his employer of his lack of previous experience in the design of multi-storey buildings.

- 2.5 However, by signing and submitting design documentation to the Christchurch City Council for building permit without ensuring adequate prior overview of his work, the Investigating Committee believed Mr Harding effectively misrepresented his competence.
- 2.6 From this position, the Investigating Committee considered that there may be grounds for discipline under the IPENZ Disciplinary Regulations and the IPENZ Rules.
- 2.7 The IC issued its preliminary report on 5 March 2014 providing an opportunity for all parties to comment. The IC then issued its final decision on 4 April 2014.
- 2.8 Having considered the grounds set out under Regulation 8 of the IPENZ Disciplinary Regulations, the IC concluded that there were no grounds to dismiss the matter.
- 2.9 The determination of the Investigating Committee was that the complaints against Mr Harding made by Mr Elms on behalf of the relatives of those who died in the CTV building and by Mr Stannard of MBIE as the central regulator should be referred to a disciplinary committee.
- 2.10 Consequently, the matter was then referred for consideration by a disciplinary committee.

3. DISCIPLINARY COMMITTEE'S PROCEEDINGS

- 3.1 A Disciplinary Committee (DC) was appointed on 16 April 2014 in accordance with Clause 43(1) of the IPENZ Disciplinary Regulations, comprising the following persons:
- Mrs Jennifer Culliford FIPENZ (Chair)
 - Dr Barry Davidson FIPENZ
 - Mr Barry Brown FIPENZ CPEng IntPE(NZ)
 - Mrs Penny Mudford (lay person)
 - Mr Bill Whitley (nominated by Consumer NZ Inc)
- 3.2 The hearing date was set for 14 July 2014.
- 3.3 A procedure was set by the Chair.
- 3.4 Mr Michael Kirkland, counsel for Mr Harding, provided submissions on behalf of his client on 23 June 2014 and 7 July 2014.
- 3.5 No submissions were provided by the Complainants prior to the hearing.
- 3.6 A pre-hearing teleconference attended by the DC Chair, Mr Kirkland, Mr Jeremy Upson (counsel assisting the DC), and Mr Charles Willmot and Ms Becca Barrow of IPENZ was held on 7 July 2014 to discuss procedural matters.

4. HEARING PROCEEDINGS

- 4.1 The hearing was held in Christchurch on Monday 14 July 2014 with all members of the DC in attendance.

- 4.2 The DC considered and approved a procedure for hearing the complaint which had previously been provided to all parties for consideration and comment.
- 4.3 A complaint arising from an inquiry initiated by IPENZ as the Registration Authority on its own motion was heard in conjunction with the hearing of the complaints raised by Messrs Elms and Stannard. The DC's decision relating to the IPENZ complaint is reported separately.
- 4.4 All oral evidence was given under oath.
- 4.5 The proceedings were recorded.
- 4.6 Mr Harding did not attend the hearing. He was represented by his counsel Mr Michael Kirkland and Ms Anna Worrill.
- 4.7 Mr Tim Elms and Professor Maan Alkaisi were in attendance and gave evidence. Also in attendance were family members of those who died in the CTV building collapse.
- 4.8 Mr Stannard did not attend the hearing and no further evidence was presented at the hearing by MBIE on his behalf.
- 4.9 All members of the Investigating Committee were in attendance.
- 4.10 Ms Becca Barrow of IPENZ was in attendance and provided administrative support.
- 4.11 Also in attendance was Mr Charles Willmot representing the Registration Authority in respect of the own motion inquiry.
- 4.12 In opening the hearing, the DC Chair explained that the process was inquisitorial in nature and that the hearing was public. Media representatives were reminded of the orders issued in respect of recording and reporting.
- 4.13 The hearing procedure was followed with amendments to timing.
- 4.14 Mr Elms presented the complaint on behalf of the families of the people who died as a result of the CTV building collapse following the February 2011 earthquake.
- 4.15 Mr Kirkland then submitted that as a matter of law the hearing could not proceed and that the Disciplinary Committee would be acting outside its powers if it heard the complaint.
- 4.16 The Disciplinary Committee adjourned to consider Mr Kirkland's submissions. At the resumption, the Chair announced that, having considered Mr Kirkland's submissions, the Disciplinary Committee had decided that it was required to proceed with the hearing and that it would issue a written decision setting out the reasons following the hearing.
- 4.17 There were no questions of Mr Elms from Mr Kirkland or members of the DC.
- 4.18 Professor Alkaisi then addressed the hearing in support of the complaint.
- 4.19 There were no questions of Professor Alkaisi from Mr Kirkland or members of the DC.

