COMMISSION RESUMES ON TUESDAY 31 JANUARY 2012 AT 9.32 AM

DURHAM STREET METHODIST CHURCH, 309 DURHAM STREET NORTH

Also appearing: **H Smith and K Benson for Structex Metro and Arrow International**

JUSTICE COOPER:

Today the Royal Commission enquires into the circumstances of the collapse of the Durham Street Methodist Church which used to stand at 309 Durham Street North. The church was extensively damaged in the 4 September earthquake and suffered a further damage on Boxing Day 2010. It was evidently decided to remove the church organ and to that end people were working in the church when the 22 February earthquake struck. Three of the men lost their lives. They were Scott Lucy, Paul Dunlop and Neil Stocker and the Royal Commission expresses our deepest sympathy to their families, many of whom are here today.

MR ZARIFEH:

Commission pleases, the Durham Street Methodist Church as Your Honour has indicated was situated at 309 Durham Street North. It was an unreinforced masonry building constructed of stone in a Gothic Style as can be seen in the photo that is in front of us now. It's a photo of the church from Durham Street. The building was divided into three parts on the site: the church that can be seen in that photograph, an annex which was behind the church as it's shown in that photograph, so the western end of the church and a hall which was next to the south side of the annex and the south-west corner of the church. All three parts were classified as category one by the Historic Places Trust. The church building was constructed in 1864, the annex constructed as an addition in 1869 and the hall was a further addition in 1873.

In the church building ornate tied timber trusses spanned buttress columns supporting the roof structure. There was a gallery at first floor level or

mezzanine level encircling the central ground seating, that floor being supported by the external walls and internal columns. Both the annex and the hall also had timber trusses supporting their roofs. On the south side of the church and so in front of the hall was a more modern building known as Aldersgate and part of that building can be seen in that photograph, which housed the Methodist City Mission and church administration.

JUSTICE COOPER:

Which one is that?

MR ZARIFEH:

To the left of the church in the photos.

JUSTICE COOPER:

So it's also on Durham Street North?

MR ZARIFEH:

Yes sir, yes sir, if one looked at the site containing all the buildings and divided it into quadrants if you like, the church which is in the front right, the annex behind it, and the hall to the left of that and Aldersgate in front of it.

JUSTICE COOPER:

And so this is the eastern elevation is it?

MR ZAFIFEH:

Yes sir, this is the east.

JUSTICE COOPER:

And that's Chester Street off behind, appears to be behind those trees on the right-hand side of those photos.?

MR ZARIFEH:

Correct Sir. It appears that no structural strengthening had been carried out on the church in the past and a structural report by R D Sullivan, structural engineer in September 2009 noted that the three parts of the building, that's the church, the hall and the annex were earthquake prone and would collapse in a moderate earthquake. Various strengthening options were proposed but none adopted. A fee submission was proposed by Mr Sullivan in May 2010 to provide details for strengthening the design. It appears that this was still being considered at the time of the September 2010 earthquake.

In September 2010, on the 4th of September I should say, the building suffered significant damage which would have required extensive reconstruction of the church, the hall and to a lesser extent the annex. The building as a whole was red stickered on the 5th of September and a cordon erected around the building as can be seen from that photograph. The Methodist Church then obtained reports firstly from Mr Sullivan and then from Structex, structural engineers, on the structural damage and whether or not the building could be repaired. It was decided to remove the pipe organ from the main church building. It was inspected by the South Island Organ Company on the 22nd of September 2010 and found to have sustained little damage in the earthquake. Structex was engaged to ascertain whether it was safe to remove the organ and further advice was sought and received from Structex following the Boxing Day aftershock. Details were provided of a safe access way via the Aldersgate building adjoining the church and some propping and fixing of a steel bracket to the west wall was proposed and carried out.

It was apparent that the damage following the September earthquake was considerably worse after the Boxing Day aftershock and that Structex by early 2011 was of the view that it was becoming less likely that the building would be able to be repaired and retained. Arrow International represented by Tim Fahy had been engaged by the Methodist Church to arrange for the structural assessments and the removal of the organ. Mr Fahy liaised with the Christchurch City Council Heritage and Planning sections in relation to the proposed removal of the organ. The South Island Organ Company was

engaged to enter the church and remove the organ and those arrangements took place in the months and days prior to the 22nd of February 2011.

On the 22nd of February the process of erecting scaffolding inside the church around the organ to assist in its dismantling, the dismantling of it, and removal of the various parts of this large pipe organ, was in progress but not yet complete, and on the 22nd of February a group of eight workmen who were part of the South Island Organ Company were at the church building, assisting in the removal of the organ. When the earthquake struck the church suffered a catastrophic collapse. Scott Lucy, Paul Dunlop and Neil Stocker were with three of their work colleagues inside the church working on the organ removal. Two of their work colleagues were outside the building. After the earthquake hit and the church collapsed Messrs Lucy, Dunlop and Stocker were trapped under the rubble. Their three work colleagues managed to get out of the building. Mr Lucy was last seen running down the stairs inside the church during the earthquake, Mr Dunlop was last seen approximately four metres from the altar inside the church, and Mr Stocker was last seen standing on scaffolding inside the church. The bodies of the three men were located subsequently by USAR.

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The likely issues that the Commission will have to consider: firstly the application of the Council's earthquake prone policy to the building; secondly, and perhaps more importantly in this case, the assessment of the structural condition of the building, in particular such as to allow the safe access and removal of the organ; and the measures put in place to provide that safe removal of the organ. That focus in relation to that issue will be on the assessment and the risk assessments by Mr Gary Haverland from Structex, the engineer who was engaged in that process, to a lesser extent by others who dealt with it, Mr Fahey I've mentioned, and also the Council involvement which I've mentioned which appears to have been mainly from the Heritage and Planning sections and the role that the Council played.

In relation to witnesses, there are seven witnesses to be called, six witnesses to be called I should say. Mr Sullivan's material is written material only and it's before the Commission. The first witness to be called is Gregory Wright

from the Methodist Church, so representing the owner of the building. Secondly, Mr Fahy who I mentioned from Arrow International, a property manager, who directed the removal of the organ and obtained, instructed Mr Haverland in relation to the various reports. Thirdly, Mr John Hargraves the manager of the South Island Organ company will give brief evidence of his involvement and the processes. Fourthly, Mr Gary Haverland who I mentioned from Structex, the structural engineer involved. Then Mr McCarthy from the Council will speak of the Council's role and, lastly, Peter Smith from Spencer Holmes Limited, the structural engineer who has carried out an independent report on the failure.

JUSTICE COOPER:

Yes, thank you.

MR ZARIFEH:

So I'll move to call the first witness Your Honour, Mr Wright.

MR ZARIFEH CALLS:

GREGORY DAVID WRIGHT (SWORN)

Q. Mr Wright, your full name is Gregory David Wright?

A. Correct.

Q. And you are the Executive Officer of the Methodist Connectional Property Committee?

A. Correct.

Q. And I think you have prepared a statement of evidence that you've signed?

A. Correct.

Q. Of 26 January?

A. Correct.

Q. Have you got that in front of you?

A. I have.

Q. Can I ask you to read that please to the Commission and perhaps you can start at the, at the second paragraph numbered 1, "This Committee is responsible."

WITNESS READS STATEMENT

A. "This Committee is responsible for the administration of the Methodist Church of New Zealand approval process for the purchase, sale, leasing and licensing of church property and for the insurance cover of all such property. All property owned by the Methodist Church of New Zealand, the Church, is held on behalf of the conference of the Methodist Church of New Zealand, the church's governing body. This is so even where titles are in the name of the church trust or, more commonly, the Board of Administration.

The property at 309 Durham Street, Christchurch, known as the Durham Street Methodist Church is held in the name of the Christchurch Methodist Central Mission incorporated under the Charitable Trusts Act 1957. The Durham Street Methodist Church was built in 1864 and had only minor changes to the structure during the following 146 years up until 2010.

The church was classified as group 1 by the Historic Places Trust and was also listed as a building of significance by the Christchurch City Council in the district scheme. Given the age of the building and the method of construction the church was aware that the building would require strengthening to meet the Christchurch City Council's Earthquake Prone, Dangerous and Insanitary Buildings Policy. The church made a submission to the City Council when the Council sought comment on its proposed policy in May 2010. A copy of this submission has been supplied to the Royal Commission.

As a result of the 4th of September 2010 earthquake the church building was significantly damaged and was red stickered meaning public access to the building was prohibited and all church uses were transferred to other church property. Temporary propping to support the property was designed by Dick Sullivan, registered engineer, and

reviewed by Structex Metro Limited. Structex are registered engineers who oversaw its installation.

Following the 4th of September 2010 earthquakes the church through my office appointed Arrow International Limited, project managers, to advise and assist the church in determining the damage caused to its buildings and in planning and executing a repair programme in association with its insurers. The assessment and repair team also included representatives of the church, our insurance consultants Marsh and loss adjustors McLarens Young. Arrow introduced Structex to the assessment and repair team and Structex have inspected and reported on several damaged church buildings. Structex inspected the Durham Street church buildings on a number of occasions and assisted in several visits to the property by church members and officials to retrieve objects and to inspect the extent of the damage. Following an inspection by Structex they report to Arrow by two letters dated 1st of February 2011 on planning for a safe path for the removal of the organ. Two safe paths were identified, one through the Aldersgate entrance, also used by Christchurch Mission officers and the other through the north door, the annex. The report also suggested the fitting of ties between the wall behind the organ to the annex roof trusses. Arrow confirmed to me that Structex's recommendations where the second safe path and tie brackets were actioned prior to the organ removal work commencing. I produce as exhibits A, B and C respectively Structex's two letters to Arrow and Arrow's report and comments to me."

Q. Thank you. I've got those.

A. Thank you. "An inspection of the church building was held on the 10th of February 2011 including representatives of the church, Arrow International, McLarens Young, Structex, the Christchurch City Council and Historic Places Trust to resolve how to treat the various fittings and fixtures within the church while decisions were reached on the building's future. A list of those involved in the inspection is attached as exhibit D."

Q. Thank you.

A. "During the inspection of the building representatives of the Council and Historic Places Trust stated that certain internal fittings could not be removed and should be protected by wrapping and bubble sheet with plywood covers but that the organ could and should be temporarily removed. It was agreed that the organ had been damaged by the shaking during the earthquakes and by dust and debris falling into the workings of the organ. It was agreed that the organ could not remain while the building was propped internally. A possible removal and re-instalment plan was determined.

The South Island Organ company had previously provided a quote for the removal, repair, storage and reinstatement of the organ together with a replacement valuation for insurance purposes. On the 20th of January 2011 Arrow sought a work programme from South Island Organ company. Arrow sought approval from the Christchurch City Council for the removal of the organ by email dated the 11th of February 2011 and this was confirmed by the Council on the 15th of February 2011 and I produce as exhibit E a copy of the approval. Work commenced on the 14th of February 2011 and continued through until the 22nd of February 2011. All within the church were greatly saddened by the deaths of Neil Stocker, Paul Dunlop and Scott Lucy.

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The church has publicly expressed its sorrow, and they were remembered again at the Church of New Zealand annual conference in Auckland in November 2011. Following the destruction of the church on the 22nd of February 2011 CERA issued an order for the demolition of the remainder of the structure and this was completed on the 1st of May 2011".

EXAMINATION CONTINUES: MR ZARIFEH

Q. Thank you, I'll just ask you a few questions to clarify some matters please. Firstly I want to deal with the situation before the 4th of September 2010 earthquake. There was a report from Mr Sullivan

I think dated December 2008 on the structure of the building and he recommended timber trusses be tied to the stone walls with steel rods to reduce the risk of roof collapse of the earthquake. Mr Smith, I don't know have you read his report?

A. No.

Q. No, Mr Smith the engineer who the, who's prepared a report for the Commission notes that this work was not done. I think you'd agree with me, you've said the church was in its original condition, there'd been no structural strengthening done?

A. Correct.

Q. So in December 2008 when the Church sought a report, what was the purpose of finding out about the structural strength of it or the state of it?

A. I think the Church was aware that given the type of construction and the age of the property that strengthening would be required. The Church was looking to see how that work could be done and the issue then revolved around how that work could actually be completed in terms of the grade 1 listing of the property because any work that had to be done would need to, to leave the appearance of the fabric of the church –

Q. Right.

A. – virtually untouched. Carrying out such repairs would have been extremely expensive in terms of meeting the requirements for Historic Places Trust and the Church was really waiting I think for the City Council to determine what its requirements would be under its review of the Building Act and where the Church made a submission to the City Council in respect of its code.

Q. Right. Do you mean as to what percentage of code buildings such as the church would have to be strengthened to?

A. Ah, partly that but also I think in the way that the Council was going to require work undertaken on listed historic places because it would be possible to undertake the work in a manner which would obtain the strengthening required but which would not necessarily retain the structural appearance or the façade appearance of the church.

Q. Right and that could have an effect on the cost of it?

A. Absolutely.

Q. Right. So you mentioned a submission the Church made and we've got a copy on the Commission records but can you tell us, can you just summarise for us what the effect of that submission was. What was the Church saying?

A. The Church was saying that it understood that it had obligations, as did all building owners, to see that its property met code requirement but that it was highlighting the issues surrounding carrying out such work on listed property to maintain the appearance of the property when there were more economical arrangements that could be put in place which would achieve the strengthening requirements but would be to the detriment of the appearance of the property.

Q. All right and I think it touched on the cost too?

A. It did.

Q. Perhaps that should be met by a wider group than just the owner of such a building?

A. Correct.

Q. Is that fair? And we've also got a copy of a report from Mr Sullivan September 2009, and I mentioned it in opening, where he commented on the condition of the church and concluded that all three parts, that's the church, the annex and the hall would collapse in a moderate earthquake. Do you recall receiving that report?

A. Ah, that report was, was received by the Mission. I have seen a copy, um, unfortunately we, we do not have access to our copies of that information.

Q. But you recall it anyway?

A. Well I've seen the report.

Q. All right. The Church then was aware that the, under the then Christchurch City Council's policy it didn't have to do any strengthening or what was the Church's position?

A. Our understanding was that there was a period of time in which strengthening work that may be necessary would have to be undertaken and my memory is that it was 15 or 20 year period.

Q. Right.

A. And we were, we were aware that the, the Council was reviewing its, its code requirement and I think it would be fair to say that the Church was awaiting advice and instructions from the Council as to what it saw was the appropriate way for that work to be undertaken.

Q. Was any thought given to considering that you knew that you would have to do strengthening to commencing that process or putting in some kind of plan over a period of time where the basic strengthening elements would be done that would be required whatever the level and over time it would get more detailed?

A. My understanding is that given the nature of the construction of the church it would be difficult to do small bits that would make significant change to the structure of the church. I think that it was the, the kind of activity where to get the, the benefit from the work you would need to do a significant portion of the work. The structure of the church as I understand it was such that there was, there was little, little structure within the construction of the church. I'm not making myself very clear, the. The means of construction as individual blocks laid one on top of the other the space filled and then plastered inside, there is, there was no frame within the building itself.

Q. It's unreinforced masonry?

A. Correct, yes.

Q. Right. Okay, so did you, did you receive, did you take advice from an engineer, from Mr Sullivan about what would be entailed to strengthen it?

A. The, the discussions that, that we had with Mr Sullivan as I recall them were that there was no simple process that would achieve significant strengthening that could be carried out in isolation of a major upgrade to the building.

Q. And was there any such upgrade, structural upgrade planned?

A. Again we were waiting for the, for the outcome of the City Council's proposal which would assist us in determining what it was that we, we needed to do and in what form we needed to do it.

Q. Okay. The – after the September earthquake you had initially a report from Mr Sullivan 15 September?

A. Correct.

Q. And he outlined the damage that had been, had occurred following that earthquake?

A. Correct.

Q. He also recommended temporary propping?

A. Correct.

Q. Do you know why that was. What was your understanding of the propping? What was the purpose?

A. My understanding of the propping was to, to retain the, the, um, particularly the towers and the front of the building, the eastern elevation, um, to, to retain the, the buildings, in a, in a vertical condition to try and ensure that if they did collapse then they fell down not out so it was a safety issue for the public and also to, to provide some stability of the building in the event of further shakes.

Q. So your understanding was that the propping was to protect in a sense, essentially to protect the public from a collapse because the building had been red stickered, hadn't it?

A. Correct.

Q. From the outset and as you've said was closed and was not at that point being accessed?

A. Correct.

Q. So just as presumably the cordons were there as we can see in that photo the propping was proposed to prevent walls collapsing outwards and affecting pedestrians or motorists?

A. I believe that's, that's, that's correct but I think also the propping was to provide some, some rigidity to the, to the structure as well.

Q. Were you aware if all that propping that was recommended was carried out?

A. To the best of my knowledge all of the propping that was determined to be needed was completed. We were certainly – our instructions through

our insurers were that whatever was needed to be done on the building was to be carried out.

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Q. Did you deal with Mr Sullivan direct or then Mr Haverland from Structex or not?

A. Ah, it was mostly through Arrow who we appointed as our project managers to undertake the work.

Q. When did you appoint them?

A. Arrow?

Q. Yes.

A. Ah, three or four days after the 4th of September earthquake.

Q. Okay, so early on?

A. Very early on.

Q. And liaising with Mr Haverland or Mr Sullivan in the early period, was that all done through Arrow then?

A. Largely through Arrow.

Q. And if, as we are going to hear not all the propping recommended by Mr Sullivan was installed. Is that something you might not have been told about?

A. As I said in my evidence the design was reviewed by Structex and they would have determined the nature of the propping that they saw as being required.

Q. All right so why was it that Mr Sullivan's involvement ceased?

A. Mr Sullivan had a very large amount of work on. He was a small practice and it was agreed that he would do some work on other buildings for us and instructed to do work on this one. It was a division of labour to try and get as much work through in as short as possible a time.

Q. All right and I think that happened quite early on?

A. It did.

Q. So Mr Sullivan's report 15 September I think he drew some additional sketches of propping and then Structex were they brought in?

A. They took over from that time.

Q. Right and you dealt solely with or relied solely on Structex from that point?

A. Correct.

Q. You said in your brief that Structex oversaw the installation of the propping. Was that something you saw or you were led to believe that by Arrow?

A. That was reported to us by Arrow. That was what the engineer was employed for.

Q. All right, in paragraph 15 you said that it was agreed that the organ could not remain while the building was propped internally. What do you mean by "internally"?

A. There was discussion with the Council that they wanted propping to secure the interior of the property or the roof of the property as I understand it. That would need to land on the ground to give it its full force and my understanding is that there was insufficient floor space with the organ and the altar and everything that was within the property that would allow that to happen. Also we were aware that we would need to get to that west wall to secure or prop part of the property and the advice that we were given was that the organ really needed to come out to give the freedom within the building for the propping to be done.

Q. Let's just look at that. The organ is up on the screen at the moment, correct?

A. Yes.

Q. So it's a fairly large organ isn't it?

A. It's huge.

Q. And how big was it compared to other organs. I don't know much about organs but you said it's huge so it's a large one of its kind?

A. I'm no expert in organs either. My understanding is it was one of the larger church organs. It certainly would be one of the largest church organs that the Methodist Church had.

Q. And the wall that the organ appears to be against or near, is that the west wall?

A. That is the west wall of the church which leads through to the annex behind.

Q. Right and how far from the west wall is it? It's a bit difficult to see in that photo. Is it against it?

A. I think you would say for all practical purposes it abutted it.

Q. So parts of the organ abutted it?

A. Yes.

Q. I think there's pipes behind what we can see isn't there?

A. I believe so.

Q. Right and just tell us a bit more about the decision to remove the organ. Why was it removed? I thought it was the church wanting to get it out because it had been largely undamaged and wanting to retain it?

A. I think there were two reasons. We saw that the organ had experienced some damage in the earthquakes. The ceilings in the church were lath and plaster and there was a significant amount of dust and small bits of plaster that had fallen into the organ. We believe that whatever happened it would need to be properly cleaned and serviced and it seemed sensible that the organ be removed. It would allow better working space in the floor of the church for the work that may be needed to be done to repair the church if that was possible and it would give the opportunity for the organ to be stripped out, taken down to Timaru, serviced, repaired and returned when and if the church was re-commissioned again.

Q. Right so it was the church wanting to do that?

A. Yes.

Q. Rather than the Council saying it had to come out?

A. Well, yes that would be correct.

Q. And you said "when and if the church could be repaired". It appears from Mr Haverland's evidence that and I'm not sure exactly when but in early 2011 it was becoming less likely he says that the church would be able to repaired and retained. What's your understanding of the position in respect of that if it could?

A. I am aware of that advice from Mr Haverland. I think the church was increasingly coming to the belief that the building itself would not be able to be retained. When we inspected the property with the Council and Historic Places Trust in the early part of February the initial comments from the Heritage group were that the building had to be repaired. We still don't know whether in fact in the end that would have been possible.

Q. So who said that to you?

A. There was a group from the Council that were walking through. There were 14 of us, 13 or 14 and that came from either the Council Heritage Planner or from Mr Margetts from the Historic Places Trust. I can't now recall which it was but it was certainly a discussion between the Council and the Historic Places Trust that the church had to be repaired. Now that was very much I believe an informal comment because they had no engineering knowledge greater than the reports we have been able to provide to them.

Q. Right but you said by that stage Mr Haverland had advised you that it was becoming less likely it could be repaired and retained?

A. Correct.

Q. And so the church on that engineering advice was coming to a position where it may well have been impractical to retain it?

A. It was preparing itself for that being the outcome, yes.

Q. One might ask then if that was the position around, at least by 10 February, why not hold off from accessing it? It was obviously a dangerous building to get the organ out and wait till a firm decision had been made. If it had been decided definitely that it couldn't be retained then have it deconstructed and the organ removed in that process?

A. I think the advice from the engineer was that while the building was becoming less likely to be retained his report also said that it was still in his view a safe option for the organ to be removed. In fact his report does say that.

Q. Right, did you give any thought to my proposition though that you could have waited until a firm decision had been made and only then allowed access or had access as part of that?

A. Well access was available in terms of the safe plan proposed by the engineer. There seemed to be no reason on the information provided not to proceed with the removal of the organ. It also I think was our understanding that removing the organ would actually enable a final assessment and a better assessment to be made as to the future of the repair of the church because as you have said, as you have seen, the organ does take up a very significant portion of the volume of that building.

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Q. So, what, an assessment of the wall behind it or what?

A. Of the wall and I think also where we were looking to prop the ceiling then we would have more usable space within the Church to do that. The other thing was that the Council were very keen that in the propping work that we were to do and any work that we were to do that we were not to damage the existing fixtures and fittings that remained within the church. Now there's –

Q. Because of the heritage status?

A. Correct, correct, and there is really little area within the floor plan of the church if the organ is remained where you can actually get down to a bearing surface on the ground with everything else that remains within the church, because the, as you will see from the photograph which is – they're showing at the moment, there is a significant gallery that runs around three-quarters of the church leading to the east end of the church, the entrance and then coming up to the side of the organ.

Q. That's the raised floor area if you like, mezzanine floor type area on the left and right in that photo?

A. Correct.

Q. It's photo 0025.002. So is that why, maybe I misunderstood you, is that why it would have been difficult to have internal propping for the removal of the organ?

A. No, my understanding was there was no requirement to internally prop to remove the organ.

Q. No requirement by who?

A. From the engineer.

Q. From the engineer right, so do you know if any thought was given to that, to internal propping of any kind?

A. I can't answer whether any thought was given by the engineer. The advice we had was that no internal propping is required, that the building was in a reasonable condition for the work to be carried out, that the two safe paths for evacuation had been identified and on the advice of the professionals we agreed to the work to go ahead for the organ to be removed.

Q. So when you say the advice of the professionals, the Church you say was relying on Structex?

A. Correct.

Q. Did the Church make any assessment of any of the risks other than relying on Structex's advice on that?

A. We discussed it with Arrow in our meetings that whatever we did needed to be in accordance with the – with a safe process and which we would obviously comply with the Council's requirements and we were – confirmed in our meetings with Arrow that the obligations for an appropriate and safe process would be followed.

Q. And you talked about that meeting with the Council on or about 10 February. Did you have any other meetings with the Council or were you present for any?

A. I was not present at any other meetings. I'm aware that Arrow was in quite regular contact with the Council, whether they were meetings or whether they were phone calls or emails, I imagine there was a mixture of various types of communication.

Q. Okay. And were you aware of any Council requirements in relation to the safety aspect of the removal of the organ?

A. I was not aware that they had raised any specific issues with regard to safety aspects for the removal of the organ and in fact the email from the Council which I think is dated the 15th of February –

Q. It talks about heritage issues doesn't it?

A. Correct, they say they were happy for the organ to be removed and their main interest thereafter was in the heritage issues of the remainder of the church.

Q. Just finally talk about the size of the organ and we can see it in that photo. And we're going to hear and I think there's some photos of scaffolding that had to be erected internally around the organ as part of the dismantling process. You said that work commenced on 14 February?

A. That's my understanding.

Q. And continued through and it still hadn't been completed at the time of the 22nd February earthquake had it?

A. That's correct.

Q. So it was a process that involved erection of scaffolding, dismantling of the organ and then removal of the various components of the organ, correct?

A. That's correct. There was a container in Chester Street where the material from the organ once it had been dismantled, my understanding it was being boxed or wrapped in some form and then transported into the container.

Q. Right, so we'll hear from Mr Hargraves, but it was obviously a process that was going to take some time, some weeks rather than a day or two?

A. That's my understanding.

CROSS-EXAMINATION: MR ELLIOTT

Q. Mr Wright, can I refer you to document BUIDUR309.0013.78. If the plan could be enlarged please. I'm just going to ask you to explain where things were so that people can orientate themselves in terms of our discussions throughout the day. So am I right in saying that the church is represented by the top section there?

A. That's correct.

Q. With the organ off to the western side.

A. That's correct.

Q. And is it correct that there's a wall between what's called the annex and the main section of the church?

A. That is correct.

Q. And is that section referred to as an auditorium?

A. The main part of the church?

Q. Mmm.

A. You could call it such.

Q. All right, and so the entrance to the church was from the east and was – is that right?

A. That's correct.

Q. And that area was particularly damaged after September?

A. The two towers which are the – on the top and bottom corner of the area you refer to as the auditorium were significantly damaged and the peak of the entry to the church, which is where the word “Church” in that arrow drawn was also quite badly damaged. The propping was across the front of the tower and lot of the loose stones at the top of that apex had been removed. The principal entry was the dotted line which is shown on that plan. There had been scaffolding erected and planks to provide a safe path in through into the side of the church from the side door.

JUSTICE COOPER:

Q. Were the front doors of the Church not regularly used?

A. No, they were not being – they were used previous to the earthquake but since September the main entrance was through the common entrance with Aldersgate.

Q. Right, on the southern side of the church.

A. Correct.

CROSS-EXAMINATION CONTINUES: MR ELLIOTT

Q. So there was a mezzanine level running right around the inside of the church?

A. Three-quarters, it was a u-shaped mezzanine.

Q. Now I'll just show you a photograph BUIDUR309.0024.4. So is one looking towards the western wall?

A. That is correct. That shot would have been taken from the north-eastern tower entrance.

Q. And that appears to have been taken from the mezzanine level. Is that right?

A. That's from the mezzanine level, yes.

Q. And the scaffolding you've referred to is there in front of where the organ is or partially was?

A. Correct.

Q. Is that right? Do you know when that particular photograph was taken?

A. No –

Q. Or would have been taken?

A. No sorry I don't. It would certainly have been after the 10th of February because it wasn't there when we were there with the Council and Historic Places Trust and clearly it was before the 22nd so it would be some time in that period.

Q. I think it's clear from your evidence that it was contemplated that there would be some risk in entering the church to remove the organ. Is that right?

A. Our advice was that the building was considered safe for the work to be done but yes, I presume as with all damaged buildings there must have been some risk.

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Q. You have discussed this to some extent already, but the – one of the questions which would be going through the minds of the families of those who died is, given that there was a risk, why was it really necessary to take that sort of risk to remove the organ? Was it really necessary?

A. Our advice was that the, the level of risk was, um, was not so great that the work should not have been done. We were advised that the work could be safely achieved. We were advised that the, the work to remove the organ was necessary so that remedial work could be

contemplated for the, for the building. Um, we could not have done that work with the organ in-situ and the organ itself would have suffered more damage had we endeavoured to, to carry out more building works around it while it remained in position. Had, I mean clearly had the Church contemplated that carrying out the work would result in the injury or death of anybody then the work would not have been done. There is no question about that at all but the professional advice we had was that the work could be safely achieved.

Q. I think you've said that you relied effectively upon what Arrow and the engineer?

A. Correct.

Q. Was there some discussion between you and them specifically about the nature of the risk?

A. We had discussion, um, directly with Arrow about the need for all of the requirements for the work to be undertaken safely being in place. We were, we were conscious that there would be obligations that needed to be followed for that work to be properly done and we sought and were given assurances that whatever was needed to comply with the requirements for the work to be done safety had been done. So we, we talked I imagine not assessing the risk but we talked about the need for the amelioration of the risk of, so that there was, it was clearly required that the, the activities had to be undertaken in a way that would meet the requirements for a, a safe work place.

Q. Did you leave the specifics of the amelioration of the risk to those advisors?

A. Correct.

Q. I see. Again you had addressed this to some extent but another question in people's minds may be, well if the risk was low enough for people to enter the building or if the risk could be minimised wouldn't the organ have been safe in that building from further damage?

