CORONERS COURT OF THE AUSTRALIAN CAPITAL TERRITORY

Case Title:	**AN INQUEST INTO THE DEATH OF BEN CATANZARITI**
Citation:	**[2019] ACTCD 1**
Date of Findings:	15 February 2019
Before:	Coroner Fryar
Decision:	See [17], [57] – [63]
Legislation Cited:	*Coroners Act 1997* (ACT) s 52(1), 52(4), 55, 57, 58 *Work Health and Safety Act 2011* (ACT)
Parties:	Counsel Assisting the Coroner The Family of Ben Catanzariti Schwing Australia Pty Ltd Belconnen Concrete Pty Ltd Allianz Insurance Ltd
Representation:	**Counsel** Mr Archer (Counsel Assisting the Coroner) Mr Collaery (The Family of Ben Catanzariti) Mr Hodgkinson (Schwing Australia Pty Ltd) Mr Hausfeld (Belconnen Concrete Pty Ltd) **Solicitors** Sarah Baker-Goldsmith of ACT Coroner's Court (Counsel Assisting the Coroner) Jolan Draaisma and Elliot Rowe of Collaery Lawyers (The Family of Ben Catanzariti) Sian Gilbert and Michael Connolly of HWL Ebsworth (Schwing Australia Pty Ltd) Greg McCann of Colin Biggers & Paisley Lawyers (Belconnen Concrete Pty Ltd) Mark Robinson of Hicksons (Allianz Australia Insurance Ltd)
Cases Cited:	*R v Coroner Maria Doogan; ex parte Lucas-Smith* [2005] ACTSC 74; 158 ACTR 1 *Briginshaw v Briginshaw* (1938) 60 CLR 336
File Number:	CD 191 of 2012

CORONER FRYAR:

Executive Summary of Findings and Recommendations

1. Mr Ben Catanzariti died on 21 July 2012 from head injuries suffered as a result of being struck by a concrete pouring boom whilst working at the Dockside Apartment Complex, Eastlake Parade, Kingston in the ACT.
2. A matter of public safety is found to arise in connection with this inquest.
3. It is not possible on the evidence to determine to the requisite degree the operative cause of the failure of the bolts that led to the collapse of the boom that caused Mr Catanzariti's death.
4. Assuming that the failure may have been caused by the failure of the workmanship of employees or agents of Schwing Australia Pty Ltd (on its own or in association with other factors) it is recommended that the company undertake a review of the processes that apply to the installation of bolts in machinery of this type.
5. Further to paragraph 4, above, a specific review should be conducted by Schwing Australia Pty Ltd of the methods employed to ensure individual bolts are uniformly tensioned and to ensure that load testing of booms is carried out after repairs of this type are undertaken. In this regard I note that Counsel for Schwing Australia Pty Ltd advised that such reviews have already been undertaken.
6. Assuming the failure of the bolts may have been caused by a failure of the bolt themselves (internal hydrogen embrittlement) or because of environmental hydrogen embrittlement (perhaps associated with the failure of the zinc coating), I recommend that the reports received in the coronial proceeding should be referred by WorkSafe ACT to the manufacturers and/or suppliers of the bolts for consideration as to whether bolts supplied and/or any zinc coating meet relevant industry standards both in Australia and in other countries.
7. Assuming that the failure of the bolts occurred as a result of the combination of the matters set out above it is recommended that the reports received in these proceedings should be referred by WorkSafe ACT to Safe Work Australia for consideration as to whether additional Australia-wide standards should be put in place:
    a. to ensure bolts used in the context of securing booms are safe;
    b. to ensure replacement and repair processes of such bolts are appropriate;
    c. to ensure that the cycle of replacement of these bolts is appropriate; and
    d. to require those processes to be effectively audited to ensure individual bolts are uniformly tensioned and to ensure that load testing of booms is carried out after repairs of this type are undertaken.

e. I also recommend that WorkSafe ACT consider whether at an ACT level there are appropriate safeguards in place to address the matters referred to at paragraphs a – d, above.

8. I further recommend that the ACT develop its own guidance for those in the construction industry undertaking concrete pours in the terms suggested by Mr Reg Hobbs in his report.