- 4.20 Mr Cathie presented the results of the IC's investigations. Mr Cathie highlighted the salient sections of the IC's report and then he and members of the IC responded to questions from Mr Kirkland and members of the DC.
- 4.21 Following this, Mr Kirkland made his submission on behalf of Mr Harding and responded to questions from the DC.
- 4.22 The DC then called Mr Thornton as a witness to answer general questions regarding engineering practice of the day ie 1986.
- 4.23 The proceedings then moved on to the second matter to be heard, the IPENZ complaint.
- 4.24 Ms Worrill read out an affidavit from Mr Harding dated 4 July 2014.
- 4.25 Mr Elms made a personal closing statement to the hearing.
- 4.26 The hearing was adjourned and the DC undertook their deliberations in private.
- 4.27 The Disciplinary Committee issued its written reasons for its decision regarding the matter of jurisdiction on 6 August 2014.

5. JURISDICTION

- 5.1 Mr Harding was a professional Member of IPENZ at the time of his involvement in the design and construction of the CTV building. He continued to be a Member when the complaints were made in late 2012.
- 5.2 The Investigating Committee reviewed the complaints in relation to the IPENZ Code of Ethics dated February 1986. This version was applicable at the time the design work was carried out.
- 5.3 The Investigating Committee referred the complaints to a disciplinary committee on 4 April 2014 and the Disciplinary Committee was appointed on 16 April 2014. IPENZ received a letter from Mr Harding on 1 July 2014 in which he resigned his membership of IPENZ.
- 5.4 As noted, the Committee decided that Clause 17(1) of the Disciplinary Regulations required it to proceed with the hearing of the complaints from Messrs Elms and Stannard, despite Mr Harding's resignation of his membership of IPENZ prior to the hearing.
- 5.5 Mr Harding sought judicial review of the Disciplinary Committee's decision. That proceeding was heard in the Christchurch High Court on 9 September 2014.
- 5.6 The Committee deferred its decision pending the High Court's decision, in accordance with Clause 20(a) of the Disciplinary Regulations.
- 5.7 Justice Mander in his judgment dated 17 September 2014 (*Harding v The Institution of Professional Engineers Inc* [2014] NZHC 2251) ruled at [36] that "*IPENZ has jurisdiction to hear the complaints regarding Mr Harding's conduct whilst a member of IPENZ which were made when he was a member of that organisation.*" Mr Harding's application for judicial review was dismissed.

- 5.8 Following the Court's acceptance of the Disciplinary Committee's jurisdiction, the Committee finalised this decision recording its findings and reasons thereof.

6. DISCIPLINARY COMMITTEE DELIBERATIONS

Written evidence

- 6.1 The following summarises the written evidence relevant to the complaint against Mr Harding provided to the DC prior to, and during, the hearing:
- 6.1.1 a numbered bundle of documents comprising 391 pages and including the IC report, the CRO report, the original complaint and associated documents – the Elms/Stannard bundle;
- 6.1.2 a submission from Mr Kirkland on behalf of Mr Harding dated 23 June 2014 together with a numbered bundle of documents comprising 138 pages and dated 24 June 2014 – the Harding bundle;
- 6.1.3 a further submission from Mr Kirkland on behalf of Mr Harding dated 7 July 2014 and comprising 70 pages including Mr Harding's affidavit which was dated 4 July 2014;
- 6.1.4 a transcript of the IC's interview with Mr Harding on 15 August 2013 comprising 81 pages;
- 6.1.5 summary of the IC's findings as presented by Mr Cathie during the hearing;
- 6.1.6 a copy of statement made by Professor Maan Alkaisi to the hearing; and
- 6.1.7 excerpts from the Lawyers and Conveyancers Act 2006 (2 pages), Statutory Interpretations (2 pages) and Union Motors Ltd. and Another v Motor Spirits Licensing Authority and Another – [1964] NZLR 146 (7 pages) tabled at the hearing by Mr Kirkland.
- 6.2 The DC had also been provided with an electronic copy of Volumes 1-7 of the Canterbury Earthquakes Royal Commission Final Report.

Specific matters

Investigating Committee presentation

- 6.3 Mr Harding was elected a professional member of IPENZ on 1 October 1985 and was still a member during the time that the IC investigated the complaints and issued its report. The IC reviewed the complaints in relation to the IPENZ Code of Ethics, February 1986.
- 6.4 Mr Cathie outlined Mr Harding's engineering education and career prior to his undertaking the design of the CTV building as follows:
- 6.4.1 *"Mr Harding graduated from Canterbury University with a Bachelor of Engineering Civil Degree with second class honours in 1973. His studies covered a variety of structural and civil engineering papers with no particular emphasis on structural engineering.*

