CORONERS COURT

NEW SOUTH WALES

NOTE: NON-PUBLICATION ORDERS HAVE BEEN MADE

Inquest / Inquiry:	**Inquest into the death of Connie Zhang** **Inquiry into fire at Unit 53, 4 West Terrace, Bankstown**
Hearing dates:	15, 16, 22 June 2015; 10-14 August 2015
Date of findings:	18 September 2015
Place of findings:	State Coroner's Court, Glebe
Findings of:	Deputy State Coroner HCB Dillon
Catchwords:	**CORONERS – Inquest** -- Cause and manner of death – Catastrophic fire in residential tower -- Fall from height to escape burning building **CORONERS – Fire inquiry** – Cause and origin of fire in residential apartment tower – Why fire escalated so quickly – Whether building complied with fire safety standards -- Whether fire safety standards adequately regulated and enforced –
File numbers:	2012/00279934

Representation:	Mr S Rushton SC with Mr C McGorey (Counsel Assisting) instructed by Ms C Berry (Crown Solicitor's Office) Mr K Andrews & Ms M Curry instructed by Ms R Burgess, Slattery & Gordon (Ms Yinou Ginger Jiang) Mr P Bambagiotti instructed by Mr D Andrews (Owners Corporation SP 80129) Mr S Beckett instructed by Mr R Wilcher, Hicksons (Silky Constructions) Mr N Chen instructed by Mr J Newby & Ms K Bates, Colin Biggers & Paisley (Mr Barry Johnson) Mr P Doyle instructed by Mr V Zhu (Mr J Peng, owner Unit 53) Ms K Edwards instructed by Ms Patricia Lenehan (Fire & Rescue NSW) Mr D Evenden instructed by Mr J Brock, Legal Aid Commission (Zhu family) Mr S Glascott instructed by Ms N Scoble (Bankstown City Council & Mr H Lambros) Mr C O'Neill instructed by Mr B Meyerowitz (Mr P Poulos) Mr H Prasad, solicitor (Mr N Prasad)
Findings:	I find that Pinkang Connie Zhang died on 6 September 2012 as a result of multiple injuries she received when she fell from the ledge outside Unit 53, Tower B, 4 West Terrace, Bankstown, New South Wales in an attempt to escape from a fire that was burning in that unit. I find that fire at Unit 53, Tower B, 4 West Terrace Bankstown, New South Wales had its origin on the balcony of the unit. The evidence does not enable me to identify the cause of the fire on the balance of probabilities.

Recommendations:	**To the Minister for Planning (NSW) and the General Manager of the Australian Building Codes Board** ("**ABCB**") *That the Department of Planning (NSW) and the ABCB conduct research (jointly or individually), in consultation with Fire & Rescue NSW and the Australasian Fire and Emergency Service Authorities Council, into the off-setting of costs associated with installing fit-for-purpose sprinkler systems in new Class 2 and 3 buildings through the possible reform of other fire safety requirements.*
	To the General Manager of the Australian Building Codes Board ("**ABCB**"): *That the ABCB consider amending the National Construction Code to provide definitions for the terms "substantially enclosed" and "direct egress" to ensure clarity and consistency of interpretation.* *That the ABCB consider amending the National Construction Code to require the installation of fit-for-purpose sprinkler systems in all new Class 2 and 3 buildings (buildings of a shared residential nature) in conjunction with the possible reform of other fire safety requirements to ensure this significant improvement in public safety is achieved in the most cost-effective manner.* *That the ABCB review the efficacy of the current requirements in the National Construction Code as regards smoke alarms and detectors in residential buildings to ensure their life safety function is not undermined by the high incidence of false alarms which are contributing to public complacency and the disabling of alarms.*

	To the Minister for Planning (NSW) and the Minister of Health (NSW) *That the Department of Planning and the Department of Health develop (jointly or individually), in consultation with Fire and Rescue NSW, Australasian Fire and Emergency Service Authorities Council and the Australian Building Codes Board, the capacity to collect and publish data regarding fire-related injuries for use in the development of fire safety policies and reforms (and see below regarding the collection of non injury related economic cost data)* *That the Department of Planning and the Department of Health (jointly or individually) engage interstate counterparts with the objective of establishing the uniform collection and publishing of data on fire-related injuries for use in the development of fire safety policies and reforms.*
	To the Minister for Planning (NSW), the Minister for Emergency Services (NSW) and the Minister for Fair Trading (NSW): *That a statutory regime be implemented for the accreditation and auditing of persons or entities that undertake annual fire safety checks and issue annual fire safety statements issued pursuant to the Environmental Planning and Assessment Regulation 2000. Consideration should be given to including Australian Standard AS1851 as part of the statutory regime as an option for meeting maintenance requirements for essential fire safety systems.* *That the ministers consider legislative reform to allow lawful powers of entry for appropriately authorised inspectors from the Department of Planning, Office of Fair Trading, Council or FRNSW to inspect property in circumstances where a reasonable suspicion of unlawful occupancy is held.*

To the Minister of Planning and the Minister for Emergency Services

That consideration be given to implementing, in consultation with Fire & Rescue NSW, a statutory requirement that installations of new, or alterations of existing, fire hydrant systems be approved by Fire & Rescue NSW prior to the issue of an occupation certificate.

That the Department of Planning, in consultation with Fire & Rescue NSW, develop the capacity to collect and publish data regarding the economic cost of fire including business interruption, property loss, displacement of residents, lost work time due to injuries including smoke inhalation injuries and associated business costs related to insurance payouts and premiums.

That the Department of Planning, in consultation with the Fire & Rescue NSW, examine the development of a star rating system for new residential building fire safety systems (in addition to mandatory compliance with the NCC regime) with the objective of readily informing the consumer about the overall efficacy of the building's overall fire safety systems and consider strategies to deter non-compliance with the fire safety requirements in residential buildings as provided by the National Construction Code and Environmental Planning and Assessment Act 1979, Environmental Planning and Assessment Regulation 2000.

That the Minister for Planning (NSW), in consultation with the Minister for Emergency Services (NSW) conduct a review of the efficacy of the enforcement powers of FRNSW in relation to fire safety with a particular focus on the effective and proportionate escalation of powers to ensure timely compliance with orders and the consideration of extending or clarifying those powers as they relate to structural matters.

That current changes proposed to clause 144 and clause 152 of the Environmental Planning and Assessment Regulation (2000) affecting the role of FRNSW in the assessment of alternative solutions be expedited so that FRNSW are better able to apply their resources on a risk basis when addressing building fire safety.

	To the Managing Director, Sydney Water Corporation ("Sydney Water"): *That Sydney Water consult with FRNSW prior to implementing any water pressure reduction program and consider alternative strategies for the maintenance of appropriate firefighting water to properties that may be required to incur significant retrofitting costs as a result of the program.*

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REASONS FOR DECISION

Introduction

1. This is an inquest into the death of Connie Zhang, a very promising 21 year-old university student, who died when she fell several storeys from the window ledge of her Bankstown apartment after she became trapped by a fire that was furiously burning. Her friend, Ginger Jiang, who had been trapped in the apartment with Connie by the fire, also fell but miraculously survived her terrible injuries.

2. This case is also an inquiry into the cause and origin of the fatal fire.

3. In a civilised society, it is a fundamental proposition that each individual person's life is valued for its own sake. The society in which we live also knows, as the poet John Donne once put it, that "no man [or woman] is an island…"[1] Sudden and unexpected deaths, especially such tragic deaths as Connie Zhang's, affect not only her immediate family and friends, but the wider community.

4. That Connie's death and Ginger's injuries have affected the community is evident by the close interest taken in the case by the public and the media. This is not mere curiousity or voyeurism. Their terrible experiences displayed on television screens, in newspapers and digital media touched many hearts. People also know that if such tragedies can happen to one or two people, they can happen to others. Like Connie's family and friends, they hope that action will be taken that will prevent others suffering in the same way.

The coroner's functions

5. In our society, sudden and unnatural or unexplained deaths are reported to coroners, independent judicial officers whose responsibility it is to investigate these deaths. The Coroners Act 2009 provides that in an inquest, a coroner must, if possible, make findings of fact as to the identity of the person who has died, the date and place of death, the cause of death, and the manner or circumstances of death. In a fire inquiry, the principal issues for the coroner are the cause and origin of the fire.

6. A coroner may also make such recommendations to government or other persons or organisation that appear necessary or desirable arising out of the case.

Pinkang Connie Zhang

7. Connie was born in China to Mrs Zhifen (Julie) Zhu and Mr Jan (Vincent) Zhu and was brought to Australia by her mother to commence Year 10 high school. Connie spoke

[1] John Donne *Meditation XVII* http://www.luminarium.org/sevenlit/donne/meditation17.php

English well when she arrived and was able to go straight into school without having to undertake language classes. Nevertheless, her academic progress was quite remarkable. To move to another country and another culture with another language must have seemed a daunting challenge for Connie. Connie liked Australia and Australian culture and became an interpreter of the culture for her parents.

8. Not only did she achieve excellent results both in her Chinese school and in her Higher School Certificate in Sydney but she was considered to be the best physics scholar her high school had ever produced. She won a scholarship to Sydney University with an ATAR score of 97.5 and commenced a combined degree course in nursing and pharmacy. She planned to be a pharmacist when she graduated. She was in Second Year at the time of the fire. She was also active in sports and other activities. She liked badminton, ice skating and swimming; she had played the piano since she was four years old; and she loved to draw and paint.

9. Her academic ability was not the most striking thing about Connie, however. Her mother described her as a "smart and active girl" who was "like an angel". She was very loving and affectionate and kind. People who knew her praised her for the way she cared for children and her respect and kindness towards other people. Her death has brought about profound and irreparable loss and pain for her family.

10. Although much of this inquest / inquiry has been spent on technical issues to do with fires, buildings, regulation and planning powers, Connie and her friend Ginger are at the heart of these proceedings. The sadness, the distress, the anger and sense of loss that Connie's parents feel, and the pain and sorrow that Ginger feels, was very evident throughout and emphasised to all involved that the true subject matter of this inquest was not the dry details of the Building Code and other technical issues but the lives of these young women and their appalling experiences.