9. In accordance with section 57 of the *Coroners Act 1997* ("the Act") I intend to forward this report to the Attorney General (who is also the responsible Minister for Regulatory Services).

Introduction

10. At about 9.35 am on Saturday 21 July 2012 an industrial accident occurred at the construction site of the Dockside Apartment complex on Eastlake Parade, Kingston in the ACT. (The full facts of the matter were dealt with in detail in the statement of Detective Senior Constable Roscoe and were read onto the court record on 18 April 2017).

11. At the time Belconnen Concrete Pty Ltd employees were conducting a concrete pour utilising a Schwing concrete pump when the boom of the pump collapsed. The boom fell onto the worksite and struck three workmen causing all three to be knocked to the ground. One of the workmen had his right lower leg crushed by the weight and impact of the boom arm. Another workman was knocked unconscious and sustained lacerations to his hand and knee as he fell to the ground.

12. The third workman, Mr Ben Catanzariti, sustained a direct impact to the back of his head causing severe head trauma and extensive skull fractures. ACT ambulance officers arrived at the scene within minutes of the incident, however they were unable to revive Ben. He was declared dead at the scene.

13. The Australian Federal Police ("the AFP"), in conjunction with WorkSafe ACT, conducted an investigation into Ben's death. An inspection of the concrete pump revealed an obvious failure of the slew ring bolts securing the base of the boom arm, upper turret and slew ring to the concrete pump. The investigation into the cause of that failure has occurred since Ben's death. It has been carried out not only at my behest but also by the AFP, WorkSafe ACT and the ACT Director of Public Prosecutions ("DPP").

The Legislative Framework

14. The statutory framework in which this inquest has been conducted is important. Section 52 of the *Coroners Act 1997* (ACT) ("the Act") provides:

> ***52 Coroner's findings***
> *a) A coroner holding an inquest must find, if possible—*
> *a) the identity of the deceased; and*
> *b) when and where the death happened; and*

c) the manner and cause of death; and

d) in the case of the suspected death of a person—that the person has died.

b) A coroner holding an inquiry must find, if possible—

a) the cause and origin of the fire or disaster; and

b) the circumstances in which the fire or disaster happened.

c) At the conclusion of an inquest or inquiry, the coroner must record the coroner's findings in writing.

d) The coroner, in the coroner's findings—

a) must—

(i) state whether a matter of public safety is found to arise in connection with the inquest or inquiry; and

(ii) if a matter of public safety is found to arise—comment on the matter; and

b) may comment on any matter about the administration of justice connected with the inquest or inquiry.

15. I remind myself again of the guidance from the ACT Supreme Court in *R v Coroner Maria Doogan; ex parte Lucas-Smith* [2005] ACTSC 74; 158 ACTR 1 and specifically the passage at [15] as follows:

> *"The [Coroners] Act is generally concerned with the resolution of relatively straightforward questions such as "what was the cause of this death?" or "what caused this fire?". It does not provide a general mechanism for an open ended inquiry into the merits of government policy, the performance of government agencies or private institutions, or the conduct of individuals, even if apparently related in some way to the circumstances in which the death or fire occurred."*

16. Their Honours go on at [28] to warn coroners against the conduct of "*a wide-ranging inquiry akin to that of a Royal Commission*" and of particular relevance to this matter, provide an example at [31] of the limits of enquiry:

> *"... a coroner might well hear evidence suggesting that a cyclist's death had been caused not merely by a collision with a motor vehicle, but also by the antecedent conduct of the driver of that vehicle in failing to stop at a stop sign adjacent to an intersection. However, the limited jurisdiction conferred ... would not authorise the coroner to inquire into any perceived failures in relation to general policy relating to the siting of stop signs or the enforcement of traffic regulations. The particular siting and design of the relevant intersection may be a different matter. The application of the common sense test of causation will normally exclude a quest to apportion blame or a wide-ranging investigation into antecedent policies and practices."*

Manner and Cause of Death

17. In respect of section 52(1) of the Act, the findings I should make are straightforward. An autopsy conducted by Dr Sanjiv Jain on 22 July 2012 showed evidence of significant head injury with lacerations and cranial bone fractures consistent with death caused by the head injury. Accordingly, as to the manner and cause of death I find that:

> ***Mr Ben Catanzariti died on 21 July 2012 from head injuries suffered as a result of being struck by a concrete pouring boom whilst working at the Dockside Apartment Complex, Eastlake Parade, Kingston in the ACT.***

Public safety and criticism of individuals

18. In coronial proceedings it is open for a Coroner to make findings that are adverse in respect of named individuals. If the Coroner proposes to make an adverse comment a process is set out in section 55 of the Act for the terms of the proposed criticism to be given to an affected party so that that party may make a submission in response.

19. In this case it is not in contention that the failure of the bolts which caused the boom to collapse caused Ben's death. However (and I deal with this issue further below), it has become apparent that even with expert assistance it is not possible to say with any reasonable certainty precisely what caused that failure, nor is it possible to attribute any blame for such a failure. Accordingly I am satisfied that there are insufficient grounds for me to make such an adverse comment of an individual or party, either in the context of the bolt failure or in relation to the control of the building site at which the accident happened. On that basis, and in line with the recommendations outlined in Counsel Assisting's submissions, without resorting to the procedures set out in section 55 of the Act, I intend to refer each possible explanation of the failure of the bolts and other recommendations in relation to Occupational Health and Safety ("OH&S") issues to the relevant company or regulatory authority for their consideration, further investigation and appropriate action, if necessary.

History of the Inquest and the section 52(4) Issue

20. The proceedings have been prolonged for a number of reasons, but largely because of the institution of criminal proceedings by the DPP against Schwing Australia Pty Ltd ("Schwing Australia") and Phillip O'Rourke, an engineer with Schwing Australia, for offences under the *Work Health and Safety Act 2011* (ACT).

21. Initially the AFP and WorkSafe ACT approached two experts, Mr Matthew O'Hearn ("O'Hearn"), a consultant engineer, and Professor Saman Fernando ("Fernando"), a mechanical engineer, who provided opinions as to the cause of the bolt failure. The conclusion they arrived at (O'Hearn by report dated 30 June 2014 and Fernando by report of 30 June 2014) was that the predominant

cause of the joint failure was the overloading of the slew ring bolts due to an uneven tightening of them.

22. Consequently, and apparently in reliance on these opinions, the DPP commenced proceedings against Schwing Australia and Mr O'Rourke for offences under the *Work Health and Safety Act 2011* (ACT) in the ACT's Industrial Court. Although they were summary offences and accordingly the requirements of section 58 of the Act strictly speaking did not follow, I accepted a submission that in the interests of justice the hearing of the inquest should be deferred pending resolution of those proceedings.

23. On 27 August 2015, only days before the hearing of those charges, the DPP received a report prepared by Dr David Schonfeld ("Schonfeld") and Mr Jeff Gates ("Gates") of Uniquest Materials Performance ("UQMP"), a metallurgical engineer. That report hypothesised that the failed slew bolts were suffering from hydrogen embrittlement and attributed the failure of the slew ring joint and collapse of the boom to the presence of such hydrogen embrittlement.

24. Faced with this evidence the DPP engaged a further expert – Dr Richard Clegg ("Clegg") – a senior metallurgical engineer, to determine whether or not a prosecution was sustainable in light of Dr Schonfeld's opinion. Dr Clegg was briefed with a large range of material including the opinions then at hand from other experts that WorkSafe ACT and the AFP had engaged, and on 14 March 2016 he reported on the failure of the bolts. Dr Clegg found that the failure of the bolted joint was a result of stress corrosion cracking ("SCC") and not hydrogen embrittlement or uneven bolt tightening.

25. Professor Fernando had been asked to review his opinions in light of the Schonfeld and Gates report. He did so by report dated 8 December 2015 and adhered to his previous view.

26. As a result of having two reports from well qualified experts that contradicted the hypothesis advanced by Fernando and O'Hearn the DPP determined that there were no reasonable prospects of a conviction. The prosecutions were discontinued, and I was notified that prosecution action had been finalised.

