IN THE MATTER OF
***THE PROFESSIONAL GOVERNANCE ACT,* S.B.C. 2018, c. 47**

and

IN THE MATTER OF BRUCE JOSEPH GERNON, P. Eng

DETERMINATION OF THE DISCIPLINE COMMITTEE

Date and Place of Hearing:	October 17, 2022 by video conference
Panel of the Discipline Committee (the "Panel")	Colin Smith, P. Eng., Chair Ed Bird, P.Eng. Alison Dennis
Counsel for Engineers and Geoscientists BC:	Andrew Gay, K.C.
For the Registrant:	Did not participate
Counsel for the Panel:	Susan Precious

Background

1. This panel of the Discipline Committee (the "Panel") of the Association of Professional Engineers and Geoscientists of the Province of British Columbia doing business as Engineers and Geoscientists BC was convened to conduct a hearing concerning Bruce Joseph Gernon, P.Eng. (the "Respondent") pursuant to section 75 of the *Professional Governance Act*, S.B.C. 2018 c. 47 (the "PGA").

2. A citation dated March 10, 2022 ("Citation") sets out the allegations against the Respondent. The particulars are:

From 2016 to 2018 you provided engineering services relating to a balcony guardrail system (the "Guardrail System") for residential buildings called [redacted] Apartments, located at [redacted], [redacted], [redacted] and [redacted], Burnaby, BC (the "Project"):

1. In the course of the Project, you did not conduct the necessary investigations or calculations for the design of the Guardrail System (the "Guardrail Design"). In particular, you failed to:

    a. perform the necessary calculations to verify the wind loads for the buildings located at [redacted] and [redacted];

    b. perform the necessary calculations to verify that the connectors between various elements, such as the welds, concrete fasteners, connectors between the post and the top rail, and connectors between the post and the bottom rail, had sufficient strength;

    c. investigate the existing site conditions to determine whether the building could accommodate the loads imposed by the guardrail system; and

    d. perform the necessary calculations to verify the capacity of the guardrails to withstand wind loads for the buildings located at [redacted] and [redacted].

2. In the alternative, you did not adequately document your structural investigations or calculations related to the Guardrail Design.

3. In the course of carrying out the Project, you were the engineer responsible for the Guardrail Design, which was deficient. In particular, you failed to:

    a. correctly calculate the allowable deflection limit for the glass panel deflection;

    b. correctly calculate the allowable deflection limit for the guardrail system;

    c. calculate the level of reliability for the guardrail glass infill panels for the buildings at [redacted] and [redacted];

    d. calculate the reliability for the bottom rail;

    e. meet the minimum level of reliability required by the BC Building Code in the heat-affected zone ("HAZ") for the vertical aluminium posts welded onto the base plate;

    f. meet the minimum level of reliability required by the BC Building Code for the anchorage for the base plates;

g. calculate the reliability for base plate thickness for the base plate and anchorage design;

h. use adequate spacing for the bolt holes for the base plate;

i. calculate the strength and reliability for the concrete anchors;

j. meet the minimum edge distance required by the BC Building Code for anchors; and

k. calculate the reliability of the endpost conditions or posts at handrail splice locations.

4. In the course of carrying out the Project, you prepared balcony guardrail shop drawings under your seal (the "Guardrail Drawings") which were deficient. In particular, the Guardrail Drawings failed to:

a. specify the applicable glass design standard;

b. specify the concrete design standard;

c. specify the connection detail between the end post and the bottom rail;

d. specify the details for the glass infill panel, including the required minimum glass bite, shape and type of gasket, the thickness and orientation of the channels, and the fastening of the channels to the post;

e. adequately specify the anchors;

f. specify the minimum embedment depth for the anchors;

g. specify the size of welds, including the weld between the post and the base plate; and

h. delineate the scope of work.

5. In the course of carrying out the Project, you failed to ensure that documented field reviews of the Guardrail System installation were conducted in connection with the building at [redacted].

6. In the course of carrying out the Project, you failed to ensure that sufficient documented field reviews of the Guardrail System installation were conducted in connection with the buildings at [redacted], [redacted], and [redacted].

7. In the course of carrying out the Project, you failed to ensure that documented independent structural reviews of the Guardrail Design were conducted.

8. The conduct set out above at paragraphs 1, 3, and 4 is unprofessional conduct, or in the alternative negligence, under s. 33(1) of the EGA and is contrary to Principle 1 of the Engineers and Geoscientists BC's Code of Ethics, as it stood at the time, which provided that members shall hold paramount the safety, health and welfare of the public, the protection of the environment and promote health and safety within the workplace.

9. The conduct set out above in paragraph 2 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(1) which provided:

> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
>
> > (1) retention of complete project documentation which may include, but is not limited to, correspondence, investigations, surveys, reports, data, background information, assessments, designs, specifications, field reviews, testing information, quality assurance documentation, and other engineering and geoscience documents for a minimum period of 10 years;

10. The conduct set out above in paragraphs 5 and 6 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(3) which provided:

> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
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> > …
> > (3) documented field reviews by, or under the direct supervision of, members or licensees, of their domestic projects during implementation or construction;

11. The conduct set out above in paragraph 7 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(4) which provided:

> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
>
> > …
> > (4) documented independent review of structural designs prior to construction by members or licensees having appropriate experience in designing structures of a similar

> type and scale, and not involved in preparing the design. The reviewer shall examine representative samples of the structural assumptions, continuity of gravity and lateral load paths, stability and detailing. Where appropriate, the reviewer shall perform numerical calculations on a sample of gravity and lateral force resisting elements necessary to satisfy any reviewer concerns. The extent of the review shall be determined by the reviewer based on the progressive findings of the review. This review and any follow up action must be completed before the documents are issued for construction.
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> The independent review of structural designs shall evaluate the construction documents to determine if the structural systems appear complete, consistent, and in general compliance with applicable codes. The structural review may be part of, but is not intended to replace, the regular checks required in 14(b)(2).
>
> Independent review of each instance of repetitive designs of individual structural components is not required, but documented initial independent review and independent review at intervals is required to confirm the maintenance of design quality.

3. For the reasons set out below, the Panel has found that Engineers and Geoscientists BC has proven all of the allegations in the Citation to the requisite standard.

Legal Framework

4. On February 5, 2021, the *Engineers and Geoscientists Act,* R.S.B.C. 1996, c. 116 ("EGA") was repealed and replaced by the PGA. The Citation was issued under the PGA. The Respondent's conduct that is at issue in the Citation occurred when the EGA was in force. In accordance with sections 35 and 36 of the *Interpretation Ac*t, R.S.B.C. 1996, c. 238, the substantive provisions of the EGA (and the Bylaws and Code of Ethics as they applied at that time) apply to this proceeding. This includes the EGA's charging provisions and penalty provisions (see *Re: Alireza (Danyal) Bahrami, P.Eng*., *Re: Thomas Lynn Trott, P.Eng*., *Re: Laura Fidel, P.Eng. (Penalty Decision)*).

5. Upon the PGA coming into force, the designation of all members was converted to that of registrants. The Respondent resigned as a registrant on May 19, 2022. The Panel retains jurisdiction. Both the EGA and the PGA provide that disciplinary

proceedings may be brought or continued against former registrants (see section 56 of the PGA and section 28 of the EGA).

6. Section 33(1) of the EGA authorizes the Discipline Committee to make determinations regarding a respondent's conduct:

> 33 (1) After an inquiry under section 32, the discipline committee may determine that the member, licensee or certificate holder […]
>
> (b) has contravened this Act or the bylaws or the code of ethics of the association, or
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> (c) has demonstrated incompetence, negligence or unprofessional conduct.

7. In order to make such a determination, this Panel must decide whether the Respondent failed to meet the standards of his profession or the requirements of the Bylaws and Code of Ethics. In *Salway v. Assn. of Professional Engineers and Geoscientists of British Columbia*, 2010 BCCA 94, the British Columbia Court of Appeal held that courts will show significant deference to disciplinary decisions of professional tribunals concerning the interpretation of their professional standards, regardless of whether those standards are written or unwritten, and that it is the disciplinary body of the professional organization that sets the professional standards for that organization. This reasoning in Salway has been repeatedly followed by many tribunals in British Columbia, including by a panel of the Discipline Committee of the Association in *Re: Ian Foreman P.Geo*. (August 25, 2015).

Legal Principles

Burden and Standard of Proof

8. Engineers and Geoscientists BC bears the burden of proof. The leading case of *F.H. v. McDougall*, 2008 SCC 53 confirmed that the standard of proof to be applied is on a "balance of probabilities". *R. v. Schoenborn*, 2010 BCSC 220 defined a "balance of probabilities" as follows:

> A party who has the burden of proof on an issue, on the balance of probabilities, must convince the court that what they assert is more probable than not, and that the balance is tipped in his or her favour. The evidence must be more convincing than the evidence on the other side. The person with the burden must show that what they assert is more probable than not

> (*F.H. v. McDougall*, 2008 SCC 53). If the evidence on an issue was evenly balanced so that the court is unable to say where the balance of probabilities lies, then the person who has the burden of proving it would have failed to do so. All of the evidence produced on that issue must be considered, no matter who has produced that evidence. In order to find that something has been proven on the balance of probabilities, it is not necessary for the jury or the trier of fact to be sure, but simply to find that the event to be proven is more probable than not or more likely than not.

Interpretation of the Citation

9. Engineers and Geoscientists BC is not required to prove the charge precisely as worded in the Citation. Rather, what must be proved are the matters alleged which are essential to a finding of unprofessional conduct or negligence. In *Ratsoy v. Architectural Institute of British Columbia*, 1980 CanLII 662, an architect was alleged to have violated a zoning bylaw but was found by the discipline committee to have violated a building bylaw. The court held that the notice received by the petitioner was adequate to "alert him both to the nature of the factual allegations made against him and the provisions of the Act and by-laws which he was alleged, and ultimately found, to have breached."