- 6.4.2 *Following graduation Mr Harding worked for a Christchurch engineering consultancy where he was engaged in the structural design of low-rise commercial and residential projects and seismic strengthening of unreinforced masonry buildings. Mr Harding became a registered engineer in 1976.*
- 6.4.3 *In 1979 Mr Harding joined the consulting engineering company Alan Reay Consulting Engineers and was responsible for carrying out design calculations for predominantly low-rise pre-cast concrete wall building structures.*
- 6.4.4 *Mr Harding left Alan Reay Consulting Engineers in 1980 to take up a position as design engineer with the Waimairi County Council. He was responsible primarily for civil engineering projects such as roading design and existing bridge maintenance surveys.*
- 6.4.5 *Mr Harding was approached by Dr Reay in 1985 and accepted the role of structural design engineer, with the understanding that he would gain experience in multi-storey building design. He understood there were also prospects for career advancement. Dr Reay and Mr Harding were the only practising structural engineers in Alan Reay Consulting Engineers at this time.”*
- 6.5 Mr Cathie then proceeded to describe the work undertaken by Mr Harding upon re-joining Alan Reay Consulting Engineers:
- 6.5.1 *“Mr Harding initially undertook the structural design of a four-storey concrete block masonry building using static analysis and not computer modelling techniques. He then went on to complete the design detailing of a nine-storey, regular layout reinforced concrete frame building initiated by previous Alan Reay Consulting Engineers engineer Mr John Henry, whose position Mr Harding had just taken over. The primary structure for this building had been analysed by Mr Henry using three-dimensional computer modelling of earthquake effects using the ETABS computer programme. The (Investigating) Committee understood Mr Harding’s role was to convert the output of this analysis into design actions on the members of the primary structural frame and to complete member reinforcing detailing accordingly.”*
- 6.6 Mr Cathie then described Mr Harding’s involvement in the design of the CTV building:
- 6.6.1 *“In early 1986 Mr Harding was provided with architectural layouts and a brief to carry out the structural design work for a proposed six-storey commercial development building later to be known as the CTV building. He related that he was instructed by Dr Reay to carry out the detailed structural analysis and design work required which would include ETABS computer modelling of the primary structure. Mr Harding advised the (Investigating) Committee that he had been instructed by Dr Reay to keep the floor framing system simple to construct with gravity-only detailing of beams and columns.*
- 6.6.2 *Seismic loads were to be resisted by a reinforced concrete wall arrangement located in the service core on the north side of the building, significantly eccentric to the centre of building mass for east-west direction earthquakes. The use of gravity-only frames was achievable according to the reinforced concrete code of practice applicable at the time, provided design earthquake inter-storey drifts could be controlled within certain limitations.*

- 6.6.3 *The template for the analytical part of the work was to be based on that for a similar building which had been previously designed by Mr Henry. This building was of eight storeys and also had a lateral load-resisting concrete wall core that was eccentric to the centre of mass of the floors similar to the CTV but with some critical differences that made it a more robust structure. Mr Cathie explained that Mr Henry added column-tie reinforcing to make the columns more resilient in the event of a larger than design-level earthquake.*
- 6.6.4 *This was Mr Harding's first experience in producing an ETABS computer model of a building. He worked his way through the procedures and was eventually able to get his computer model to produce results but found inter-storey deflections were outside the necessary code limitations.*
- 6.6.5 *The matter was discussed with Dr Reay and was able to be rectified, at least by Mr Harding's interpretation of computer results, by the introduction of a coupled concrete shear wall structure located on the southern façade. The Royal Commission noted that this was likely to be the only matter of significant technical discussion that took place between Mr Harding and Dr Reay during the course of the building design.*
- 6.6.6 *Having resolved the matter of excessive drifts Mr Harding proceeded to complete his structural analysis of the building and oversaw the drafting of structural engineering design drawings.*
- 6.6.7 *It appears that a preliminary and incomplete set of structural engineering drawings were provided to the Christchurch City Council in support of a building permit application on 26 August 1986.*
- 6.6.8 *One day later the Council's checking engineer, Mr Graeme Tapper issued a handwritten form to Alan Reay Consulting Engineers advising that building permit processing was being held up pending receipt of a substantial quantity of missing information. This included copies of calculations supporting the design, a foundation report, a structural specification and clarification on a number of design details, not the least of which were missing details of the connections of floor slabs to the structural walls. Mr Tapper also requested that the drawings be signed as checked and approved by the engineer responsible.*
- 6.6.9 *The Royal Commission report noted that on 5 September 1986 Mr Harding had transmitted "amended drawings as required" together with calculations covering the fire rating of the floor slabs.*
- 6.6.10 *There was some suggestion provided in the Commission's report that a full set of structural calculations and the foundation report may have been provided to the Council prior to 5 September 1986. The calculations were not later found on Council records, however.*
- 6.6.11 *The Commission's report also noted that there was no evidence that there was a design certificate produced for the job but that Council had on their files copies of the design drawings signed by Mr Harding. Records indicate the building permit approval for construction to proceed was granted on 10 September 1986.*
- 6.6.12 *There was no evidence of any overview of the completed design being carried out by Dr Reay who has maintained that he specifically left responsibility for compliance of the building with Mr Harding.*