Expert Evidence on the Failure Issue

27. After the inquest hearing was resumed in January 2017 I directed that the experts who had previously provided reports in the criminal and coronial proceedings be invited to re-consider their reports to determine if either some consensus could be reached or at least some convergence of views that may permit me to reach a concluded view as to the cause of the bolt failure.

28. It is noted that to some extent (as mentioned above) this process had already been undertaken. The report of Dr Clegg of March 2016 was written in light of all other reports that had been prepared at that stage. Professor Fernando's December 2015 report also undertook a review of his own opinions in light of the report of Schonfeld and Gates.

29. However in response to my request I then received the following from the experts:

    a) A brief response from Dr Clegg in which he adhered to his previous view without commentary;

    b) Dr Schonfeld and Mr Gates provided a very lengthy report slightly modifying their original views at the margins but substantially reaching the same conclusions as before. They rejected the thesis put forward by Fernando that the cause of the bolt failure was over/incorrect tightening of the bolts. They were of the view that the differences between their conclusions and those of Clegg were substantially a matter of emphasis;

    c) Professor Fernando provided what was his second supplementary report. He adhered to his previous position;

    d) A report from Mr Jonathan O'Brien, a civil and structural engineer under the letterhead of Unisearch Expert Opinion Services. That opinion had been sought by Belconnen Concrete in the context of civil litigation that had been brought in respect of the accident by Kay Catanzariti, Roberto Catanzariti and Cian Ebert. Belconnen Concrete was the first defendant in those proceedings and Schwing Australia was the second defendant. Mr O'Brien was briefed with the original reports of the other experts including Schonfeld and Clegg. He did not have available the up-to-date report of Schonfeld and Gates (March 2017). The effect of Mr O'Brien's report is that the failure of the bolts was due to the incorrect tightening of the bolts by Schwing Australia and is similar in its conclusions to O'Hearn and Fernando.

30. The opinions of the original experts, therefore, remained the same despite the exhaustive process of "hot tubbing" and testing that has occurred over a number of years.

31. Much later during the inquest a further report was received from Emeritus Professor Bruce Dunne. That report was dated 11 November 2017. It was obtained by Collaery Law on behalf of the Catanzariti family. The report reviews the theories advanced by other experts referred to above. Professor Dunne did not dismiss the explanations that have been advanced by them as to the cause of the failure of the bolts. He did not have the opportunity to conduct testing of his own. Professor Dunne's conclusions are based on his assessment of the existing reports and other more general information that he, as a result of his expertise, is familiar with. He concluded that a number of factors may have contributed to the bolt failure:

    2. Executive Summary of Report findings

    My analysis of the reports provided has led to the opinion that failure occurred by the mechanism of hydrogen embrittlement cracking and that the pre-conditions for this type of failure were established by the non-standard procedures used in the mandatory maintenance of the slew bearing assembly.

……

5. Bolt Failure Re-visited

In my experience, focus on a root cause (a single factor) responsible for a fracture can be unhelpful, because in many cases failure results from a combination of factors which together compromise the fracture resistance. A classic example, which is highly relevant to the present case, is hydrogen induced cold cracking (HICC) of steel. This form of fracture is common in the case of wielding steel and has been intensively studied to provide industrial guidelines for its prevention. Three factors are known to be necessary for HICC: a high localized stress concentration, a critical hydrogen concentration and a susceptible microstructure. These variables are not independent and even very low solute hydrogen contents can initiate cracking if the stress concentration is critically high and the microstructure consists of martensite or tempered martensite of sufficiently high strength and hardness that its fracture toughness is limited. This last microstructure-property factor clearly applies in the current case ……..

……

The message here is that if the stress concentration is sufficiently high, even modest concentrations of hydrogen can lead to cracking.

So what are the unique features of the current failure that stand out as deviating from the norm? There appears to be little reason to suppose that there were defects in the materials of the manufacturing processes used in producing the bolts (apart from a possible coating adherence problem). The obvious departure from standard operating processes was the 6 year service procedure which introduced a problem in torque control during the bolt tightening. Uneven bolt tightening, particularly over-torqueing of some bolts, as proposed by Fernando, introduced abnormally high stress concentrations that led to progressive service failure of many of the bolts by one or both of the hydrogen embrittlement mechanisms, IHE or HiSCC, before final ductile overload failure of the remaining bolts.