10. Similarly, in G*olomb and College of Physicians and Surgeons of Ontario*, (1976), 12 O.R. (2d) 73, the court held:

> In cases of this type, no one would suggest that an allegation of professional misconduct need have that degree of precision that is required in a criminal prosecution. But the charge must allege conduct which if proved could amount to professional misconduct and it must give the person charged reasonable notice of the allegations that are made against him so that he may fully and adequately defend himself. This proposition has been stated by many authorities…

11. In *Bartel v. Manitoba (Securities Commission)* (2003), 173 Man. R. (2d) 43 (C.A.), a real estate agent was disciplined for, amongst other things, publishing a "feature sheet" without the instructions of his client, the content of which was misleading. The feature sheet was not mentioned in the charging document. The Court of Appeal held that:

> The statement of allegations provided considerable detail to the applicant of the allegations against him and the underlying factual basis. It is true that the statement of allegations does not make specific reference to the feature sheet, but

> that is not fatal if there was fair disclosure to the applicant to enable him to address this specific factual circumstance. As noted previously, the applicant had ample opportunity to respond to the evidence presented by the staff for the Commission.

12. Engineers and Geoscientists BC submits that these authorities are relevant for two reasons. First, the Citation sets out numerous particulars of the Respondent's alleged unprofessional conduct and negligence. If one of those particulars is not proved, this does not preclude a finding of unprofessional conduct or negligence in relation to the others or in general. Second, at paragraph 1 of the Citation, Engineers and Geoscientists BC asserts that the Respondent did not conduct the necessary calculations for the design of the Guardrail System. Four particulars are set out. If the Panel finds that not only did the Respondent prepare no calculations relating to the matters that are particularized, but prepared no calculations at all, the Panel may make this finding and hold that this constituted unprofessional conduct or negligence. Engineers and Geoscientists BC submits this finding is available to the Panel because the Respondent has been provided with fair notice that the allegation against him is that he failed to conduct the necessary calculations for the design of the Guardrail System. The Panel agrees with Engineers and Geoscientists BC's submission in both respects.

Unprofessional Conduct

13. In *Salway*, the Court of Appeal clarified that older cases requiring proof of conduct that is "dishonourable, disgraceful, blatant or cavalier" no longer govern allegations of unprofessional conduct. Rather, it is for the Panel to decide on the appropriate standards of professionalism for members of the profession:

> [32] The reasonableness standard of review acknowledges that there is "a range of possible, acceptable outcomes which are defensible in respect of the facts and law". Reasonableness requires courts to give deference to a professional body's interpretation of its own professional standards so long as it is justified, transparent and intelligible. The pre-Dunsmuir decisions relied on by the respondent, including Reddoch, no longer set the standard for professional misconduct as conduct that is dishonourable, disgraceful, blatant or cavalier. Rather, it is the disciplinary body of the professional organization that sets the professional standards for that organization. So long as its decision is within the range of reasonable outcomes—i.e., it is justified, transparent and intelligible—it is not for courts to substitute their view of whether a member's conduct amounts to professional misconduct.

14. Engineers and Geoscientists BC relies upon the following definition of "unprofessional conduct" set out in *Re Foreman* (August 25, 2015), a decision of Engineers and Geoscientists BC's Discipline Committee, noting that this has been consistently adopted and applied by panels of the Discipline Committee, including in *Re: Eric Chrysanthous, P.Eng.* (May 17, 2017), and *Re Laura Fidel, P.Eng.* (July 12, 2021):

> [93] The Association's Code of Ethics Guidelines addresses the standard of professional conduct as follows:
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> > *"The APEGBC Code of Ethics serves several purposes. It designates the standard of conduct expected of engineers and geoscientists in easily understandable terms. It distinguishes appropriate professional conduct from that which fails to meet a required standard. The Code also provides a basis on which allegations of unprofessional conduct are adjudicated by the Discipline Committee or other groups charged with responsibilities related to the conduct of members."*
>
> [94] Hence, unprofessional conduct is that which does not meet the standard expected through application of the Code of Ethics. The Panel accepts the submission of the Association, based on *Law Society of British Columbia v. Martin*, 2005 LSBC 16, that professional misconduct is established when there is a marked departure from the standard to be expected of a competent professional, and that minor or inadvertent failure to comply with professional standards does not constitute unprofessional conduct.

15. In *Familamiri v. The Association of Professional Engineers and Geoscientists of British Columbia*, 2004 BCSC 660, the court was asked to set aside a decision of a panel of the Discipline Committee which found the engineer to have engaged in unprofessional conduct. The court upheld the panel's decision. The panel found unprofessional conduct on the basis that the engineer had taken a "rough and ready" approach to the design, had failed to show details in the design, had failed to note that part of the design was incomplete, and had made arbitrary choices as to when to calculate the loads and when to use the tables in the Building Code. The panel further held at paragraph 77: "Professional engineers are held to a high standard of responsibility and professional practice…" The court upheld these findings. The court did not apply any specific definition of "unprofessional conduct" but noted that the panel had considered the content of the Building Code and the "general obligations incumbent on all engineer professionals" (paragraph 78).

16. There is no definition of “unprofessional conduct” in the EGA. The Panel recognizes that in assessing whether conduct is unprofessional, it must use its own judgment and expertise, should be guided by the content of the Code of Ethics, and should focus on what should be expected of a professional person in the circumstances. Engineering standards should be considered but those standards are not determinative. The Panel also recognizes that part of the assessment is whether there has been a marked departure from the standard to be expected of a competent professional. A minor or inadvertent failure to comply with professional standards does not constitute unprofessional conduct. The Panel considers that standards of professionalism are not required to be written down. Consistent with the approach in *Salway*, it is open to the Panel to draw upon its own professional experience and common sense in assessing whether a member has acted unprofessionally.

17. Engineers and Geoscientists BC submits that where the engineering work involves risk to human life, as with balcony guardrails, the standard of professionalism expected of members is high, as reflected in the language of the Code of Ethics. The Panel agrees.

Negligence

18. *Re Foreman* set out the following definition of “negligence” which has been repeatedly cited by past panels of the Discipline Committee and which this panel also finds to be useful:

> [97] For the purpose of considering whether a member’s conduct is negligent within the meaning of s. 33(1)(c) of the Act, the Panel was referred to *Davidson v. British Columbia, [1995] B.C.J. No. 1806*, in which the following definition of negligence has been relied upon:
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> > *“ … the standard of skill and care which a professional man is required to exercise may be defined as follows: that degree of skill and care which is ordinarily exercised by reasonably competent members of the profession, who have the same rank and profess the same specialization (if any) as the defendant. If the standard is formulated in this way, it is fair to both parties. The professional man will not be held liable in the absence of personal fault on his part. The client is adequately protected, because it is normally actionable negligence if a professional man undertakes work beyond his competence.”*

19. *Re Fidel* confirmed that it is not necessary to prove that an engineer's conduct caused damage in order to prove negligence.

The Code of Ethics

20. The Code of Ethics can inform whether a member engaged in unprofessional conduct. Section 22 of the EGA also makes the contravention of the Code of Ethics a separate ground for penalizing a member.

21. Paragraph 8 of the Citation alleges that the Respondent violated Principle 1 of the Code of Ethics which provided at the time that a member must "hold paramount the safety, health and welfare of the public, the protection of the environment and promote health and safety within the workplace."

22. Engineers and Geoscientists BC submits that Code of Ethics provisions are not technical provisions and should not be read to contain legal terms of art. Provisions in the Code of Ethics should be given their ordinary meaning and the Panel must bring its own experience in assessing whether the Respondent has violated the Principle 1. The Panel agrees with this approach.

Guidelines

23. Guidelines of a professional's regulatory body can help establish the expected standard of conduct for that professional. While proof that the Respondent did not comply with an Engineers and Geoscientists BC guideline does not necessarily establish negligence or unprofessional conduct, it may be strong evidence of negligence or unprofessional conduct.

Multiple determinations available

24. In *Re Fidel*, the Discipline Committee held that where the same conduct could result in multiple determinations, it is preferable to make a singular determination about each allegation and not characterize the conduct as meeting two or more types of conduct:

> 121. Having reviewed the structure of the Act and considering the various terms used in section 33 of the Act, the Panel has concluded that the preferred approach in these circumstances, where allegations in a Notice of Inquiry could result in a variety of findings under the Act, is for the discipline panel to make a singular

> determination about each issue and to not characterize the conduct as meeting two types of conduct set out in section 33. There are gradations of culpability as between the various terms and a discipline panel should reach a conclusion as to the most serious finding that is appropriate on the given evidence.
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> …
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> 123. A course of professional conduct may be seen to be an act of negligence by a professional. However, if there are elements of the conduct that also invoke a consideration of the Code or the ethical standards of the profession, or where the conduct at issue can be said to be a marked departure, then such conduct might properly be said to rise to the level where it is better viewed as being an instance of unprofessional conduct. If that was the case, the Panel has determined that the best course would be to make a finding of unprofessional conduct only.

25. In this case, Engineers and Geoscientists BC submits that the appropriate determination is to find that the Respondent engaged in unprofessional conduct.

Evidence

26. Engineers and Geoscientists BC called two witnesses: Joanne Wilson, an investigator with Engineers and Geoscientists BC, and Leonard Pianalto, P.Eng., who was qualified by the Panel as an expert.

27. As noted above, the Respondent did not participate in the Discipline Hearing.

28. The Respondent was a registered as a member of Engineers and Geoscientists BC on December 12, 1990. He resigned his registration on May 19, 2022.

29. The Respondent holds a Bachelor of Science in Civil Engineering and a Master of Science in Ocean Engineering. The Respondent's background is in the offshore oil business and the wood industry. He has experience as a wood truss engineer relating to farm buildings. In his interview, the Respondent stated that as a consultant he did a wide variety of engineering work, including in relation to guardrails. In his interview by Ms. Wilson and the Investigation Subcommittee on May 17, 2021, he stated that he had been involved with hundreds of guardrail designs in the past.

