ENGINEERING NEW ZEALAND - HIGH LEVEL EXPERT REVIEW

COMPLAINT: TAURANGA CITY COUNCIL VS BRUCE CAMERON (419)

Introduction

This High Level Expert Review report has been prepared at the request of Engineering New Zealand by way if its letter dated 20 March 2018. The review concerns a complaint received by Engineering New Zealand from Tauranga City Council (TCC) concerning engineer Bruce Cameron CPEng, IntPE(NZ), MEngNZ, BE, NZCE.

My name is Trevor William Robertson and my qualifications are CPEng, IntPE(NZ), BE(Hons), FEngNZ. I am a structural engineer with over 48 years experience in design, design review, construction observation and project management.

I am sole Director of TWR Structural Ltd, formed in 2014. Previously I was a Senior Principal of Sinclair Knight Merz Ltd (SKM), which became Jacobs Ltd in 2013; based mostly in Auckland. For a period of about seven years I was manager of all SKM NZ operations in the buildings market and subsequently Structural Section Manager NZ. In my final few years with SKM/Jacobs I relinquished these management roles in order to concentrate on the technical side of structural engineering. I am a Past President and Life Member of the Structural Engineering Society New Zealand (SESOC) of which I was a founder and was on the Management Committee for many years. I am member of the New Zealand Earthquake Engineering Society, the Timber Design Society and the NZ Cement & Concrete Association.

I have extensive experience in structural engineering and inter-discipline co-ordination and management, built on my background in the building industry as a structural engineer and project manager of large multi-disciplinary projects, several of them award winning. I have recently stood on two IPENZ (now Engineering New Zealand) committees, for re-draft of its Code of Ethics and also redraft of its practice note for Peer Reviews. Over the last decade or so I have frequently been engaged as an expert witness on structural matters.

I have read the Engineering New Zealand Guidelines for Expert Advisors, November 2017 and I am familiar with the Code of Conduct for Expert Witnesses as contained in Schedule 4 of the High Court Rules 2016.

I have not had contact with any of the parties to this matter, either directly for this review or earlier in my career.

Brief

Engineering New Zealand advises that TCC's allegations are that, in his capacity as CPEng, Mr. Cameron:

1. signed Producer Statements – PS1 – Design without supplying sufficient information;
2. signed Producer Statements – PS4 - Construction Review for building work that did not comply with the relevant requirements of the issued Building Consent and/or without supplying sufficient information;
3. provided engineering services that did not meet a reasonable standard, including applying incorrect design assumptions, failing to apply relevant standards, submitting standard drawings which were inappropriate for the specific site;
4. provided engineering services in a negligent manner;
5. misrepresented work as being his own when it had been carried out by another party;
6. provided engineering opinions that were not honest, objective and factual; and
7. behaved unprofessionally, including criticizing TCC staff.

My brief relates to the technical aspects of TCC's complaint and not to the complaints about Mr. Cameron's lack of professionalism. I have therefore not reviewed the quality of communications from Mr. Cameron to TCC, which limits my response with respect to items 6 and 7 above.

To carry out this review I was supplied (electronically) with the following documents:

- TCC letter of complaint dated 2 December 2016.
- Engineering New Zealand records of interviews with both Mr. Cameron and officers of TCC,
- Statements by five TCC employees/contractors,
- Bundle of Documents (BoD) containing six volumes (over 2,500 pages) of information collated by TCC and presented as evidence relevant to its complaint. These volumes included letters, emails, drawings, reports, Producer Statements, calculations, reference material and similar background documentation. There was significant repetition of material.

It should be noted that the TCC letter of complaint does not set out its complaint in the seven subjects listed by Engineering New Zealand, but instead sets it out on four separate "Grounds", as in BoD page 00003, in order to align with the Engineering New Zealand and/or CPEng Codes of Ethics. I have structured this report around the seven items set out by Engineering New Zealand. I have not attempted to then tie it back to the four "Grounds".

Review of matters complained of

1. Signed Producer Statements – PS1 – Design without supplying sufficient information

The BoD included numerous PS1 certificates signed by Mr. Cameron. These ranged from March 2015 to September 2016 and covered mostly pole retaining walls but also several relating to house foundations/structure.

