HEARING RESUMES ON FRIDAY 7 SEPTEMBER 2012 AT 9.31 AM

JUSTICE COOPER:

Yes. Mr Laing.

MR LAING:

As the Commission pleases. The submissions that you're about to hear are made on behalf of the Christchurch City Council and as part of that process they will respond to closing submissions of counsel assisting and cover other matters that have arisen during the course of the hearing.

JUSTICE COOPER:

Thank you.

MR LAING:

The intention is only to address those matters that have a bearing on the Council itself and so there is no intention to deal with collapse theories, except in relation to some incidental matters I will come to in due course.

JUSTICE COOPER:

Thank you.

MR LAING:

I will be making some comments about the submissions on behalf of Dr Reay and his company as I go along. The proposal is that I will deal with the first 13 pages, to paragraph 50, my friend Mr Reid will then deal with the next section which deals with code compliance and then I will complete dealing with the post-earthquake building assessment issues that arise. Turning back to the text. The submissions generally follow the order of counsel assisting. So I thought that would be helpful, to follow the same order.

JUSTICE COOPER:

Thank you.

MR LAING:

Except in relation to paragraphs 151 to 171 of their submissions. It is not proposed to canvass the introductory matters in the submissions of counsel assisting because they are really dealt with in more detail later in these submissions and theirs and, again, I don't intend to deal separately with the submissions on behalf of counsel for the bereaved families and those injured. That's no disrespect it is simply that the matters that we wish to address are contained in the submissions of counsel assisting.

JUSTICE COOPER:

Thank you.

MR LAING:

The first area relates to design issues. I don't intend to comment on paragraphs 35 to 151, primarily focussed on Dr Reay, his company and Mr Harding. At paragraphs 122 to 134 of counsel assisting submissions there is a comment relating to Mr Harding's role in relation to specific matters of design and to the extent that they relate to code compliance matters they will be dealt with later in the submissions.

Turning to the building permit section of the closing submissions that relates to three issues, firstly, non-compliance of bylaw 105 in codes. The next issue is Mr Tapper's sign-off on the structural design and the 27 August letter and, thirdly, areas of non-compliance that should have been identified by the Council's referring engineer.

I say in paragraph 8 that issues (a) and (b) will be dealt with in a preliminary way as follows and issue (c) is dealt with later in the submissions by my friend Mr Reid.

Firstly, the compliance issue that's raised in closing submissions in an introductory way. This section discusses the concept of a shear wall protected gravity load structure and the use of non-seismic provisions of NZS 3101:1982 leading to the general submission that the application of this approach to design the CTV building did not comply with bylaw 105. There is

then a discussion about various papers and seminars that may have had a bearing on this topic.

In my submission there are two distinct issues to be addressed. Did the actual CTV design comply with bylaw 105 in the relevant codes? And, secondly, could any building be designed with a shear wall protected gravity load structure with columns and beam column joints being designed using the non-seismic provisions of NZS 3101?

The first question will be elaborated on later in these submissions in relation to code compliance but the Council accepts, as it did in opening, that the CTV building did not comply in certain respects with bylaw 105 and the relevant codes. There are, however, important differences between the submissions of counsel assisting and these submissions as to both the interpretation of the bylaw and codes and in relation to the question of non-compliance.

The closing submissions at paragraph 151 state that the absence of guidance in relation to a non-ductile frame structure, together with the warning set out in the article, illustrate the incompatibility of such a structure with the obligations avoiding collapse and minimising injury and death. To the extent that this submission is referring to a specific interpretation of bylaw 105 and the relevant standards that issue is dealt with later in these submissions under the heading of code compliance.

But more generally, and contrary to what is suggested at paragraphs 142 and 146 of the closing submissions, the CTV building was not in my submission a hybrid structure in the accepted meaning of that term and I refer there to clause 3.5.8.1 of NZS 3101. All the loading was intended to be taken in the shear walls.

Further, it is submitted there is nothing in the publications referred to in paragraphs 143 to 150 of the closing that would suggest that a shear wall protected gravity load structure cannot be designed in accordance with the relevant codes, although it is accepted the detailing will be important and again we turn back to this topic later in these submissions.

I now turn to a separate topic relating to design certificates which is discussed at paragraphs 173 to 176 of the closing.

As indicated in the counsel's opening submissions at paragraph 34 clause 8.2.5 of bylaw 105 required the designer to provide calculations to establish that the concrete elements had been designed in accordance with the requirements of the bylaw, or alternatively certified in an approved manner. The design method conformed with a recognised code of practice. It seems clear from clause 825 the designer was entitled to make selection rather than the Council.

Mr Tapper in his letter of 27 August 1986 requested calculations. This is consistent with the fact that no design certificate had been provided by Alan Reay Consulting Engineer. The bylaw did not expressly deal with the situation where the Council reviewing engineer was still not satisfied with the concrete design, notwithstanding the provision of a design certificate.

However, it seems clear that even if the designer did provide calculations or a design certificate in the first instance the Council could still decline to issue a building permit if it was not ultimately satisfied about compliance with the bylaw.

If I could take you now to clause 2.13.1 and the reference is ENG.CCC.0044A.19. I hope you can read that Sir but –

JUSTICE COOPER:

Yes.

MR LAING:

At 2.13.1 – The engineer may withhold a permit if he considers that deficient information has been supplied relative to the matters herein referred to or required by any other relevant bylaw in force or if he considers the building does not comply with the requirements of this bylaw or other relevant Acts. I don't need to read the rest of that.

The other procedure the Council could

0940

have adopted was to require a structural design features summary under clause 2.4.2 and 2.4.5 of the bylaw but this was not a substitute for a design certificate.

It is suggested at paragraph 177 of the closing that the Council appeared to attribute a low level of skill to its own staff and their ability to identify design deficiencies or areas of non-compliance. In my submission this does not fairly reflect the totality of the evidence that was given to the Royal Commission by:

firstly, Mr Nichols who disagreed with Mr Henry's view as to the competence of Mr Bluck,

Mr John O'Loughlin who commented about the competence of both Mr Bluck and Mr Tapper,

Professor Mander and Dr Reay who also commented on Mr Bluck's reputation.

It is apparent the design of the CTV building was challenging for reviewing engineers but this should not be equated with the notion the Council's structural design checking engineers had low levels of skill or abilities. They had to deal with a wide range of building designs in the course of their work and were well regarded engineering community.

And I'd just like to pause there if the Commission pleases and deal with submissions made at paragraph 72 of the closing on behalf of Dr Reay and this is the issue relating to, or the suggestion by Dr Reay that he use, or was entitled to use the Council as some sort of checking agency. And I'd just like to make some brief submissions in response to that and just by a omnibus submission I'd say that such a practice confounds the respective roles of the design engineer and the Council. I'd say it's quite clear from bylaw 105 that the onus is on the applicant and the design engineer to demonstrate compliance with the bylaw, and I say that that's apparent firstly from clause 2.5.3 and that's at point 15, 2.5.3 – that relates to the need to provide the names of people taking responsibility for the design of the building and specifically listed as structural engineering design. So it's quite clear that the Council is requiring people to provide their names and take responsibility for the design.

And also in that regard I'd just go to 2.6.1.1 which relates to the details that had to be provided, sufficient to show to the satisfaction of the engineer the exact nature and character of the proposed undertaking and provision made

for full compliance with the requirements of this bylaw and any other relevant bylaw in force.

So absolute clarity around the fact that the documentation supplied with a building permit application must demonstrate compliance with the bylaw.

But the next matter of importance in my view is the fact that drawings had to be signed by the engineer responsible and that is apparent from clause 2.8.1 at point 17.

"All drawings, computations and other data submitted shall be signed by the architect, engineer or designer responsible for their production and shall clearly identify him and his firm or organisation".

And that was confirmed by Mr Henry in cross-examination and the transcription reference there, sorry Mr Harding sorry, not Mr Henry, and the transcript reference is 20120731.25 lines –

JUSTICE COOPER:

Sorry start again please.

MR LAING:

I'm sorry sir. TRANS 201 -

JUSTICE COOPER:

Yes.

MR LAING:

20731.25.

JUSTICE COOPER:

Yes.

MR LAING:

Lines 20 to 27 and also there I'll just simply take you to the Tapper letter again of 27 August 1986. I don't need to bring it up but as you will recall he states in that letter,

"All drawings, computation at the date it's submitted shall be signed by the architect, engineer or designer responsible for their production and shall clearly identify him and his firm or organisation".

And he went onto say, "There is no indication on the plans that they have been checked and approved for issue and construction."

JUSTICE COOPER:

That could have been I suppose from the Council's point of view checked by the original designer or checked by somebody else in the firm or checked by somebody in another firm so long as when he came in the door it was illustrating a complying structure.

MR LAING:

Yes I think the way the bylaw is structured is that the person who is signing the plan is the person taking responsibility. That's the person the Council will go to, to ask for further information which of course happened here in the case of Mr Tapper's letter.

JUSTICE COOPER:

Just the word "checking," you talk about checking your own work or, what do you think that connotes?

MR LAING:

Well that's not an issue that's dealt with. It's more to do with the person who is taking responsibility for those drawings must identify themselves so Council can go back to them.

JUSTICE COOPER:

Sure.

MR LAING:

So I don't think, it's not clear from the bylaw whether the checking has to be done internally or by peer review. There's no reference to that.

JUSTICE COOPER:

No.

MR LAING:

And as I think we heard in evidence peer review did not appear to be a common or standard practice at the time.

JUSTICE COOPER:

Well we've had evidence about plans being checked within engineering firms –

MR LAING:

Within the firms themselves, yes.

JUSTICE COOPER:

As a matter of practice.

MR LAING:

Within the firms yes.

JUSTICE COOPER:

But no firm with so few engineers as this one had.

MR LAING:

Yes.

JUSTICE COOPER:

So we're thinking about that.

MR LAING:

And that is the conundrum here. If you don't, in a small practice.

JUSTICE COOPER:

But your point is, well the point I put to you a few minutes ago is in a sense it's a matter of indifference to the Council what checking process has been carried out so long as there has been one.

MR LAING:

They want to know who has been responsible for design, and want to see the plans signed to show that that responsibility's taken. I think that's the only point I make out of that. So that concludes that part.

I now go onto the Graeme Tapper letter and I would say that there is a close alignment between the submissions I'm going to make to you now and what you heard from my friend Mr Rennie on this topic yesterday. I've approached it slightly differently but I think we both reached, we came to the same point.

It is now proposed to address paragraphs 183 to 229/119 of the closing submissions. This section of the closing leads to an ultimate submission that the evidence supports various conclusions set out in paragraph 229 and that the relevant circumstances do provide a reasonable assurance the statements are reliable in terms of sections 16 and 18 of the Evidence Act 2006.

I then set out the key background facts that are now well known to the Commission:

building permit application lodged 17th of July '86,

structural drawings received 26th August,

Mrs Tapper's letter the next day in relation to the drawings.

I say in (d), given the original Tapper letter was in the Council's file it must have made its way back to the Council at some unknown date. Mr Harding identified his writing in the top right-hand corner of the front page. It is, however, unclear as to whose handwriting the word "received a day or so later after letter sent" in the left-hand margin, the page of that letter.

At the end was a document transfer form dated 5 September from Alan Reay signed by Mr Harding and again received by the Council at an unknown date. And then Mr Tapper's initials on the structural sign-off on the 10th of September.

0950

And then I say as I indicated 183 of the closings some of the concerns identified by Mr Tapper appear to have been dealt with on the permit drawings transmitted to the Council.

It is then submitted at paragraph 183 of closing submissions that the concern about the diaphragm connections was not addressed on the structural drawings based on the fact that there was no difference based on the fact there was no difference in relation to the design details between the structural drawings provided by Alan Reay Consulting Engineer and the permit drawings held by the Council. And this issue is subject to further submissions below and I simply give you a reference there it is paragraph 151(b) of our submissions. And you may recall Mr Rennie also dealt with that issue yesterday and I would make a similar submission about the issue of stirrups raised by Mr Tapper in his letter.

The submission is then made, at paragraphs 186 and 196 of the closing, that based on the evidence of Mr Nichols, Mrs Tapper, Mr John Henry and others, that Dr Reay had gone over Mr Tapper's head to Mr Bluck and convinced him it was appropriate to issue the building permit to be issued for the CTV building.

While it is clear that Mr Tapper was raising an issue about the diaphragm connection there can be no certainty as to the precise nature of the concern identified by him. Contrary to what is suggested at paragraph 193 of the closing submissions, the evidence of Mr Nichols and Mr Henry has no real probative value in resolving what exactly was behind Mr Tapper's comment in his letter.

As is evident from questions put to Dr Reay by Mr Rennie, Dr Reay had gone directly to Mr Bluck, must have been sometime between – that should be sorry 5 and 10 September, that's a typographical with the weekend intervening.

A significant amount of evidence was given by witnesses concerning vigorous debates between Mr Bluck and Mr Tapper over their period together at the Council, and further was general evidence, not accepted by Dr Reay, that Dr

Reay went over the head of Mr Tapper on occasions to get Mr Bluck to intervene.

Most significantly however, it is submitted that this evidence doesn't of itself establish in relation to the CTV building that Dr Reay persuaded Mr Bluck to override Mr Tapper and to effectively direct him to sign off on the structural design on 10 September 1986.

JUSTICE COOPER:

This version of events which you are urging on us, am I right, it requires us to accept that the permitted plans in relation to the connection to the north shear core wall were acceptable, Mr Tapper found them acceptable, notwithstanding that he raised an issue about that connection on some earlier version of the plans?

MR LAING:

That seems Your Honour to be the necessary inference because he did sign off on the plans.

JUSTICE COOPER:

And you think that is plausible, or you submit it's plausible –

MR LAING:

(inaudible 09:54:00) we know that he initialled the structural column on the – the building permit application you may recall has these little columns which has got sign offs on the front page of it and he put his initials on that on 10 September.

JUSTICE COOPER:

So that the – for this version of events to be correct what has been permitted is an improvement on what was previously before the Council?

MR LAING:

Yes because we don't have the version of the plans that he looked at on, or where you have commented on as letter of 27 August.

JUSTICE COOPER:

No, but how does that respond to the question?

MR LAING:

Well we must – he signed off on the plans which became the permitted plans.

JUSTICE COOPER:

So he must have thought that the permitted plans were an improvement on what had previously been a matter that he was raising as a concern?

MR LAING:

Well that is the inference from that sequence of events, yes Sir.

JUSTICE COOPER:

And this is a highly competent and experienced checking officer?

MR LAING:

That is right. But I just need to qualify that by saying, we don't know precisely what Mr Tapper's concern was about the diaphragm connections, he is raising it in relation to S15, S16 but we are not certain what the concern was. Was it a detailing matter, was it a – in principle matter, it's just not at all clear as precisely what that concern was. We only have the letter, we have no other information about that.

JUSTICE COOPER:

No, we have two sets of plan.

MR LAING:

Yes.

JUSTICE COOPER:

Both of which are the same in that respect, is that right?

MR LAING:

We don't know – well, the only plans we have, we have the permit plans, we cannot be certain what changes were made to the plans from when Mr Tapper looked at them and to when he then received amended plans and signed off on the structural design. That's the inherent uncertainty that we are faced with at this stage. Am I clear in my – I just want to make sure –

JUSTICE COOPER:

Well I understand what you are saying but what we'll have to weigh is whether we accept that Mr Tapper – well that the permitted plans were different in respect of the connection than the ones that were originally before him and that's the issue.

MR LAING:

Yes that is the issue, there isn't – there is an inference to be drawn if you so wish, there is an inference to be drawn from that.

JUSTICE COOPER:

Yes.

MR LAING:

I don't think I can take it – put it any higher than that Your Honour.

JUSTICE COOPER:

No.

MR LAING:

I've – as we all have, we've all puzzled over this over many weeks and it is quite clear that there were changes to the plans, generally, there were a number of changes made, that is quite clear because it looks, you can do, as

my friend Mr Mills did in his submissions, he compared them but on this critical point we don't have, we can't make a direct comparison.

JUSTICE COOPER:

All right, so I accept that. Now just whilst we have stopped, just in relation to paragraph 27?

MR LAING:

Yes.

JUSTICE COOPER:

What's the – I am not sure if I am grasping the significance of the fact that if Dr Reay had gone directly to Mr Bluck it must have been sometime between 5 to 10 September 1986. What's the significance of that?

MR LAING:

I don't draw – I don't put, other than the fact it's a very short window, I don't put any further significance on that.

JUSTICE COOPER:

Well, what, short in relation to what? Surely it is time enough for there to be a discussion?

MR LAING:

There is time enough to be a discussion.

JUSTICE COOPER:

And if there was a discussion it would have to happen on a certain day wouldn't it, I mean I am not sure –

MR LAING:

Certainly.

JUSTICE COOPER:

- I understand what the force of this point is?

MR LAING:

Well I don't, I am not raising it to suggest that the discussion did or didn't happen Your Honour, if that is what is in your mind, that is not my point, it is simply pinpointing that time.

JUSTICE COOPER:

Yes, well I mean it is about the right time, if there was to be such a discussion, isn't it?

MR LAING:

Yes it is, I am not making any point that that necessarily makes it unlikely there was a discussion or not, it's simply pinpointing a time over a very short period with a weekend intervening.

JUSTICE COOPER:

Okay, thank you.

1000

MR LAING:

I think I was at paragraph 30.

It then becomes necessary to consider the evidence from Mr Nichols about his encounter in the street with Mr Bluck and the evidence of Mrs Tapper of her conversations with her husband.

The evidence of Mr Nichols is reviewed at paragraphs 208 to 212 of the closing submissions and I don't think I need to take you through that. Mr Nichols refers in his evidence to a fracas between Mr Bluck and Mr Tapper about the issue of a building permit. This evidence does not in itself establish that Mr Bluck over ruled Mr Tapper and effectively directed him to approve the structural design.

The observation is then made in the closing submissions that the relevant evidence of Mr Peter Nichols was not challenged. This of course highlights

the difficulty with hearsay evidence of this nature. Mr Nichols may be a perfectly truthful witness and may have had a good recollection of events but affected parties are deprived the opportunity of testing the underlying factual matters and seeking clarity on some highly relevant issues and I then list the issues that I think are very relevant.

Firstly, what exactly were the precise design issues in contention between Mr Tapper and Mr Bluck that led to the fracas?

What initial misgivings did Mr Bluck have in terms of the design involving a novel technological approach? How were these misgivings first raised with Mr Bluck?

How did Dr Reay's involvement which was not recalled by him come about? Did he or some other person in his office make the first contact with Mr Bluck, Mr Tapper or some other Council officer?

What was the precise nature of the discussion between Mr Bluck and Dr Reay if any?

What factors led to Mr Bluck being persuaded that his initial reservations were unfounded?

Was Mr Tapper in any way involved in discussions? And if so was he also ultimately persuaded his concerns, whatever they were, were unfounded?

Putting aside all these questions to which it is submitted there can be no clear answer, there is nothing in Mr Nichols evidence if accepted to indicate that Mr Bluck did not apply himself in a professional manner to the design issues, and it would in any event be unfair to draw any such inference many years after the alleged events, especially when he cannot now defend himself.

I then now just turn briefly to Mrs Tapper's evidence.

Her reference to 1986 as the date of the conversation with her husband was in answer to a question by counsel assisting which mentioned that date. It is not a criticism, it is simply just what happened.

In answer to a question about her husband losing a job she agreed it could've been a throw away comment. She stated he would stand up for what he believed was right. She also stated that Mr Bluck and Mr Tapper were good personal friends. In answer to a question of Mr Rennie, Mrs Tapper said her

husband never really mentioned the incident again. All of this evidence could suggest that Mr Tapper was not seriously concerned about the loss of his job.

Mr Hutt's evidence about the lack of other qualifying buildings depends on the discussion between Mrs Tapper and her husband actually taking place in 1986. I simply there refer to memorandum that is filed on behalf of the Council which conducted a much wider search and found evidence of a dispute in 1990. I will just provide the document reference there, BUI.MAD249.0606.1.

Further, and as a case of evidence to Mr Nichols, the immediate difficulty with Mrs Tapper's evidence is that she could not assist the Commission with some important issues, some in common with those set out in relation to the conversation between Mr Bluck and Mr Nichols that potentially reflect on the reputations of Mr Bluck and Mr Tapper. I list these questions.

How was the debate between Mr Bluck and Mr Tapper on the day in question resolved?

In particular did Mr Tapper and Mr Bluck finally have a meeting of the minds on whatever the precise design issues in contention were?

Did Mr Tapper have reservations about proving the structural design, did he document his concerns at the time?

Was Dr Reay in fact involved in a discussion on a day described by Mrs Tapper in her evidence?

Did Mr Bluck in fact put pressure on Mr Tapper to sign off on the structural design?

How real were his job concerns? Was anything said by Mr Bluck to give him cause to fear for his job?

None of these questions can now be satisfactorily resolved even assuming Mrs Tapper's evidence is accepted at face value.

JUSTICE COOPER:

Well on that point is there a reason that it shouldn't be?

MR LAING:

I'm sorry Sir, you're saying the?

JUSTICE COOPER:

You say even assuming Mrs Tapper's evidence is accepted at face value.

MR LAING:

Yes.

JUSTICE COOPER:

Is there a reason that it shouldn't be?

MR LAING:

No, I did qualify my submission but if you press me to indicate that do I have any reason her evidence shouldn't be accepted, then I say I think it is evidence that can be accepted in the round, but as Mr Rennie said in closing yesterday, cross-examination of evidence does take on a slightly different complexion. So that's what I –

JUSTICE COOPER:

Well I accept that, I'm just wanting to know what's behind the reservation in that paragraph, that's all. I'm not pressing you Mr Laing, I'm just asking?

MR LAING:

No well I, that, I put it that way when I prepared the submissions but I don't have, I could not really make a submission to you the evidence shouldn't be accepted. But of course I'm only saying that because it is up to you to ultimately whether you accept it or not, and if so –

JUSTICE COOPER:

Well that's always the case, but if there were a reason for your reservation I'd be interested to hear it.

MR LAING:

No, no it is simply phrased in that way, it's not intended to, but I do say that the cross-examination that did take place –

JUSTICE COOPER:

I've grasped that point.