- 6.6.13 *Mr Harding took on the responsibility of monitoring the structural aspects of construction through its course to completion.”*
- 6.7 Mr Cathie summarised information from the Royal Commission’s report related to Mr Harding and the design of the CTV building:
- 6.7.1 *“The Royal Commission undertook a detailed analysis of the structural design of the CTV building based on the design drawings and specifications. It concluded that the design did not comply with the legal requirements of Christchurch City Council Bylaw 105 in several important areas. These were as follows:*
- *inadequate floor diaphragm connections to shear walls*
 - *non-seismic detailing of some columns*
 - *inadequate beam-column joint reinforcing*
 - *inadequate shear reinforcing of columns*
 - *inadequate spiral reinforcing in the region of lapped splices of longitudinal reinforcing*
- 6.7.2 *The Royal Commission also concluded that it was not reasonable to expect the Christchurch City Council checking process to identify three of the above five noted defects. These were the non-seismic detailing of columns; inadequate beam-column joint reinforcing and inadequate spiral reinforcing in regions of lapped splices.*
- 6.7.3 *The CTV building suffered some damage as a result of the 4 September 2010 Darfield earthquake, but not sufficient to preclude continued occupation. The building suffered rapid and catastrophic collapse in the more powerful Christchurch earthquake of 22 February 2011.*
- 6.7.4 *The Royal Commission concluded in section 9.10 of their report that there were four features of the design and construction of the CTV building that were major contributors to its collapse. These were:*
- *the failure to adequately consider seismic behaviour in the design of the beam-column joint zones*
 - *the failure to provide adequate tie strength between the floors and the north wall complex*
 - *inadequate confinement of columns*
 - *the failure to identify clearly the need to roughen the interface between the ends of the precast beams and the insitu concrete in the columns”*
- 6.8 Mr Cathie went on to provide a brief summary of the submissions made to the IC on 14 January 2013 on behalf of Mr Harding.
- 6.9 Paragraph 3 of section 2 of Mr Kirkland’s submission stated *“our instruction from David is that he accepts the findings of the Royal Commission and as a consequence there would be nothing achieved by traversing point by point issues relating to the design”*.
- 6.10 In section 3.3, Mr Kirkland submitted with regard to the matter of Mr Harding’s experience and competence the following: *“On page 65 of the Commission’s report at paragraph 2.1.5.1 inter alia it is said, Mr Harding’s own evidence was that he was not competent to undertake the design of the CTV Building*

without supervision by an engineer with experience in the design of multi-storey buildings”.

- 6.11 In section 3.4, Mr Kirkland further submitted with regard to supervision and/or mentoring of Mr Harding the following: *“On page 67 of the Commission’s report inter alia it is said we did not find credible or convincing Mr Harding’s suggestion that he thought Dr Reay was indirectly reviewing his projects by looking at the work the structural draftsman were doing and at the details Mr Harding had provided to them”.*
- 6.12 Mr Kirkland further submitted on this matter *“whilst the Commission was not persuaded by David’s evidence on this point he had a honestly albeit mistaken belief that his work was being impliedly reviewed. Again our instructions from David re his response to this matter are that he submits to the Commission’s report”.*
- 6.13 As noted by the IC, the IPENZ Code of Ethics, February 1986 states:
- “Each member shall so conduct himself as to uphold the dignity standing and reputation of the Institution and of the profession.*
- In furtherance thereof*
- He shall not misrepresent his competence nor, without disclosing its limits, undertake work beyond it.”*
- 6.14 Mr Cathie then summarised the IC’s opinion that:
- “Mr Harding*
- a. *effectively met the disclosure of limits of competence criteria in that his employer would have been aware of his previous lack of experience in the design of multi-storey buildings when he re-joined the company;*
 - b. *was mistaken in his belief that his work on this form of building, for which he had little or no previous experience, had or would have sufficient overview by someone experienced in multi-storey design. The building was inherently complex in its structural layout;*
 - c. *in signing and submitting design documentation for the building to the Christchurch City Council effectively misrepresented his competence.”*
- 6.15 In response to questions from members of the DC seeking further clarification about the design of the CTV building, the IC noted that the codes of the time did allow an engineering designer to effectively separate the seismic resisting elements into primary and secondary systems. In the case of the CTV building this was separating the shear walls from the gravity-only frames. The IC understood that there may have been differences in the way various engineering practices at the time applied the rules relating to allowable inter-storey drift. The DC noted, however, that the minimum requirements of the standards of the day still needed to be satisfied.
- 6.16 When questioned about the extent to which the Investigating Committee considered what was standard business practice in respect of design review in a consultancy at that time, the IC referred to section 18.7 of their report:
- “The IC contends that it was primarily Dr Reay’s responsibility to ensure such checking was attended to by someone with suitable competence. Mr Harding also had a responsibility as a registered engineer to ensure a*

thorough overview was undertaken given his own, acknowledged lack of experience.”