The issues

11. Before the inquest began a list of issues that I proposed to consider was circulated. Connie's death, and the fatal fire, appeared to raise the following questions and issues for consideration:

- As at 6 September 2012 what were the required fire protection systems and services which should have been installed within the complex known as 2-4 West Terrace Bankstown and, in particular, Tower B?

- Subsequent to the issue of the final occupation certificate on 17 April 2009 were any alterations made to Tower B which necessitated the installation of further fire protection systems and services?

- If so:

    - What were the alterations?

    - On whose instructions were they made?

    - What were the additional fire protection systems and services which should have been installed as a consequence?

  - Were any additional fire protection systems and services installed and, if not, why not?

- How was the complex, and in particular Tower B, assessed for the purpose of determining what fire protection systems and services were required?

- As at 6 September 2012 were there any deficiencies in the fire protection systems and services installed within Tower B?

- If so:

  - How did this come about?

  - Did those deficiencies contribute to the spread, progress and containment of the fire?

  - Were those deficiencies a contributing cause of the death of Ms Zhang?

- In what circumstances was a fourth bedroom constructed within Unit 53 of Tower B? In particular:

- Who caused the fourth bedroom to be constructed?

- Was the prior approval or consent of any person or body required and, if so, was it sought?

- If the prior approval or consent of any person or body was required and was not sought, why not?

- Did the fourth bedroom add to the fire load within Unit 53?

- If so:

  - To what extent?

  - Did any additional fire load contribute to the spread, progress and containment of the fire?

  - Was the existence of any additional load a contributing cause of the death of Ms Zhang?

- Between the issue of the final occupation certificate on 17 April 2009 and 6 September 2012 what steps were taken by the owners' corporation, Bankstown City Council and Fire & Rescue NSW to ensure that all required fire protection systems and services had been installed within the complex and were operational and adequately maintained?

- Since 6 September 2012 what steps have been taken by the owners' corporation, Bankstown City Council and Fire & Rescue NSW to ensure that all required fire protection systems and services have been installed within the complex and are operational and adequately maintained?

- Whether it is necessary or desirable for any recommendations to be made in connection with this matter.

12. In this report I propose to deal with these issues under the following broad headings:

- The fire
- The building
- The rules and the regulators
- The culture of "compliance v a real safety culture
- What more should be done to improve safety

13. In coming to my conclusions and formal findings I have given careful consideration to the evidence and submissions made by Counsel Assisting and counsel for the interested parties. In the interests of economy, however, and because this is a coronial report, not a judgment, I have only referred to them where I think it is necessary to do so.

The fire

14. Connie was one of a number of young Chinese people who shared unit 53 on the fifth floor of Tower B West Terrace. On the afternoon 6 September 2012, Connie, Ginger and Jason Zeng were at the unit. Each were in separate bedrooms at the time. Connie was in her boyfriend, Terry Li's, room.

15. After the fire, Jason Zeng told investigators that he had had a cigarette on the balcony of the unit at around 2:30pm. He stated that he extinguished the cigarette and placed it in an ashtray which was sitting on top of the air-conditioning unit located on the balcony. Mr Zeng appears to have returned to his bedroom after finishing his cigarette.

16. It was a windy day, with winds gusting from the west, and for that reason the door to the balcony was kept shut.

17. Shortly afterwards, the electricity to the unit went out. The occupants left their rooms and saw a fire on the balcony, which they thought was emanating from the air-conditioning unit. Jason Zeng got a bucket of water and opened the door to the balcony and tried to douse the fire with water. The flames however increased and black smoke entered the unit. Unfortunately, Mr Li did not close the door to the balcony. He left the unit almost immediately, leaving the front door open. This had the effect of increasing the intensity of the fire as the wind blew directly through the unit.

18. Jason Zeng later told police that he had been overcome by the smoke and was not able to warn the girls. The visibility in the unit quickly became very poor as it filled with smoke and he was unable to see the bedrooms. He then ran out the front door to the stairwell. He told police that the "…first landlord left a gym weight dumbbell there so I left it in the door to leave the door open so the two girls can run out". Mr Zeng fled from the building. He handed himself in the following day. He has since been deported back to China.

19. Connie retreated from the fire into Terry Li's room and attempted to call him. Ginger joined Connie in that room soon after. They shut themselves in Mr Li's bedroom and became trapped as the fire engulfed the unit.

20. As the heat intensified, Ginger and Connie withdrew from the fire by climbing out the bedroom window onto a ledge. By this time, the temperature of the fire must have reached at least 600^{o} C because the aluminium frame of the window was melting and

burning Ginger's arm. The two women then jumped or fell from the window onto the roof of a restaurant below.

21. Connie died of multiple injuries on impact. Ginger was conscious when rescuers arrived and was ultimately treated by paramedics at the scene and conveyed to hospital where she was treated for multiple injuries. She survived but was hospitalised for 10 months with long term disabilities.

How did the fire start?

22. One of the more difficult questions to resolve in this case is how the fire started. The witness most likely to be able to give an explanation is Jason Zeng. Unfortunately, however, he overstayed his visa and was deported after the fire. Although he gave a statement to police investigators, and to some extent it appears to have been truthful, elements of that statement also appear to be very self-serving. This raises unresolved questions about the reliability of Mr Zeng's account.

23. It is common ground that the fire began on the balcony of Unit 53 and quickly spread into the interior of the unit from there.

24. The evidence raises three possible causes of the fire:

- That Jason Zeng was smoking and his cigarette butt ignited some other combustible substance, possibly a fluid, that spread quickly from the point of ignition;
- That the air-conditioner on the balcony incurred an electrical fault which caused a fire within the machine and spread from there;
- That there was an explosion within the air-conditioner that caused refrigerant fluid to catch fire and spread.

25. Expert evidence was given by Mr John Gardiner, an electrical engineer and fire investigator. Mr Gardener conducted a thorough and independent examination of the air-conditioner unit and the surrounding area. Mr Gardiner's findings were that the air-conditioner unit was unlikely to have been the source of the fire. In his opinion, the physical evidence suggested that it was much more likely that the fire had originated in a metal waste bin that was located on the balcony adjacent to the left hand side of the air-conditioner unit.

26. He based this opinion on a number of observations:

- The lowest point of the concentrated fire damage was located adjacent to the left hand (west facing) side of the unit;
- The pattern of damage to the bin and the remains of a plastic bucket within the bin indicated that there had been a fire in the bin while the lid was closed;
- There were no electrical parts inside the bin and no sources of ignition that could be identified within the bin. What had caught fire in the bin could not be identified – a cigarette butt is one possibility;
- The pattern of fire damage to the wall behind and to the right (eastern) side of the air-conditioning unit indicated that fire had spread upwards and in an easterly direction

towards the balcony door then into the unit. This was consistent with the direction of the wind at the time. Mr Gardener also observed signs indicating that an unidentified liquid at or near the source of the fire may have assisted the fire to develop and spread;

- The air-conditioner unit appeared to have been damaged as the fire spread. The damage pattern on the unit indicated that the fire had been drawn in through the heat exchanger at the back and then out through the fan grille at the front;
- Secondary damage to the air-conditioner appeared to have resulted from a well-developed fire on the right-hand (eastern) side of the unit. The indications were that this fire had then spread through wiring entry cut-out. This may have been the reason or one of the reasons why power was suddenly cut in the home unit. The spread of the fire into the air-conditioner apparently short-circuited the wiring, in effect 'hot-wiring' the air-conditioner, suddenly causing it to start up, blowing acrid smoke into the unit;
- Finally, and most compellingly, Mr Gardiner's observations of the electrical circuitry of the unit were that there was insufficient concentrated fire damage to indicate that the fire had started there and been caused by internal electrical fault.

27. His explanation of the explosion that was heard was that it was likely to have been caused by pressurised refrigerant lines in the unit rupturing as a result of the fire damaging them and causing them to explode. Upon this happening, the refrigerant would have vaporised and exploded. Refrigerant can contain oil which would have caught alight and spread.

28. In my view, the physical evidence strongly suggests that the air-conditioner was not the source or point of origin of the fire.

29. The most likely hypothesis available on the evidence is that Mr Zeng in some fashion accidentally ignited the fire. There is no direct evidence of this but the following circumstances point to this being the most likely answer to the question of how the fire started:

- Mr Zeng was in the habit of smoking cigarettes on the balcony;
- Mr Zeng was on the balcony smoking at some time before the fire was noticed;
- He stated that he had put his cigarette into an ashtray on top of the air-conditioner but, because the ashtray was rusty, he was unsure whether the cigarette butt went down into the metal ashtray;
- This indicates that Mr Zeng did not pay close attention to his disposal of the butt. At the time there would not have been any particular reason for him to do so. The cigarette butt may have remained on top of, not inside, the metal ashtray;
- It was a windy day with gusts and winds capable of moving small light objects, such as cigarette butts, exposed to it;
- The ashtray was in relatively close proximity to the metal pedal bin that Mr Gardner identified as the most probable source of ignition of the fire;

- Alternatively, Mr Zeng may have placed a butt or a match in the bin and had forgotten this when interviewed by police. The traumatising effect of the fire might have disturbed his memory;

- We do not know what was in the bin at the time the fire started but on Mr Gardner's evidence it appears to have contained some sort of combustible fluid that was ignited;

- Mr Gardiner's observations suggest that a fire started within the bin and that at the time it had its lid down;

- If that is so, a source of ignition must have reached the contents of the bin. As no one else smoked on the balcony, and there is no other evidence of any of the occupants using fire in any form on the balcony shortly before the fire, the evidence points towards Mr Zeng either putting something burning into the bin (a match? A cigarette butt?) without fully extinguishing it, or leaving something on the balcony that was later moved under or into the bin due to air currents.