32. Therefore, from the expert evidence obtained, there are potentially four explanations for the failure of the bolts:

    a) O'Brien and Fernando – The failure of the bolts was the primary result of two workmanship problems related to the installation of the new bolts. The first workmanship problem was associated with the actual installation of the bolts and the degree to which the individual bolts were uniformly tensioned by the use of a torque wrench. The second workmanship issue was that the normal procedure of load testing the boom after it was repaired was not carried out. This procedure would normally have detected any gross problems with the tensioning of the holding down bolts. Professor Fernando added that the water, dirt and oil residues in the blind holes suggest that sufficient care had not been

exercised in the bolt tightening process. The presence of water may have impeded the bolt not being able to reach the required level of tension.

b) Clegg – The failure of the bolts was due to SCC of over half the failed bolts. The remainder of the bolts failed by overload once a sufficient number of the bolts had failed by SCC. He considered it was unlikely that the failure of the bolts was due to hydrogen embrittlement from hydrogen sources present in the bolts at the time they were supplied. SCC in this type of steel is considered to be likely as a result of hydrogen embrittlement from hydrogen, generated locally by the corrosion process. The protective coating on the bolts was a zinc coating – but the coating had poorly adhered to the bolts. The cause of the SCC was attributed to corrosion occurring in exposed areas of the bolt where the coating had been lost.

c) Schonfeld and Gates – The failed slew bolts were suffering from 'hydrogen embrittlement' and the failure of the slew ring joint and collapse of the boom was due to the presence of hydrogen embrittlement (or SCC).

d) Dunne – the failure was multi-factorial. It was caused by the bolt tightening and one of the hydrogen embrittlement mechanisms before the final ductile overload failure of the remaining bolts.

Submissions of the represented parties

33. Schwing Australia Pty Ltd supplies, services and carries out maintenance on Schwing concrete pumps and equipment. Belconnen Concrete Pty Ltd had been a customer of Schwing Australia for over 20 years. Mr Bruce Hodgkinson SC submitted on behalf of Schwing Australia that the Australian Standard was that concrete pumps were required to be stripped down every 6 years for a major inspection. It is that inspection that was undertaken on the relevant concrete pump shortly before the accident.

34. He submitted that the methodology used was consistent with the directions provided by Schwing America. The tools used were appropriate and had been properly calibrated, therefore the bolts could not have been overtightened. Schwing Australia expressed concerns over the initial inspection of the slew ring following the accident, conducted by O'Hearn. The concerns included that there may have been contamination by work gloves, bolts were removed without marking the location and no protective cover was placed over the slew ring until the next day.

35. Mr Hodgkinson SC further submitted that given the state of the expert evidence it is appropriate not to make findings or observations as to which expert opinion should be preferred, and accordingly it is not possible to say with any reasonable certainty what caused the failure. He noted the recommendation in the Schonfeld and Gates report at paragraphs 41- 42.

36. It was further noted that although the proposed recommendation directed at Schwing Australia (set out in paragraph 59 below) had essentially already been complied with in that they have reviewed all practices associated with the 6 year maintenance regime of bolts, such a recommendation was not opposed. Otherwise it was submitted that the other proposed recommendations set out in Counsel Assisting's submissions were balanced and sensible.

37. Mr Ian Hausfeld, representing Belconnen Concrete Pty Ltd, agreed with the recommendations set out in paragraph 22 of Counsel Assisting's submissions. In relation to the exclusion zone issue he submitted a referral to Standards Australia would encourage that organisation to expedite a review of standards concerning the use of concrete pumps, including exclusion zones if relevant, and the servicing of concrete pumps, including the mandatory replacement of bolts at 6 yearly intervals. The submission was also made that a referral to WorkSafe ACT for the development of interim guidelines in accordance with paragraphs 27 and 30 of Counsel Assisting's submissions, should not be in the terms set out in the Hobbs Report.