Generally (but not always) the PS1 certificates were accompanied by structural calculations, a free-hand sketch detail and marked up architectural plans providing location. Where the certificate was for retaining wall(s) or foundations there was usually no site-specific information supporting the soil properties relied on. Sometimes a geotechnical investigation had been carried out by others, but frequently not so. Mostly the calculations could be followed by other engineers, but not always; sometimes the calculations were obscure or poorly set out making review difficult. Examples of these include the following:

- BoD 479-480. No derivation of the passive pressure relied on. Also the value of 400 appears to be the width of the footing, not the depth as used in the calculation.
- BoD 512. Fails to allow for the toe soil slope or there is no information indicating it had.
- BoD 638. Typical of many calculations the embedment calculation uses obscure formulae without verification of the source. They may or may not be legitimate, but differ from those customarily used by retaining wall designers so the source should be provided. It is useful to compare these formulae with those given by Stratum on BoD page 1240 (below "After Pender"). It is difficult to relate the two to each other.
- BoD 1205. No working provided; just results.
- BoD 1467 No working provided; just results. (typical of many spreadsheet outputs)

For the majority of cases submitted TCC responded in writing seeking additional information, particularly site-specific soil information, but also verification of other assumptions made (e.g. ground profile). Invariably this information was not then provided in a timely manner, if at all. Sometimes another engineering consultant was engaged by the owner/developer/architect to either peer review both the information and design or to provide an alternative design. TCC then relied on that information for Building Consent purposes. Examples of this include:

- BoD 0677. The developer states "*We actually ended up getting* another engineer *of* [redacted] *to do the engineer's design and report*"
- BoD 1056. Alternative design produced March 2016 for address 14 [redacted] by another engineer [redacted] for client [redacted] This is for the same site certified PS1 by Mr. Cameron in December 2015 (BoD 1034).

- Another engineering consultant engaged by client. Consultant states *"As instructed, we have reviewed existing walls and designed new walls as required by Council...."*. Then further on at BoD 1236 Consultant provides a second report to provide independent design calculations. Note in the 4th paragraph Consultant say *"Council requires an independent review of the approved design"*. It should be noted that an independent peer review is not an unusual requirement for significant designs, but somewhat unusual for a simple retaining wall.
- BoD 1438. The client engaged another engineer to carry out an As-Built review and then revised design for a site where Mr. Cameron had already provided a design.
- BoD 1507. another engineer addressing the developer, states *"As requested, we have carried out a geotechnical design of a cantilever timber retaining wall...."* This site is also discussed under TCC complaint number 5 below.

It appears from the correspondence that Mr. Cameron had been accustomed in earlier years to providing information to TCC (and, presumably, other Territorial Authorities (TAs)) in this format and having his Producer Statements accepted as sufficient evidence of compliance. However times have changed. TAs have frequently been "the last man standing" when building matters have ended up in court and also been subject to frequent audits of their systems. Consequently, they have become significantly more risk averse. In my experience this is true of TAs generally around the country, the same as for TCC. TAs now require substantially greater documentation and verification than in previous times. The TAs' stance on this is supported by Engineering New Zealand's Practice Note on Producer Statements[1].

Mr. Cameron could be forgiven for initially not realizing a change in TCC requirements with respect to information supporting both Building Consent applications and Producer Statements, at whatever time TCC tightened up on its requirements, but it appears from the examples submitted that Mr. Cameron resisted the change and instead of amending his practices to supply such information in the first instance, he continued to resist TCC and instead tried to argue that his certificate should be sufficient and that TCC was being overzealous. The whole profession has tightened up on procedures and, since well before 2015, it is usual for engineers to provide substantial information to TAs in support of Building Consent applications and Producer Statements. This can be observed in reports by other engineers contained in the BoD (refer to examples given in bullet-points above). Mr. Cameron should be no exception.

I therefore consider that over the period March 2015 to September 2016 (at least) Mr. Cameron frequently (in almost all of TCC's examples) provided insufficient information in support of his PS1 certificates. I have not seen any of Mr. Cameron's PS1 Producer Statements more recent than

[1] The Practice Note can be accessed at: www.engineeringnz.org/resources/practice-notes-and-guidelines/

September 2016 and so have no knowledge of whether he is now providing better supporting information.

2. Signed Producer Statements – PS4 - Construction Review for building work that did not comply with the relevant requirements of the issued Building Consent and/or without supplying sufficient information

The bundle of documents included many PS4 certificates signed by Mr. Cameron. These ranged from October 2015 to November 2016 and covered mostly pole retaining walls.