30. Mr Zeng was in his room in the unit at the time the electricity suddenly switched off. If he had left a butt or match smouldering in the bin, or somehow the butt had been blown under or into the bin, it would take at least a little time for such a small fire to develop into a larger one in the bin. It would have taken additional time for the plastic bucket to melt. It seems that the bottom of the plastic bucket in the bin melted and released a flow of burning liquid that then spread towards the air-conditioner. Mr Zeng estimated that he had had his last cigarette on the balcony about 50 minutes before the electricity blacked out. Whether this is an accurate estimate is impossible to say. What can be accepted is that there was a delay of unknown time between Mr Zeng's "smoko" on the balcony and the fire spreading from the bin to the air-conditioner.

31. Although this hypothesis remains speculative to a significant degree, in my view, it seems the most likely explanation of the cause of the fire.

Why did the fire spread so fast?

32. A number of factors combined to enable this fire to spread very quickly. First, assuming that Mr Gardener's theory that the fire was fuelled by a combustible fluid is correct, the fire was not quenched when Mr Zeng threw a small quantity of water onto it. In fact, the water seems to have had the opposite effect. This suggests that the main source of fuel at that stage was petroleum-based: water merely spreads such fuels. When Mr Zeng threw water onto the fire, the quantity of smoke coming from the vicinity of the air-conditioner immediately increased and the air-conditioner fan suddenly began to operate, emitting a cloud of black, toxic smoke that forced Mr Zeng back into the unit.

33. Second, instead of closing the balcony door once this happened, Mr Zeng left it open. He ran through the unit to the front door which he also jammed open with a barbell. His intentions were to let air into the unit and to create an escape route for the two young women who had by then retreated to the bedroom from which they later jumped. Opening the two doors, however, created a wind-tunnel. Winds that day in the Bankstown area were strong and gusty and blowing into the balcony. These were two fatal mistakes by Mr Zeng.

34. Third, evidence was given by a senior fire fighter, Chief Superintendent Greg Buckley that modern furnishings are very frequently manufactured from cheap synthetic, hydro-carbon-based materials that burn very quickly and reach a very high temperature very quickly. In earlier times, when natural materials were predominantly used, fires developed much more slowly. From the speed with which this fire developed, we can infer that the materials from which the furnishing in this unit had been manufactured were largely synthetics.

35. "Flashover" occurs when the materials in a fire scene are heated to their ignition temperatures and they catch fire. If the bulk of the materials in the scene are of similar type they will catch fire spontaneously and virtually simultaneously once the ignition temperature is reached. What appears to be a relatively small fire initially can develop exponentially into an inferno very quickly. Hydro-carbon-based materials, once alight, emit large quantities of black smoke which is largely unburnt hydro-carbons. They will explode once ignition point is reached. The concentration of such quantities of hydro-carbon-based materials in modern domestic environments means that flashover point can be rapidly reached – within minutes – once a fire develops.

36. Mr Buckley gave evidence that the network of fire stations in the Sydney metropolitan area was built when flashover times were very much longer. Fire stations were spaced out so as to be able to reach any building in their districts within the generally estimated time of flashover. This is no longer the case. We would need fire stations on every corner to be able to do this now.

37. Fourth, the unit was not fitted with sprinklers. Sprinklers are undoubtedly the best defence of life and property in a fire like this. Sprinklers operate automatically once a certain temperature is reached. Their primary effect is to reduce the heat of the gases that develop in a fire fuelled by synthetic materials. This means that the temperatures in the near vicinity remain survivable for human beings and do not reach flashover point. The time gained gives fire services much greater opportunity to reach the scene and conduct both rescue and fire-fighting operations successfully.

The building

38. The residential/commercial building at 4 West Terrace, Bankstown was built by Silky Constructions Pty Ltd. Construction was completed in about April 2007. The building has 144 residential units and is known as the "Euro Apartments". There are two main residential blocks, being blocks A and B. Unit 53 is located on the fifth story of Block B. There are 96 residential units in block B.

39. Block B is rectangular in shape. In the centre of block B is a vertical void space, from the ground to the roof. The units in the block are accessed via a corridor on each floor. Each corridor looks out into the vertical void space.

40. The original design was for the vertical void space to be covered at the roof by a metal louvred enclosure. The louvres would allow natural light and rain into the space.

41. The building was designed and constructed so as to have an 'effective height' of no more than 25 metres. The Building Code of Australia and related planning legislation and regulations require that residential buildings with an effective height of more than 25 metres have built into them a number of fire safety features that are not required for buildings of no more than 25 metres. In particular, such buildings are required to have

sprinklers fitted throughout the building, including residential units unless approved alternate fire safety measures have been incorporated into the structure of the building.

42. Developers building residential towers make commercial decisions based, among other things, on this '25-metre' rule. The installation of sprinklers and the other fire safety features required in buildings with an effective height over 25 metres is a significant additional construction cost. One rough estimate of the cost of retro-fitting sprinklers in these buildings was provided in a letter from a quantity surveyor to the Crown Solicitor's Office that it would cost in excess of $3,000,000 to undertake such a project. (Presumably the cost would be less if carried out at the time of construction.)

43. During his evidence, Mr Finianos denied that during the construction he had shaved a few centimetres off the building's height to ensure that it did not exceed an effective height of 25 metres for cost reasons. While his evasive answers on this topic did little to enhance his credibility as a witness, it is difficult to be critical of a developer merely for complying with a rule that will save costs. The real issue here is the rule itself.

44. The evidence suggests that the 25-metre rule was derived in times past from the maximum practicable height at which aerial fire appliances (that is, fire engines with ladders that can reach to significant heights) can be used to rescue people from burning buildings.

45. Whether Tower B exceeded or fell below an effective height of 25 metres is therefore a matter of considerable significance.

46. A related issue concerning the building is whether the interior void space at the time of the fire was an atrium or a light well. Buildings with atriums are required under the BCA to have sprinklers fitted throughout the building regardless of their effective heights. Other fire safety features that are required include smoke exhausts, air pressurisation for fire stairs and emergency communications systems and intercoms. In my view, for reasons that I will outline, the void space in Tower B was an atrium for the purposes of the BCA. The building, however, was not fitted with various fire safety features that are required by the Code in such structures.

Was the effective height more than 25 metres?

47. For the purposes of the BCA and regulations, the 'effective height' of a building such as Tower B is defined as:

> *The height to the floor of the topmost storey (excluding the topmost storey if contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.*

48. The architects, planners and certifiers who were involved in designing, approving and certifying this building all, from the outset, assumed that for the purposes of the BCA the 'lowest storey providing direct egress to a road or open space' was the ground floor or foyer level, not the car park.

49. An independent expert report by Mr Andrew Montgomery, however, offered the opinion that the effective height of Tower B was 27.69 metres. His calculation included the garage level that was built below the commercial and residential sections of the building.

50. Some support for Mr Montgomery's view is to be found in the decision of the NSW Supreme Court in *The Owners Strata Plan 69312 v Rockdale City Council* [2012] NSWSC 1244 (Lindsay J) in which the court held that the effective height of a residential tower building could (and in the particular case, should) be measured from the floor of a car park under the building because the driveway from the car park to the street provided 'direct egress'.

51. Until this decision, the generally held view in the construction industry (including local councils managing the approvals system) appears to have been that the 'lowest storey' providing 'direct egress' to the street or open space referred to the lowest storey at which a person descending from the topmost storey (or some point in between) would *most directly* exit the building. In this case, that would be through the foyer of the building. As Lindsay J pointed out the *Rockdale City Counci*l case, however, the plain words of the BCA do not say this.

52. If the *Rockdale City Council* case is correct, the effective height of Tower B may have exceeded 25 metres. The better view, however, I think, is that the relevant level from which to measure effective height is the building foyer.

53. While it is arguable that there is 'direct egress' to a road or open space from the car park under Tower B, in practical terms the car park driveway is designed primarily for motor vehicles rather than foot traffic. Moreover, it has a gate operated electronically. Access into and out of the building via the driveway is through the gate which is intended to be kept locked for security reasons except when it operated to allow vehicles in or out.

54. Mr Montgomery's opinion was based upon the fact that there were fire stairs from the upper level of the car park to a road or open space. A number of reasons were put to Mr Montgomery why this was not the appropriate way to calculate the "effective height" of the building. One was that he had used Section C1.2 of the BCA to calculate the storeys but had ignored the definition of "storey" in Section A1.1 of the BCA. On one view "rise in storeys" is used to determine the types of materials which must be used to prevent the spread of fire rather than "effective height". Further, the definition of "storey" excludes a space that only contains a stairway.

55. It is also arguable that the fire stairs did not provide direct egress to open space or a road. As I understand the evidence they were not connected to the fire stairs which ran from the top level of the building to the foyer. A person using those fire stairs would be very unlikely to enter the car park for the purpose of exiting the building via the fire stairs located there. The foyer of the building is slightly above ground level but allows pedestrians in and out of the building and provides direct egress to the road outside the building. It seems to me that measuring "effective height" from the floor of the storey on which the foyer was located is consistent with the definition.

56. Even if I am wrong in this analysis and the effective height should have been calculated from the car park level, given that the architects, engineers, planning authority and certifiers all thought that the building complied with the '25-metre' rule and advised Silky Constructions accordingly, it would be unfair to criticise Silky for breaching the rule.

57. Much more significant, in my view, is the next issue: the atrium question.

Atrium or light well?

58. For the purposes of the BCA, an 'atrium' is defined as follows:

> *'Atrium' means a space within a building that connects 2 or more storeys, and –*
>
> *is wholly or substantially closed at the top by a floor or roof (including a glazed roof structure); and*
>
> *includes any adjacent part of the building not separated by an appropriate barrier to fire; but*
>
> *does not include a stairwell, rampwell or space within a shaft.*[2]

59. An "Atrium well" means a space in an atrium bounded by the perimeter of the openings in the floors or by the perimeter of the floors and the external walls.

60. Although it was argued by a number of interested parties and also by some of the expert witnesses that this definition is ambiguous, at least in its application to Tower B, I disagree.

61. It was also argued by a number of interested parties and expert witnesses that the void space in Tower B was not an atrium. I disagree with that proposition as well.

