

Discipline Committee
Association of Professional Engineers and Geoscientists
of Alberta

Date: April 9, 2014
Case No.: 12-015-FH

In the matter of the *Engineering and Geoscience Professions Act*
and
In the matter of the conduct of John William Clark, P.Eng.

Decision

This matter came up for hearing before a panel of the APEGA Discipline Committee (the Panel) on April 15, 2013 in Edmonton, Alberta.

Charges

The notice of hearing, dated May 8, 2012, contains the following charges brought by the Investigative Committee against John William Clark:

1. In or about August, 2010, you accepted an assignment from [REDACTED] to conduct a structural inspection of a commercial building located at [REDACTED] in Edmonton, Alberta, to determine whether the concrete slab-on-grade floor would be able to support the storage of 16,000kg single-axle hydrovac trucks. Your structural inspection was deficient in one or more of the following respects:
 - a. It attempted to predict future performance of the slab based on past performance;
 - b. It ignored flexural stress and/or shear stresses;
 - c. It attempted to predict ultimate load capacity of the slab by simply comparing the compressive strength of the concrete to the contact stress applied by the load;

The above noted conduct constitutes unskilled practice of your profession.

2. You undertook the assignment of evaluating the structural capacity of the concrete slab-on-grade, notwithstanding that you lacked expertise in the field of practice.

The above-noted conduct constitutes unskilled practice of your profession or unprofessional conduct in violation of APEGA's Code of Ethics Rule of Conduct #2.

Background

The hearing was called to order at 9:00 a.m. on April 15, 2013. Mr. Clark was present and was represented by his legal counsel. The Investigative Committee and their legal counsel were also present.

The charges brought forward by the Investigative Committee relate to engineering services provided by Mr. Clark (Clark) to ██████████ in November, 2010, with respect to a property located at ██████████ Edmonton, Alberta. The property in question had recently become vacant after being occupied by a long term tenant. The owner of the property, ██████████ retained Clark through Clark's employer, Nichols Environmental (Canada) Ltd., to assess a cast in place concrete floor at the building and ensure its adequacy to serve a potential new tenant.

The previous occupant of the building had used the building to house a large commercial freezer. The freezer occupied one-third of the total building area. Floor construction in the former freezer area consisted of two 4" thick cast in place concrete slabs with a 4" layer of rigid insulation in between. This slab was used to support large commercial storage racks, and hard-wheeled fork lifts were used to move material within the freezer.

The potential future tenant intended to use the space to store a variety of rubber tired vehicles, the heaviest of which was a 16,000 kg single-axle hydrovac truck. A condition on the lease agreement included a need to confirm that the hydrovac vehicles could travel on the floor structure without damaging it.

██████████ retained Clark to obtain core samples of the floor structure and to determine the compressive strength of those concrete cores. ██████████ testified that it was his normal practice to compare the core sample compressive strength results against the inflation pressure of the vehicle tires. It was his understanding that this was an adequate analysis approach to determine the adequacy of a floor structure to support anticipated loads.

Clark obtained the concrete core samples as directed, and summarized his findings in a letter to ██████████, dated August 17, 2010. This letter included statements as follows:

- That ██████████ "was contracted to perform a structure inspection with specific focus on the strength of the floor;"
- That "the corrected compressive strength resulting from the concrete core breaks averaged 42.4 MPa...";
- That "... the largest vehicle having the greatest point load pressure... .. is a hydrovac truck weighing 16,000 kilograms (GVW), sitting on a single rear axle (total six tires), each having a floor bearing footprint of 0.6 ft².";
- That "The equivalent point loading pressure of this equipment converts to 350 psi... "
- That "... there is an excess capacity of almost 20 times (i.e. $44.3/2.4 = 18.5$)... ";
- That the analytical computational evaluation work done for this site is restricted to the actual corrected compressive strengths... "

Upon receiving this letter, ██████ came to understand that the floor capacity exceeded anticipated loads with a factor of safety of 18.4. Had this result been closer to a range of 3 to 5, he would have considered additional analysis. He removed the condition on the lease agreement based on the information conveyed in Clark's letter.

Upon obtaining access to the building, the new tenant commenced work on significant renovations which required the services of a structural engineer. Those services were provided by ██████. As part of his services, ██████ indicated to the tenant that the floor should be properly evaluated for the new loads to be imparted by the vehicles. ██████ was provided with Clark's August 17, 2010 letter. After reviewing the letter, and consulting with several of his professional colleagues, ██████ forwarded a complaint to the APEGA Investigative Committee regarding Clark's conduct.