MR LAING:

Yes. At paragraph 40, in summary it is submitted it's not appropriate to draw any of the conclusions listed at subparagraph (c) to (k) of paragraph 229 of the closing and certainly not in a way that's potentially adverse to the reputations of Messrs Tapper and Bluck. The only way that these conclusions can be drawn is to put considerable and in my submission unjustified weight on general evidence of the relationship between the various persons concerned. It is submitted this is not appropriate as this evidence simply does not establish what actually happened in relation to the CTV building in any reliable manner.

JUSTICE COOPER:

You don't deal specifically about the reported observation of Mr Bluck to Mr Nichols that he was persuaded by Alan Reay that the design was okay, or words to that effect?

MR LAING:

Yes.

JUSTICE COOPER:

Now doesn't that indicate an involvement between Mr Bluck and Dr Reay?

MR LAING:

Yes but it doesn't, it doesn't –

JUSTICE COOPER:

In a matter which ostensibly was being processed by Mr Tapper?

MR LAING:

In, so far so good yes it does, but it doesn't prove that if the inference is that somehow there was pressure brought to bear by Dr Reay, it doesn't prove that. It doesn't prove that Mr Bluck then put pressure on Mr Tapper. If that, yes if Mr Nichols' evidence is accepted.

JUSTICE COOPER:

Well why was it a matter for Mr Bluck at all?

MR LAING:

Well that is what we don't know and I mean as some of the questions I pose, we don't know the circumstances in which Mr Bluck had that conversation. We don't know who made contact with who. We don't know whether Mr Tapper went to Mr Bluck and said, "I've got a problem, you deal with it." Or whether Dr Reay himself intervened, we don't, none of those things we know, and in my submission it's just not appropriate to draw inferences that somehow, you know I'm not being an advocate for Dr Reay but I think in fairness there is nothing in my submission of the evidence to suggest that

1010

somehow Dr Reay was the initiating cause. It could have been, it may not have been.

JUSTICE COOPER:

But at some stage it appears doesn't it that there was a discussion between Mr Bluck and Dr Reay in the course of which Dr Reay persuaded Mr Bluck to issue the consent.

MR LAING:

Yes but the evidence is also consistent with the fact that Mr Bluck gave the matter detailed consideration, so I would say that's as far as you can take it, there is evidence, hearsay evidence but I'm not – didn't challenge that evidence and it's there, but all that tells is there was a conversation and during

the course of that conversation Dr Reay persuaded Mr Bluck, well Mr Bluck was persuaded as a result of that conversation. I think I'd be very clear about that, but it also suggests that Mr Bluck gave the matter detailed consideration. And that's my submission as far as the evidence goes and it is simply not appropriate to use what my friend described as contextual evidence to try to fill the gaps.

JUSTICE COOPER:

Well I just want to make note of this – the transcript will pick it up won't it.

MR LAING:

If I'm – if there's nothing else on that topic I'll move to my next topic if Your Honour pleases. This is really relating to the collapse causes and as I've already mentioned we do not want to engage on that topic generally but there were some matters that I did want to mention in passing.

I say in paragraph 41 that no need for us to comment on the evidence of Mr Morris.

JUSTICE COOPER:

Why's that?

MR LAING:

In my submission it doesn't have any weight.

JUSTICE COOPER:

Thank you.

MR LAING:

Or the issues surrounding construction of the internal staircase and I think that was already dealt with very well by Mr Holmes.

I do wish to address you on the issues relating to the Going Places tenancy and that's dealt with in the closing of counsel assisting at 242 to 256.

Firstly to clarify paragraph 242 of the closing, in the counsel's opening submissions Dr O'Leary's dispute with Dr Reay related to two very specific issues. One was that Dr Reay suggested the change of use involved the change in the seismic risk factor. And the other one was Dr Reay's calculations to reduce seismic design load, load as 1.8 kpa. And they were very discrete issues where Dr O'Leary gave evidence.

It is accepted as indicated at 245 of the closing that there were changes in the code standards between 1986 and 2001, but the risk factor did not increase with the change of use and I refer to our opening at paragraph 78 to 81.

While the counsel's opening submissions, it was indicated there was no contemporaneous record as to how the Council addressed the change of use issues apart from the structural check list. Mr McCarthy's subsequent evidence under cross-examination cannot be categorised as entirely speculative.

Mr McCarthy gave evidence that he'd spoken to Mr Harrow, Council engineer involved in the change of use application, that Mr Harrow had looked at the layout of the particular floor involved and determined the increase in people numbers would not have structurally increased the live load to the extent that there was a structural upgrade required.

He gave consideration to the age of the building and the code that it was built under.

He advised Mr McCarthy that typically buildings built after 1976 were generally considered to be about two-thirds of design code as at early 2000.

And he would have been aware the changes to the codes in relation to transverse reinforcement in columns.

It is again submitted that contrary to what is suggested by 253 of the closing submissions that there is evidence that the Council is aware of the difference in the applicable codes and the implications these changes in terms of building performance and in particular changes in live loadings.

It is submitted having regard to a range of factors between the age of the buildings, the fact that change of use related on one floor and 20 additional people, the Council could have reasonably concluded the building as nearly as reasonably practical complied in terms of structural behaviour. It is not

appropriate in my submission to single out changes to requirements, the transverse reinforcement columns is something that Mr Harrow should have specifically addressed in terms of possibility of strengthening columns. This is setting an unreasonably high standard of scrutiny in the exercise of Council's powers relating to a change of use. It would involve a significant and detailed review of the structural drawings as a whole and the relevant codes.

What was required consistent with the High Court's decision in the Auckland City Council case and I dealt with that at opening at paragraph 84, was a weighing exercise and a particular consideration of the purpose of the requirement and the problem involved with compliance.

That's a sacrifice, and I'd just like then to deal with one further matter arising out of the submissions on behalf of Dr Reay and this is paragraph 213 at pages 57 and 58. The submission was made there about – a submission was made there about the King's Education and the clinic tenancies and it was said that they – the fact that the Council's views as contained in our opening submissions were at best tentative and possibly erroneous. In my submission there was no basis for that submission, it was a very careful analysis provided to the Commission in our opening and it has not been challenged by any of the other parties. If the Commission pleases I'll now hand over to Mr Reid.

MR REID:

May it please the Commission, the part of the closing submissions that I'll be dealing with is that under the heading code compliance and best practice from paragraph 51 through to paragraph 153.

So dealing first with the Christchurch City Council Bylaw 105 1985, and the context in which that bylaw was developed.

So at 51, in understanding the relationship between the Christchurch City Council Bylaw 105 and the various codes in force at the time and relevant to the permitting of the CTV building, it is helpful, it is submitted, to understand the wider context within which the bylaw was developed.

The bylaw making functions of local authorities with respect to building control were contained in the Local Government Act and its predecessors prior to the reforms effected by the Building Act 1991. Although the regulation of building

was in this way devolved to local authorities it was clearly desirable that there be a degree of consistency across the country as to the development and implementation of building controls.

Under the Standards Act 1956 the Standards Council was tasked with developing and promulgating standard specifications for use within New Zealand.

1020

JUSTICE COOPER:

1965.

MR REID:

1965, yes sorry. Section 27 provided that bylaws could be made by adopting standard specifications issued by the Standards Council, so early on a practise had already developed of issuing model building bylaws for use by New Zealand local authorities.

A model building bylaw was first published in 1936 as NZS 95. In 1964 this became NZS 1900 and it continued to be known by this designation until superseded by the Building Act 1991.

The model bylaw contained separate chapters dealing with relevant topics such as building design loads, concrete, steel and so on. From 1970 onwards these separate chapters evolved into separate New Zealand standards commencing with NZS 101P 1970 which is a predecessor to the code under consideration and relevant with respect to the CTV building and I understand that the P stood for preliminary or perhaps it was proposed, bylaw proposed.

JUSTICE COOPER:

Perhaps it was provisional.

MR REID:

That, conceptually it was provisionally. So that related to concrete and NZS4203 1976 relating to general structural design and design loadings for buildings. The remaining chapters of the model bylaw from around this time onwards greatly shortened in summary format.

The model bylaw took the approach of recognising the other New Zealand Standards which had previously been dealt with in the chapters as means of compliance with NZS1900. These standards were listed in a schedule. The changes explained in the introduction to the model Building Bylaw Chapter 8 published in 1976 follows.

At 57 the Christchurch City Council bylaw generally adopted the changes to the model bylaw as parts of its bylaw and that was the case in 79, 72, 73, 69 that should read bylaw 51, 69, 72, 73, 79 and –

JUSTICE COOPER:

Sorry which should be 69 the one after the reference?

MR REID:

So we've got, I think these dates are slightly wrong, bylaw 51 was 69, bylaw 67 was 79, and 105 was 79.

JUSTICE COOPER:

So the only change to have you've got there is the first one.

MR REID:

It's just the first one. So those bylaws expressly adopted NZS1900 subject to local exceptions which were set out in a schedule, appendix 4.

Apart from these local matters the substance of the model bylaw is – was generally reproduced in the Christchurch – in Christchurch City Council model bylaw, Christchurch City Council bylaw 105. An example of that is the summary in chapter 8 of the model bylaw NZS1900 relating to general structural design and design loadings, and I've set that out. And the significance of this point is that the words of the model bylaw here are identical to those that counsel assisting places some weight on and that are included in the bylaw 105.

And I say that at 59, the terms of the model bylaw in that respect are identical to clauses 11.1.4 and 11.1.6 of bylaw 105. It is submitted that it is clear from the context that the model bylaw was from this context, that the model bylaw

was intended to set up all local authorities who chose to adopt it a consistent regulatory framework in which the New Zealand standards were a means of compliance. It would in general terms have been inconsistent with this framework for the model bylaw, if the model bylaw contained different requirements in terms of compliance to the standards.

Counsel assisting relies on clause 11.1 or part 11 of bylaw 105 and states at paragraph 263(g) of the closing that:

"To the extent that NZS 4203:1984 or NZS 3101 in 1982 contradicted or failed to fulfil the critical requirements of clause 11.1.5(d), compliance with codes was not sufficient to comply with the bylaw".

As indicated above clause 11.1.5 is identical terms to clause 8 of the model bylaw. For this reason counsel assisting submissions are submitted contrary to the manner in which the bylaw, the model bylaw and the standards were intended to operate. That is part of an overall structure designed by the Standards Counsel to facilitate the control of building in New Zealand.

There is also evidence that when the Council adopted Bylaw 105 it did not intend the bylaw to operate to introduce any substantial changes to the model bylaw apart from relating to matters that had no local application. The report to the Council at the time Bylaw 105 was introduced said, and I have just set that out, that's attached as a schedule to the submissions.

JUSTICE COOPER:

Perhaps you should read that?

MR REID:

Yes. So the importance of this submission, may it please the Commission, is that this really relates to the submission of counsel assisting that there had been – it had been the approach of the Council to adopt a cherry picking approach to the standards where parts of them were – parts of the standard were deliberately adopted and others deliberately excluded. So to go through the quote:

"In 1981 the Council began a comprehensive review of its bylaws. In the intervening years most of the bylaws had been rewritten and are in a form where they are readily available to the general public.

The building bylaw has been the one exception. It had been revised to conform to the general pattern of other bylaws but much of the text was still contained in the New Zealand Standards and are often amended and are now quite expensive.

A revised building bylaw is attached to this report. As far as possible it has incorporated clauses from the New Zealand Standards but the New Zealand Standards have been severely edited to remove clauses that are not particularly relevant to present building conditions.

The more recent standard bylaws have been in a form of a relatively simple bylaw with the means of compliance being contained in a separate document. The means of compliance documents, the technical documents that explain how to comply with the bylaws are not changed and are being used throughout the country."

So in my submission that explanatory note identifies that it's not intended that the summary process that's gone through with respect to the bylaw is intended to supplant or change the operation of the standards.

JUSTICE COOPER:

Well how does what you've just read explain the pattern that the bylaw then assumes?

MR REID:

Well the bylaw, what appears to have happened is that parts of the bylaw took parts out of the standard that were seen to be of significance for the purposes of summarising those and providing a document that was readily accessible and not expensive, but nevertheless as a means of compliance the standards were to remain and explain how to comply with the bylaws and were not changed as being applicable throughout the country.

JUSTICE COOPER:

Well that's – you've just summarised what's written here.

MR REID:

Yes, or emphasised it Sir.

1030

JUSTICE COOPER:

I just – I'm not sure it meets, it does provide an explanation for the – on the points that Mr Mills was raising whether it does explain why some are there and some aren't. However I'm deliberately asking you a question it's impossible for you to answer I think.

MR REID:

Yes. Well what the explanatory note does emphasise or does illustrates Sir is that there is no – there wasn't an intention to alter the effect of the bylaw. It would in my submission have said so, the explanatory note would have said that if that had been the intention and it plainly doesn't do that and just as an interesting side note the – we know from other documents which can be provided that this explanatory note came from a report and the report was prepared by Mr Bluck at the time.

So at 63 occasionally the Model Building bylaw appears to have dealt with issues left unresolved by the standards. This was the case with respect to the additional words of clause 11.2.5.2(a) of Bylaw 105 as noted in 302 of counsel assisting submissions and that's dealt with below, I'll come to that point. So at 64, deal with the legal basis for the issue of a permit.

In addition to the context set out above there are a number of provisions in the bylaw which confirm that it was always intended that compliance with the applicable standard would be sufficient to constitute compliance with the bylaw. This was stated to be so in relation to the general requirements of the bylaw such as clause 5 in the opening statement in the second schedule to the bylaw, and it was also the case in relation to each category of building material.

Now those two are matters that I have referred to, clause 5 and the second schedule of the bylaw. You've been referred a number of times to clause 5 but

I'm not sure that you've been referred to the second, the opening statements of the second schedule so if it's helpful I can take you to that.

JUSTICE COOPER:

Thank you.

MR REID:

So this is at ENG.CCC.0044A.11, and it's the opening words to the list of documents of codes, the second schedule details those standards, standard specifications, codes of practice and appendices which, a detailed means by which the requirements of the bylaw may be complied with. These documents are not part of the bylaw.

At 65 the relevant code or codes of practice are referred to at the end of each material section for timber, masonry, concrete and steel as a means of compliance. For concrete clause 8.4, followed the scheme and provided – I've set that out, but just in terms of the wording of clause 8.4.1 just note that what is stated is that the concrete elements clause, a compliance with clause 3.1.1 is a means of compliance, is deemed to comply with the requirements of the bylaw. It's not just the requirements of the part applicable to concrete.

Part 11 relating to general structural design and design loadings did not follow that structure, and clause 11.1.6 however stated general structural design and design loadings complying with NZS4203 shall be approved as complying with the requirements of clause 11.1.5. That's the clause that I'd set out before. It's a summary provision from the Model Bylaw which sets out in general terms in my submission what 4203 is intending to achieve.

At 67 clause 11.1.5 sets out the objective of structural design and design loadings applicable to all buildings in summary form and as noted and reproduced in the Model Bylaw. The reference in clause 11.1.6 meant that compliance with NZS 4203 was sufficient for the purposes of part 11. Furthermore clause 8.2.5 made it clear that the Council did not intend there to be a relevant distinction for concrete purposes between compliance with the bylaw and compliance with a recognised code of practice, but the provision provided, this is in relation to design certificates:

"The designer of any concrete element shall provide calculations which establish that the concrete element has been designed in accordance with the requirements of this bylaw or alternatively certifying an approved manner that the design method conforms with the requirements of a recognised code of practice".

Thus a designer could provide calculations to establish that a concrete element met the requirements of the bylaw as a whole or alternatively provide certification that the design method conformed with the requirements of the code of practice and made no distinction between the two, either were sufficient.

I now go on to deal with requirements for ductility in the code and bylaw.

At paragraph 302 of the submissions of counsel assisting it is noted that clause 11.5.2.2 of the bylaw relating to ductility does not accord with clause 3.2 of NZS 4203 and there was some significance placed on that point. The two provisions are set out for convenience with the differences underlined. Won't read that out but just going through in summary to 71, the added portion of 11.2.5.2 which relates to an exemption from the ductility requirement of small buildings, not exceeding a certain area and height, is added in the bylaw as against the standard. The exemption provided for in the standard referred to 3.4.8 which also related to small buildings. However that provision was deleted from 4203:1984. I'm not – not apparent at all from the enquiries that I've made as to what – why it was deleted but it was deleted and so that left a position in relation to the standard where the work, the standard was incomplete and so I make the submission at 72 that in other words the ductility clause as it stood in NZS 4203:1984 was incomplete and it is submitted that that must be the reason for the additional words, that the additional words in the bylaw were included. And just – just for clarity sake I should say that the words in the bylaw referred to an exemption for small buildings that did not exceed 140 metres squared, and the words in the standard originally referring to 3.4.8.2 referred to small buildings that were less than 1400 metres squared so there was a significant difference between what was being exempted in terms of how big the small building was.

JUSTICE COOPER:

Sorry that was in the standard?

MR REID:

Yes.

JUSTICE COOPER:

Originally was it?

MR REID:

Originally, yes and deleted perhaps because 1400 square metres wasn't a particularly small building but whatever the reason it was deleted.

JUSTICE COOPER:

Do you know when it was deleted?

MR REID:

I will be able to identify that Your Honour and perhaps I can come back to you after break.

JUSTICE COOPER:

Yes, I take it it was in a revision of the standard was it?

MR REID:

Yes.

JUSTICE COOPER:

Sometime after 1984.

MR REID:

1040

Yes, as I understand it but I can identify precisely when it was Sir and come back to it.

So at 73, I go on to discuss the relationship between the codes and just summarise the position that we say, we get to with the bylaw, we say that it did not operate substantially after the effect of the relationship between the codes so then we get to what is the relationship between the codes.

Counsel is submitting, counsel assisting submits at paragraph 284 to 291 that NZ4203 took precedence over NZS3101 effectively because of the timing of the two documents 4203 being later in time. The effect of this argument is that if on a proper reading of the codes aspects of 4203 are inconsistent with 3101, the inconsistent aspects of 3101 are to be treated as being redundant.

In statutory interpretation terms it might be argued by analogy that counsel submitting argument amounts to a submission aspect of 3101 have been impliedly repealed by 4203 and just note that the Courts have repeatedly cautioned against the use of the doctrine of implied repeal except in cases where the two inconsistent provisions simply cannot be read in a consistent manner.

JUSTICE COOPER:

It is not quite a true analogy is it because –

MR REID:

No Sir it is not, I am certainly not saying that the doctrine applies because the doctrine relates to interpretation of statutes and there are particular considerations obviously relevant to statutes. Parliamentary sovereignty being one of them, but it's interesting to note in my submission that the approach of the Courts has always been to work to seek to make, to find a reading which means that the documents are, that the provisions – that the inconsistent provisions are not inconsistent. It finds consistency where possible and that's the –

JUSTICE COOPER:

The other reason I am thinking it is not a true analogy also is because of the wording of the bylaw, of the NZS4203 itself which raises the issue and says effectively that it is to be the master if there is a genuine –

MR REID:

Well Sir the point relates to the earlier in time submission, so I understand my learned friend's submission has two points, there is the point about 4203 being later in time and then there is the point about the reference to the master document. I go on to talk about that now.

JUSTICE COOPER:

Yes.

MR REID:

So at 75, counsel assisting refers to paragraph 2.8.6 of the closing submissions to the statement in the introduction to 4203 that pending revision of various other New Zealand Standards 4203 was to be regarded as the master document with other standards where appropriate subject to it.

76, it is noted however that 3101 was drafted in the context of the revision to 4203 being finalised and that it is clear, as is clear from the statement in paragraph 12 that,

"It should be noted that some provisions of this code are based on proposed amendments to 4203 which at the time of publication are being finalised".

That was a, that is a statement from 3101.

The inference is that the drafters of 3101 may have been aware of the likely nature of the amendments to 4203. 4203 came into effect some two years after 3101 and it appears that the early to mid 80s revisions of the two documents were being developed together.

I should just also – in relation to the statement about master document, I just note that it is a very general statement and it is not only referring to 3101 which is being developed, but the other standards that were being developed around the same time. So it's not particularly helpful in my submission in relation to seeking to understand how the two standards work together in relation to a particular clause.

So at 87 [*sic*], I deal with the submission at 297 of the interpretation of counsel assisting submissions that relates to the Interpretation Act and this point has

already been dealt with by my learned friend Mr Rennie so unless Your Honour wants me to go through it, I don't propose to.

JUSTICE COOPER:

Well the reference to the 1908 Act is not right, is it?

MR REID:

Sorry it is the 1924 Act Sir.

JUSTICE COOPER:

Correct. So there is a sort of scattergun approach being adopted by counsel on this matter.

MR REID:

Yes sir. But it is the 1924 Act Sir yes.

JUSTICE COOPER:

If you refer to all the relevant Interpretation Acts you will be able to get the right one in there somewhere. Yes 79?

MR REID:

So 79, it is submitted therefore that New Zealand Standard 3101 and 4203 should be interpreted. Firstly in context which in the case of New Zealand Standards means so as to be consistent both internally and with each other so far as practicable. The drafter of the standards was the Standards Council and they were, that is two standards, were clearly intended to be utilised together. And secondly, in the light with of and with reference to engineering practices and understandings at the time of drafting.

Paragraph 80, the principle issue of inconsistency identified by counsel assisting relates to the interpretation of the ductility provisions of 4203 that is clause 3.2.1 as against the ductility provisions of 3101 clause 3.5.14. The interpretation of these clauses considered below. They go on to do that.

At 81, I set out what the Council says is the appropriate interpretation of clause 3.2.1 is the ductility provision of 4203 as follows:

Clause 3.2.1 of NZS4203 is in materially the same terms as the bylaw and there is no relevant distinction to be made between the code and the bylaw for the reasons set out above. That's – the difference is the small building issue that I have already discussed.

Clause 3.2.1 provides for buildings as a whole and all elements that resist seismic forces or movements or that are in the case of failure a risk to life to be designed to posses ductility.

Ductility is defined in the definitions section of the standard, clause 1.1.3.1 as follows.

"Ductility means the ability of the building or member to undergo repeated and reversing inelastic deflections beyond the point of first yield while maintaining a substantial portion of its initial maximum load carrying capacity."

These provisions are qualitative rather than quantitative they do not provide any guidance as to the magnitude of the deflections that the building or member is required to be designed for.

On its face therefore the provision is incapable of being given effect to in a meaningful way without reference to the quantitative provisions of 4203 and for concrete 3101 equally. This is consistent with the approach taken in the standards for deflection limits and so seismic loads. These requirements of 4203 are also incapable of given effect to on their own. They are only relevant to a particular building in the context of a standard describing how they are to be used relative to a particular building or member. The concrete these provisions are contained in 3101.