62. It was put to me by counsel for Mr Barry Johnson that "on the position taken by Counsel Assisting, none of the evidence given by any of the witnesses is relevant because it is an orthodox question of construing the language used." I agree. But I also agree with Counsel Assisting's proposition.

63. The 'Golden Rule' of statutory interpretation is that "the grammatical and ordinary sense of the words is to be adhered to, unless that would lead to some absurdity, or some repugnance or inconsistency with the rest of the instrument, in which case the grammatical and ordinary sense of the words may be modified, so as to avoid that absurdity and inconsistency, but no farther…"[3]

64. The modern approach to statutory interpretation is to place the words in their context:

> *Ordinarily… the legal meaning [of a statutory provision] … will correspond with the grammatical meaning of the provision. But not always. The context of the words, the consequences of a literal or grammatical construction, the purpose of the statute or the canons of construction may require the words of a legislative provision to be read in a way that does not correspond with the literal or grammatical meaning.*[4]

65. This approach does not permit an interpretation that is absurd, or in accordance with professional custom but inconsistent with the words unless that leads to an absurd result, or which merely accords with wishful thinking. The ordinary grammatical meaning of the words of the definition of 'atrium' are not difficult to construe, are grammatical and do not (or should not) lead to absurdities or inconsistencies requiring inventive reinterpretation.

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[2] Clause A1.1

[3] *Grey v Pearson* (1857) HLC 61 at 106 per Lord Wensleydale cited in Pearce, DC & Geddes, RS *Statutory Interpretation in Australia* (6th ed) Sydney: LexisNexis, 2006 p26.

[4] *Project Blue Sky Inc v Australian Broadcasting Authority* (1998) HCA 28; 194 CLR 355 at [79].

66. This leads to a second problem that must be remarked on: using experts or extraneous sources to interpret legislation. In *HG v The Queen*[5], Gleeson CJ warned against the improper use of expert evidence. He said (at [44]):

> *[I]t is important that the opinions of expert witnesses be confined, in accordance with s 79 [of the Evidence Act 1995], to opinions which are wholly or substantially based on their specialised knowledge. Experts who venture "opinions", (sometimes merely their own inference of fact), outside their field of specialised knowledge may invest those opinions with a spurious appearance of authority, and legitimate processes of fact-finding may be subverted.* (Emphasis added.)

67. The purpose of the exception to the opinion rule allowing expert opinion evidence to be given is to enable judges of fact to gain sufficient understanding of matters that are outside the knowledge or experience of ordinary persons to make the ultimate findings of fact. In other words, where there is a field of expertise that is alien to the ordinary person, an expert may enable the judge of fact to "see" things that would otherwise not be observed or observable by the lay person, or which, if observed, could not be interpreted accurately by the lay person. It is not to invest the expert with that ultimate responsibility of fact-finding.

68. In this case, interpretation of statutes or legislation is not a formal field of specialist knowledge of the building experts. Even if their experience of using the BCA prima facie qualifies them in some fashion as experts in the interpretation of the BCA, it does not disqualify me from exercising that function. Expert opinion evidence is ultimately meant to be of assistance to the court. It is not permitted for it to displace the fact-finder, much less to displace the judicial officer as the decision-maker in relation to questions of law.

69. In light of these principles, it would not be proper for me to delegate or surrender the task of construing Clause A1.1 of the BCA to expert witnesses, especially those who may have an interest, conscious or otherwise, in the outcome.

70. Without being in the least bit facetious, the "duck test"[6] could be adapted here. If a structure looks like an atrium and has the characteristics of an atrium, it is probably an atrium.

71. Whilst it is impermissible to use the Guide to the BCA as a means of construing the words of the BCA[7], I note that the guide contains a diagrammatic representation of an "atrium" and an "atrium well" which is consistent with the conclusions I have reached. (See figure below.)

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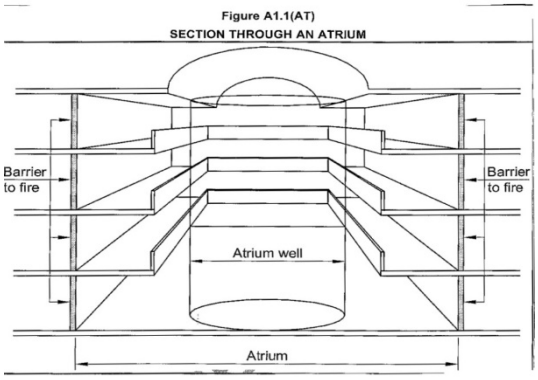
[5] [1999] HCA 2; 197 CLR 414; see also *The Owners Strata Plan no 69312 v Rockdale City Council* [2012] NSWSC 1244 at [92] per Lindsay J.

[6] "If it looks like a duck, swims like a duck, and quacks like a duck, then it probably is a duck."

[7] *Strata Plan 69312 v Rockdale City Council* [2012] NSWSC 1244



72. It is not in contest that at the time of the fire the void space connected 'two or more storeys', nor that corridors ran around the void space connecting units and that these corridors or pathways were not separated from the void by fire barriers.

73. The question then is whether the space was substantially or wholly enclosed at the top by a floor or roof. Once the lay observer is apprised of the definition in Clause A1.1, that factual question, in my opinion, can be settled by straightforward observation. To resolve it does not require the mediation of an expert interpreter.

74. I will not to seek to quantify the concept of 'substantially enclosure'. Even if it were up to me to do so, that sort of approach leads directly to the sorts of measures taken by developers to avoid infringing the '25-metre' rule and incurring significant extra costs. (By this comment, I do not imply a criticism of commercial developers. They do not set the rules or standards.)

75. In my opinion, the fundamental problem with the approach taken by Mr Watson and others such as Mr Quaglia is that instead of reading the words of the definition and applying those words to the structure they could observe, they became concerned with the *performance* of this particular structure in a fire. Thus we received and heard evidence concerning modelling and how smoke travelled through louvres and so on.

76. It appears to me that conceptual errors also crept into the expert evidence. Mr Watson, for example, when he sought to analyse whether or not the void space was an atrium, stated "it is proper to consider the 'top' of the light well as being in the same plane as the main roof level of the building. A secondary space bounded by the louvred structure sits above this." Mr Watson apparently excluded the main roof from his consideration despite the definition in Clause A1.1. He appears only to have considered whether or not the *opening* in the main roof was substantially enclosed.

77. Clarity sometimes emerges only slowly in court cases. But it is necessary now, like the little boy in the fairy tale, to say "the Emperor has no clothes"[8] -- that is, to state the obvious. And in my opinion, it is obvious that the top of the space was substantially enclosed. I think that it is arguable that, once the polycarbonate sheeting was placed over the top of the louvres, it was 'wholly enclosed' but I do not have to decide this.

[8] Hans Christian Andersen *The Emperor's New Clothes*

78. For our purposes, it seems to me that the 'top' of the void space is not the opening in the roof but the *roof itself* above the void (in which there happens to be an opening). A structure does not have to be completely enclosed at the top to be considered an atrium. Openings allowing entry of light and air are common. The question is whether there is *'substantial'* enclosure. The large majority of the space above the void at roof level is in fact enclosed by the roof and walls.

79. It follows from that further fire safety systems should have been installed. Most importantly, unless an approved alternate fire-engineered solution had been built into the structure, Tower B should have contained fire sprinklers throughout.

80. I am not suggesting that the existence of the "atrium" played any role in relation to the ferocity of the fire in Unit 53. The evidence was that it did not. There was evidence from Chief Superintendent Buckley that the "atrium" may have mitigated the "chimney ventilation effect" which would have otherwise contributed to the severity of the fire both in terms of its speed and intensity.

81. However, as was also noted by Chief Superintendent Buckley, by containing the smoke the "atrium" posed an immediate threat to the safety of occupants on upper levels. It played a significant role in confining a substantial amount of thick, black smoke within the building thereby contributing to the number and extent of occupants suffering from smoke inhalation requiring treatment.

82. Notwithstanding the above, it remains the case that the building did not have a sprinkler system.

Red tape, regulators and developers

83. One of the more striking aspects of this case is that regulatory systems and processes intended to ensure that large residential buildings are constructed according to strict standards failed. In part the failures were caused by the fact that the Bankstown City Council section responsible for following up safety orders was under-resourced; in part by what appears to have been lax or incompetent management by the strata agent; and in part by what appears to have been an insouciant attitude to fire safety on the part of the developer.

84. The chronology tells the story:

Post occupation works

85. Sometime after the issuing of the final occupation certificate on 17 April 2009 and before December 2010, perspex (about 1.2 metres in height) was positioned over part of the south vertical side of the metal louvred enclosure. Polycarbonate roof sheeting was also positioned over the horizontal louvred plane.

86. These additions were erected by or at the direction of Silky Constructions Pty Ltd or West Terrace Development Pty Ltd or by persons involved in the management or operation of those companies.

87. They were carried out to prevent rain entering the vertical void space via the metal enclosure. This may have followed complaints being made to the Owners Corporation regarding damage or inconvenience caused to the common areas by rain entering via the metal louvred enclosure. There is no evidence that this alteration was ever approved by a

general resolution of the Owners Corporation, by Bankstown City Council or any other relevant authority. Fire and Rescue NSW was not consulted or informed of these additions before they were carried out.

Annual Fire Safety Statement – 28 June 2010

88. On 28 June 2010, an employee of Firecorp Australia Pty Ltd issued an Annual Fire Safety Statement for the Building. That statement certified that each essential fire safety measure specified in the statement had been assessed by a properly qualified person and found to perform to the required standard. It was issued following an inspection undertaken by that employee on 11 June 2010.

89. That statement was provided to Mr Peter Poulos, the strata manager, who, in the same document, also certified that the information contained within it was accurate to the best of his knowledge and belief. Mr Poulos believes that Firecorp Australia Pty Ltd had been recommended to him by the builder.

90. Mr Poulos subsequently caused that statement to be lodged with the Council pursuant to the *Environmental Assessment and Planning Regulation 2000.*

91. The evidence given at the inquest indicates that this statement was probably inaccurate in several respects. Only a few months later, another report found a significant number of fire safety faults and deficiencies.