Submissions on behalf of the Respondent

- 6.17 Mr Kirkland in his written submission states that Mr Harding did not in any way attempt to deny the allegation that he was not competent to design the CTV building and quotes part 2.1.5.1 of Vol 6 of the Royal Commission’s final report:

“Mr Harding’s own evidence was that he was not competent to undertake the design of the CTV building without supervision by an engineer with experience in the design of multi-story buildings.”

- 6.18 In relation to design review, Mr Kirkland quoted part 2.1.4.6 of Vol 6 of the Royal Commission’s final report:

“Mr Harding said that Dr Reay’s evidence that there was no review procedure in place in 1986 was news to him and that if he had thought he was doing the project by himself he ‘would have bailed out right then’.”

- 6.19 It is noted in Mr Kirkland’s written submission of 23 June 2014 that Mr Harding in paragraph 15 of his evidence to the Royal Commission says:

“Alan was aware that I had not used ETABS before, and that I was relying on him for guidance in the use of the program and the resulting method of building design.”

And in paragraph 20:

“The structural draughtsman would have prepared carcass drawing for the building according to directions from Alan, and based on their earlier experience with drawing multi-storey buildings. I would have provided details of reinforcement in order to complete the drawings. Alan would regularly visit the draughtsman to monitor progress of the work, and to view details and information which I had given to them. If he had any concerns as to the type of detailing, my failure to use standard details, or my use of non preferred products, then he would advise me of the changes he required.”

- 6.20 Mr Kirkland submitted that *“Dr Reay was acutely aware of Mr Harding’s previous experience, which was essentially that of a civil as opposed to a structural engineer, and the fact that Dr Reay’s previous structural engineer, John Henry, was leaving the firm. Hence, there was a much higher onus on Dr Reay to ensure that Mr Harding’s work was supervised.”*

- 6.21 Furthermore, Mr Kirkland notes that the Royal Commission at part 2.1.5.1 of Vol 6 of its final report said:

“While counsel for Dr Reay submitted that Mr Harding’s age and years of experience supported Dr Reay’s position that he was competent to undertake the CTV design, we do not accept this.”

And at s 2.1.5.2:

“Dr Reay should also have been aware of Mr Harding’s lack of experience relevant to the CTV design and the need for his work to be checked.”

- 6.22 Mr Kirkland also made reference in his written submission to reviews of the CTV building conducted by parties other than Alan Reay Consulting Engineers. These included the review by the Christchurch City Council when

the design was submitted for a building permit and a pre-purchase review by the Holmes Consulting Group in 1990. Both of these reviews identified area of concern with the building design.

Engineering practice

- 6.23 The DC was interested in learning about common or accepted practices in engineering consultancies in the mid-1980s and how they compared with current-day practices. Accordingly, Mr Thornton who was a member of the IC and is a well-respected consulting engineer, was asked to answer questions from the DC in this regard.
- 6.24 Mr Thornton explained the use of design certificates as they were in the 1980s. These certificates were a precursor of what is now called a producer statement. The wording was significantly different from the current day producer statement. Mr Thornton noted that a design certificate was not always provided or required and that this depended upon the jurisdiction. For example, Mr Thornton understood that the local authority in Christchurch often required a design certificate to be submitted whereas in Wellington, which is Mr Thornton's area of practice, a certificate was only very seldom used and that was because calculations were always required by the Wellington City Council and were reviewed in-house. It was Mr Thornton's understanding that in Christchurch submitting a design certificate was perhaps an alternative to submitting calculations and so effectively a lesser level or sometimes no checking was carried by the local authority. The certificate effectively said that the design met the codes of the day in general terms.
- 6.25 The design certificate was an ACENZ document and its use by member firms was regulated by ACENZ.
- 6.26 Mr Thornton went on to say that the practice has evolved since then and that the producer statements that are now used have quite a different form of wording. They are on a reasonable grounds basis and cite compliance with the Building Code. The engineer of record may not themselves have all the competencies related to the design of the building they are signing off but they need to satisfy themselves that the people they are relying on for particular aspects of the design are suitably competent.
- 6.27 Mr Thornton agreed that design certificates tended to be documents signed by the principal of the firm as opposed to a staff member of the firm. He went on to say that was the general practice today. In larger organisations there are managers or engineering managers who are empowered to sign on behalf of the firm and most of the big firms have very strict rules about who is able to take that responsibility on behalf of the practice. Mr Thornton went on to say that in his view the normal process in smaller practices such as his own and the size that Alan Reay's firm was at that time would be for the practice owner to sign documents such as design certificates. He confirmed that this practice continued in his own firm today.
- 6.28 Mr Thornton confirmed that it would not be normal practice for a person at a lower level to sign drawings as approved but it would be more likely be the person signing the producer statement.
- 6.29 The DC then proceeded to ask questions about the IPENZ/ACENZ Practice Note No 14 relating to Structural Engineering Design Office Practice published in August 2009.