The general ductility requirement in 3.2.1 is expanded upon in clause 3.2.2 with respect to "systems intended to dissipate seismic energy by ductile flexural yielding". These systems are to have adequate ductility.

Adequate ductility for the purposes of clause 3.2.2 is considered to have been provided where all primary members resisting seismic forces are detailed in accordance with a special requirements for ductile detailing in the appropriate material code, in this case 3101.

1050

JUSTICE COOPER:

Mr Reid, I've heard enough from you on these issues to know that what you've written here has been very carefully put together and we will, I'm also conscious that there are probably better ways of dealing, considering this kind of issue which is really with the bylaw provisions and code provisions in front of one and going through it all carefully at each stage of the argument. Now I don't want to stop you going through this but my view anyway is that given the quality of what you have put together, we're going to be able to consider this in our deliberations more effectively than listening to you go through it all. I'll just check with my colleagues as to the case that I'm out on a limb here. We're quite happy for it to be taken as read without wanting to say stop.

MR REID:

I'm very grateful for that indication, so.

JUSTICE COOPER:

And I mean what I said, that it obviously will deserve and get our very careful consideration.

MR REID:

Yes thank you Sir, and with that indication I will simply leave it and the balance of these submissions in relation to interpretation at least, deal with evidence on interpretation, so I would propose to briefly go through that.

So Sir that's at paragraph 100 and I don't need to go through, Sir, the detail of what all the experts have said but except to note that the structure of these submissions is to deal with the design approach and how prevalent it was or wasn't in New Zealand and Christchurch during the period under consideration, and there's a number of witnesses that have dealt with that. Dr O'Leary, Mr O'Loughlin, Mr Henry in quite some detail, Mr Hare, Mr Hyland, Dr Jacobs, Mr Smith, Professor Mander, so just, perhaps just go through unless Your Honour wants me to go through that material in detail I can go through to paragraph summary which is 111?

JUSTICE COOPER:

Yes that will be fine thank you. Oh, 112?

MR REID:

It's 112 yes, yes. So it's submitted on the basis of that summary of the expert material that the evidence to be described above demonstrates generally a consistency of view among those practicing in the 1980s that Mr Henry's described gravity frame protected by stiff shear walls approach was regarded as legitimate and appears to have been widespread at least in Christchurch.

JUSTICE COOPER:

Widespread or not uncommon? I mean we've had reference of two other buildings that were designed in this way. Is that, that's what you're referring to?

MR REID:

Yes Sir, yes, I mean, well we don't have evidence as to what number of buildings were designed generally in Christchurch during the period in question, but it seems as though there were a significant number designed using this approach and I've referred to those in the evidence but there's, there's a good half a dozen anyway that are referred to in the evidence.

JUSTICE COOPER:

Are most of them from the same firm?

MR REID:

Well a number of them by Mr Henry at different firms, yes.

JUSTICE COOPER:

Yes, I suppose so, yes.

MR REID:

And I should also say Sir, just as a general note that of course early on the Commission took the approach of organising or arranging for an investigation to occur by the DHB, the DHB's been conducting an investigation as to the number of build – how widespread this practice was and I'm not sure of the outcome of that investigation but I understand it is well advanced.

JUSTICE COOPER:

Yes, it's not something we arranged. We may have provoked it.

MR REID:

Provoked it Sir, yes. Of course that is an investigation into the use of this approach throughout the country.

JUSTICE COOPER:

Yes.

MR REID:

So at 113 to 142 I go through the experts' views on interpretation. The last section was really the experts' view on interpretation. The last section was really the experts' views on how widespread or not the approach was. This is a more gen – a more specific consideration of the experts' interpretations and in particular that of Mr Jacobs, Mr Smith and Dr O'Leary, so perhaps not necessary for me to go through that either Your Honour.

JUSTICE COOPER:

I think it's in the same category.

MR REID:

It is Sir, yes. There's been a number of submitters I think, or a number of submissions relating to the effect of all of the expert evidence relating to interpretation that have noted that there's a general consistency of view Your Honour regarding whether the columns and frames in the CTV building could have been regarded as secondary elements, and the person that

departed, the expert that departed from that view was Dr Jacobs. He took the view in his evidence, well he seemed to take the view in his evidence in chief that the frames couldn't be regarded as secondary elements, but I just draw your attention to the sequence of cross-examination and re-examination where the implication of what he says is that that couldn't be the case. That's set out. So at 125 –

JUSTICE COOPER:

That passage you're just referring to is set out in your paragraph 117 is it?

MR REID:

Yes it is Sir, yes. And at 118 there's a reference to the re-examination where the point was confirmed. So I then go on to deal with the particular issues of non-compliance.

Firstly, asymmetry at 125. Clause 11.2.5.2 of the bylaw and 3.1.1 of 4203 provided:

"The main elements of a building that resists seismic forces shall as nearly as practicable be located symmetrically about the centre of mass of the building."

Dr O'Leary's view is that clause 3.1.1 which is part of the introductory provisions of part 3 of 4203 does not raise a specific standard compliance issue. The issue –

JUSTICE COOPER:

Well why should we accept his view on that?

MR REID:

Well I go on to discuss that Sir but the issue really is whether from a compliance perspective, so from the perspective of the Council who is looking at it, if the issue involves matters of judgement, engineering judgement or otherwise, it becomes a very difficult matter for the Council to engage on in a sensible way.

JUSTICE COOPER:

So it might as well not exist then, that provision?

MR REID:

No it's, and this is the point Sir about the way the standards are used in my submission, that there's the standards include directory material, it includes advisory material and it's for use by practicing engineers but not all of it is susceptible or capable of assessment by a Council in a compliance context. And this is one of those type of areas in my submission Sir, because it involves issues of judgement.

JUSTICE COOPER:

But if, another way of putting that though would be to say that if it appears that there is a reasonable argument that something is symmetrical, to the extent

1100

practicable, then it's all right but if something clearly isn't. I mean there must be some margin of appreciation which is, which is left to the design engineer, I accept that, but surely at least theoretically it must be possible for the consent authority to say, well, that doesn't comply with that provision.

MR REID:

Well perhaps –

JUSTICE COOPER:

Otherwise it's just, I don't know, what, it's an exhortation is it? It's not a law. Don't building designers have to comply with the bylaw?

MR REID:

They do Sir.

JUSTICE COOPER:

Doesn't the Local Government Act say that?

MR REID:

Yes.

JUSTICE COOPER:

Or didn't it, rather?

MR REID:

Yes.

JUSTICE COOPER:

I mean –

MR REID:

Well perhaps in an extreme case Sir. In an extreme case where it's clearly –

JUSTICE COOPER:

You don't have to use the word "extreme" you have to use the word "clear." A "clear" case.

MR REID:

Yes well I, the issue at the end of the day comes down perhaps to –

JUSTICE COOPER:

A question of fact and degree.

MR REID:

Fact and degree and –

JUSTICE COOPER:

But it's a very extreme position to adopt in my view to say that it can never have a regulatory effect.

MR REID:

Well at the margins that we're talking about here Sir, and there's clearly some difference in the experts about the degree of eccentricity that the building had –

JUSTICE COOPER:

Yeah.

MR REID:

That's covered in the, in the –

JUSTICE COOPER:

Well I accept that.

MR REID:

Yes.

JUSTICE COOPER:

If it's a thing about which engineers could reasonably disagree you're not going to be breaching clause 11.2.5.2. I agree with that.

MR REID:

Yes.

JUSTICE COOPER:

But what I don't agree with is to say that the engineers have got together and repealed that clause.

MR REID:

Yes Sir.

JUSTICE COOPER:

Which is what Dr O'Leary's saying.

MR REID:

Yes I think the point though, I think the point from the engineers' perspective as I understand it as that there are buildings which are generally regarded as being permitted under the plan which are just highly asymmetric on any view of it and a building like that might be a, for some a C-shaped building or an L-shaped building. There are buildings that the plan, that the standards are not seeking to rule out but are clearly on any view of it highly asymmetric.

JUSTICE COOPER:

This is about proximity to the centre of mass.

MR REID:

Yes, perhaps slightly different.

JUSTICE COOPER:

It doesn't require a slavish adherence to a simple shape?

MR REID:

No Sir.

JUSTICE COOPER:

Okay.

MR REID:

So at 131 – The drift capacity of the columns, column confinement and minimum shear reinforcing of the columns. I won't go through that except to note, well I won't go through the first part of it because the issue is dependent on whether the building was able to be detailed under 3.5.14.3, under the non-seismic provisions of the code.

At 135 I just note that the ERSA analysis at Appendix F of the Hyland Smith report dealt with and set out the particular, the degrees of non-compliance with respect to the indicator columns. And so for column C1 it did not meet the drift requirements for an east-west earthquake at four out of the five levels

considered and for column F2 it did not meet the drift requirements in a north-south direction on levels 5 and 6 only. Likewise this column complied at all other levels for north-south and east-west earthquakes. The elastic deformation limit for column F2 was calculated at 62%, a .62% whereas the calculated drift was .64%. It was put to Dr Hyland in cross-examination that these margins were fairly fine. Dr Hyland did not agree with this on the basis that the analysis was conservative. That may be the case but it is submitted that the analysis as it was undertaken indicated that for some of the columns in some of the locations the margin was fine.

And I only make that point because, and this goes onto, what I'll discuss in a minute, but it's difficult in my submission, and perhaps impossible in some situations for a Council reviewing engineer to second guess those kinds of fine judgments.

At 141 – Transverse reinforcement of beam column connections. So that's accepted as being a non-compliance and equally the diaphragm connection to that north shear wall at 142, that's also accepted.

Spandrel panels. I deal with that briefly but that really seems to be an issue about whether the plans as they were detailed were sufficient because they clearly contemplated a gap although that gap was not clearly set out.

At 145 we make a brief submission in relation to the issue of best practice and it's brief Sir because for the Council it's not a significant issue in my submission and that was accepted by Professor Priestley.

So then at 147 the submissions go on to review the evidence relating to whether or not those identified non-compliances ought to have been picked up by a reviewing engineer. At 147 the Council's evidence on that topic was from John O'Loughlin and Dr O'Leary. In addition Peter Nichols and John Henry also gave evidence on the Council's approach to the structural engineering review during the periods when they were employed at the Council.

The areas of non-compliance which Mr O'Loughlin and Dr O'Leary accepted should have been identified are as follows: The diaphragm connection to the north wall and the insufficient spiral reinforcement in the beam column joints.

Mr O'Loughlin in his first statement of evidence at paragraph 14 drew a distinction between the design role of an engineer and the Council's reviewing role. He stated that the Council's role involved checking at a general level that the designer had considered and dealt with the compliance issues appropriately. Other aspects of relevance that were noted by him include:

The amount of time available to Council engineers to carry out a review as compared to a full peer review. Mr Wilkinson stated in evidence that a report such as that carried out by Holmes Consulting in 1990 would take approximately 35 hours of staff time but this would only identify any significant structural issues. It would not be sufficient time to carry out a full peer review. In comparison Mr Wilkinson noted that a full design process for a building like the CTV building would take between 300 and 600 hours.

Now the Council's structural checking section did not have staffing resources that were available to consulting engineers although the Christchurch City Council resourcing compared favourably with Dunedin and Wellington cities.

The Council did not have computers and software analysis systems or the ability to do an ETABS analysis.

The Council was processing a higher than average number of building permits/applications at the time.

Mr O'Loughlin commented that it must have stretched the capacity of the Council staff to fully understand how the building was behaving. Mr Henry made a similar comment in answer to a question. While Dr O'Leary thought the design of the building was not too difficult for a Council to adequately perform the task of verifying compliance.

In relation to the issue of inadequate reinforcement in beam column joints it was accepted by Mr O'Loughlin as an issue that possibly could have been picked up by a Council reviewing engineer however Mr O'Loughlin noted in respect of this issue that there were four different drawings that a reviewing engineer would need to visualise and assemble in his mind to determine the particular

1110

arrangement of reinforcing in the column joint and that it would have been difficult – it would have been difficult to visualise that arrangement.

At 151, it appears to have been conceded in the closing submissions that it could not be expected that a Council reviewing engineer would be involved in the fine detail of a design.

But it is then submitted at paragraph 162 that the Council reviewing engineer should have detected a wide range of issues about the CTV building. And just in relation to paragraph 161 of counsel assisting's opening submissions, it is accepted that that is a fair summary of the Council's obligations and how it should have been approached.

So we turn to the issue of asymmetry.

Dr O'Leary agreed that the imbalance between the south shear wall and the north wall was something of note and would lead a reviewing engineer looking at the drawings and the calculations to see whether it was adequately accounted for in the design. Dr O'Leary did however note that the lack of balance between the walls was a situation that was not uncommon at the time and it would not have raised any alarm bells if he was confronted with that, with this layout. The issue was also subject to comment by Peter Nichols, John O'Loughlin in the evidence.

On Mr O'Loughlin's unchallenged evidence it was that the Council reviewing engineer could have reasonably formed the view that the building was reasonably symmetrical about the centre of gravity. Mr O'Loughlin was not questioned on this point in cross-examination by any counsel.

The adequacy of connections between the diaphragm and the north shear wall.

It was clear from Mr Tapper's, it is clear from Mr Tapper's letter of 27 August 1986 to Alan Reay Consulting Engineer that he in fact identified an issue relating to the diaphragm connection to the north wall. His line of questioning directed to John O'Loughlin illustrates it is not clear exactly what Mr Tapper picked up in that point has been canvassed extensively. Mr O'Loughlin also commented that in his experience there was not, there was a lot of phone connection between a reviewing engineer and the designer but whether any such contact occurred between Mr Tapper and Mr Harding cannot be determined.

Further, in contrary to what might be suggesting at the closing submissions at 183, the mere fact that the plans received by counsel assisting from Dr Reay and the permitted plans showed no difference in terms of diaphragm connection, does not establish that there was no change in the plans by Dr Reay's office between the 27th of August and 10th of September in relation to that connection. And there is just one point, this issue was covered by my learned friend Mr Laing earlier but at paragraph 5 and 6 of Mr O'Loughlin's second brief of evidence and the reference is WIT.O'LOUGHLIN.0002.2 he raises, hasn't really received any attention but he does raise a point about the difference between the calculations and the plans as they, as we now have them. It is to do with the reinforcing in the north shear area between the core and the north core and his point is that as the issue was dealt with in the calculations there was significantly less reinforcing than there ultimately was in the final plans and he speculates, and it is only speculation, that perhaps the first set of drawings accorded with the calculations so that there was an alteration that meant reinforcing was added.

JUSTICE COOPER:

Yet there was an area of non-compliance there –

MR REID:

And there remains an area of non-compliance, yes Sir.

JUSTICE COOPER:

And Dr O'Leary said that it should have been picked up.

MR REID:

Yes, yes.

JUSTICE COOPER:

So, all right....

MR REID:

I can't take it any further Sir it's as it is.

JUSTICE COOPER:

Yep.

MR REID:

So just going over the page, C1.

JUSTICE COOPER:

Those calculations though were sent in at the same time as the plans, weren't they?

MR REID:

Well it's not – yes, yes, the point is, I think –

JUSTICE COOPER:

Because that was that document transfer form –

MR REID:

Yes it was, that is quite right Sir but the point that I think Mr O'Loughlin is raising is that the plan – if, there may have been an earlier set of plans that we don't have and if there was it may have reflected what is in the calculations and if it did there would have been significantly less reinforcing in those plans than there was ultimately in the final drawings.

JUSTICE COOPER:

I don't know enough about it to understand the significance but my colleagues probably will have their views, but you'd think on first glance that why would you rely on calculations for an earlier iteration of the design and send in calculations that weren't actually going to reflect the strength of the building that you had shown on the plan?

MR REID:

Yes well and that is the position because the plans as they are, as I understand Mr O'Loughlin's evidence, contain more reinforcing than what is referred to in the calculations.

JUSTICE COOPER:

Mmm. All right, thank you.

MR REID:

So at item C the absence of calculations relating to the diaphragm connection and error in which Mr Harding dropped to zero. Mr O'Loughlin was questioned about the dropping of the zero, he conceded the reviewing process could not have, oh, sorry he concluded the reviewing process could not have been expected to identify the error as a line by line review could not be carried out. Mr O'Loughlin has later noted in his evidence that a Council reviewing engineer's role in relation to the calculations is to check that proper processes have been followed through. And it is telling that Mr O'Loughlin was the only structural engineer giving evidence at the hearing who mentioned this error in S57 of the calculations. It is submitted that this reinforces the view that the reviewing engineer could not have been reasonably expected to pick up the error.

It is further submitted that the absence of specific calculations relating to the diaphragm connection is in the same category. It is again noteworthy that this issue was not raised in the Hyland-Smith report nor the peer reviews by William Holmes. It appears to have been first raised in the evidence or Mr Banks.

JUSTICE COOPER:

I am missing something obviously but how does that submission square with the fact that Mr O'Loughlin was able to assess the amount of reinforcing in the connection on the basis of the calculations?

MR REID:

Well I think they are different points Sir.

JUSTICE COOPER:

Are they?

MR REID:

Yes, so the first point which is C1 is dealing with the issue about the dropping of the zero –

1120

JUSTICE COOPER:

I understand that. No my question was in relation to the oral discussion that you and I had a few minutes back about the fact that Mr O'Loughlin reported to be able to tell from the calculations that the permitted plans showed more steel in the diaphragm connection to the shear wall. Now you're making a point about the absence of specific calculations relating to the diaphragm connection and I'm just saying in my mind anyway there's a tension between those two.

MR REID:

Well I think the issue though is to do, Sir as I understand it, with there were, there are some calculations about the connection and they relate to the east-west direction as I understand it. The missing calculations are the north-south direction.

JUSTICE COOPER:

I see.

MR REID:

I think that was what, I'm unsure as to who gave the evidence now but there was evidence that was missing that seemed as though there was a missing page because the north-south issue hadn't been dealt with although the east-west had.

JUSTICE COOPER:

So the incremental reinforcement would have been in relation to the east-west direction?

MR REID:

Yes Sir, yes it was, yes. And Mr O'Loughlin's point as I understand it is that in an east-west direction the amendments if they were that for the inclusion of additional bars and additional reinforcing would have addressed the issue in an east-west direction but not in a north-south.

JUSTICE COOPER:

Dr O'Leary said it remained non-complying in the east-west direction.

MR REID:

Yes he did, yes, yes he did, he did say that, but that was a –

JUSTICE COOPER:

So that means that on the specific issue which was at the top of Mr Tapper's mind, Mr Tapper got it wrong?

MR REID:

Well, as I understand Mr O'Leary's evidence, he does take the view ultimately that the connection didn't comply in an east-west direction but that that was very much at the margins and that was quite apparent from his evidence. He was unsure about that and it was something that he was unsure about but it was certainly something at the margins. So –

JUSTICE COOPER:

Well I don't recall him being unsure of, but perhaps I need to read his evidence again.

MR REID:

No unsure was the wrong word Sir but I think it was clearly at the margins. Yes and of course that, ultimately that evidence wasn't accepted on Mr Banks.

JUSTICE COOPER:

Sorry?

MR REID:

That evidence of course wasn't accepted on Mr Banks.

JUSTICE COOPER:

Yes.

MR REID:

So Sir I'm not, so those are the main, those in my submission are the principal non-compliances. There are a range of others that are identified in counsel assisting's submissions. I'm happy to go through those, but in the interests of moving along –

JUSTICE COOPER:

We'll take those as read.

MR REID:

Take those as read. So that then takes us through to 152, the standards to be applied.

At paragraph 169 of closing submissions it is submitted that the evidence of the standard actually applied by Mr Tapper sets an appropriate benchmark for the expected standard at least in relation to identifying compliance issues.

While there was considerable evidence about the general design approach adopted by Mr Tapper, the only direct evidence of Mr Tapper's standards as related to the CTV building is his letter of 27 August 1986. If this letter reflects the benchmark standard then it would seem to follow that the letter reflects what a reviewing engineer should at that stage have identified at least prior to the receipt of the calculations that were forwarded on 5 September 1986. In the absence of any further documentation or record of discussions with the design engineer it is uncertain what further matters may have been

considered by Mr Tapper on receipt of the calculations amended plans. So Sir that's the end of my section and I'll hand now over to Mr Laing.

JUSTICE COOPER:

Mr Reid, thank you very much for that. We are grateful for its thoroughness.

MR LAING:

The final section deals with building assessments and I will try to make fairly quick progress through this.

At 154 I've referred to the section of the section of the counsel assisting's closing. Relevant sections 476 to 554. The Council wants to make some points in reply. The particular matters relate to reliance on the green placard. The fact that the 7 September assessment team did not include an engineer. Issues around the Council's information systems. Access to structural drawings, and the Professor Mander issue I'll briefly deal with as well. And again we have used the headings and numberings by, used by counsel assisting so you can align our submissions with theirs.

Then firstly the green placard issue.

This section of the closing submissions discussed the relevance to the building occupants and Mr Drew of the green placards issued for the CTV building following the September and Boxing Day earthquakes.

156 I refer to the Council's submissions relating to building management so I can just move on from that. Counsel assisting also notes at paragraph 488 that there was no legal requirement for the CTV building owner to arrange their own inspection of the building following an earthquake and again that's a matter noted in the Council's submissions relating to the building assessment.

However the issue that really specifically concerns us is at 158 and this is the submissions about the apparent reliance placed by Mr Drew on green placards. At paragraph 488 counsel assisting refers to Mr Drew placing "significant reliance" on the green placard, although noting that he understood it was recommended an owner obtain its own inspection. Then again at 489 counsel assisting states that Mr Drew should've obtained a further inspection

from Mr Coatsworth at Boxing Day, but that he appeared to continue to place reliance on the green placard.

It is submitted that, although Mr Drew suggested he did rely on the green placard, this could not have been in fact the case. His evidence was that through discussion with the business people, discussion with Murray Wood and through information in media September became aware that Council inspectors only went so far and it was the responsibility of owners to get a more detailed inspection.

He said it was this reason he asked Mr Coatsworth to carry out his inspection September.

Mr Drew also agreed that he was aware of the wording on the green placard and I set out the passage from his evidence.

162 it is clear from the wording in the placard that only a limited inspection's been carried out, there's a need for a more detailed inspection to follow arranged by the building owner. Media releases made by the Council following September and Boxing Day events also conveyed this message. And that is in, there's reference to that in the Council's sort of volume dealing with post-earthquake assessment inspections.