92. Worryingly, the evidence from Mr Harry Lambros, the Bankstown City Council officer with responsibility for such matters, was to the effect that annual fire statements were merely filed but never checked.

FireScope Report – 20 October 2010

93. On 20 October 2010, FireScope Consulting prepared a report entitled "Building Fire Safety Audit Consultancy Proposal Re: 2-4 West Terrace Bankstown".

94. The report referred to a site inspection of the Building on 15 October 2010 in the company of "Joe Hussein of NSW Alarm and Ray McKay of NSW Fire Brigades". Although the report is addressed to "The Owners of Strata Plan c/- Strata Management for Euro Terraces at 2-4 West Terrace Bankstown", it is directed to "Dear Jacqui" and the author states that he based his review in part on an email "…*from your representative Mustak Hussein (Joe) of NSW Alarms*". It appears from this that the report was not forwarded directly to the Owners Corporation rather it was sent to "NSW Alarms".

95. The report identified a number of deficiencies with essential fire safety measures in the Building, including but not limited to deficiencies with the Automatic fire detection and alarm systems, the occupant warning system, and the absence of portable fire extinguishers. One of the recommendations was that FireScope conduct a review of "…any Alternative fire engineering report that may exist for the building containing an Atrium in Block B".

96. Mr Poulos testified that he never requested this report and did not know of its existence before the fire on 6 September 2012. He further testified that he did not know who the

"Jacqui" referred to in the report was. Mr Stanley Jane, secretary of the Owner Corporations' Executive Committee, also testified that he did not know of the existence of this report before the fire.

Council orders

97. On 22 December 2010, Fire and Rescue NSW wrote to the Council concerning fire safety concerns with the Building. In that letter, reference is made to an inspection carried out at the Building by a Fire Safety Officer and the Council's Senior Building Surveyor – Fire Safety, Mr Lambros.

98. It appears as a consequence of that inspection that Mr Lambros discovered the polycarbonate sheeting that had been placed over the metal louvred enclosed in Tower B. Mr Lambros was concerned as to the impact that alteration had in terms of the building's compliance with the Building Code of Australia.

99. On 1 February 2011, the Council issued a final safety order to the Owners' Corporation. It ordered, amongst other matters, that a fire engineer report be obtained demonstrating that the building complied with the BCA and made reference to the "atrium roof of the building" and that "[t]he building…is not provided with all the active and passive fire safety systems…". The Order specified that it be complied with by 1 June 2011.

100. Mr Poulos testified, in essence, that neither he nor Home World received a copy of the order made 1 February 2011 or were aware of its existence. In all likelihood, he did not have the key to the Owners Corporation letterbox at the building at this time. Any mail delivered in that box at that time was collected by someone from the Owners Corporation Executive Committee and delivered to Home World. Mr Poulos was provided a key to access this box at a later time. This account was largely corroborated by Mr Stanley Jane during his testimony. Mr Lambros confirmed in his testimony that Mr Poulos was not present during his inspection of the Building that preceded the issuance of the order made 1 February 2011.

101. It does not appear that this order came to the attention of the Owners Corporation when it was made.

102. The Council did not receive any response to that order. Mr Lambros, in essence, testified that towards the latter part of the year he identified Mr Poulos as the strata manager and got in contact with him. When asked about the delay in following up on this order, Mr Lambros testified that he was, effectively, primarily responsible for surveying and fire safety compliance within the Council.

103. Records show that Mr Lambros attended another inspection of the building in October 2011. This time Mr Poulos was present during the inspection. Mr Lambros determined then that none of the concerns identified before had been addressed.

104. On 25 November 2011, the Council issued another Order on the Owners' Corporation. It again, amongst other matters, sought that a fire engineer report be obtained. The Order specified that it be complied with by 22 May 2012 and that the order made 1 February 2011 was revoked.

105. That order was sent directly to Mr Poulos. Mr Poulos received that on or about 29 November 2011. Mr Poulos forwarded a copy of that order to Mr Ray Finianos by email on 29 November 2011. It appears he did so as he considered the developers were responsible for the issues raised as the building was still under warranty.

106. During his testimony Mr Poulos could not specifically recall whether he provided an actual copy of the Order made 25 November 2011, at the time, to the members of the Executive Committee. A copy of the same was not forwarded to the members of the Owners Corporation. He testified that the members on the Executive Committee certainly knew about that order around the time he received it and testified that the Owners Corporation members would have been told about it at the Annual General Meeting.

Annual Fire Safety Statement – 17 January 2012

107. On 17 January 2012, Mr Narend Prasad of NSW Fire Extinguisher Services Pty Ltd issued an annual fire safety statement for the building. The statement certified that the essential fire safety measures specified in the same had been assessed by a qualified person and found to satisfy the required standard.

108. Mr Poulos testified that he believed he had obtained quotes from different businesses to provide this statement. NSW Fire Extinguisher Services Pty Ltd may have been selected as it provided the cheapest quote. In his testimony he could not recall whether the Order made by the Council on 25 November 2011 was brought to the attention of NSW Fire Extinguisher Services Pty Ltd's attention before the annual fire safety statement made on 17 January 2012.

Fire Engineering Report – 26 March 2012

109. On 26 March 2012 Impact Fire Pty Ltd prepared a fire engineering report for Silky Constructions Pty Ltd. This was done in answer to the Council order made 25 November 2011.

110. Reference was made in the report to the covering of the metal louvred sheets. The report writer assumed for the purposes of the report that the horizontal louvres covered with polycarbonate sheeting technically resulted in an atrium and thereby triggered the 'deemed-to-satisfy' provisions of the BCA.[9]

111. The report writer also recommended the construction of metal sheeting on two sides of the metal louvred enclosure, positioned at least 1.2 metres away, to shield it from the wind.

112. This metal sheeting was installed by or at the direction of Silky Constructions Pty Ltd and/or West Terrace Development Pty Ltd or by someone involved in the management or operation of those companies prior to 6 September 2012. There is no evidence this was approved by general resolution of the Owners Corporation.

113. Impact Fire Pty Ltd's report was provided to the Council.

[9] "Deemed-to-satisfy" provisions relating to defined structural elements are construction practices, such as the installation of sprinklers, etc that, without further need for modelling, or other forms of complex forms of verification, are 'deemed to satisfy' the performance requirements of the BCA.

114. On 3 April 2012, Fire and Rescue NSW attended a basement fire at the Building. A station officer lodged a "Lodgement of Fire Safety Concern" following that attendance in relation to stair pressurisation, exit signs and other matters.

115. An Emergency Order issued by an authorised Fire Officer under the *Environmental Planning and Assessment Act 1979* was issued to the Owners' Corporation (addressed to the Strata Manager) on 5 April 2012 seeking a number of remedial actions be undertaken by 10 May 2012.

116. On 9 May 2012, the Council wrote to the Owners' Corporation about the Fire Engineering Report. In essence, it sought verification with respect to the modelling relied upon in the report. If this was not done or the results were not satisfactory to the Council, "…an alternative approach demonstrating compliance with the Performance Requirements will be required".

117. Further correspondence was exchanged between the Council and the Owners' Corporation or its agent or delegate between 30 May and 19 June 2012 in relation to the Fire Engineering Report.

118. On or about 30 May 2012, a supplementary report by Impact Fire Pty Ltd was forwarded to the Council in response to issues that had been raised by the Council. Without being exhaustive, those issues concerned the modelling that was relied on by Impact Fire Pty Ltd in reaching the conclusions expressed in its report dated 26 March 2012.

119. In a letter dated 19 June 2012, the Council raised further issues with Impact Fire Pty Ltd's modelling. The Council also noted that compliance was required by 22 May 2012 advised that it required Owners' Corporation representations as to how it intended to comply (including completion date) by 6 July 2012.

120. It appears the Council received no further response from either Mr Ray Finianos, Mr Poulos, the certifier or the Owners Corporation on this matter after 19 June 2012. Nothing substantive occurred before the fire on 6 September 2012.

Hydrant flow issue

121. The Fire Order issued by the Fire & Rescue NSW on 5 April 2012 required, amongst other matters, that the Owners' Corporation conduct "…a test of the fire hydrant installation and associated fire brigade booster assemblies affording protection to the building…" and that it provide "…a record of the results of the inspection and test…"

122. On 2 May 2012 Paramount Fire Consultants carried out a hydrant flow test at the building on the most hydraulically disadvantaged hydrant. In a report of the results, it noted that the test requirement was 250 kPa at 1200 litres/min. The tested carried out registered the flow at 70 kPa at 130 litres/min.

123. A copy of that report was forwarded by Paramount Fire Consultants to Ray Finianos by email on 14 May 2012, copying in Mr Poulos. In that email, Paramount Fire Consultants' representative advised "…THE HYDRANT TEST FAILED AND WILL NEED A PUMP TO ACHIEVE CODE REQUIREMENTS…"

124. It is not clear why the pressure recorded prior to the occupation certificate being issued in 2009 and that recorded on 2 May 2012. An expert in these proceedings speculated that pressure in the mains may have been reduced by Sydney Water since 2009.

125. Ray Finianos then forwarded the email from Paramount Fire Consultants dated 14 May 2012 onto the certifier, copying in Mr Poulos, Allstop Fire and Lindsay Billinghurst of LPB Fire Service Pty Ltd. Mr Finianos requested the certifier to "…please comment and advise on the next course of action and advise the strata of its options and steps to take remedial works to comply with the current codes…"

126. There is no evidence that the results of the tests carried out on 2 May 2012 were ever forwarded to Fire and Rescue Services NSW as ordered, nor that Fire and Rescue Service was put on notice of this issue. Fire and Rescue Service NSW appear not to have followed up on the Order made 5 April 2012 prior to the fire on 6 September 2012.

127. There is no evidence that Mr Ray Finianos, the certifier, or Mr Poulos took any further action beyond the email sent to the certifier on 10 May 2012.

128. Mr Poulos testified, in essence, that he noted this matter at the time but considered it a matter to be remedied by the developer.