38. Submissions made on behalf of Ben's family were made by Mr Bernard Collaery. He pointed to what was said to be a deviation from the standard practice of Schwing Australia in the maintenance when the bolts were replaced, and submitted that I should prefer Professor Dunne's opinion to the others before me as the other consultants had not attained the same academic ranks. On that basis it was submitted that I could find that the cause of the accident, and accordingly Ben's death, was the overtightening of the bolts. It was further submitted that I should then provide written notice of such finding to the DPP.

Section 52(4) Findings

39. To make a finding that prefers one explanation over another would have the effect of attributing blame for the collapse of the boom (and thus for Ben's death) to the manufacturer of the relevant bolts or alternatively Schwing Australia. The level of satisfaction that would be required to make such a finding would be high because of the seriousness of the allegation and the potential consequences of such a finding. In such a circumstance, in my view, the test espoused by the High Court in *Briginshaw v Briginshaw* (1938) 60 CLR 336 ("*Briginshaw*") is the appropriate standard to apply: the more serious the allegation and its consequences, the higher the level of proof required for a matter to be substantiated.

40. In an inquest the standard of proof is not the criminal onus of "beyond a reasonable doubt", however where there are serious allegations the proof must be "reasonably persuasive". Accordingly findings should be made on more than the balance of probabilities but in the words of Rich J in *Briginshaw* at page 350, the coroner should have "*a comfortable satisfaction that a just and correct conclusion has been reached"*.

41. It is instructive that the DPP has formed a view that there are not reasonable prospects of conviction in relation to any prosecution. Although that finding does not bind me it highlights the difficulty of reaching a level of satisfaction as to the cause of the failure of the bolts. Unfortunately the additional material received during the inquest has not brought greater clarity to issues of causation involving the bolt failure, and indeed perhaps the contrary is true.

42. It is noted that the parties accepted an approach to the expert evidence that did not result in their evidence being tested orally. Rather the parties were invited to contribute to the process of review that was involved in having the experts re-visit their opinions or, in the case of Professor Dunne, having another expert provide another opinion.

43. There was some discussion as to whether the authors of the expert reports should have their views tested through cross-examination. However I was, and remain, of the opinion that would be less than fruitful. All the experts were very well qualified. Those experts who had previously provided reports had been given the opportunity to modify their opinions in light of reports provided by others. I formed the view that an outcome that resulted in the views of a particular expert being marginalised to any significant degree were sufficiently remote so as to not require cross examination of the expert witnesses. Whilst I accept the submission that Professor Dunne was well qualified, I note again that he did not have the advantage of undertaking testing of his own. I cannot find that because of an asserted seniority his view should be preferred over the other experts. I note again that his opinion was ambiguously expressed and he suggested that a number of factors may have contributed to the ultimate failure of the bolts.

44. In light of the totality of the evidence I am not of the view that a finding that attributes the failure of the bolts to a specific cause can be made to "a comfortable satisfaction."

45. In making this finding I do not reject the findings of any of the experts, including Professor Dunne. Rather, I have concluded that the matter of public safety raised by Ben's death is best addressed by relevant authorities treating each explanation of the cause of the bolt failure as being reasonably open on the evidence. This is addressed below.

46. I accept that Ben's family were frustrated by the DPP's decision to withdraw the prosecutions that were commenced. Indeed, the family have asked the DPP to reconsider that position. What the DPP does in relation to that request will fall to the discretion of the Director.

47. I am bound by the terms of the *Coroners Act 1997* (ACT). My power of referral is under section 58.

> ***58 Procedure where evidence of indictable offence or indictment to be presented***
>
> *(1) Subsection (3) applies if, during an inquest or inquiry, a coroner has reasonable grounds for believing that, having regard to the evidence*

given at the inquest or inquiry, a person mentioned at the inquest or inquiry has committed an indictable offence.

(2) For subsection (1), the coroner must have regard to—

(a) the admissibility at trial of the evidence given at the inquest or inquiry; and

(b) whether the director of public prosecutions, or a person who may be affected by the referral to the director of public prosecutions of evidence relevant to the alleged offence, is, or has been, given the opportunity to present or give evidence in connection with the alleged offence.