Given that Mr Drew accepts he'd read the green placard and that he was aware in September that rapid assessments carried out by Civil Defence were not detailed assessments, it is submitted it's not reasonable for him to suggest that no inspection was arranged following Boxing Day because he continued to rely on the green placard.

JUSTICE COOPER:

Not reasonable for who to suggest?

MR LAING:

Not reasonable for him to suggest sorry.

JUSTICE COOPER:

Him, who, Mr Drew or?

MR LAING:

Yes, yes Sir sorry. Yes Mr Drew to suggest. So I say there it's clear that he could not reasonably have done so.

The final comment, counsel notes that the closing submissions at 491 refer to the evidence of Mr Kehoe. His evidence was in the United States the wording on the green placard had been changed from "safe to occupy" to "inspected." As noted above the green placard used after September and Boxing Day earthquakes likewise did not include the words "safe to occupy."

JUSTICE COOPER ADDRESSES MR LAING

HEARING ADJOURNS: 11.30 AM

HEARING RESUMES: 11.49 AM

JUSTICE COOPER:

Yes.

MR LAING:

Thank you Your Honour. I was at 165 and I was turning to the topic of lack of training, understanding and I just note at 165 that the closing submissions, counsel assisting refer to a lack of training of the participants in the building assessment process and I then just set out the reference to the Council's opening submissions and also its submission in relation to the building management hearings.

At 166, Council does not consider the totality of the evidence heard by the Commission from participants in the CTV building assessment process demonstrates a lack of training, understanding of that process. The officers generally indicated that more training would be beneficial but their evidence also on the whole indicates a good understanding of the rapid assessment process. And I then refer to Mr Van der Zee's evidence, who participated in the level 1 assessment, he referred to the briefings he attended following the 4 September earthquake and he considered that they were sufficient to give

an adequate understanding of the rapid assessment process. He was aware the purpose was to look for any obvious damage or hazards. He was also aware that a level 2 assessment would be done if a level 1 form identified any issues.

Mr Calvert, he indicated in evidence that he attended a seminar in 2009 concerning the Emergency Operations Centre and how this would operate. The seminar included a presentation from Mr Brunsdon about the rapid assessment process. Both Mr Calvert and Mr Flewellen also accurately explained in evidence the difference between rapid assessment placards.

Marie Holland who carried out the post-Boxing Day assessment also indicated in evidence that she understood the difference between the placards and the distinction between a level 1 and level 2 assessment.

The closing submissions refer to a comment from Mr Simson that they "were left to second guess and use their combined experience as to what was safe or otherwise." It is submitted a level of judgment will also be required of teams carrying out rapid assessments. In the particular case of the 7 September assessment Mr Flewellen and Mr Calvert and Mr Simson all had considerable experience in the building construction industry and Mr Flewellen in particular commented that:

"We all come from building backgrounds and have a fair bit of experience. We know what shear walls are, floor diaphragms and connections and we know the appropriate places to look where you expect stress."

Council assisting also state at 493, the lack of training was highlighted by the different understandings each of the three had regarding the level of level 2 assessments they were supposed to carry out. It is submitted this is not supported by the evidence that each of the witnesses gave.

And then the fact that no engineer was involved in level 2 assessment.

There are three matters in this section that I wish to address. Firstly, the statement at 496 of the closing submissions that there were other occasions where level 2 assessments were carried out without an engineer.

Counsel assisting suggest at paragraph 496 of Ms Holland's evidence was to the effect that there were other level 2 assessments carried out without an engineer. However, Ms Holland's evidence was that while she thought there

may have been other occasions where a level 2 assessment was carried out without an engineer she was not aware of any specific examples. She also said the types of buildings where this could have occurred would perhaps be buildings below three levels or non-critical facility buildings.

Other officers involved in the rapid assessment process also gave evidence on this issue. Mr Flewellen stated he conducted numerous rapid assessments on 4, 5 and 6 September and all of those assessments were conducted by him in association with an engineer and it was out of the ordinary to be directed to conduct the CTV assessment without an engineer.

Mr Simson agreed in response to a question from counsel assisting that it was a fixed rule that the level 2 assessment required an engineer to be in the group.

While Mr Calvert's evidence was there was not always engineers on assessment teams he was not aware of any other cases where the assessments carried out without an engineer were level 2 assessments.

Therefore to submit that Mr Flewellen's comment that it was out of the ordinary for an assessment to be carried out without an engineer is a more accurate reflection of the evidence on this issue than that suggested by counsel assisting, in particular in relation to level 2 assessments.

I then turn to comments made in closing submissions at paragraphs 497 and 498. Counsel assisting's submission is that Messrs Calvert, Flewellen and Simson knew level 2 assessments should be carried out by an engineer but although they knew this they were content to rely on an assurance from a man they understood to be the building manager that an engineering inspection would be arranged and then the submission is made that this reliance was inappropriate and potentially dangerous.

Mr McCarthy did accept in cross-examination that it would have been preferable if the three inspectors had returned to the EOC and requested that an engineer carry out a level 2 assessment of the building. The submissions made by counsel assisting do not include any consideration of the context at the time nor do they reflect the full extent of the steps taken by the three inspectors.

It is now two years since the three visited the building. The time of their visit was three days after a very significant earthquake event. Ongoing aftershocks were being experienced. There was widespread damage across the city. Civil Defence was receiving large volumes of requests from both commercial and residential building owners for assistance. These requests had to be prioritised and a large number of Council staff and volunteers had to be managed and allocated to more urgent response efforts.

It is against this background that three urgent jobs apparently came to the attention of Mr McCarthy including a request to inspect the CTV building. It is uncertain now why the request in relation to that building was urgent. It appears to be how it was understood by Mr McCarthy at the time and it seems this was conveyed at least to Mr Flewellen.

The evidence is that at the time the request was received all available engineers had already been assigned to other tasks. So Mr McCarthy turned to three senior staff from his unit and asked them to attend the three jobs and then I set out the explanation Mr McCarthy gave for that.

What's also clear from the evidence is that when the three officers arrived at the building it was already occupied, a level 1 assessment had been carried out. Clearly they were aware that a level 2 assessment would normally require an engineer but they made a decision to check the building for any obvious signs of damage. While they are not engineers they were experienced in building matters and could at least check for any signs suggesting the building occupants were in immediate danger.

All three officers assessed the exterior of the building. Mr Calvert checked the ground floor. Mr Flewellen went to the stairwell, he believes probably to the top, and began working his way down looking for any evidence of damage, including the area of the connection of the floors to the north core of the stairwell. Mr Flewellen also accessed the tenancy in one of the upper floors of the building but was unable to access the other tenancies because the building manager had not been able to locate any other keys.

Mr Simson and Mr Flewellen also gave close attention to an area at the bottom of the stairwell where there was a gap between the floor and the block

wall on the north side of the building. Mr Flewellen's conclusion was this gap was not caused by earthquake movement.

He stated that he and Mr Simson entered the covered carpark and when in the carpark they viewed four or five columns checking their connections to the floor beams. They also checked the connection between the stair shaft and the floor slab.

As Mr Calvert notes, if the three inspectors had seen any signs of significant damage at that stage they would have told the occupants to get out of the building straightaway.

In addition to this visual inspection they also discussed with the building manager and the receptionist whether they had any specific concern about any areas of the building. Mr Calvert's evidence is that they did not indicate any areas of concern.

Mr Calvert said that he had a clear memory of talking to the building manager, and I use those words in quotations, about the need for an engineer to conduct a thorough inspection of the building. Mr Calvert said this would have stressed every person they came across in the building.

It is submitted that, contrary to what was said in closing submissions, the three were not content to merely rely on a statement from the building manager that an engineer would be coming. They carried out an assessment of parts of the building they could access and did not see signs of significant damage. They checked with two occupants of the building whether they were aware of any issues and they impressed upon all the people they met that an engineer's assessment was required. They were told this was carried out and, in fact, it was.

Given the scale of tasks arising from the 4 September earthquake the response and recovery relied on significant involvement of many Council employees and volunteers including Mr McCarthy, Mr Flewellen, Mr Calvert, Mr Simson, Mr Van der Zee and Ms Holland.

Mr Calvert's evidence is that after making sure his family was safe he arrived at work at 6.15 am on

1200

4 September and on subsequent days he would normally arrive at the Art Gallery at 7.00 am. He notes that what followed was a very busy and unusual time. Mr Flewellen returned from holiday to provide assistance on 4 September, he arrived at the Art Gallery at 7.00 am that day. Similarly Ms Holland returned from Christmas holidays to assist with the post Boxing Day response as Mr Flewellen noted in evidence they were all simply trying to do their bit.

Out of necessity these people had to make judgment calls about appropriate action in what was a new and stressful environment. Counsel assisting's description of decisions made by Messrs Calvert, Flewellen and Simson is inappropriate and potentially dangerous as an unfair characterisation of the actions they took on 7th of September to satisfy themselves the occupants of the building were not in immediate danger. As discussed below their assessment of the building as occupiable subsequently confirmed by Mr Coatsworth.

The final matter I just mention here is the comment by counsel assisting that Mr McCarthy's comment of level two assessment was superseded by Mr Coatsworth's subsequent inspection. I think the point that Mr McCarthy was making there was that Mr Coatsworth's carried out a more detailed inspection of the building on behalf of the building owner.

As we all know that assessment confirmed the building could be occupied. Mr Coatsworth did not identify any damage that would indicate the green placard was inappropriate. Any detailed assessment will always take precedence over anything less detailed gone before. If Mr Coatsworth's assessment of the building should not be occupied, this would have equally have superseded the 7th September assessment carried out by the three officers.

I just note, finishing that part of the submissions that of course the green placard cease to have any legal effect at the end of the state of emergency in, on 16 September 2010.

JUSTICE COOPER:

The occupants of the CTV building though, few of them would have known that generally?

MR LAING:

No I totally accept that Sir but which obviously it comes down to the, some of the issues we've been discussing the other day about the whole transition at the, or should say the general level of untidiness there is about that at the moment and I am sure you know the Commission has got that well in hand.

JUSTICE COOPER:

Well we are well aware of them –

MR LAING:

You are well aware of the issues, yes thank you Sir.

Just turning briefly to information systems. The Council thoroughly accepts the comments at 506 of the closing submissions that an adequate information system is imperative following an earthquake. The Council does not however agree with counsel assisting description of the record keeping system as inadequate at the time.

The Council does have the record of two rapid assessments carried out to 4 September and after Boxing Day, they were attached to Mr McCarthy's evidence. The issue with record keeping relates more to how to deal with the vast amount of hard copy information in a timely manner. For example in September level 1 rapid assessments had been carried out for all commercial buildings in the central business district including the CTV building by midday on 6 September 2010. These rapid assessment forms contained a significant amount of data which had been recorded electronically, obviously taking time and resources.

As noted in the Council's opening submissions the need for electronic emergency management information systems is a matter arising from the response to 4 September earthquake that needs further consideration. And Sir, certainly the issue about documenting electronically building files. They are all very worth improvements that could be made but I think it is rather unfair to categorise the record keeping system the way that counsel assisting has done so.

Structural drawings, I don't need to read that.

I have already made the point that it is certainly, would be very useful to have all structural drawings made electronically.

And then the next issue is red stickering by fiat and I just note Mr Holmes' comments about that proposal, I don't think I need to deal with that in any detail.

I turn now to the drag bar retrofit and obviously as Your Honour is aware from our opening that the Council is of the view that the works required a building permit and I think that is very clear from the definition of erection of a building which is at ENG.CCC.0044A.4 to .5. I don't think I need to take you to that but it is very clear from that definition which includes an alteration or an addition to a building.

JUSTICE COOPER:

I put that to Mr Banks.

MR LAING:

Sorry Your Honour?

JUSTICE COOPER:

Didn't I put that to Mr Banks?

MR LAING:

Yes I think you did Sir.

JUSTICE COOPER:

I mean what's – I don't think there is an argument really, well none has been presented, what's been said is that that is not the way he used to do it but it is a clear requirement of the bylaw I would have thought.

MR LAING:

No, and obviously I can't really answer that point 'cos we don't have any direct evidence of – I mean from the Council's perspective –

JUSTICE COOPER:

Well it wouldn't matter if it was, well I suppose it might justify in some way but it was still unlawful.

MR LAING:

Still unlawful, that is right. So those are our submissions if Your Honour pleases. I'm happy to deal with any matters arising, if there are any?

JUSTICE COOPER:

Well no Mr Laing, thank you very much for that. Now it might be convenient if we turn to you Mr Shamy next if that is all right with you Mr Kirkland. I take it you won't want to stay for the balance of these proceedings. Thank you.

MR SHAMY:

May I please the Commission these submissions are filed on behalf of Graeme John Calvert, one of the three Christchurch City Council building inspectors who inspected the CTV building on 7 September 2010. Effectively these submissions are also made on behalf of the other two building inspectors Messrs Simson and Flewellen. These three inspectors were directed by their employer to inspect the building as part of what was called the rapid assessment process and did so as well as their abilities, their training and circumstances allowed.

Mr Calvert and Messrs Flewellen and Simson were not engineers and did not have any in depth training as regards assessment of buildings subsequent to earthquakes. All three inspectors came from a background of the building trade as opposed to engineering.

Although there had been some relatively brief training in terms of post earthquake inspection, this appears to have been insufficient to impress any particular specialist knowledge on any of the three inspectors involved. Effectively all three inspectors drew upon their general building knowledge and commonsense in undertaking assessment of a building after the earthquake.

The evidence of Mr Simson is instructive:

"For my own part I was inspecting against my knowledge of buildings to visually identify if there was any obvious damage or immediate risk of the buildings collapsing. The key issue for me was whether it was safe for people to be in a building. I saw the inspection as a screening test to sort out those buildings which were plainly dangerous, those which were safe and those where further investigation was required."

In the period between 4 September and the inspection of the CTV building on 7 September, Mr Calvert was called upon to undertake a number of tasks unrelated to inspections of multi-level buildings. For instance:

"I was doing a number of things including marking for barriers and containers to protect roads and buildings."

All three inspectors were clear that they were

1210

instructed to look at the CTV building.

Mr Calvert said:

"I do not recall whether the CTV building was one of the buildings on the list of buildings for us to check, or whether we were called up on our mobile by someone at the Art Gallery and directed to that."

Mr Flewellyn said:

"The three buildings that we were instructed to assess were the Oxford Terrace Baptist Church, a small commercial building on the corner of Worcester Street and Latimer Square and the CTV building."

Mr Simpson said:

"I do not recall who sent us out on the inspection or what specifically gave rise to the instruction to inspect these buildings. The instructions would have come from someone working in the Art Gallery. I assumed that there must have been some initial concerns about the buildings we were sent to inspect."

As there was already a green level 1 assessment on the building, it seemed to the inspectors logical that if they had been sent to a building which already had a level 1 assessment, that they would carry out a level 2 assessment.

Although they had been sent without an engineer, they had been requested to assess the building. Consequently it appeared logical to presume that they

were being requested to carry out a level 2 inspection without an engineer. As employees tasked with a specific purpose they were carrying out their instructions.

Their difficulties were compounded by the fact that a number of the levels of the building were locked and could not be inspected. Those levels that were accessible were inspected.

It can be noted that it appears to be accepted that the building was already occupied prior to the inspection by the three building inspectors. All three building inspectors speak of people working in the building at the time of their arrival. Indeed there was specific mention of a receptionist and a building manager.

Consequently it seems that the level 1 placard had already led to at least partial occupation of the building.

One of the factors which was relevant in the assessment is that the occupants of the building appeared to have no concerns about the building at that stage. Reference is made to Mr Calvert's statement,

"The building manager he did not have any concerns about the building, we specifically asked him if he had any concerns."

In addition Mr Flewellyn said,

"The building manager told us that none of the occupants had raised any concerns about the safety of the building."

This was to be a damaged based assessment. At the end of their assessment in the circumstances as they were, these building inspectors saw no obvious damage.

There is no evidence that they missed anything of significance in their assessment. This is due to the fact that the inspection by Mr Coatsworth later that month, an in-depth assessment by an engineer, found no particular cause for concern.

Unless the Commission has any enquiries those are my submissions.

JUSTICE COOPER:

You have leave to withdraw at anytime now thank you Mr Shamy. Mr Kirkland will it be convenient for you to proceed now?

MR KIRKLAND:

It's a long time to have the pads on Sir when you come in at number seven. Mr Harding, or David Harding Sir is outside the country at the moment. It's the reason he's not here today and I have been able to get all the submissions across to him, albeit with some difficulty and he's read them all carefully and my instructions follow from his reading of those. It's not a very pleasant task for me here today Sir, because effectively I'm going to be addressing in some detail the tensions and the differences between Alan Reay and David Harding. My friend Mr Rennie mentioned Erebus and this is not too different when I think about it because we've got an employer and an employee in this case that have very little in common. As I recall that's exactly what Justice Mahon, Justice Peter Mahon had to deal with in Erebus in terms of the company's policy or Air New Zealand's policy that the pilots were flying at an altitude below 16,000 feet when the code said they were not able to do that, whereas the employees, the pilots were relying on the coordinates that were put into the computer which ultimately took the aircraft towards Ross Island when Ross Island should have been to the left and I see clear distinctions between that and what we're dealing with today.

And that's where I've opened in saying in the ordinary course Dr Reay and Mr Harding would have presented submissions on the united front on the basis it was Dr Reay's firm that carried out the work. Submissions would be made on behalf of the firm following evidence from Dr Reay as its principal and Mr Harding as an employee. However for the reason which is blatantly apparent alas that was never to be.

Mr Harding's instructions to me, it pleases the Commission, is that he accepts the closing submissions of the counsel assisting the Commission in respect to engineering issues. He says they are balanced, technically accurate and considered and he adopts those submissions. And that's probably some stance Sir in the evidence he was giving as I recall, he was of the view (1) that it was a well designed building, (2) he was putting a lot of weight on the issue of the vertical acceleration aspect of the earthquake, and on reflection he now accepts in particular two points, and the first point was his failure to carry out

the calculations to verify whether or not the columns would remain elastic when subjected to natural sway of the shear walls, and secondly he accepts the diaphragm connections to the northern shear wall were not designed in terms of the parts and torsion sections of the code.

He is somewhat comforted in the fact when I have made it clear to him that the experts who have been giving evidence over the last seven weeks have a higher duty to the Commission and he understands that and therefore he adopts the closing submissions in respect to engineering issues that were given by Mr Mills.

However in paragraph 3 there are some issues that I have to address in some detail on behalf of Mr Harding.

The first one is paragraph 13 of counsel assisting, an allegation if I can put it that way and it's categorically not accepted and I'm going to come back to that and tie this thread up when I refer to the specific section of the code. Now what Mr Mills is saying:

"It was submitted that Mr Harding did not comply with the IPENZ code of ethics in acting outside his area of competence. One of the lessons to be learnt from events that have occurred here is that both the IPENZ rule that applied in 1986 and the one that applies currently [and the new rules or the new code adopts the section or carries the section through which I'm going to refer to,] which leave it to the engineer to determine when they might be working outside their level of competence provided an inadequate restraint of when it is appropriate to an experienced structural engineer to embark upon work never previously undertaken."

It is my submission to the Commission that at all material times Mr Harding was a competent engineer and that is borne out in Mr Rennie's submissions. He doesn't have too much difficulty in finding that Mr Harding throughout his practising career was a competent engineer but it's my submission that what we have here is Mr Harding being a very inexperienced engineer in respect to the CTV job and that's something that is quite different, quite able to be distinguished between not competent and I'll come back as I said and I'll tie that thread up in terms of the code of ethics, because it is an important point for me to stress because if Mr Harding was

1220

found in breach of the code of ethics of the day then of course that could well lead to disciplinary matters, censure, fine, I don't know if striking off is, I suspect that is part of the process and that's an area that I can't allow Mr Mills to stray into without challenge.

And the starting point is to look at the experience that Mr Harding had, and to a certain extent we're going to cover some old ground, but it is important in this submission that I'm making.

At 5.1 I talk about the criticism would be valid if Mr Harding was a sole practitioner undertaking the work in the knowledge a client would be relying solely on him and his expertise to carry out the design, including calculations. He accepts, as I recall in his own evidence in his self review that on a standalone basis, without being reviewed or mentoring or having his work supervised, that he would not be confident to have carried out the job.

5.2 the decision to accept the project was Dr Reay's. Mr Harding had no control over that.

5.3 Dr Reay knew or ought to have known Mr Harding was not experienced in (a) the design of high rise buildings, (b) the use of ETABS computer program.

In paragraph 6 of his first brief of evidence Mr Harding says that,

"In about August 1985 I was offered the opportunity to return to Alan Reay Consultants Ltd. Alan advised me that since my earlier employment with his firm he had expanded the firm in order to design multi-storey buildings and at that time had designed a number of multi-storey buildings. He said that he had engaged a structural engineer and a structural draughtsman previously employed by Holmes Wood Poole and Johnstone, particularly because of their experience with design and draughting of such buildings. His current structural engineer John Henry was shortly to leave the firm and offered me that position. Alan understood that I had no experience in the design of multi-storey buildings which required the use of ETABS computer program or the dynamic analysis of such buildings. He advised me that I had the option to gain that experience in this office and to become an associate with his firm in the near future."

The point that I make from that statement is clearly that Alan Reay acknowledged, was put on notice that Mr Harding did not have experience, in particular in terms of ETABS and I think it's important that I refer at this point to the evidence of John Henry in respect to ETABS.

I don't think this needs to be brought up but I do want to just refer to what John Henry said in the point I'm attempting to debate in his submission here is that from the evidence of John Henry it's my understanding or what I take from it that ETABS is not something that you pick up in five minutes if I could put it that way. At TRANS.20120802.65 through into .67 this is what Mr Henry says. This is in response to questions that I requested Mr Mills to make on my behalf. If I could just interpolate there, it's been difficult for me dealing on a piecemeal basis, coming and going, having to read transcripts and having documents out of context. I've done the best I can and I had something like about eight to 10 Eastlight files and David Harding. He doesn't have the same resources that others have got and has been on a standalone basis, so for this reason I was indebted to Mr Mills who put these questions to John Henry and what John Henry says in the question from Mr Mills, and this is where the exchange started,

"Somebody who's not done ETABS work before, steps would be required in your view to train them in the use of ETABS to a level of competence sufficient to do the ETABS analysis on the CTV building?"