6.30 Mr Thornton confirmed that the practice note was a new document when it was published in 2009 and that its development was prompted by concerns arising in 2008 that standards of practice may have dropped. Mr Thornton read out the introduction which he felt set the scene for the practice note.

“In recent times the quality of structural engineering practice particularly as it relates to the design of buildings has come under scrutiny both from inside and outside of the engineering profession. There is little doubt that the practice of structural engineering has changed considerably over the last 30 years. Many factors have required practices to adapt:

.....

In many ways the adaption has been remarkable with great technical skill and innovation being exhibited along with fantastic increases in productivity. However these quality improvements have not been uniformed and the perception of poor design quality do exist. With this in mind IPENZ and ACENZ boards have encouraged the production of this practice note which aims to define the fundamentals of acceptable office practice for structural engineering design and improve the overall quality of structural engineering design services and ultimately regain the trust and respect of the public and regulators which has been lost or at least tarnished.

6.31 Mr Thornton then reflected on the period from the mid-1970s to mid-1980s when there were significant changes occurring in the way structural design was carried out. There was a change from the working stress method to the ultimate strength design method. The form of structures was changing as a result of better analysis tools and new technologies being available. There was a lot of re-education in the new methods and industry at the time was, in Mr Thornton’s opinion, very positively adapting to the change in the design environment.

6.32 Mr Thornton went on to say that it was normal practice at that time for the director, or the partner or the senior engineer to do the concept design and perhaps then hand it over to engineers that he was supervising to do the detailed design and that it was a given that there were a lot of checks and balances undertaken through that design process. However, the process was often not documented, particularly in smaller practices, in a form that was later more prevalent with the introduction of quality standard systems and certification.

6.33 Mr Thornton noted that there was a large growth in the number of firms at that time and that adoption of quality assurance practices was not consistent across firms. He suggested that some firms may not have the advantages of perhaps having a new graduate who could explain some of the new techniques. Also there were practice differences relating to checking processes with engineers setting up firms when they were quite young who may not have been exposed to the process of the inherent checking that the more established firms with older partners may have followed as a matter of course.

6.34 In response to further questioning from the DC, Mr Thornton stated that in his view it would have been very unusual for a design engineer not to seek review and for the principal of the engineering practice not to apply some sort of review to a design in such circumstances.

Considerations

- 6.35 The Disciplinary Committee acknowledges that Mr Harding accepted the findings of the Royal Commission and by doing so essentially accepted that he had breached the IPENZ Code of Ethics current at the time he completed the design of the CTV building.
- 6.36 The DC considers that Mr Harding met the requirement to disclose the limits of his competence. However, by signing and submitting the design documentation for the CTV building to the Christchurch City Council, Mr Harding effectively misrepresented his competence. Furthermore, Mr Harding as a professional engineer should have been proactive and taken steps to ensure that his design was properly reviewed.
- 6.37 Professionals in any field, not only engineering, must learn and develop new skills and so it was with Mr Harding. One of the reasons for re-joining Alan Reay Consulting Engineers was the opportunity to develop skills in the structural analysis of multi-storey buildings.
- 6.38 However, such new skills must be learned and developed under close supervision and monitoring and in the case of Mr Harding's introduction to the design and analysis of multi-storey structures through his design of the CTV building, the necessary close supervision and monitoring were lacking as evidenced by the findings of the Royal Commission (which as noted Mr Harding accepts).
- 6.39 The DC sought to identify whether there were lessons to be learned that could contribute to improvements in engineering practice and in particular structural engineering design practices for this type of building.
- 6.40 The DC heard from Mr Thornton that the profession had identified in 2008 that there may be issues related to the then-current standards in structural design leading to the development of the IPENZ/ACENZ Practice Note - Structural Engineering Design Office Practice that was published in August 2009.
- 6.41 The DC considered whether any of the evidence presented to the hearing identified issues not addressed by the practice note.
- 6.42 Mr Thornton was of the opinion that the lack of review undertaken by Alan Reay Consulting Engineers was not the usual practice for consulting companies at the time or since.
- 6.43 The practice note identifies the issues faced by small firms in achieving adequate review of their designs thus:
"Small practices and sole practitioners need to be particularly mindful of how to achieve effective review, particularly when undertaking complex work. Some form of external review, possibly on a reciprocal arrangement, may be an appropriate solution."
- It is the view of the DC that this advice could be expanded and strengthened.
- 6.44 The DC noted the comment made by Mr Kirkland in paragraph 27 of his written submission dated 23 June 2014.