30. The Respondent worked for a firm named KNH Engineering. He was a contractor with KNH.

31. In the matter before the panel, the Respondent provided guardrail engineering services in relation to four buildings in Burnaby, British Columbia:

    a. [redacted] – 24 storeys;

    b. [redacted] – 8 storeys;

    c. [redacted] – 8 storeys; and

    d. [redacted] (incorrectly referred to as [redacted] in some of the materials) – 24 storeys

    Collectively, "the Projects"

32. On July 28, 2020, Ms. Wilson notified the Respondent of the investigation. She requested his response to the complaint and a copy of his complete file for the Projects. Ms. Wilson attached the drawings signed and sealed by the Respondent pertaining to the Projects and a number of the Building Code schedules pertaining thereto, also signed by him, which Ms. Wilson had obtained in another investigation.

33. On August 10, 2020, the Respondent answered Ms. Wilson and provided a copy of his file for the Projects.

34. As noted above, the Respondent was interviewed by Ms. Wilson and the Investigation Subcommittee on May 17, 2021. A transcript of that interview was introduced into evidence.

35. The Respondent confirmed in the interview that the material provided with his letter dated August 10, 2020 to Ms. Wilson constituted his complete file. Subsequently, the Respondent provided additional documents.

36. The Respondent's file contained calculations. Those calculations are not dated. In his interview, the Respondent confirmed that the calculations were not prepared prior to the installation of the Guardrail System but were prepared after Engineers and Geoscientists BC requested them.

37. The Respondent stated in the interview that he was not aware that [redacted] was a 24-storey building. He acknowledged that he initially only provided calculations to Engineers and Geoscientists BC for an 8-storey building. The

Respondent also acknowledged that would mean the wind load would be significantly different than what he assumed. The drawings of the two buildings show 24 storeys.

38. One of the undated calculations provided by the Respondent to Engineers and Geoscientists BC after his interview is a wind load calculation for a 24-storey building.

39. In the interview, the Respondent stated that the manufacturers of the guardrails generated shop drawings which were sent to KNH Engineering's office. They would be assigned to one person and that person would handle the design work. In this case, the drawings were assigned to the Respondent as engineer. The Respondent stated that he received one to two pages of documents from the manufacturer, showing the layout and the typical floors of the building.

40. The Respondent was asked in the interview what his next steps were following receipt of the one-to-two-page document from the manufacturer. He responded:

> I will either Google the address for the project. The project will usually come back and say, 15-storey project located at such and such. Or I may have some conceptual drawings that appear on the website for it. Otherwise, I go back to the manufacturer and ask them how high the building is.

41. During the interview, the Respondent addressed the absence of important information in the drawings, suggesting that the responsibility for any inadequacy fell to the manufacturer.

> R. KEVESDI: Are you aware if the glass was tri-glazed with neoprene or EPDM gasket or were glazed with structural silicone?
>
> THE WITNESS: I'm not aware.
>
> R. KEVESDI: In your opinion, why is it necessary to provide a sufficient glass bite during the installation?
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> THE WITNESS: Well, we're dealing with glass, and glass is not a terribly predictable member to begin with. So if you get anything on the edges, it will actually crack the glass. So I would assume that by using -- when you're setting the glass into place, there needs to be a cushion because you're dealing with two different materials: the glass and then the aluminum. If I have any -- a piece of sand pops in through there while they're doing it, you can better believe that that glass panel would be compromised.

R. KEVESDI: What I'm talking is about the glazing bite into the glazing pocket. So I'm not talking about the gaskets. But the top and the bottom channel, they have some sort of pocket there so the glass can extend into the pocket quarter inch, half inch, three quarters of an inch. So do you think it's necessary to provide a sufficient glass bite?

THE WITNESS: If you don't have it, then in a high-wind situation, you could have the glass panel, if it deflects a lot under that, pop out.

R. KEVESDI: That's correct. But nothing is specified on the drawings what is the minimum glass bite that is required.

THE WITNESS: No. It's not on the drawings.

R. KEVESDI: So where would --

THE WITNESS: Each -- each manufacturer -- basically, they -- they want to stay in business. That's what -- they want to make sure that they're putting in a good product, and the onus falls onto them. If there's an issue -- and we've been called to job sites where there has been an issue. The issue is usually addressed. I'm not going to say anything more than that. I don't know how much information we can actually technically put on these drawings.

R. KEVESDI: All that is necessary for the safety of a guardrail system.

THE WITNESS: Point made.

42. Similarly, in the interview, the Respondent addressed whether the drawings were prepared under his coordination and instruction:

R. KEVESDI: But for this project, had the shop drawings been prepared by Spectrum under your coordination and instruction?

THE WITNESS: Spectrum knows pretty much what they're doing. I'm not sitting over at Spectrum's office to be verifying stuff. I know their work. I know their quality of stuff. They send something over, unless it's sitting out in left field, I'm not going to nix. I've looked at it. It makes sense. We've done it before. I would have to say on this project, I don't see anything that's out of the ordinary that would have required having consultations about some standard details because they're standard details.

R. KEVESDI: But you are the one who has to tell them what the details should be, what the anchorage details should be, what the material cross-section properly should be for the project. It's not just up to them.

THE WITNESS: I know. But if they've been in business for 20 years, they obviously know a little bit about what they've been doing because they haven't had callbacks with problems or anything else. It's the manufacturers that tend to expand the envelope that usually have issues. All of these guys are really good. We're keeping things at around 4 feet on centre. I'm happy with that. What I'm not happy with is the guys that go 5, 6, 7 feet between posts. There's an issue there. I won't deal with those customers.

> R. KEVESDI: But you still have two very different building types, one high-rise and one low-rise, and using exactly the same system everywhere. And your calculations were provided only for the low-rise and the --
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> THE WITNESS: Right.
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> R. KEVESDI: -- calculation was not done -- not accurate for the -- for the strength of the guardrail posts. So how can you -- how can you -- you will not see the -- that maybe there could be some issues on the high-rise?
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> THE WITNESS: I feel pretty comfortable with my work. You're making good questions. I don't mind looking at this stuff. But, you know, this is -- it's kind of normal. If my overall procedure is incorrect, okay, so be it. You want me out of the business of guardrail design? Let me know. I'll get out. But I think what I've been doing, I -- when I'm working on stuff, I feel pretty comfortable with it. I don't mind learning new things or getting different perspectives. And you guys have brought up some good points today. But if you really don't want me to do guardrails, come out and tell me.

43. In the interview, the Respondent addressed two third-party testing reports which he supplied to Engineers and Geoscientists BC. The first report was of testing on a post containing an internal stiffener. The Respondent explained that the second testing report was prepared after he concluded the work on the Projects and because he was aware of the complaint against him.

44. The Respondent confirmed in the interview that no stiffener was used on the Projects.

45. During the interview, the Respondent provided the following answers regarding parts of the Building Code related to guardrail design:

> R. KEVESDI: -- where I'm getting is that in the Building Code and also in the glass -- in the guardrail design standard of the association, they refer to the objectives, and they have structural objectives, and they have safety objectives in the Building Code that you must comply with. And if we go down on the page, so there is OS3.1. And it's -- it is telling you what needs to be considered during the design of the specific component -- in this case, the glass or the infill panel. So tell me, please, if the 6-millimetre tempered glass -- how does it comply with this objective? Can you read it?
>
> THE WITNESS: Oh, I can read it. And then this is the first time I've actually seen this, quite honestly. So when I'm designing the glass, I'm only designing it for the wind load or the infill load. That's it. So tripping, slipping, falling, no.
>
> R. KEVESDI: No. But under the Building Code, so every statement in the Building Code has its objective stated, and this is one of them that needs to be considered. So you are -- you -- first time you are seeing this? That's --
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> THE WITNESS: Yes.

R. KEVESDI: -- your response?

THE WITNESS: That's correct. If I slip into the glass, gee, that's kind of -- might as well put the 225-pound load in the middle of the glass.

R. KEVESDI: No. It's saying how you protect the safety of the -- how you reduce the probability of injury to the occupants of the building and the person located nearby. That's what it is about.

THE WITNESS: Okay.

R. KEVESDI: But -- okay. So you haven't considered that?

THE WITNESS: I haven't considered this, no.

46. The documents before the Panel indicate that the Respondent signed and sealed the Building Code Schedules for the Projects as follows:

Address	Schedule B	Schedule C-B
[redacted]	June 19, 2017	None
[redacted]	April 3, 2017	April 26, 2017 February 15, 2018
[redacted]	October 14, 2016	February 15, 2017
[redacted]	June 19, 2017	July 20, 2017 August 30, 2017 April 19, 2018

47. The Schedule C-B assurances required the Respondent to, amongst other things, give assurance that he has “fulfilled [his] obligations for field review as outlined in Subsection 2.2.7, Division C of the British Columbia Building Code and in the previously submitted Schedule B, "ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW"”.

48. The Respondent was asked in his interview whether he completed field reviews for the Projects. He replied, “personally I don’t”. The Respondent stated that the firm KNH Engineering employs field inspectors who perform field reviews.

49. When the Respondent provided his complete files in response to requests from Ms. Wilson, he produced an inspection report for each of [redacted]; [redacted]; and [redacted]. The inspection report for [redacted] is dated November 8, 2017, after the Schedule C-B signed by the Respondent. The inspection report for [redacted] is dated the day before the first of two Schedule C-Bs signed by the Respondent. The inspection report for [redacted] is dated the day after the Respondent signed and sealed the first Schedule C-B.

50. There is no evidence of an inspection report in relation to [redacted]. There is no evidence as to the Respondent ensuring that any field reviews were conducted at [redacted] or that those were documented.