Answer, *"Back in those days you mean? Back in those days?"*

Question, *"'86?"*

Answer, *"Well I start with a simple more symmetrical building,* [I'll come back to the West Park building]. *This would be a good example, this West Park one because it eliminates a lot of the complications that you would get them introduced to the system, an understanding to what inputs were, that would be the first step. Potentially be quite a long answer to this question, depends how the person took to it as well but I mean I can, perhaps the question you asked me before is interrelated. For a shear wall building, I mean ETABS wasn't specifically set up for shear wall buildings to make them. That wasn't the first prime use. Frame buildings were very simple but once you've got a shear wall building you had to introduce these panel elements to model these*

walls and basically stack them up like and join them together. It was something that can mathematically would create all forces so you could make a virtual frame to put the panels in and as I indicated before you could know these things had to be joined together at the corners to get rid of the right effect and how ETABS joined things at the corners. It was always, I think, a bit of a mystery so you needed to be able to interpret what came out to ensure that say if you were designing the tube, and this is the complex part of what was coming out the results of the tube, was that you expected and that's where if you hadn't had the mentor or someone like Andy Buchanan who could see it and explain it to you, because for the next step they had to take those forces from the elements and design the tube when you've got those elements. Forces from various panels at the bottom of the wall and then you want to apportion reinforcement of those. There was no program you could just feed into and push a button and the answer would come out. It was quite a lot of trial and error, particularly because in one direction you've got a certain lot of reinforcing and the other direction you've got a different lot at the corners. They overlapped so you had to balance the reinforcing around the corners. So it didn't overdo one direction and not the other."

Question and Mr Mills trying to clarify a little further, *"I might just try to help Mr Kirkland here by putting the question a little differently."*

Answer, *"I'm trying to help myself actually to get to the answer."*

Question, *"Let me just ask you this, this probably is what he's really asking. Imagine you're training up Mr Harding to a level where you feel he's competent to do the ETABS analysis on the CTV building. What steps would you think you needed to take him through before he could do that? I think that's what he wanted to know effectively?"*

"Well okay," answer, *"I don't mean to complicate the answer but who was just doing the analysis like the analysis versus the design of the building, there are two different answers there and I assume mean enough to be able to understand the output, what's coming out and adjust it and rerun it until you're satisfied with what you've got."*

Question, *"I assume that's what he's wanting to know?"*

Answer, *"Yeah well I would expect to do a straightforward building and a more involved building with shear walls in it and definitely one with a shear wall core, so it may be three buildings."*

Question, *"You mean working with him, that's what you are saying?"*

"Yeah. You would definitely work with him as he went along the various parts would become obvious and you wouldn't have to certain inputs you work out as David Harding had done in here he can work out those straightforward, but it's what comes back out and what you do with it, it's just that is the thing that takes the experience to which I think you like expertise and judgements."

That's the point and I've laboured that to a certain extent that Mr Harding did not have experience of ETABS. I'll come back and as I said I'll deal with the West Park building and that is one of the factors that I'm going to tie when I come back and talk about the specific code of ethics.

In exchange with Mr Mills… this is halfway down page 2, …the following emerged:

"So do I take it or do you accept that what was being offered you was

1230

a potential associate-ship of the firm?"

David Harding's answer, *"As I said, that was an aside, that was not the main reason for going there. That was, I've explained, that the reason I went with was as what I've said in the evidence that I recall you calling it was that I was offered the opportunity to go and learn how to do multi-storey buildings."*

And I put emphasis on that word "learn," one can't learn then become experienced and then after one learns you become hopefully competent.

"If he'd offered me the opportunity and said that I'd be doing the same thing I was doing before, or as you say, cutting-edge tilt panel then it wouldn't have interested me at all."

"So where did you think the experience was going to come from once that person left?"

Answer, *"From Alan."*

Question. *"Thank you. So it was Dr Reay where you were looking for that experience to come from?"*

"Yes."

5.4 – Mr Harding in my submission had a reasonable expectation to rely on Dr Reay for supervision, guidance and review.

5.5 – Mr Harding had a reasonable expectation a competent and experienced draftsman would be assigned to the CTV project. I'll come back and I'll deal with that point when I come back to the, the timesheets.

At paragraph 72,

"Although in the course of cross-examination on day 66 Mr Harding referred to needing to know that there was a review process in place because when you are designing something for the first time you don't know what you don't know there is little or no evidence that supports Mr Harding's claim that he had any doubts about his ability to work on his own."

Paragraph 73.

"At one stage in response to a series of questions put to him by Mr Rennie QC he said,

Q: *"The elements of structural design they were in fact all matters within your skills and expertise."*

Answer, *"That was nothing new."*

Question, *"But at the time you considered that you were confident, were you competent to do it, didn't you?"*

Answer, *"I was competent to do it provided there was someone reviewing it."*

And that's the important submission I make in terms of the qualification that David Harding made. This is not an engineer taking a cavalier attitude as my friend would have one believe and further, as I understand Mr Rennie's evidence, Mr Rennie's evidence was that in fact David Harding, sorry Mr Rennie's submission was that David Harding was in fact an experienced engineer and he referred to him in terms of his qualifications, his Honours Degree, he was aged 35 et cetera but there were three points that I distilled from Mr Rennie's submission whereby he relies on his submission, or the base for his submission, that Mr Harding was experienced and the first one is the Waimairi Council. He talks about his experience at the Waimairi Council and that was the first point that I took from Mr Rennie's submission. Now we've been through this on one or two occasions before but it's important

because of the weight that Mr Rennie has put on this that I refer just back to what in fact Mr Harding was doing at the Waimairi Council,

"The work principally included civil engineering including the design of roundabouts, the reconstruction of shape, correction of district roads, the reconstruction or diversion of main roads such as Johns Road, Prestons Road. I carried out cost benefit analysis for the Northcote/New Brighton Expressway and designed the first stages between Mairehau High School and Travis Road. I designed the landfill access through Bottle Lake Forest and carried out preliminary designs and cost benefit studies with Fendalton roading four-laning. There was some structural engineering relating to the annual survey of bridges and the maintenance of bridges."

Mr Rennie referred to the building of bridges.

"I carried out preliminary investigations then designed the Jellie Park waterslide and the associated platforms and swimming pools."

In my submission the work that Mr Harding was doing with the Waimairi Council provided him no base whatsoever, or no strong base, to be able to make the transition, particularly on a standalone basis, into high-rise buildings and, further, at Waimairi he was in the main doing, or carrying out civil work as opposed to structural work.

The second point that Mr Rennie made in terms of allocating experience to David Harding was he referred to the design of two buildings, or being involved in two buildings, prior to getting to the CTV building and as I recall the evidence in respect to those buildings, the first one was when David Harding was effectively working out his time at the Waimairi Council. He was involved with a Hospital Board building which as I recall was a low-rise concrete masonry building and the equivalent static method was used in the design of that building and Mr Harding's evidence was that he was experienced in using that method as opposed to ETABS.

The second building that Mr Rennie put reliance on was the Westpark building. From my understanding there were two points that flow from that building the first was that in fact John Henry had commenced the ETABS program and that David Harding was attaching to the work that John Henry had commenced. And secondary, the second point is that building was a

concentric building as opposed to the CTV building which I understand from memory was an irregular structure in terms of what the code refers to, or a torsionally eccentric building.

The third point that Mr Rennie appeared to give weight to was the issue of attending a conference. This was the "Design of Concrete Structures" conference in 1986. Now the two points that arise from that is it would be my submission that attending a three day conference is not going to make one overnight an expert. And the second point is the timing of that conference. The conference was held between the days of 9 in July 1986 and the permit was lodged –

JUSTICE COOPER:

Sorry what was the dates of the conference?

MR KIRKLAND:

9 to 11 July, Sir, 1986. And the permit for the building of the CTV building was lodged with the City Council six days later on the 17th of July 1986. So I suspect a lot of the design work would have been well and truly undertaken before Mr Harding attended that conference.

Paragraph 7, Mr Harding's self evaluation that he was not competent to carry out the work on a standalone basis. *"I was competent to do it provided there was someone reviewing."*

Mr Harding relied on Dr Reay to have continued contact with draughtsmen in the office. This I have referred to as implied review. Now I don't know what the answer to this is but there may well be possibly some criticism of David Harding in terms of as I recall his evidence relying on Alan Reay within the office environment, going across to the draughtsman's desk and looking at their work and calculations. And the expectation on the part of David Harding 1240 that in fact, the work that he had done and passed across to the draftsmen was catching the eye of Alan Reay. Now whether David Harding should have been more proactive and I'm coming back to the south shear wall in a moment, I just don't know the answer to that. It may well be David Harding's

make-up, he is by nature reasonably shy and may as I called it implied review that may have been a danger or a risk that he ran in not being more proactive in saying to Alan Reay, well look, these are my calculations, these are my drawings, let's get together over a cup of tea and go through them together. That clearly did not happen and I accept that.

Other than when I come back to the next point is Mr Harding acted responsibly in my view when the ETABS output showed excessive deflections. This led to the discussion over the introduction of the south shear wall. I accept there's evidence going both ways in terms of whether the south shear wall was actually in plans from the outset or in fact it was inserted as the second seismic element following the ETABS output which David Harding says showed excessive deflections which led him to discuss the matter with Dr Reay.

It's grossly unfair in my submission to go as far as counsel does in paragraph 13, in particular in relation to the context where Mr Harding was faced with a fait accompli in respect to design. In effect he was introducing the calculations.

In paragraph 11 of his first brief Mr Harding says:

"One of the first projects I was involved with and the first multi-storey building requiring an ETABS analysis was at 249 Madras Street, now known as the CTV building. [We know that's wrong in terms of Westpac was – Westpark was the first building and I'll come back to that.] *Alan consulted with the client and the architect prepared the preliminary calculations and the concept design, and arranged for the preliminary architectural drawings to be amended to meet his requirements."*

I accept there is conflicting evidence over that point.

In paragraph 12 inter alia he says:

"These drawings were then presented to me and Alan advised me of the reasons for the building layout shown on the drawings. He explained the client had seen an existing building at 299 Durham Street which was at the north west corner of the intersection of Durham and Armagh Street. This is now referred to as the Contours building. The client had been impressed by the look of the Contours building and he wanted the CTV building to have a

similar layout to the services core and the same façade treatment. In order to repeat the look and detailing of the Contours building the client engaged the same architect to design the CTV building as had designed the Contours building and I understand that to be Alan Wilkie Architects."

My submission in 10 that Dr Reay had knowledge from an early meeting that the design would be shear wall – stabilised gravity frame as opposed to a ductile frame. Beam columns would be part of the gravity frame and therefore no requirements for ductility. I'll come back to the issue of ductility. Hi-Bond floors and the offset shear core.

In the circumstances it is submitted that it was reasonable for Mr Harding to rely on Dr Reay for guidance. That is the, or it's the submission which I do not accept that Mr Rennie put forward in attempting to portray Mr Harding as an experienced engineer, which he was, but going that step further and painting the picture that he was experienced to do this type of work and it's my submission that clearly he was not without supervision and guidance.

In paragraph 12 of my submission Mr Harding was badly let down by Dr Reay who displayed intellectual arrogance, and I'm going to come back because I've chosen those words carefully in terms of John Henry and Professor Paulay and given Dr Reay 's own lack of experience in respect of high rise design and the use of ETABS, that is my impression of what I've distilled from the evidence. If I'm correct on that point I've gone to the next word which I have given a lot of thought to before putting it into the submission, he was reckless in dismissing the concerns of John Henry and I think it's important.

JUSTICE COOPER:

Now these words are in italics and quotation marks but am I to understand they're your own words?

MR KIRKLAND:

They are my own words Sir, yes.

As I recall Mr Rennie's evidence that I think he said that Professor Paulay had no real concerns but I don't understand that to be precisely the case and when you look at the exchanges in the evidence that John Henry had with Mr

Mills in some of the transcript, TRANS.20120801.130 through to 131 and through to 132. This is what John Henry had to say,

"Before commencing detail design as part of my review of the concept design for Landsborough House I also sought an overview comment from Professor Paulay at the University of Canterbury. I remained concerned about the proposed eccentric configuration of the shear walls and I wanted his opinion on the fundamental configuration with regard to the eccentricity and the possible torsional effects. I was not looking for a detailed review, I especially wanted Professor Paulay's opinion because I considered he was an expert on torsional issues and building layout and reinforced concrete shear walls. I was aware from his lectures that in certain cases depending on the torsional stiffness of the whole system the response of some structural configurations can cause unexpectedly poor performance once ductile yielding has commenced under earthquake loading. Ductile yielding of structural elements is a key factor in limiting earthquake forces in buildings but although the earthquake load is limited the deflection of the building is not. The energy dissipation occurs a result of the building deflecting at the same time yielding the reinforcement. The more yielding and displacement and the more energy dissipation, the design code utilises this aspect to dissipate seismic energy by controlled ductile yielding of the reinforcement in selected elements."

He then goes on to say at .132,

"Professor Paulay had mentioned in his lectures the example of a building with a wall on each end and otherwise little torsional resistance which could lead to the majority of the yielding occurring on one of the walls. I had a clear recollection of him saying this."

Then goes on to say,

"Professor Paulay did not raise any such fundamental issues with regard to Landsborough House but he did comment on the eccentricity of the building and a possible loss in stiffness and consequent increase in deflections arising from cracking of shear walls under earthquake loading."

And this is the point that I'm coming to, when I've chosen the word reckless.

"I discussed my concerns and Professor Paulay's caution with Alan Reay. He was dismissive of this aspect and we proceeded with the design. While I

thought the design for Landsborough house was at the limit of acceptability I believe that it met the code deflection requirements and as a result I designed, I accepted the design would proceed."

And at .133 I think I just took you Sir to .132, this is the further page, .133, and in answer to a question,

"That's right, yeah."

The question, *"Is there anything in particular that makes you feel that it is correct to describe his reaction."*

This is Dr Reay's dismissive, answer, *"Well I thought it was a reasonable way of putting it without going into a lot of detail." He really wasn't –*

1250

– didn't show any indication of picking up on it or taking it any further."

"Was there anything in particular that he said to you that led you to say that he was dismissive?"

"Well there was. I mean it was quite a tricky situation really, in fact really I was quite surprised. More than surprised when he did not comment at the time and I think because of that I still remember it clearly that it sticks with me. Yeah it was."

Question, *"What was that?"*

"Well it was basically, what would he know about it?" Referring to Professor Paulay.

Question, *"What would he know about it, and then what's "he" that's being referred to is?"*

"Pardon. Oh, Professor Paulay, yeah."

Question, *"I see. Well why did you think he was saying that?"*

Answer, *"Well I think the best interpretation I could put on it was that he saw like an academic ideal sort of statement versus, you know, practical day-to-day practitioner's world, you know, you've got to get on with the job and that's all very well being like a theatrical type comment, yeah, but that's how I viewed it."*

Question, *"And you have a clear memory, that's what he said to you?"*

"Oh yeah, it was a shocker, really yep."

Then John Henry goes on to say that I detailed the column tie reinforcing with reasonable provision for ductility, demand in the end regions of all the columns just in case deflections greater than those calculated in ETABS analysis occurred in the extreme earthquake event. That's the reference I make to, to reckless in terms of as I recall David Harding's evidence was that he was not to contact John Henry, and now that this is in the light or in the context that possibly the evidence is accepted by the Commission, that in fact Alan Reay did not have the expertise to design high rise buildings in ETABS on a standalone basis. Then in my submissions dismissal of what Professor Paulay had to say and John Henry's concerns is reckless to the extent that, this is hindsight, that if David Harding was able to speak with John Henry then we may have ended up with the ductile columns which I understand from an engineering point of view would've made a substantial difference.

The top of page 5, John Henry's concern was whether the gravity load system would be adequately protected by the shear walls. This was in relation to Landsborough House.

It is submitted that there was a duty in my submission on Dr Reay in the circumstances to involve John Henry on the basis of external review to dovetail John Henry's obvious engineering talents with the skills that David Harding did have.

I have no doubt that if John Henry was involved, he would've identified that there was a failure to carry out calculations to verify whether or not the columns would remain elastic when subjected to the lateral sway of the shear walls. It is accepted by David Harding that he did not do.

Those calculations would have shown that the columns did not remain elastic and would have been designed for ductility, as indeed my understanding of what John Henry did in respect of the columns in Landsborough House, and that knowledge sadly was not passed across to David Harding. It is also my understanding that there was more of a reason to be concerned insomuch as I recall the shear core of the Landsborough House was actually inside the footprint whereas the north shear core wall of CTV building was outside the footprint, and hence exacerbated the issues of torsion.

This would have involved closing the spacing of the helical binding in the columns, had they been designed for ductility.

Paragraph 13, by deriving drift limits from this and using the modification factor specified in clause 3.8.1 et cetera Dr Hyland and Mr Smith identified V delta. They carried out an assessment of column capacity, they determined that identified columns

1255

did not remain elastic at V Delta and the columns should have been designed for the seismic provisions of the code. This finding was endorsed by the Department of Building and Housing expert panel.

Mr Henry's involvement would have also probably addressed the issue being that the diaphragm connections to the north core shear walls were not designed in terms of the parts and portion section of the code. That's the second point that Mr Harding does make an admission to.

So the point I've probably laboured here is that it's my submission that clearly Mr Harding did not have the experience to carry out this work on a standalone basis and clearly Dr Reay knew that, he knew that as a fact which leaves me now to draw the thread together in terms of my friend's submission that David Harding was in breach of the code of ethics.

In paragraph 14 I've referred to the two relevant parts of the 1986 code, in furtherance thereof, (1) each member shall exercise his professional and technical skill and judgement to the best of his ability and shall discharge his professional and technical responsibilities with integrity.

I come back to that section when I talk about what has been referred to as whistle blowing duties but more importantly for the point that I'm making at the moment, the code says in (6) he shall not misrepresent his competence, nor without disclosing its limits undertake work beyond it. In my submission David Harding did not misrepresent his competence. His competence was well known to Dr Reay in terms of the experience that he had and I don't want to go back through that because we've been through it a number of times.

JUSTICE COOPER:

Was it well known to the Council?

MR KIRKLAND:

That's a difficult question to answer Sir, directly probably not but indirectly in terms of David Harding's other work that the Council probably would have been involved with, the answer would be yes but I would have to accept that directly no.

JUSTICE COOPER:

Well I suppose – I mean I haven't been thinking about this case in terms of the code of ethics to a great extent but it seems to me that you're seeing this as a matter between Mr Harding and Dr Reay but the plans of this building that were submitted for the building permit were signed by Mr Harding weren't they?

MR KIRKLAND:

They were Sir and he accepts that.

JUSTICE COOPER:

Well, all right.

MR KIRKLAND:

I have referred also to the guidelines or those part of the guidelines in the current code and in 2.4, paragraph 15 here this carries through to ensuring you do not represent your areas of levels of experience or competence and – I'm just taking up on that point Sir because I have had to deal with the tension between Alan Reay and David Harding, not pleasant, in fact it's an odious task to have to do it but in terms of representing surely I can, and I do frame the argument on the basis that the competence was represented on the basis that David Harding believed his work to be reviewed, in other words there were certain parts of design work that he felt able and competent to do but not to carry through to completion without somebody reviewing that work. In other words he was aware that he was learning how to do this type of work and

needed that assistance. In that recognition I don't think it can go as far as to say he's misrepresenting his competence.

JUSTICE COOPER:

There's very little evidence though, even in his own mouth, that he took any steps to seek help or guidance from Dr Reay.

MR KIRKLAND:

I accept that Sir and the only direct evidence is the issue over the south shear wall when the – when David Harding carried out the ETABS test which referred to the deflections. I can't probably take that any further other than, and I repeat and I think David Harding has to take some criticism in not being proactive in the office, was his reliance that there was interplay between Alan Reay and the draftsmen as a second line of defence or checking mechanism, and I can't take that any further or put that any higher Sir at all because that's the evidence, I can't go beyond the evidence.

Paragraph 16, Mr Harding's first brief inter alia he says Alan was aware that I had not used ETABS before, that I was relying on him for guidance, in the use of the programme the resultant method of building design.

Paragraph 20 Alan would regularly visit the draftsmen, this is his evidence, to monitor progress of the work and to view the details and information which I had given to them. If he had any concerns as to the type of detailing, my failure to use standard details or my use of non-preferred products then he would advise me of the changes he required.

And at paragraph 21, he says David Harding, my assessment as to whether the building complied with the relevant codes would be based on my previous experience with each element, in areas where I was experienced I would refer to the template calculations provided prior to the submissions of the documents for a building consent, Alan would review the drawings and calculations. In some cases Alan may redesign elements himself or refer them back to me for amendment or redesign.

Now clearly we've got a conflict of evidence there Sir. Dr Reay says that David Harding did not have that interplay with him. David Harding is saying

that it was there and I would have hoped that given the level of experience that David Harding had that it was there and that he was sufficiently prudent and careful to obtain that guidance.

JUSTICE COOPER:

Is that – I haven't got that evidence before me now but is it in relation to the CTV building that he's saying this or –

MR KIRKLAND:

Yes it is.

JUSTICE COOPER:

And other buildings – can we just see that in context, WIT.HARDING.0001.9? 1305

MR KIRKLAND:

It's under the heading, "CTV building" Sir which commences at paragraph 11 of his evidence.

JUSTICE COOPER:

But I mean there was cross-examination on this paragraph as well, wasn't there?

MR KIRKLAND:

As I recall there was Sir, but again we are left with the, one party saying one thing and one party saying the other.

MR MILLS:

I think he was cross-examined on the use of the word "would."

JUSTICE COOPER:

Because the way it is written it is, well it is not very direct is it? Saying what would have happened and there is no – the suggestion that Dr Reay re-designed elements themselves or referred them back to Mr Harding for

amendment or re-design was never, it has never been particularised, has it in relation to the CTV building.

MR KIRKLAND:

No it hasn't Sir and I accept that and possibly just thinking aloud at the moment, I think there was evidence as to the concern from David Harding in terms of, if I can put it – the Tapper letter. I think I referred it to the requisitions and it may well have been that – and I think it was Mr Harding's evidence that the drawings may have been taken away from the draughtsman at an earlier point to get them across to the Council in terms of the permit application. Now I don't know – if I can take that much further because I am not quite certain how we know the Tapper letter got to the Council because I recall the original of that letter was found on the Council file. So it may have been that, and a fair inference that Dr Reay may well have been involved with plans and calculations and discussing matters with Mr Tapper and Mr Bluck but we can only – that is the inference and I can't take it any further than that Sir.