“Whether or not, at all material times, it was a reasonable expectation that local authorities (particularly in relation to small engineering firms) would review an engineer’s work is a matter that appears even to this day to be in some dispute.”

- 6.45 The DC is firmly of the view that primary responsibility for ensuring proper and adequate review of engineering design documentation lies with the organisation responsible for the delivery of the design. Local authorities may undertake their own reviews, or have peer reviews undertaken on their behalf, but this does not remove the primary responsibility for review from the organisation that developed and executed the design. As noted in the practice note referenced above, smaller organisations may need to use an external party to undertake design reviews.
- 6.46 The DC also considered whether there was anything arising from the complaints against Mr Harding that indicated where improvements might be achieved in the regulation of the engineering profession. At the time that Mr Harding designed the CTV building he was a registered engineer, a qualification obtained under the Engineers Registration Act 1924. This Act was long considered to be inadequate in that, for example, there was no requirement to provide evidence of ongoing competence beyond that required for initial registration, a code of ethics was not enshrined in the act and the disciplinary provisions were limited. Consequently a new Act, the Chartered Professional Engineers of New Zealand Act 2002 (the 2002 Act), was passed and the 1924 Act repealed. The 2002 Act requires engineers to demonstrate ongoing competence and to abide by a code of ethics and includes a process for complaints and discipline. A purpose of the 2002 Act is to establish the title of chartered professional engineer as a mark of quality.
- 6.47 Mr Harding is a chartered professional engineer but because his work on the CTV building pre-dates the 2002 Act, the provisions of this Act do not apply to that work. A complaint against a chartered professional engineer in respect of engineering work carried out since 2002 would be subject to the disciplinary provisions of the CPEng Act. Possible sanctions under this regime include suspension or removal of chartered professional engineer status.
- 6.48 Registration as a CPEng is not required to practise as a professional engineer in New Zealand, but the Act protects use of the CPEng title. Some regulations specify that certain kinds of work must be carried out or supervised by chartered professional engineers.
- 6.49 When the 2002 Act was passed it was anticipated that there would be recognition of registration as a chartered professional engineer as a mark of quality and that regulation would follow requiring the ‘engineer of record’, or the responsible or supervising engineer to be a chartered professional engineer. Whilst such regulation is in place for some activities such as certifying certain types of machinery, there are areas where public safety is a major concern that do not require a CPEng sign off on design or construction. It is noted that whilst it is normal practice for a chartered professional engineer or a registered architect to sign producer statements, the use of producer statements has no status under the Building Act 2004.
- 6.50 The DC considers that IPENZ could be proactive by recommending to the relevant authorities that engineering activities that have such inherent risks should incorporate a requirement that the responsible professional engineer has chartered status.

- 6.51 The DC is required to make one of two decisions when considering complaints: either that specified at Regulation 17(2) *“that there are no grounds for disciplining the Member complained about under Rule 11 of the Institution”*; or that specified at Regulation 17(3) *“that there are grounds for disciplining the Member complained about under Rule 11 of the Institution”*.
- 6.52 The DC determines that Mr Harding breached the IPENZ Code of Ethics published in February 1986 and that this breach constitutes grounds for discipline under Rule 11 of the IPENZ Rules.
- 6.53 In its decision dated 6 August 2014 dealing with the matter of jurisdiction, the Disciplinary Committee accepted that Mr Harding’s resignation effectively removed its ability to discipline Mr Harding under the IPENZ Rules. This was in the sense that the Disciplinary Committee no longer had power to make any orders against him, because he was no longer a Member of IPENZ.
- 6.54 However, Justice Mander in his judgment observed that the DC’s comments at its paragraphs 25 and 33 of its 6 August 2014 reasons *“may have gone too far”*. At [28] of his judgment he continued to say: *“It would appear that the Committee’s acknowledgment ... may not have taken into account the sanction of publication which still remains available and has the potential to be punitive in its own right”*.
- 6.55 The Judge has not held that the DC may now exercise its disciplinary powers; neither has he held that it may not do so.
- 6.56 In the light of this uncertainty and also in consideration of the DC’s previously-expressed view, the DC has determined that it is appropriate to limit the sanction imposed on Mr Harding to publication of the details of the complaint and the DC’s findings and to name Mr Harding.
- 6.57 Prior to making its decision regarding publication, the DC afforded Mr Harding an opportunity to make a submission on the matter. Mr Kirkland responded by email dated 10 October 2014.
- 6.58 In making orders for publication, the DC takes account of Mr Kirkland’s email of 10 October and Mr Harding’s state of health, but notes Mr Harding’s openness about the personal impact of the disciplinary process on him. It also takes into account Mr Harding’s previous public admissions of the findings of the Royal Commission. In the opinion of the DC, it is important that the disciplinary process is seen to be open and transparent. There has been much public interest and media coverage of the complaints against Mr Harding. The DC considers that public interest outweighs any interest in non-publication.
- 6.59 The DC is concerned that the manner and content of the publication should be controlled and balanced.
- 6.60 Accordingly, the DC determines that this decision should be published in full and without commentary on the IPENZ website and that it should remain on the website for a minimum of one year.
- 6.61 Furthermore, the DC has decided that it will publish a summary of the case to be posted simultaneously with its decision on the IPENZ website. This summary will also be available for use as a media release and should also be