Usually these were accompanied with a single sheet "Site Inspection Record" which ticked off the site checks made, but often simply noting that observations were made and "good ground found". TCC invariably requested better information including the outcomes for the specific features observed. Such features (for pole retaining walls) may include ground bearing verification, hole diameters, hole cleanliness, hole depth and pole size verification. Often these requests for information were either not responded to or resulted in argument, presumably giving TCC cause to believe that maybe such observations had not been carried out.

TCC has quoted examples where subsequent site inspection has shown that the as-built wall did not comply with the consented design, notwithstanding that Mr. Cameron had issued a PS4 verifying the construction. It is possible that Mr. Cameron used his judgment that the non-compliance didn't affect the stability of the wall, but this does not justify issuing an incorrect and misleading PS4.

An example is addresses 12 and 13 (BoD page 00006 and 01238) where poor quality backfill was signed off but subsequently had to be replaced. A graphic photograph of backfill approved by Mr. Cameron for address 12 site is given in BoD 01118.

As discussed in complaint 1 above, TA's have tightened up on their requirements for supporting information and the profession has responded accordingly. Mr. Cameron, over the period reported, appeared to resist complying with TCC's current requirements and therefore did not conform to the norms of the profession.

3. Provided engineering services that did not meet a reasonable standard, including applying incorrect design assumptions, failing to apply relevant standards, submitting standard drawings which were inappropriate for the specific site

Based on examples within the bundle of documents, there were examples of incorrect calculations carried out by Mr. Cameron.

Non-Retaining Wall Example

A good non-retaining wall example provided in the BoD pertained to design of an external deck balustrade for prevention of falling. This single page of calculations (numbered 00175 in the BoD) contained no less than four errors:

1. Incorrect code load selected in that Mr. Cameron had selected the top rail load for internal balustrades, whereas external balustrades require a significantly higher load;
2. No load factor had been applied to the top-rail load. As this is deemed a Live Load a factor of 1.5 applies;
3. An incorrect lever-arm was used to calculate the fixing bolt shear load. Having taken the applied moment about the bolt centroid the shear in the bolts should have been calculated about the same centroid, not by using the bolt spacing. This effectively halved the calculated bolt load, in addition to the above two errors also applying.
4. The permissible bolt edge-distance (to the end of the joist) was calculated as 2.5 Bolt Diameters (30mm) whereas it should have been 8 Bolt Diameters (96mm). Inadequate edge distance can result in splitting of the timber along the line of the applied bolt load. (The detail as submitted showed 45mm edge distance, not the 30mm as calculated).

   These fundamental engineering requirements are supported by either codes or available engineering references. **1.** The required external top rail load of 0.75 kN/m is required by NZS1170.1 Table 3.3, Category A (Domestic) second line (note that first line specifically excludes external). **2.** NZS1170.1 does not specifically state that this is a Live Load, but calls it an Imposed Action, however NZS1170.0 clause 1.1(b) clarifies that Imposed Actions are live loads. This is further clarified in clause 1.5 Definitions for "Q", then in clause 4.2.2 it defines that the Load Factor to be applied to Q (Imposed Actions) is 1.5. This is all further clarified in MBIE publication "*Guidance on Barrier Design*" March 2012. **3.** Taking moments about a common point in order to determine forces/reactions is fundamental structural engineering, as taught in year 1 engineering courses and even secondary school physics. I am not aware of any code that sets this out, it is too fundamental, but it is likely to be mentioned in many basic engineering textbooks or school physics textbooks. **4.** This is covered in NZS3603:1993 "*Timber Structures*" Figure 4.1 (penultimate diagram). A preferred method of fixing a timber baluster is provided in the MBIE publication, Figure 4.8.

The above errors result in a calculation of a bolt load only 25% of what it should have been, then applied this load at an unacceptable edge distance. The resultant balustrade would be dangerous based on the intended structural actions, though confinement by the boundary joist and decking may partially have mitigated the under-strength. The post itself was also under-sized but not so dramatically.

This example is the only non-retaining wall case that I am aware of, but the errors are so fundamental, going to the very core of structural analysis, that they raise significant concerns with me about the standard of Mr. Cameron's competence.

Retaining Wall Calculations

There were errors in some of the retaining wall calculations viewed. Some of these are the same issue repeated on multiple designs, notwithstanding TCC pointing the matter out, but there were other errors that occurred in some wall calculations and not in others with the same situation. This is curious.