129. By about 7 May 2012, Mr Stanley Jane, the Secretary of the Owners' Corporation, had been told about the existence of the Fire Order made 5 April 2012 by Mr Poulos. He testified that basic details of that order were explained to him by Mr Poulos but a copy of that order was not provided to him for the Executive Committee. Mr Poulos was being relied upon by the Executive Committee to address that order. Neither Mr Jane, nor it appears the Executive Committee, were specifically informed about the Hydrant Flow issue before the fire on 6 September 2012.

Mr Finianos

130. Problems with this building concerning fire safety were first identified in 2010. Yet despite the appearance of activity to address the issues, nothing substantial to make the building safer was done before 6 September 2012.

131. This was not only a systemic issue. During his evidence, Mr Ray Finianos admitted that developers should not make unauthorized alterations to their buildings after an occupation certificate is issued. Despite the fact that he and his father have been in the business of constructing residential towers for many years, Mr Finianos claimed that he did not know that, even on his own certifier's understanding of the definition of an atrium, putting a roof over a 'light well' converted the structure into an atrium.

132. He also claimed that he would have complied with any directions for safety improvements that were made to his company. When Mr Finianos asserted this in his evidence, it appears that he had overlooked the fact that several such orders had been made over a lengthy period, none of which had resulted in any substantial improvements to the building by 6 September 2012.

The red tape labyrinth

133. It appears to me that the combination of an ineffective or only very slowly effective system of regulation and enforcement of fire safety standards, and a cost-conscious developer who (despite his claims in evidence) was reluctant to comply with orders, resulted in a stand-off that jeopardised the safety of residents in the building for about two years. It was only the fire itself that resulted in real action being taken.

A culture of "compliance" v a real safety culture

134. This inquest is yet another demonstration of the paradoxical effect of a culture of legal compliance that is intended to enhance safety having the polar-opposite effect of deadening our sensitivity to the fundamental purpose of such regulatory schemes –mindfulness of danger and public safety.

135. I have remarked on this paradox in other inquests.[10] We know that catastrophic fires in residential buildings are rare. This probably encourages a mind-set that fire safety standards and checks are only a form of routine paperwork, and an unwarranted confidence that because nothing had gone catastrophically wrong in the past, nothing is likely to in future.

136. An emphasis on compliance and regulation of safety can, paradoxically, reduce safety. In my view, it is likely that the various orders and checks and annual fire statements were regarded by all involved in the two year paper war as a form of regulatory homework rather than as a tool for improving the actual safety of residents in the building.

137. In short, we can infer from the lack of urgency on the parts of almost everyone involved in this process, but especially on the part of the developer, that compliance (insofar as that went) at least cost and inconvenience, rather than mindfulness of risk itself, was the uppermost consideration.

138. How to raise public consciousness of the dangers of modern house and structure fires, of fire safety and the significance of fire safety regulation is an issue for agencies such as Fire & Rescue NSW and government, especially local government.

What more should be done to improve safety?

139. It is sometimes difficult in inquests to draw general lessons from particular cases. But when questions of public safety are raised, it is critical that genuine efforts are made by coroners and interested parties to identify the relevant lessons to be learned.

140. The point was made, perhaps melodramatically, but very emphatically, in an article published by the *Sydney Morning Herald* that reported an engineer's prediction that a new high-rise building will experience a 'major fire' sometime in the next two years unless the system of certification is significantly improved in NSW.[11] (That article and the report to which it referred are not in evidence and have not been taken into account in my findings.

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[10] See, for example, the *Inquests into the deaths of Trevor DRAYTON and Edgar ORGO and Inquiry into explosion at Draytons Winery, Pokolbin* (13 July 2011)

[11] Sue Williams "High-rise apartments vulnerable to 'major fire': engineer" SMH 20 June 2015 citing Mr Robert Hart of Engineers Australia speaking at the launch of its report *Defect-Free Construction in NSW: How it can be achieved.* http://www.domain.com.au/news/highrise-apartments-vulnerable-to-major-fire-engineer-20150619-ghriq0/

I mention them merely to underline the need to draw the necessary lessons from Connie's death.)

141. In the course of the inquest, great attention was paid to the question of whether recommendations could be made to relevant bodies that would increase public safety and reduce the risk of similar catastrophes occurring in future. During the course of the inquest draft recommendations were circulated to interested parties. All involved, including Connie's parents, made positive contributions to the discussion.

142. The terms of the final draft of the recommendations appear below, as do my comments. These recommendations are important. Modern life in NSW and, in particular, large urban centres is characterised by multiple occupancies and high rise development. In my opinion it is critical that adequate measures are taken, and taken now, to ensure that in the future the possibility of tragedies such as occurred to Connie, her family, and Ginger and her family, is limited so far as is humanly practicable.

***To the Minister for Planning (NSW) and the General Manager of the Australian Building Codes Board** ("**ABCB**")*

That the Department of Planning (NSW) and the ABCB conduct research (jointly or individually), in consultation with Fire & Rescue NSW and the Australasian Fire and Emergency Service Authorities Council, into the off-setting of costs associated with installing fit-for-purpose sprinkler systems in new Class 2 and 3 buildings through the possible reform of other fire safety requirements.

143. This is a very important recommendation. I received evidence, which I accept, to the effect that it is difficult to secure changes to the BCA because the process is dominated by cost/benefit analysis. That is unfortunate when it comes to matters of safety. Nevertheless, I accept that this represents the current state of affairs and matters need to be addressed on that basis. The evidence in this inquest and in other inquests over which I have presided leave absolutely no doubt in mind that the most effective fire safety measure in any building housing multiple occupants is a fire sprinkler system. It is second to none.

144. As I have already noted, had such a system been installed in Tower B it is almost certain that Connie would not have perished nor would Ginger have suffered such terrible injuries. Further, those other residents of the building, particularly those occupying upper floors would not have experienced significant respiratory problems as a result of the fire. Smoke-induced respiratory complications can lead to death.

145. I also heard evidence, which I accept, that fire sprinkler systems are so effective that a number of other fire measures could be sacrificed or abandoned where such a system is installed. To do so would not increase the risk of tragic consequences from fire but substantially reduce such a risk.

146. This recommendation is not only supported by Fire & Rescue NSW but by the Department of Planning. I should point out that the Department of Planning has suggested that this recommendation correlates closely with the third recommendation noted below and that there should be consolidation of these recommendations. I accept that they are related but not to such an extent that consolidation should occur.

147. There are two reasons why there should not be a consolidation. In my opinion there is always a risk that multi-layered recommendations will cause confusion and take on a meaning which was unintended. In my experience, short, sharp and reasonable recommendations are more likely to receive attention from stakeholders (including government).

148. My second reason for not supporting consolidation is that the Department of Planning also supports the third recommendation.

To the General Manager of the Australian Building Codes Board ("**ABCB**"):

That the ABCB consider amending the National Construction Code to provide definitions for the terms "substantially enclosed" and "direct egress" to ensure clarity and consistency of interpretation.

149. It cannot be gainsaid that absolute clarity is highly desirable where matters of health and safety are concerned. The evidence which I have heard suggests that there may be confusion within the building industry concerning the meaning of *"direct egress".* The experts who gave evidence before me are testament to that as is the decision of the Supreme Court of NSW in *Strata Plan 69312 v Rockdale City Council [2012] NSWSC 1244.*

150. I am more concerned with amending the definition of "substantially enclosed". This particular inquest has demonstrated that those involved in the building industry are capable of deriving meanings which are not really available from plain English words and expressions. The evidence which I heard in relation to the meaning of the definition of the word "atrium" is a very good example and "substantially enclosed" I am concerned that whatever way the plain English words of the BCA are further refined there will be some who will seek to reinterpret them. I question too how the expression can be further refined without introducing some mathematical formula.

That the ABCB consider amending the National Construction Code to require the installation of fit-for-purpose sprinkler systems in all new Class 2 and 3 buildings (buildings of a shared residential nature) in conjunction with the possible reform of other fire safety requirements to ensure this significant improvement in public safety is achieved in the most cost-effective manner.

151. In my opinion this recommendation is critical and I cannot think of any defensible reason for failing to adopt it. The simple fact is that the terrible tragedy which occurred in this matter would almost certainly not have occurred if the subject of this recommendation had been law. If this recommendation is not adopted then it is more likely than not that similar tragedies will occur in the future. In fact it is all but certain.

152. Although this recommendation contemplates, in effect, some form of cost benefit analysis that has been included to facilitate adoption of the recommendation in a regulatory environment which contemplates that this is desirable, if not mandatory. I would like it to be clearly understood, however, that whether or not sufficient cost savings can be achieved to fully offset the cost of sprinklers, those sprinklers should become mandatory in all Class 2 and 3 Buildings.

153. If there is a residual cost then it is one which builders and developers should bear. Although there is a risk that some will seek to pass that cost on to consumers, that will not necessarily be so. Builders and developers are always able to achieve cost savings by offsets which do not involve matters of health or safety; lesser finish to a kitchen, a bathroom with tiles rather than marble less expensive carpet perhaps.

154. Even if the cost is passed on to consumers, the overall cost to each consumer would be a relatively small additional cost. So, for example, if the additional cost of installing sprinklers in Tower B was approximately $3,000,000 as estimated by one quantity surveyor, the cost per unit would be about $30,000. This is, of course, a substantial sum. But when amortised over the life of a mortgage, especially at low interest rates, the annual cost is relatively small, especially when compared with the overall cost of housing in Sydney and the likely capital gains from residential property over that time. I am

unconvinced that the fractionally increased cost would be a significant deterrent to home buyers, investors or developers.

155. I note that this recommendation is also supported by Fire & Rescue NSW and the Department of Planning.

That the ABCB review the efficacy of the current requirements in the National Construction Code as regards smoke alarms and detectors in residential buildings to ensure their life safety function is not undermined by the high incidence of false alarms which are contributing to public complacency and the disabling of alarms.