A. Our understanding was that if we were to carry out work in the building then the, the level of dust and debris that would be raised would be to the detriment of the organ. I'm not an organist but I'm, I understand that

they will not work terribly well if, if they are subjected to significant vibration or to dust, moisture.

Q. You're not saying though that the risk of that type of damage to the organ outweighed the risk of injury or harm to people?

A. Well we, we were told that the activity could be completed in a safe manner, that there was, there was, um, there was no inherent, um, issue with people accessing the premises to remove the organ and the advice that we received from the engineer clearly was that it was possible to do that.

CROSS-EXAMINATION: MR LAING – NIL

CROSS-EXAMINATION: MISS SMITH

Q. Just a couple of minor questions. You've referred in evidence to the fact that propping was required for the roof of the church?

A. Correct.

Q. From the inside? I understand though that the only advice that you had received about propping was received from Mr Sullivan and later from Structex. Is that correct?

A. Correct.

Q. In Mr Sullivan's report he has not recommended propping to the roof as such but has recommended propping in relation to the west wall. Is that your understanding?

A. He certainly recommended propping to the west wall, this is following the September earthquake. The question of propping to the roof was a more later development when we were talking about how we would deal with the church following Boxing Day if we were looking to repair the damage, so I believe the, the references to the roof propping came later than Mr Sullivan's report.

Q. So Mr Sullivan wasn't involved with the church at that time?

A. Correct.

Q. And Mr Haverland's evidence was that he did not recommend that there would be propping to the roof, or that certainly wasn't required?

A. I don't believe it was required for the, for the removal of the organ. The propping was for the long term benefit of the fabric of the church and my understanding was that to get that propping properly landed on a secure footing then we would need to, to go through the floor of the church onto the ground and also that would be a much easier proposition with the organ not in the church.

Q. So just to be clear it wasn't temporary propping that was recommended, it was propping intended for much further down the track if the property was to be retained?

A. Correct.

RE-EXAMINATION: MR ZARIFEH

Q. Who was that discussion about the propping of the roof, was that discussion you had with Mr Sullivan, Mr Haverland or Mr Fahy? Who was it?

A. It wasn't with Mr Sullivan. It would have been probably with Arrow, um, and they would've transferred the information on from Structex.

Q. To you?

A. To me.

QUESTIONS FROM COMMISSIONER FENWICK – NIL

QUESTIONS FROM JUSTICE COOPER:

Q. I wonder if we could have the document 13.78 displayed again please.

WITNESS REFERRED TO DOCUMENT 13.78

Q. Right. In your evidence that you've read to us Mr Wright you say that following an inspection by Structex they reported to Arrow by two letters dated 1 February 2011 on planning for a safe path for the removal of the organ and there were two safe paths identified. One was through the Aldersgate entrance also used by the Christchurch Mission offices and the other through the north door, the annex. Now the use of the Aldersgate entrance I think we discussed that briefly already but that's shown on this diagram by means of the dotted line, is that right?

A. That's correct, Sir.

Q. And that would involve actually going into the Aldersgate administration building and then turning into a door in the south wall of the church is that right?

A. Correct, the, the entrance way was an atrium which joined the Aldersgate building to the church building which was constructed after the Aldersgate building was built so it was, um, it was a passageway of three and a half, four metres width, something of that order.

Q. So but you would remain in the Aldersgate building effectively before stepping into the church, is that right. You didn't go outside at any stage?

A. No you didn't.

Q. Now the other route identified was out through the annex, is that right?

A. That's correct, Sir. If you, if you were to stand where the P of platform is looking towards the organ it would be to your right-hand side. There was a doorway in the, in that wall between the annex and the auditorium, I would imagine roughly equi-distant between the north wall and the edge of the, of the organ.

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Q. Right. So just -

A. And then there was another door leading to the exterior about the "E" of annex.

Q. The western end of the annex?

A. Yeah about the, the middle of the northern wall of the annex so I would think about the "E" of the word annex on that plan.

Q. I see, right. Well then what was your understanding of why these were safe paths?

A. My understanding is that they had been designed particularly with regard to protection of things falling from the exterior of the building. There were scaffolding and planks placed to protect the atrium and the door out of the annex had been protected by removing of loose stones and I think there may have been some scaffolding on the exterior of the doorway to provide a safe path out.

Q. So one of the roles of the scaffolding that was placed in the Church was to protect people inside the building from falling masonry?

A. My, my –

Q. Or only outside the building?

A. My understanding of the scaffolding inside the Church in front of the organ was to provide vertical access into the organ to enable –

Q. That's the scaffolding that was in the auditorium?

A. Correct, correct.

Q. Yes.

A. The scaffolding on the side of the atrium and as I understand it the scaffolding at the annex entrance were to provide safe exits from the building. They were to protect head room from things falling from the upper reaches of the walls.

Q. As people went outside?

A. Correct.

Q. And the element of safety was designed, it was nothing to do with the organ it was for people.

A. Correct.

Q. Is that right?

A. Correct. Absolutely.

Q. And when the work of removing the organ was commissioned by the Church, did you understand the work would take many days to complete?

A. My memory is that we were expecting it to be something like three weeks.

Q. And so far as you were concerned that was understood by the, by Mr Haverland?

A. I would imagine so. He, he –

Q. Well you made that assumption did you?

A. Well clearly in the discussions with, with Arrow when we were looking at the, or they'd received the work plan from South Island Organ company that had indicated how long they thought the work would take and I would, I can see no reason why that information would not have been

shared with Mr Haverland. There was certainly no conversation that I recall that the, the safe plan was for some period other than the time that would be required to remove the organ.

WITNESS EXCUSED

MISS SMITH CALLS

TIMOTHY MARTIN FAHY (SWORN)

Q. Is your full name Timothy Martin Fahy?

A. It is.

Q. And you're employed as a project manager by Arrow International Limited?

A. Yes, that's correct.

Q. And you've got a certificate, sorry New Zealand Certificate in Architectural Drafting with 33 years' experience in the building industry as a designer and project manager?

A. Yes that's correct.

Q. And you've prepared a statement for the Commission?

A. I have.

Q. Can I get you Mr Fahy to read that from paragraph 2 please.

WITNESS READS STATEMENT FROM PARAGRAPH 2

A. "The Methodist Church property in Durham Street consisted of three adjoined buildings. The church, the annex located at the western end of the church and the hall located in the south-western corner of the site. There was also the Aldersgate building which is a more modern building on the southern side of the church."

EXAMINATION CONTINUES: MISS SMITH

Q. If I can just get you to stop there Mr Fahy. I think it might be useful if we can have reference to a couple of documents. The first is BUI.DUR3090011B.1.

WITNESS REFERRED TO DOCUMENTS

Q. I'll just have that enlarged for a moment. Mr Fahy in front of you there should be a mouse and perhaps if I can just get you to orientate us in terms of the buildings that you're talking about. Just to lead you in some respects to the right where the road is, where the red car is, is Durham Street. Is that correct?

A. Yes that's correct.

Q. And the road at the top of that picture is Chester Street West?

A. Yes, that's correct.

Q. And with reference to the buildings that you've been talking about can you just highlight the particular buildings that we're discussing?

A. Certainly this is the, the church, the church building. The annex is to the west as we've previously seen and the hall is to the south, the south-western side. This is the Aldersgate building and this is the glass atrium that ran through ostensibly connecting the Aldersgate building with the church.

Q. And was that a fully encased area or was there a gap or?

A. The glazing was, was such that it came down adjacent to the buttresses on the side of the church. So there was, there was room, the buttresses were about 800 to a metre wide at the bottom. So there was room for some pungas and ferns and what have you to grow up against the side of the church but the rest of it was a glazed atrium that was connected to the Aldersgate building and also had a link through at this point here into the Church.

Q. And when we're talking about the eastern end of the church with the Durham Street frontage where the propping was, that's really where those two towers indicate isn't it?

A. Yes, that's correct.

Q. Okay. Can I just refer you to another document which just leads on from this. It's BUI.DUR3090013.132 and we will come back to this from time to time during the evidence but this is a building plan which is on the same orientation as the last picture. So the Durham Street runs to the right of that picture, of the plan sorry?

A. Yes Durham Street is, that's correct.

Q. And Chester Street West at the top?

A. Yes.

Q. And again we've got the church located there with the two towers to the right?

A. Yes.

Q. And the annex at the back?

A. Yes.

Q. And then the hall and the only building that is missing is the Aldersgate building which is in the gap?

A. Yes, that's correct.

Q. Just with reference to that plan, whereabouts is the organ located?

A. This is the, this is the approximate bulk and location of the organ.

Q. And that also shows the, what's listed there as a mezzanine but a lot of people have referred to as the gallery?

A. Yes, that's correct.

Q. And the west wall that the organ is adjacent to, is it your understanding that that was historically the exterior wall of the church before the annex was built?

A. Yes there's some evidence that suggests that was the exterior and the annex was built some 10 years later.

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JUSTICE COOPER:

Q. Can I just ask, behind the organ are they stairs coming down on either side from the mezzanine level?

A. Yes Sir. There was two stairs that went up from the ground floor. They landed in the annex. There's the landings. At the top of the landings is actually in the annex. Then you walk through the doorways in that western wall and onto that same gallery level. There was choir stalls that were situated around the sides and the front of the organ that were tapered in a tiered format.

EXAMINATION CONTINUES: MISS SMITH

Q. Perhaps one last point. Can you just indicate on the plan where the Chester Street West doors were?

A. Certainly. This is actually the mezzanine plans so it's the level above but the doors were out of the north side of the annex as I'm indicating with the mouse.

WITNESS REFERRED TO DOCUMENT 134

Q. That's the lower level can you indicate?

A. Yes that's correct and there's the base of the same stairs going up to the annex and they are the northern doors out of the annex onto Chester Street West.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 3

"The church had a Group 1 building status under the Christchurch City Council City Plan which meant it had the highest level of protection. It was also registered as a Category 1 Building by the New Zealand Historic Places Trust.

On 13 September 2010 Arrow was engaged by The Methodist Church in relation to a number of its properties. Initially it was 26 properties but this later increased to 33. When Arrow was engaged my immediate priorities were to have a structural engineer undertake an initial damage assessment and prepare plans for temporary propping. Initially I had instructed RD Sullivan, structural engineer, to provide temporary propping details. The initial instruction to Dick Sullivan came about because the Methodist Church advised that R D Sullivan had for some time been involved with a number of their properties.

In the weeks following the earthquake Dick Sullivan was very busy and could not service all Methodist Church properties. The Methodist Church requested that we get Structex involved. Structex was engaged on behalf of the Methodist Church properties, with Dick Sullivan engaged on the other half. We engaged Structex (Gary Haverland) to complete a report on the damage and the condition of the church which included preparing initial reports and, later, a more detailed strength assessment. Structex was also engaged to review the temporary propping details which were being prepared by Dick Sullivan. Structex were engaged as engineers as at 22 February 2011.

When we were instructed I contacted Dick Sullivan. We met on site and reviewed the damage to the church. I am now aware that he had prepared a report of the damage but he did not mention that to me at that time or subsequently. There was no mention to me of any existing reports whether in relation to earthquake damage or otherwise. The

only information was a floor plan which we obtained from the Methodist Church archives. We also knew that the church had been given a red placard. We spoke about some temporary repair work that Mr Sullivan thought would be required. He thought that we would need propping to the Durham Street frontage and the north-east corner wall, propping for the north wall with ties through to the south wall and a steel frame located either side of the organ to be tied at the top and braced down to the church floor. We also spoke about remove of the organ.

Later that day (22 September 2010) Judith Becker (also a project manager at Arrow) wrote to Mr Sullivan asking whether propping would be required on the west wall of the annex to allow for a new power cable to the Aldersgate Building. She instructed Mr Sullivan to provide propping details for the Durham Street frontage and the Chester Street side wall and confirmation as to whether we should use a crane to remove the parapet end facing the street for public safety. Mr Sullivan was also instructed to prepare a scope of works for removal of the organ and provide temporary propping details to support the west wall as we had discussed that day.

On 23 September 2010 I met with Mr Sullivan on site. We spoke about the removal of the top part of the Durham Street gable and associated parapet and the temporary ties to be installed to restrain and stabilise the tops of both towers. I emailed a sketch of the work required to Mr Sullivan for him to review and sign off so that we could arrange contractors. He approved me arranging this work and indicated that the removal of the gable should be the first priority.

A project meeting was held on site on 28 September 2010. This meeting was attended by Amanda Ohs (Christchurch City Council Heritage), Dave Margetts (Historic Places), Dave Pearson (Heritage Architect consulting to Council), Judith Becker and me from Arrow. The removal of loose stones from the exterior of the Durham Street frontage was discussed. It was agreed that Stoneworks would remove the loose stones and install straps around the towers. We all agreed that due to the emergency nature of the works the temporary propping could take

place without formal approvals being sought and that retrospective resource consents would be sufficient. The instructions and outcomes of meeting were recorded in an email to Amanda Ohs dated 28 September 2010.

Work commenced on removing loose stones from the exterior of the Durham Street towers and parapets on 29 September 2010. No internal access to the church was required to undertake this work. On 1 October 2010 Dick Sullivan emailed through drawings for the propping to the Durham Street frontage and the north-east corner wall. He noted that the propping design for the west wall of the atrium *[sic]* would follow later once complete.

EXAMINATION CONTINUES: MISS SMITH

Q. Sorry, Mr Fahy I think you said there that it was the west wall of the "atrium". Did you mean the west wall of the "annex"?

A. I beg your pardon if I did. I certainly meant "annex".

WITNESS CONTINUES READING STATEMENT AT PARAGRAPH 13

At this stage Structex was engaged to complete a structural assessment report and also a peer review of the temporary propping proposed and designed by Mr Sullivan. On 4 October 2010 I received from Mr Haverland a structural assessment report. The report covered damage to the hall, the annex and the church. In terms of the church, Mr Haverland's view was that the main area of damage was the towers and the Durham Street frontage. (He referred to it as the eastern wall). His view, however, was that side walls (north and south) were still in relatively good condition. In terms of the west wall specific damage was not noted but he thought that, in terms of likely repair work to that area, there would need to be ties from the end wall west gable into the roof structure.

Although Structex was engaged Mr Sullivan had already progressed the design of the temporary propping. On 5 October 2010 I emailed Mr Sullivan with a sketch for temporary bracing for the west wall of the

Annex. On 7 October 2010 Mr Sullivan emailed me with revised sketches for the annex.

On 11 October 2010 I emailed the temporary propping details for the Durham Street frontage and the north-east corner wall of the church and the west wall of the annex to Amanda Ohs at Council. I indicated that tenders for the work closed that day and we were keen to award the contract and get the contractors mobilised as soon as possible.

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I asked her to contact me if she had any queries. Prior to the installation of temporary propping and removal of the nominated stained glass windows, I met on site on 11 October 2010 with representatives of the Methodist Church and McLarens Young to discuss the scope and requirement of the proposed work. I had seen some practical issues with the propping to the west wall that had been proposed by Dick Sullivan. He thought that the organ was providing support to the west wall of the church. I was unsure about that. The only area of connection was by way of four 50 by 50 millimetre wooden battens behind the wooden pipe, one of which had broken. They appeared to be a means of providing some limited stability to the pipes rather than providing support to the wall. In terms of the propping proposed by Mr Sullivan I was not sure how this could be achieved as parts of the organ were in the way. Further the length of the required members would have meant installing the propping via the roof. Mr Sullivan also proposed installing the members to the ground floor, however that could not be achieved because the gallery structure was in the way and there was also insufficient anchorage at the ground floor because it was a timber floor.

EXAMINATION CONTINUES: MISS SMITH

Q. Perhaps at this point Mr Fahy I can refer you to a photograph and maybe you can explain the nature of the propping that was proposed. If I can bring up BUIDUR3090024.4 please. So in this picture at the far end we have the west wall of the Church with the mezzanine or the

gallery structure running around the Church. Can you describe the nature of the temporary propping to that wall that Mr Sullivan had proposed and the concerns that you had with it?

A. Certainly, it's the scaffolding obscures part of the organ and by this stage the – I'm not sure of the technical name but the larger wooden pipes that form like big wings to the side of the organ have been removed and it was these parts and the taller parts of the organ that were going to be in the way. We would have had to remove some of those down to physically get up and put the props on the wall. The organ was massive, not only was it wide, it was also very deep, so whilst it sat against the west wall it had machinery in behind it and then it had several sets of pipes that staggered out in a flaired formation, so the prospect of getting a prop from the top of the wall, it had to go down past the organ so parts of that organ would have had to have been removed to do it and as I mentioned, the nature of the gallery seating or the choir stalls that were in front, plus the presiders' area, plus the altar in front plus the raised area where that was in front of the altar, it was an awfully long way from the west wall to get down to the floor of the church and there simply wasn't space, there wasn't any access to get any large propping members in because you'll remember that the front doors of the church are unusable and that we've got propping going up in that area.

Q. So when you say that it was a very large significant distance or large distance from the west wall to the front of the organ, what are we talking about in terms of distance, metres or ...

A. Yes, I'm – it was in the vicinity of about eight metres.

Q. If I can just get you to continue reading your statement from paragraph 18 please?

WITNESS CONTINUES READING STATEMENT

A. Due to the organ's position in the church it became apparent that it would need to be removed. There were a number of factors in that decision. As it was installed against the west wall we needed to remove it so that we could undertake a full inspection of that area and ensure

EXAMINATION CONTINUES: MISS SMITH

Q. If I can just stop you there at that point. Mr West's evidence was that there was going to be some dust and dirt and that could damage the organ. Sorry Mr Wright, apologies for that. His evidence was that there could be some damage to the organ as a result of dust and dirt from repairs that were to be undertaken. Is that your understanding?

A. Definitely. The earthquake had also shaken parts of it out of alignment and it's a reasonably delicate instrument. The other concern was that any temporary work that we were to do in there we were at risk of contractors damaging it inadvertently by working in and around it and being too close.

Q. I mean when you talk about dust and dirt it sounds like that there wasn't that much going on in the church in the terms of likely remedial works. What were we talking about at that point in terms of the work that would have to be undertaken?

A. Well we were really looking with an eye to the future. You can see from the photograph in there how much dust and dirt is already in there and there's no work has taken place, so that's purely what's come out of the earthquake and the subsequent aftershocks. So there was a lot of plaster. There was lots of small particles and they were the pieces that were going to damage the organ. There was no suggestion that it was going to be stone damage or anything falling on it. It was all of the collection of dust and grit and the pieces of plaster out of the lath and plaster ceiling plus plaster off the rear wall of the – or on the western wall that was likely to fall into the organ.

Q. And as you say, that your understanding at that point was that some work was required to the west wall?

A. Definitely.

Q. Was it possible to access the west wall from behind the organ at all?

A. No, the challenge was that as – there were stairs coming up on the opposite side of the west wall and on this side of the west wall where the organ is sitting, it was you know just a few millimetres off the wall so there was no chance of getting in there to do any work whatsoever. Well you couldn't even access it properly to inspect it let alone to do any repair work on it.

Q. Thank you. If I can get you to continue reading from paragraph 19 please.

WITNESS CONTINUES READING STATEMENT

A. The loss adjustor requested a review of Mr Sullivan's temporary propping designs. He was concerned about the proposed scope, scope proposed. Arrow instructed Structex to review the drawings for the temporary propping designed by R D Sullivan, and determine how to remove the pipe organ and the pews. On 13 October 2010 Kate Askew from the Council emailed me to call her to discuss the proposal for temporary propping. I called Miss Askew daily until she returned my call on the 18th of October 2010. I confirmed our discussions in an email to her dated 18 October 2010, namely that we would need to seek retrospective consent to cover the temporary propping work and the Council would give us about a month's grace to apply for the consents. She replied on 19 October 2010 indicating that I would need to provide the Council with appropriate details of what we were proposing to do so that a Council judgement could be made prior to the works proceeding as to whether the works and the proposed methodology were appropriate. She asked me for plans showing the works. I had already sent this information to the Council by my email to Amanda Ohs but I sent it again. On 21 October 2010 I received a letter from Mr Haverland confirming that the proposed propping systems and details appeared to be of a robust nature to provide temporary medium support to the

Durham Street frontage and north-east tower. He said he did not believe that the main church auditorium had suffered significant structural damage and was unlikely to collapse as a result of significant aftershocks. He advised that the temporary propping in addition to the tower was not considered to be necessary to allow removal of the organ, piano and music library. He recommended however that the building occupancy be minimised to assist in reducing risk to persons carrying out the removal work. By 5 November 2010 the temporary steel propping to the Durham Street frontage and north-east corner had been completed. Mr Haverland inspected the propping and confirmed it was appropriate after requiring some additional bolts in the anchor blocks.

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Q. Can I just stop you there and we'll take a look at the temporary propping that was installed, and if I can refer you to document 0024.1 please.

WITNESS REFERRED TO DOCUMENT 0024.1

Q. So Mr Fahy this shows a picture of the church obviously with the cordon in front which I understand extended around into Chester Street West, is that right?

A. Yes, that's correct.

Q. And who installed that cordon?

A. Um, I imagine it was either Civil Defence or the City Council. It was there by, by the time that we were engaged.

Q. And just in term of the propping that had been installed, you can see there in the front of the church some steel propping with some concrete blocks and I understand there was some steel propping that is obscured by the tree, is that correct?

A. Ah, yes it, it comes out you can see the base of it or the blue, the blue steel work coming down on the props that's facing that's on the east side facing again Durham Street and you can possibly make out some blue lines through the trees and that comes, that comes down on to the Chester Street West side on the northern side.

Q. And there's also has been some removal of stone work and some strapping. Can you just illustrate to us the areas?

A. Yes the gable was the first area of stone work at risk. That was the part that we took down first. At the same time removed the pinnacles from the tops of the towers on both of those towers and some other loose stone work and then the blue ,there's two lines of blue strapping around there which are acting as ties to, to contain the tops of the towers.

Q. And we'll talk about this a little later but to the left of the building you can actually see can you not the scaffolding in the Aldersgate Atrium?

A. Yes. That's the, that's the vertical scaffolding that we erected to protect the, the, the glass atrium of the Aldersgate building from the likelihood of any stone falling off the, off the southern side of Durham Street.

Q. Thank you, can you continue reading from paragraph 24 please.

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. "On 11 November 2011 I emailed John Hargraves of the South Island Organ Company. The South Island Organ Company had earlier been engaged by the Methodist Church to provide a report on the damage to the organ. I advised Mr Hargraves that temporary propping on the Durham Street frontage and the north-east tower had been complete and we had sign off from the structural engineer to allow contractors to work inside the building albeit on a restricted basis".

Q. If I can just stop you there, sorry. In relation to sign off, what did you regard as sign off from the engineer?

A. We had clear approval from the engineer that the building was, was safe to allow us to work in there to remove the organ.

Q. And by that do you mean the reference to Mr Haverland's report of the 21st of October?

A. Um, yes I'm not sure of the exact date of that report.

Q. Mr Fahy can I get you to read, continuing from "we discussed methodology for the organ"?

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. Yes, "We discussed methodology for the organ removal which had been proposed by the South Island Organ Company. We spoke about a

horizontal scaffolding stage which extended from the face of the organ over the step seating area. This was to facilitate the dismantling and the removal of the very long and large pipe work and getting the larger components out. Access to the scaffolding stage would be obtained by the stairs at the western end of the church and ladder access from the nave. Overheard protection was not required. The ceilings were lath and plaster and the identified risk was the stone work on the exterior of the church. The larger and longer components of the organ from the church were to be removed through the doors at the south, south of the church along the narrow space between the church and the Aldersgate building sometimes called the Aldersgate Atrium to Durham Street and then around to a container located on Chester Street West".

Q. Maybe if we just have a quick look at the scaffolding stage. I know it's been referred to before, document 0024.4 please.

WITNESS REFERRED TO DOCUMENT 0024.4

Q. So this is a scaffolding stage or working platform that had been erected and this is what you had discussed with the South Island Organ Company?

A. Yes, that's correct.

Q. And so what you're saying though is that it didn't provide any overhead protection?

A. Ah, not it had two components to it, one is the large flat area so that they could remove these, the vertical pipes and lay them down and then safely lower them down to the floor and it had a vertical component to allow them to get to those pipes and safely dismantle them but we, there was no overhead protection. As I said it wasn't, it wasn't seen as a risk. The only ceiling we had was lath and plaster and that was typically, there was tiny chunks if any that were coming off that or dust.

JUSTICE COOPER:

Q. Were there beams across the church at that western end?

A. Um, there is a, there is a truss right on the western end Your Honour and the trusses are about three metres apart.

Q. They were in sound, they were considered to be in sound condition is that right?

A. They were Sir.

EXAMINATION CONTINUES: MISS SMITH

Q. Can I get you to continue reading from paragraph 25 please.

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. "On 23 November 2010 I advised the Council by email of the intention to remove the organ from the church. I indicated that we did not have a firm programme but that the work would not occur before Christmas. We were awaiting approval from the Methodist Church's insurers. I'm not sure when but we had also sought permission from the Council to remove at-risk stained glass windows on the Durham Street frontage and around the eastern end of both north and south elevations.

On 30 November 2010 Claire Revell emailed me regarding removal of the lead light windows and the organ. She indicated that because of the longer time frame for removal of the organ and because of the temporary work already undertaken and the window removal, a consent application could be lodged to cover all three elements.

We were installed – we were involved in a number of projects for the Methodist Church and other building owners. The priority was to get the temporary work done which was regarded as urgent and this was being undertaken with Council approval. The Council later extended the time for consent to be applied for to 18 February 2011 and then to 1 March 2011. Throughout the project I was engaging with the Council by telephone calls, meetings and correspondence to ensure it was aware of what work was being proposed and undertaken. The work that was undertaken was done so with either written or verbal Council approval. By early December various temporary works had been completed including removal of the Durham Street gable and other loose stone work from the exterior. The temporary steel propping to the Durham Street frontage and north-east corner. A protective scaffolding wall was erected in the narrow space between the Aldersgate Atrium

and the church. It was a scaffold structure clad with reinforcing mesh and covered with planks at strategic locations. It was designed to protect the glass roof of the Aldersgate Atrium from the potential fall hazard in terms of masonry from the parapets and buttresses of the church. Stained glass windows were removed and ply panels installed in the empty window openings. The stained glass windows were packed into protective crates and transported to a Council storage facility in Pages Road on 21 December 2010.

JUSTICE COOPER ADDRESSES MISS SMITH – MISSING NUMBER IN BRIEF WIT.FAH.0001.13

MISS SMITH:

Just bring that document up perhaps it's a drawing, hand drawn of the scaffolding. And this was the scaffolding structure that we had seen in the earlier photograph to the left side of the church Sir.

JUSTICE COOPER:

Yes thank you.

EXAMINATION CONTINUES: MISS SMITH

Q. Paragraph 30 Mr Fahy.

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. "After the Boxing Day earthquake the building was re-inspected by Structex on 19 January 2011 to assess whether there had been any further damage. At this stage Arrow was instructed by the loss adjustor to proceed with the removal of the organ.

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After his inspection Mr Haverland was going to prepare a report but he indicated to me that he thought the removal work could still proceed. On 20 January 2011 I emailed John Hargraves advising that we could proceed with the removal of the organ once Mr Haverland had given clearance for the work to occur in the church. I wanted to wait until I'd received Mr Haveland's report before giving the go ahead. On

21 January 2011 Claire Revell emailed me to check how works were progressing and to see whether any progress had been made towards preparing an application for resource consent for the retrospective works and the removal of the organ. I telephoned and emailed Claire Revell back on 26 January asking for an assessment of processing costs and outlining the scope to be covered in the resource consent application. On 26 January I emailed Mr Haverland saying that I needed to discuss access for scaffolders from Chester Street West rather than through the Aldersgate atrium. I also wanted to know whether the scaffolders' truck could be parked next to the hall whilst they were unloading the scaffolding.

On 1 February 2011 I inspected the site with Mr Haverland to consider a further egress route to the then designated safe paths through the protected Aldersgate atrium. Mr Haverland said that if access was to be provided through the Chester Street doors a protective scaffold would be required over the doors in order to provide protection against loose stonework being dislodged from the top of the wall. He also noted that some loose, large pinnacle stones on adjacent buttresses which he said would have to be removed and they were. He indicated that contractors' trucks could be parked adjacent to the west wall of the hall. He noted that this wall was on an outward lean but roof ties were present which provided some structural stability to the wall. He indicated that parking in this area should be kept to a minimum to reduce the risk. The truck was to be used only to unload scaffold. Mr Haverland also advised that contractors would need to be advised of the risk and evacuate the area immediately if there was a notable aftershock. His conclusions were presented in a report dated 1 February 2011."

EXAMINATION CONTINUES: MISS SMITH

Q. Mr Fahy if I can just stop you there briefly. All of the evidence that you have given is premised on the working platform or the scaffolding structure being constructed inside the church. Did you give any

consideration at all to any other method of protection for those working inside the church?

A. Yes there was, there were several. The gallery area that, that was like a horseshoe that went around three sides of the gallery provided excellent protection for anybody that was working in there. The, the western, the annex on the western side, there was already a first floor and a roof supporting the western wall and the risk was not assessed as, the risk to the folk removing the organ was not assessed as high.

Q. What about, for example, did you give any thought to the possibility of a steel tube or a steel cage that people could work within?

A. We did. There was, there was issues with access in getting it in there. We simply didn't have, we didn't have the access to get that in there. It seemed impracticable.