During the formal hearing, the Panel heard from several witnesses. In addition to ██████ and Kennedy, the Panel heard from ██████

██████ was presented as an expert witness in the area of structural engineering and in particular the area of evaluating concrete slabs on grade. ██████ credentials were not contested and he was accepted by the Panel as an expert in this area. Walters testified that:

- Evaluation of an existing structure is the practice of engineering;
- Evaluation of a concrete slab on grade must consider the flexural strength of the floor, and the interaction of the floor with the supporting soil under the expected applied loads;
- The flexural strength of concrete is difficult to determine but that it can be approximated from the compressive strength of the concrete;
- A rudimentary analysis, using such estimates and approximations represents the absolute minimum standard of care;
- Notwithstanding the instructions of the client, it is the responsibility of the engineer to inform the client of what is required to properly perform an analysis;
- A complete analysis must be performed before arriving at a conclusion regarding the expectation that a slab on grade will perform adequately under expected loads.

Many of ██████'s statements resonated with the Panel. He testified that a concrete slab does not fail in compression; generally speaking, the compressive strength will always be adequate. Walters indicated that the issue is not a matter of how strong the concrete is, but, rather, how strong the floor is. He pointed out that a structural engineer must rely on the experience of a geotechnical engineer to determine the properties of the foundation, as the slab is dependent on the grade for its structural integrity. Finally, he expressed his opinion that the slab in question was complex and, therefore, worthy of more involved analysis.

██████ testified as to the process involved when the Investigative Committee receives a complaint about a professional member. Part of this process includes reviewing the member's application for membership. ██████ testified that Clark was granted

membership in APEGA as a Professional Engineer based upon his surveying and petroleum expertise to that point in time.

Clark testified:

- That, in his work at [REDACTED], he works regularly with structural engineers, and is familiar with the soil parameters they require to complete their designs;
- That previous cores from other areas in the building had been obtained prior to this assignment, and that he had access to the results of those core samples;
- That, in addition to obtaining the core samples, he completed several other tasks in his evaluation of the floor, including a visual examination of the floor which revealed no signs of distress, some localized soil testing involving a sledge hammer and a short length of 20M reinforcement, and a review of the original construction drawings;
- That he considered all of this information in evaluating the floor;
- That he did run flexural checks;
- That he utilized various references, charts and analytical approaches as provided and prescribed by the American Concrete Institute;
- That he consulted with several structural engineers in the course of his evaluation;
- That his August 17, 2010 letter was “not up to his usual standard”, and that he chose to present the pressure calculation to demonstrate and articulate the factor of safety present;
- That several months after the fact, with the assistance of a structural engineer, a finite element analysis program was used to analyse an 8” concrete slab on grade under the same load and soil conditions as the slab in question, with a resulting factor of safety of 2.8.

At the hearing, the Panel was also presented with a considerable number of documents. Included in those documents was Clark’s response to the APEGA Investigative Committee’s Notice of Investigation dated March 3, 2011, and a transcript of the interview that the Investigative Committee panel conducted with Clark, dated September 22, 2011.

The Panel noted that, in his March 3, 2011 response, Clark repeated the calculation he provided in his report to Mr. [REDACTED]. At the hearing, Clark testified that this letter was “not a stellar response” because he was upset at being in the process.

The Panel, upon reviewing the Investigative Committee panel interview transcript, noted that Clark felt that he was unprepared to argue and described the interview as “hostile” which caused him to “shut down” and not respond appropriately. Nevertheless, the transcript from the interview had Clark confirming that he had not done “any other design analysis and also calculations”.

Findings and Reasons

Charge 1

The Panel found the evidence of [REDACTED] to be highly credible as an unchallenged expert witness. In summary, [REDACTED] described a relatively sophisticated process whereby the

flexural strength of a concrete slab is properly determined and compared to the flexural stress expected to be imparted by the loads expected to be applied. Comparison of compressive strength of the concrete to expected applied pressures is not an adequate method of assessing a concrete slab on grade.

It was clear to the Panel from ██████'s testimony that Clark had met the requirements of his client. ██████ received an analysis of the "core breaks" that he asked for. He clearly understood business risk and was willing to accept the business decision that he made. In fact, in two years of operation subsequent to Mr. Clark's work, the Panel believes that the slab is performing well.