51. Mr. Pianalto was qualified as an expert by the Panel to provide opinion evidence on structural design and restoration of commercial and residential buildings with a specialization in structural glass design and guards. Mr. Pianalto prepared an expert report dated August 16, 2022 and a supplementary report dated October 7, 2022. Mr. Pianalto also testified at the hearing.

52. Mr. Pianalto holds Bachelor and Master’s Degrees in Civil Engineering. He is the Managing Principal of the Building Science and Restoration Team at Read Jones Christoffersen Engineers. Mr. Pianalto is the former chair of the Professional Practice Committee of the Structural Engineers Association of BC. He was the principal author of Engineers and Geoscientists BC’s guideline D*esigning Guards for Buildings (2013)*.

53. Mr. Pianalto gave detailed evidence regarding the following deficiencies in the Respondent’s design process:

> (a) the Respondent did not obtain necessary information about the building to which the guardrail system would be affixed;

(b) the Respondent failed to perform necessary calculations;

(c) the Respondent performed some calculations incorrectly;

(d) the Respondent's drawings lack important detail, including overall dimensions of the guardrail system and dimensions such as the shape of the top rail and the size of the glass bite; and

(e) There is disconnect between the drawings and the calculations.

Analysis

Allegation 1

From 2016 to 2018 you provided engineering services relating to a balcony guardrail system (the "Guardrail System") for residential buildings called the [redacted] Apartments, located at [redacted], [redacted], [redacted] and [redacted], Burnaby, BC (the "Project"):

1. In the course of the Project, you did not conduct the necessary investigations or calculations for the design of the Guardrail System (the "Guardrail Design"). In particular, you failed to:

    a. perform the necessary calculations to verify the wind loads for the buildings located at [redacted] and [redacted];

    b. perform the necessary calculations to verify that the connectors between various elements, such as the welds, concrete fasteners, connectors between the post and the top rail, and connectors between the post and the bottom rail, had sufficient strength;

    c. investigate the existing site conditions to determine whether the building could accommodate the loads imposed by the guardrail system; and

    d. perform the necessary calculations to verify the capacity of the guardrails to withstand wind loads for the buildings located at [redacted] and [redacted].

54. The allegations at paragraph 1 of the Citation involve the investigations and calculations work that an engineer should perform in relation to guardrail system design.

55. The evidence before the Panel indicates that the Respondent performed no investigations in relation to the design of the guardrail system for the Projects. The Respondent acknowledged to Engineers and Geoscientists BC that he was unaware there was a 24-storey building. Moreover, he failed to account for design aspects such as concrete slab thicknesses where guardrails are to be installed.

56. The Panel finds based upon the evidence before it that the Respondent performed no investigations or calculations prior to signing and sealing the drawings for the Projects nor did the Respondent provide any contemporaneous calculations. The Respondent admitted that the calculations that he did provide were prepared after the fact.

57. In his "opinion 1.0" of his expert report, Mr. Pianalto outlined the steps that a reasonably prudent practising structural engineer would be expected to undertake with respect to investigations and calculations prior to preparing drawings for a guardrail system:

> In my opinion, the steps a reasonably prudent engineer practicing structural engineering would be expected to undertake in regard to assessments, investigations, and/or calculations prior to designing and preparing drawings for the Guardrail System in the given circumstances would be to follow the professional practice guideline Designing Guards for Building Projects published by Engineers and Geoscientists British Columbia (EGBC) on December 11, 2018. In my opinion, this guide sets out the standard of practice for engineers involved in guard designs including the work of Mr. Gernon which was primarily conducted in 2017. Section 1.4 of this document outlines the scope of the guideline, as follows:
>
> *"These guidelines apply to the practice of structural engineering as related to Guard Design for buildings. They summarize the standard of practice for a Specialty Structural Engineer when preparing drawings and specifications in the design and implementation of guards used in buildings."*
>
> In my opinion, Mr. Gernon, in carrying out the project, was acting as the Specialty Structural Engineer and ought to have followed the practice guideline referenced above. This guide states that the Specialty Structural Engineer must:
>
> > 1) Develop a scope of work for the required designs, specifications, and field reviews for the guard as well as the connections.
> >
> > 2) Liaise with the appropriate registered professionals for the required services.
> >
> > 3) Be aware of and adhere to the codes and standards applicable to guard design.
> >
> > 4) Consider the following with respect to the design of guards:

a) Where guards are required

b) Dimensional Requirements

c) Strength design including load path to the primary structure

d) Serviceability (deflection, graspability, climbability)

e) Relationship to the building enclosure

f) Aesthetics

g) When designing with aluminum, the loss of temper and associated reduction in strength of any welded connection

5) Design guards for all relevant load combinations, importance factors, and companion loads. In particular, the design load for guards is considered to be a Live Load according to the British Columbia Building Code (BCBC), therefore, wind loads must be considered in combination with guard live loads in the design of guards.

6) Carefully and clearly define their scope of work when preparing shop drawings to ensure connecting elements are suitable for the completed system. Shop drawings should also include general notes indicating materials used, design codes referenced, and a description of the scope of work.

7) Provide reaction loads, particularly if it is known that another engineer is responsible for the base building.

58. In his supplementary letter dated October 7, 2022, Mr. Pianalto stated that there were no substantive changes from the May 3, 2013 edition of the guide regarding the general practice of structural engineering as related to guard design for buildings.

59. In “opinion 2.0” of his expert report, Mr. Pianalto specifically addresses the assessments, investigations and calculations that would need to be undertaken in respect of the four particulars identified in paragraph 1(a) to (d) of the Citation:

> The following is my opinion on the particular assessments, investigations, or calculations that would need to be undertaken in addition to those presented in Opinion 1.
>
> 1) To verify wind loads, the procedure outlined in the BCBC ought to have been followed to determine the governing wind loads acting on the balcony rails. Design wind loads are influenced by the height of the building where generally, wind loads increase with the height of the building. The building located at [redacted] is 8 stories tall, whereas the building at [redacted] is 24 stories tall.
>
> 2) To verify the sufficiency of the strength of the connectors between components within the guardrail system, the following process ought to have been followed:

a) Calculate the applied loads (including wind loads) and load combinations acting on the guard.

b) Determine and follow the load path through each connection and ensure that the factored loads do not exceed the factored resistance of each connection and at every connection point.

c) Review and incorporate into the design, Limit State Design standards for each material used including the following:

i. For Aluminum: CSA S157

ii. For Glass: CGSB 12.20 and/or ASTM E1300

iii. For Concrete: CSA A23.3

iv. For Steel: CSA S16

v. For Guards: CSA A500

These standards are referenced in the BCBC and must be adhered to in the design of any structural element in a building. Limit States Design refers to a structural design method that must be followed in order to meet the minimum reliability requirements set out in the BCBC. The Limit States Design method is based on a probabilistic approach to determining material behavior (e.g. strength of aluminum, glass, etc.) and environmental loading (e.g. from wind, snow, earthquakes, etc.). It is intended to establish harmonized performance and reliability criteria for structures designed and built in British Columbia.

3) In my opinion, investigations into the existing site conditions to determine whether the building could accommodate the loads imposed by the guardrail system ought to have been completed. In the file materials that have been provided to me there is nothing to indicate that this information has been provided by another reliable source (i.e. the structural engineer of record for the project or the architect). In my opinion, the investigations should have included the following:

a) Verification of concrete strength through testing or review of the original base building design information.

b) Measurement of slab thicknesses where guardrails are to be installed, as this is often the governing design factor in determining the strength of post installed concrete anchors.

c) Measurement of the general layout of the balconies to ensure that the position of the railing posts and base plates could be placed to provide the required edge distance for concrete anchors.

4) In my opinion, to verify the capacity of the guardrails to withstand the wind loads for the buildings located at [redacted] and [redacted], the load combinations as described in point 2.2.a ought to have been compared against the sufficiency of strength of each component of the guard as described in point 2.2.b and 2.2.c. In my opinion, this is the general practice of specialty structural engineering in British Columbia whereby environmental loads are calculated and compared against the calculated strength of each component along the load path starting at the point of application of the load (i.e. person pushing on the railing of a guard) through the assembly and ending at the point of connection to the building.

60. In “opinion 3.0” of his expert report, Mr. Pianalto provided the opinion that the Respondent did not conduct the necessary assessments, investigations, or calculations preparatory to the design of the Projects’ guardrail system. Mr. Pianalto addresses each of the alleged failures particularized in paragraph 1(a) to (d) of the Citation. Mr. Pianalto provided his opinion as if the calculations the Respondent provided to Engineers and Geoscientists BC were prepared contemporaneously. Mr. Pianalto expressed the opinion that:

> 1) In terms of the necessary assessments and investigations that ought to have been conducted, I refer to TAB 6, page 47 of the transcript where Mr. Gernon states the following related to the information that was made available to him and used for his design of the guardrail system: “…. in this particular case, I think I’ve got one or two pages. That’s pretty much it. It just shows the layout. Typical floors. That’s pretty much it.” This quote indicates that there was very little information provided to Mr. Gernon regarding the condition of the existing building. In addition, I have reviewed the information provided in Schedule B comprised of the instruction letter from Gudmundseth Mickelson dated July 20, 2022 and I could not find any information regarding the existing buildings other than photos (see Tab 7). As such, the only way to obtain this information would have been to visit the site and conduct assessments and investigations as described in point 2.3 above. There is nothing in Mr. Gernon’s file to indicate that he conducted the required assessments or investigations. In my opinion, Mr. Gernon failed to conduct the necessary assessments and investigations in order to have sufficient information to undertake the design.
>
> 2) In terms of the necessary calculations that ought to have been conducted, I reviewed the calculation spreadsheets that were presented by Mr. Gernon in Tab 1 and Tab 7 of Schedule B. In Tab 1, the calculations are not dated but appear to be attached to a letter prepared by Mr. Gernon dated August 10, 2020. In Tab 7, the calculations are dated June 8, 2021. The calculation pages were not dated, therefore, the dates they were performed could not be verified. However, for the purpose of my review this fact is irrelevant because my comments and conclusions are not dependent on when they were performed. The following items were presented in Mr. Gernon’s calculation spreadsheets:
>
> > a) A wind load calculation for free standing walls based on the BCBC for a 70 ft. tall building which would generally correspond to a 7 or 8 storey building was completed and found at Tab 1. Another wind load calculation was found at Tab 7E for a 230 ft. tall building which would generally correspond to a 23 or 24 storey building. In my opinion, the guardrail assemblies are aptly treated as free standing walls. When calculating wind loads on such free standing walls, the magnitude of the wind load is generally proportional to the aspect ratio of the wall (i.e. a long skinny wall will experience a higher wind load than a shorter more squat wall). In both calculations, found at Tab 1 and Tab 7E, the aspect ratio used is the same at approximately 31 ft long to 3.25 ft tall, however, the drawings found at Tab 2 and Tab 7 suggest that the aspect ratio of the guardrails at each of

the buildings are not the same and the guardrail is shown to be 3.5 ft tall (not 3.25 ft.). Note that, the overall dimensions of the guardrails are not indicated on the drawings so it is not possible to verify the wind load calculations, however, the wind load calculations appear to be incorrect since the wrong height was used.

b) Glass strength and deflection calculations based on CAN/CGSB 12.20 for tempered glass are found at Tab 1 and Tab 7. The calculation includes inputs for the wind load, however, does not appear to account for guard loads. In addition, the results are tabulated for different glass thicknesses but do not indicate what glass thickness is used in the final design and do not indicate if said glass is sufficiently strong. Finally, in my opinion, the calculations are incorrect as the un-factored strength of the glass used in the calculations is 25 MPa which corresponds to glass away from edges, however, the governing condition for the project would be the strength of glass at the edges which has an unfactored strength of 20 MPa. As such, the resulting calculation of the factored, or useable strength of glass is overestimated by 25%.

c) An aluminum strength check of the top rail based on the code defined guard loads is found at Tab 1. The calculation does not appear to account for load combinations which ought to include wind load effects. In addition, the strength calculation of the aluminum railing appears to be based on a crosssectional shape which appears to be different than the actual shape shown on the drawings. Note however, that the drawings do not show dimensions and thicknesses of the top rail. In my opinion, such dimensions are required on drawings that have been stamped by a structural engineer because the builder would need this information in order to know what material to use to construct the guardrail.

In particular, this standard requires that the “classification of members in bending (see P24 Feb 2005)” be checked in order to determine the failure mode of the member and its useable resistance according to the code. However, there is no such calculation provided in the spreadsheet.

d) An aluminum strength check of the guard post that is not complete according to the procedures set out in CSA S157. Similar to Item 3.2c) above, there is no reference to a check of the classification of the member in bending. Additionally, there is a check of the heat affected zone (i.e. adjacent to the weld) at the base of the guard post that indicates that the post is overstressed by 30% when compared to Mr. Gernon’s calculated maximum applied load. However, the maximum applied load does not appear to be calculated accurately as it does not appear to include the combined effects of wind and guard loads, and there is an “LPF” reduction factor which does not appear to be defined elsewhere in the calculations. As such, I estimate that the post in the heat affected zone near the weld at the base plate to be overstressed by approximately 2.7 times in the worst case scenario (i.e. at the upper floor balcony in the Tower) based on my own independent and abbreviated calculations (Refer to Schedule C).

e) There is a check of the concrete anchors which does not conform to the procedures set out in CSA A23.3 – Annex D as the bolts are too close to the edge of the concrete. Using a commercially available software package created by the manufacturer of the concrete anchors specified in Mr. Gernon's calculations, and by making adjustments to meet minimum edge distances in order to produce a result, I found the pull out resistance of a single concrete anchor to be 1,452 lbs (Refer to Schedule C). Mr. Gernon's calculations indicates the pull out strength of a single concrete anchor is 2,440 lbs (refer to Tab 1 and Tab 7). In my opinion, Mr. Gernon's result is not correct since it is 1.7 times greater than the result I obtained from the commercially available software produced by the concrete anchor manufacturer. In my opinion, this is an accepted method for determining the strength of a concrete anchor. Additionally, the calculation shown to determine the capacity of the connection does not make sense since the resisting moment of the bolt was added to the resisting moment of the baseplate to produce the overall moment resistance of the guard post connection. This is not correct since the weaker of the two resistances will govern; adding the two resistances produces an unrealistic result, and over estimates the strength of the connection.

f) Test reports (Tab 1 and Tab 5) completed for sample guard assemblies do not appear to conform to the items in the drawings (Tab 2 and Tab 7). For example, in the test report dated April 18, 2019 (Tab 1), there is a stiffener plate that can be seen in the photos, however, there are no such stiffeners indicated on the project drawings. Another example, in the test report dated January 12, 2021 (Tab 5), there are three posts spaced at 4'-4"(Tab 5), however, in the project drawings (Tab 1 and Tab 7) there are typically more than three posts in a row and they are spaced at 41-5/16".

g) In the June 8, 2021 calculations (TAB 7E), there appears to be an additional wind load cited for a 24 storey building. These revised calculations indicate that the post is overstressed by a factor of 2.4 in the heat affected zone near the weld at the base of the post. In Mr. Gernon's letter of August 10, 2020, as well as in the notes of his June 8, 2021 calculations, he puts forward an argument that the strength of aluminum in the heat affected zone as defined in the aluminum code (CSA S157) is overly conservative and not reflective of the actual in service performance as demonstrated by the testing. Mr. Gernon also refers to two additional publications by the US Army Corp of Engineers (1994) as well as Brian McCaffrey, PE (2013) to support his argument regarding the heat affected zones. However, both publications speak to the effects of welding resulting in a loss of temper and consequential loss of strength in the aluminum that must be considered in the design of such railings (Page A-2 and A-3 of US Army Corp of Engineers and Page 10 of McCaffrey). In the information provided, there is no indication that Mr. Gernon considered the reduced strength of the aluminum in the heat affected zone in determining the strength of the posts specified on this project.

3) In my opinion the calculations discussed in Section 3.2 above are both incorrect and incomplete. The errors, which I have commented on in points 3.2 a) through g) above are summarized as follows:

1) Load calculations are incomplete and do not appear to account for all load cases and combinations as would be required by the BCBC.

2) The effect of welds which reduce the strength of aluminum were not properly accounted for. In my opinion, the resulting strength loss on welded tempered aluminum ought to be well known to a structural engineer.

3) The reliance on testing seems misguided given that the test samples do not appear to be
representative of the assemblies shown on the drawings.

4) The calculated strength of the post and top rail are not completed in accordance with CSA S157. For members that are subjected to bending stresses such as those that would occur at the base of a vertical post subjected to a lateral load there may be a number of different failure modes including: tension rupture, localized buckling, or compression rupture. The determination of the failure mode is not presented in the calculations.

5) The base plate fastener calculations are not correct and the fastener type referenced in the calculations are not consistent with the type of fastener shown on the drawings (refer to Tab 1, Tab 5, and Tab 7). The drawings call up a “wedge bolt” while the calculations refer to a “Kwik bolt”. In my opinion, Mr. Gernon ought to have made sure the products specified on the drawings matched or were equivalent to those referenced in his calculations.

6) The bottom rail has not been properly checked for its adequacy to support the weight of the glass panel. The calculations found at Tab 7G show that Mr. Gernon has used a distributed load to represent the effect of the weight of the glass panel. However, in my opinion, the standard of practice in the fabrication of glass structures would dictate that the glass panels be supported at 2 discrete points some distance away from the ends. This produces a different stress distribution in the support member. Treating the load from the glass as a distributed load is incorrect. Additionally, the support points are not shown on the drawings, therefore, it would not be possible to accurately estimate the stress distribution in the support member and there would be no way of verifying if it was installed properly. Finally, the shape that was used to calculate the section property of the bottom rail was shown as a custom extruded H-shape (Tab 7F). This is different than the shape identified on the drawings which is called up as a “1-1/2” x 1-1/4” bottom channel”. In addition, there were a number of omissions in the calculations prepared by Mr. Gernon (Tab 1 and Tab 7) that in my opinion ought to have been considered by a reasonable and prudent structural engineer. In particular, there is nothing to indicate in the information provided that the following items were considered:

1) The top rail has not been checked for bending due to vertical loads. The code requires that guardrails be designed to withstand a downward vertical load of 1kN.

2) The glass bite has not been checked. This is the amount of overlap between the edge of the glass and the lip of the channel.

> 3) The fasteners between the top rail and bottom rail to the post have not been checked.
>
> 4) The base plate has not been checked for bending resistance.

61. The Panel accepts Mr. Pianalto's expert opinion in its entirety. The Panel found his evidence to be clear and consistent. It was also unchallenged.

62. In addition to Mr. Pianalto's testimony which assumes the Respondent's calculations were made contemporaneously, the Panel notes that all of the evidence before the leads it to conclude that the Respondent did not however perform any calculations prior to reviewing, signing and sealing the design drawings. In addition, the calculations that the Respondent did subsequently perform were not the necessary calculations. These were incorrectly performed and did not contain the necessary information.

63. The Panel finds that the Respondent failed to investigate the existing site conditions to determine whether the building could accommodate the loads imposed by the guardrail system.

64. As such, the Panel finds that allegations 1(a), (b), (c) and (d) are proved to the requisite standard.

65. Engineers and Geoscientists BC submits that failing to gather critical information, failing to calculate operative loads, failing to make any contemporaneous calculations at all, represents a marked departure from the expected standard of a professional engineer. Failing to comply with Engineers and Geoscientists BC's Guidelines is further evidence of unprofessional conduct.