Q. And when you say “we”, who are you talking about in terms of?

A. Well in Arrow I was having discussions but I was also talking to Gary about, to Gary Haverland about it as well.

Q. Continue at paragraph 36 please.

WITNESS CONTINUES READING BRIEF OF EVIDENCE FROM PARAGRAPH 36

A. In a further report dated 1 February 2011 Structex reported on the general condition of the church following its inspection on 19 January 2011. Mr Haverland noted that cracking to the stonework was significantly worse. He noted that the Durham Street frontage in the north-east tower was well propped with, with the towers also wrapped with straps restraining the tops of the towers. He noted that a bow had been observed in the west gable wall of the Church and recommended additional bracings, additional brackets to be provided to the annex trusses and bolted through the wall. Details of this work was provided. Mr Haverland highlighted that based on his recent observations it was becoming less likely that the building would be able to be repaired and retained. He indicated that he was underway with a detailed assessment and repair for the hall and the church and that would follow, that would forward, sorry, let me start that bit again. He indicated that

he was underway with a detailed assessment and repair for the hall and church and would forward that report by 7 February 2011. On 2 February 2011 I issued a contract variation to supply and install the additional brackets to the annex trusses as per Structex details. I noted that two brackets would be installed before any organ removal started and the final two installed once sufficient amounts, sufficient amount of pipe work removed to allow access. I noted that the works were to be completed by 11 February 2011. As it transpired the contractor was able to access behind the organ pipe work and install all of the additional brackets prior to any organ removal. The scaffolding protection over the Chester Street doors was installed and the loose stones from above the Chester Street entrance were removed.

JUSTICE COOPER:

Can I just ask you to go back to paragraph 38. You say you issued contract variations to supply and install the additional brackets to the annex trusses as per Structex' details and I think you've referred to that at the end of paragraph 36 but what I'm not following is the connection with those, between those annex trusses and the bow that had been observed in the west gable wall of the church which is also referred to at paragraph 36 and before you answer me is there a plan of that or a photograph of that area which would assist my understanding of this?

EXAMINATION CONTINUES: MISS SMITH

Q. I don't think there's a particular photograph. One of that plans – would that assist Mr Fahy?

A. There's, well there's two things. There's a photograph of the brackets that were installed. If you saw the brackets then I could perhaps explain where they were in relationship to both of those items.

MISS SMITH:

I don't think that's actually one of the documents before the Commission. It's a relatively close-up shot of one of the brackets. We can make it available if you wish.

JUSTICE COOPER:

Well let's see how we go. I'm not understanding why work on the, is the west gable wall of the church – where is, where is that?

MISS SMITH:

Mr Fahy perhaps if you refer to document 0013.134.

MR FAHY:

The detail that's just been shown is a sketch of those brackets.

JUSTICE COOPER:

Q. Yes.

A. And Your Honour they're, the wall shown in the middle that is the west gable wall. So the organ is on the left-hand side of that detail. That is the, that is the wall and the annex is on this side of the detail and these timber rafters are part of the trusses that are supporting the roof on the annex which is on the west side of the west wall and the intention of the engineer was to provide a positive connection of those, of those trusses to the west wall.

Q. So this is, this is the, the wall that's depicted in this drawing which has got the suffix 13.66. Is that, is the organ mounted or is the organ, does the organ adjoin that wall?

A. Yes Sir. The organ –

Q. Yes.

A. – is on the left-hand side of that wall.

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Q. Yes and just go back to that – 13.66 please. So these works were designed to shore up that wall?

A. Yes Sir, to ensure that the strength in the annex was being transferred onto that western wall to provide additional strength.

Q. Yes.

A. It was a way of tying the – making sure the structure was tied together.

Q. So does that suggest that it wasn't in fact necessary to remove the organ to properly support that wall?

A. No Sir, it's a completely different scenario. The organ still had to come out to give access to that wall to do the repairs on it. What the engineer was doing with this detail was providing some additional temporary support to ensure the stability of that wall whilst the organ was removed.

Q. So when you say to do the repairs on it, you mean the repairs on the wall?

A. The repairs on the wall.

Q. And was this the wall that was bowing?

A. Yes, it had been – whether the bow was historic or whether it had recently occurred as the result of an aftershock was unknown, but it was noticed that there was a slight bow in it.

Q. So why was it necessary to have access from the other side of the wall to repair that damage?

A. Well the –

Q. By that I mean why was it necessary to remove the organ to repair the damage to the wall?

A. Because this wall is some width and –

Q. About a metre, or 800 millimetres, sorry 800 centimetres.

A. Somewhere in that vicinity Sir and it wasn't going to be possible to repair it purely from one side.

COMMISSIONER FENWICK:

Q. Before there was talk about propping it from the organ side and the difficulty of doing that. Why could it not have been propped from the annex side and tied back to a temporary structure in the annex side to hold the wall up, to strengthen the wall on a temporary basis?

A. Well that's, that was the determination of Structex. Once they looked at the details that had been provided, all the details that had been discussed by Dick Sullivan and they determined that there was no propping required because the structure that was there being provided by the floor plane of the annex and then the roof plane above that, gave adequate strength to it given its relatively small amount of damage.

EXAMINATION CONTINUES: MISS SMITH

Q. Mr Fahy from paragraph 40 please.

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. On 10 February 2011 a meeting was held at the church to discuss the removal of the pipe organ and other chattels from the church. Those attending that meeting were representatives from the Methodist Church, the loss adjustor, Philip Hector; senior building consent officer, Claire Revell; Council planner, Amanda Ohs; Council heritage, Dave Margetts and Christine Whybrew, Historic Places; Gary Haverland; William Fulton, Heritage architect from Fulton Ross Team Architecture; and Judith Becker and me from Arrow. Neville Higgs, council structural engineer was invited to the meeting but did not attend and Philip Hector left after the initial introductions. The Historic Places representatives were adamant that all items were safest remaining in the church and covered with bubble wrap and plywood to protect them, but that the organ could and should be temporarily removed to provide access to the wall immediately behind the organ. That was what was agreed and the Council requested a copy of the organ removal proposal. I sent a copy of the South Island Organ Company organ removal proposal to Claire Revell at Council on 11 February 2011. I had not done this previously as I had only received a commitment from the loss adjustor to remove the organ on the 20th of January 2011. I noted that we had agreed with Miss Revell that we would by 18 February 2011 lodge a resource consent to cover the work which had already been undertaken. The make safe stone

removal, temporary propping and weather proofing and the removal of at risk stained glass windows fixed and loose furniture and fittings and the organ. By email dated 15 February 2011 Claire Revel extended the time to lodge a consent application to 1 March 2011. She also formalised the permission previously granted at the meeting on 10 February 2011 but with some additional conditions. The email was copied to Jenny May, Council Heritage; Amanda Ohs, Council Heritage and Dave Margetts, Historic Places. She stated that she, Amanda Ohs; and Jenny May had removed the organ removal proposal and were generally happy for this to proceed before resource consent was granted, subject to some conditions which would later form part of any resource consent and one point of clarification. The point of clarification relates to how risk to any other structures in the church such as pews or interior fittings from erecting and dismantling the scaffold would be mitigated.

The South Island Organ Company commenced dismantling the organ on 14 February 2011. All temporary propping measures required by Structex were fully installed prior to that date. We had installed propping to the Durham Street frontage and the north-east corner, bracing to the towers and additional brackets from the west wall to the annex trusses, loose stone work had been removed and we had also provided two egress points with scaffolding protection in place. The condition of the church was such that it was not appropriate for public access, however temporary propping work was required with a view to then undertake longer term repair work. In order to undertake temporary propping work and undertake those repairs, contractors were required to access the church. We were focused on minimising the risk as far as possible to those working in the church.

We had provided the South Island Organ Company with all the information that we had about the condition about the condition of the building. Arrow was also a member of Site Safe New Zealand which is dedicated to preventing deaths and injuries in construction. Arrow has fully integrated the site safe system and all associated documentation

into our safety systems. As part of this process we look at the task a contractor is to undertake in the circumstances they are working in, and do a task analysis with them. We look at the risks of doing those tasks and look at what we can do to mitigate the risks and detail the method of control.

EXAMINATION CONTINUES: MISS SMITH

Q. Mr Fahy when you say that you provided the South Island Organ Company with all of the information that you had, did you provide them with the reports that you had received from Structex?

A. No we didn't. We explained the content of that to them over a course of some weeks as you would see the length of discussion it took some, in fact it took three or four months to get to a point and they were kept abreast and appraised of the condition of the building, as we were going through that process.

Q. Thank you. From paragraph 47 please.

WITNESS CONTINUES READING BRIEF OF EVIDENCE

A. All contractors working on the Methodist Church site completed full Site Safe site-specific safety documentation. Every person entering the building was inducted on site, made aware of the safety procedures and the engineers specified safe egress routes to use in the event of an aftershock. The documentation and records of inductions, safety inspections and safety meetings were kept in folders on site in the work place. Therefore all this documentation was lost in the building when it collapsed.

On 17 February 2011 Structex produced a further report. Structex had been engaged to carry out a seismic assessment and report on the church and the annex. The purpose of the report was to summarise the building damage caused by the September earthquake and subsequent events and assess the building to determine if it was earthquake prone. If the building was earthquake prone, strengthening options to 33 and 67 percent of current code were provided. The assessed strength was

based on the undamaged state of the building which meant that the building in its current state would have had strength less than its assessed value. Mr Haverland assessed the church to have a lateral load capacity of 10 percent of current code. When I received this report I spoke with Mr Haverland about his conclusions. We discussed whether it was still appropriate to undertake the removal of the organ and he considered that it was.

COMMISSION ADJOURNS: 11.32 AM

COMMISSION RESUMES: 11.49 AM

CROSS-EXAMINATION: MR ZARIFEH

Q. Mr Fahy I just want to be clear about the reason for the removal of the organ. Mr Wright told us it was likely to be damaged. That was one of the reasons?

A. Yes sir.

Q. To prevent that and that was the dust and vibration from repair work or construction work that might occur?

A. That was certainly part of the reason, yes sir.

Q. And you said that the west wall couldn't be properly accessed to repair without removal of the organ. Presumably that was something Mr Haverland told you?

A. Well we discussed that and whilst you could see the western side of the west wall you certainly couldn't see the eastern side because of the pipe work and then further down the actual machinery of the organ that was at lower level.

Q. Right and you referred to a diagram of the bracing that was put on that west wall on the annex side. I'm not sure if this is the photo. I'll just get it brought up. It's 0013.72. Do you know what that is a photo of?

A. Yes that's the photo but it's 90 degrees out of orientation.

Q. We'll get it turned around.

JUSTICE COOPER:

Q. Should it be rotated left or right?

A. To the right, Sir.

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. So that's the wall between the annex and the church on the left there?

A. Yes that's correct.

Q. And it's from the annex side?

A. That's correct.

Q. And that is one of the trusses that was put in or is that a roof truss, existing roof truss behind the bracket?

A. That is an existing roof truss that was already part that was supporting the annex roof.

Q. Right and so this is the black piece of steel, is that the bracket that you talked about?

A. Yes sir.

Q. And how many of those were installed?

A. Four. There were four sets of roof trusses and four brackets.

Q. Right so it's obviously bolted to the roof truss and then is the one bolt that goes through the wall?

A. Yes sir. If you recall the detail the bolt goes all the way through the wall and there's a large wooden spreader on the back of that with a metal washer and then the nut to provide mechanical connection through to connect the annex roof trusses through that western wall.

Q. Right so did you see that installed yourself or not?

A. Yes sir.

Q. You did, so how much time did you spend in the church?

A. That's hard to quantify. I was there on many occasions, all the various visits and taking contractors in there or various other visits during the course of that between when we started in the middle of September through to the 22nd of February.

Q. Just looking at that photo it seems to be quite a large crack, horizontal crack in the wall just to the left of the bracket. Can you tell us about that?

A. The crack is in the plaster work and until you take that plaster work off you have no means of assessing what's going on with the stonework or the substrate behind that.

Q. So had any plaster been removed in any part of the church to make that kind of assessment?

A. Not at this stage.

Q. You mean at the stage when the organ was being removed?

A. Or at the stage when the brackets were installed, yes.

Q. Well was any plaster removed at any stage prior to 22 February?

A. No. There were big chunks that had already fallen down as a result of the various aftershocks.

Q. Right but just following on from your point before you said you've have to remove the plaster to assess the damage?

A. Yes.

Q. Had any of that taken place before 22 February, any removal for that purpose?

A. No it hadn't.

Q. You were aware I presume of all the propping that was detailed and then installed?

A. Yes sir.

Q. So I'm just trying to understand and I appreciate that there was propping detail by Mr Sullivan and then Mr Haverland reviewed it and came to conclusions about what propping was required?

A. Yes.

Q. So just so that we've got an understanding of what was in fact installed in the end, am I right that not all of the propping detailed by Mr Sullivan was actually installed?

A. That's correct.

Q. So tell us what wasn't installed that he wanted installed?

A. If there is a floor plan it would be easy to demonstrate.

Q. Right we will go back to that one you were using, 132. Does that help?

A. Yes that's fine thank you. So the propping that you've seen in the photograph on the Durham Street frontage was in place largely as Dick Sullivan had designed as was the propping on the northern tower plus on the northern side of the northern tower. Dick Sullivan had also proposed propping down the western wall of both the annex and the hall and that wasn't deemed to be necessary under Structex's review.

Q. Did you understand why not?

A. Yes absolutely. There was very little damage to this western wall and the floor diaphragm of the first floor of the annex plus its roof structure were providing adequate support.

Q. That was Mr Haverland's view anyway?

A. Absolutely.

Q. Right, because that's what you were relying on I presume?

A. Yes we were. We weren't doing the design.

Q. Did you appreciate that the building was likely to be an earthquake prone building or did you not have any understanding of that concept.

A. In general terms I certainly understood what earthquake prone meant. We didn't have any specific calculations to deem it one way or the other and I was loath to jump to conclusions.

Q. Right, but you knew it was an unreinforced masonry building that suffered significant damage in the September earthquake?

A. Yes.

Q. So did you have any discussions with Mr Haverland about the approach to such things as propping and whether to adopt a conservative approach or not?

A. Yes we definitely. We said, "We want to be in here. We want to make this thing safe. If we are going to have people in here then that's our first priority. What do we need to do? What measures do we need to put in place and what's the sensible thing, what's the appropriate level of propping and protection to put in place here?"

Q. You said that you met Mr Sullivan at the site and talked about temporary repair work and propping. Did you discuss with him why he thought there should be propping on those western walls of the Annex and the hall?

A. Yes I did. He was of a much, well he was of a much more conservative nature about the version or his view of what was required.

Q. And did you talk in those discussions about the nature of the building?

A. Yes we did.

Q. Did you pass that on to Mr Haverland when you discussed the same issues with him?

A. Ah, yes. In fact we gave him those details to do the peer review on and with.

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Q. Right. What I'm talking about is this, obviously Mr Sullivan took a more conservative view of propping that should be installed given the nature of the building and the damage that it suffered. Did you pass, in your discussions that you had with Mr Haverland did you bring those kind of issues up?

A. Yes.

Q. And what was the response?

A. Well he considered that, I don't exactly recall his words but he considered that as part of his overall review of the process.

Q. Sorry I interrupted you. You were telling us what was not installed – so the west wall of the hall and the annex?

A. That was as far, yes the west wall down this side was as far as Dick Sullivan got with the, with any of his preliminary design for the propping. Part of the, part of the, the, the circumstance around using Dick was that he was essentially a two-man band so he was way under-resourced for the scope of the work that he had to do and he just simply didn't have the time to complete what he had initially started.

Q. All right but leaving aside whether he'd drawn up sketches or plans, what else was he suggesting in terms of propping that wasn't put in place?

A. He was talking about, as we've previously talked about props off this western wall to go down to the –

Q. So internal props?

A. Internal props down to the floor and he had also talked about ties. This is only verbal discussion, there was never any detail on it, ties that would go from north to south to, to tie the walls together although at the time I said to him, "Well is that going to aid anything because we've already got trusses that are immense and they're already tied. Will it really provide anything?" And there was no real culminating, no real end to that conversation.

Q. Right so I take it you haven't got any background in structural engineering?

A. No Sir.

Q. So why, what basis were you questioning the structural engineer and suggesting that the trusses would be sufficient? Did you have some knowledge of, of those matters or?

A. No none at all apart from a practical, a practical view on it. I was keen to know what he was looking to do that would further enhance what the trusses were already providing.

Q. Was there some cost issue in terms of the number of props because obviously the more that you've got in the more costly. Was that part of the consideration?

A. The, the loss adjuster was keen that we had the, the process peer reviewed. They were also concerned about the cost if all of this propping was to go ahead. There was certainly a cost element raised from their perspective but not from, not from anybody else.

Q. Okay so is it fair to say then that you as the project manager, or Arrow, were under pressure from the loss adjuster to reduce the amount of propping and therefore the cost?

A. No we weren't under pressure. We were asked to review it as we were with all of the properties that we're undertaking. Our expenditure had to be prudent in every case.

Q. Right so the loss adjuster requested the review because of the cost not because of his concerns about safety?

A. He requested the, the review initially because of the time being taken to get the temporary propping in place.

Q. But I just want to be clear. The loss adjuster requested that you get Structex to review the propping Mr Sullivan was suggesting. Correct?

A. Yes he did.

Q. I think you've said that in paragraph 19 –

A. Mmm.

Q. "The loss adjuster requested a review of Mr Sullivan's temporary propping designs. He was concerned about the scope proposed." Right. So the loss adjuster would presumably not have had his own ideas about whether they were required or not for safety. Correct?

A. No he, he's not an engineer either.

Q. He was solely concerned at cost. Is that fair?

A. Cost and time because obviously they're looking to protect the asset and prevent further damage as well.

Q. So –

A. So cost is certainly a, a component of it and it wasn't an atypical situation. We were having other, other buildings were being designed for temporary propping and we were having peer review processes done on those as well.

Q. But it seems from what you've said that the reason in this case you had Mr Sullivan's propping designs and scope reviewed was because of the loss adjuster raising it?

A. Yes.

Q. And if he hadn't raised it then you may well not have sought a review of those?

A. I think it would have, it would have come to a head purely because of the time being taken by Dick Sullivan to provide it and if the loss adjuster didn't raise it then it wouldn't have taken long for us to, for Arrow to raise it.

Q. But why would you not have just, you mean because there was a change of structural engineer because of resources?

A. Yes because of the resourcing.

Q. But if you'd had the work done by Mr Sullivan you could have simply, when you changed structural engineers, have said we'd like you to carry on and oversee the installation of the propping. You wouldn't have had a reason to question it if it hadn't been raised by the loss adjuster.

A. I don't think any engineer would pick up somebody else's design and just install it without first peer reviewing it.

Q. But he was specifically asked to do that because of the issue being raised by the loss adjuster.

A. Yes he was.

Q. Right.

A. But it was definitely a two-pronged approach to that. One was time and one was cost.

Q. And the cost was on, in the loss adjuster's mind, and do you say the time as well or was that –

A. Yes.

Q. – your concern, it was all loss adjuster's concerns?

A. Yes well they, they were aware of the prominence of the building and they wanted other, other properties were getting protection work put in place and there was nothing visible happening here.

Q. I don't understand why you couldn't have just got the work done then if it was a time issue. Couldn't you have got someone onto it and got it propped up as soon as Mr Sullivan said, "this is what should be happening?"

A. Well the details needed to be designed and that was the, that was the problem. They weren't being designed fast enough so we could get them out to tender, get the contract awarded and get them installed.

Q. But it sounds like from what you've said in your brief and what you've said now that the reason for the review was to see if there could be a more limited propping, less cost, less time – as you've said. Is that fair?

A. That wasn't the primary motivation. It was a time thing. The cost, the cost was a secondary consideration and it was certainly sitting there as a consideration as it was on all of our jobs.

Q. And how do you know it was secondary from the loss adjuster's point of view?

A. Well it was secondary from our point of view. I can't answer from the loss adjuster.

Q. What I'm suggesting though is that the impetus for a review came from the loss adjuster who was concerned about the cost and perhaps the time?

A. They were concerned about cost all of the way.

Q. So presumably they wanted it reviewed to see if it could be done with less propping?

A. Well that was certainly one outcome, one possibility.

Q. Well is that what you understood to be behind it?

A. I say that was part of it. I'm, I'm –

Q. But it wasn't a review because there was some dissatisfaction with the integrity of the propping suggested?

A. No.

Q. No?

A. No.

Q. Okay and, all right, so sorry, I got side-tracked. Going back to the propping that wasn't installed. So you, you mentioned the north and south walls being tied together. That's what Mr Sullivan suggested should happen.

A. That had been a part of the conversation, yes.

Q. And so that wasn't done?

A. No, no it wasn't.

Q. Why was that not done?

A. I, I can't speak for, for the structural engineer but I think he found that there was adequate strength in the trusses that were already provided, that it wasn't, it wasn't required as additional.

Q. Right well you said that you mentioned that to Mr Sullivan.

A. Mmm.

Q. So did you then go and discuss it with Mr Haverland at a later date?

A. That was discussed as part of the over-all propping scheme.

Q. Well I'm just trying to understand it because you said that you met Mr Sullivan at the site, I'm not sure you said the date, but I presume early on anyway in September –

A. Mmm.

Q. – and that's when he said that the north and south walls should be tied in and you talked about whether the trusses were sufficient. Presumably you then passed that onto Mr Haverland at a later date or not?

A. I think all of those comments were passed on when we discussed where, where Dick Sullivan had got up to with, in terms of his design.

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Q. Right.

A. And what we needed to consider going forward.

Q. Okay.

A. So in terms of what we discussed yeah there was full disclosure from our part.

Q. I'm not suggesting there wasn't but I'm just trying to understand who made the decision that there should, there didn't need to be ties whether it was yourself or Mr Haverland?

A. Oh, no we made no decisions about the, about the propping.

Q. Right.

A. Um, other than to comment on some of the practical details to try and provide some workability but in terms of the actual design they were clearly the domain of the engineer.

Q. Why did Mr Sullivan think that there should be this tie between the north and south walls?

A. I'm not exactly, I'm not exactly sure.

Q. But it must have been presumably to support, provide support, to ensure that they didn't collapse if your reply was wouldn't the trusses do that?

A. Well I think he was, his – probably his concern which I can't speak for him again was that to make sure that the two walls weren't, weren't separating in a north and south direction that would be the only reason to provide ties.

Q. Right. All right but anyway you passed that on to Mr Haverland and he didn't consider it was necessary?

A. Not in the final analysis no.

Q. All right but is that something he reported to you that that's not necessary?

A. Ah, well we, once he came out with the design of course we talked it through and said, um, you know, "What's the reason for not having these trusses, not having the supports down the western side?" and he explained the rationale, he talked about the ability of the mezzanine floor or the gallery floor to provide that ring, that strengthening because that was a substantial structure in itself and it was providing very good support at a mezzanine level through the mid height of the wall and he didn't consider it was necessary.

Q. So what, perhaps I'll ask Mr Haverland but you said it was providing very good support. How was it doing that?

A. Well Mr Haverland would be better –

OBJECTION: MISS SMITH (12:11:24)

(inaudible) very difficult for Mr Fahy who's not an engineer to address these on Mr Haverland's behalf.

JUSTICE COOPER:

Mr Zarifeh.

MR ZARIFEH:

Well Sir I was only asking because he said it provided very good support so I was interested to know why that was or how he came to that view that was all but I will take it up with Mr Haverland but if Mr Fahy can help us then it may be relevant.

JUSTICE COOPER:

Yes well Miss Smith I accept what you say that Mr Haverland is the one with expertise. On the other hand Mr Fahy was effectively project managing and his views might have been important in terms of what was actually done so I don't wish to stop Mr Zarifeh pursuing this line.

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. If Your Honour pleases. So going back to the mezzanine or gallery. What was your understanding, how did it provide support for those north and south walls?

A. Well my understanding only arose out of conversations with the engineer because we talked about you know many, many aspects of the building and how they would work and operate so my understanding certainly came from him plus you could see the, the nature of the structure. It was a substantial structure and it was connected to both north and south walls. It runs around in a horseshoe and it to a lay

perspective it looks like it provides some substantial support to those stone walls.

Q. Some kind of bracing between them. Is that what you're saying?

A. Yes Sir.

Q. Yes. It sounds as though throughout the weeks and months even between September and February, firstly you're in regular contact with initially with Mr Sullivan and then mostly throughout with Mr Haverland and it wasn't as if you left it completely to him and he just said this is what you should do, sounds like you were raising issues with him and questioning. Is that fair?

A. Yes Sir.

Q. Right. To presumably satisfy yourself that what he was saying was or wasn't necessary you understood at least and if you didn't agree presumably you would have said?

A. Yes I definitely would have.

Q. Right because I think you gave an example of you raising an issue with Mr, it was Mr Sullivan with one of his requirements I think you said that in paragraph 17 that he thought that the organ was provide support to the west wall of the church?

A. Yes.

Q. And you said, "I was unsure about that", and you talked about the connections, so it wasn't as if you couldn't or didn't feel you could question either Mr Sullivan or Mr Haverland?

A. That's true.

Q. All right so is that, from your understanding, is that all the propping details have we dealt with them as to what wasn't installed that Mr Sullivan said should be?

A. Um, to the best of my knowledge.

Q. Right. Just having a quick look, I think you dealt with some of these issues in paragraphs 7 to 9. You talked in 7 about the north/south ties, you dealt with that. In 8 you said that your colleague Judith Becker wrote to Mr Sullivan asking whether the propping would be required on

the west wall of the annex to allow for a new power cable. What happened with that?

A. With the propping or the power cable?

Q. With the propping?

A. Um, -

Q. Or that issue which she raised, what was the answer?

A. Well, um, Mr Sullivan started down the track of designing propping for that, for that west wall and it was about at that time that Structex came on board and reviewed the whole, um, the whole proposal for the propping and it was at that time that the engineer determined that it wasn't required.

Q. Right. And so that instruction to Mr Sullivan end of paragraph 8 where you say, “Mr Sullivan was also instructed to prepare a scope of works for removal of the organ and provide temporary propping details to support the west wall”, he didn't get to the west wall you say?

A. No he didn't get to, he didn't get to provide the scope of work for the removal of the organ either.

Q. No. But there are quite a few drawings that he did for propping weren't there?

A. Not for the west wall.

Q. No but for the rest?

A. Ah, he did, he did some sketches for, for both the west and the east walls yes.

Q. All right and obviously his details for the east wall were carried out?

A. Um, as I say largely the way he had designed them yes.

Q. Were they changed?

A. A little yes.

Q. In what way?

A. Um, we were concerned, um, part of the detail and I don’t know if you’re able to access that to, to show people, there's a sketch that shows the propping details for the wall which may be useful.

Q. Right.

JUSTICE COOPER:

For which wall?

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. For the east wall?

A. For the east wall yes for the Durham Street frontage.

JUSTICE COOPER:

Try 13.23.

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. It will come up anyway.

A. There's a series of sketches there and –

MISS SMITH:

Sir if I could assist the series of sketches are referred to in Mr Haverland's brief and document WIT.HAV.0002.14 to 21.

WITNESS REFERRED TO SKETCHES

MR FAHY:

Um, yes that's are you able to move on to, there's a larger scale sketch of the detail of the connection please. Yeah sorry could you keep going please. That will, that will enable me to talk about it. May I take you –

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CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. Is that the one you wanted to look –

A. Well there's a, there's an additional detail, a supplementary detail which shows an alternative to this metal plate which is a hand sketched timber packer in the middle of the metal plate.

Q. And is that the only difference?

A. Yes.

Q. The concept was the same?

A. The concept was the same. The, the only reason that we had, no sorry that's the wrong end. The only reason that we had discussed that particular detail was that it was installed on the eastern frontage and inside both the north and the south towers which was the, the worst damage in the building and the plate that's, the inside, the backing plate that's on the inside is a 600 x 600 x 12 piece of mild steel which is, which is substantial and it weighs probably in the order of 50 kilos and it would have involved putting up scaffold inside of those areas to allow the installation of that to be done safely and we were concerned with the time that would take to put up, to erect the scaffold and then have two men up to install all of these series of, of metal plates and we negotiated with Mr Haverland so that we could put up big timber blocks, 300 x 100 timber blocks that were 600 millimetres long, able to be handled by one man on a ladder, to be done swiftly and expediently rather than having two guys in there erecting scaffold and then putting up the, the metal packers.

Q. Right so how long did it take to put the wooden one in rather than the metal?

A. A few seconds.

Q. And the metal one would have taken how long?

A. Well the –

Q. Roughly, roughly how long?

A. A couple of days.

Q. So what was the concern, that you didn't want workmen in there for that time period?

A. Yes, yes.

Q. Did you appreciate that the removal of the organ was going to take some weeks?

A. It was, it took nine, nine working days was the programme for it.

Q. Right but it hadn't been completed when the 22nd of February hit had it?

A. No we were three days away from completion.

Q. So how does that fit in, in terms of risk assessment, where you were concerned about someone being in there for two days to install plates?

A. Well this is, this is down the eastern end -

Q. That's the east end.

A. – which is completely well away from the area that we were working in. The area where the organ was being removed was, was deemed to be the safest and strongest part of the whole church.

Q. That was Mr Haverland's view?

A. Yes.

Q. So just so we, we're clear then. What propping was there actually in the church when the organ removal started. There's the propping at the front that you've just talked about.

A. Yes.

Q. The eastern side.

A. Yes.

Q. And the towers and that propping went right through to the, to the wall for those plates to be attached?

A. That's correct.

Q. There was no propping on the north and south walls?

A. No.

Q. None at all?

A. No there wasn't.

Q. No and that was because of Mr Haverland's view and presumably one you shared that it wasn't required and what – wasn't as damaged or not?

A. No there was, there was substantially less damage on both the north and the south walls and it was completely Mr Haverland's view that propping wasn't required there.