156. I received evidence in this inquest which demonstrates that false alarms are potentially a recipe for disaster. There were numerous false alarms in the property over many months. Unsurprisingly the occupants of Tower B became complacent. The fire in Unit 53 triggered the alarm but a number of occupants of the building treated it as another false alarm and stayed put rather than evacuate.

157. The actual cause of the false alarms is unknown. However, there must have been a cause and I anticipate that there would be particular matters which could cause alarms to activate without fire over an extended period. Those causes need to be identified and addressed

158. Fire & Rescue New South and the Department of Planning support this recommendation.

To the Minister for Planning (NSW) and the Minister of Health (NSW)

That the Department of Planning and the Department of Health develop (jointly or individually), in consultation with Fire and Rescue NSW, Australasian Fire and Emergency Service Authorities Council and the Australian Building Codes Board, the capacity to collect and publish data regarding fire-related injuries for use in the development of fire safety policies and reforms (and see below regarding the collection of non- injury related economic cost data)

159. As I understand the evidence I have received, the cost/benefit approach of the ABCB to the change of BCA standards depends upon the presentation of evidence. That is entirely understandable. However, there are indirect economic costs which are not reflected in readily available information concerning actual deaths by fire. Thankfully deaths by fire within a residence are reasonably infrequent occurrences in New South Wales.

160. What is not readily available are figures which reflect hospital admissions, hospital treatment or treatment by health professionals for fire related injuries which are not fatal. They might be anything from serious burns to respiratory problems. In my opinion, fire safety standards need to be set by reference to not only fatalities but non-fatal injuries. That combination sets the parameters of the true cost to our community.

161. This recommendation is supported by Fire and Rescue New South Wales. It is also supported by Planning subject to two matters. The Department has suggested that this recommendation closely resembles the next recommendation. I agree. The requirement to engage with interstate counterparts is important. The standards set by the ABCB are national standards. The Department has also flagged that it is not certain whether existing databases are intended to be used or a new data base. It has given as examples of existing databases the Australian Incident Reporting System and Australian Bureau of Statistics.

162. It is my understanding that these databases are unlikely to contain complete details of all fire injuries which are not fatal but nevertheless could be reported by hospitals and health professionals. It may be that the Australian Incident Reporting System and the Australian

Bureau of Statistics will be adequate but that is a matter which requires assessment by the organisations named in this recommendation.

That the Department of Planning and the Department of Health (jointly or individually) engage interstate counterparts with the objective of establishing the uniform collection and publishing of data on fire-related injuries for use in the development of fire safety policies and reforms.

163. This has been addressed. It is supported by Fire & Rescue New South Wales and, subject to the comments made above, the Department of Planning.

To the Minister for Planning (NSW), the Minister for Emergency Services (NSW) and the Minister for Fair Trading (NSW):

That a statutory regime be implemented for the accreditation and auditing of persons or entities that undertake annual fire safety checks and issue annual fire safety statements issued pursuant to the Environmental Planning and Assessment Regulation 2000. Consideration should be given to including Australian Standard AS1851 as part of the statutory regime as an option for meeting maintenance requirements for essential fire safety systems.

164. I have already commented upon the Annual Fire Safety Statement which was issued on 17 January 2007. It was clear to me that the person who issued the statement was not sufficiently qualified to do so and as I understand the evidence received by me during this inquest, this is an industry wide problem. It needs to be addressed.

165. As I have previously noted these Statements have real capacity to mislead occupants of the buildings to which they relate. Assessment of the adequacy of fire safety measures within a building should never be left to people who are not trained or qualified to make such assessments. Fire safety standards are continually updated and accordingly those who make assessments need to be audited so that the public can have confidence in the certification process.

166. Any assessment process needs a standard by which it must be made. Fire & Rescue New South Wales provided evidence that Australian Standard AS 1851 is the most appropriate standard and I accept that evidence.

167. Whilst Fire & Rescue New South Wales accepts this recommendation there is partial support from the Department of Planning. It has suggested that the recommendation is consistent with improvements to building regulation and certification currently being contemplated and that further work needs to be done before such a regime could be implemented, including discussions with relevant bodies, the assessment of the capacity of industry to meet demands if the change is implemented and assessment of the cost implications. The Department has suggested that the words "Consideration be given to. .." be added at the commencement of this recommendation. I disagree. The Annual Safety Statement contains representations. One of the representations is that it has been issued by a "qualified person". If that is not so then it is utterly inappropriate for the document to be issued at all. Council may recognise this flaw but the general public do not.

168. The Department also suggest that Australian Standard AS 1851 should be no more than a guide based upon the Departments assessment of practicality, cost and "other" implications. Again I disagree. If no standard is to be applied other than the best guess of a person who represents that they are qualified (when they may not be) and in circumstances where a member of the public would understandably assume that there is some objective standard governing the assessment, then there needs to be a standard. As I

have said, I received evidence that AS 1851 was the appropriate standard and I accept that evidence.

That the Ministers consider legislative reform to allow lawful powers of entry for appropriately authorised inspectors from the Department of Planning, Office of Fair Trading, Council or FRNSW to inspect property in circumstances where a reasonable suspicion of unlawful occupancy is held.

169. The evidence concerning the fourth bedroom in this case suggests that there needs to be adequate powers of entry and inspection by those bodies which are best equipped to deal with what they find. Powers of entry upon (real) property have always been curtailed by the common law although continually eroded by statute. The Department has expressed certain concerns but has supported a review of how powers of entry are activated rather than expanded. I am not entirely convinced that this would be adequate but accept that further consideration is appropriate. That is what the recommendation currently provides.

To the Minister of Planning and the Minister for Emergency Services

That consideration be given to implementing, in consultation with Fire & Rescue NSW, a statutory requirement that installations of new, or alterations of existing, fire hydrant systems be approved by Fire & Rescue NSW prior to the issue of an occupation certificate.

170. This recommendation suggested by Fire & Rescue New South Wales is built upon its many years of experience in dealing with deficient fire hydrant systems. It may well be , as suggested by the Department of Planning that "in a planning sense" the word "approved" means approved by development consent. That is a given. However the recommendation has nothing to do with planning approval. On every building site various aspects of building works must be certified by someone who is competent to do so. It is just plain common sense that the particular system which has been installed be approved by the very body who might be called upon to utilise it. One matter which is crystal clear from the evidence I received is that private certification can be deeply flawed.

That the Department of Planning, in consultation with Fire & Rescue NSW, develop the capacity to collect and publish data regarding the economic cost of fire including business interruption, property loss, displacement of residents, lost work time due to injuries including smoke inhalation injuries and associated business costs related to insurance payouts and premiums.

171. In my opinion this recommendation is a very important one. I have already explained my understanding, based upon the evidence, of the use of cost/benefit analysis in formulating, improving and, perhaps, changing building standards. To rely solely upon direct economic costs is, in my opinion, a deeply flawed methodology. Business interruption, property loss, displacement of residents, lost work time and the like are in many respects the true indicators of cost and benefit. If a cost/benefit approach is to be adopted, it should encompass all the relevant quantifiable costs. And the final position ought to be one that recognises and takes into account that the real and ultimate cost is the loss of life and the dreadful consequences to Connie, her family, and Ginger and her family.

172. This recommendation is supported by Fire & Rescue New South Wales but it is not supported by the Department of Planning. It claims that the "purpose and intended outcome of this recommendation to the department is unclear". I have to say that I find that surprising having regard to some of the earlier recommendations. Indirect economic consequences are important inputs in any cost/ benefit analysis if they are available. The purpose of the recommendation is clear. It is to better inform those who control building standards the true cost and to implement change. In this case that means a mandatory requirement to install fire sprinklers in Class 2 and Class 3 buildings.

That the Department of Planning, in consultation with the Fire & Rescue NSW, examine the development of a star rating system for new residential building fire safety systems (in addition to mandatory compliance with the NCC regime) with the objective of readily informing the consumer about the overall efficacy of the building's overall fire safety systems and consider strategies to deter non-compliance with the fire safety requirements in residential buildings as provided by the National Construction Code and Environmental Planning and Assessment Act 1979, Environmental Planning and Assessment Regulation 2000.

173. This is a controversial recommendation and, in large measure, it is not supported, in large part, by the Department of Planning. It has made the point that it involves a "grading" or "ranking" system and a new building "must" be safe. Anything less than this should not be acceptable. I agree with these comments in part. However, they assume an industry where "must" means "will". What happened in this matter is a prime example. The occupants of the building were entitled to assume, and no doubt did assume, that the building was fire-safe. It was not. There were features of the building which required additional fire measures: a sprinkler system unless there was an approved alternate solution – which there was not at the time of the fire and had never been.

174. Further, the BCA standards are *minimum* standards. There does not seem any good reason why a builder or developer who does more in the interests of owners and residents should not be entitled to publicise that the standards applied are well beyond the minimum required. It seems to me that a star rating system is one way to achieve this. It may not be the only way. But in some way members of the public are entitled to know whether the building which they occupy is compliant, but minimally so, or safer than the minimum standards.

175. I note that the Department supports the recommendation to the extent that it concerns strategies to deter non-compliance. It contends that this is supported because it is "consistent" with improvements to building regulation and certification currently being "contemplated" by the Department.

176. However I do not know what improvements in building regulation and certification it has in mind which might have prevented the terrible tragedy which has been the subject of this inquest and will do so in the future. I hope that the period of contemplation is short and sharp as it was in the aftermath of the Quakers Hill Nursing Home fire.

That the Minister for Planning (NSW), in consultation with the Minister for Emergency Services (NSW) conduct a review of the efficacy of the enforcement powers of FRNSW in relation to fire safety with a particular focus on the effective and proportionate escalation of powers to ensure timely compliance with orders and the consideration of extending or clarifying those powers as they relate to structural matters.

177. This is a recommendation which was advanced by Fire & Rescue New South Wales. It regards it as very important. So do I. Under the existing regulatory environment Fire & Rescue New South Wales had no power to require correction of structural deficiencies even in circumstances where Council had identified a number of the same issues and had served Orders.

178. The Department of Planning disagrees. It has pointed to the fact that Fire & Rescue New South Wales can issue penalty infringement notices but that responsibility for structural changes to existing buildings rests with Council and should remain there.