66. The Panel agrees with Engineers and Geoscientists BC's submission. The Panel has determined that the Respondent committed unprofessional conduct in relation to allegations 1 (a), (b), (c) and (d). He failed to gather critical information and failed to make any contemporaneous calculations let alone calculations with respect to the operative loads. The Respondent failed to comply with Engineers and Geoscientists BC's Guidelines. The Respondent's conduct represents a marked departure from the expected standard of a professional engineer.

Allegation 2

> 2. In the alternative, you did not adequately document your structural investigations or calculations related to the Guardrail Design.

67. This allegation is in the alternative to the allegation at paragraph 1 of the Citation. If the Respondent performed structural investigations or calculations prior to signing and sealing the design drawings for the Projects, these are not contained in his file. The Panel has found that the Respondent failed to undertake the work in allegation 1 rather than performed the work and failed to adequately document as alleged in allegation 2. As the Panel has found that Engineers and Geoscientists BC proved allegation 1, it is not necessary for the Panel to determine the alternative allegation 2.

68. Allegation 9 in the Citation relates to Allegation 2 in the Citation. Accordingly, it is also unnecessary for the Panel to make any finding with respect to Allegation 9.

Allegation 3

> 3. In the course of carrying out the Project, you were the engineer responsible for the Guardrail Design, which was deficient. In particular, you failed to:
>
> a. correctly calculate the allowable deflection limit for the glass panel deflection;
>
> b. correctly calculate the allowable deflection limit for the guardrail system;
>
> c. calculate the level of reliability for the guardrail glass infill panels for the buildings at [redacted] and [redacted];
>
> d. calculate the reliability for the bottom rail;
>
> e. meet the minimum level of reliability required by the BC Building Code in the heat-affected zone ("HAZ") for the vertical aluminium posts welded onto the base plate;
>
> f. meet the minimum level of reliability required by the BC Building Code for the anchorage for the base plates;
>
> g. calculate the reliability for base plate thickness for the base plate and anchorage design;
>
> h. use adequate spacing for the bolt holes for the base plate;

i. calculate the strength and reliability for the concrete anchors;

j. meet the minimum edge distance required by the BC Building Code for anchors; and

k. calculate the reliability of the endpost conditions or posts at handrail splice locations.

69. This allegation concerns specific deficiencies in the Respondent's guardrail design.

70. Mr. Pianalto addressed each of these deficiencies in his report. Specifically, he expressed the opinion that the Respondent's design did not meet the standard of a reasonably prudent structural engineer as follows:

> 1) The allowable deflection limit for the glass panel was not calculated properly. Mr. Gernon's calculations refer to a maximum deflection defined by a span ratio of L/60 (Tab 1 and Tab 7D). However, the CGSB 12.20 defines the maximum deflection of glass in a guard to be no more than 40 mm at the point of application of the load (refer to paragraph 7.1.d of CGSB 12.20).
>
> 2) In the information provided the deflection of the guardrail system does not appear to have been calculated.
>
> 3) The calculations to determine if the glass infill panels are sufficiently strong and therefore meet the reliability requirement of the BCBC have not been done correctly since they do not account for load combinations which ought to include wind and guard loads.
>
> Additionally, the incorrect reference stress is used since Mr. Gernon uses 25 MPa rather than 20 MPa which is applicable to this project because the governing condition is the stress that occurs at the side edges of the glass panels, not the middle of the panel. See Tab 1 and Tab 7.
>
> 4) The calculations to determine if the bottom rails are sufficiently strong and therefore meet the reliability requirement of the BCBC have not been done correctly in the calculations provided (Tab 7D). In addition, the test reports provided do not indicate that the bottom rail was tested to identify its capacity (Tab 1 and Tab 5).
>
> 5) The calculations to determine if the aluminum posts are sufficiently strong in the Heat Affected Zone and therefore meet the reliability requirement of the BCBC have not been done correctly as they do not account for load combinations which include wind and guard loads. In addition, the calculations indicate that the posts are 30% overstressed in one instance and 2.4 times over stressed in another (Tab 1 and Tab 7E). Mr. Gernon annotates these results with "NG" which in our industry is taken to mean "NO GOOD". However, rather than following the results of the calculation he follows the test report results at Tab 1 and Tab 5 to support that the design can meet the required loading as elaborated upon in my Opinion 3.2.d and 3.2.g
>
> 6) The calculations to determine if the anchorage for the base plates are sufficiently strong and therefore meet the reliability requirement of the BCBC (Tab 1 and Tab 7E) are not done correctly as elaborated upon in points 5.7 to 5.10 below.

> 7) Calculations to determine if the base plates are sufficiently strong and therefore meet the reliability requirement of the BCBC were not included in the information provided. Base plate strength can influence bolt forces as, in general, weaker base plates result in higher bolt forces due to secondary prying effects.
>
> 8) An analysis of the spacing of the bolt holes for the base plate was not included in the information provided. There is a calculation of the bolt forces at the base plate which would be influenced by the spacing of the bolts (Tab 1 and Tab 7E), however, this calculation was done incorrectly and therefore does not accurately account for the spacing of the bolts. The error in the calculation has been elaborated upon in my Opinion 3.2.e.
>
> 9) The calculations to determine if the concrete anchors are sufficiently strong and therefore meet the reliability requirement of the BCBC have not been done correctly as described in point 5.8 above (Tab 1 and Tab 7E). Additionally, they do not account for load combinations which ought to include the combined effects of wind and guard loads.
>
> 10) In addition to point 5.8 above, edge distances of the concrete anchors were not included in the calculations (Tab 1 and Tab 7E). Therefore, it cannot be known from the information provided if the minimum edge distance required by the BCBC has been met.
>
> 11) The calculations to determine if the end post conditions or handrail splices are sufficiently strong and therefore meet the reliability requirement of the BCBC were not included in the information provided (Tab 1 and Tab 7E).

71. The Panel accepts Mr. Pianalto's evidence on the Respondent's design deficiencies. As noted above, the Panel also finds that the evidence establishes that the Respondent did not perform any calculations prior to reviewing, signing and sealing the design drawings.

72. Accordingly, the Panel finds that allegation 3 has been proved to the requisite standard.

73. The 2018 Guideline on Designing Guards for Building Projects, which Mr. Pianalto says represented the standard in 2017, set out the requirement to consider load combinations:

> Loads must include load combinations, importance factors, and companion loads, as well as the effects of impact testing, according to this standard. Vibration should also be considered, including fatigue and serviceability issues arising from noise. The design Guard load is classified as a Live load. This standard defines different load combinations for ultimate limit states and serviceability limit states.

74. Allegation 8 in the Citation alleges that the conduct referenced in Allegation 3 is unprofessional or in the alternative negligent, and is also a violation of Principle 1 of

the Code of Ethics, referenced above. As noted earlier in these reasons, Engineers and Geoscientists BC is not asking the Panel to make all three findings.

75. The Panel has determined that the Respondent committed unprofessional conduct. Failing to make calculations represents a marked departure from the expected standard of a professional engineer. In addition, the number and significance of the errors and omissions in the calculations provided after the fact represents a marked departure from expected standards. The Panel considers that the Respondent did not hold public safety "paramount", as is required by Principle 1 of the Code of Ethics, and finds this ethical failing is further support of a finding of unprofessional conduct.

Allegation 4

> 4. In the course of carrying out the Project, you prepared balcony guardrail shop drawings under your seal (the "Guardrail Drawings") which were deficient. In particular, the Guardrail Drawings failed to:
>
> a. specify the applicable glass design standard;
>
> b. specify the concrete design standard;
>
> c. specify the connection detail between the end post and the bottom rail;
>
> d. specify the details for the glass infill panel, including the required minimum glass bite, shape and type of gasket, the thickness and orientation of the channels, and the fastening of the channels to the post;
>
> e. adequately specify the anchors;
>
> f. specify the minimum embedment depth for the anchors;
>
> g. specify the size of welds, including the weld between the post and the base plate; and
>
> h. delineate the scope of work.

76. This allegation concerns deficiencies with the drawings that were signed and sealed by the Respondent. Mr. Pianalto sets out the elements and specifications that a reasonably prudent structural engineer should include in such drawings and addresses the deficiencies alleged in paragraphs 4(a) to (h) of the Citation:

Mr. Gernon prepared balcony guardrail shop drawings found at Tabs 2, 3, and 7(c), (d), and (e) in Schedule B.

My opinion of the elements or specifications that a reasonably prudent structural engineer would include in such balcony guardrail shop drawings as well is provided below:

1) The BCBC references two different glass design standards: the CAN/CGSB 12.20 and the ASTM E1300.

The code allows the designer to choose either of these standards for their glass design. In my opinion, the general notes on the drawings must include references to the appropriate standards that are applicable to the materials that are shown on the drawings. It is noted that there are a number of other standards referenced in Mr. Gernon's drawings, however, the reference to what glass standard was used to design the glass is not included on any of the drawings.

2) Similar to point 6.1 above, the drawings do not include a reference to the concrete design standard, CSA A23.3. The project involves new concrete anchors that are to be fastened into existing concrete and therefore, the structural design of such anchors should be completed according to this standard. In my opinion, Mr. Gernon ought to have included a reference to this standard in the drawings.

3) In my opinion, the specification of the connection detail between the end post and the bottom rail ought to have been shown on the drawings. This is a critical structural connection since the bottom rail supports the weight of the glass infill panel and transmits wind loads from the glass panel into the posts. As such, in my opinion, these are critical structural connections and must be included in the drawings.

4) In my opinion the drawings had insufficient detail required to properly specify the glass infill panel since the glass bite, the gasket shape and type, the thickness and orientation of the channels, and the fastening of the channels to the post were not shown. Since glass is a brittle material, connection detailing is very important to ensure the safe transfer of loads between the glass and the metal support structure. In particular, the glass bite and gasket are critical elements to ensure that the load transfer occurs in a manner that is not potentially damaging to the glass. Most importantly, the gasket creates a soft transition that avoids deleterious stress concentrations in the glass. Additionally, the size of the channel will dictate the glass bite and clearance between the glass and metal channel. Without this information on the drawings, there is no way for the installers to know if they are using the right materials in order to meet the design intent during construction.