Q. But there was cracking wasn't there. Quite substantial cracking on the, I think between the buttresses or were you not aware of that?

A. Yes there was –

Q. Yes.

A. There was some, there was some cracking.

Q. But you relied on him –

A. Yes we –

Q. – didn't you on that? You didn't assess the cracking and the significance?

A. I have no capacity to do that.

Q. So there's none on the north and south walls so the only other wall was the west wall.

A. Yes.

Q. And there was going to be nothing initially, am I correct, but then there was the bowing discovered, I can't remember the exact date but a bit later on but nearer the time of work –

A. Yes.

Q. – and so Mr Haverland said those brackets should go on to the roof trusses that we looked at in the photo?

A. Purely as a precaution.

Q. And we covered, there's no propping on the annex and hall?

A. No sir.

Q. No. All right so the, there were the two routes, the initial route through Aldersgate?

A. Yes.

Q. And then a route through the annex door to Chester Street?

A. Yes.

Q. Which was, were they both used or just the one in the end?

A. They were both used. The, the reason for the two routes was, was several fold. One was that the, the very long pipe work could only be taken out through the Aldersgate entrance because of the width of the corridor. The, the access route out through the annex and through the doors onto Chester Street was, was too, too congested to allow those longer pipes but smaller components could be, could be shifted out that way.

Q. And the scaffolding that you talked about at Aldersgate, at the atrium, that wasn't to protect the workmen, the scaffolding protecting the atrium, the glass atrium, correct?

A. The, it was to protect anybody who was in that glass atrium on the south side of the building.

Q. If rocks came off the church building?

A. Yes that was perceived as the risk, that things from high level could get flung off and go down through whether they be workmen or customers, clients, staff coming to Aldersgate.

Q. So were there people, other people using that Aldersgate route that was marked on the plan we saw?

A. Yes.

Q. So it was a public access way was it?

A. Aldersgate was open for business by that stage.

Q. Right so was the scaffolding erected anyway or was it, I thought it was erected for this organ removal but it wasn't?

A. No it was to protect the, the atrium, to allow safe access into Aldersgate.

Q. For the public?

A. Yes.

Q. As well as these workmen as it transpired?

A. Yes.

Q. So was there anything at the door as you went into the church door on that side to protect from rocks falling or was that scaffolding extended?

A. That scaffolding extended over the doorway.

Q. Okay and on the other side, the other route was there similarly some scaffolding at the doorway to protect from rock, rocks that might have fallen off the church?

A. Yes sir.

Q. And what, presumably it extended out some distance did it?

A. Yes it did, yes.

Q. And you said that, I think you heard Mr Wright. He talked about, talked about internal propping. I just wanted to ask about that. Now you've said that some, there was some discussion about internal propping because Mr Sullivan wanted that on the west wall, the wall that the organ was against, but you said that that wasn't going to be possible because of the size and bulk of the organ?

A. It was just, it was, it wasn't impossible but it was going to be impracticable.

Q. And presumably costly or not?

A. No that didn't enter into the equation at the time.

Q. Well was there any discussion about, again, taking a more conservative view and putting that in if it was thought to be necessary?

A. I, I discussed that fully with, with Mr Haverland at the time and he determined that it was not a requirement for the reasons that we've previously talked about.

Q. And you said that you were applying your own mind to it as well but presumably what he said provided you with enough assurance for you not to say, "Well I think we should go with that," the more conservative Sullivan approach say?

A. Yes we, we had the confidence in the engineer's ability.

Q. Because you could have put diagonal bracing internally on each side of the organ couldn't you?

A. The challenge was actually getting it inside there because of the sheer length involved and the ability to get long lengths in because the front doors were inoperable.

Q. So did you discuss that with Mr Sullivan when he first –

A. Yes.

Q. – detailed it?

A. Yes. He didn't detail it, it was only a conversation.

Q. But recommended it.

A. Yes.

Q. And what was the reply. Was it going to be impossible or just impracticable?

A. No we never really got to the end of that whole conversation.

Q. And you didn't need to go into it too much with Mr Haverland because he thought it wasn't necessary?

A. Well we certainly discussed it but his determination was that it wasn't required.

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Q. Was there any, because it was a heritage building was there any issue and I notice one of the conditions in the Council consent was that there

be no drilling of holes in the internal structure so that's presumably the wooden floors – was that any part of the thinking when you were looking at internal propping?

A. No.

Q. No. And you said to Miss Smith that you looked at some kind of cage or something like that, tell us about that, what was the discussion about?

A. We looked at the prospect of putting a steel pipe in there or a like a steel tunnel to allow access for contractors working inside the building, but one of the issues was that you couldn't take the long components down a steel pipe because of the relatively tight route that you needed to get them out.

Q. Was that something you'd seen done or knew of or was that raised by one of the engineers?

A. I'm not sure where that had – where that arose, it arose in a conversation so we looked at it.

Q. With Mr Haverland or Mr Sullivan?

A. No it wasn't with Mr Sullivan, it was with my own colleagues.

Q. And what about any thought given to – we see scaffolding erected for the purpose of removal of the organ or dismantling of it, what about thought given to any kind of protective scaffolding erected at a higher level to try and provide some protection for workers at the face of the organ?

A. We certainly discussed that and the risk was perceived as the external walls that had this high level decorative stone that had been the stuff that was all falling off and the risk was well away from the organ as I said we had a lath and plaster ceiling with what appeared to be a robust timber truss and roof situation and the risk did not – the risk was not perceived as one from above.

Q. So when you said we discussed that, who's the we?

A. Mr Haverland and myself.

Q. The propping, what was the purpose of that? Was it to prevent the walls collapsing at all, or prevent them collapsing outwards?

A. The intention of the propping was – had a couple of reasons. One of them was to provide some structural integrity to the towers to prevent them collapsing or prevent them, what's the word, worsening or getting worse from the series of aftershocks that we were facing, and we were clear that if we were going to rebuild it then we wanted to make sure the thing was preserved in as good a state as possible. It was a clearly a consideration that if it collapsed it didn't want to go out and endanger people on the footpath but it was providing the structural integrity to that end of the building.

Q. Because I think I'm correct in saying that Mr Sullivan when he was involved that was before the issue of the organ removal came up or not?

A. No he was there at the time when the organ removal was discussed.

Q. Right, but was the propping for that purpose or rather for the purposes of structural integrity of the walls and to protect the public on the outside?

A. Well they were both working hand in hand, you were looking after the structural integrity of the building, therefore it maintained that end but we had already – we had been down the route of discussing if that end was severely damaged, what would it be like at the end with the organ in it and it was determined by the engineer that that was still the safest and strongest place to be.

Q. Mr Wright mentioned propping of the roof. So that was a later development. Do you recall that?

A. No I don't.

Q. So you weren't part of that discussion?

A. No I don't recall that at all.

Q. Was he having discussions with Mr Haverland that you weren't a party too?

A. It's possible.

Q. That you're aware of?

A. Not that I'm aware.

Q. Not that you're aware of. So Mr Haverland clearly said to you that the danger end if you like was the eastern end?

A. That's correct.

Q. And in – you said that you passed on all the information you received to Mr Hargraves?

A. That's right.

Q. Who was controlling his workmen in the operation. So you said that you didn't pass on copies of the reports from Mr Haverland or the letters, but when you got one you would appraise him of what was being said?

A. That's right.

Q. So any new developments you would pass them on?

A. Well we had conversations over the four month period between when the prospect of removing the organ arose and the day they started and so he had been on site, or his men had been on site to inspect the organ initially, so they had an appreciation of what the building was like and then to the best of our ability we kept them appraised of that ongoing situation all the way through.

Q. So obviously the propping was put in, the safe route established and the scaffolding that was there at the entrances, that was all put in in place. What did you actually tell Mr Hargraves in addition to those measures should be taken into account for safety of the workmen? What other factors were in your mind were present to mitigate the risk?

A. Well we have a whole Site Safe handbook that we went through completely before they were inducted and allowed to work on the site.

Q. Okay, but I'm just thinking in relation to this particular job, what – were there any other factors?

A. In terms of the damage to the building?

Q. Mitigating the risk to the workers?

A. No, I think they were addressing all of the risks that were perceived.

Q. Mr Haverland in his statement has said that one of the things that would mitigate the risk was to minimise the number of people in there. Is that a factor that he talked to you about?

A. That's true, yes.

Q. So did you pass that on?

A. Yes.

Q. So what you said to Mr Hargraves should keep the number of workers to a minimum?

A. That's right.

Q. The other factor appears to be that that east end is dangerous and what, should be avoided?

A. Yes, there was no reason for them to be in the towers or ...

Q. And that was passed on?

A. Yes.

Q. Do you remember that photo that was shown this morning of the internal, the interior of the church, I'll get it brought up again, but that appears to me anyway to have been taken from the north-east corner of the church. It's 0024.4 thank you. Would you agree with me that it must have been taken from the north-west corner?

A. North-east corner.

Q. North-east corner sorry.

A. Yes.

Q. And would that be on the mezzanine or gallery floor?

A. That's correct.

Q. And it looks like it's right on the corner from the angle. Is that right, the angle of the chairs?

A. It's close to the corner, yes.

Q. And looking at the scaffolding, when would that have been taken, can you tell us and what's been removed?

A. When would the –

Q. Photo have been taken?

A. The photo had been taken?

Q. Yes, what we see.

A. I would have said it's just after the organ removal started. I couldn't be sure of the date, yes well you can see the boxes that are lying on the scaffold there.

Q. Right.

A. They would have been – initial parts taken off I would anticipate.

Q. So you didn't take it, I take it?

A. No I've taken many of them.

Q. So did you take photos while this removal was going on?

A. Yes.

Q. But you didn't take that one?

A. I didn't take that one.

Q. Did you take any from that end? Guess what I'm wondering is were there people at that end, clearly someone was at that end taking a photo but were the people generally moving around the whole area or were they avoiding that area?

A. No, there was no need to be – there was no need to be down that end.

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Q. And was there any other mitigating factors – keep away from the east end, keep the numbers down. Presumably they had to do the job in the time it was going to take –

A. Yes.

Q. – they couldn't leave bits out to make it quicker. So anything else or would that cover it?

A. Ah, no. We talked about the procedure in the event of an aftershock and because these folk were from Timaru they didn't have the same experience of what it was like to experience the aftershocks and generally what the experience was, what the evacuation procedures were, where the assembly point was and we ran through all those practical details.

Q. Did you consider minimising the number of workmen needed for the job? Did you consider it in terms of risk assessment which I presume you'd done on many occasions in your project management work? Did you consider that was reasonable to mitigate the risk in a situation like this?

A. Yes I recall discussing with John Hargraves the number of people that you could potentially put into the circumstance, the number of areas that can be worked on simultaneously to cut down the time and I'm sure John told me there was an optimum number to have who could work on various areas at any one time.

Q. What I was getting at do you think that was a factor that could be given any real weight when you're dealing with a red stickered building that was clearly dangerous?

A. Well, no, the determination from the engineer was that it was safe for those guys to be in there and we knew the duration of the project.

Q. Right I'm just asking you from your experience in terms of risk assessment. Do you think in hindsight do you think that given that factor any real weight when this was a red stickered building that the Council had obviously deemed dangerous and I think that was supported from subsequent engineering inspections and as well it was included in an aftershock zone wasn't it?

A. Yes clearly. I'm not sure that you can answer that adequately with the benefit of hindsight because the only –

Q. – Well what about at the time when you thought about it, did you consider that –

A. Absolutely.

Q. – the nature of the building, the aftershocks?

A. The environment that we were working in we had the September quake, we had had the Boxing Day quake which was the supposed next big one and all of the shocks and aftershakes were all trending downward and I think the publicly available and publicly held awareness of the situation was that things were all trending downward and we had no knowledge or expectation there would be anything larger than a minor tremor that we would be left to deal with.

Q. But minimising the number of people was something you discussed with Mr Haverland?

A. No, with Mr Hargraves.

Q. All right but did Mr Haverland –

A. Sorry, I probably discussed it with both. I wouldn't rule that out.

Q. Did it come from Mr Haverland or was that your idea?

A. Ah no. I wouldn't know exactly where it came from. It was part of the whole discussion and scenario with Mr Hargraves about how many

people did we need, how long would it take, how long would we be in there, what was the circumstance and the conditions et cetera.

Q. Mr Haverland's report or letter of 1 February, or one of them, he said that it was becoming less likely that the building could be repaired or retained, correct?

A. That's correct.

Q. So my question is if at 1 February that was looking like the situation why not wait until that was confirmed and if it wasn't going to be able to be repaired and retained maybe look at an alternative. You know, if the building was going to be demolished, look at getting the organ out in that process. Did you think about that?

A. Only in very brief terms. At that stage there was no buildings that, well there's two answers to that question. There were no buildings that were being deconstructed at that stage so that was largely technology that was unknown to us. It was only there in very outlined formal concept. The other one was that Historic Places were clearly never going to let the building be demolished and we could see the situation arising where the building would be sitting there in a damaged state for the next conceivable 10 or 20 years. That's only my take on it and that it would sit there unavailable for access.

Q. Why do you say that Historic Places would never had allowed it to be demolished? Do you mean if there was any possibility of repair they would have insisted on it?

A. Absolutely.

Q. Is that from your experience?

A. Yes. At the meeting of the 10th of February they were very emphatic in what they said. They were clear that all of the furniture, fittings and equipment inside of the building needed to be left inside and protected with bubble wrap and plywood and that the building would never be demolished. They were categoric.

Q. So given that attitude then despite Mr Haverland saying it was looking more likely that it wouldn't be able to be repaired or reinstated you

considered that there would be no way that could not happen if at all feasible. The cost wouldn't enter into it?

A. No the cost wasn't a part of that determination.

Q. So just dealing with the Council. You dealt with the Heritage and Planning Section you said, and looking at their letter of approval that's the email approving the removal of the organ, there's no reference to any issues of safety or entering into a red stickered building or a dangerous building and you should be careful of this or that. There were no conditions put on by the Council in that regard, correct?

A. No none at all.

Q. Was there any discussion by anyone from the Council at any stage about safety issues?

A. No.

Q. And so all the discussions were about not damaging the heritage fabric of the building?

A. Yes that's correct.

Q. Why did you invite Mr Higgs who was an engineer with the Council to that meeting?

A. We wanted everybody – the Council were working out of their normal way and shape and so getting access to people at the Council and have a communication with them was fragmented because they were out of their building and all over the place and it was an opportunity to gain as many people as we could to come and have a look at the building to see the status and to get them all around the table in that sense.

Q. Right, why an engineer though. Was there any reason in particular to get an engineer. Were you concerned about the safety issues?

A. No.

Q. Or was that relating to the heritage issues?

A. Well I had a talk with Amanda Ohs at the Council and said we want to get people involved, we want to bring them down, we want to have a site visit, we want to show them what's involved in this big building, who would be appropriate. We knew that she had been there. Dave Margetts from Historic Places Trust had already been there.

These people had an active interest in it and we wanted to gain as many people as we could to bring down there and show them through.

Q. But Mr Higgs wasn't at that meeting anyway?

A. No he didn't arrive.

Q. You said that Mr Haverland gave you a report of 17 February. That was the latest report and he did one I think on both the Church and the hall, separate ones, correct?

A. That's correct.

Q. And the one in relation to the church as I understand it he had by then done a formal more detailed assessment of the strength of the building and that it was 10 percent of new building code?

A. Yes.

Q. He says in his evidence as I understand it that that was not taking into account the damage from the earthquakes so one would presume it was less than that and I think you said at the end of your brief that when you got that report you got hold of him and spoke to him about it?

A. I did.

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Q. Why was that. What concern did you have?

A. Well I wanted to be, I wanted to be sure that given the, the reduced strength and the fact that he'd done the calculations that we were able to rely on being able to go into the building safely.

Q. Right so you were concerned about that, what, low strength?

A. Yes or the, the result of the ongoing damage and were we able to safely access the building.

Q. Were you aware whether or not he'd made any calculation or estimation of the strength of the building before then? Was that the first time you were told?

A. Specifically, no.

Q. Is that the first time you were told about that?

A. Yes.

Q. Okay and that's the reason you went back to him?

A. Yes but I mean I was aware of the condition of the building. I wasn't, I wasn't blind to that.

Q. Right but presumably the low strength that had determined was a concern?

A. Yes.

Q. And I think he wrote to you on 16 February. I'll just get it brought up, it's 0016.20. This is a letter, it's dated 16 February 2011, to yourself from Mr Haverland and if you just look at the third, fourth, fifth and sixth paragraphs. If they can be highlighted. Do you recall this letter?

A. Yes.

Q. So he talks about the weakest area of the building was the auditorium of the main church. Correct?

A. Yes.

Q. And he talks about that, load capacity of 10 percent. So the auditorium's where the organ was, correct?

A. Well it was down the western end, yes,

Q. Yes but it was in the auditorium.

A. Mmm.

Q. Assessment of strength based on its pre-earthquake condition with no cracks. So the building in its current state would have a strength less than its assessed value. So it would be less than 10 percent. Correct?

A. Yes.

Q. And he says in the next paragraph, "Following our recent visits to the building, which have been carried out after the Boxing Day earthquakes, there has been noticeable additional damage, particular to the north wall annex. Cracking of the side wall buttresses also appear to have increased," and he says, "Further damage will continue to occur as a result of ongoing aftershocks, which could result in the building becoming unsafe." Did that concern you, those comments?

A. Yes.

Q. Right. Did you –

A. And I discussed them with him and that was the motivation for calling him and saying, "Listen is this, is this still going to give us safe access?"

Q. Then he says, “We understand that the building, as well as its contents are of significant historical value. It is therefore necessary that additional temporary bracing be installed to the north wall of the auditorium as well as to the west wall of the hall to provide longer term protection to the building and its contents in the event of significant ongoing aftershocks.” So what was your understanding – that the north wall of the church had to be braced? Correct?

A. Yes if you, you will see that the date of this letter is after the meeting that we had with all of those Council and Heritage folk.

Q. Yes.

A. And it was abundantly clear that the building was going to be, was going to stay there with its contents inside albeit the organ would be removed and it was, we were still having minor aftershocks at this stage and it was for the long term, that’s what he says, to provide long term protection of the building and its contents –

Q. In the –

A. – and additional propping would be required on those areas.

Q. In the event of significant ongoing aftershocks, right. So my question is well, did you ask him, well look if we've got to install temporary bracing to the north wall of the church to protect the contents, why aren't we doing it to protect people going in there?

A. It wasn’t, it’s a timing issue. It was perceived as being required for the longer term for ongoing work.

Q. Right but in the shorter term wasn’t the perception that aftershocks were more likely in the short term rather than the long term?

A. No the engineers’ determination is the building was still safe to go into and this was a much longer term protection thing.

Q. So did you raise these issues nevertheless with Mr Haverland?

A. Yes.

Q. On 16 and 17 February?

A. Yes I did.

Q. And once you got this from him you didn't think, let’s call a halt to, to the operation?

A. Well we, we had been relying on his advice all the way through the project. It didn't seem to, it didn't make any sense to change our reliance on it.

Q. To be fair though it sounds like you got this letter and the report of 17 February and were concerned?

A. Yes.

Q. And you went back for reassurance?

A. Yes I did.

Q. Did you pass on this letter or its contents or the report of 17 February and its conclusion about the strength to Mr Hargraves?

A. Not in that form, no.

Q. Did you tell him essentially what was being said or not?

A. I honestly can't recall.

CROSS-EXAMINATION: MR ELLIOTT

Q. Mr Fahy I think you accept that it was contemplated there would be at least a measure of risk to people who entered that church?

A. Yes sir.

Q. And is it correct that you and the engineer Mr Haverland were engaged to advise on that risk?

A. Yes.

Q. And to advise on the amelioration specifically of that risk?

A. Part of, yes.

Q. Is it correct to say that in, in carrying out that function that you had safety at the forefront of your mind throughout your entire involvement?

A. Definitely.

Q. The reason for removal of this organ is referred to in paragraph 18 of your statement and I just want to ensure that people can understand exactly what you say the reasoning was. So am I correct to say that as far as you understood it anyway the reasons in the organ being removed were that a full inspection was required, point 1?

A. Yes.

Q. Point 2, ensure that contractors could access the west wall to undertake repairs. Point 3, that there may be damage as a result of temporary works that may be required.

A. Yes.

Q. And I think I would add point 4 which was mentioned earlier on by the owner which was a risk of dust or damage caused by dust to the organ if it remained in place.

A. Yes that's true.

Q. Are they the reasons from your point of view for the removal –

A. Yes they –

Q. – of the organ?

A. The organ was also a very important item to the Methodist Church and they were keen to, keen to see it protected as, recovered and protected.

Q. Document BUI.DUR309.0013.77 please. Is this the, the outline of the programme for removal of the organ?

A. Yes sir.

Q. Was that prepared by you?

A. It was.

Q. And am I correct in saying that this document contemplates that there would be people within the building for the three days of erecting the scaffold followed by 10 days commencing with dismantling et cetera and then two days of removal of scaffold at the end making a total of 15 working days of people being inside the building?

A. That was the anticipation at the outset. The scaffolding erection didn't take that long and then the, the organ removal was nine days.

Q. All right and these were eight hour days were they?

A. I think they may have worked longer just to ensure that the work was done within the allotted timeframe.

Q. Do you have an idea what hours they were in the building?

A. No I would need to, I would need to check on that.

1259

Q. But you heard me ask the question earlier on which, which was in the circumstances was removal really necessary and I appreciate that's

ultimately a matter for your client but you have commented in your evidence about the reasons and you were engaged to advise about risks and so on. So I'm just going to ask you to briefly comment upon those reasons that you've given for the necessity to remove the organ. I take it that in terms of potential damage and dust that could have been dealt with just by throwing a cloth or something over the organ could it?

A. Yes.

Q. In terms of likely damage as a result of temporary works that may be required, that's another reason, are you talking there about people working in the area potentially damaging the organ?

A. Yes that was, that was a definite concern.

Q. While accepting that that would mean that there were people in there albeit it for a different reason could that not have been addressed by just giving some explanation to those people about the care they should take in the vicinity of the organ?

A. That was certainly one avenue but we knew there was a risk involved of having, if contractors were in there for any other reason then inadvertent damage was a, was a risk.

Q. My question really is did you consider the possibility that that type of work may have put people in the building for less time than the full removal of the organ and that you may have ameliorated the concern of damage just by explaining to them to be careful during that time?

A. The, the ultimate reason was that we were unable to get access to both sides of that western wall to do any of the repair work.

Q. All right.

MR ELLIOTT ADDRESSES JUSTICE COOPER - ADJOURNMENT

CROSS-EXAMINATION CONTINUES: MR ELLIOTT

Q. Mr Fahy you've just mentioned I think one of the other reasons that you gave in your evidence. Are you talking about the need to ensure contractors could access the west wall to undertake repairs. Is that the issue you're talking about?

A. We could see that as being further down the track but that was certainly an objective.

Q. By that are you saying that it was necessary to get the organ out so that repairs could be done to the building so the building could be retained?

A. Yes.

Q. I'll just ask you, or you may not need to refer back to it but am I right in saying that Mr Sullivan's repairs contemplated strengthening being done effectively around the organ rather than requiring removal of the organ?

A. No sir he, right at the outset he was involved in that conversation to have the organ removed at the same, for the same reason.

Q. I'll just refer you to document BUI.DUR309.0009F.2. [Your Honour this is behind tab 9]. That's a letter from R D Sullivan dated 15 September 2010 to the Methodist Church. Did you see this letter when you became involved with this work?

A. Certainly at some point I have, yes.

Q. I'll just refer you to the next page which is F3 and then if we could highlight the section down the bottom beginning with the heading "West Wall." It appears that section of the document's talking about this western wall that you've been discussing.

A. Yes.

Q. And doesn't it say under "Temporary Work," "A steel frame to be located either side of the organ and this be tied at the top to the existing beams and braced down to the church floor?

A. Yes.

Q. "Additional steel work is required at the top to allow temporary support and covering of the organ." That at least seems to suggest Mr Sullivan was contemplating the work being done around the organ rather than removal.

A. No sir, if you go on and look at further documentation he was talking about taking the organ down in stages to allow the installation of that propping. He was clearly of the opinion that the organ needed to be removed.

JUSTICE COOPER:

Yes if we have a look at page F4. Just above the item 2, west two-storey wing, there's a heading "Organ."

MR ELLIOTT:

Yes, thank you Your Honour.

CROSS-EXAMINATION CONTINUES: MR ELLIOTT

Q. So that says "the organ will have to be removed to storage while the work in the church is undertaken". So was he contemplating as far as you're aware that that would happen immediately or after the temporary work we've just referred to?

A. He was talking, Mr Sullivan was talking about it happening in two, two stages because of the extent and nature of the pipes and the, and the spread of them he was talking about removing some of those before props could be put in and then brought down to the floor to then enable the rest of it to be removed.

Q. Mr Zarifeh referred you to the comment by Mr Haverland. I'll just quote the exact words. In his letter dated 1st of February 2011, "Based on our recent observations it's becoming less likely that this building will be able to be repaired and retained." Would that not have eliminated that need for structuring, need for structural support as one of the grounds for removal of the organ?

A. I'm sorry I don't understand the question.

Q. Well one of the reasons that you've given for the need to remove the organ was the, and I'll quote your words, "To ensure the contractor could access the west wall to undertake repairs," but given Mr Haverland's observation there perhaps those repairs may not be contemplated anymore?

A. I'm with you. Well that's a possibility. I think we were, yeah I think we were of the mindset that it was all organised. The organ was a very important piece of equipment to the church and they were, and we were keen to remove it and the, the state of the building was such that it was

a possibility that it may become further, you know, the instability of it may arise so that it wouldn't become safe to be in but at that stage we were very definitely and clearly of the understanding that it was safe to be in. I mean I was in there more, more than most people and I certainly wasn't about to be in there if it was, if I thought it was unsafe in any way, shape or form.

Q. One of the questions which may be on people's minds is that given your reference to loss adjusters and insurers, whether the insurer was exerting some pressure on a particular course being taken given financial implications?

A. No that wasn't the, that wasn't the case.

Q. The final reason that you've given for the need to remove the organ was the need for a full inspection. Am I right in saying that work began on the 14th of February?

A. To remove the organ?

Q. Yes.

A. Yes that's correct.

Q. Hadn't Mr Haverland produced by the 17th of February a full report on the building which, which contemplated various loadings in the building and the types of repairs that might be undertaken?

A. Yes [nodding head].

Q. So in light of that do you think it was, he'll answer this obviously, does it remain your position that the organ needed to be removed for there to be a full inspection of the building?

A. Well initially it was thought that it may have been required for the full inspection but in any case it was going to be required for the repair work.

Q. Repair to the organ or to the –

A. No repair to the building.

Q. And Mr Zarifeh questioned you and you gave thorough answers on the types of steps taken to address the risk. Am I right in saying that one of the potential dangers in this environment was the risk of something

falling on those who were working within the scaffolding area and along the exit paths?

A. Yes, that was the risk if you inside or outside close to the edge walls, to the exterior walls, that was the risk.

1309

Q. Were there any specific steps taken to minimise the risk of harm to people from falling debris within their working zone?

A. Within the working zone of the organ?

Q. Within the zone that they were working in the building?

A. All of the evidence that we had seen to date was that anything that fell, fell outside and generally within the confines of the wall. It didn't fall very far. It really toppled off it and fell down the sides of the wall so the risk to people working on the organ, there was no stones or buttresses in that area. It was a lath and plaster ceiling and a sturdy truss roof and the risk wasn't perceived to be from above them.

Q. One of the perceptions that especially families might have of this question of minimising the number of people is that well that implies that there was a risk but we'll just take a chance by minimising the number of people who are in there. What do you say to that?

A. All building sites whether they are brand new buildings have inherent risks. Building is a risky business but by limiting the number of people on the site you are inherently limiting the risk to those people just by limiting the number of people that are on the site so it wasn't about chance. It was about doing a job prudently.

Q. And finally, just so far as you're aware, were the particular risks associated with the site explained directly to those who would be going in there?

A. Yes it was part of the induction and briefing process before they were allowed on site.

Q. Do you have some record of what was said to them?

A. Unfortunately that was all in our site safe folder which was lost on the work site but the detail and explanation of the nature of the building, the type of the building, the damage that had occurred to the building, the

egress path, the safe areas to work, all of that was explained in quite some detail.

Q. And was that by you or by someone else?

A. Both. There was myself and there was a construction manager who was there at times when I wasn't able to be there.

Q. I did say finally but was there a supervisor on site during the whole process?

A. When people were arriving or leaving. At times there were people there doing their work. There was no supervisor all the time.

CROSS-EXAMINATION: MR LAING – NIL

RE-EXAMINATION: MISS SMITH – NIL

QUESTIONS FROM THE COMMISSION – NIL

WITNESS EXCUSED

COMMISSION ADJOURNS: 1.12 PM

COMMISSION RESUMES: 2.00 PM

MR ZARIFEH CALLS

JOHN KEITH HARGRAVES (SWORN)

Q. Mr Hargraves, can you give the Commission your full name please?

A. John Keith Hargraves.

Q. And are you a director of South Island Organ Company Limited?

A. I am the managing director of South Island Organ Company.

Q. And what – how would you describe the business of your company, what do you do?

A. Our company builds, restores, rebuilds, maintains and tunes pipe organs nationally, about 300 all over New Zealand and in three states of Australia. We have done about 20 large projects which we also tune and maintain.

Q. How long have you been doing that, the company?

A. The company has been going 43 years and I have been there for most of that time in the capacity of a director, but not the managing director.