However, the level of comfort ascribed by Clark in his November 17, 2010 letter was in error: The factor of safety against failure was closer to 2.8, much less than the 18.4 indicated. While the actual factor of safety was still well within acceptable limits, Mr. Clark did not provide ██████ with the opportunity to review his tolerance of that risk. In fact, Slawsky gave evidence that, had the safety factor been "3 to 5 times", he would have wanted further analysis. By not completing an adequate analysis of the floor, Clark did not meet the expectations of his client.

Clark did demonstrate, at the hearing, some understanding of the analysis required to evaluate a concrete slab on grade. However, the Panel is of the belief, based upon the documents produced and issued by Clark prior to the hearing, that he did not employ the proper processes and procedures to properly assess this concrete slab on grade floor at the time of his assessment and prior to issuing his letter of August 17, 2010. The testimony provided by ██████ is considered by the Panel to be a concise summary of the proper approach in assessing a concrete slab on grade. Further, the Panel is of the belief that, at minimum, some consideration of the flexural stress that would develop in the slab under the new operating conditions would be necessary to complete even a rudimentary review of the floor. Clark did not meet this minimum standard.

With regard to the specific allegations in Charge 1, the Panel finds that Clark did accept an assignment to conduct a structural inspection of the concrete slab on grade floor and that the inspection was deficient in the following respects:

- It did attempt to predict future performance of the slab based on past performance.
- It did ignore flexural stress and/or shear stresses.
- It did attempt to predict ultimate load capacity of the slab by comparing the compressive strength of the concrete to the contact stress applied by the load.

As a result, the Panel finds that, in failing to perform a proper structural analysis, Clark's conduct constitutes unskilled practice of the profession.

Charge 2

The question before the Panel with respect to this charge has two aspects: that Clark accepted an assignment outside of his area of expertise, and that he knew or ought to have known that the assignment was outside his area of expertise and accepted it anyway.

Clark presented a significant amount of testimony intended to persuade the Panel that, notwithstanding the content of his November 17, 2010 letter, he performed an adequate analysis of this concrete floor. Clark described a series of tests which he undertook in the building and in the core holes similar to those suggested by Walters. He described consulting several senior structural engineers, although it was clarified under cross-examination that this was for the purposes of understanding the building design.

Clark's description of his approach was confusing and contradictory. He claims to have consulted some of the documents described by Mr. [REDACTED] as fundamental to this design "lightly". Yet he also described a process by which he analysed each of the layers independently from "the bottom up" using "geotechnical performance approach".

[REDACTED] evidence was that the appropriate analysis alone could take up to a day. Clark would have the Panel believe that he attended the site, did a thorough inspection of the floor, monitored the coring process, tested the subgrade, reviewed the drawings, completed his analyses, consulted with several structural engineers and wrote his letter, all within a day or two. The Panel does not find Clark's testimony credible on this point, and is not persuaded that Mr. Clark had done anything other than a cursory evaluation of the slab and provided conclusions from an erroneous analysis.

The Panel ultimately found Clark's testimony to be unreliable. If Clark did clearly understand the structural engineering and analysis aspects of this assignment, he had the opportunity to challenge [REDACTED] misunderstanding and introduce an appropriate approach to determining the adequacy of the slab to [REDACTED]. It was Clark's testimony that he was performing this analysis anyway. If that analysis was being performed, Clark could easily have provided a letter describing that analysis process and the resulting factor of safety. Under these circumstances, Clark's November 17, 2010 letter could be considered to have been deliberately misleading.

The Panel is not of the belief that Clark deliberately misled his client. Again, while Clark did demonstrate some understanding of the analysis required to evaluate a concrete slab on grade at the hearing, it is the belief of the Panel that he did not possess this degree of understanding at the time he accepted this assignment.

With regard to Charge 2, then, the Panel finds that Clark undertook the assignment of evaluating the structural capacity of the concrete slab on grade without having expertise in that field of engineering practice. The Panel finds that this conduct constitutes unprofessional conduct, in violation of Rule 2 of *APEGA's Code of Ethics*.

Supplemental Submissions

The Panel received supplemental submissions from counsel representing both the Investigative Committee and Clark. These submissions were intended to inform the Panel regarding various legal precedents on the question of whether a single error, or a single occasion where a lack of professional judgement was exercised, should result in a finding of unprofessional conduct or unskilled practice.

The Panel carefully considered the arguments presented, particularly the general points that a proven allegation does not necessarily constitute a breach, and that no person is perfect. The Panel acknowledges that we are all potentially guilty of an error in judgement

at some point in our professional careers. The Panel is equally aware, however, that an argument consisting of “it only happened once” is not necessarily an adequate foundation to dismiss charges regarding professional conduct.