5) The anchor specification is not complete and does not correspond to what is shown in the calculations.

The drawings call for "3/8" diameter x 3-3/4" long stainless steel wedge anchors with stainless steel washers". Wedge anchors are a generic term, however, all concrete anchors are proprietary and therefore the manufacturer and part number must be identified. There is also a note on the shop drawings that states that the base plates are to be "shimmed as required". According to the concrete design standard, the strength of the fasteners is primarily dependent on the following factors:

The embedment of the anchor into the concrete, the strength of the concrete, the spacing of the anchors, the distance of the anchors to the edges of the concrete, and the thickness of the concrete. In my opinion, the information provided on the drawings is either incomplete or nonexistent as described below:

a) Embedment is discussed in point 6.6 below.

b) The drawings do not indicate a concrete strength nor do they direct the contractor to verify the in situ strength of the concrete. There is no way of verifying the strength of the anchor without knowing the concrete strength.

c) The spacing of the anchors is provided as it will correspond to the pre-drilled holes that are to be provided on the base plate which is shown on the drawings.

d) The edge distance is shown to only one edge which appears to be the leading edge of the balcony slab or distance to the top of the concrete parapet. However, there are potentially two or three edge distances to the side edges of the balcony slabs depending on the orientation of the base building. More information is needed to ensure that the installer does not inadvertently install anchors too close to the side edges. Concrete anchors that are installed too close to slab edges can exhibit dramatic strength loss.

e) The thickness of the concrete slab is important because concrete anchors must be installed with sufficient clearance from the tip of the anchor to the opposing surface of the concrete slab. The strength of the anchor will diminish as the concrete slab thickness decreases. Since the slab thickness is not shown on the drawings, there is no way to verify the in situ strength of the anchors.

6) Embedment of the anchors is not provided since the length of the fastener is specified as well as an allowance for shimming. The amount of shims will be dictated by naturally occurring, dimensional variations in the concrete surfaces. Shims are used to level out the concrete to ensure that the railing is level and plumb. The thickness of the shims that are required will vary, therefore, the embedment of the anchor will vary since the anchor length is fixed. As described above in point 5, the anchor embedment is a critical parameter in determining the strength of the fastener. If this is not specified, the actual in situ strength of the fastener cannot be determined.

7) The drawings indicate welds by showing weld symbols in a number of places including the following: post to base plate, post to fastening angles, and top of post to top rail. In all cases, the size of the weld is not shown. Weld size is critical to the strength of the connection. If the size is not specified, the actual in situ strength of the welded connection cannot be known or verified.

8) In my opinion, the drawings do not delineate the scope of work that the engineer is responsible for. Scope delineation is important in order to clearly show what products shown on the shop drawing and the extent of the base building that the engineer is intending to take responsibility for. If the engineer intends to exclude the performance of any of the parts of the assembly and/or the base building, they must indicate this on the drawings and show specifics of how the items in their scope will interact with the other components and/or the base building so that other engineer(s) responsible for the other products and/or the base building can evaluate the effect of the new product(s). The Guard Design Guide published by EGBC states the following: “…. basic elements must be shown and identified on the shop drawings … clearly identifying the structural function and requirement for

> those components for which design responsibility is assumed to be by others". The importance of this is to allow the lead engineer or architect to determine if there are any design gaps that may need to be filled by other professional(s). Also, this information is important to the field reviewer in order to know what is to be included in their observations when on site.

77. The Panel accepts Mr. Pianalto's evidence set out above.

78. The Panel finds that allegation 4 is proven to the requisite standard.

79. The Respondent's failures are also contrary to 2013 Engineers and Geoscientists BC Guideline on Designing Guards for Buildings and Engineers and Geoscientists BC's 2018 Guideline on Designing Guards for Building Projects which require that shop drawings should include connection details, design codes and the engineer's scope of work, amongst other things.

80. Allegation 8 in the Citation alleges that the conduct referenced in Allegation 4 is unprofessional or in the alternative negligent, and is also a violation of Principle 1 of the Code of Ethics. Again, Engineers and Geoscientists BC seeks a determination of unprofessional conduct.

81. The Panel finds that the number and significance of the deficiencies in the design drawings represent a marked departure from the expected standard of a professional engineer. Non-compliance with the 2013 Guideline is also evidence of unprofessional conduct. The Panel considers that the Respondent did not hold public safety "paramount", as is required by Principle 1 of the Code of Ethics, and finds this ethical failing is further support of a finding of unprofessional conduct.

Allegation 5

> 5. In the course of carrying out the Project, you failed to ensure that documented field reviews of the Guardrail System installation were conducted in connection with the building at [redacted].

82. As discussed above, the Panel finds that the Respondent produced records of an on-site inspection performed at each of the other three Project buildings but not at [redacted]. The Panel finds that the Respondent produced his entire file. The Panel finds that the Respondent did not perform any inspections himself. The

Panel finds that there is no evidence of any field reviews of the guardrail system installation connected in accordance with the building at [redacted].

83. This allegation is proved to the requisite standard.

84. The Respondent was obligated to ensure that field reviews were appropriately comprehensive and documented pursuant to Bylaw 14(b)(3):

> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
>
> …
>
> (3) documented field reviews by, or under the direct supervision of, members or licensees, of their domestic projects during implementation or construction;

85. The Panel has determined that the Respondent committed unprofessional conduct. The Respondent's conduct is a marked departure from the standard expected of a professional engineer. There is a complete absence of documentation pertaining to any field reviews for [redacted]. The Panel agrees with Engineers and Geoscientists BC's submission that there is an ethical failing in the Respondent's approach as public safety was not sufficiently his focus and it is appropriate to describe his conduct as unprofessional in the circumstances.

Allegation 6

> 6. In the course of carrying out the Project, you failed to ensure that sufficient documented field reviews of the Guardrail System installation were conducted in connection with the buildings at [redacted], [redacted], and [redacted].

86. Mr. Pianalto provided expert evidence with respect to the standard required for field reviews:

> The standard of practice pertaining to documented field reviews is defined in the Guide to the Standard for Documented Field Reviews During Implementation or Construction published by EGBC in February 2021. A previous edition of the guide was published in January 2018. In my opinion these guides represent the standard of practice with respect to documented field reviews and would have been applicable in 2017 when this project was undertaken. These guides state the following with respect to the number and timing of field reviews during construction:
>
> 1) Decisions about the number and extent of field reviews must always remain at the discretion of the Professional.

> 2) Field reviewers must observe the work of the contractors to ascertain whether the work substantially complies in all material respects with the professional engineering concepts or intent reflected in the documents.
>
> 3) Field reviews must take place during times when critical components of the work are visible and available to be observed.
>
> 4) Field reviews should occur periodically to suit the nature and progress of the implementation or construction.
>
> In my opinion and based on the content of the guidelines cited above, the minimum number of field reviews that ought to have been completed for each building is as follows:
>
> 1) An initial visit to record the existing conditions of the buildings including critical dimensions such as slab thickness and state of the structure. With existing structures, there may be deterioration or alterations that would require special attention during design or repairs that may be required prior to installation.
>
> 2) At least one visit at the beginning of the project to ensure that the contractors understand the drawings, are using the correct materials, and are following manufacturer's instructions where required. In particular, for concrete anchors being installed into existing concrete slabs, the embedment depth must be verified (most anchors have indicators on the head of the bolt to help identify this). In the event that work is found to be deficient, additional visits during installation may be warranted.
>
> 3) A final visit once the work has been completed. This work is relatively unique in that most critical conditions can be observed even at completion since there are no items that are covered or concealed. Therefore, completed work can be observed and deemed to be in conformance with the design intent at the end of the work. It is imperative that a visit at completion be conducted because railings are required for life safety and are intended to protect building occupants from fall hazards. In the event that the railings are incomplete or do not meet the design intent, the engineer would be responsible to check for these conditions.

87. The Panel agrees with and accepts Mr. Pianalto's opinion above.

88. The Panel finds that the inspection reports for [redacted] and [redacted] are dated after the Respondent signed and sealed Schedule C-B's for those properties. The Panel finds that the inspection report for [redacted] is dated the day before the first of two Schedule C-B's signed by the Respondent. The Panel infers that no field review was performed based upon the fact that there is no inspection report between the first and second Schedule C-B. Even if that is incorrect, there is no documented field review before the Panel.

89. The Panel finds that the inspections performed were only partial inspections. The [redacted] inspection document states "east side units only; units 1 & 8…".

The [redacted] document states “remaining units done”. [redacted] document says “floors 1 thru 8; west and south sides only; partial review”. As such there is no evidence of documentation of field reviews for large portions of the buildings in question.

90. Mr. Pianalto testified that adequate field reviews are necessary to assure proper installation and are not trivial activities given the life safety purpose of guard rails.

91. Mr. Pianalto gave evidence that Engineers and Geoscientists BC’s 2018 Guide to the Standard for Documented Field Reviews represented the standard of practice in the industry in 2017. The 2018 Guideline provides that the professional of record responsible for the engineering documents must either conduct the field reviews or directly supervise them. The 2018 Guideline also provide that if the professional of record is not engaged by the client to conduct field reviews, the professional should have a documented QM process containing protocols such as confirming that another qualified professional will conduct the field reviews or directly supervise them.

92. The Panel finds that the Respondent did not perform the field reviews himself and did not engage in direct supervision. The evidence from the interview with the Respondent was clear he does not perform field reviews himself. He did discuss some aspects of supervision elsewhere in the interview however there is no documentation in relation to the Respondent having engaged in direct supervision in this case. The three inspection reports provide little information as to what occurred on the field review and what was observed. There is no evidence that the Respondent provided the field reviewers with any of the guidance outlined by Mr. Pianalto.