(3) The coroner—

(a) must, by written notice, tell the director of public prosecutions about the coroner's belief; and

(b) for a related indictable offence—must not proceed further with the inquest or inquiry until the day worked out under section 58A, other than to establish the following facts:

(i) for an inquest—the death of a person, the person's identity and the date and place of the person's death;

(ii) for an inquiry—the date and place of a fire or disaster.

48. Again the standard for the exercise of such power is high. I must hold a belief, on reasonable grounds, having regard to all the evidence available to me, that a person mentioned at the inquest has committed an indictable offence. In submissions from the family it was not made clear to me what specific indictable offence might have been committed in this case or on what basis I could find in respect of issues of causation that criminal responsibility could attach to specific individuals or corporate entities.

49. As I said previously, and I hold to this opinion, having regard to all the evidence before me I do not have such a belief as required by section 58, and I will not make a referral to the DPP.

Exclusion Zones

50. During the Inquest I invited parties to put before the court evidence as to whether there were effective measures in place at the time of the accident to ensure that appropriate work practices (specifically the implementation of exclusion zones) were in place. Reports were received from Dr Gerard Ayers, the OH&S and Environment Manager for the CFMEU [Victoria and Tasmania] ("Ayers"), and Mr Reg Hobbs, an experienced engineering consultant with expertise in the building industry as to OH&S issues and safe work practices ("Hobbs").

51. Dr Ayers noted that in general terms it was the duty of "persons conducting a business or undertaking ('PCBU')" to ensure safe systems of work were in place. Noting the absence of specific guidance to contractors in relation to exclusion zones under concrete pouring booms the general responsibilities owed by the PCBU and the *Work Health and Safety Act 2011* (ACT) applied. He noted that

the construction industry is "*acknowledged and renowned for its dangerous and hazardous nature and has one of the highest injury and fatality rates across all industries*". He noted that when working in the construction industry, "*it is custom not to work directly above or below persons or plant*". He further noted that exclusion zones could be implemented although he did not address generally, or in the context of this accident, who might legitimately be within an exclusion zone during a concrete pour. Mr Ayers did not analyse the relevant worksite or make reference as to whether in his view Ben was within an exclusion zone and, if he was, whether he should have been there.

52. Mr Hobbs conducted a more detailed analysis of the specific guidance available in the ACT as to safe practices in the context of concrete pouring. He concluded there was none. As to the question of exclusion zones he analysed whether people could be under booms (and therefore in exclusion zones) and concluded that they could be depending on the task they were performing. He agreed with Dr Ayers in concluding that Safe Work Method Statements ("SWMS") were an important part of ensuring safety in the workplace in relation to concrete pours. In his view the SWMS that were in place at the Kingston site at the time of Ben's death were generic and not specific as to the processes of the pour that was to be undertaken.

53. He was also of the view that "tool box talks" were important in ensuring workers were given specific and relevant advice as to how the pouring process should be undertaken. Although he noted that a tool box talk had been conducted on the morning of the accident (and Ben had attended), he was not able to say what topics were covered. Whilst Ben was in what should have been an exclusion zone, Mr Hobbs could not say whether or not Ben should have been there. Further, on an analysis of the positioning of the boom and its movements as the bolts failed, he concluded Ben was not under the boom when it failed. Rather the boom moved towards him as it collapsed.

54. Mr Hobbs concluded that the ACT should develop its own industry guidance in relation to the controlling of work sites on which concrete pours are being undertaken. The glacial pace of the development of national standards makes it desirable for interim guidance be given to the construction industry including as to the development and enforcement of exclusion zones. Mr Hobbs observed in his report at paragraphs 848 - 856:

> *"I consider that the Coroner could assist this situation by recommending that a Code of Practice for concrete pumping and boom operation be developed for use in the ACT and approved by the Minister pursuant to the WHS Regulation 2011.*
>
> *As the only other 'harmonised' state with such a Code of Practice is Queensland, then that code may be a reasonable template, with amendments made to cater for ACT specific issues such as cold climate, local materials issues, etc. Suitable material may be able to be found in the Victorian 'Industry Standard' and the New Zealand 'Guidelines'. Suitable guidance material to communicate the provisions of the Code in a form that will be readily understood by workers should also be produced."*

55. I find that there is no evidence to suggest that in respect of the conduct of the concrete pour on the day of Ben's death the PCBU did not (absent the failure of the boom itself) do so other than in compliance with the requirements of the *Work Health and Safety Act 2011* (ACT) and that there was no specific written industry guidance as to the conduct of such concrete pours that was available at the time. In respect of exclusion zones there is evidence to suggest that Ben was within the exclusion zone. However, there is insufficient evidence to say he should not have been there.