An example of this latter case is in the selection of load factor to be applied to the soil load. This should be either 1.5 if designed to NZS1170 or 1.6 if designed to Building Code B1/VM4. Mr. Cameron variably used 1.5 within spreadsheet calculations or 1.6 within hand calculations – either would be acceptable. However for address 26 Mr. Cameron applied a load factor of 1.2 (spreadsheet calculations) until this error was pointed out by TCC. This seems to have been an isolated instance.

A further example arises on page 01478 of the BoD. As annotated by TCC the value 19.2 is not the correct solution to the quoted formula. The numerical solution is 15.6. Fortunately even 19.2 was not sufficient for this particular wall and Mr. Cameron increased the pole size to the next standard pole size, which was sufficient. While this is just a simple arithmetic error, it is symptomatic of the standard of calculations presented. Had the value of 19.2 met the assessed demand then Mr. Cameron wouldn't have increased the pole size and the design would be under-strength (actual strength 15.6 in lieu of perceived 19.2).

Common themes within the available documents are:

- Lack of soil information supporting the soil property values used in the calculations. It appears Mr. Cameron relied on his judgment in most instances. By way of example, for [redacted] address 33 according to TCC, Mr. Cameron used clay soil properties for retaining wall design and sandy soil properties for soakage design (BoD page 02083 b). Mr. Cameron has defended his approach (BoD page 02088) by demonstrating that the two soil properties are at different locations on the site. Differing properties could be possible. The BoD does not contain information on the retaining wall design for this site so I cannot verify TCC comment. A similar error occurs at address four where the soil properties used by Mr. Cameron were based on a clay soil (BoD page 00886) whereas a subsequent detailed soil investigation by engineering consultancy showed the soils to be silty sand (BoD page 00891). Mr. Cameron's calculations were therefore inappropriate.
- Disagreement between Mr. Cameron and TCC as to the magnitude of surcharge above the wall. In the examples I have reviewed, I generally support TCC approach. There was

sometimes debate whether the surcharge should be 2.5 kPa based on light vehicles or 5.0 kPa based on heavy vehicles. It is sometimes hard to determine which approach is appropriate from the documentation available but there was certainly at least one case where I would side with Mr. Cameron's view.

- Similarly there is disagreement as to the ground slope above the wall, which must be taken into account either directly or by assuming an equivalent surcharge load. An example is shown in the photo on BoD page 00811. Mr. Cameron has argued there is no above wall ground slope whereas the photo clearly shows a steep slope.

Illustrative example: address 16

An example that illustrates many of TCC's key concerns is address 16 presented by TCC at BoD page 00005, and with data pertaining to this Building Consent presented on BoD pages 01366 to 01458.

This was a circumstance where various walls were constructed, by others, without a Building Consent and the design calculations, PS1 and PS4 issued to TCC retrospectively in order to obtain either a Building Consent or Certificate of Acceptance. TCC rejected the calculations and hence PS1. They said that although the calculations were quite comprehensive the calculated pole sizes were incorrect. TCC also rightly rejected the PS4 as it lacked any supporting information such as inspection records and photographs to verify the construction quality. It is quite common and appropriate in a retrospective situation such as this for a TA to require substantial supporting information, as the TA has been denied the opportunity to carry out its own inspections, yet it is the body that ultimately must make the decision as to whether the construction is adequate and acceptable. Further, TCC did visit the site to view the finished product and found that the wall elements it could see differed from the submitted design. TCC therefore lacked confidence that the PS4 adequately represented the essential parts of the construction that could not be seen I.e. the foundations.

The calculations were then resubmitted, but TCC elected to have both the design and construction reviewed by an independent consulting engineering company, (SC) In two out of three locations checked by SC the as-constructed pile depth was less than Mr. Cameron's "design" (2.1m c.f.2.5m), notwithstanding Mr. Cameron's PS4, and also Mr. Cameron's design determined substantially less embedment than the SC calculations (2.5m c.f.4.0m). SC developed a strengthening scheme.