HEARING ADJOURNS: 1.08 PM

HEARING RESUMES: 2.16 PM

MR KIRKLAND:

Mercifully Sir I hope to move away from this Harding/Reay tension but I need to finish one or two points and I think I was at paragraph 18 before lunch and I was just giving some thought just a moment ago in respect to Your Honour's question in terms of taking the step of misrepresenting competence to the Council. I just made a note to myself here, Sir, to try and have a logical sequence, and the steps that I've gone through Sir is the first step is it's my submission David Harding did not represent his level of competence to his employer, Alan Reay's company, that's the first step.

JUSTICE COOPER:

Did not misrepresent it?

MR KIRKLAND:

Misrepresent. And the second step I have put down Alan Reay made an incorrect assumption as to his ability, or took a calculated risk. And given John Henry's expertise had left the office I'm driven to the latter.

And the third step in my note, and I don't want to be overly legalistic about this but it was Alan Reay Consultants Limited, the company, that produced the drawings, the calculations et cetera for the permit application.

JUSTICE COOPER:

That's ARCE I think. Alan Reay Consultant Engineer was the firm as it was called in those days.

MR KIRKLAND:

I'm sorry Sir, I've taken that wrong from my friend Sir, background paragraph 1 submissions. So the company as it was then produced the drawings, calculations, permit et cetera for the Council.

The fourth step that I've put in this sequence is that there was Reay, Horn, Harding, Strachan, they were a team, and I think it would be unfair Sir for you or the Commission to single David Harding as an individual in that team. You may be able to go that far but it's my submission you can't.

And the next step that I've got, Sir, under the code, and this is trying to bring back some balance to the sustained attack that has been made on David Harding, is I'm reversing the issue of competence, and if Mr Mills' submissions are accepted that Mr Reay or Dr Reay did not have the ability to design high rise buildings and use ETABS then he in fact is misrepresented. His competence to his future employee David Harding.

And the last point that I've got in the sequence, and I refer to paragraph 14 of my submission, the first point that I've taken from the code which says, this is the "Code of Ethics", *"Each member shall exercise his professional and technical skill and judgement to the best of his ability and shall discharge his professional and technical responsibilities with integrity."* It's my submission there has been a second breach of the code under that head by Dr Reay. And the reason I say that is when I refer to the Holmes' report, as I recall Dr Reay's evidence, he said there was code compliance in terms of what Holmes Consulting were saying. Well that's not quite the case because when I read this again there is the preface under the conclusions in paragraph 2 where it says, "Generally complies with current design loading and material codes."

And then under the critical paragraph which is paragraph 6.3 and I don't think I need to go through that, it's probably well known, other than repeat the fourth paragraph which says,

"The result of this will be in the event of an earthquake," talking about shear walls and the floor diaphragm. "The building would effectively separate from the shear walls well before the shear walls themselves reached their full design strength."

The author of that report goes on in the next paragraph,

"Discussion has continued on this matter with Mr Geoff Banks of Alan Reay Consulting Engineer and it currently appears that there may have been some provision made for this during construction. However, no documentation

apparently exists so it would only be safe to assume that this aspect fails to comply with current code design codes."

So it's my submission there was a continuing duty to David Harding even after he'd left the employ of Dr Reay's company and the Holmes' report was a sufficient signal, a sufficient warning sign for detailed inquiry to be made. I think in particular there's two references to the issue of the code.

That's all I want to say in terms of the tension between those two players other than just complete what I say in paragraph 18. I do not for the reasons given agree the allegation should stand. There was no deliberate or intentional act on the part of Mr Harding to represent a level of competence beyond the level in fact he had.

The next issue that David Harding takes up is found in paragraph 44 of my friend's submissions where he talks about initial contact with Dr Reay involved a meeting between Dr Reay and Mr Scott. It seems likely that Mr Brooks was at that meeting as well. The meeting was probably at Dr Reay's office. Mr Scott thought he was introduced to David Harding at that meeting and Mr Harding was asked to produce preliminary structural drawings from the A2 architectural sketches. As the ARCE timesheets show, the first time reported for Mr Harding is in March 2006. This may not be correct. The word "may" is used, however it is also possible the word "possible" is used for the next sentence that Mr Harding was introduced to Williams Construction team at that meeting but it would not have recorded time for an introductory meeting of this kind. More supposition. Mr Harding said that he had no contact with the design-build contract, however this is clearly not correct as he acknowledges contact once construction started, however in the light of Mr Scott's evidence after that initial meeting he only dealt with David Harding, and Dr Reay's evidence that he had no further contact with Williams Construction after that initial meeting. It seems likely the contact was either earlier than that and probably did not commence at the initial meeting with Dr Reay.

1425

Mr Harding unequivocally disputes the allegation that he was involved with the contract from the outset. He of course was involved with the contract after construction commenced. I refer to those paragraphs and he was involved

with inspecting concrete pours, steel in the foundations, the taking off of the boxing or the column supports and I put either time timesheets produced to the Commission are correct or they're not. That's an issue that the Commission is going to have to grapple with. I put on the assumption that they are and of the initial meeting with the contractor was in February 1986, the timesheets are consistent and corroborate Mr Harding's view. His view basically is that the design elements and parameters were in place and putting it as bluntly as I can, he put the numbers in. The timesheets record Dr Reay allocating two hours to the CTV project number 2503 and Mr Harding's first introduction to the timesheets is 22 hours in March 1986. As I mentioned earlier in my submission I have to accept it's a two edged sword because the timesheets actually tell against Mr Harding as I recall, when he was of the view that Mr Strachan was the draftsman that was allocated the majority of time to the CTV building as opposed to Mr Horn, but those timesheets show Mr Strachan at 2.75 hours and Mr Horn at 141 hours so again that's a matter that how you resolve that I'm not too sure but it's a matter that has to be resolved.

The next paragraph that Mr Harding has a quarrel with is 578. Bill Jones, that he would ring, said that he would ring David Harding for every concrete pour except the columns because of the steel because there the steel was already sticking out of the columns for them to see at their initial inspection. However he said that sometimes Mr Harding did not arrive at the site, he would ring and say, "If you don't see us go ahead." Mr Jones this did not concern him. Mr Harding denied this it had occurred. Unfortunately Mr Harding's site inspection records have not been able to be located.

Mr Rennie's submission, I think it was in paragraph 56, there's reference to Mr Scott that Mr Harding was there and I quote, "there on a regular basis."

Twenty-two, Mr Harding's denial is consistent with this manner. In my submission his manner and make-up is not one of being cavalie.

Peter Nichols at paragraph 27 says,

"I am advised that David Harding was employed by Alan Reay at the time the CTV building was designed and was involved in the design process. I did not know David Harding well but do recall him being less dogmatic than Alan

Reay, although still assertive. I regarded him as a very competent engineer whose design work I considered to be characterised with elegant simplicity, practicality and economic instruction."

The Commission shall assess issues of credibility, it is submitted that Mr Harding's demeanour giving evidence-in-chief and under cross-examination was that of a truthful witness and I recall his evidence. Initially he was of the view that the building was of good design. As I earlier stated put a lot of weight on the issue of the vertical acceleration in the earthquake but in my submission standing back and looking at his demeanour in the witness box, he in my view was a person who gave evidence truthfully and complied 100 percent of the oath that he took on each time he went to the witness box. In particular I just refer to some of the exchanges that he had with Mr Mills and at the time I was going to object to these exchanges. I didn't, and the reason I didn't is because, and I refer at TRANS.20120731.74 and if I just take two of these:

Question, Professor Priestley, and these issues relate to the north core, north shear wall," and this is from the transcript just for the record at day 57, page 54, he described the connections to the north core as, "Very remarkable," and that was not put in a positive way I can assure you, "or were you aware that he said that?"

Now the answer was no. There was no argument, and the reason that I – well initially I was going to object because that line of questioning in my view was unfair to the extent there was no base put to David Harding, but the reason I did not object is because I think it was on 65 of the same transcript, Professor Fenwick you asked questions of David Harding and then that was followed up with further questions and answers, and it's simply my submission in terms of the demeanour of David Harding giving evidence that he wished to engage academically in an engineering debate but at the end of the day he certainly made concessions and properly made concessions, and overall in my submission that once certain issues were put to him, he accepted those without demur and moved on from there, but the important point I'm making, he was a credible and truthful witness, and Mr Rennie as I recall attempts to sway me from that, and he seems to only do it on two bases.

As I recall those the first base that he uses is at paragraph 29 of his submissions. *"Mr Harding in particular displayed a tendency to remember events only when helpful to his position".* I don't think that is correct in my view. During questioning from his counsel in relation to his first brief of evidence, *"Mr Harding for the first time claimed that whenever he had used the phrase it was considered, it was agreed or it was determined, on each occasion, it was Dr Reay's consideration, decision or determination as if he could recall each occasion clearly".* It's important to understand that was the first time that David Harding was addressing those issues. He dealt with them in my view in a truthful manner and the other important factor to take into account on advice, David Harding prepared his brief of evidence without looking at any other party's brief of evidence. He did that on a standalone basis from scratch if I could use the word, without being influenced by any other brief.

And the only other point that my friend Mr Rennie seems to attack Mr Harding is on the issue of memory in respect to the order of events in terms of as I recall Westpac, he thought as I recall, that's Mr Harding, that Westpac may have come after the CTV building, but once records were put to Mr Harding and his memory was able to be jogged, if that's the right word, with documentation, he readily accepted that he was mistaken on that point, but that doesn't make him an untruthful witness.

So my submission in the round is that there are no issues of credibility in my view that can be sheeted home to David Harding.

Paragraph 130 in respect to the issues and others Mr Harding proceeded blindly, unaware of the risk in the design for which he David Harding taken responsibility. The latter is in my submission a quite unfair allegation being passed across to Mr Harding. I repeat it's almost ad nausuem now, he was an experienced engineer in this field relying on the assistance of Dr Reay. He did not take responsibility, the responsibility was joint for the reasons averted to. Mr Harding does not accept this criticism.

Twenty-five, well it's for the Commission to draw the threads together and provide findings, conclusions and recommendations. It is submitted that at all material times Mr Harding was, and still is, a competent engineer.

1435

He found himself in an environment that simply did not have the resources and expertise upon which he could rely.

And I now move to Mr Harding's conclusion of his evidence which I refer to verbatim. These are standard and code issues and it, from a lay person and in the piecemeal time that I have been able to attend this hearing the documents that I have been able to read and as I recall the note that I made was, when Dr Jacobs gave evidence, he referred to after checking ability to accept deflections derived from V delta the member still was in the elastic range and there was no need to, the ductile behaviour to be provided for that element. Now when I read that and cross reference it to 3.2.1 and this is hindsight and of course the perfect world, this is the section under ductility and David Harding agrees with the point I am about to make I think at the end of my submission, the building as a whole in all its elements that resist seismic forces or movements or in the case of failure a risk to life shall be designated to possess ductility. As I said in hindsight, this appears to show the tension between various sections in the code. If that was on a standalone basis Sir these columns would be detailed, or the columns in the CTV building would have been detailed for ductility as I understand the – as it was the only seismic elements of this building were the north and the south shear walls.

I also just, on that point which is, has been of concern as I think of it now, the issue of the word, or the word buildability has been mentioned on a number of occasions. I am not actually quite sure what is meant by that word but it may well be in the context of Alan Reay's firm it may have had an economic nexus in terms of, well let's build to the code and the culture of this firm and buildability is on the basis that the building is a building that complies with the code on the one hand and if the client is going to be reasonably satisfied on the other in terms of the – it is not necessary to spend a lot more money on steel, concrete, et cetera. That was just a concern that I had probably as a lay person and it seems to me if the code was able to have this type of all-encompassing a section which makes it mandatory to design elements of ductility then all the better for it and I think that is what I am coming on to in the final note from David Harding.

And he says, this is paragraph 26,

"I agree with many of the recommendations in the reports.

Following observations of a number of buildings following the earthquakes., it appears that many buildings have experienced lateral sway which is somewhat larger than expected from design calculations and computer analysis.

This may be partly due to two assumptions made during the modelling of the building, such as the assumption that shear walls are rigidly fixed at the base; no allowance has been made for foundation flexibility; the flexibility of the soil below the foundations in liquefiable soils; the degree of cracking in the concrete; the state of the concrete and the reinforcement following earlier earthquakes; and the reinforcement content of the walls and columns."

Then he probably moves on now to the point that he was making a lot of play on in his evidence,

"There was no provision for vertical acceleration on buildings NZS4203:1984. Even the current building code NZS1170.5:2004 Structural Design Actions New Zealand only requires that the vertical acceleration be assessed at .07 times the horizontal acceleration."

And of course he has provided his own calculations in his evidence.

"As previously noted the paper written by Bradley and Cubrinovski, titled, 'Near-Source Strong Grounds Motions Observed in the 22 February 2011 Christchurch' earthquake reports on the observed vertical accelerations. The vertical accelerations were three times the horizontal accelerations at the Pages Road Pumping Station. That report goes on to report, at page 189, relative to both the 22 February earthquake and the 4 September 2010 earthquakes,

'it can be clearly seen that at V to H ratios above 1.0 are frequently observed for distances up to Rrup equals 40 kilometres in both these events (as well as other historical earthquakes worldwide) and hence the code prescription of .07 is without question significantly un-conservative.'"

The weight that David Harding put on the issue of vertical acceleration is shared by others. My friend Mr Mills in his introduction to his final submissions refers to talking about this but I don't think there was any general

discussion and as I recall in the conclusions to the Hyland report at page 121, the learned author talks about "the following factors are identified as likely or possible contributors to the collapse of the CTV building". His opening bullet paragraph, "the stronger than design level ground shaking", then he goes down further, "the effects of vertical earthquake accelerations probably increasing the axial load demand on the columns and reducing their capacity to sustain drift". I suspect I go back in a full circle, John Henry was involved. Earlier on in Professor Paulay's concerns and the columns were designed for ductility and there was compliance with that catch-all provision of the code, possibly we may not be here today.

39, *"It would be my hope,"* this is David Harding speaking again, *"that due to the excessive lateral movement which takes place in an earthquake, the present code be amended to also require that all columns be detailed for ductility irrespective of the calculated lateral sway of a structure."*

Again mercifully because of David Harding's frank admissions to the two points that I referred to earlier in my submissions is that I don't have to deal with any other technical engineering issues. So that is my submission on behalf of David Harding. He is not in the country at the moment but he has asked me to say, and I repeat these words that have come from him.

"There is never a day that goes by where I do not think about the CTV building. Again to the families of those who lost loved ones in the collapse my thoughts will always be with you."

JUSTICE COOPER:

Thank you. Yes that brings us to you Mr Hannan.

MR HANNAN:

Yes thank you Sir. In the nature of Holmes involvement with respect to this hearing I can I hope be really very brief. It is not my intention to read through the submissions which have been filed but I will summarise some key points and then go to some points which emerge from submissions made on behalf of Alan Reay Consultants and Mr Banks.

So firstly to the summary of key points and these broadly appear in the written submissions in this order that I've, as I say I am not going to read them.

Firstly, Holmes was instructed to carry out a pre-purchase review for a prospective purchaser.

Second point, this was not a peer review, it was abundantly self-evident in my submission from the context and the content of the draft report that it wasn't a peer review.

Next, Holmes identified a serious potential problem in connection with the north shear core to diaphragm or floor slab connection, essentially through analysing a load path and it did this pretty much at the moment it reviewed the plans that the architect have supplied to it, so this was done even before visiting the offices of Alan Reay Consultants and looking at what the design engineers had in their files.

1445

On the 26th of January 1990, and that was a Friday, John Hare from Holmes Consulting visited the Alan Reay Consultants' offices to review the design documentation held there. During that visit Mr Hare told either Mr Reay or Mr Banks or both of the problem that Holmes thought existed or might exist.

On the 29th of January which was the following Monday, and there is some significance to that date, I'll come to it later, Mr Banks of Alan Reay Consultants started doing calculations about the issue and there are some calculations in the documents reflecting that.

Mr Banks and Mr Hare inspected the building on 30 January.

On the 31st of January Holmes' client said, "Stop work and give us the work product that you've so far produced" and Holmes did that. Sent what it then said was a draft report to its client under cover of a fax sheet saying it was a draft, and that report, and I won't take the Commissioners to the relevant passages, but that report was qualified. It's in the Conclusion, section 3.0, used the language "Limited time available, brief inspection, approximate calculations". That's all there in the report.

Mr Hare developed a draft remedial detail for drag bars on all floors for costing purposes on the 31st of January. Alan Reay Consultants was given a copy of the Holmes' Report on the 1st of February by the Receiver. It does seem to

be by the Receiver because the letter from Alan Reay Consultants to Adam and Adam, Insurance Brokers, on the 1st of February says that the Receiver had given a copy of the report but the fax cover which said the report was draft was not included in what Alan Reay Consultants was given so it's clear they weren't told it was a draft.

Discussions about taking responsibility for the problem really carry on in a serial way throughout.

Mr Hare has discussions on the 26th of January with either Mr Reay or Mr Banks or both.

Mr Wilkinson had a discussion with Mr Banks on the 2nd of February. Mr Banks or Alan Reay Consultants sent a letter to Holmes, attention Mr Wilkinson on the 2nd of February.

Mr Banks had discussions with Mr Hare on the 14th of February. In the course of those discussions Holmes and Mr Hare clearly understood, and this is not I think in any contention, that Alan Reay Consultants had recognised the problem and had accepted responsibility for dealing with it. They had taken responsibility for it. There had been, as Mr Robertson put it I think in response to one of Your Honour's questions, "a passing of the baton". Now that is the end of my summary of key points.

Coming to a few specific points which emerge from submissions and evidence from Alan Reay Consultants and Mr Banks. Firstly this question of reliance and there is a section in the written submissions which I have put before the Commission about this and that's at page 4. I won't read it again, but essentially there are statements in the evidence and submissions for Alan Reay Consultants, Mr Reay, Mr Banks, that they relied on the Holmes' Report as a basis for not having concerns about the compliance of other aspects of the building and not themselves undertaking a comprehensive review of other aspects of the building. Now plainly Holmes has no knowledge of what was in their minds and it doesn't take issue with what they say about that. This question of reliance was never discussed with Holmes. It's not suggested that it was, but there is one factual matter that I do point out which is that Mr Banks' initial calculations which were limited to and focused on the floor diaphragm issue were done on the 29th of January, whereas the written report

from Holmes was not received through the intermediaries through him. It went, of course, having initially been given only to Holmes' client. It wasn't received until the 1st of February. So the report itself couldn't have been relied on in, as it were, setting the ambit of what Alan Reay Consultants was going to do in response to the initial advice from Mr Hare on the 26th that there was this problem.

Coming now to the question of the responsibilities to advise the new owners and to take some action as a result of the detection of this apparent problem. There's a suggestion in the submissions on behalf of Alan Reay Consultants that others should have advised the new owners and that those others should have included Holmes and there's also a suggestion that Mr Robertson's opinion about who bore the ethical obligation to take action cannot be sustained. My submission on that is that no principle has been articulated in anyone's submissions under which an engineer in Holmes' position having told the design engineers of a problem it thought it had detected and received an acknowledgement from the design engineers that they would deal with the matter, had an obligation to do anything more. Alan Reay Consultants took responsibility, as was proper, and that was as far as Holmes needed to take it.

I next come to some observations made by Mrs Smith for Mr Banks and this is respect of the comparison of the Alan Reay Consultants drag bars remedy for the problem and the costings remedy, if I can put it that way, which Holmes designed for those costing purposes. Mrs Smith submitted (paragraph 26 of her written submissions) that the drag bars in Mr Hare's design had a lesser overlap with the slab than the ARC design. Now this may be a matter which is peripheral and not of any particular significance but to the extent that it may be, Holmes' response is that firstly, and I'll give the references, the Alan Reay Consultants Limited detail has a different length element on each of the lines, that's to say line D and line DE. It's 1700mm on line D and 2690mm on line DE. The documents showing that are MAD (we don't need to have them up) MAD249.0130.30 and .31. By contrast, the Holmes' detail which is MAD249.0005.19 was noted as an angle approximately 3 metres long. Mrs Smith's submissions were based on the bolt spacings but they had been noted on the Holmes' design as typical and would have been represented as

minimum spacings and I won't take that any further to the extent that it's a matter of interest to the Commission. The references are there and the comparisons can be made.

Next point by way of response, leaving drag bars off the two floors. There was some suggestion by Mr Banks and in the submissions of my learned friend Mrs Smith for Mr Banks that the issue of omitted drag bars on the lower two floors had been discussed with Mr Hare or with Holmes.

1455

Well they had certainly discussed the possibility of a reduced connection at level 1. That's in the documents. And they had discussed the possibility of redistributing loads.

The letter of the 2nd of February 1990 from Alan Reay Consultants to Mr Wilkinson mentioned reducing loads on lower floors in accordance with the "Parts and Portions" section of NZS4203 1984. But Mr Hare specifically denied that omitting drag bars on both levels 1 and 2 was discussed with Mr Banks and Mr Banks conceded in the end, in cross-examination that there had been no specific mention in the letter 2 February of omitting both ties. That's transcript 20120817.42.

Commissioners, those are the additional points I wish to make. I'm happy to assist the Commission further if I can. I would like to just make an additional statement. Holmes Consulting Group acknowledges the suffering and the distress of the families and the friends of those who died or were injured in the CTV building collapse. It also acknowledges their interest in there being answers so far as possible to the question of what caused the collapse, and it hopes that its contribution as to this inquiry can assist in providing such answers. Those are my submissions.

JUSTICE COOPER:

Mr Hannan you are free to go when you wish to.

MR HANNAN:

I am obliged to you Sir.

JUSTICE COOPER:

And that applies to you Mr Kirkland. Mr Laing the same applies to you if you wish to?

MR LAING:

While I'm on my feet I could just deal with the matter that Mr Reid indicated we come back to Your Honour? This related to clause 348 of 4203 and the question is when was that clause deleted? And my researchers which I hope are correct because I haven't had it checked for myself in the office is that that clause didn't appear in the 1984 edition of NZS 4203, so it was omitted from that version. If I find anything different on Monday I can always file a memorandum about that.

JUSTICE COOPER:

Mr Mills, we had submissions from, on behalf of Mr Coatsworth. Is it intended that they simply be taken as read is that right?

MR MILLS:

Sir, that's correct.

JUSTICE COOPER:

And the same applies in the case of Mr Shirtcliff?

MR MILLS:

Yes. Correct is the answer to both of your questions Your Honour.