Q. Now the organ that we're concerned with in this hearing that was in the Durham Street Methodist Church, your company had maintained and tuned that organ on a regular basis prior to the September earthquake?

A. Yes we had, since 1977 I think.

Q. I think you've been sitting in the hearing. You've heard the evidence of Mr Fahy?

A. I have.

Q. So you know the issues that we're concerned with in relation to the organ?

A. I do.

Q. I just want to ask you about the removal of the organ early 2011. Firstly did you have any part in the decision-making of whether to get the organ out or not, or was that done by the Church and Mr Fahy?

A. I had a point of view on it, and we were in consultation with the Church authorities who at that point were represented by Mr Fahy.

Q. But in terms of whether it should be removed and the reasons for it. Did you have any part in that?

A. Yes.

Q. What was your view?

A. It was clear to me that the organ had to be, well in terms of the mindset at that time, which was the importance of saving the building, because of its heritage classification and from our point of view, it was – so it was important to effectively be able to brace and repair the building to remove the organ because the organ was blocking access to vital parts of the building, because the organ is seven metres high, about four metres deep and about 12 metres long and was built against the west wall, in fact some of it went right through the wall in the centre where there was double doors going through to the room in the annex. There was access to the organ from the annex.

JUSTICE COOPER:

Q. Mr Hargraves, I think Mr Fahy may have suggested that it was eight metres deep, you say it's four?

A. The depth of the organ?

Q. Yes.

A. Yes, the depth of it would have been more in the vicinity of four than eight. Well it depends what you call the organ. I mean the actual structure of the pipes, but then in front of that lower down in the tiered gallery was the console which is where it was actually played from, so you can view that as part of the organ, then the organ occupied the full depth of the gallery there which I imagine would be about eight metres.

Q. So was the console at one with the mechanism behind the pipes and the mechanism, or was it in a separate –

A. No, no, it was a separate cabinet, like a big writing bureau at the –

Q. But placed in front of the pipes?

A. Placed directly in front of the pipes but with several rows of choir seats between the organ and the console, but on a tiered platform so the console was – there's a balustrade at the bottom of the gallery and the console was immediately to the west of the balustrade.

EXAMINATION CONTINUES: MR ZARIFEH

Q. And I think one of your employees went into the church on the 22nd of September and checked the condition of the organ?

A. Yes, that's a process that we were doing for all the earthquake damaged organs in Christchurch.

Q. And I think it had been relatively undamaged?

A. At that stage it was.

Q. At that stage, right?

A. Yes.

Q. So were you advised at some stage by Mr Fahy that a decision had been made to remove the organ?

A. Yes we were.

Q. And you said that you had some input into whether or not it should be removed. Was that early on in late 2010?

A. It was clear, yes because initially the engineer was of the opinion that the organ may be holding up the wall, the west wall. We helped him to an understanding that in fact that was not the case. The organ abutted the wall and used the wall to hold up some of the longer pipes but in no way was the organ had any structural relationship to the wall.

Q. And you knew that from, what from your previous visits?

A. We knew that from the beginning, because we know the organ well, we've done considerable work on it over the years, yes.

Q. Now I just want to ask you about your liaising with Arrow?

A. Yes.

Q. Over the removal of the organ. Were you asked to prepare an organ removal methodology or procedure?

A. Yes.

Q. And you provided that to Arrow?

A. Yes we did.

Q. And that stipulated how long you thought it would take and the number of people?

A. Yes.

Q. In terms of the safety of those workmen that were going to be involved, did you seek anything, any assurances or any information from Mr Fahy or from the Church?

A. Yes we did, we relied a lot on Mr Fahy. He was the person that relayed to us the decisions of the engineers, and we – and that was what we were most interested in.

Q. So you would have heard him give evidence today that he was keeping you abreast of any developments or anything he heard from the engineer. Would you agree with that?

A. He kept me informed of the decisions of the engineers.

Q. And did you ask any questions of him in relation to safety, can you recall?

A. I'm sure we did but I can't be specific as to –

Q. In terms of the planning of how many men would be involved and how long it would take, did you do that or someone else?

A. No, I did that.

Q. And do you recall any discussion about keeping the numbers to a minimum?

A. Yes, but from our point of view the numbers were at a minimum to achieve the two objectives. One objective was to have enough men on site to do the work safely and efficiently and the other was to have enough men on site to do the work as quickly as possible because we did not want to be in the building for any longer than was necessary.

Q. So and that's because of the potential risk from aftershocks?

A. Yes.

1410

Q. Do you recall being given any information about the strength of the building in terms of seismic strength or any of that kind of information?

A. Not specifically, no.

Q. Would it have meant anything to you if you got it?

A. We are working in many buildings like that all over the country all the time. We are used to working in buildings like that so I doubt whether that information in its, that information would have been of some value but we were not ignorant of the fact that it was an unreinforced building. What we were ignorant of was the effect of vertical acceleration which I believe was the crucial factor in this particular event.

Q. You will have heard the reference to the evidence of that assessment by Mr Haverland of the building having 10 percent or in fact less than 10 percent of building code?

A. That information came out on the 17th of February when we were a fair way through the process of removing the organ.

Q. Okay but you got that information?

A. No, no we didn't. I was unaware of that report.

Q. You're just talking about the report coming out at that time?

A. The report of the 17th of February –

Q. Was after work had started?

A. The work was well underway then and I was unaware of that report until this day.

Q. All right well if you'd been given that information do you think it would have made any difference to your view?

A. That's a very hard call because we now have hindsight. The mind set at that time and the expectation of what might happen in that small space of time, we only had two or three days more work to finish the job. It probably wouldn't have made any difference.

Q. All right but what about that kind of information at the outset? Would that have been relevant to your thinking or not?

A. Well the information that the engineer's view was that the building was beyond retaining I think would have made a difference, yes. I'm sure it would have made a difference.

Q. And were you told that? That was I think the 1st of February. He didn't say it was beyond retaining. He said that –

A. – He was of a view, I forget the exact words but –

Q. – It was looking more likely that it would not be able to be repaired or retained?

A. Yes that point of view had not been indicated to us.

Q. So you were relying on information that you were given about the engineer's views and the state of the building. Is that what you're saying?

A. Absolutely yes.

Q. At the time did you feel that you were getting enough information there?

A. We weren't getting the details but we trusted Tim Fahy and Arrow. All our dealings with them had been of a very professional and careful nature. We felt that they had considered everything that we needed to know in conjunction with the engineers but we were not privy to the details.

Q. Right, and you were relying on Arrow ensuring –

A. – and our own experience. At that time we had already removed three instruments from other damaged churches in Christchurch.

Q. Had they been red stickered those churches?

A. Probably. The first one was St Paul's, Dallington and the second one was Holy Trinity, Avonside, which we had done prior to Durham Street.

Q. And you'll remember Mr Fahy saying that the factors that were impressed on him or that he spoke to you about to ensure that the risk was mitigated was (1) to keep the numbers to a minimum – we've covered that and, secondly, for people not to go down the east end. Do you recall him saying that?

A. I don't specifically remember him saying that. I was not one of those that was on site. He would have been making that clear to the team that was on site.

Q. All right so there was never anything in writing to your company with those factors?

A. Not that I recall.

Q. And so things to do with safety and getting people that were involved, briefing them, that would have all been done on site and you wouldn't have been present for any of that?

A. I wasn't present but Neil Stocker who was our foreman in charge of the job was highly experienced and was a meticulous person that never fudged attention to that sort of detail.

Q. Did you discuss the project with him?

A. Yes.

Q. And what about the risks?

A. He assessed the risks and did ask for some changes to be made to the scaffold design for instance.

Q. The scaffold design where?

A. The scaffold that was put up for the express reasons to facilitate the removal of the organ.

Q. Are you talking about the internal scaffolding or -?

A. Yes I am.

Q. And did your company have any policy in place to ensure that Mr Stocker and his workers and there were eight of them involved altogether weren't there in the project?

A. Yes.

Q. Were aware of what was involved in the risks?

A. Yes we have our own health and safety programme and we are working with that sort of risk all the time. That's what we do.

Q. And so in terms of communicating the risks to workers you've got a process for that?

A. Yes.

Q. So is it fair to say that essentially you may not have got the detail of what the engineer was saying but you were getting assurances via Tim Fahy that the engineer had looked at the church on a regular basis and after Boxing Day and that he was assuring Tim Fahy that, in his view, it was safe for workmen to go in and remove the organ?

A. In fact the work was delayed several times while we and Tim Fahy waited for that report and assurance to come.

Q. But the final report that contained the structural assessment you didn't see or didn't hear about till today?

A. No because the work was half way finished at that stage.

CROSS-EXAMINATION: MR ELLIOTT

Q. Mr Hargraves is it your position that in terms of the employer's obligation to identify hazards and to eliminate or minimise hazards you were deferring to Arrow and the engineer in this case?

A. Yes and also to Christopher Templeton who did the assessment on the 22nd of September about what was going to be required to remove the organ but was not able to access the building after that. So that was the only time that we inspected the organ inside the building prior to beginning the dismantling work.

Q. Mr Haverland will tell us when he addresses his brief of evidence that he gave consideration to a particular risk factor of .5. Were you aware of any of that?

A. No.

Q. You weren't aware of the particular reasoning behind the position that he and Arrow had reached about what the risks might be or how they might be addressed?

A. No not in engineer's terms. I have only learnt that in the last few days by reading the reports on the website from the engineers.

Q. From your point of view did you arrange supervision at the site?

A. Well that was the reason why the work was in charge of Neil Stocker because he was highly experienced at supervising a team to do that sort of work and had supervised the two previous removals that I mentioned earlier.

1420

Q. And did you personally give any explanation to staff about potential risks at this site or did someone else do that?

A. No well I would have been involved in that. We had Christopher's report. We had, um, reports from Tim Fahy. We had our own knowledge of the instrument and the building going back many years. We put all those together and proceeded on that basis.

Q. This issue of workers, employees, entering buildings which may have some danger is obviously an important one as we move forward and buildings in Christchurch now would be in a position of people moving in

A. Well we kept the safety of our men in mind at all times. I would say it was a lack of knowledge at that time of what the possibilities were. With what we know now we would not have gone into that building and done that work. But at that time we didn't have that sort of knowledge of what an earthquake like that could achieve in a few seconds. That was quite almost incomprehensible at the time.

CROSS-EXAMINATION: MR LAING AND MISS SMITH – NIL

QUESTIONS FROM COMMISSIONER FENWICK AND JUSTICE COOPER – NIL

WITNESS EXCUSED

MISS SMITH CALLS:

GARY HAVERLAND (SWORN)

Q. Your full name is Gary Haverland? Is that correct?

A. Yes.

Q. And you're a director of Structex Metro Limited?

A. Yes.

Q. And you have a Bachelor degree in Civil Engineering and you're a chartered professional engineer?

A. Yes.

Q. And you've been practising as a qualified structural engineer for 24 years?

A. That's correct.

Q. Mr Haverland you've prepared a statement for the Commission. Can I get you to read that from paragraph 2 please.

WITNESS READS STATEMENT

A. Sure. "My involvement with the Durham Street Methodist Church came about when Arrow International Limited, Arrow, engaged Structex. The nature of the engagement was to assist Arrow and the Methodist Church with the assessment of the extent of damage and repairs required for a number of Methodist properties primarily for insurance purposes. We were also asked to comment on aspects associated with accessing buildings".

Q. I'm going to stop you there. Sir I wasn't proposing that he read paragraph 3 because it simply describes the buildings that we're talking about and I think we're familiar with that.

JUSTICE COOPER:

Yes that you.

EXAMINATION CONTINUES: MISS SMITH

Q. If I can get you to continue reading from paragraph 4 please.

WITNESS CONTINUES READING STATEMENT

A. Sure. The building was generally constructed with stone walls consisting of a natural stone exterior, a plastered brick and stone interior and a combination of rubble stone and mortar fill to the cavity. The slate roof is likely to have been supported on battens with timber sarking on purlins and main supporting exposed timber trusses. The ceiling was constructed with lath and plaster. The ground floor was timber and was likely to consist of timber flooring boards on joists supported on timber bearers on concrete or timber piles. A gallery floor had been constructed in the church and extended around the perimeter of this area, the gallery. Access to the gallery was by two stairs at the front of the church facing Durham Street which were incorporated within the two towers.

The building was damaged in the earthquake on 4th of September 2010. I understand it was given a red placard following a rapid assessment but I was not involved in assessing the building at that time.

In late September 2010 Structex was engaged by Arrow to complete a structural assessment report of the building. The purpose was to identify and comment on earthquake damage and possible strengthening options. I did not undertake detailed calculations at this stage. I was simply providing strengthening options based on experience and judgement only. This was the first phase of our work. The next phase which we undertook was a detailed strength assessment of the building. There were no plans available at the time of my inspection and I did not undertake a search of the Council records. I asked Arrow to provide us with any drawings that were available and received a copy of a building plan but that was of limited value. Site plans and elevations were commissioned by Arrow but these were not available until January 2011. At the time of my inspection I was not aware that R D Sullivan Consulting Engineer had been involved with the building. The nature of my inspection was a walk over survey of the building as opposed to a detailed inspection or investigation of the structure. That is an interior and exterior inspection viewing elements which were visible but without removing linings. Being

stone however meant that most of the structure was exposed for viewing.

There did not appear to have been any structural strengthening carried out prior to September 2010. Some rose head washers were present in various locations although it was not known when these installed and they appeared to have been in place for some time. The September earthquake had reduced the seismic capacity of the building. This was evident from the extent of the damage and cracks that had formed. My conclusions are detailed in a report dated 4th of October 2010. I noted that the hall had suffered significant damage but the annex had suffered limited damage mainly only to the west wall. The majority of the damage was in the church.

The main area of damage to the church was in the towers where the stairs were located although the south-east tower had performed better. In terms of the eastern wall there was significant damage in this area with cracks clearly visible on the exterior face generally in the stone mortar joints. The plaster had also spalled significantly on the interior face with significant damage visible to the brick interior face and to the core of the wall. The timber floor appeared to have bulged in the middle which I thought could be the result of some foundation settlement below the exterior heavy stone walls or heaving of the light timber floor or a combination of both. Stone work jambs around the window frames had dislodged slightly. The north and south walls however were still in good condition with limited cracking on the inside plaster face above the windows. I also noted that some buttresses to the outside wall on the north side had some cracks generally along the mortar joints between the stone and the south side buttresses had some cracks but were much smaller.

Q. Mr Haverland if I can just stop you there and refer you to document 0013.132 which is a plan of the church and the annex?

WITNESS REFERRED TO PLAN OF CHURCH AND ANNEX

Q. I know that you've described the nature of the damage that you've seen in your statement but it would just be useful I think to get an

understanding with reference to this plan the particular areas that you're talking about and the damage that you observed in September?

A. Sure.

Q. Are you able to take the Commission through?

A. Yes I can do that. This area around here that I'm highlighting is the church and the annex with the annex located at the west end here and the church auditorium located in this area here. When I observed the building, maybe if we just start in, in this corner here.

1430

JUSTICE COOPER:

Q. The south-east corner?

A. Yes. This is the south-east corner. So there's two towers. One here and one here. The south-east corner as far as I can recall had very little damage to the outside stonework. The inside had some damage and cracking, mainly above this door here and I recall there being a crack through this wall as well. In terms of the –

Q. Now we're going to run into trouble with the transcript – can you use words to say where you're pointing so that we have a record of what –

A. I see.

Q. – you've been pointing at because when we're looking at this evidence again we won't have the benefit of the cursor.

A. Sure.

Q. So if you could find words please to just describe as you go.

A. Okay this will take a bit more wording.

Q. Yes.

A. But I'll work my way through it. The south-east tower had very limited cracking to the exterior stone faces. The interior walls of the south-east tower had some cracking. Most of the cracking was above the south-west door from the gallery into the south tower.

Q. That's good. Thank you.

A. There was also a vertical crack on the north wall of the south tower. In terms of the east wall that is located between the two towers, that was

substantially cracked and I recall there being two significant vertical cracks running up the inside face of the stone wall at least on one side of that central window. The north tower had suffered more damage and there was cracking to the outside face, or the two outside faces of the north tower and there was also cracking above the door to the north tower which is located in the north-west corner of the north tower. The buttresses along the north wall had some cracking. The cracking was generally worse at the east end of the building and as we moved to the west the cracking got significantly less. The annex had very limited damage. The damage that we observed was a small crack in the north-west corner of the annex and that was only above the first floor level and there appeared to be some dislodging of the west wall outwards towards the west. The south wall of the church also has a number of buttresses and there was very limited cracking to those buttresses. It's worth pointing out that when we go around the inside of the building these two side walls, sorry the interior of the north side wall of the church and the interior of the south side wall of the church were both still in very good condition. The cracking that we noticed was very limited cracking above the, above the windows of those side walls and really only at the east end of the building where the towers were which is where most of the damage was concentrated, and it's also worth pointing out that the trusses that span from side-to-side of the building, and they're located on every buttress line, were also well-connected. There was no damage that we saw of the truss connections into the top of the buttresses.

EXAMINATION CONTINUES: MISS SMITH

Q. So how were they actually connected into the buttresses?

A. It's likely that they were built into the buttresses during the construction of the stone buttresses.

Q. And in relation to the west wall of the church or the auditorium where the organ sat, what was your recollection of the damage to that particular wall?

A. Yeah my recollection of the damage to that wall was very, I don't recall seeing any cracks to that wall during the first visit that we made apart from probably cracks above the, the doors at each end of that wall which is on the north side of the building and the south side of the building and that generally tended to be a common place for cracks to occur, above the doors and above the windows.

Q. And what would that indicate to you?

A. To me that indicated some interaction between the cross wall and the side wall as they moved with the, with the building shaking and you tend to start to get a break-down of the, the stonework at those locations.

Q. And how far did those cracks extend?

A. Not very far at this end of the building.

Q. Can I get you to continue reading your statement please from paragraph 12?

A. Sure.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 12

A. I considered that the church could be retained although significant work would have been undertaken mainly to the east walls and the towers. I also noted that some foundation enhancement work would likely be required depending on the existing ground conditions. I indicated that detailed geotechnical information would be required to proceed with the next phase of this work. Later in October I was asked by Arrow to review a propping design which had been undertaken by Dick Sullivan. Arrow provided the drawings to me to review and comment on. My review consisted of an overview of the drawings to provide a second opinion on how appropriate the proposed propping was. It did not include design calculations as it was not part of our brief.

EXAMINATION CONTINUES: MISS SMITH

Q. If I can just stop you there and bring up documents WIT.HAV0002.14 to 21. Now what I would like you to do just so the Commission is clear on the documents that were referred to you is just take us very briefly

through each document and identify the areas that it related to at a very sort of general high level.

A. Okay. As, as you can see on the plan there are two main areas of propping. One is at the east end of the church and the other is located at the west end of the church and hall. The propping at the east end was installed to provide additional stability to the east wall of the church and to the north-east tower that had suffered significant structural damage. The propping at the west end of the church was to, well my understanding was to provide additional stability to the wall that was located at the west end of the annex and then there was also some additional propping that was proposed to the west wall of the hall.

Q. Just in relation to that particular area of the property. I understand that you didn't review those details for the west end of the annex and hall. Is that correct?

A. That's correct. Our review was only for the propping at the east end of the church.

Q. What was your opinion, however, as to whether the west end of the annex, whether it required some propping to be undertaken?

A. In, in our view additional propping to the west end of the annex was, was not necessary. There had been some movement at that location but not of a substantial amount that would indicate that that west wall of the annex would become unstable.

MISS SMITH:

Your Honour there are a number of other drawings but they simply relate to more detail of this particular propping. So unless you want me to go through those in particular –

JUSTICE COOPER:

No I don't think so.

MISS SMITH:

– I'm happy to move on.

JUSTICE COOPER:

I mean we have them. There may be some questions arising out of them but we don't need to deal with them at this stage thank you.

EXAMINATION CONTINUES: MISS SMITH

Q. So if I can get you to continue reading your statement from paragraph 14 please.

1440

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 14

A. I was not required to review any propping details for the hall west wall or the annex. Arrow advised that the rear section of the building would not be propped as it was out of the public area and would be barricaded off. I telephoned Dick Sullivan as a courtesy call to let him know that we were involved in the project. We only discussed the temporary propping. Propping was proposed to provide temporary medium term support to the east wall of the church and the north-east tower. I understood from my discussions with Arrow that the intention of the propping was to provide public safety and avoid the collapse onto the footpath. When reviewing the propping design I therefore considered the risk of collapse onto the footpath. The propping included whalers on the outside face with the fixings that extended through the wall with large plates on the inside face. These provided additional stability to the damaged wall to reduce the risk of collapse towards the inside.

On the 21st of October 2010 I reported to Arrow following my review of the proposed temporary propping details. In relation to the propping for the eastern wall and the north-east tower I concluded that the proposed propping system and details were appropriate to provide temporary medium support. I advised that based on our inspection and report dated the 4th of October 2010 I believe that the church auditorium had not suffered significant structural damage and was therefore unlikely to collapse as a result of significant aftershocks. The building had performed well in the September earthquake and the aftershocks that

were being experienced at the time were of a shorter duration and lower magnitude. Based on the extent of damage and performance of the building I considered collapse during an aftershock was unlikely.

EXAMINATION CONTINUES: MISS SMITH

Q. And I will just stop you there Mr Haverland. Why do you say it was unlikely?

A. That is based on, I mean we were present in Christchurch for the 4th of September earthquake. We knew what the strong ground motion shaking was like and how long it went on for. We viewed the building after that and saw the extent of damage that had occurred to the towers and to the balance of the building, and we also felt the aftershocks that were occurring after that and were able to monitor the performance of the building during those periods of aftershocks as well and in our view it was unlikely that the building would suffer collapse during an aftershock. In fact we would have, because the aftershocks were continuing on an ongoing basis, we believe that were able to monitor the progress of the structure in terms of how it was performing.

Q. There's been some reference this morning to Mr Sullivan having recommended that the trusses be tied to the walls to prevent roof collapse. What's your comment on that?

A. I certainly would not have seen a need for that. The truss connections were still well connected into the side walls. We were able to get up onto the gallery and have a close look at those connections and there was no evidence that the side wall buttresses were coming away from the roof trusses at all.

Q. So how many of those buttresses would you have checked to come to that conclusion?

A. We would have looked at all of them.

Q. And in terms of any propping for example to the north or the south walls, what was your view of that?

A. I wouldn't have considered additional propping to the north and south walls being necessary.

Q. And the reason for that?

A. The reason for that is the inside services of the side walls were still in good condition. The only cracking to the side walls that we could see on the inside was above the windows. We would expect to see that cracking, in fact we would have probably expected to see more cracking given the size of the earthquake that we had, but it's natural to expect that when the side walls want to rock back and forward, that you would get some movement occurring above the windows which is the weakest point in the building, and it would tend to crack through that location but certainly would remain stable. So there were, in our view there were still substantial portions of both side walls that were intact and in good condition to provide stability to the building.

Q. And does the gallery structure assist or hinder in that stability at all?

A. Absolutely – no the gallery structure would provide significant additional support to the church building. Most church buildings that I have been into don't have that gallery structure in them. They're are very open building and the side walls are very tall whereas this building here had the substantial benefit of the gallery structure in there and we saw that as a huge bonus to this building in that it helped tie in the side walls.

Q. If I can get you to continue reading from paragraph 19 please?

WITNESS CONTINUES READING STATEMENT

A. In my report I indicated that temporary propping in addition to the tower was not considered necessary to allow removal of the organ. I did however suggest that building occupancy be minimised to assist in reducing the risk.

I cannot remember when I first became aware of the proposal to remove the organ from the church or how I became aware of it. The organ was situated at the west end of the church auditorium adjacent to the east annex wall. That was an area where the damage was low and it was away from the area of greatest damage, namely the east wall of the church and the north-east tower. I had inspected the west wall of the church in September. Although the organ was a significant structure I could see a large portion of the wall from inside the church on either

side of the organ and I was also able to see the other side of that wall from inside the annex.

EXAMINATION CONTINUES: MISS SMITH

Q. Just a couple of questions before we go on about this aspect. First of all, was it your opinion that the organ was supporting that west wall?

A. Definitely not – no the organ would have been a standalone structure and the west wall would have been self-supporting, most definitely.

Q. And did you see that?

A. I had a look in behind the organ and as far as I remember there was a physical gap between the west wall and the organ, but you know to me it just doesn't make sense that you've got a 500 thick stone wall that would be supported by a pipe organ that would be installed afterwards. So in my view there is no doubt that the west wall was self-supporting and the organ was a completely separate item.

Q. I wonder if we can just have a look at a couple of photographs, and although these are taken after, sort of around January or February it might give some indication of the damage that you were looking at the time.

A. Sure.

Q. If I can bring up document 0024.5 please and then later seven.

WITNESS REFERRED TO DOCUMENT

Q. So this is a photograph of the west wall of the church?

A. Mmm.

Q. And we can see some evidence of some cracks above the door in the right-hand corner and also some damage to the wall above the scaffolding platform. Can you just maybe take us through the nature of the damage that we can see here and how that compared with what you saw in September?

A. Sure. As far as I recall when I first went into the building I did see what appeared to be cracks in the plaster work above the archway doors at each end of that west wall. However those cracks had mould and fungi growing out of them. They were obviously had been there for a long,

long time and had – they were growing fungi out of the cracks. The area right at the top, which is above the organ. We did have a close look at that and that was – there appeared to be some sort of paper or surface coating that was over the wall and that was – it was peeling off. So they, they're not cracks, it's the surface coating of the plaster that seems to be peeling off –

Q. And was it –

A. – and I don't think there would be indication of cracks in behind it because generally when cracks in the wall start to appear, the plaster cracks very easily and then can either spall out or come away.

Q. And maybe if we can just have a look at number 7, the same sequence, that's the other corner of the west wall?

A. Yes.

1450

Q. And again there does seem to be some cracks to that wall. Can you just explain those?

A. Look I think the main area of damage that you can see there is, directly above the door you can see some plaster that has spalled off the surface. To me that's indicative that there has been movement that has occurred at that location and it's natural when there's movement in these walls it causes the plaster to dislodge. The area directly above that door I guess when you look at this photo for the first time you'd say while there are big cracks there they are not actually cracks, that's imperfections in the plaster that has that mould growing out of it.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 21

A. As I have said, although I did not consider additional propping was required I did suggest that building occupancy be minimised to assist in reducing risk to persons carrying out the removal work. This was part of an overall risk assessment for the building. In considering this issue I had regard to ASNZS1170.02002 which incorporates risk factors. Risk factors are a function of the building life and purpose and affect the earthquake design loads on the building. The higher the risk factor the higher the earthquake design load the building is required to resist.

Buildings with a 50 year life containing crowds, such as the church, have a higher risk factor – 1.3. Risk factors for temporary propping and construction works which have low numbers of persons working on the site for a shorter period of time have a lower risk factor .5. The risk factor recognises reduced likelihood of a large earthquake occurring over a shorter period of time when construction work or removal work is carried out.

EXAMINATION CONTINUES: MISS SMITH

Q. Just if we can address that particular point. You've heard in evidence this morning that the programme for the completion of this works was something in the region of nine to 14 working days. What do you say to somebody who might say that's actually a long period of time that people were working within this building and you should therefore have increased the risk factor that you used?

A. Yeah, the risk factor is appropriate for building life of six months or less or when working on construction sites which could be a year or a year and a half, and in my view working in a building for a period of three weeks is still a very short amount of time compared with that six month window that this risk factor would allow for.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 22

A. On the 22nd of October 2010 I carried out a further inspection of the site with Colin Messon of Arrow and Ben West, the stonemason. The site inspection was undertaken following concerns expressed by Mr Ben West about the lack of propping on the eastern wall. During this inspection Dick Sullivan's temporary propping design which I had reviewed was not installed as a lead time of two to three weeks was expected. At this time the footpath had been closed off along Durham Street and Chester Street West and I recall a cordon fencing the area off from public outside the east end of the church. Loose stone and parapet had already been removed from the towers and the east wall. Straps had been wrapped around the top of the towers to secure the top portions of the towers. I noted some significant vertical cracks to the

north-east corner of the north-east tower. There was some bulging at the mid height of the tower also occurring which was evidence of instability. I considered the building's ability to withstand further aftershocks in particular in relation to the east wall and the north-east tower of the church. I considered that a very significant aftershock would be required to cause instability and possible collapse of the east wall and the north-east tower and if the tower did collapse it would fall down within its own general proximity rather than falling out onto the street. The north-east tower was bounded by a stone wall and a metal fence on Chester Street West and I considered that falling stone was unlikely to fall outside the fence line. The fence was acting as a barrier. As the east wall was partially restrained by the inside gallery floor I thought that collapse of the entire wall was unlikely and the top portion was most likely to fall well within the entrance courtyard, away from the footpath and current pedestrian area. Although the south-east tower had some cracking, the corner buttresses were providing stability. Until the temporary propping was installed, and as a precaution, I recommended that a line of concrete blocks be installed along the Durham Street footpath. The concrete blocks were each roughly one cubic metre, weighing about two and a half thousand kilograms and were installed to protect the footpath from falling hazards. The concrete blocks were expected to be in place by the next day and it was expected that the blocks would be used for the temporary bracing when installed.

EXAMINATION CONTINUES: MISS SMITH

Q. And the photograph that is in front of you at the moment is a picture of the propping that was installed. Are those the concrete blocks that you are talking about at the base there?

A. Yes they are.

Q. And this is obviously with them being used to anchor the propping but what you're saying is prior to this they were actually installed along the frontage much further?