The Panel notes that the precedents provided include examples of instances where a single act did not result in a finding that an ethical code had been breached. However, the Panel was not provided with information regarding the consequences to those individuals if their actions had been found to have constituted such a breach. For instance, findings of ethical breaches in other professions may result in an individual no longer being permitted to practice their profession. The Panel is aware that this is rarely the case with APEGA; while findings of unskilled practice and/or unprofessional conduct are accompanied by sanctions against the member, those sanctions are generally intended to educate the membership and return the member to good standing. With APEGA, the finding is only a part of the decision to be reached.

Charge 1 concerns the subject of unskilled practice of the profession on a matter of structural analysis. It is understood that the concrete slab in question has performed adequately over the last few years. The fact that no financial or performance loss has been experienced does not excuse the fact that this analysis was not performed correctly. This slab was reported to have a factor of safety of over 18 when, in fact, it had a factor of safety of less than 3. Fundamental structural engineering principles, such as the consideration of flexural stress, were ignored. Failure to consider the fundamental performance criteria of a structure can have catastrophic results, regardless if such a failure is the first omission or the latest in a succession of breaches. On this basis, the Panel finds that a single professional breach with respect to unskilled practice of the profession of engineering, in this instance, can and should result in a finding of unskilled practice.

Charge 2 concerns the subject of unprofessional conduct. It is asserted that Clark’s conduct in accepting an assignment outside his area of expertise constitutes unprofessional conduct. In the supplemental submissions, the argument is made that a single proven breach may not necessarily require a finding. However, the cases presented generally involve individuals who have unknowingly contravened codes of conduct.

In this instance, Clark is fully aware of the divisions of expertise within the broad spectrum of engineering practice. His work, and that of his firm, includes providing information to structural engineers regarding the behavior and characteristics of soil to enable those structural engineers to perform their design work. He knows the area of structural engineering exists; he knows that concrete floors are designed by structural engineers; he is not a structural engineer by virtue of his training and education; and by his own admission, he has not otherwise gained expertise by virtue of additional training or experience. Clark accepted a structural engineering assignment despite clear knowledge that it was outside his area of expertise. His actions are not comparable to an individual who inadvertently breaches a code of conduct by virtue of some circumstance not known to them.

Further, Clark wrongly asserts that his analysis was adequate on three separate occasions: in his November 11, 2010 letter, in his response to the Investigative Committee Notice of Complaint, and in his interview with the Investigative Committee

panel. These three occasions span a period of 10 months. It is the Panel's view that this behaviour does not constitute a single lapse in judgement, but, rather, a generally held belief of Clark, during this period at least, that he is capable of structural engineering analysis. That belief and the behaviour resulting requires attention and correction.

On this basis, the Panel finds that a single professional ethical breach, in this instance, can and should result in a finding of unprofessional conduct.

Orders

Having determined the outcome of the charges, the Panel asked for submissions from both parties for comments regarding sanctions. The parties provided the following written submissions on penalty and, subsequently, on the matter of assessment of costs of the discipline hearing:

- Investigative Committee's submission on penalty dated November 7, 2013;
- Mr. Clark's response submission on penalty dated November 21, 2013;
- Investigative Committee's submission on costs dated December 6, 2013;
- Mr. Clark's response submission on costs dated January 10, 2014;
- Investigative Committee's reply submission on costs dated January 14, 2014.

In its submissions, the Investigative Committee sought Orders that included:

- That a letter of reprimand be issued to Mr. Clark;
- That Mr. Clark pass technical examinations in the field of Structural Engineering;
- That Mr. Clark's authorization to practice structural engineering be limited until such examinations are complete;
- That Mr. Clark pass the Professional Practice Exam within 12 months;
- That Mr. Clark's registration with APEGA be suspended should the above Orders not be met;
- That Mr. Clark pay all costs of the Hearing (subsequently determined to be in excess of \$45,000);
- That the details of this matter be published in the PEGG.

In his submissions, Mr. Clark stated the following;

- That Mr. Clark did not and does not desire to practice structural engineering, and therefore there is no value in an Order requiring him to pass structural engineering examinations before he can continue to do so;
- That the itemized summary of costs provided by the Investigative Committee included costs incurred, in part, by unforeseen delays in the Discipline Hearing process;
- That costs in excess of \$45,000 for a one-day Hearing is an excessive amount;
- That Mr. Clark is nearing the end of his professional career.