JUSTICE COOPER:

So we come to you Mr Elliott?

MR ELLIOTT:

May it please the Commissioners, we see before us there the familiar photograph of the CTV building. Before the 22nd of February 2011 it was an unremarkable building. I don't mean that in a critical way, Commissioners. It

was a relatively modern building and seemingly not different to the hundreds of other commercial buildings around the CBD in Christchurch. Another photo will come up now of the building after the earthquake at 12.51 on that day and it was unrecognisable. Looking at that building it's hard to know it had even been, or that photograph, it's hard to know if it had even been a building at all. No-one will forget seeing that and other images of the building in its collapsed state in the hours and days after the earthquake and the feelings of shock and unreality that went with those.

In New Zealand we don't expect a building to collapse in that way, and in my submission that expectation is not beyond reason. The Commission has heard evidence about how prominent New Zealand engineers are nationally and internationally, academics and engineers, and just one example of that is the publication by Park and Paulay, *Reinforced Concrete Structures* referred to as the bible by members of the profession. And one doesn't need to venture very far into that text, page 7 in fact, to find some statements about ductility which are extracted in Mr Mills' submissions at paragraph 301.

And the text says that,

"It's important to ensure that in the extreme event of a structure being loaded to failure it will behave in a ductile manner."

And that means ensuring the structure will not fail in a brittle manner without warning, but will be capable of large deformations at near maximum load carrying capacity.

They say,

"The large deflections at near maximum load give ample warning of failure, and by maintaining load carrying capacity, total collapse may be prevented and lives saved."

Those words published in that book in 1975. In my submission, that concept of ductility is so sound, so straightforward and so important. It was a concept which was recognised in New Zealand firstly in 1965 but no specific guidance was given in the codes. But in the 1970s ductility considerations were incorporated into the standards. It may be that ductility may have been one of the reasons why that nearly every building designed and constructed after that

time survived the earthquake without total collapse. And of course only one did not.

So perhaps the most fundamental question that bereaved families have is how could this happen in a developed country which has long been known to be prone to earthquakes, and which has continually developed building codes to address this risk?

As the Commissioners have heard over and over, the bylaw applicable at the time set out two fundamental and mandatory legal obligations that in a major earthquake the designer should seek to avoid collapse and to minimise the probability of injury to and death to those not only in the building but around the building.

And yet this building, the CTV building collapsed in the most horrible and catastrophic way. It was the most complete and utter failure of any building in Christchurch. The Commission has heard evidence in relation to many other buildings. The PGC building which was designed in the 1960s but was upgraded to some extent and in which 18 people died and others were seriously injured, at least remained partially standing. Some of the connections around that central shear core remained and the ground floor remained intact allowing some to escape who might otherwise have died.

It's not comparing like with like but the Commissioners also heard about unreinforced masonry buildings, some of which were almost a hundred years old and even they did not fail in the same way. Parapets and walls fell mostly outwards, but structures seem to remain standing, unlike the structure of this building.

And every other building in Christchurch built under the same codes as the CTV building withstood the earthquakes and remained standing, and no-one died in any of them.

But of course this building did not just fail, in my submission pancake is the only description that can be given.

1505

Here is a photograph taken by Dr Heywood of line A, the western side of the building which illustrates that. We can see here levels three, four, five and six, floor slabs lying on top of each other with very little separating them. And then

another photograph, this time taken by Mr Frost taken from the south with the remains of the south wall showing levels one to six all compacted so their total height was no more than about what level one must have been. This was a total collapse, those in the building had virtually no hope, some bodies were never even recovered and to stumble alive from this building was a miracle.

Christchurch is rebuilding and there is talk of the future but there are still people who wake up every morning who cannot forget that day because parts of their lives are missing and they're desperate to know why did the person that I love leave me that morning and not come back. The same question is shared by those who lost friends and colleagues and workmates, many people knew people who died in the CTV building and they all want to know why did this building collapse, why did it cause such death and injury? In my submission those questions mirror the questions set out in the Commission's terms of reference.

It is also natural for those people to ask could someone have done something that would have made a difference? Could the death of my wife or husband, my child, a mother or father, my friend, somehow have been prevented, and I submit these are also questions which fall within the terms of reference. When asking why the building failed it maybe because someone did not do something which they could or should have done, or to put it another way it's relevant to ask if someone had done something, might it have prevented failure, might it have prevented injury and death?

At paragraph 11 I say, some family members who have come here, have come here almost every day over the hearing, some have travelled many hours each day to be here. Some who would have liked to be here could not due to family or work commitments. Some have just decided to let the Commission run its course without following it. Many have been unable to be here because they live overseas, but with the assistance of support people and volunteers and embassies, they have been able to follow the Royal Commission's work.

On behalf of all of these families, I would like to thank Kate Collins, the Commission's Family and Community Liaison Officer, and Robin Major, the

Commission's Senior Communications Advisor, for the care they have taken before this hearing and throughout this hearing to support those people.

Mr Mills has given an extensive account of the history of this building and invited the Royal Commission to make findings and on behalf of the families and those injured, I invite the Royal Commission to accept those submissions. Mr Mills has already covered many areas which are of particular concern to families. I have contributed to those submissions as Mr Mills said.

I am also required to represent the interests of bereaved families and those injured, and so these submissions are for that purpose. My comments will add to what Mr Mills said. I won't seek to repeat it, I couldn't say it any better. I wouldn't say it as well but I'll try and set out areas of particular concern that families have and just emphasise those.

So now I'm in paragraph 16 and dealing with the collapse on the 22nd of February. Mr Rennie described the earthquake as exceptional and he said that this should be borne in mind at all times and in my respectful submission he is right. In fact again with respect I say he could have done even more to emphasise that point, and it's such an important point that I will. He could have gone onto say according to what I understand the position to be, response spectra show that the February earthquake produced ground motions that statistically would only be expected once every 2500 years. So as Mr Rennie said, once again I submit correctly that should remain at the forefront of our minds, although as we consider the CTV building with that in our minds, we notice something striking, and another photograph will come up now, BUI.MAD249.0189.191 and we see the north shear core is standing, is standing, it withstood the 2500 year event, in fact it withstood 4 September and all of the aftershocks between the 4th of September and the 22nd of February. We know that it was the most important structural component of the building designed to bear the brunt of earthquake forces and it stood through them all, just as every other building stood through them all.

What is clear as I say at paragraph 17, is that during the earthquake firstly the connections between the floors and the north shear core and south coupled shear wall detached. We know that because we can see it in the photographs, they're no longer attached. We also know from the evidence

that the connections between the columns and the beams disintegrated such that there was nothing in fact holding the columns to the beams. Not only did the connections between beams and columns fail, but there was evidence that the columns themselves failed by way of fracture or spalling or being crushed and giving way.

The sequence of these failures has been the subject of a great deal of discussion. One may have happened followed by others, one or more may have happened at the same time, one may have been enough to trigger others that it's clear that all of them happened. For the families that have an interest in knowing whether any of these crucial areas of failure could have been prevented, and if they had been prevented and my comments will just address briefly each of these areas.

As I say in paragraph 20, the diaphragm connections to the north core was crucial to keeping the building intact. If it severed it could only have resulted in greater torsion and of course those connections also were part, an important part of the load paths which connected the diaphragms to the wall so as to transmit earthquake loads to what was intended to be the plastic hinge regions of the walls, and in my submission those connections were non-compliant from the day of design until the day of collapse, and Mr Mills has set out the reasons for this in paragraphs 336 to 365.

As I say in paragraph 21, it is clear in relation to the columns and beam-column connections that they too were crucial to preventing this type of collapse. I will ask for another photograph here from Mr Heywood, once again taken from the western side of the building showing vividly again levels three, four, five and six compacted in the columns, in the beam column connections below them were the structural elements that kept those slabs apart. In my submission we can see therefore why they were critical and we can see why it's clear that their failure could only have been a risk to life.

As I say in paragraph 22 it will have caused much pain to families to learn that Dr Reay and Mr Harding on the face of it had a choice about whether to use seismic or non-seismic provisions of the code for the design of columns and beam column connections although as Mr Mills submitted and I will submit briefly, compliance with the by-law required the seismic provisions to be used.

Professor Priestley gave evidence that had the seismic provisions been used the column displacement capacities would have been sufficient to resist the forces predicted by the non-linear time history analysis of the 22 February earthquake. Your Honour asked Mr Mills yesterday which analysis Professor Priestley was referring to and Mr Mills said it was the first. The second Compusoft report reference BUI.MAD249.0552.85 and 86 shows that the comments would similarly apply when one sees what the drift demands predicted by that non linear time history analysis were, they were 3.8% according to that and Professor Priestley had predicted capacity of 6.5% so the evidence stands that the capacity would have been greater than the demand on that day.

1515

As I say at paragraph 23, in a sense in my submission, it is not surprising that the building failed so completely when one considers its history. At almost every important stage, there appears to have been a mistake or a lack of care, an oversight or an unfortunate twist. There were many opportunities for people to do something that might have prevented such injury and death but unfortunately it seems every one of these opportunities was missed. Some of those who missed opportunities could not be expected to have done anything different to what they did. One only sees in hindsight what the opportunity was, but hindsight can also become a coward's refuge. It takes real courage to say I should have seen this at the time and for some, in my submission, hindsight should not have been required.

Paragraphs 26 to 28 I talk about the building design. I comment briefly on two areas where in my submission there were flaws which sealed the building's fate. Firstly, the walls and secondly, the columns and beam column connections. Although I am saying they are two areas, it is evident I am in fact talking about every part of the structural system, the walls and the frames. The walls, firstly the north shear core was placed outside the building envelope. That was not a problem in itself and that did not make it non-compliant in itself but there were also very large voids in at least two of the three bays. In fact most of it consisted of voids and so that was always going to mean, in my submission, that diaphragm connections would be more

difficult to achieve in a competent way. Dr Reay knew about this design because he saw it on the architectural drawings at the first meeting he went to and he also saw it on the drawings when he and Mr Harding talked about the south wall. Secondly, the north core, although it has been described as a core, perhaps may not in fact have been a core, not in the same way that the PGC shear core was because it wasn't closed. As it wasn't closed it meant the torsion was an inevitable danger as Mr Henry's models so vividly illustrated and that too should have been obvious to Dr Reay and to Mr Harding. In the south coupled shear wall, was added with a different structural type factor. It wasn't the same length, it wasn't as strong. Asymmetry in my submission was a consequence as Mr Mills has described and we know Mr Harding and Dr Reay discussed the south wall.

So to summarise the position the design decisions about those walls, placement and the strength inevitably led to difficulty in achieving competent diaphragm connections and torsion being a very real danger. The columns and beam column connections were designed using the non-seismic provisions of NZS3101 and that also resulted from a design decision and it appears that Mr Harding made it and it is recorded in his calculations. Dr Reay said he didn't know about that but he did know that Landsborough House was designed on that basis and that was what he had asked Mr Harding to use as his basis for the design and Dr Reay also said in evidence that even if he had known there would have been no change to that element of the design. So my submission both that Dr Reay and David Harding are personally responsible for these design decisions and their implications.

In paragraph 29, I refer to the mandatory legal obligations in the bylaw and I just invite the Commission to consider, what if Mr Harding and Dr Reay had considered those provisions at the time of design? What if they had considered their objectives to be, to avoid collapse, to minimise the risk of injury and death? If that had been on their mind, and they'd asked, should we have shear core outside the envelope, open and not closed with a smaller weaker wall on the other side, their answer would have had to have been, no we can't do that. When they came to consider the columns, they would have known or should have known that to design them in a non-seismic fashion

would mean they would fail when exposed to much lower loads than if designed using the seismic provisions. Given also, that the decision about the walls accentuated this issue of torsion which would have had an impact on inter-storey drift making it potentially greater, that worsened the risk to the columns in my submission. So if they were considering the criteria set out in the bylaw in my submission the seismic provisions of the code were the one to use. Would they have been entitled to say, well there is this, as Professor Mander described, a loop hole here, secondary elements and seems many others are doing it so should we do it too? Well, in my submission they made that decision but clause 3.5.1.5 of NZS3101 said the consequences of failure of elements that are not part of the intended primary system resisting seismic forces shall be considered. And if they were to consider the consequences of failure of that part of the building which they had intended to treat as not part of the primary system, again there could only have been one consequence of failure and that is what happened on the 22nd of February 2011.

As I say in paragraph 30, both codes, although I should emphasis not the bylaw, both codes refer to this concept of capacity design. The code said the structure was required to be designed using capacity design and both Dr Reay and Mr Harding seem to treat the walls alone as the structure. In my submission capacity design like the concept of ductility is such a sound and simple and yet powerful concept, the designer would ask, if this building is going to fail, how do I want that to happen? The obvious answer being, well it should happen in a way that prevents injury and death. How does one do that? By avoiding collapse. So a designer applying capacity in my submission would consider the behaviour of the whole building and ask how will earthquake loads work their way through the building? If parts of this building are going to fail what should they be? I will make every part of the building stronger than that which I want to fail and ensure the section which is going to fail has sufficient ductility. Professor Mander said the hierarchy of strength in the CTV was the reverse of what it should be, the walls being the strongest, the beams, the columns and the beam column connections, so in my

submission it is no surprise they failed and in a sense the building was inevitably going to fail when exposed to sufficiently forces.

For these reasons and those referred to by Mr Mills, as I say at paragraph 31, Dr Reay and Mr Harding simply did not have sufficient experience to design this building. This was worsened by Dr Reay, by failure to review the drawings before they were sent to the Council and to satisfy himself that the work was acceptable. Although that may not have made a difference apparently because Dr Reay said he was even less familiar with the relevant code than Mr Harding. So that leaves the submission that Dr Reay should never have taken the job on. If the Commission is also to find that Dr Reay persuaded Mr Bluck that a permit should be granted, his previous mistakes would have been compounded by that persuasion taking place against the background of his limited knowledge of the building and limited understanding of the code.

The bereaved families are also concerned that the Council allowed a permit to be granted for a building which did not comply with the bylaw. The reviewing officers were concerned about the building which is not surprising given the defects that Mr Mills has outlined. The permits should not have been granted until those defects were addressed.

It is not an excuse in my submission to say, that there were limited resources. The problems should have been identified and it appears they may well have been identified but the evidence shows that Mr Bluck was nevertheless persuaded to grant a permit and so an opportunity was missed.

1525

The problems should have been identified and it appears they may well have been identified but the evidence shows that Mr Bluck was nevertheless persuaded to grant a permit and so an opportunity was missed and that was an important time because the approval by the building as compliant, I use the word “infected”, subsequent important decisions and the most particular of those being inspections, and I put it to Mr Coatsworth that one of his underlying assumptions had been that the building did comply with code when he carried out his inspections and so that missed opportunity by the Council remained and played a part at crucial times of the building’s history.

When one looks, as I say, at paragraph 36 at construction once again it's no surprise, regrettably, that serious deficiencies resulted. A dispute between directors, a five month period during which I say in my written submissions "construction" but I should say during which Council "inspections" had stopped. All of that could have been because work had slowed down. Construction manager who is a convicted fraudster and was described as not being up to the job, an ongoing turnover of workers, a company which ended up in receivership are hardly compatible with achieving quality construction.

This problem may been at least partially addressed if there was effective ongoing supervision during construction but the Council records show rudimentary inspections in my submission and there was also evidence that Mr Harding sometimes did not turn up before concrete pours but told them to go ahead anyway.

As I say in paragraph 38, Dr Reay had a further opportunity then in 1990 and 1991 to address defects but did not and so the building remained non-compliant even after the retrofit.

It must have been clear that Mr Harding had violated a very basic engineering principle and Dr Reay said as much in evidence, that of ensuring adequate load paths. That should, in my submission, have sent a message about Mr Harding's limited abilities and led to a full review. It did not.

Dr Reay and his firm initiated work without a building permit, taking it upon themselves and not leaving it to the legally established territorial authority to decide what should be done and when, showing indifference to the requirements of the Bylaw, same indifference which was demonstrated at the time of the original permit.

Paragraphs 41 and 42 I comment upon some things which might be done about that. I won't read them because the Commission has already heard much on that.

I deal with change of use in paragraphs 43 to 48 and I'd just like to very briefly reply to one or two matters the Council have addressed in their submissions. Commissioners they refer to this issue in paragraphs 47–50 of their submissions and they refer to the case of *Auckland City Council v New Zealand Fire Service*. The Commissioners may wish to look at this more

closely but they refer to Mr McCarthy's evidence in paragraph 47 currently in support of the submission that they did all which they were required to do but in my submission even the points referred to by Mr McCarthy demonstrate there was no consideration given by the Council to how the building may have been brought up to compliance as nearly as is practicable with no consideration given to how practicable it may have been to take those particular steps. That's even worse because Mr McCarthy quotes Mr Harrow as saying he would have been aware of changes to the code in relation to transverse reinforcement of columns but no evidence from the Council's part that they considered any form of strengthening to the columns, although in fairness to them I should highlight Commissioner Fenwick's point which was that strengthening of the columns may have then presented further difficulties for beam column connections which would have remained of much lesser strength than a strengthened column, but of course if the Council had looked at the beam column connections they would have observed an area which seems most are agreed now was non-compliant because the reinforcing didn't even meet the minimum, that is, the non-seismic provisions of the code. So in my submission there was a failure to comply with s 46 on the Council's part.

It seems also in fact that the Council say it was the case that the King's Education tenancy would have amounted to a change-of-use as well. As I understand it change-of-use categories incorporate at least consideration of a number of likely users so it seems likely that the King's Education tenancy resulted in more people being on that floor than was legally permissible. The tenancy should not have been in the building without the Council approving the change-of-use.

However, unfortunately it may not have made a difference if the Council was informed of this tenancy given previous failure to require an upgrade in the case of the Going Places tenancy and the Council itself says in relation to King's Education that even had they considered an upgrade, a structural upgrade would not necessarily have resulted in those considerations.

I should also highlight what Dr Hyland and Mr Smith said, as I say, in paragraph 47. There's no evidence that any addition weight introduced to the

building was a contributing factor to failure, especially given vacancies at other levels.

Finally, on that point The Clinic tenancy went into the building only weeks before the 22nd of February. The Council wasn't informed although they said they did not need to be informed. Mr Drew was entitled on the basis of a phone call to take that tenant into the building but it is of particular concern to families of those who died in that part of the building that it's possible to move a medical clinic into a commercial building without any need to address the particular needs associated with the operation of a medical facility. Beyond highlighting that, Commissioners, it's not a matter I can advance any further within the terms of reference. And that concludes that topic Your Honour.

HEARING ADJOURNS: 3.32 PM

HEARING RESUMES: 3.47 PM

MR ELLIOTT:

I'm at paragraph 49 of the submissions and about to address the Commissioners on post-earthquake assessments which remain an area of serious concern to many families. As the Commission is aware, the tenants in the building expressed concerns to each other and to the manager about whether it was safe to be there after 4 September. Buses went past and the building would move. People walked past and the building would, parts of the building would move. And the demolition of course, next door, caused much distress.

There were things that these people did not know, which we now know, which is that the building in my submission was not compliant in some ways. That a retrofit had been needed to address a major defect. And that as Professor

Priestley said, “A retrofit could not have been as effective as getting the design right in the first place.” That the building had a capacity of between 40 and 55% of current code according to Dr Hyland and Mr Smith. And also we know now that the reinforcing steel in the columns and beam column connections was much less than it was increased to as a minimum in 1995, and much less than would be allowed under current codes.

But of course the tenants, those who used the building, were never aware of any of this. They may have made different decisions about continuing to occupy the building had they known.

As I say at paragraph 52, in relation to the Council, just focusing on that level 2 assessment which resulted in a green placard, in my submission the green placard should not have been assigned to the building at that time. There were three Council officers there, none of whom was an engineer, none of whom were sufficiently qualified to form a view about risks the building posed. A gap in the stairs had been identified as needing further attention but some parts of the building had not been inspected due to inaccessibility. So rather than placing a green placard on, they ought to have left without putting a green placard on.

JUSTICE COOPER ADDRESSES MR ELLIOT – CLOSING ADDRESS CANNOT BE HEARD FROM BACK OF ROOM

MR ELLIOTT:

So as was the case with other buildings, the green placards prompted unjustified complacency. But again I’m not going to dwell on that because that’s been very extensively addressed by the Commission in other hearings. Mr Drew was the building manager, paid to carry out that role, and so responsible for ensuring that all reasonable steps were taken to verify that the building remained suitable for occupation during the thousands of earthquakes that followed 4 September.

In my submission, Mr Drew failed to do everything he could've done. Mr Coatsworth had told him in writing that drawings would be very helpful in understanding the structural systems in the building. So Mr Drew ought to

have asked Mr Coatsworth to review them when they became available in October.

There were also a number of reasons why Mr Drew ought to have asked Mr Coatsworth to come back and reassess the building after the Boxing Day earthquake. The earthquake was different to others in its proximity to the CBD and the consequent strength. There was damage to the CTV building that was reported to him. Ms Vivian in particular expressed concerns. He would've known also of the extent of the damage to the building next to The Clinic which was severe enough for a red placard to be placed on that. That was the reason for looking to move The Clinic into the CTV building, and he was also aware that the Boxing Day event was treated by insurers as a new event.

That failure to obtain a further assessment was a critical omission and I submit Mr Drew's approach was cavalier at best and reckless at worst. By reckless I mean heedless of danger, failing to give thought or care to the results of action or in this case inaction. I put it to Mr Drew that he could've done more to ensure the safety of himself, because he and his wife were occupants too, and others, and he agreed.

Mr Coatsworth carried out the assessment, as the Commission is aware, in September/October. In many ways that assessment was very good, especially when compared to others that the Commission has seen, and certainly he applied the same type of test that others applied.

I say he did it even better in many ways. He took photographs, provided an extensive record, he took extensive notes, he came back to the building to look at certain cracks again and prepared diagrams of those. He spoke to professional colleagues to find out whether his thinking was right. As I say in paragraph 58, his assessment feels somewhere along the spectrum between a brief visual inspection and a full detailed assessment of the building's capacity which would've picked up things like the extent to which the building complied with current codes and would've included an assessment of the building's drawings. The difficulty here, as is the case, I don't attribute criticism to him for this, but he determined where on the spectrum the assessment should be.

He then identified the desirability of looking at drawings, but didn't tell Mr Drew that Mr Drew should provide them to him once they became available. In my submission Mr Coatsworth should have done this, but the reason which he gave in his message to Mr Drew which was that they would be very helpful in understanding the structural systems, and one thing well a number of things they may have shown him, but one first was that he didn't know if the seismic or non-seismic provisions had been used for columns and beam column connections, and the drawings would've shown that.