56. Finally I note, and am grateful for, the helpful submissions of Mr Archer, Counsel Assisting. His diligence and efforts in assisting the parties to focus on the relevant matters for my attention and determination in this inquest were invaluable. I agree with the submissions that he has made concerning the recommendations that I may make, in accordance with the following paragraphs.

Findings and Recommendations

57. I find that a matter of public safety is found to arise in connection with this inquest. In light of the explanations that the experts have given I make the following comments and recommendations.

58. As previously stated, it is not possible on the evidence to determine to the requisite degree the operative cause of the failure of the bolts that led to the collapse of the boom that caused Ben's death.

59. Assuming that the failure may have been caused by the failure of the workmanship of employees or agents of Schwing Australia (on its own or in association with other factors) it is recommended that the company undertake a review of the processes that apply to the installation of bolts in machinery of this type. In particular a review should be conducted by that company of the methods employed to ensure individual bolts are uniformly tensioned and to ensure that load testing of booms is carried out after repairs of this type are undertaken. In this regard I note that Counsel for Schwing advised that such reviews have already been undertaken.

60. Assuming the failure of the bolts may have been caused by a failure of the bolt themselves (internal hydrogen embrittlement) or because of environmental hydrogen embrittlement (perhaps associated with the failure of the zinc coating), I recommend that the reports received in the coronial proceeding should be referred by WorkSafe ACT to the manufacturers and/ or suppliers of the bolts for consideration as to whether bolts supplied and/or any zinc coating meet relevant industry standards both in Australia and in other countries.

61. Assuming that the failure of the bolts occurred as a result of the combination of the matters set out above it is recommended that the reports received in these proceedings should be referred by WorkSafe ACT to Safe Work Australia for consideration as to whether additional Australia wide standards should be put in place:

a) to ensure bolts used in the context of securing booms are safe;

b) to ensure replacement and repair processes of such bolts are appropriate;

c) to ensure that the cycle of replacement of these bolts is appropriate; and

d) to require those processes to be effectively audited to ensure individual bolts are uniformly tensioned and to ensure that load testing of booms is carried out after repairs of this type are undertaken.

e) I also recommend that WorkSafe ACT consider whether at an ACT level there are appropriate safeguards in place to address the matters referred to at a – d, above.

62. I further recommend that the ACT develop its own guidance for those in the construction industry undertaking concrete pours in the terms suggested by Mr Reg Hobbs in his report. To that end, and to assist interested people, I will publish a copy of this report on the ACT Coroner's Court website annexing the expert reports I have previously referred to.

63. In accordance with section 57 of the Act I intend to forward this report to the Attorney General (who is also the responsible Minister for Regulatory Services). I commend the recommendations above that would, in my opinion, improve public safety.

Conclusion

64. Throughout this coronial process has always been, at the forefront, Ben's loving and grieving family – his brother Jack, his father Roberto (Barney), and of course his mother Kay. Whatever I say can never go close to encapsulating the depth of the trauma and grief they have been through. In particular I was provided a statement from Ben's mother where she expresses how Ben's death has rocked her very being to the core, and she says it has broken her. However, I see a mother's stoic determination, and the extraordinary efforts that Kay has undertaken to somehow make sense of what occurred to her darling son.

65. Mrs Catanzariti continues to emphasize that Ben's death was a "preventable" incident. What I would hope, as Counsel Assisting mentioned in his closing submissions, is that Ben's death has been the trigger for reform, so that construction sites within the ACT and indeed around Australia, might be safer workplaces.

I certify that the preceding 65 [sixty five] numbered paragraphs are a true copy of the Findings of Coroner K. M. Fryar
Associate: Emma Bayliss
Date: 15 February 2019