In its Findings, the Discipline Committee Panel found that Mr. Clark's actions constituted unskilled practice of the profession, and in particular, unskilled practice of structural engineering. The methods of analysis employed by Mr. Clark were not appropriate for the situation, and the conclusions reached by Mr. Clark were therefore erroneous.

The Panel further understood that the analysis of a concrete slab on grade is a complicated matter that includes an understanding of both geotechnical and structural engineering principles. While it may not have been and may not be Mr. Clark's desire to pursue a career in structural engineering, he nonetheless will be required to apply structural engineering principles if he continues to practice in his current field and in his current role. APEGA must therefore be assured that Mr. Clark understands fundamental structural engineering principles, if for no other reason than to ensure Mr. Clark can identify the limit of his technical abilities. This is most easily accomplished through the successful completion of nationally recognized technical examinations.

The Panel found that, in accepting this assignment that he was not technically capable of completing, Mr. Clark was engaged in unprofessional conduct. The Panel is of the view that it is vital that professional members recognize their limits and work within them. Failure to do so compromises the safety of the public and the reputation of the professions. APEGA needs to be assured that Mr. Clark clearly understands the limit of his abilities, but more than that, the implication to the public and the profession should he choose to accept future assignments outside the limits of his abilities. This is most easily accomplished through the successful completion of National Professional Practice Examination.

With respect to costs, the Panel acknowledges that considerable cost can accumulate as a result of the Formal Hearing process. In addition to the investment of both parties in terms of legal advice, and the costs related to the compilation and distribution of documents, there is also the contribution of many volunteer members of APEGA involved in the process. The Panel is of the belief that, as a self-governing profession, APEGA has a responsibility to ensure that the discipline remains fair and transparent, and with that comes a responsibility to incur costs on behalf of the membership to ensure that the process is fair.

The Panel also understands that APEGA is strongly supportive of self-ordering. APEGA's self-ordering process consists of the offending member and the Discipline Committee reaching agreement on a summary of the conduct in question, the Findings resulting from the conduct, and the Orders arising. However, where self-ordering cannot be accomplished, a Formal Hearing process ensues.

Mr. Clark, during the Hearing and in his subsequent submissions, acknowledges that he engaged in conduct that constitutes unskilled practice and unprofessional conduct. Had he come to the same conclusion earlier in the process, the Formal Hearing process, and the costs related to that process could have been avoided.

The Panel acknowledges that a considerable amount of the costs incurred, as outlined by the Investigative Committee, are related to delays and other issues not related to the this Formal Hearing or this Panel. In determining its Orders, the Panel has considered the costs directly relating to the April 15, 2013 on a shared basis.

In arriving at the costs to be ordered, we included the following:

- Mr. [REDACTED] expert witness costs;
- One-half of the Investigative Committee's costs for the April 15, 2013 hearing date and subsequent submissions;

- The Discipline Committee's costs for the April 15, 2013 hearing date and review of subsequent submissions.

Based on the parties' capacities to pay, we assessed 1/3 of the total of the above, \$7,250, against Mr. Clark.

Having given careful consideration to the parties' submissions, the Panel makes the following orders:

1. Mr. Clark shall receive a letter of reprimand.
2. Mr. Clark shall not engage in the practice of structural engineering, under any circumstances, until he has completed one of the following:
 - a. APEGA Technical Examination 98-Civ-B2, Elementary Structural Design;
 - b. CIV E 474 – Structural Design II as provided by the University of Alberta;
3. Mr. Clark shall successfully complete the National Professional Practice Exam within 12 months of the date of this decision;
4. Mr. Clark shall pay to APEGA a portion of the costs of the hearing in the amount of \$7,250 within 12 months of the date of this decision;
5. If Mr. Clark fails to comply with Orders 3 and 4, his registration with APEGA shall be suspended until he does comply with those orders;
6. If Mr. Clark's registration with APEGA is suspended for failure to comply with orders 3 and 4, and if the suspension exceeds 12 months, then his registration shall be cancelled.
7. This decision shall be published in the *PEG* magazine with Mr. Clark's name.

Dated this 9th day of April, 2014.



Discipline Committee Panel

Appearances:

Gregory Sim
for the APEGA Investigative Committee

David Jardine
for John William Clark

Discipline Committee Panel:

Marty Klaassen, P.Eng., Chair
Timothy Cartmell, P.Eng.
Paul Ruffell, P.Eng.

Discipline Committee Counsel/Staff:

Dwayne Chomyn, QC, Neuman Thompson
Ray Chopiuk, P.Eng., Director of Professional Practice, APEGA