It's also likely that if he looked at them he would've seen the deficiency in the connections between the diaphragms in the north core. Of course what may have happened then can only be speculation. He may have recommended closure. Some may have refused to enter the building. Again we do not know, but it may have made a difference.

A full detailed evaluation would have identify areas of structural weakness which are now very obviously to other engineers. And if the tenants had known about these things they may have made a different decision about whether they were willing to continue to work there during the many ongoing aftershocks.

As I say in paragraph 62, some also consider that Dr Reay and the building owner, having been aware that a retrofit took place, should've taken some action. I should say however that the information may not have been appreciated as being of significance to Madras Equities because the problem was represented as minor by Alan Reay Consulting Limited.

By from Dr Reay's perspective, as I put to him in evidence, this was the only building in which it had been necessary for him to arrange drag bars and it was rare for him to notify insurers of a claim.

1555

In my submission the building should have stood out in his mind for these reasons but he didn't take action to warn people or to at least alert those in the building that the retrofit should be looked at as part of an engineer's assessment of the building. Despite that he has called Professor Mander to give evidence that all buildings should have been closed by fiat and as I understand the submissions made on his behalf the building should have

been red stickered, notwithstanding any of the inaction on his part after 4 September.

Turning to the demolition, as the Commissioners will appreciate that has been a concern for many. It's clear that a wrecking ball was used. That wrecking ball was not provided for in the Demolition Methodology provided to the Council. The Council did not monitor demolition and were not aware of the wrecking ball but it certainly caused much distress. However, it should be noted that no evidence has emerged that the demolition work caused any structural damage to the building or that it contributed to the collapse on 22 February.

The Commission has in paragraph 66, make the point that the complete collapse resulting in such overwhelming injury and death might have been prevented at certain points in the life of this building. Of course that can only be speculative but those points highlight places where things may have been done differently and can then lead on to possible learning points.

So in my submission those points are firstly if Dr Reay had recognised that no one in his firm had the expertise to design the building and refused to take the job on;

or if having taken the job on Dr Reay and Mr Harding had in fact ensured compliance with the bylaw and best practice;

the Council had required design flaws to be addressed before the permit was granted;

if when notified in 1990 of the defect, Dr Reay had recognised the extent of Mr Harding's lack of competence and arranged for a full peer review;

if the council had required a upgrade arising from a change of use;

if Dr Reay had told the owner and tenants, or reminded the owner and told the tenants that a retrofit had been carried out to a critical area, which should be taken into account in post-earthquake assessments;

or Mr Coatsworth had carried out the most complete possible assessment of the building, including looking at drawings or identifying potential weaknesses and the extent of compliance with current codes;

and if Mr Drew had asked Mr Coatsworth to review the drawings when they became available and had arranged for Mr Coatsworth to come back and look at the building after Boxing Day.

The fire has also been a real concern for many families. Obviously they ask, how could it start, and how could it burn with such intensity for so long? The Royal Commission has attempted to answer these questions and heard evidence from a member of the Fire Service and that evidence showed that there were hundreds of possible ignition points throughout the building and many sources of fuel for the fire and my cross-examination only served to amplify that, only served to illustrate it even more. So unfortunately given the appalling state of the building, the building which collapsed, and then due to the rescue and recovery, debris was moved, not possible it seems to get answers, those answers about the fire.

I turn now in paragraph 70 to make some submissions in relation to Dr Reay. Before doing so I acknowledge what Mr Rennie said in his submissions that the Commission investigation process is rigorous, independent in searching, but the process is neither a pillory of which those alleged to have erred are paraded and humiliated nor a time of atonement. Punishment and apology are both relevant for the disaster but not to the purpose of the investigation or its outcome. Paragraphs 306 and 307, and he also said the collapse of the building was stunning and distressing for ARCL and Dr Reay.

Obviously Dr Reay and Mr Harding are in the most horrible position having been involved in the design of a building which collapsed, killing so many and it would be only natural for them to hope with every fibre of their being that their actions did not contribute to that in some way and they have both given evidence here voluntarily, on a number of occasions, answered every question that was put and that process must have been extremely difficult.

Engineers occupy a very important position in our society. I will not address whether it's more or less important than that occupied by lawyers. Equally as engineers they have taken on a role in society in which they literally have people's lives in their hands with the decisions they make every day. If you like a surgeon or a pilot, not a lawyer, with people's lives in their hands they require a high level of skill and a high level of responsibility, inevitably if lives

are lost their actions will be subject to scrutiny and as Mr Rennie said, rigorous scrutiny.

Some bereaved families consider that Dr Reay had more opportunity than anyone else to prevent what happened on that day. I regret to say that some also feel that his actions have been disrespectful towards them and to the Commission. Dr Reay's counsel said that he is committed to the Commission's work of understanding the causes of the collapse and ensuring that buildings are safer in future. I submit that unfortunately these words were not always borne out by Dr Reay's actions. He did not make any real attempt to answer one of the most fundamental questions about this building, which is whether it was designed in accordance with the applicable Bylaw.

On the fourth occasion he gave evidence he said that he had now identified two compliance issues, the connections to the diaphragm to the north shear core and the amount of confining reinforcement in the beam column connections, although in the submissions that Mr Rennie delivered yesterday the connection to the diaphragm between the diaphragm and the north core seemed to disappear as a compliance issue until Your Honour directed a question to Mr Rennie about what the errors of non-compliance were accepted to be, at which point Mr Rennie said, and Mr Palmer can correct me if I'm wrong, the beam column joints, the diaphragm connections, and he also said some columns were on the margin but I'm not sure what that meant.

When Dr Reay gave evidence he described these areas as possible and in my submission the use of that word in itself indicates that it was disingenuous, that he was reluctant to accept when he did something wrong and that he coupled the statement with the assertion that documents may have gone missing but we can't be definitive about that so we can't be definitive about whether the building complied with the bylaw and that's ironic given that Dr Reay continued to find and produce documents months after his lawyers had told counsel assisting that all documents had been provided. He did not produce timesheets relating to the building to the Commission until June, and even during the hearing, he continued to produce documents. The families are also concerned that Dr Reay or someone in his firm disposed of a computer disk containing documents about the building and the only proof

that we have that all of the documents which were on the disk have now been provided is the word of Dr Reay. In my submission rather than criticising the Hyland/Smith report in February 2012 he could have announced publicly at that time that he did agree there were at least two areas in which the building was non-compliant.

He also asserted that there were five potential causes of collapse which had not been investigated by the Department, but in my submission that was also seemed to designed it seems to divert rather than assist. It was obvious in my submission that none of those potential causes would reflect any responsibility on his part and yet he was unwilling to accept even that when it was put to him by Mr Mills. But it also emerged upon questioning that he hadn't considered or investigated these issues in depth and yet he then went on in evidence to suggest quake table testing, but it then emerged during questioning that that would have cost several million dollars.

1605

In my submission the approach of putting forward these possibilities without substantiation was consistent with an approach throughout the hearing including the instructions to call a witness who accepted that his evidence about holes being drilled was a guess which could be wildly out and in my submission has no probative value. In addition, the first two times he gave evidence, Dr Reay did not examine the drawings in detail or put himself in a position to give substantive evidence about the design of the building or review Professor Mander's evidence notwithstanding his desire to assist. When asked why he had not done the latter, he said he didn't have time but then a short time later he said it was because he had been advised by his lawyer not to read evidence so his knowledge was not tainted by evidence from others and yet he could cite Mr Strachan's evidence about exposure of chemicals affecting his memory.

We now find that this general approach continues until the last in that the closing submissions include another described as probable, collapse scenario. This is not a scenario which has been suggested by any expert and nor was it suggested by Dr Reay until closing submissions. The scenario is based it seems on collapse initiating from the south wall. It's submitted by his

lawyers that no critical structural weakness has played a part in that scenario. That the columns that failed in that vicinity were demonstrably compliant although it was not demonstrated when that submission was made and it was also submitted that the whole collapse may not have occurred without that initial trigger of the south wall connection disconnecting, and I would just like to make some brief submissions about that.

The first point is that the submission that the collapse may not have occurred without the initial trigger of the south wall connection disconnecting is not as far as I am aware, based upon any evidence or if so none was cited. Nor was it based upon any indication of any non-linear time history analysis nor any evidence of any expert.

Secondly, the schedule attached to the submissions included various diagrams. The schedule in my submission plainly included expert or a mix of expert opinion evidence and submission and the best illustration of the expert opinion evidence is the diagrams which appear, but it was all couched as submissions. There was no objection on our part and I am not objecting to what was put but I am going to invite the Commission to deal with it in a particular way. If those were submissions they should be, in my submission, be treated as such, submissions made by lawyers on behalf of their client for the purpose, the justifiable purpose which I don't criticise of putting their client in the best possible light but as a means to consider an issue of great complexity in my submission they should have little weight. If the submissions were expert evidence at least to some extent where no witness was called, if a witness had been called they would have been required to comply with the code of conduct with all of its obligations and to be questioned as Commissioner Fenwick observed, by counsel and by the Commissioners. Dr Reay has chosen to put the scenarios to the Commission in this way, that is his choice. In my submission it should be given little weight and less weight than those possibilities put forward by experts complying with the code under oath subject to questioning from counsel and the Commission.

But if Dr Reay's focus is on the south wall, in my submission there is nothing to be proud of there. As Mr Mills has pointed out this was the wall which was weaker than the north core, part of the problem of asymmetry, coupling

beams stronger than they should have been and the connections part of the overall problem of inadequate load paths throughout the building.

I also refer the Commission to an exchange between Commissioner Fenwick and Dr Reay. This is referred to in paragraph 352 of Mr Mills' submissions but I am going to just bring it up briefly. It is at TRANS.20120815.44. It related to use of capacity design to determine connection strength between the floor slabs and the walls and the south wall was specifically mentioned in that context. I will just give the Commissioners a chance to read that section.

In fairness to Dr Reay it does highlight some vagueness about the code as Commissioner Fenwick pointed out, but it also highlights the fact that capacity design was not used to determine the connections to the diaphragm. Dr Reay relied upon the parts and portions section of the code and made that point. Commissioner Fenwick put to him well that that didn't make much sense did it. And Dr Reay said, "Well in hindsight no."

Mr Rennie's submissions referred to judicial recognition of Dr Reay that he was recognised as one of New Zealand's foremost structural engineers and lead consultants. An engineer of exceptional ability whose work has been acclaimed. So where was that man when this building was designed? Those who were in the building when it faced its greatest test, badly needed the design to have been done by that type of engineer. So the approach I have outlined in Dr Reay's position has been a concern to families and with regret I also submit that they are entitled to be cynical about what purported to be an apology.

Mr Rennie concluded the submissions on behalf of Dr Reay by saying he gives a pledge to continue to work to ensure that such an event will not occur again. With those words hanging in the air and the nature of the pledge and the work undefined Dr Reay left the Commission and is gone.

At paragraph 83 I say, it is not clear whether those who were involved with this building remained conscious of it at all times, but the design and construction of a building carries life and death implications and therefore anyone who is in position to make the occupation of a building safer, or to restrict occupation if it is not safe, is in a position to ensure that people are not

at risk. Conversely, anyone who does not do something which they could plays a part in exposing people to the risk of injury and death.

Of course families and survivors want to know that lessons are learned. Many recommendations have already been made by the Commission.

I have set out in paragraphs 85 through to 98, some further suggestions, some of which come from families and supplemented by me. I won't read them out, but Commissioners they are there to consider. They touch upon comments about the codes and peer review, education of engineers, the design approach used and post-earthquake assessment and about information about buildings being made available to the public. They are matters which the Commission has also considered in some cases in relation to other buildings. For example, next week there is a hearing in relation to the education of engineers.

So I leave it to the Commission to consider those matters but I will just read out paragraph 99, which relates to I've called it a design philosophy. And I say this on behalf of those who died and their families. I say this really to engineers making decisions daily about buildings.

Those involved in designing, permitting and building buildings should keep the people who use the building in the forefront of their mind. Buildings are for people and the safety of those people should override every other consideration.

I'd like to conclude, if the Commission pleases, by talking briefly about the people who were in the building, all of whose names I read out on the first day of hearings, and also about their families who have such an interest in the Commission's work, and I'm at paragraph 100.

The hours following the collapse of this building must have been the most painful in the lives of the families of those trapped inside. As darkness fell that day, smoke rose from the building.

1615

Many of those people sat in Latimer Square waiting, hoping, looking across at what was by then a ruined pile of concrete and twisted steel but of course most families were thousands of miles away. They had to rely upon media reports and information provided by embassies about what had happened to

their sons and daughters, their mothers and fathers, brothers and sisters and friends.

By the time the fire was out, the rubble had been hauled away, 115 people had been named as dead. Thirty-nine were born in New Zealand or were New Zealand citizens born in other countries. The other 76 had come from all over the world – 11 from the Phillipines, 23 from China, 28 from Japan, six from Thailand and the others from Taiwan, Canada, France, South Korea, Malaysia and Iraq. So most were visitors to New Zealand.

JUSTICE COOPER:

Q. Mr Elliott, there was somebody from Turkey wasn't there?

A. Yes Your Honour, I'm sorry. That's right. Thank you.

MR ELLIOTT CONTINUES:

Many of those who escaped the collapse will live with their injuries all their lives. For example, Kento Okuda and Rika Iwakura. They were Japanese students at King's Education who both had a leg amputated. Kendyll Mitchell and her children, as the Commission heard, were lucky to get out. Her son Jett was three and her daughter Dita only 10 months old.

Those who died were aged between 18 and 66. They included doctors and their patients, nurses, television production staff and reporters, English language teachers, administrators, sales consultants, a paediatrician, midwives, an osteopath, a clinical psychologist, receptionists, practice managers, an accounts manager, a managing director, a director of studies, an IT systems operator, a marketing manager, finance administrator and many, many students, some of whom were also nurses.

It is an especially striking feature of this building that all of its tenants were engaged in doing work for others – a medical centre, counselling agency, community broadcaster, a language school.

Some who were in the building that day, for example, Matthew Beaumont, were doing work they loved when they died. He was a programme scheduler for CTV and had hosted programmes such as Matty B's Kids' Clubhouse.

Issac Thompson was a sound operator, an IT technician with CTV. He was fascinated by technology and machinery from the time he was a child. He once wrote, “Lord if I get nothing else done today I want to spend time loving you and loving others because that is what life is all about.”

Other who died in the building were working towards fulfilling that dream – Lee Hsin Hung from Taiwan wanted to work as a nurse in New Zealand and join the Red Cross and was studying English at King’s Education.

Some had come from other countries to New Zealand to give their families a better life, such as Dr Husam Sabar Al-Ani who had come from Iraq. He provided health care for youth.

Nurses had come from overseas to study English. For example, Mary Amantillo who was Filipino. She initially survived the collapse and sent a text message to her mother, “Ma, I got buried.....” and then later, “Ma I can’t move my right hand.” She and her friend Valquin Bensurto both died.

Lai Chang who was studying English rang her father in China after the earthquake and told him she wouldn’t make it.

Dr Tamara Cvetanova spoke to her husband Alec as late at 1.00 am the next morning and his search for answers will continue at an inquest next month.

Some were only in the building for a short time such as Pam Brian who was there for a work related appointment with psychologist Susan Selway. Heather Meadows was seeing Dr Maysoon Abbas for an appointment. Xin Sisi who was from China was in the building because she accompanied her Turkish friend, Didem Yaman to a medical appointment.

Some, like Susan Chuter had been working in the building for only a short time. Kyle Jack-Midgley had just taken up a new position with Ashley and

Martin Medical Hair Centres three weeks before the February earthquake and his favourite quote was, “Dream as if you’ll live forever. Live as if you’ll die today”, by James Dean.

Others had been working in the building for years such as Shawn Lucas, a production manager with CTV, and Joanna Didham, a programme co-ordinator for “Let’s Go Shopping” who had worked with the company for years.

Some, like Marina Arai from Toyama College of Foreign Languages, arrived in Christchurch only days before the earthquake. She lived with her father, mother and older sister in Toyama in Japan.

Twelve students from the Toyama College of Foreign Languages died. The family of one, Sakuda Saya, told The Press she was very kind to other people and had a strong sense of justice.

Ezra Medalle, who was 24, died alongside her boyfriend Jessie Redoble. Both were nurses and it was their first day of English class at King’s Education. Jessie made phone calls after the building collapsed in which he told friends that they were fine but their limbs were growing cold.

Gillian Sayers was working in the building as an English teacher. Her favourite quote by Albert Einstein was, “Only a life lived for others is worth living.”

Elsa Torres De Frood was working as a director of studies at King’s Education. She had written on Facebook, “Love my job!!! I meet interesting people all the time and the people I work with are great!! Who could ask for anything more??” Her remains were never found but her wedding ring was discovered in the ruins.

Yu Gilhwan and his sister Yu Naon, both from Korea, were killed. They had both spent time working as volunteers supporting teenagers from broken families.

Paul Wu was a finance administrator at CTV and will be remembered as their hacky-sack king. In the last year of his life he spent hours tending his rose, herb and vegetable garden.

Xu Linlin, from China, who lost her mother when she was 19, swore she would become a doctor and was studying English at King's Education.

One of the youngest who died, Ishikuro Tomoki from the Toyama College of Foreign Languages, loved playing the electric guitar and carried his guitar pick wherever he went.

Hyuga Rika, an only child from Japan, wrote a poem about being a nurse. The final three lines were, "The world is like a jigsaw puzzle made of a thousand pieces. Smiles and trust are two small pieces next to each other. If these two do not stand by one another, then the whole world will shatter."

Zhong Yantao was a midwife from China. She was studying English. Her husband has described her as "an angel in white". Her daughter Lily was 5 when her mother died.

Since the 22nd of February 2011 at least 50 children have had birthdays, woken up on Christmas morning or gone to school for their first day, without their mother or father. At least one child now has no mother or father at all.

There is a table in the foyer at the Royal Commission with messages, words from children at St Theresa's School which include, "May the people who died in the earthquake rest in peace. You're in our hearts and our prayers. Even though you've lost someone very important in your life, remember that everyone loves you." On the table where this book sits is a set of drum sticks

and they were owned by Tetaki 'Wally' Tairakena. He worked as an English Language teacher at King's Education. His favourite quote was, "He aha te mea nui o tea o? He tangata! He tangata! He tangata! What is the most important thing in the world? It is the people, the people, the people.

JUSTICE COOPER:

Now I understand that Marwa Alkaisi would like to speak to us. Now you can come forward and just find one of these microphones Miss Alkaisi.

1625

MS ALKAISI:

My name is Marwa Alkaisi and I'm speaking on behalf of myself and my family. On 22nd February 2011 I lost my beautiful mother, Maysoon Abbas. She was a doctor working at the clinic on level 4 of the CTV building. That day our lives turned upside down.

After the quake I spent four hours walking through the broken and chaotic city centre looking for my mother. I was so sure I would find her. Friends and family told me they were sure she was helping out at the triage at Latimer Square and had simply not had time to make contact, as that is the type of person she is.

Heartbreakingly we waited for eight painful days before we heard any word of what had happened to our precious mother. Mum is the pillar of our family. When we heard the bad news our world felt like it collapsed, much like the catastrophic collapse of the CTV building.

Those days we waited for word of what happened to Mum were horrific as information was drip fed to us from the authorities. That time was so traumatic for me, I try to block it out completely. It was as though we were living in a nightmare. How could his have happened to us? Why did this happen? I remember thinking there must have been a mistake, Mum will just walk through the door any time now. How could it be a building collapses completely here in New Zealand? I had only ever heard of these sort of things happening overseas in less developed countries.

As time went on and I watched my family being ripped apart from the inside. The once cheerful father that I have grown up to know disappeared and was replaced with a man who worried all the time and was forever thinking what he can do next to find out what happened to the CTV building. I watched my sisters cry and hurt every day. I watched myself change and become more and more angry with everything around me.

I think about Mum every day. When I am in the kitchen I almost feel inappropriate to try and make the dishes she used to make for us. She was such a great cook. When I have a bad day I crave a hug, just a hug from her to make things just a little better.

I dream about her often. I had a dream recently where I saw her and held her hand and begged her to stay and not leave me alone. It hurts so much to know that I will never see her beautiful face again. To know she will never be here for any of the family milestones, to be there for my sister's 21st and graduation. Not for the birth of anymore of her grandchildren, and most importantly never to be with the people that love her and appreciate her the most, her family.

On 22nd February 2011 a building pancaked and then burned, columns, beams, floor slabs, steel and concrete fell. Lifeless things taking away so many lives. The building collapsed taking away and injuring so many of our loved ones. For me that building took away my mother and my best friend.

To the Commissioners and the Royal Commission lawyers I thank you all. I thank you for all your efforts that you have made so far towards answering some of the questions myself and my family have. All myself and my family want to know is what happened to that building that day? Why was it the only building in Christchurch to completely pancake and take away our mother from us? Yes there was a big earthquake but all of Christchurch experienced this, not just the CTV building. There were many other buildings older and more vulnerable, yet they did not fail completely as the CTV building did. Listening to all the evidence at the Commission has been sometimes hard and takes an emotional toll on us, but I have found it important to listen to it all to understand the full picture. It was hurting to realise that we lost our mum

possibly because an inexperienced engineer was allowed to carry out work unsupervised, risking the lives of hundreds.

What is most important to us is we learn good lessons from this building. Things such as inexperienced engineers should have their work reviewed. That after each sizeable earthquake such as the Boxing Day earthquake, a thorough inspection by qualified engineers is initiated. That once information is found out about a danger in a building, the affected parties are informed and this information is recorded and become available to all.

To name but a few of the lessons that we must learn, our beautiful Christchurch City must lead by example from now on. The world is watching us now. For me and my family, knowing what happened will help us to get justice for our mother, and help us ease the pain we feel inside every day.

JUSTICE COOPER:

Thank you Ms Alkaisi. You have been very brave speaking to us today and I think you very much for the dignity with which you have done that.

We have reached the end of our hearing into the collapse of the CTV building. We have much to consider and our conclusions on what we have heard will be set out in our final report which will be issued before the end of the year.

I thank counsel for their assistance and I acknowledge all those family members of those who died who have, many of you, attended this hearing in what must have been a very painful ordeal.

HEARING ADJOURNS: 4.32 PM