Approach to retaining wall calculations

TCC has maintained that Mr. Cameron made an error in many retaining wall calculations, by taking the maximum pole bending moment at the top of the concrete encasement instead of at some calculated depth into the soil. Mr. Cameron's approach relies on composite action between the timber and the concrete immediately the pole meets the concrete. The former (TCC) approach will

generally result in one pole size increase compared to Mr. Cameron's approach. While I support TCC's position, this is a bit of a controversial point with two different approaches being taken within the profession. Mr. Cameron would not be the only engineer to take his approach. There is very little specific guidance on this matter, and what is available is contradictory. The Timber Design Guide 2007 advocates the approach taken by Mr. Cameron (refer BoD page 00371 – top diagram), so Mr. Cameron could be justified in taking this approach. However, in September 2014 Mr. B Brown published a paper (BoD pages 00379 – 00383) in the SESOC Journal challenging this approach arguing that composite action is unreliable and that the peak bending moment actually occurs at some lower depth. Based on calculations I have seen carried out by other engineers, Mr. Brown's approach is now commonly used and indeed was in common use well before Mr. Brown's article. I don't know if Mr. Cameron is a member of SESOC and therefore whether he had access to this article. Consequently it is understandable that Mr. Cameron may have used his approach initially, but I would have expected most reasonable engineers to update their practice after the unreliability of the original approach was brought to their attention, as was done by TCC.

4. Provided engineering services in a negligent manner

This seems to be a "catch-all" complaint reliant largely on the errors and omissions complained of in other sections. It is therefore hard to give specific comment.

However the other sections do demonstrate quite frequent and common errors, many of which in turn demonstrate a lack of checking and over-reliance on personal judgment rather than specific investigation. Particularly there seems to have been a willingness to sign off on construction standards that clearly were inadequate. There are quite a few instances where other engineering companies have reviewed either Mr. Cameron's design or the as-constructed result and required changes. With reference to the examples cited in this report, and similar cases I have seen within the BoD, my opinion is that Mr. Cameron's work has frequently fallen short of the standards expected of a reasonable engineer.

5. Misrepresented work as being his own when it had been carried out by another party

There seems to be only one detailed example provided in the body of the BoD in support of this complaint, being [redacted] building consent for address 17 [redacted] presented by TCC at BoD page 00005 and with data relating to this Building Consent presented on BoD pages 01461 to 01530. I note that [redacted] TCC engineer in his Statement of Evidence Clause 3.1(e) refers to a second example BC52108 at [redacted] an address and also [redacted] TCC engineer Statement of Evidence Section 6 provides more detail of this, but the only evidence provided is that included by [redacted] TCC engineer as "Case 5". There is otherwise no sample documentation provided. I also note that this second case is not included in TCC Letter of Complaint.

Address 17

The sequence of events for building consent is not easy to follow.

Mr. Cameron submitted a set of calculations and PS1 for retaining walls on the site on or about 15 November 2015. TCC determined the calculations contained errors and lacked supporting data, and issued a RFI seeking correction and further information. Mr. Cameron engaged a geotechnical engineering consultancy (GC) to carry out a peer review of his design. GC carried out its own calculations rather than review Mr. Cameron's, as they found his hard to follow, and provided a report dated 2 February 2016 that generally supported Mr. Cameron's design in its text, but with the qualification that ground conditions must be verified prior to construction. However a table of pole sizes and embedments attached to the report showed sizes smaller or the same as Mr. Cameron in all but two cases, the same embedment for general walls but substantially greater embedment for walls close to boundaries (which allowed for much higher surcharge above the wall). It is hard to reconcile GC's comments with their table.

Mr. Cameron then reissued his calculations to TCC without amendment except for altering the pole selections for different retained heights. That is, his calculations did not match the sizes presented. For the walls near boundaries his embedment was still substantially less than GC's Mr. Cameron also reissued his PS1 dated 12 February 2016.

It is not clear what then happened, but within two weeks of issuing its Design Review report GC issued a further report to the site developer, [redacted] providing a new design accompanied by its own PS1. This report also provided a specification and construction details that clearly anticipated observation of construction by GC It is clear that this alternative design had been commissioned by the developer.

TCC has maintained in its notice of complaint that the 2nd issue of Mr. Cameron's PS1 was in relation to the GC design as if it was his own. I am not able to reach this conclusion based on the information available. While the date of Mr. Cameron's second PS1 is the same as GC's PS1, it was issued only one week after receipt of GC's peer review report, which, at least in the text, said that Mr. Cameron's design complied. It is quite plausible that the certificate was issued in support of his amended calculations submitted on 9 February 2016 (notwithstanding that they appear to be incorrect). The PS1 makes no reference to the GC design.

The issue is complex and the sequence of events not quite clear. Overall there is not enough information for me to determine that Mr. Cameron has fallen short of the standards expected of a reasonable engineer in this respect.