A. Yeah I really need to sort of clarify this whole process because up till this point in time no additional bracing had been installed to the building and there was some concern expressed that, you know, if these towers collapsed then they would fall out into the street and were a hazard so we went to assist in determining the risks associated with the possibility of the towers collapsing or the east wall collapsing and, as a precaution for the short period of time that it was going to take to get the propping installed, we said that the concrete blocks needed to be installed along the front entrance of the courtyard to retain any stones that might fall out from the building if there was an aftershock.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 26

A. By the 17th of November 2010 the temporary propping work to the east wall and the north-east tower was installed. I inspected the work. I identified that the bottom brace of the north tower had only two bolt fixings to the anchor block when the drawings specified four bolts. I instructed that two additional bolts be installed. Once this was done I considered the temporary propping work was appropriate. As I have said, there was no propping undertaken to the west wall of the annex and the hall. This area was fenced off and outside public access. It was blocked off and taped and barricades were put up.

On the 19th of January I carried out an inspection of the church and my observations were included in a report dated the 1st of February 2011. The purpose of the inspections and subsequent report was to observe any additional damage that had occurred as a result of the earthquake on the 26th of December 2010 and subsequent aftershocks. It was also to determine any safety issues associated with removing the organ from inside the building. The church had suffered further damage. I noted cracking to the stonework that was significantly worse than its condition on the 4th of October. There was additional cracking and existing cracks had widened significantly and was particularly evident in five of the seven north side buttresses. Cracks to the south side wall buttresses were still relatively minor. The west wall of the annex had displaced further away and a number of stones on the north side of the annex

were dislodged at eaves level with a large crack formed above the door to the north annex wall. Crack widths to the towers had increased and there were four cracks to the south tower.

EXAMINATION CONTINUES: MISS SMITH

Q. Maybe if I can stop you there again and just to get an understanding of the difference between the damage after Boxing Day and September. I refer you back again to the building plan which is document 0013.132 and again just get you to talk through the differences that you saw as between your January inspection and when you saw the building after September's earthquake?

1500

A. The main difference is that I noticed when I inspected the building after the Boxing Day earthquake were increased crack widths to the north tower. There were what appeared to be additional cracks to the south tower. I counted four cracks and as I recall the cracks were relatively minor on the south tower. With regard to the north-side buttresses the crack widths appeared to have increased and we noticed that five of the seven buttresses now had quite wide cracks in them. The north wall of the west annex had some stones that were dislodged up at the top of the wall and there was a vertical crack, as I recall, above the door, the ground floor door to the north wall of the annex. The west wall of the annex appeared to have moved out slightly further and along the south wall of the building the cracks in the south-side buttresses were still relatively minor. When we go inside the church there was additional cracking to the inside walls but once again these were located mainly above the windows and they were worse at the east end of the building than at the west end of the building.

Q. When you've said that there was some cracks in five of the seven north buttresses to the church –

A. Mmm.

Q. – did that give you any concern for the stability of that wall or any cause to think about some temporary propping to that wall?

A. Yeah it, it was certainly a consideration, however given that the building was so well tied together and the lack of damage that we had observed on the south-side buttresses, we believed that there would have had to have been a lot more deterioration of the south-side buttresses before this building would have started to reach a point of instability. So at this point in time even considering the additional cracking, cracks that had formed in the building, we considered the building still to be relatively stable in, in the normal course of aftershocks that we were experiencing.

Q. And maybe if I can refer you to a photograph which is 0024.4 which is from the inside of the church looking at the southern wall.

A. Yep.

Q. Maybe if you can just take us through the damage or the condition of that southern wall that we can see there?

A. Sure. This is the south side wall viewed from the inside. We can see that the, the roof trusses are still well-connected into the side walls. We did not observe any movement of those roof trusses relative to the buttresses. Generally the condition of the side walls was still good. You can see on the, I'll count this out from the west end but the one, two, three, fourth window from the west end, there is a crack above the arch window and once again that is to be expected as the piers move back and forward, movement does occur at that location and begins to crack the wall over the top. In my view that does not reduce the stability of that wall. It's well away from the connection of the roof truss and it's not affecting the shear capacity of the, of the side wall.

Q. And just for the transcript. You've referred to the window being the fourth wall from the west but in terms of the picture that you're looking at it's actually the centre window that's visible or the third from the right, third from the left sorry.

A. It's the third from the left, yes.

Q. Okay and maybe if I can just refer to one further photograph which is 0024.5 which gives the view at the western end of the north wall.

A. Yep.

Q. Is this outside the area of the buttresses that you were referring to had some crack, some cracking to them?

A. No, no this, this is once again the, the, sorry yes the buttresses on the outside of this wall were cracked, mainly at the eastern end of the, of the building but once again you can see that the side walls on the inside face are still in, in very good condition and the connections between the roof trusses and the side walls are also, they appear to be sound, there's no visible signs of separation or movement that's occurred there.

Q. Paragraph 28 please of your statement.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 28

A. "Although not noted during my inspection on the 19th of January I noted on a later inspection that a bow was observed in the west gable wall of the church. It appeared to be mainly historical but as a precaution I recommended some additional brackets be installed to the gable wall to provide additional stability to the wall while the organ and other chattels were removed. A sketch of the work was provided."

Q. And that's the sketch that is on the screen in front of you now?

A. Yes, that's correct.

Q. It's document 0013.66. Can we maybe have a look at the photograph we were discussing this morning which is 0013.72. Now that is the bracket that you had recommended and instructed be installed?

A. Yes it is.

Q. And you will see there that to the left of that bracket there's a crack that has formed. Did you see that crack and did it cause you any concern?

A. After the Boxing Day earthquake I did notice some additional cracking in this west wall. I was conscious that when they removed the organ they were working right in behind this wall. I did not have any concerns about the overall stability of this wall. I, I don't believe it had been compromised and this particular shot does pick up some spalling plaster that has occurred on the annex side of this wall. These brackets are really a precautionary measure that we believed would be, I mean they were very easy to install but they were very effective in providing

Q. And in terms of your statement just then that you didn't consider there was any stability issues with the annex and so –

A. Mmm.

Q. – so on what was providing the stability in your view?

A. To the annex?

Q. Yes.

A. The annex had, in the ground floor it was surrounded by stone walls and in through the middle of the ground floor there was a cross wall which was also constructed out of masonry. We did observe that wall and there were two cracks in the wall just running up either side of the internal door and once again that is to be expected. As the walls rock back and forward they tend to crack above the doors. So, so that's, that's to be expected, you know, with the, with the level of shaking that the building had been through. The upper part of the annex, the side walls were running right around the three sides of the building and they were tied into the roof truss. It's probably worth also pointing out that the, the west wall of the annex. I mean it's a relatively thick wall and there were actually two chimneys that were located on the inside of those walls which are even thicker again and in my view they tend to provide greater stability to the wall because of the additional thickness. The wall is only going up one storey as well as opposed to many other walls in the building that are, that are full height.

Q. If you can just read from paragraph 29.

WITNESS CONTINUES READING STATEMENT FROM PARAGRAPH 29

A. "I considered that it was becoming less likely that this building would be able to be repaired and retained. I reported that I was underway with a detailed assessment for repair and would forward our reports when complete. Although there had been further damage I did not consider the church was yet in a condition that would prevent the organ from being removed. My reasons for this conclusion included: 30.1 The deterioration was gradual and most of the additional damage was likely

to have been the result of the Boxing Day event which was considered to be a very large aftershock in itself producing larger ground accelerations than the aftershocks that were typically being experienced. The stone work generally fell out from the building and all work was occurring inside. In a structure of this nature the roof and gallery structure would normally prevent the walls from falling in. A safe path, a safe protected path had also been constructed through Aldersgate. The side walls and end walls were restrained by the gallery floor which extended all around the perimeter of the church as well as the adjacent annex floor at the mid-height providing additional stability to the west wall of the church adjacent to the organ. The roof trusses were tied together with a steel rod providing a good tie between the stone side wall buttresses and the main risk identified at this stage was associated with individual stones from, falling from the exterior of the building.

On the 26th of January 2011 Tim Fahy contacted me by email. He wanted to discuss access for scaffolders from Chester Street West thereby avoiding the need to come through the Aldersgate building. He also wanted to know whether the scaffolders' truck could be parked next to the hall while they were erecting and dismantling the scaffolding. On the 1st of February 2011 Tim and I inspected the site to view alternative egress routes for removing the organ and other chattels. At that time the designated safe path from the church was through the protected Aldersgate entry. We looked at the possibility of providing access through the north door of the annex. I indicated that if access was to be provided through this area, protective scaffold would be required over the door in order to provide protection against loose stone work from being dislodged from the top of the wall. I also noted some loose large pinnacle stones on adjacent buttresses which I said would have to be removed. I indicated that contractors' trucks could be parked adjacent to the west wall of the hall. I noted that this wall was on an outward lean but roof ties were present to provide some structural stability to the wall. I indicated that parking in this area should be kept to a minimum to

reduce the risks. As noted previously because the time of a person being in this location was very short I considered that the risk exposure is low. It is also a location which is very easy to exit from in the event of an aftershock. I advised that contractors would need to be advised of the risk and evacuate the area immediately if there is a noticeable aftershock. My conclusions are presented in a report dated the 1st of February 2011.

At each stage I was undertaking a risk assessment having regard to the damage that the building had sustained. I was in regular contact with Tim Fahy of Arrow. I was regularly on site and viewing the damage from the exterior and interior. The organ was required to be removed from the church. Contractors needed to access the building to undertake this work. Given the damage sustained it was not possible to eliminate the risk. The risk had to be minimised by providing for limited access for the building, sorry, providing for limited access to the building and for a short period of time. Safety briefings given by Arrow highlighting the risks to persons entering the building, providing protective scaffolding and safe paths and installing additional brackets to the annex wall behind the organ to give additional stability to the wall adjacent to the organ where the work was being carried out.

By this time my seismic assessment of the church and annex was nearly complete. I had a good understanding of the building and their relative strengths and weaknesses. I was now, I was also now aware that the areas which would be accessed by the contractors were the areas of least damage and they would be working in the strongest part of the building.

On February the 6th, on the 16th of February 2011 I advised Arrow that the seismic assessment of the church and hall was now complete. The seismic assessment report relating to the church is dated the 17th of February 2011. The assessed strength was based on the undamaged state of the building that would have existed prior to the earthquakes. For a building having a 50 year life with a crowd loading. I assessed the church to have a lateral load capacity of between 10 percent and 87

percent of current code and a longitudinal capacity of 15 percent to 20 percent of current code. Propping at the east end had been installed which would have improved the lateral load capacity in this direction.

Prior to completing the detailed calculations and assessments that led to the findings in the seismic assessment it was unknown as to whether the building was earthquake prone in the context of the earthquake, in the context of the Christchurch earthquake prone building policy. Our seismic assessment showed that the areas of the building having the highest risk of earthquake damage were the side walls and towers both in the longitudinal and transverse directions, that is along and across the building. This conclusion differed from the damage evident on site. Although the towers were damaged as expected the side walls had had, the side walls had little damage. There was also no permanent shearing of the buttresses where we expected load to be the highest. The weakest area of the building was the church, which was the church which had a transverse lateral load capacity of 10 percent of current code. That assessment did not take into account however the additional stability and load sharing ability provided by the gallery. Having regard to the limited damage that was evident in the church auditorium to the south, to the north and south walls, my view was that the gallery provided significant additional strength to the building".

Q. Mr Haverland I think it might be useful if we just work through some of these issues now. When you've said that the assessment didn't take into account the stability provided by the gallery, did you factor the gallery into your assessment at all?

A. Ah, we certainly did yeah, um, when we assess a building we need to take the weight of the building and apply the earthquake loads which are in proportion to that weight. The weight of the gallery was part of the load that was applied to the building but the beneficial effects of the gallery acting as a, as a diaphragm around that mid-height level was not taken into account.

Q. Okay, now maybe if I can get you to take us through the assessment that you did with reference to the plan which is 0013.132.

WITNESS REFERRED TO PLAN

Q. Can you just take us through your assessment in terms of the particular areas of strength or weakness in the church and the annex?

A. Um, sure, it's, it's probably most helpful if I outline this in the two principal directions so when we assess and design buildings we're considering an earthquake that goes across the building and then an earthquake that goes along the building. So across the building is the transverse direction and along the building is the longitudinal direction. Our report dated the 17th of February summarises the various lateral load capacities and we'll start off with the transverse lateral load capacity of the towers and so this is in the, in the north/south direction and they have a capacity of 17 percent in both flexure and shear. Now flexure is, is bending or rocking and shear is the ability of the structure to resist sliding, and it's also worth pointing out that when these structures bend or rock that is a like a good way of dissipating seismic energy. So you don't often get buildings that will simply fall over unless they break apart, so it's better that the buildings can rock back and forward and it's much less preferable for the buildings to break through and shear. Okay. So the, in the transverse direction, this is the north/south direction, the towers have a capacity of 17 percent of current code. The auditorium has a capacity of 12 percent in shear and 10 percent in flexure.

1520

The west wall auditorium, so this is the wall right in behind the organ had a shear capacity of 61 percent of current code and a flexural capacity of 87 percent of the current code and the west wall of the annex, so this is right down at the west end now, has a shear capacity of 51 percent and a flexural capacity of 59 percent. So already we're saying that the building is very strong down at the west end and not as strong down at the east end, but the towers were the two stronger elements of the building and yeah, I'll talk about this a little bit later but there's obviously some load sharing going on between the tower and the side wall buttresses and we saw that that load sharing was occurring

as a result of the presence of the gallery floor. So that's the earthquake capacity in the north-south direction. When we look at the earthquake capacity in the east-west direction, so this is now the longitudinal capacity, the two areas that were assessed were the north side wall which had a shear capacity of 17 percent and a flexural capacity of 19 percent and the south side wall had a shear capacity of 15 percent and a flexural capacity of 20 percent. So they're very similar, those two values.

Q. Perhaps if I can get you to continue reading from paragraph 37 please?

WITNESS CONTINUES READING STATEMENT

A. We observed further damage, particularly to the north wall of the annex and increased cracking of the side wall buttresses that had occurred since the Boxing Day earthquake. I advised Arrow on the 16th of February that further damage would continue to occur as a result of ongoing aftershocks which could result in the building become unsafe. I advised that it would be necessary for additional temporary bracing to be installed to the north wall of the church as well as the west wall of the hall to provide longer term protection to the building and its contents in the event of significant ongoing aftershocks. To be clear this work related to longer term protection of the building, I did not consider that the building was unsafe for short term access. My view was that it still had a low probability of collapse during an aftershock, particularly the nature of aftershocks that were being experienced. I did not consider that additional propping would be required for the organ removal. The proposed bracing to the west wall of the hall was outside the area of occupancy and the north wall was not considered to be a high risk of collapse in the aftershocks that were being experienced at the time. Tim Fahy contacted me on the 10th of February 2011 after receiving an earlier draft copy of my report dated the 17th of February 2011 and asked about my conclusions and whether it was appropriate for the organ removal to proceed. I discussed my conclusions with Mr Fahy. I pointed out that the building had performed well and beyond expectations during the September and Boxing Day earthquakes, apart

from the east wall and the towers which were braced it did not show significant signs of collapse under the lateral loads associated with the aftershocks that were being experienced. The assessments of this level of analysis are typically conservative. The calculations used for the building assessment are for a 50 year design life with crowd loadings and there are other redundancies in the structure which were not taken into account in the analysis which would have provided significant improvement in stability such as the gallery floor at mid-height and the steel roof ties.

EXAMINATION CONTINUES: MISS SMITH

Q. And is that what you were talking about before when discussing the particular percentages that you had –

A. Yes.

Q. – reached?

A. Yes. I mean understandably as soon as you see 10 percent of current code that raises alarm bells and it's probably worthwhile me just explaining you know the differences that we do experience many times with, when these buildings are assessed in theory and how they actually perform in reality. I know of a building that I was involved with which was strengthened to I think 62 percent of current code and this is back in the mid-1990s. That building had been through this particular earthquake and as best as we can determine this earthquake was about a two-thirds of code load, so it was quite a significant earthquake that would have exceeded the design load for this particular building that I had been involved with and when we say the load was exceeded, that does mean substantial damage would have occurred to the building so it's not just a few cracks, it's like really getting into quite a significant damage state and that particular building I know of people who went into the building afterwards and said that there wasn't any cracks in the building, so that was following the September 4 earthquake. I'm also aware of another building that we had assessed. That building has since been removed now but that was assessed as having a strength of

10 percent of current code and that went through the September earthquake and the February earthquake and remained standing, so I mean we try and be as accurate as we can with our assessments and, you know, I do believe that they are conservative for these old buildings but in many cases we find that the building capacities are well beyond what they're assessed at in theory, so that, I guess that just gives some context to you know when we said the building was 10 percent code and it's been through an earthquake that was up at two-thirds code, you know, the questions often get asked well why hasn't it collapsed and in theory it should have.

Q. And what you're saying though is that, are you saying you took into account obviously those assessments and the code that you were required to assess against, but that what you're saying is that there was particular elements of this building that you thought provided some additional strength to it?

A. There obviously was. I guess a couple of other things that I should point out, we were using the Csock guidelines dated 2006 in carrying out this assessment. We were typically getting shear stress capacities of the mortar of anything from you know 25 to 45 kPa and I know historically in the past when we would assess buildings like this we've used figures of around 70 kPa so there may well have been a, you know, quite a difference in the shear capacity values that we're using today which may, I mean they may be much more conservative than what has been used in the past.

Q. And so when you say in the past, that's obviously before the 2006 guidelines (overtalking 15:28:04)?

A. Oh yes, yeah.

Q. If I can get you to continue reading the final paragraph, which is paragraph 40.

WITNESS CONTINUES READING STATEMENT

A. My view remained that it was appropriate to use a risk factor of .5 for construction loads as these were appropriate for short term access. This would also be consistent with the propping design carried out by

Dick Sullivan. A risk factor of 1.3 would have assumed full use with full occupancy for a 50 year life. In assessing the risk involved with contractors being on site at this stage was appropriate in my view to scale these figures to take account the factors referred to in AS/NZS1170.2002 such as the limited access. In that sense it would have been possible to scale the figures in relation to contract a short term access from 10 percent to 26 percent or in the case of the west wall adjacent to the organ, from 87 percent to 226 percent.

EXAMINATION CONTINUES: MISS SMITH

Q. Just one final point. Peter Smith I think refers to the fact that the whole building might have been stable under gravity load, but he says that the lateral stability of the building needed to be considered. Did you give consideration to that?

A. Yeah, we did give consideration to that. I mean you know there were many parts of the building that were still in good condition. I mean it's unfortunate that when we write our reports in terms of damage assessment and repairs, we're highlighting everything that has gone wrong with the building. We're just not pointing out the items that are still good about the building but in walking through the building you know we sense that there were many aspects of the building that were still in good condition. When – we also considered the damage that had occurred to the east end of the building and that was still stable and it continued to remain stable for a period of two months between when the September earthquake struck and when the propping finally went in on the 4th, or early November, that area had remained stable and the other parts of the structure in our view had not approached that condition in terms of degradation.

COMMISSION ADJOURNS: 3.31 PM

COMMISSION RESUMES: 3.46 PM

CROSS-EXAMINATION: MR ZARIFEH

Q. Mr Haverland were you aware of Mr Sullivan's report I think dated 15 September?

A. No I wasn't.

Q. That wasn't provided to you at any stage?

A. No.

Q. In that report he noted cracks to the north and south walls between the, he said, "Extensive cracking in the walls between the buttresses." Did you note that?

A. There was cracking in the buttresses themselves which we observed. There was no cracking to the inside face of the walls that we observed.

Q. I'm talking about the exterior.

A. The exterior – only cracking to the buttresses, yep.

Q. What about between them?

A. No didn't observe any cracking between the buttresses.

Q. Well he was of the view that there should be a tie between the north and south walls.

A. Mmm.

Q. And you disagreed?

A. Yeah I would disagree because the building was already well tied together both at the roof level because the timber trusses had a steel tie that ran between them –

Q. Between them, yep.

A. – and at the gallery level as well. So in my view the building was already well tied together.

Q. The gallery though was u-shaped, am I right?

A. No I don't believe it was. It certainly went right along the north side across the east end and then back down the south side and then it stepped down and then it came back up again. So it was, in my view it was a complete doughnut. It was, it was circular.

Q. So providing connections at each end?

A. Yeah.

Q. So was it above the organ at the west end?

A. The organ seemed to, well it formed part of the platform so I mean you did step down from the gallery down to where the organ was and then back up to the other side.

Q. Right. But would that provide connection at that end in terms of strengthening?

A. Yes it would, yep.

Q. But not as much as the other end?

A. It would be close to what the other end is. If you look at, that plan does actually show it coming right around.

JUSTICE COOPER:

So that's the plan with the suffix 132.

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. And you concluded that the majority of the damage to the building as a whole was to the church. Correct?

A. Primarily at the east end of the church, yes.

Q. If the east end of the church collapsed in an earthquake wouldn't that compromise the roof and potentially the other walls, the side walls?

A. Not necessarily, no.

Q. But it could do?

A. It's, it's possible but most of the failures we have seen with these buildings have been one wall completely falling out and, you know, a lot of the roof structure can and does remain in place.

Q. But you saw the danger area, if I can put it that way, as the east end?

A. Yes, yeah.

Q. But you thought if that wall collapsed, it, it would fall outwards?

A. Mmm.

Q. Did you give any thought to what might then happen to the other walls and the roof?

A. Well the east end was propped so that had been stabilised.

Q. Did the propping, was the propping effective in the February earthquake though?

A. No it wasn't effective and we've got photographs of the building after the February event and the, the whole building had, had shattered basically into stones and, you know, my view is that no amount of propping –

Q. It wouldn't make any difference?

A. – would have, would have saved that building in that event and part of the reason I think is because we had such enormous vertical ground accelerations.

Q. In February, I think the 16th of February your letter –

A. Mmm, yep.

Q. – you mentioned in that that there should be propping or steel ties presumably between the north and the south walls?

A. No, in that letter we mention that additional propping would be required if they were to keep the building and do something with it in the future.

Q. Right so, and I think you're right, propping was to the north wall in particular you're talking about?

A. Mmm.

Q. Because you'd seen reasonably extensive cracking to that following Boxing Day hadn't you?

A. Yeah the cracking on the north wall had got worse since Boxing Day.

Q. So just for people to, you know, lay people to understand, why would you recommend bracing of the north wall when you saw that cracking but only as a long-term measure to protect contents and not put bracing in when you're considering propping for people to go in for two or three weeks?

A. Yeah, our view of this building is that it had sustained damage in the September event. The Boxing Day event added to that damage and if we were to have left the building there long term and the February event hadn't have happened but we had of got continued aftershocks then I, I believe we would have seen, you know, gradual and progressive breakdown of the building and at the time that we were working our way

through the reports it was still undecided what the long-term future of the building would be and the letter of the 16th of February it, it certainly wasn't to highlight that, hey, the building's unsafe now we shouldn't go into it anymore, it was to highlight to both Arrow and the building owner and the City Council that, look, you, a decision needs to be made on the future of the building so that more measures can be put in place to protect it long term.

Q. I understand that but my question is simply if that was to protect contents long term –

A. Mmm.

Q. – surely when your mind's directed to a situation where you've got an unsafe building, it's been red-stickered –

A. Mmm.

Q. – you're in an aftershock zone, people are going to go in for two or three weeks –

A. Mmm.

Q. – probably for long hours from the sound of it –

A. Mmm.

Q. – and potentially be exposed to significant aftershocks –

A. Mmm.

Q. – why would you not prop the north wall because of the cracking that you'd seen then, or recommend it, but you would long term? Weren't the aftershocks decaying? Isn't that the understanding?

A. Well they were decaying but –

Q. Decreasing?

A. Yeah, I mean the, the normal pattern of aftershocks is that after a large earthquake you get the aftershocks and they do decay away but we had been advised late in November that, you know, the aftershocks could continue for quite some time, longer than expected after a normal event.

Q. How – could you properly assess the risk and what was required to try and mitigate that risk in terms of things like propping without knowing the strength of the building?

A. Well it's, I mean the assessment that we did initially was a, was a qualitative assessment based on the performance of the building, the damage we had seen and the other parts of the building that were still in good condition including the area that they were going to access. So that, that's really the basis of giving our opinion on whether it was acceptable to access the building to remove the contents.

1555

Q. Right, but it wasn't until February from the sound of it that you were able to actually work out the strength of it?

A. That's correct, yeah.

Q. And then that's when you found out it was as low as 10 percent?

A. Yes.

Q. Or perhaps even lower because of the damage?

A. Ah, that is correct, yeah.

Q. Right, but that still didn't concern you when you found that out in February?

A. Um, it did not alter our opinion of the building in terms of how it had performed in September and how it was continuing to perform in the ongoing aftershocks.

Q. So it didn't worry you as to its capacity to withstand a significant aftershock?

A. Well we were experiencing significant aftershocks and the decay of the building, was, was only gradual. It was something that was able to be monitored and that's why each time we went back to the building we identified the risks that we felt were appropriate of the building and put in protection measures in place to mitigate the risks.

Q. Okay, you would have heard probably in opening when I mentioned a report from Mr Sullivan in September 2009?

A. Mhm.

Q. When he said that a moderate earthquake in his opinion a moderate, moderate earthquake would collapse all three of the parts of the building?

A. Mhm.

Q. Would you disagree with that?

A. Ah, no I would've made the same statement if I was writing a report based on earthquake prone building.

Q. Well this was an earthquake prone building back in January/February wasn't it?

A. Ah, yes. Yeah.

Q. But then you confirmed that when you calculated its strength didn't you.

A. Yes, yeah.

Q. So in a moderate earthquake it could all collapse?

A. Um, yeah but we, what we had was two times a moderate earthquake and it did not collapse.

Q. Right.

A. So –

Q. But you're, you said you would have agreed that a moderate earthquake could have collapsed it?

A. On the basis of the theoretical –

Q. And already had.

A. – assessment was done yes.

Q. So did that not concern you then when you actually worked out the strength?

A. Um, no, no it didn't because it didn't change our perspective of the building in terms of, in terms of the damage that had occurred to the building and how well it was standing up.

Q. Okay so the theory was that it, a moderate earthquake could collapse it?

A. Mhm.

Q. Because we're talking about brittle buildings aren't we?

A. Yeah.

Q. There's not a lot of give in them is there when they reach a certain point, when the earthquake forces reach a certain point?

A. Yeah, I mean there is a certain amount of, um, sliding and flexing that can occur, um, but essentially they are, they are significantly more brittle than a steel building or a reinforced concrete building that is true.

Q. Well hence the conclusion that a moderate earthquake could collapse the building?

A. Mhm.

Q. Right. Okay, so the propping, do you think that Mr Sullivan's propping suggestions were more conservative? Would that be fair?

A. Um, yeah they could be regarded as more conservative yes.

Q. Okay, and did you give consideration to applying a more conservative mind to the issue, or not?

A. Um, I, I believed at the time that we had taken adequate precaution in terms of what we were doing.

Q. Okay. We heard from Mr Fahy that the loss adjustor requested a review of Mr Sullivan's propping, the scope of his propping –

A. Mhm.

Q. – detail. Were you aware of that?

A. Ah, I, I was aware that, I mean Tim had asked us to carry out a review and I, I can't remember the reason why the review was being carried out. I knew that Tim had told me that Mr Sullivan had been involved with the project, had designed some propping and could we review it and we were going to carry on with the project.

Q. Okay so did you understand there to be any cost issue with the propping that was proposed originally?

A. Um, not that I recall no.

Q. And was that, there wasn't any pressure on you to try and cut the cost down?

A. I, I certainly didn't feel pressured to cut cost down no.

Q. What protection was there for the workmen that would have been in that building –

A. Mhm.

Q. – if there was a moderate earthquake and the building collapsed?

A. Um –

Q. In terms of the plan or thinking of, safety thinking in terms of the operation?

A. Yeah, I, I mean to me that is considering an extreme event of if the building were to collapse while they were in there and we did not regard that as being a likely event in the relatively short time that people were going to occupy the building for.

Q. Did you consider it as a, in terms of the risk assessment did you consider it as a possibility though?

A. The main risk that we identified were individual stones that might fall out –

Q. I understand that –

A. – from the building.

Q. But you agreed with me that a moderate earthquake could collapse that building?

A. Mhm.

Q. Did you consider the likelihood of that in your risk assessment?

A. Ah, we considered the likelihood of that was very low.

Q. All right and the risk factor you talked about, did you then apply that to that, that risk?

A. Well no the, the risk factor is appropriate for short-term access into buildings. I mean this is one of the things that we're having to grapple with in terms of you know what do you account for when you allow people into buildings for short-term to recover items and you know as engineers we're working with you know high risk factors for crowd loaded buildings and lower risk factors for short-term access.

Q. I understand that but I'm not sure how you compare the risk when there's full occupancy?

A. Mhm.

Q. Presumably that's in normal times?

A. Yep.

Q. Or are you talking, because here you're talking about a building that was red stickered?

A. Mhm.

Q. By the Council declared to be dangerous or unsafe?

A. Mhm.

Q. And you're in this aftershock zone you know –

A. Mhm.

Q. – relatively close to the September earthquake?

A. Mhm.

COMMISSIONER FENWICK:

Q. Can I just add one question or point there? You talk about this risk factor which I would take in terms of 11/70 as the return factor which for earthquake prone building typical buildings we've been looking at the earthquake prone level was taken as one third?