published in *Engineering Dimension* for the purpose of informing other professional engineers.

6.62 The DC will publish a public notice in the national press stating that its decision is available on the IPENZ website.

6.63 The DC wishes to record the acknowledgements made by both the Complainant (Mr Elms) and Mr Kirkland regarding the helpful and sensitive manner in which IPENZ staff members have dealt with this complaint.

7. DISCIPLINARY COMMITTEE'S DETERMINATION

7.1 It is the decision of the Disciplinary Committee in exercising its delegated powers that there are grounds to discipline Mr David Harding under Rule 11 of the Institution of Professional Engineers New Zealand Inc's Rules.

7.2 The Disciplinary Committee will publish its decision in full on the IPENZ website where it shall be retained for a minimum of one year.

7.3 The Disciplinary Committee will publish a summary of its decision. This summary shall be published on the IPENZ website at the same time as this decision. Furthermore, the Disciplinary Committee's summary shall be published in *Engineering Dimension* for the purpose of informing other professional engineers and will be available to be used as a media release.

7.4 The Disciplinary Committee will publish a public notice in the national press advising that its decision is available to be read on the IPENZ website.

8. RECOMMENDATIONS

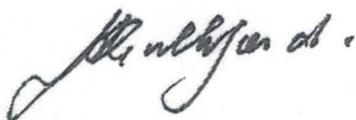
8.1 This case has highlighted a shortcoming in the IPENZ Disciplinary Regulations insofar as the Regulations are silent regarding the consequence of a member against whom a complaint has been made resigning his or her membership of IPENZ. The Disciplinary Committee recommends that IPENZ reviews its rules in this regard and notes for consideration Regulation 13.14 of the Engineers Australia Disciplinary Regulations November 2007:

"If a Respondent ceases to be a member of Engineers Australia and/or Registrant, a complaint will proceed to determination as if the Respondent/Registrant remained a member or Registrant."

8.2 The Disciplinary Committee recommends that IPENZ and ACENZ undertake a comprehensive review of the Practice Note - Structural Engineering Design Office Practice published in August 2009 to take account of the issues related to the practice of structural engineering that have been identified not only from the collapse of the CTV building but also from the wider investigations of the Canterbury Earthquakes Royal Commission. In particular, the Disciplinary Committee suggests that guidance be given in respect of acceptable practices for small design firms and sole practitioners, expanding significantly on what is written in the current version of the practice note.

8.3 IPENZ and ACENZ could also give consideration to developing guidelines for the management of small engineering design consultancies since the challenges of dealing with issues such as design review, and the supervision and mentoring of staff are not unique to structural design offices but rather are common to all small professional engineering organisations.

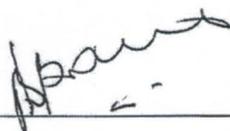
- 8.4 The Disciplinary Committee recommends that IPENZ conducts a review to identify specific engineering activities for which the public interest would be served by requiring through regulation that the responsible engineer was a chartered professional engineer and follows this up with recommendations to central government and local authorities.



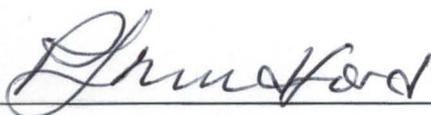
Mrs Jennifer Culliford FIPENZ
Chair of the Disciplinary Committee



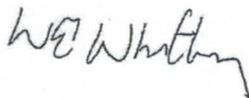
Dr Barry Davidson FIPENZ
Disciplinary Committee Member



Mr Barry Brown FIPENZ CPEng IntPE(NZ)
Disciplinary Committee Member



Mrs Penny Mudford (layperson)
Disciplinary Committee Member



Mr Bill Whitley (nominated by Consumer NZ Inc)
Disciplinary Committee Member

Dated 23 October 2014