An address not referenced in the decision

As stated above, the only evidence for this building consent is that contained in TCC's Statement of Evidence, Case 5. On the face of that evidence it does seem that Mr. Cameron's PS1 is covering work provided by another engineer. The PS1 doesn't specifically refer to it, but a letter several days prior on 3 June 2015, addressed to (Contractor/Developer), specifically refers to calculations by structural consultancy (SC) and attaches a copy. However the PS1 is dated 8 June 2015 and therefore clearly did not accompany that letter. Both the PS1 and the SC calculations are date-stamped as received by TCC on 11 June 2015. Therefore, on the face of it, it seems that these two documents were submitted together. TCC states that he phoned SC and says that they had no knowledge that their calculations had been submitted.

While the lack of full documentation may leave an element of doubt, on the face of evidence available it appears Mr. Cameron provided a PS1 certificate for another engineer's work, without that engineer's knowledge. His PS1 refers to "*drawings numbered 15044543*", which appears to be Mr. Cameron's (Civil's) project numbering system. The first page of the SC calculations has annotated in the margin "*15044543*", presumably by Mr. Cameron. The standard wording of a PS1 includes the words "*The design prepared by us...*" This wording would therefore preclude using the certificate for another engineer's work, except in the special circumstance that the other engineer is engaged by the certifying engineer as a sub-consultant, and the certifying engineer is taking full responsibility for the design. There is insufficient documentation to ascertain how SC was engaged and by whom, but it appears to not be by Mr. Cameron. However, in mitigation, Mr. Cameron did not disguise the fact that they were SC calculations nor claim the calculations were his own. They clearly carried the SC logo.

6. Provided engineering opinions that were not honest, objective and factual

This complaint needs to be broken into the three subjects of honest, objective and factual.

My brief is to assess Mr. Cameron's work from a technical perspective, and not to comment on the TCC's complaints about his professional integrity. I am therefore limiting myself to assessing the factual aspects of this ground of complaint.

There certainly are examples where information is shown to not be factual. In this context not being factual is not the same as dishonesty as the latter implies intent to deceive. Information not being factual, without intent, could arise due to lack of care, relying (erroneously) on past experience, relying on information from others etc. While these possibilities may all be unprofessional they are not necessarily dishonest. The lack of being factual primarily relates to construction observation, either with respect to a PS4 issue or a request for a Certificate of Acceptance. It is primarily when reporting on construction standards that matters of fact come up. Examples were given under complaint 2 above and there are other examples within the BoD.

7. Behaved unprofessionally, including criticizing TCC staff

I am advised that reviewing the quality and content of Mr. Cameron's communications with TCC staff, other than in a technical sense, is outside of my brief.

Conclusions

It is clear that there has been (at least between 2015 to 2016 inclusive) a chronic breakdown of communications, and hence respect, in both directions between Mr. Cameron and TCC. The more this became embedded the further the distrust of each other developed. I have no knowledge of these matters before 2015 or after 2016.

The strained relationship between Mr. Cameron and TCC should not affect the standards of competence expected of a reasonable engineer. Mr. Cameron's documentation supplied to TCC has been deficient with respect to content (lack of supporting information), technical accuracy, thoroughness and tidiness (i.e. difficult for other engineers to review). Mr. Cameron has resisted TCC requests for additional and better information, which TCC is entitled, as a TA, to request.

Mr. Cameron was clearly used to operating on the basis that his word as a CPEng supported by his Producer Statements as being sufficient evidence of design or construction compliance. My expectation of a reasonable engineer would be that they would recognise that times have changed and that TAs generally require more information than in past times.

Engineer of consultancy set out this matter very succinctly in his letter to TCC dated 2 June 2016 (BoD pages 02125 – 02126) and I can do no better than quote his paragraph:

> *"Bruce Cameron has issues with the requirement to supply information to the council. In the past, an engineers* (sic) *statement may have been accepted without qualification, but times have changed and the council are* (sic) *requiring evidence and justification for designs submitted. Councils are now rigorously audited, and to a far higher standard than ever before, and they must have evidence as to why a design was accepted – it is not acceptable to just say they relied on the engineers' statement without any supporting information. In the end of the day, councils tend to end up carrying the can as they are always there – engineers come and go or can hide behind legal entities."*

I concur with this view.

Overall I consider that much of Mr. Cameron's work contained in the documentation provided by TCC was below the standards required of a CPEng engineer.

Trevor W Robertson
BE(Hons) CPEng, IntPE, FEngNZ

Date: 18/4/2018