A. Ah, yes earthquake prone buildings are one third.

Q. And in your calculations you were using, you were assuming a half?

A. No, no. No. When we assessed the building for its strength we used the risk factor of 1.3 which was appropriate for a crowd loaded building for a life of 50 years. That's what our assessment was based on because that's what we had to upgrade the building to if it was going to be retained and strengthened.

Q. Right so you've taken this up to 1.3?

A. Yes.

Q. But then the requirement in the code for 33 percent of code loading will correspond then to .5 over 1.3 wouldn't it?

A. Ah, yes, yes it would, that, yeah, that is correct, for – and that would be appropriate for short-term access.

Q. So in fact you were in your risk assessment you were actually going above the level for what would be a client defined as an earthquake prone building?

A. Um, well, yeah, that, that is true but, um, you know there's no, there's no rules or guidance around you know what level does your building have to be at to allow short term access.

Q. Of course, I'm just trying to set it in context?

A. Yeah, no, the point that you make is true yes.

Q. Thank you.

CROSS-EXAMINATION CONTINUES: MR ZARIFEH

Q. And you didn't see any difficulty then in the context of this exercise, risk assessment exercise that it was red stickered in, in that aftershock zone?

A. Yeah, I – if I can try and explain it another way to put it in its context. If, I guess if we were to have a normal building here with a risk factor of 1 and people have been occupying the building for the life of the building which is say 50 years and then we say, "Okay we've had an earthquake we've got some damage, should we allow people back into the building for short-term access?" Then to me it would be appropriate to take that risk factor of 1 and bring it down to .5 which means we could have sustained 50 percent damage to that building and still be living with the same risk as being occupying the building for 50 years so that this is the process that we're going through in order to –

Q. Okay and –

A. – determine the risk associated with going into these buildings.

1605

Q. And do you think that that same exercise can be applied to a substantially damaged unreinforced masonry building which is clearly earthquake prone?

A. It depends what the extent of the damage is, yeah, but based on the assessment that we did of this building with the damage being located at one end of the building and us going in at the other end of the building. I think that risk assessment process was appropriate.

Q. Did you take any linings off to look at connections. The building we know was built in three parts wasn't it?

A. It appears so, yeah, yeah – the hall, the church and the west annex.

Q. Did you look at any of the connections between walls and ceiling, roof sorry and floor – those three parts?

A. The building is plastered stonework so, you know, the bones of the building are visible and you can see the structure, you know, directly. The key areas for us were areas like the roof trusses that framed into the side wall buttresses and we did not see any sign of movement at

those locations. The other key area is the mezzanine floor beams that framed into the side wall buttresses and, you know, what we saw in those locations was the ornamental corbel had sometimes broken right off and sometimes had spalled but we never saw any locations where the rafter had pulled out from the side wall so from our point of view it was still quite well tied in together.

Q. What about the wall between the western wall of the church, so between the church and the annex. Did you take any linings off there?

A. Most of that was exposed as well.

Q. What, it was stone?

A. Plastered stone, yes.

Q. So that bracket or brackets that you directed to be put on to the roof trusses. Were the roof trusses connected by a horizontal piece?

A. No, the roof trusses are framed up and then back down onto the far wall.

Q. So if there was force applied to that, longitudinal force, in the east-west direction rather, there's nothing stopping, it's just like an apex is it without a horizontal join?

A. It is like an apex, yeah. That photo doesn't show it.

Q. Well perhaps the one of the connection which is 0013.72. So what's the horizontal piece of timber that we can see there?

A. I think that that is just a ceiling batten. I don't recall that as being part of the truss.

Q. But the roof trusses are not joined to that. Doesn't look it from the photo does it?

A. No, no.

Q. And do you say that this plaster wall you removed some of the plaster or not?

A. No we didn't remove any plaster from the plaster wall.

Q. Did you give consideration to an earthquake coming from either direction, from north/south or east/west?

A. Yes.

Q. And the different elements of the building and the damage that you'd seen didn't concern you in that regard?

A. No not for short-term occupancy. I think it's worth making the point that in the longitudinal direction I don't believe there was any breakdown of the structure based on what we observed and we still had pretty much full lateral strength in that direction. We also had the benefit of the bracing that was installed at the east end and we had assessed the building in that direction at between 17 and 20 percent and that would translate to about 50 percent if you take into account the risk factor.

Q. Do you agree with me though that, although we'll never know, the more conservative approach would have been to put propping on all four walls, including the west wall of the hall and annex, so that the whole building was propped at least?

A. I can't deny that that would be a more conservative approach but, you know, we were doing what we believed was realistic and necessary without, you know, going well beyond what we thought would be realistic.

Q. And there wasn't any pressure not to apply a conservative approach?

A. I certainly, I mean, you know, Arrow and us have worked closely together. If we feel very strongly that something should be done then Arrow would be right in behind us to do that but it was our genuine belief that what was provided was adequate for short-term access.

Q. Have you read the report from Peter Smith?

A. No I haven't.

Q. You haven't?

A. No.

Q. We'll hear from him, but don't know if I'm being fair but I think the impression I get from him is that there wasn't a conservative approach to the building and I understand what you're saying and your reasons and your thinking. Even when you got that strength assessment in February, 10 February, or whenever you first drafted it, you heard Mr Fahy had concerns and spoke to you again. That didn't cause you to reconsider?

A. I guess we'd had the benefit of having assessed many buildings in the past and seen buildings go through earthquakes and observed how well they've performed, you know, this one has gone in the reverse order in that we've seen it perform and then we've assessed it so our conclusions were that the building must have been significantly stronger than what it was assessed at and we can point to some things that would show that or that would be realistic to indicate that but I don't claim to know every single thing about these buildings.

Q. One of the things that you mentioned a few times in your brief as a factor mitigating the risk was to get across the point that there should be the minimum number of people involved?

A. Yeah.

Q. Did you see that as quite a strong factor in the exercise?

A. Well I come back to the point of this .5 risk factor which is allowing for small numbers of people for short periods of time, even 10 people for three weeks in my view is still a short period of time compared with a six month window that this particular clause allows for and still a very short period of time when you are considering earthquakes of return periods of 500 and two and a half thousand years which is the earthquake that we got on February the 22nd.

Q. Except that you wouldn't be comparing it to full occupancy of a red stickered building would you?

A. No but then it comes back to, you know, we could have accepted exactly the same risk profile if there was 50 percent damage to the building.

Q. You said that you gave consideration to some kind of steel tube or cage arrangement?

A. I didn't.

Q. You didn't?

A. No. I think that was from Tim's evidence. When I was on site with Tim we spoke about protection for people as they come out of the building and the main risk was individual stones that might dislodge if there was

an aftershock and those protection measures were put in in the form of scaffold.

Q. I understand that but the cage type arrangement would be for while they are inside if it was going to be put in?

A. Yeah.

Q. Did you say he didn't talk to you about that at all?

A. No I don't recall talking to Tim about that.

Q. Clearly if he was talking about that or thinking about that that was obviously addressing the issue of safety once in the building?

A. Yeah.

Q. You didn't ever do that?

A. Well no. I mean the main risks associated with people being in the building were not things falling on them while they were in the building.

Q. No, the main risk in the building would be a risk from collapse?

A. A total collapse, yes.

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CROSS-EXAMINATION: MR ELLIOTT

Q. Mr Haverland, one issue on the minds of the families of those who died is really how was the extent of the risk assessed and you have given some very detailed evidence so far in answering quite a few questions on that. I'm not going to ask many more questions, just really to try and enhance that understanding a little more. You – am I right in saying that you reached your decision about the risk by reference to this hazard analysis and allocation of a risk factor and I think you refer to that in paragraph 21 of your statement. That is the place where people could go back to and read to understand that.

A. Yes.

Q. Is that right?

A. Yeah.

Q. And secondly am I right in saying that there was what appears to be an underlying assumption which you refer to at the end of paragraph 18 of your statement that based on the performance and the damage of the

building so far, it collapsed during a further aftershock was unlikely. Well they're the two main frames of reference in your mind were (overtalking 16:16:33) –

A. Yeah they certainly were from our point of view.

Q. Just briefly in relation to the first of those two that the hazard analysis and allocation of a risk factor which is referred to there in paragraph 21 of your statement. You've referred to a standard?

A. Yes.

Q. Am I right in saying that that standard contemplates that particular buildings should be able to or should be built to sustain different levels of force?

A. Yes.

Q. And are you distinguishing between buildings which may have a longer life and/or higher occupation?

A. Yes.

Q. And they would be designed and built to withstand higher forces. Is that right?

A. That is correct, yes, yep.

Q. And you've distinguished between those and a building in which there may be temporary propping and/or construction and that would have a capacity to withstand a lower level of forces?

A. That is correct, yep.

Q. And that is the figure of .5 which you adopt. Is Mr Smith right in saying in his report that the propping was designed with a risk factor of .5, effectively half of current code? Is the risk factor of .5 equivalent to half of current code?

A. It is, that is correct and that is appropriate for short term occupancy or short term duration and the reason for that is because the likelihood of a large earthquake striking the building while it's being constructed over that short period is much less than if the building were to be there for 50 years or 100 years, so it's really looking at the likelihood of an earthquake striking the building in a very short period of timeframe.

Q. So was it your assumption or your determination that this building should be able to withstand an earthquake at .5 of the level of current code?

A. No, no.

Q. Can you explain?

A. The building is earthquake prone so it is less than current code, well in fact it's less than one-third of current code. That's the state of the building. Sorry, I'm going to need you rephrase the question so I can explain.

Q. Well maybe I can ask a different question. It's inherent in this thinking is it that there is a nominated figure of strength which a building can bear and that you, or assuming a nominated figure of strength that this building would have?

A. No, no, that's not the case. No what I'm comparing is the risk associated with 300 or more people occupying the building for a period of 50 years and comparing that with the risk associated with 10 people being in the building for less than six months.

Q. But is it inherent that you were contemplating that this building should be able to sustain earthquake forces at a particular level?

A. No, no, it's associated with the likelihood of the earthquake striking the building over that shorter period of time.

Q. Correct me if I'm wrong, I'm treading water a little here.

A. Yeah, yeah.

Q. But you were making an assumption about whether there would be a particular level of earthquake at that site?

A. The levels of earthquake that we were typically experiencing at the site, the building was performing adequately for that. So there was no issue in our view of the building continuing to perform under the aftershocks that were typically being experienced. However the likelihood of a much larger earthquake striking the building and collapsing it over that short period of time is a much lower likelihood.

Q. Right, that answer seems to address the second of the two tests that I asked you about, namely performance in the earthquake so far, but do

you say that answer ties back into your assessment of the risk factor of .5?

A. No, I'm not understanding sorry.

Q. Well I maybe the only one in the room, but I suppose I'm just asking you to explain if you can in lay person's terms exactly what your reasoning was in adopting this risk factor of .5. Can you explain what it means to people?

A. In adopting the risk factor of .5 we are taking into account the very short amount of time that people are in these buildings.

Q. I see. So it assumes that there is a risk of being in the buildings at some level?

A. Yeah, and there is always a risk.

Q. But that –

A. I mean there was always a risk with people being in the building for the previous 20, 30, 40, 50 years and we're making a comparative risk with that.

Q. And are you also saying that your thinking incorporated an assumption about what that level of risk was going to be within that period of time or were you just focused on the time?

A. The risk, but the risk is associated with a few number of people being in the building for a short amount of time.

Q. That derives from the standards that you referred to?

A. Mmm.

Q. Do those standards so far as you're aware apply in the context of an aftershock sequence?

A. I believe they do and the reason for that is because the February earthquake was so much higher than what we could normally expect, we've had a zone factor change from .22 to .3 so all the loads, all the earthquake loads in Christchurch have been increased by 36 percent. We've also had a change to the risk factor for serviceability limit state earthquakes. Now that is the return period associated with smaller earthquakes that might cause superficial damage to buildings, but we have not had a risk factor change for temporary works and short term

works, so in terms of the codes and what has recently come out, even now after February which was much more significant that September, that risk factor is still appropriate. Now it may be that engineers would want to reconsider the appropriateness of that risk factor after the February event, but certainly after the September event there was, my understanding is there was no question of it.

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Q. All right, well Mr Smith who's here might have some comments on this next question, but looking back on it, do you consider that the tool which you used, in this case the code, was the best tool for someone in that position to use or is there some other tool which would have been useful to you?

A. Look hindsight's a, a wonderful thing I know and I mean we've done a huge amount of reflecting on this because of the tragedy that's occurred but even looking back on it you know I was, I was comfortable with the risk assessment that was done of the building and the, and the method that we, the reasoning process that we went through to come to that conclusion. You know if we'd known that there was going to be this massive event that, you know, would have destroyed half of our city then, you know, we would have just vacated the place.

Q. So do you consider there would need to be any alterations to the code to have made it a more useful tool when considering a red stickered building?

A. Some guidelines is always helpful, otherwise, you know, it is often left up to the individual engineer to make their own assessments and we we've seen today already that does vary from engineer to engineer.

Q. And just, secondly, and briefly, on the second issue, that is, your comment in paragraph 18, "Based on the extent of damage and performance of the building I considered collapse during an aftershock was unlikely." I mean in fairness that type of assumption was not uncommon –

A. Mmm.

Q. – around Christchurch but the reasoning there is that because the building got through September and the aftershocks it will get through another of similar, magnitude isn't the right word obviously, ground accelerations?

A. Yeah, yeah. I mean September was quite a strong motion, long duration, sorry, yeah strong motion earthquake which had reasonably high ground accelerations for an extended period of time, 40 seconds that earthquake went for and when we, you know, considered the aftershocks that were happening after that time they were, they were lower in intensity and much shorter in duration. So they would have had a much lower effect on the building. One of the benefits about this building is that, you know, with the, with the ongoing damage that was occurring to the building we could actually see what was occurring to the building and, and monitor how it was going. So, yeah.

Q. Doesn't the fact that ongoing damage can be sustained undermine the sort of thinking that you're relying upon there?

A. I think that we would have got to a point where we would have said, look, you know, we've started off here, we're working our way, you know, with having some damage occurring there, there does need to be an end point and that was one of the reasons for writing the letter on the 16th of February to say, look, look once the organ is out then we need to reconsider what we do with this building.

Q. And doesn't that assumption that you've referred to paragraph 18 also sort of not take into account the possibility that an earthquake can produce the same level of ground accelerations but have different effects on a building if it's from a different direction for example or duration of shaking?

A. Yeah absolutely. Direction is a factor and different buildings were affected in different way because of the direction of the earthquake. I mean we, we considered both directions.

Q. Which you have said earlier.

A. Mmm.

Q. All right and obviously we've had a lot of information today and my question really is, looking back on it do you think that there was more scope for perhaps explaining some of these risks that you've identified yourself but perhaps not told Arrow or the company or the workers about, more scope so that people can understand the risks themselves and make their own decisions about whether to go into buildings like this?

A. Yeah. I, I think I explained everything as best as I could to Arrow. You know I do remember after the 10th of February meeting that we had on site with the City Council staff both Tim and Judith came back to our office and we talked through this whole issue. So, you know, I think that there was a, a, a, from my point of view I, I really felt that I'd given them a comprehensive understanding of, of what was going on but, you know, in the context of how Christchurch was operating back, back then we had, we had got through the September earthquake, we had got through a significant aftershock in Feb – in December and, you know, a lot of people were very pleased that they were able to get on with their lives and, and get things back together. You know the, the expectation of such a significant and devastating earthquake coming at that time was, it was just very unexpected.

CROSS-EXAMINATION: MR LAING

Q. Mr Haverland just one question. You refer to your letter of 16th February.

A. Mmm, mmm.

Q. I take it that you didn't send it to the Council did you?

A. No I didn't because all our correspondence was being handled through Arrow.

Q. Yes.

A. Yep.

RE-EXAMINATION: MISS SMITH – NIL

COMMISSIONER FENWICK:

Q. Just one or two points. We were told earlier on that, if we could have 0009E31. That shows a sketch connecting the outside western wall to the floor. Were some details like that used to actually connect that wall or, this was a sketch from Sullivan. Was that sort of detail used to connect the wall through to the floor, through to the, the, the west, the wall next to the, well the west wall and then through to the wall adjacent to the one with the organ?

A. No that detail has not been installed.

Q. What sort of connection was there between the floor in that annex to the two walls?

A. Yeah I, I suspect that it was the timber, timber joist and timber trusses that were housed into the stone wall in normal practice.

Q. Just buried in?

A. I suspect so, yeah.

Q. Yes okay. It looks as though Sullivan was not, Mr Sullivan was not prepared to rely on that, that connection.

A. Mmm.

JUSTICE COOPER:

Q. Do you agree with that?

A. That's likely to be the case, yes.

COMMISSIONER FENWICK:

Q. As I say he was taking a more conservative approach on that aspect. Whether that was justified or not we'll never know.

A. Well yeah I'm, if we continued down the path of strengthening the building –

Q. Yeah.

A. – then this would have been something that would have gone everywhere.

Q. That's right. Now your use of the risk factor, if I get this correct, you use that through 11/70 to calculate the, the forces for the period, you know,

define the response spectrum or in this case just for the fundamental period. Now you'd use that just for calculating the forces on the propping you were designing, not the building as a whole?

A. We, we -

Q. Is that my understanding?

A. Sorry we had not designed any propping. The propping was designed by Dick Sullivan and I understand that the risk factor of .5 was used for the design of that propping.

Q. Right so that was on the basis he used, not on the building as a whole?

A. No.

Q. Okay.

A. No.

Q. As you're quite right then that does not give you an idea of what the strength of the building was because it was not all propped.

A. Yes.

Q. Good. Thank you for clearing that up. Can we have, sorry, can we have BUI0013.72. This, this was a picture we saw before and it was explained by the people from Arrow.

A. Mmm.

Q. But the cracking was just in the plaster.

A. Mmm.

Q. And they really didn't know what was below it. Now my question to you then is, on the other side of that wall which is the wall adjacent to the, sorry on this side of the wall because the other side was the, the organ –

A. Yes.

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Q. – was there any attempt to remove that plaster and see what the damage was to that wall because we were told it could have been hidden by that plaster which I'm not sure if you'd agree with that. But I was wondering was there any attempt to sort of actually take that plaster off and see what the state of the stone work was in that wall?

A. Ah, no there wasn't and generally we have found that as soon as these stone, these plastered stone or brick walls start to crack it's reflected straight through in the plaster. It's not like there's any sort of flexible membrane over it that might conceal it so I mean we're, we're of the view that in terms of what you see on the plaster is, is, is what you get but in some cases it's of an exaggerated form because the plaster can spall off as opposed to just mimicking the crack.

Q. Yes. That sort of raises the issue, I mean I agree that the indication there wasn't appreciable cracking there because you would have spotted it?

A. Mhm.

Q. Indicates the wall was probably quite good state all except for this location where we can see there's quite a major crack there which implies perhaps do you think that there might be a major crack in the wall at that level?

A. Yeah, I don't believe that there were any major cracks in this wall. The wall is actually quite well restrained by the gallery floor on one side, the annex floor on the other side, the annex roof on that side and then the main roof on this side. So there were, there were multiple points of restraint of this west wall. In terms of face load you know I, I think this was one of the safest walls to be in.

Q. Can you explain the origin of that crack then if it wasn't a crack through the wall?

A. I, I suspect that the crack maybe a result of the timber truss just trying to dislodge itself out of the wall and it's just taken a little bit of maybe the stone work or the plaster work with it when it's tried to do that.

Q. Do you sort of now think in retrospect it might have been an idea to have removed that bit of plaster so you could actually see what happened to the stone wall?

A. Um, yes I could've but I don't think it would have changed my conclusions about the building.

JUSTICE COOPER:

Q. Your last answer didn't really respond to the question Mr Haverland, which was whether in hindsight it would have, you think it would have been a good idea to remove the plaster, you said, “I could have” but –

A. Mhm.

Q. – the question was would it have been a good idea to do it?

COMMISSIONER FENWICK:

Q. The crack looks as though there's an indication of, a possible indication there's some distress in that wall. Maybe it only moved a bit of movement but a bit of movement of course in that wall does imply some appreciable deterioration which might indicate deterioration elsewhere. That's why I’m wondering just in retrospect whether one perhaps…?

A. Um, yeah, yeah, it’s probably a good idea to remove the plaster and examine the cracks.

Q. Now you reviewed the propping produced by Mr Sullivan and the propping to the west wall you decided was unnecessary?

A. Yes.

Q. Did you go back to Mr Sullivan and discuss the reasons of why he might have put that propping in? And perhaps also why he had detailed this connection between the wall and the, the floor that we saw before?

A. Yeah, I, I must say I was not aware of that connection detail that was shown on the previous slide. That's the first time that I’ve seen that, um, and no I didn't talk to Mr Sullivan about the propping on the west side of the building.

Q. So again in retrospect do you think it would have been wise if you’re checking someone else’s work and they have done something specific, do you think it might have been a wise precaution to have gone back and actually talked to him and say, “Now why did you put that in because my estimate says it doesn't need it but why did you put it in?” so that you could –

A. Mhm.

Q. – check, check why he put it there and perhaps there was some feature probably not but some feature you hadn't spotted?

A. Yeah. That's a fair comment yes.

JUSTICE COOPER:

Q. Mr Haverland I'm not sure if I understand this risk factor notion at paragraph 21. I understood you in response to a question that Commissioner Fenwick posed to you a few moments ago that you agreed that it was a factor to be applied with respect to temporary propping and construction works and in respect of those works rather than something which was applied to assess the strength of the building as a whole. Have I understood that?

A. Ah, yeah, look the factor is not applied to assess the strength of the building as a whole. What it, what it's dealing with is the comparative risk of many people being in the building for a long period of time and comparing that with a few number people being in the building for a short period of time. So that's the difference in the, in the risk factor and where it should be applied.

Q. Well what did you use it for?

A. Ah, we used it as part of the qualitative assessment to allow people to go into the building for short periods of time.

Q. But were you applying it in relation to any temporary works or am I still not understanding it?

A. No the, the – I, I guess in terms of the propping that was designed by Dick Sullivan a risk factor of .5 was used which we believe is appropriate.

Q. Yes, so it was appropriate in relation to the propping that had been done?

A. Yes.

Q. But as a tool to assess the strength of the building as a whole it was not useful or used?

A. No, no, no. It's not used for the assessment of the strength of the building.

Q. And in terms of its rationale it's an abstract concept in the sense as I think you said to Mr Elliott it's not one which might take into account elevated risks which exist during an earthquake sequence or during a series of aftershocks?

A. Um, I wouldn't describe it as a, as an abstract concept.

Q. Well it's – does its theory take into account the elevated risks which exist during an earthquake sequence or don't you know?

A. Ah, I understand that it does based on the codes as they currently stand.

Q. I see.

COMMISSIONER FENWICK:

Q. Can I just come back in there, now I've understood from what you told me that the risk factor was used by Mr Sullivan in designing the, the propping?

A. Yeah.

Q. Treating it as a temporary building which would have a risk factor of .5?

A. Yes.

Q. But that risk factor was not actually applied by you to the building or to the propping because you didn't design the propping so did you actually apply the risk factor to anything?

A. Oh yeah, we, we applied the risk factor of 1.3 when we assessed the building.

Q. But this was for the long term, because I mean the 1.3 implies there's a crowd in it, so that 1.3 was actually not applied to the workmen in the building because you knew there were only going to be a few people in the building and it was only going to be a short period of time?

A. Yes.

Q. So I'm at a loss to know how you applied this risk factor to anything unless you were doing an analysis to assess how the building could be upgraded in its permanent state to its final state when it was strengthened?

A. Yeah, ah, the, the risk factor was used as a, as a comparison with people being in the building long-term compared with people being in the building for a short period of time.

Q. You have said that the strength in the east/west direction I think was 10 percent of new building standard?

A. Yes.

Q. So were you applying that risk factor to 10 percent because the risk factor of course is written for temporary buildings and it's a .5 on a 500 year event?

A. Yeah, no the 10 percent relates to a risk factor of 1.3. If we were to convert that to a temporary situation –

1645

Q. You were saying, yes I know, but that's for new buildings.

A. Yes.

Q. I don't quite see how one applies a .5 to an existing building that has a strength which is 10 percent or less than the full code level.

A. Yeah –

Q. I think perhaps this may be a case where we should write to you and ask you to set it out for us.

A. Clarify it, yeah.

JUSTICE COOPER:

Q. But you can't do it quickly?

A. Well I just hope that we're talking along the same lines. When we assessed the building we assessed it as having a lateral load strength of 10 percent of current code. That was based on a full 50 year life with a crowd load which had a risk factor of 1.3 which was appropriate for a new building. Now if we were to strengthen this building to whatever percentage of code, we would use that risk factor of 1.3 because it's got more than 300 people in the building. So if we were to say look we're only go to into the building for a short period of time then you know we believe it would be legitimate to instead of using a risk factor of 1.3, to use a risk factor of .5 which means the 10 percent goes up to

26 percent, so it would be saying for short term access into this building the building is equivalent to 26 percent of current code.

COMMISSIONER FENWICK:

Q. I might come back to you.

A. All right, well –

Q. Let me search through the code and see if I can understand what you are saying. Thank you.

JUSTICE COOPER:

Q. Can I just ask you to have a look at what – part of what you said in your 17 February report which is suffix BUIDUR3090013 at 125. No, start at 124 please. This is a part of the report which is addressing seismic repairs and strengthening. Do you recognise it?

A. Yes.

Q. And in paragraph A you list there in a series of bullet points what repairs should be carried out to the building to reinstate it to its pre-earthquake condition. Is that right?

A. Yes.

Q. And then on the next page you deal with what's required to strengthen the building to 33 percent of code and under that strengthening to 67 percent of code.

A. Yes.

Q. Am I right, the only difference between strengthening to 33 percent and strengthening to 67 percent seems to be, and we need to go yet another page for this, the last item mentioned under 67 percent heading, which is new concrete skin walls to the annex.

A. Yes.

Q. But otherwise the prescription for 33 percent and 67 percent is exactly the same. Is that right?

A. It is, yeah.

Q. Now is that because the work which is described in each of the bullet points under the two headings may in fact be done more rigorously with

A. No generally for buildings that are earthquake prone there's a reasonable amount of work to do to get it to 33 percent.

Q. Yes.

A. And then there's a small amount of incremental work that's required to get it up to 67 percent and so what this is saying is that parts of the annex are already at 33 percent code, so it would only – well sorry the parts of the annex are between 33 and 67 percent code so the skin wall would needed to be added into the annex to actually get it right up to 67 percent.

Q. I thought that this particular report was dealing with the church and the annex isn't it?

A. It is yes.

Q. So does that answer still hold?

A. Sorry, does my answer still hold (overtalking 16:51:08)?

Q. Yes.

A. Yes.

Q. Well let's just look at one of these things for example, strengthening to 33 percent of code, talks about stainless steel wall tiles at 600 centres each way, drilled and grouted into wall and buttresses and it's exactly the same in both cases.

A. Mmm.

Q. So the only difference on the words used is that reference to the new concrete skin walls to the annex.

A. Yes.

Q. And that's what makes the difference is it?

A. Yes, it would be because all the work that's listed under item B strengthening to 33 percent code would also or could be upgraded to also give 67 percent of code. The only difference would be that concrete wall to the annex which would need to be added to get it up to that level.

Q. Well I thought that was one of the options I gave you was the explanation between the two, but – and you'd rejected it. So am I right

then that although the descriptive words are the same in both lists, the actual work involved might be more onerous in the sense of for example requiring bigger bolts or something, in the case of the 67 percent strengthening?

A. That would be appropriate, yes.

Q. Well is that the case, is that what this –

A. That is the case, right.

Q. Well then let's go back to the 33 percent prescription. What is said there amongst other things is install new fixings at roof truss locations, bolting right through buttresses, complete with rose-head washers, auditorium and annex. Do I take it that the existing fixings were in your view inadequate?

A. From a design point of view in terms of upgrading the building to 33 percent we would want to see a positive tie between the two.

Q. As opposed to?

A. As opposed to the connection that would already be there.

Q. So what was that?

A. The, typically these timber members are housed into the tops of, well are housed into the buttresses and the tops of the walls.

Q. But had you inspected those fixings on the existing structure?

A. Yeah, we had – certainly in the church auditorium we had viewed the connection between the two and observed that they had not moved, so we were satisfied that they were – that they had performed well.

Q. But does that mean that you had inspected the manner in which they were fixed?

A. Well you could only inspect the manner in which they were fixed by breaking it open.

Q. Which you did not do?

A. No we didn't do that.

1655

Q. And the next line says “install floor fixings complete with angle brackets and tie and rods each side of gallery floor beams to masonry walls.” So

in that case were you aware of the existing floor fixings and their state or is it in the same category of the previous item?

A. It's in the same category as the previous one.

Q. This was, these two parts of the structure were really what you were relying on, or let's, let's, yes really what you were relying on as elements which gave the building structural strength. Is that right?

A. Yes.

Q. And you were, you were inferring that from the lack of observed damage or movement at the places where they were attached. Is that right?

A. Yes.

Q. But in order to ascertain how they might perform and what contribution they might make to the performance of the structure in another earthquake it would be necessary for some sort of invasive investigation. Is that right?

A. In order to upgrade the building, yes.

Q. Well in order to observe what condition they were in against the possibility of another significant earthquake?

A. Well the, the condition of these connections after the building had been through the earthquakes was, was still good. That's what our observations on site –

Q. From a visual observation?

A. A visual observation on site, yes.

COMMISSIONER FENWICK:

Q. I think you might agree though, if you observed that the truss, probably, if the connections were good, would have quite some strength for outward movement of the walls but for inward movement of the walls it would have been no effect at all would it?