93. The 2018 guideline indicates that the frequency and timing of review will vary depending on a variety of factors but “must be consistent with the standard of practice in the profession for the specific engineering and geoscience work”. As described above, Mr. Pianalto outlined the minimum number of visits which ought to have been conducted.

94. The Panel finds that this allegation is proved to the requisite standard.

95. The Panel finds that the evidence in this case indicates that the reviews fell short of this standard. There is no documentation of an early field review or a review part way through construction. The inspections that were performed appear all to have been done at completion only, which is what the Respondent also stated in his interview. This is consistent with the dates of the Schedule CB's. There is no reference to verifying anchor locations, edge distances or embedments. Finally, there is no evidence of final inspections for large portions of the units. In the case of [redacted], the inspection form indicated "Re-Inspection Required", however, there is no documentation that occurred.

96. As outlined above, the Respondent was obligated to ensure that field reviews were appropriately comprehensive and documented pursuant to Bylaw 14(b)(3).

97. The inspection reports for the two [redacted] properties are dated after the Respondent signed and sealed Schedule C-Bs for those properties. The inspection report for [redacted] is dated the day before the first of the two Schedule C-Bs signed by the Respondent. There is no inspection report for the period between the first and second of the Schedule C-Bs. There is no evidence of a field review having been performed or documented between the first and second Schedule C-Bs. The description of the inspections makes clear that they are only partial. Accordingly, there is no evidence of documentation of field reviews for portions of the buildings. There is no documentation that the Respondent himself played any role in the inspections or field reviews. Mr. Pianalto testified that partial reviews are not sufficient and that the minimum number of field reviews that should have been undertaken in relation to the Projects is three. There is no evidence that the Respondent himself played any role in the inspections or field reviews. For these reasons, the Panel finds that the Respondent's conduct in relation to the field reviews is a marked departure from the standard expected of a professional engineer. The Panel has determined that the Respondent committed unprofessional conduct.

Allegation 7

> 7. In the course of carrying out the Project, you failed to ensure that documented independent structural reviews of the Guardrail Design were conducted.

98. Bylaw 14(b)(4) requires that members establish documented quality management processes which shall include documented independent review of structural designs prior to construction.

99. In his expert report, Mr. Pianalto set out the relevant standard concerning structural reviews as follows:

> According to the professional practice guideline for Designing Guards for Building Projects published by EGBC in December 2018, "an independent review is a documented evaluation of the structural design concept, details, and documentation based on qualitative examination of the substantially complete structural design documents which occurs before those documents are issued for construction and is to be carried out by an experienced structural engineer who has not been involved in the design."
>
> According to Documented Checks of Engineering and Geoscience Work – Quality Management Guidelines published by EGBC in October 7, 2013, "Checks must be documented. These records must be retained to confirm that a required check has occurred. The record must identify the project or work, the APEGBC professional of record, checker, purpose of the check, and when the checking occurred."
>
> In my opinion, these guidelines and the descriptions provided for documented independent structural reviews of Guardrail Designs represent the standard of practice and would have been applicable in 2017 when this project was undertaken.

100. The 2018 Guideline provides:

> 4.1.7 DOCUMENTED INDEPENDENT REVIEW OF STRUCTURAL DESIGNS
>
> Bylaw 14(b)(4) refers to an independent review in the context of structural engineering. An independent review is a documented evaluation of the structural design concept, details[s], and documentation based on a qualitative examination of the substantially complete structural design documents, which occurs before those documents are issued for construction. It is carried out by an experienced Engineering Professional qualified to practice structural engineering, who has not been involved in preparing the design.

101. The 2013 Guideline on Checks of Engineering and Geoscience Work provides that "A documented checking process is one that has been thought out and reduced to writing in suitable form." Section 2.7 requires that "Records of checks must indicate

what, if any, concerns were raised, how they were addressed, and what, if any, corrective action was identified, approved and undertaken."

102. The Engineers and Geoscientists BC Quality Management Guideline on Documented Independent Review of Structural Designs (2016) requires a documented quality management process that includes independent reviews of structural designs and the professional must ensure there is a documented independent review.

103. The Panel finds that there is in no evidence of any reviews or checks in the Respondent's file. If there was a review, it was not a documented review as is required by the bylaw and by professional standards. While the Respondent stated in his interview that another engineer in his office performs reviews of his work, he did not state that occurred in this particular case. The Respondent stated in this interview that he prepares a single-page summary of the load calculations and attaches the drawings, and the second engineer looks at the basic concept, not necessarily duplicating calculations. However, because there is no evidence of the Respondent having prepared calculations prior to the investigation, there would not have been calculations to summarize or for the second engineer to check. Irrespective, a reviewer's task is not to examine the basic concept. Rather, the 2016 Quality Management Guideline provides they must be satisfied that he or she has examined the design in sufficient detail to make an informed judgment as to the adequacy of the design for its intended purpose. The independent reviewer is required to re-evaluate and extend the review when his or her evaluation suggests there might be problems with the design. The 2016 Guideline further provides that the independent review should include a review of design criteria, loads, continuity of load paths, and where appropriate perform design calculations on a representative sample of structural elements to determine whether the analysis, design and detailing comply with the appropriate codes and standards. The 2016 Guidelines also require that the reviewer must document the results of the review and provide those to the Engineers and Geoscientists BC professional of record. The Panel finds that the Respondent's file contains none of this documentation.

104. The Panel finds that this allegation has been proved to the requisite standard.

105. The Panel has determined that this is a marked departure from expected standards and accordingly is unprofessional conduct. It is clearly also a violation of s. 14(b)(4) of the Bylaws which is set out above.

Allegation 8

> 8. The conduct set out above at paragraphs 1, 3, and 4 is unprofessional conduct, or in the alternative negligence, under s. 33(1) of the EGA and is contrary to Principle 1 of the Engineers and Geoscientists BC's Code of Ethics, as it stood at the time, which provided that members shall hold paramount the safety, health and welfare of the public, the protection of the environment and promote health and safety within the workplace.

106. The Panel has addressed its findings and determinations under allegation 8 above in the corresponding sections dealing with allegations 1, 3 and 4 of the Citation.

Allegation 9

> 9. The conduct set out above in paragraph 2 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(1) which provided:
>
> > 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
> >
> > > (1) retention of complete project documentation which may include, but is not limited to, correspondence, investigations, surveys, reports, data, background information, assessments, designs, specifications, field reviews, testing information, quality assurance documentation, and other engineering and geoscience documents for a minimum period of 10 years;

107. The Panel did not make a finding with respect to allegation 2 and therefore the Panel makes no corresponding determination under allegation 9.

Allegation 10

> 10. The conduct set out above in paragraphs 5 and 6 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(3) which provided:

> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
>
> …
>
> (3) documented field reviews by, or under the direct supervision of, members or licensees, of their domestic projects during implementation or construction;

108. The Panel's determinations that the conduct in allegations 5 and 6 are contrary to section 14(b)(3) is set out above.

Allegation 11

> 11. The conduct set out above in paragraph 7 constitutes unprofessional conduct and is contrary to the Bylaws of Engineers and Geoscientists BC, as they stood at the time, and in particular s.14(b)(4) which provided:
>
> 14 (b) Members and licensees shall establish and maintain documented quality management processes for their practices, which shall include, as a minimum:
>
> …
>
> (4) documented independent review of structural designs prior to construction by members or licensees having appropriate experience in designing structures of a similar type and scale, and not involved in preparing the design. The reviewer shall examine representative samples of the structural assumptions, continuity of gravity and lateral load paths, stability and detailing. Where appropriate, the reviewer shall perform numerical calculations on a sample of gravity and lateral force resisting elements necessary to satisfy any reviewer concerns. The extent of the review shall be determined by the reviewer based on the progressive findings of the review. This review and any follow up action must be completed before the documents are issued for construction.
>
> The independent review of structural designs shall evaluate the construction documents to determine if the structural systems appear complete, consistent, and in general compliance with applicable codes. The structural review may be part of, but is not intended to replace, the regular checks required in 14(b)(2).
>
> Independent review of each instance of repetitive designs of individual structural components is not required, but documented initial independent review and independent review at intervals is required to confirm the maintenance of design quality.

109. The Panel's determination with respect to allegation 7 is set out above.

Summary

110. In summary, the Panel's conclusions in this matter are as follows:

    a. Engineers and Geoscientists BC has proven the allegations in paragraphs 1, 3, 4, 5, 6 and 7 of the Citation on a balance of probabilities.

    b. The Panel has determined with respect to the allegations in paragraphs 1, 3, 4, 5, 6, and 7 of the Citation that the appropriate finding is that the Respondent committed unprofessional conduct.

    c. There is no finding with respect to the allegation at paragraph 2 of the Citation as it was an alternate allegation.

Penalty and Costs

111. Having made a determination under section 33(1) of the EGA, the Panel will next determine the sanctions which should be imposed upon the Respondent and whether, and in what amount, costs are payable.

112. The Panel requests that Engineers and Geoscientists BC provide written submissions on the appropriate sanctions and costs in accordance with the following schedule:

    a. Counsel for Engineers and Geoscientists BC must provide their submissions to the Respondent and the Panel by no later than November 3, 2023;

    b. Counsel for the Respondent must provide his submissions to Engineers and Geoscientists BC and the Panel by no later than November 24, 2023; and

    c. Counsel for Engineers and Geoscientists BC must provide any reply submissions to the Respondent and the Panel by no later than December 1, 2023.

113. All submissions may be delivered by email to the other party and to Susan Precious, independent legal counsel to the Panel.

October 5, 2023

<original signed by>
Colin Smith, P. Eng., Chair

<original signed by>
Ed Bird, P.Eng.

<original signed by>
Alison Dennis