179. I do not accept that maintaining the status quo is appropriate in relation to structural deficiencies which from a fire safety perspective may impact upon the health and safety of occupants. A very good example is provided by this matter. Fire & Rescue New South

Wales had no power to direct the developer or the builder to remove the polycarbonate sheeting on the "atrium". Worse, Council did not do so. It called for an engineering solution. The sheeting remained in place. Then there was a fire. The polycarbonate sheeting had a seriously deleterious impact upon residents on the upper floors of Tower B. One or more could have died. There is no good reason why the experts in relation to fire safety, Fire & Rescue New South Wales, should not have the power to direct structural changes to an existing building if safety so demands.

That current changes proposed to clause 144 and clause 152 of the Environmental Planning and Assessment Regulation (2000) affecting the role of FRNSW in the assessment of alternative solutions be expedited so that FRNSW are better able to apply their resources on a risk basis when addressing building fire safety.

180. It is common ground that this recommendation should be made. It is supported by Fire & Rescue New South Wales and the Department of Planning.

181. I note that both bodies are currently in discussions about this particular recommendation.

To the Managing Director, Sydney Water Corporation ("Sydney Water"):

That Sydney Water consult with FRNSW prior to implementing any water pressure reduction program and consider alternative strategies for the maintenance of appropriate firefighting water to properties that may be required to incur significant retrofitting costs as a result of the program.

182. In my opinion this is necessary as the facts of this matter demonstrate. There is no doubt that lack of water pressure inhibited the activities of Fire & Rescue New South Wales although, fortunately, only temporarily. And the evidence does not discount the possibility that a pressure reduction program may have been responsible rather than the quality and performance of the systems on site.

183. I note that Fire & Rescue New South Wales and the Department of Planning both support this recommendation. The Department has also helpfully noted that the recommendation should extend to any other water utility implementing a town main water pressure reduction program. I agree and I am sure that Fire & Rescue New South Wales would too.

184. The Owners Corporation suggested a number of refinements to the recommendations. I will briefly note my views below.

185. Recommendation 2 - I disagree that there is any need to clarify the meaning of the definition of "atrium". My reasons are already apparent.

186. Recommendation 3 – I agree that there should be clarification of the test for "fit for purpose" sprinklers so that there is no ambiguity as to the nature and class of sprinklers intended. I agree too that there should be some notification or signage as to the existence, class and character of the sprinkler facilities available. I note that the Department agrees.

187. Recommendation 8 - I do not agree that an Owners Corporation should have unfettered power to enter individual units. There is a very substantial risk that the privacy of occupants could be invaded in the name of fire safety concerns but for other reasons. If the Owners Corporation believes that there are unauthorised alterations which create fire risks then they can draw such matters to the attention of the local Council or Fire & Rescue New South Wales.

188. In relation to the balance of what has been advanced by the Owner's Corporation as amendments to my recommendations I am not prepared, on the evidence, to adopt those

amendments. Nevertheless, by and large, they have support from the Department of Planning. None seem to me to have had a direct impact upon the terrible events of 6 September 2012. However, they may have a bearing on accountability. As such they should be carefully considered by government.

Conclusions

182. Had sprinklers been installed throughout this building, it is very likely that both Connie and Ginger would have survived without serious injury. Another major fire, at the Quakers Hill Nursing Home in 2011, which cost the lives of 14 people, has resulted in the installation of sprinklers in all nursing homes and similar facilities. The life-saving potential of sprinklers has been recognised.

183. Connie's story is, in one sense, a story about Australia and China in the 21st century. But is also the story of Australia since 1788. For more than 200 years, people have come to this country for the chance of a better life, or to give their children opportunities that they did not have or could not have at home. And, of course, the wave of immigrants from Asia that has arrived during the past two generations has brought enormous benefits to this country and our community. After her death, Connie's mother wrote, "My husband and I worked very hard for our daughter. We did everything for Connie to pay her tuition fees for her university study. We moved to Australia to give her a better life and to have a wider view of the world."

184. Sadly, the hopes of these loving and devoted parents have been destroyed. One of the most tragic aspects of this terrible event is that not only have Connie's parents lost their beloved daughter, their only child, but our community has lost a highly intelligent, kind, charming young woman who might have achieved many things. We can be confident that she would not only have made her parents proud but that she would have been a fine Australian, helping build this country and its links with Asia.

185. Connie's life and death, however, were not meaningless. Her death not only touched the minds and hearts of many people in Sydney and around Australia in 2012, but the image of Connie and Ginger on the ledge outside their apartment remains a vivid memory for many. If, as every member of the coronial team hopes, and many others who participated or took an interest in this inquest also hope, the recommendations that have been made in this coroner's report are actively considered, Connie's last contribution to her adopted country will have been to help make buildings like West Terrace safer.

186. There is no greater pain known to the human race than for helpless parents to see their children die in front of them. There is no closure, no softening of that blow. I hope, however, that Mr and Mrs Zhu will accept the very sincere and respectful condolences that the coronial team and I offer them. We are so very sorry that they have lost their beautiful daughter. We also offer our sincere sympathy to Ginger for the pain and suffering she has undergone as a result of this fire.

Findings s 81 Coroners Act 2009

187. I find that Pinkang Connie Zhang died on 6 September 2012 as a result of multiple injuries she received when she fell from the ledge outside Unit 53, Tower B, 4 West Terrace, Bankstown, New South Wales in an attempt to escape from a fire that was burning in that unit.

188. I find that fire at Unit 53, Tower B, 4 West Terrace Bankstown, New South Wales had its origin on the balcony of the unit. The evidence does not enable me to identify the cause of the fire on the balance of probabilities.

Recommendations s 82 Coroners Act 2009

189. **To the Minister for Planning (NSW) and the General Manager of the Australian Building Codes Board** ("**ABCB**")

That the Department of Planning (NSW) and the ABCB conduct research (jointly or individually), in consultation with Fire & Rescue NSW and the Australasian Fire and Emergency Service Authorities Council, into the off-setting of costs associated with installing fit-for-purpose sprinkler systems in new Class 2 and 3 buildings through the possible reform of other fire safety requirements.

190. **To the General Manager of the Australian Building Codes Board** ("**ABCB**"):

That the ABCB consider amending the National Construction Code to provide definitions for the terms "substantially enclosed" and "direct egress" to ensure clarity and consistency of interpretation.

That the ABCB consider amending the National Construction Code to require the installation of fit-for-purpose sprinkler systems in all new Class 2 and 3 buildings (buildings of a shared residential nature) in conjunction with the possible reform of other fire safety requirements to ensure this significant improvement in public safety is achieved in the most cost-effective manner.

That the ABCB review the efficacy of the current requirements in the National Construction Code as regards smoke alarms and detectors in residential buildings to ensure their life safety function is not undermined by the high incidence of false alarms which are contributing to public complacency and the disabling of alarms.

191. To the Minister for Planning (NSW) and the Minister of Health (NSW)

That the Department of Planning and the Department of Health develop (jointly or individually), in consultation with Fire and Rescue NSW, Australasian Fire and Emergency Service Authorities Council and the Australian Building Codes Board, the capacity to collect and publish data regarding fire-related injuries for use in the development of fire safety policies and reforms (and see below regarding the collection of non- injury related economic cost data)

That the Department of Planning and the Department of Health (jointly or individually) engage interstate counterparts with the objective of establishing the uniform collection and publishing of data on fire-related injuries for use in the development of fire safety policies and reforms.

192. To the Minister for Planning (NSW), the Minister for Emergency Services (NSW) and the Minister for Fair Trading (NSW):

That a statutory regime be implemented for the accreditation and auditing of persons or entities that undertake annual fire safety checks and issue annual fire safety statements issued pursuant to the Environmental Planning and Assessment Regulation 2000. Consideration should be given to including Australian Standard AS1851 as part of the statutory regime as an option for meeting maintenance requirements for essential fire safety systems.

That the ministers consider legislative reform to allow lawful powers of entry for appropriately authorised inspectors from the Department of Planning, Office of Fair Trading, Council or FRNSW to inspect property in circumstances where a reasonable suspicion of unlawful occupancy is held.

193. To the Minister of Planning and the Minister for Emergency Services

That consideration be given to implementing, in consultation with Fire & Rescue NSW, a statutory requirement that installations of new, or alterations of existing, fire hydrant systems be approved by Fire & Rescue NSW prior to the issue of an occupation certificate.

That the Department of Planning, in consultation with Fire & Rescue NSW, develop the capacity to collect and publish data regarding the economic cost of fire including business interruption, property loss, displacement of residents, lost work time due to injuries including smoke inhalation injuries and associated business costs related to insurance payouts and premiums.

That the Department of Planning, in consultation with the Fire & Rescue NSW, examine the development of a star rating system for new residential building fire safety systems (in addition to mandatory compliance with the NCC regime) with the objective of readily informing the consumer about the overall efficacy of the building's overall fire safety systems and consider strategies to deter non-compliance with the fire safety requirements in residential buildings as provided by the National Construction Code and Environmental Planning and Assessment Act 1979, Environmental Planning and Assessment Regulation 2000.

That the Minister for Planning (NSW), in consultation with the Minister for Emergency Services (NSW) conduct a review of the efficacy of the enforcement powers of FRNSW in relation to fire safety with a particular focus on the effective and proportionate escalation of powers to ensure timely compliance with orders and the consideration of extending or clarifying those powers as they relate to structural matters.

That current changes proposed to clause 144 and clause 152 of the Environmental Planning and Assessment Regulation (2000) affecting the role of FRNSW in the assessment of alternative solutions be expedited so that FRNSW are better able to apply their resources on a risk basis when addressing building fire safety.

194. **To the Managing Director, Sydney Water Corporation ("Sydney Water"):**

That Sydney Water consult with FRNSW prior to implementing any water pressure reduction program and consider alternative strategies for the maintenance of appropriate firefighting water to properties that may be required to incur significant retrofitting costs as a result of the program.

Magistrate Hugh Dillon
Deputy State Coroner for NSW