A. I would have thought they would have performed quite well in both directions.

Q. That is tied by a long, thin, presumably steel member between the two which would you not think came under compression. I mean the, it's

okay so long as there's sufficient gravity load on the top to keep it in tension –

A. Mmm.

Q. – but if it came under compression because of loading from the walls that member would go into compression and that was a long member and a very small member by looking at the pictures.

A. The, the, the main roof trusses consisted of timber, decorative timber trusses that sort of came down and off to the sides and then there was a short –

Q. Going to a single point at the top?

A. Yes.

Q. And tied together by something several metres long –

A. Mmm.

Q. – small diameter, hard to see it in the picture, 15 millimetres, 20 millimetres diameter.

A. Mmm.

Q. And you think that over several metres that would not have buckled?

A. It could have buckled under compression load.

JUSTICE COOPER:

Q. Did you following the September earthquake and indeed the Boxing Day earthquake I suppose, did you have an understanding what, what level of future earthquake were you, were you assuming when you gave advice in relation to this, this building?

A. It was the similar level of earthquake shaking that we had typically experienced over that period of time.

Q. So nothing, nothing more, nothing stronger than what had been experienced on, on Boxing Day?

A. Boxing Day was our, by far our strongest aftershock in the inner city as far as I'm aware.

Q. Yes. Can I just ask you to tell me about one other thing. If we can have a look at the photograph which is suffix 22.9. Now if we can just enlarge the top photo. This is a police photograph taken sometime after the

22nd earthquake. Just, just looking down on the Church part of the site. Am I right did you go to the property after the 22nd of February?

A. It was the first property that I visited straight after the earthquake, yes.

Q. And am I right that we can see the reinforcing there remaining that was, that was, that had been applied to the eastern wall?

A. That is correct. Yes.

Q. Thank you Mr Haverland. We may come back to you about the, the manner in which you calculated the, the safety factor and what role it may have played but that will depend on what we think.

A. Okay.

WITNESS EXCUSED

JUSTICE COOPER ADDRESSES MR ZARIFEH

MR LAING CALLS

STEPHEN JAMES MCCARTHY (SWORN)

Q. Your full name is Stephen James McCarthy?

A. Yes it is.

Q. You have previously given evidence to the Royal Commission?

A. Yes I have.

Q. Could we start reading your evidence at paragraph 6 please.

WITNESS READS BRIEF OF EVIDENCE FROM PARAGRAPH 6

A. "Events between 4 September 2010 earthquake and 22nd February 2011 Earthquake. On 5 September 2010 a level 1 rapid assessment was carried out and the building was issued with a red placard. On 5 September 2010 a level 2 rapid assessment was carried out and the unsafe red posting was confirmed due to substantial structural damage to the building. On 11 October 2010 Tim Fahy, a project manager from Arrow International, emailed the Council with plans for temporary propping of the building. These plans had been prepared by R D Sullivan, a CPEng civil and structural engineer. Mr Fahy's email advised that tenders for the propping work were to close on that day. Council records indicate that extensive shoring works were in place by 25 November 2011.

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Further correspondence was received by the Council from Tim Fahy on 23 November 2010 setting out proposed work in relation to the removal of stained-glass windows and the removal of the organ. The Council replied by email on 30 November 2010. The email advised Mr Fahy that resource consent would be required for the various works set out in his email including retrospective resource consent for some work already carried out. On 1 December 2010 approval was given for the removal of the stained-glass windows and work was to proceed the following week. On 21 January 2011 Council followed up with Tim Fahy to check progress on the application for resource consent for retrospective works and the removal of the organ (Annexure "C").

Council staff attended an on-site meeting on 10 February 2011 with Arrow International staff to discuss the proposed works from a heritage perspective. Tim Fahy provided the Council on 11 February 2011 with information related to the removal of the organ from the building. The organ removal outline methodology provided to the Council by Arrow International refers to the identification of a safe passage out of the building. The methodology states that the most efficient safe passage out of the building has been identified as out through the Aldersgate atrium. This passage is marked on the attached site plan which also indicates that temporary fencing was in place around the outside of the building. On 15 February 2011 the Council provided conditional approval by email for the removal of the organ before a resource consent was granted. Approval was given on the understanding that a retrospective resource consent application would be made no later than 1 March 2011. The approval was also subject to a number of conditions to be detailed and a retrospective resource consent. The Council requested that a full structural engineer's report be prepared and provided to the Council for resource consent purposes. The Council had not received a structural engineer's report by 22 February 2011.

Application of Relevant Legislation in the Council's Earthquake Prone Policy: The building was constructed from unreinforced masonry so was deemed to be earthquake prone under the Building Act 1991. As it appears that no earthquake strengthening was carried out on the building, it would have continued to be earthquake prone on the introduction of the Building Act 2004 and for the purposes of the Council's Earthquake Prone Building Policy 2006. Up-grading in terms of the Council's 2006 policy would only have been necessary if the building consent was sought for a significant alteration of the building. No inspection or assessment of the building had been carried out by the Council in terms of the 2006–2010 Earthquake Prone Building Policies. A seismic risk building survey and hazardous appendage survey was carried out by the Council in December 1992 prior to the introduction of the Council's Earthquake Prone Building Policies.

CROSS-EXAMINATION: MR ZARIFEH

Q. Mr McCarthy, just on that last aspect the earthquake prone nature of the building. We heard from Mr Wright that no structural strengthening had ever been done to his knowledge and that there had been a report from the structural engineer, Mr Sullivan, in 2009 essentially saying that it was earthquake prone and could collapse in a moderate earthquake.

A. Yes.

Q. That would have been consistent with the Council's understanding of the building?

A. Yes.

Q. And the hazardous appendage survey in 1992 which recommended I think remedial work within two years, we know from what you've said previously on other buildings that that wouldn't have been followed up?

A. That's correct.

Q. So really it was up to the owner to do anything in terms of strengthening?

A. Yes it was.

Q. And there wouldn't have been any requirement by the Council, certainly for some many years, if that wasn't carried out?

A. That's right other than if there was a significant alteration or a change of use of the building.

Q. Which was unlikely given its nature?

A. Yes.

Q. Now turning to events after the 4th of September. The building is red stickered, classified as unsafe by the Council or on behalf of the Council in both Level 1 and Level 2 rapid assessments on the 5th?

A. Yes.

Q. And that status didn't change as far as the Council was concerned. It remained an unsafe building?

A. Yes.

Q. There was no inspection Boxing Day?

A. That's right.

Q. Why would that have been?

A. We didn't inspect all buildings. It was already fenced off and a building not being used so I guess the intent or the view would have been there would be little point in doing that.

Q. And as far as the Council was concerned then in February 2011 when this operation was underway to remove the organ, what was the Council's view of this building, the state of this building?

A. The building was not being used. It had restricted entry. It was in the hands of a project engineer and an engineer who was controlling access to the building. It was fully fenced so it was in a situation where the Council's view of it was that it was a building that was undergoing some change and it was obviously the intent of the owner to resolve the issue with the building at some stage. So our people were working with the owner and the owner's representative to get the building back to a reasonable state.

Q. But did the Council have any official control over the building at that point in February?

A. No it didn't.

Q. Why is that?

A. Because the owner and the project engineer were working on it. They were in control of the building, so the Council didn't deem it necessary to have control over it.

Q. And the red placard status, did that still apply in February?

A. There wasn't a current red notice in place but the effect of the red notice, the fact that it was controlled access, it was fully fenced, it had been propped and wasn't going to affect public places. The effect of all of that was that the building was in the same state as a red notice.

Q. So had the red placard status expired by then?

A. Yes.

Q. And it hadn't been renewed?

A. That's correct.

Q. And is the reason it hadn't been renewed by the Council, do you know the reason?

A. The reason is that it wasn't deemed necessary to issue a Building Act Notice on the building given this situation that I've explained was fully contained, fenced, et cetera.

Q. Because the Council was in contact, albeit its heritage section, the Council knew that?

A. Yes we did and the other thing was it was right round the road from our emergency operations centre in the Council buildings. I think we were all aware of the situation.

Q. In paragraph 8 you said that the Council records indicate that extensive shoring works were in place by 25 November?

A. Yes.

Q. Where was that information obtained from. Where did the Council obtain that from?

A. I'm a little unsure of that. I think we observed it every day when we walked past. I certainly observed it.

Q. So did you record that?

A. Not formally in the record no.

Q. It seems from what Mr Fahy said that the only dealings that they had were with the Heritage and Planning Section of the Council?

A. At that time, yes.

Q. And that at no stage was there any requirement by the Council to have any input or to oversee the safety element of the removal of the organ. Is that fair?

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A. That's fair, that was, that was in other building professionals' hands.

Q. You mean the owner and engineers?

A. The owner, the project manager and the engineers yes.

Q. Right and is that what would normally happen?

A. Yes.

CROSS-EXAMINATION: MR ELLIOTT

Q. Mr McCarthy this question of the stickering of the building is of interest to families.

A. Yes.

Q. So I just want to asks you a couple more questions on it. You said the building was red stickered and I take it that was during the emergency period?

A. Yes it was.

Q. Is that right? And so I am putting a legal point here and I'm happy for Mr Laing to jump up and to answer the question if you can't but I think you can probably, the – there was the Canterbury Earthquake Building Act Order 2010?

A. Yes.

Q. And under section 8 of that a red card, that being the type of card issued during the emergency period was deemed to be a notice under section 124(1)(b) of the Building Act that warns people not to approach the building.

A. Yes.

Q. So that was the effect of that section?

A. Yes.

Q. But then in section 9 of that same order it says that "a notice issued under section 124(1)(b) of the Act as modified by this clause may be issued for a maximum period of 60 days and may be renewed". So is it because of that period of 60 days that there was no current notice in place into 2011?

A. The Civil Defence rapid assessment, the red placard had an end date of the end of November and so when that ran out the red placard in effect had, wasn't, wasn't official, but for the other circumstances I've explained that with respect to this building that didn't particularly matter.

Q. Well I'll just ask you about that but you're saying that as at the end of November?

A. Yes.

Q. There was no red sticker in effect?

A. That's correct, yes.

Q. And the Council chose not to issue a new one or to renew the existing one?

A. That's right.

Q. The effect of the red sticker while it was current was that people were warned not to enter. Is that right?

A. Yes.

Q. So that by not renewing the sticker was the Council willing for people to enter?

A. No not at all, ah, I think as I've explained the, there was an extensive cordon right round which the Council had put in place. The church had a notice on the front door saying, "This church is no longer in operation". The, there was controlled access by the Church and by the building professionals involved so the, the reason for having a red placard, there wasn't any reason, there wasn't any reason for us to issue a 124 notice on the owners of the building. They were doing everything the 124 notice would lead to.

Q. I see. So 124(1)(b) notice is one in which "the territorial authority attaches in a prominent place on or adjacent to the building a notice that warns people not to approach the building", and in this case the territorial authority did not think it needed to take that step?

A. That's correct.

Q. Am I right in saying that notwithstanding the expiry of the notice?

A. Yes.

Q. In the period when there were discussions between Council and owners' representatives about work and entry did the Council have an interest in the safety dimension to that discussion?

A. Sorry with regards to?

Q. Well there was a period during which there were communications between Council?

A. Yes.

Q. And the owners' representatives?

A. Yes.

Q. Arrow and so on, about the entry to the church to get the organ out?

A. Yes.

Q. Do you agree with that?

A. Yes.

Q. And do you agree that some of those discussions took place after the expiry of the Building Act, of the red sticker?

A. Yes.

Q. And my question is just whether in that period following expiry the Council notwithstanding the expiry saw that it should interest itself in the safety dimensions attaching to the entry to the church?

A. The, um, our belief was that, ah, primarily – responsibility for that rested with the, the owner, the project manager and the engineer who were involved every day with that building. The Council, I don't think it could've contributed to enhancing the safety in that regard and, and that wasn't really our role at that time.

Q. It wasn't the role do you say?

A. It wasn't directly our role at that time with regards to the removal of the organ.

Q. So I'll just show you one document?

A. Mhm.

Q. BUI.DUR.309.0013.90.

WITNESS REFERRED TO EMAIL

Q. And just looking at the lower section of the page email, or you can't see. I'll just read out from Claire Revell, 15 February 2011 to Tim Fahy copy to Jenny May, Amanda Ohs, Dave Margetts and that email appears to be the Council's approval for the removal of the organ, is that right?

A. Yes. Yes that's correct.

Q. And we can flick through that – I'm sorry have you read that email?

A. Yes I have.

Q. And am I right in saying there's no reference in there to the Council enquiring about the safety attaching to the removal?

A. That's correct.

Q. But there's reference to the possibility of further damage to the organ, the need for protective materials and padding protection between poles and beams to protect the surface, protection of heritage fabric, protection of interior fittings and pews?

A. Yes.

Q. Just appears from all of that that the Council was more interested in pews than people?

A. The, um, the Council I think has faith in building professionals to, um, design health and safety plans, ah, for the work for which they're responsible and that would be very much our expectation. The Council isn't the administrator of the Health and Safety in Employment Act which drives those, um, safety considerations. If there were a building consent in place then clearly the building inspector who was inspecting any building works would be checking on such things, would be making sure that any observable safety issues were, were addressed at that time but clearly the responsibility under that legislation rests with other people ah, so, um, our focus was on protecting the heritage issues associated with that church at that time that was our role, ah, that's not to say that the Council is oblivious to safety issues but clearly that in this particular case there was other people that needed to take that responsibility on.

Q. And so in this case the Council didn't ask to see the safety plan or risk assessment or anything attaching to the potential risk to people?

A. No because we weren't in control of that job.

CROSS-EXAMINATION: MISS SMITH – NIL

RE-EXAMINATION: MR LAING – NIL

QUESTIONS FROM COMMISSIONER FENWICK – NIL

QUESTIONS FROM JUSTICE COOPER:

Q. Mr McCarthy this may not be a question that you're comfortable answering but I'm just wondering how with respect to the document we've just been looking at that can be returned. The Council in effect gives approval for work that needs resource consent on the basis that the application will follow. Is this – are they treated as emergency works under the Resource Management Act?

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A. Yes it certainly not our preference that it happens. Retrospectively we would have preferred a – to fully consider and receive an application in advance of this work going on but I think what this is demonstrating is that the Council felt it had be flexible at the time, and allow works to proceed to both protect some heritage features of buildings and also to respond to obviously an immediate community need so what was considered important was to allow the work to proceed and not to be seen as an impediment to that going ahead.

Q. Well Mr Laing will probably criticise me for asking a question of law, but that was my question. Effectively where does the power come from to do this. I infer that if Resource Consent was necessary to remove the organ, the Council here is saying, here's the consent, give us the application later.

A. Mmm.

JUSTICE COOPER ADDRESSES MR LAING

Q. And the only way to do that I would have thought would be under the emergency provisions of the Act. Mr Laing, do you – do you know the answer to this.

A. Your Honour, I think I need to look at them in a bit more detail before really chancing my arm on an answer.

Q. There is an emergency –

A. There is in that section 330 of the Resource Management Act Your Honour.

Q. Is it, preservation of life is usually –

A. There are a number of grounds but then you would have to apply for retrospective consent (inaudible 17:27:17) but I really couldn't hazard an answer as to whether this particular matter fell within section 330. It certainly was applied immediately post the emergency at the time, but whether it was applicable then I really would have to look at section 330 and section 331 as well.

MR McCARTHY ADDRESSES JUSTICE COOPER

Q. I think there was also an amendment that perhaps enabled this to occur and Mr Laing of course will flesh that out at a later date, but I think there was a recognition especially for Canterbury at that time, that under the Resource Management Act that this might – that enabled this, so, yes.

MR LAING ADDRESSES JUSTICE COOPER

Mr McCarthy is right, there were amendments by an order in council to section 330 but again I haven't got them with me Your Honour, so.

JUSTICE COOPER TO MR LAING

Q. I wonder with reference to this case Mr Laing you might just let us have a memorandum on that point.

A. Yes Your Honour I can certainly do that.

Q. By the 1st of March. Would that be possible?

A. Yes Sir.

WITNESS EXCUSED

MR ZARIFEH CALLS

PETER SMITH (SWORN)

Q. Mr Smith you have provided an independent assessment of the earthquake performance of the building that we're enquiring into for the Commission dated December of 2011?

A. I have.

Q. And that's a fairly comprehensive report of 18 pages. I don't want to take you through each of the issues, but you've been sitting here listening to the evidence and I really want to come to the main issue that has occupied the hearing today and that is the assessment of the building post the September earthquake and in particular an assessment of the risk and the safety of workmen entering the building in the state it was in and removing the organ. So that's what I want you to deal with and comment on, and I appreciate that on pages 6 to 8 of your report you deal with that. Can we start perhaps with a comment from you on looking at the chronology what happened after September the 4th? We had evidence that Mr Sullivan had been engaged and had done various plans or sketches for propping the building?

A. Correct.

Q. And then Mr Haverland was instructed and he reviewed that propping and directed that some of that be installed. A couple of items I think were not, were not considered necessary by him, and he's given evidence as you will have heard as to why he did that and the assessment that he made, an inspection that he made of the building to come to those conclusions. Can you make any comment about that firstly?

A. Yes I think one of the main issues arising is the basis on which engineers undertake these assessments immediately following a significant earthquake. I think undoubtedly in this case it was based on an aftershock as the, I think the industry was contemplating it, where that would be a magnitude less inferring that it would also be somewhat lesser intensity of shaking, because the magnitude of the earthquake itself is not a good measure of what may happen. I think that in that

respect the December earthquake would have given the engineers some confidence on the building's performance in a reasonably significant earthquake. I think the tragedy which happened, the level of shaking and in particular the vertical acceleration that occurred in the February event was way beyond anyone's expectation and tragically the building disintegrated virtually.

Q. Mr Haverland talked about it disintegrating into almost stones. Would you agree with that?

A. From the photos I've seen that's effectively what seemed to happen.

Q. And I think you've got some photos of the aftermath of February at page 14.

A. Yes I think some of those have been –

Q. (overtalking 17:33:26).

A. – of the hall building but you can see –

Q. I'll get them put up, they're 0015.14 thank you, that's where they start. Just take us through those if you don't mind, the top one anyway.

A. The top building, one in particular I interpret as being the front entrance of the building. I believe this is after USAR have been through the building so I don't believe it's truly representative of the condition immediately following the earthquake, but –

Q. It could have crumbled more you mean?

A. I believe it, yes I think that they've attempted to go through the rubble just to make sure there aren't people there and therefore that certainly is a lot of stones, just how it was immediately after the earthquake.

JUSTICE COOPER:

Q. In the police photograph we showed earlier when I was questioning Mr Haverland it seemed to show the propping remaining in the –

A. It appeared to Sir, yes.

Q. – in the front yard.

A. In that – that appears to be the propping in place.

Q. Yes.

A. But even then I do believe that is after USAR had been through, the roof for instances seems to have been removed or destroyed enough to give access so again I don't think that is a condition immediately following the earthquake.

EXAMINATION CONTINUES: MR ZARIFEH

Q. But in terms of the failure, and the effect of the February earthquake, can we see that by reference to these photos, perhaps looking at the next page?

A. Yes I think – I'm not absolutely certain where the next page – the photos are, I suspect some of those maybe the hall roof.

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Q. Okay.

A. And I think the –

Q. The next page please.

A. That's still clearly the –

Q. Durham Street.

A. The entry, yeah Durham Street. Again, that's Durham Street.

Q. Page 17.

A. And that's again looking out on the Durham Street portion of the site. That one I suspect might be in the, of the hall.

Q. Right.

A. The same with that I believe. That one again I suspect is the end of the hall. I don't recognise those windows but I could be wrong. That all seems to be looking in a similar direction.

Q. I think that's perhaps looking from Chester Street. The bottom one.

A. Yes it could be. It's …

Q. All right. So a fairly catastrophic collapse?

A. I understood there was, I understood there was enough room on the right-hand side of that, if that was the hall, the main church for access for propping and that wouldn't appear to give that but I'm not sure.

Q. Although it's a bit hard to tell what's –

A. It is.

Q. What's fallen isn't it?

A. I mean there's very little of the masonry left in place.

Q. Could you draw any conclusions as to the failure mechanism. I mean obviously it's collapsed but (inaudible 17:36:45).

A. I suspect that the vertical acceleration was a significant component of the failure. It was a rubble filled wall I think. It had been severely cracked by the previous earthquakes and I think it simply will have disintegrated under that vertical shaking.

JUSTICE COOPER:

Q. Which wall are you talking about?

A. I think most of the walls –

Q. Most of the walls?

A. Most of the walls of the church, yes, I think –

EXAMINATION CONTINUES: MR ZARIFEH

Q. Would have disintegrated?

A. We observed from the, Joe's Garage sir the intensity of shaking which is likely to have occurred equally on this site and the, the fact that the shaking occurred in both the longitudinal/transverse sort of directions. It was not just directional, and I think that was pretty devastating on this building.

Q. Right. Now turning to this issue of the propping of the building.

A. Yes.

Q. As you observed the propping or the scaffolding that was used to prop the front or the east side appears to have still been there at least in one of the photos?

A. Yes.

Q. And perhaps part of that east wall, the lower part?

A. Lower part, yes.

Q. But not the upper part. I think there's only one horizontal bracket shown in the, in the other photo we looked at.

A. The latest thinking in terms of propping of these buildings is that propping can actually be destructive rather than positive on the protection of the building.

Q. Why is that?

A. It's, the building itself will deform under the earthquake shaking and the propping tends to try and hold portions of that building in a position against which the building would like to shift and that can be detrimental I think. Certainly the overseas, in Italy the current thinking is to, to wrap the building and try and tie the building as a unit and make the building respond in its own way, as it would wish to under the earthquake but to tie it together in a way that it has some greater resilience to the shaking.

Q. Right. So, what, tie the opposite walls together, that kind of thing?

A. Yes basically putting a wrap around the building in the same way as they did around the towers which by overcoming – masonry is weak in tension and if you can apply some degree of compression into it you end up by enhancing the strength.

Q. So in this case we have had evidence of the propping proposed by Mr Sullivan and I think it was suggested to Mr Haverland that that appeared to be more conservative than the propping he decided was required. Do you have any comment about that?

A. I think it's very difficult to try and give an opinion. Firstly, we haven't heard from Mr Sullivan. Secondly –

Q. Did you know the drawings and the extent of it?

A. Yes we did. I haven't personally seen the damage or the, the actual condition of the building –

Q. Just stay in front of the microphone please.

A. Sorry. I think clearly Mr Sullivan's interpretation of what was needed for safety was, was more conservative. If we look to the performance of the building on the 26th of December there is some confidence that the assessment that Structex gave, had some degree of resilience. I think, my own view is I would have had more confidence had some of the connections between the various components been investigated as part of that assessment.

Q. How would you do that?

A. Well we know the building was built in three separate periods. This is going back into the 1800s. It's unlikely that the integrity of the building is as good, having built in three separate occasions, as it would have been had it been built initially in one operation and I think it would have been perhaps prudent to open up some of those connections to understand just how the –

JUSTICE COOPER ADDRESSES WITNESS – MICROPHONE

EXAMINATION CONTINUES: MR ZARIFEH

A. I think just to understand really the mechanisms of load transfer from walls into diaphragms et cetera. Remember these buildings have 800 thick walls. That's an extremely thick wall and it really is a challenge to ensure that those walls remain stable. So the role of a diaphragm such as a floor in the annex and the connection of the wall to the floor becomes quite important.

Q. Right so hence removing linings to check that?

A. Yes I believe that would have been prudent.

Q. But do I understand you correctly to say that in your view even if the propping that Mr Sullivan had detailed or in fact even more substantial propping than that, the building would have still failed?

A. Yes I believe that the propping that was proposed, even though it was more conservative, would not have been effective in protecting the building.

Q. Right.

A. Or the lives of those inside the building.

Q. So what can we learn, if anything, from the failure of this building for future cases where there's been a significant earthquake and access is required for whatever reason to an unsafe building. Have you got any view on that?

A. Yes I think Christchurch will be, and with the history of time, will be seen as an anomaly where the ground shaking in an aftershock was

particularly severe. I suspect if we go forward on the assumption that Christchurch could repeat itself we will be seen to be extremely conservative and I think the challenge of Christchurch and the 22nd of February event is to interpret appropriate measures for public safety moving forward.

Q. So anything specific in your view?

A. Yes I think when we are allowing people into buildings even for removal of such things as organs I think it's important that the engineer does understand fairly comprehensively the way in which the building is constructed and I also think we probably as an industry need some guidance as to the order of aftershock that may occur.

Q. What about this issue of the risk factor. Have you got any comment about that? I think you refer to it in your report.

A. Yes I think the use of the .5 factor for the design of propping was appropriate. There's a, that figure is proposed for something up to about six months in a normal construction activity. That, the period that the building was likely to be propped was probably something similar to that. We were dealing with an earthquake prone building at that stage so it was not much point in having the propping significantly stronger than the building itself. The aim was to try and hold that wall or the walls concerned under a series of minor, moderate aftershocks and I think the use of that .5 factor was appropriate.

1745

Q. Even in relation to a red stickered building in an aftershock zone?

A. I don't think there's much point in designing the propping as we've seen for something way in excess of the strength of the building. We've heard evidence that the building had a strength of about .1, 10 percent of code. To design the propping for 50 percent was probably almost an overreaction but when you look at the objective of trying to protect human life that seems justified.

Q. Right. So are you saying that perhaps thought has to be given to not necessarily propping but more tying in and wrapping the building?

A. Yes I think the more the building has some resilience and that connection that Mr Sullivan proposed for the floors was an example of how to give a building some more resilience in that period of likely aftershock.

CROSS-EXAMINATION: MR ELLIOTT

Q. I'm a little hesitant to ask this Mr Smith but I'll just give it a try. In your report you say the propping was designed with a risk factor of 0.5?

A. Correct.

Q. And you heard the evidence earlier on about the use of the risk factor from Mr Haverland?

A. Correct.

Q. And I know that you can't explain what was in his mind but just based upon the evidence that you've heard from him today can you give an explanation about how you perceived that he was using this risk factor?

A. My interpretation of, of what he was, the way he's approaching the issue was that to assess 10 percent of code looking at a 50 year life with a crowd loading for the short term occupancy was probably a severe measure of the, it was probably over severe on the building In other words by saying it was 10 percent was probably a severe interpretation and that possibly under those circumstances you could at least take the 1.3 factor off and some reduction of that for the shorter term in terms of assessing the risk not in terms of improving the strength of the building but assessing the risk it seemed possibly justified.

Q. Are these words and so on that you're using are they, do they derive from the standards that Mr Haverland referred to and if one was to look at them could one get a better understanding of the –

A. I don't –

Q. – reasoning?

A. I don't believe the standards address that issue, I think it's the way in which an engineer approaches risk. Often you were placed in a position where we have to assess whether a risk is acceptable. There aren't very

strong guidelines to an engineer when he's undertaking that role and I think the risk factors in the code are often used as a reference point.

Q. Do you think there's scope for the development of guidelines that may assist engineers in this type of position in future?

A. I think that the engineering community does need some guidance immediately following a significant earthquake but I hesitate to see that in black and white because the circumstances I believe may be quite different in each event, I think the important thing is to have a process which gives engineers guidance as to likelihood of an aftershock and the intensity of that aftershock so that they can use their technology to undertake a risk assessment of the building.

Q. There are people entering buildings even now which have been deemed as dangerous for the purpose of inspecting or taking property out.

A. Correct.

Q. Are you saying that those people's, that the assessment of risk in each case will have varied depending upon the individual engineer's judgement and not by reference to a particular identifiable criteria?

A. Yes I mean when you're entering a building that's got 10 percent of code, each engineer that goes in there to do an assessment enters that building at risk and the decision to let other people do that is one that the engineer doesn't make lightly. I know for a, in some instances I'd much rather go into a building myself than have a staff member go in. So engineers are asked as part of their role in society to enter those buildings and to make assessments and those decisions are not easy.

CROSS-EXAMINATION: MR LAING

Q. Mr Smith, at page 7 of your report you refer to the Council's approval process rating to the removal of the organ. You recall that?

A. Yes.

Q. And could I ask you to have a look at BUI.DUR.309.0011C.1 please.

WITNESS REFERRED TO DOCUMENT

Q. And is that the document that you are referring to when you talk about the Council's approval of the works for the removal of the organ?

A. Correct.

Q. That document relates to approval of works pending a retrospective resource consent application doesn't it?

A. Correct.

Q. And there's nothing in that document to suggest that it was an approval to, from a health and safety point of view is it?

A. That is correct. The, I think the confusion arises amongst the public in particular that once the Council has red stickered the building, it has sort of placed some degree of control over health and safety or entry to the building and there's a sort of a grey zone that happens following that as the owner, the responsibility for the health and safety and entry into the building becomes that of the owners.

Q. Yes. Well in this case the health and safety issues were clearly being dealt with by Mr Fahy, by the engineer and therefore also by the owner weren't they?

A. It's apparent that they were handling it in quite a responsible manner.

Q. Yes and the, as you've heard the red sticker on the building had at that stage lapsed?

A. I understand that now.

CROSS-EXAMINATION: MISS SMITH – NIL

QUESTIONS FROM COMMISSIONER FENWICK AND JUSTICE COOPER - NIL

WITNESS EXCUSED

EVIDENCE CONCLUDES

JUSTICE COOPER:

Yes that completes the hearing into this matter. Our conclusions will be set out in our report when it's issued later in the year. We are adjourning now until 9.30 tomorrow morning.

COMMISSION ADJOURNS: 5.53 PM