QUEENSLAND COURTS

CORONERS COURT OF QUEENSLAND

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Jordan Robert Crocker**
TITLE OF COURT:	Coroners Court
JURISDICTION:	BRISBANE
FILE NO(s):	2022/537
DELIVERED ON:	31 July 2025
DELIVERED AT:	BRISBANE
PRE-INQUEST HEARING DATE(s):	28 January 2025
INQUEST HEARING DATE(s):	31 March 2025 - 2 April 2025
FINDINGS OF:	Ainslie Kirkegaard, Coroner
CATCHWORDS:	Coroners: inquest; work related death; electrocution; electrician; restricted domestic roof space; ducted air conditioner system; indoor unit; fault finding; communication error; residual current device (safety switch); risk assessment; safe system of work; product design, installation and safety warnings

REPRESENTATION:

Counsel Assisting:	Ms. J L Franco
Crocker Family:	Mr. P Telford Instructed by Travis Schultz & Partners
BG Electrical Pty Ltd	Mr. R Clutterbuck instructed by C Niven, Tailored Legal
Office of Industrial Relations:	Ms. E J Cooper
Daikin Australia Pty Ltd:	Mr. M Trim, instructed by Baker & McKenzie
DB Electrical Pty Ltd:	Ms. B Stringer instructed by Gilchrist Connell

Contents

Introduction

1. Jordan Robert Crocker was a 25 year old licenced electrical fitter mechanic who was fatally electrocuted inside a domestic roof space at 1 Corbett Street Everton Park on 2 February 2022. Jordan died when he inadvertently contacted exposed live parts when trying to diagnose a fault code by inspecting the control box components of the indoor unit of a Daikin ducted air conditioner system. The circuit supplying the air conditioner system was not protected by a safety switch.

2. The Office of Industrial Relations (OIR) investigated Jordan's death under the *Work Health and Safety Act 2011* and the *Electrical Safety Act 2002* because he was undertaking this task as an employee of BG Electrical & Air Con Pty Ltd ('BG Electrical'). Information obtained from this investigation informed the coronial investigation.

3. Coronial autopsy confirmed the cause of Jordan's death to be electrocution.

4. A safety switch would have saved Jordan's life.

5. The inquest examined:

   (a) the findings required by section 45(2) of the *Coroners Act 2003*

   (b) the factual context in which Jordan proceeded with the job knowing he had to enter a restricted roof space with the power on; and

   (c) safety proposals including product design, safe installation practices for electrical equipment, in particular air conditioner units, in restricted roof spaces.

6. My role as Coroner is to independently investigate Jordan's death to make findings about his identity, the medical cause of death and when, where and how he died. The Coroners Act prevents me from determining criminal or civil liability or regulatory consequences for Jordan's death.

7. The relevant standard of proof is that of the balance of probabilities, with reference to the Briginshaw[1] standard. Accordingly, the more significant the issue for determination, the clearer and more persuasive the evidence must be for me to be sufficiently satisfied on the balance of probabilities that the issue has been proven.

8. I may, where appropriate, comment on matters connected with Jordan's death and make preventative recommendations concerning public health and safety, the administration of justice or ways to prevent deaths from happening in similar circumstances in future.

[1] *Briginshaw v Briginshaw* (138) 60 CLR 336.

The ducted air conditioner system

9. The design of the system's indoor unit, the internal layout of its control box and the unit's orientation within the roof space are important to understanding how Jordan came to be fatally electrocuted.

10. The system was a Daikin Australia Pty Ltd ducted air conditioner Model FDYQN100LAV1 and AC refrigeration unit Model number RZQ100LV1 with operating voltage 220-240V rated current 27.5 amps manufactured in August 2015. This model was discontinued in November 2019 to make way for newer design products.

11. The system was sold in October 2015 and installed at an unknown time between then and July 2019, when the current homeowner bought the property. Investigations could not identify the contractor who installed the system.

12. The indoor unit was installed in the roof space approximately 1850mm from the manhole entry in an easterly direction. Its orientation was such that the control box faced north, away from the manhole entry (Figure 1). The unit was mounted above a sheet metal drip tray.

Figure 1: The environment within which Jordan was working (showing the perspective from the manhole entry)

13. The indoor unit's control box measured 260mm high x 250mm wide x 100mm deep. It had a metal cover. There were "warning" and "caution" stickers on the front of the cover (Figure 2).

14. A warning in large red type to disconnect all power supply circuits (both indoor and outdoor) was directed to the task of obtaining access to the terminals.

15. Beneath this warning were cautions in smaller black type including “Before starting to inspect the electrical parts (electrical box, fan motor, etc) make sure to turn off the air conditioner power to both indoor and outdoor unit, otherwise you may get an electric shock”.

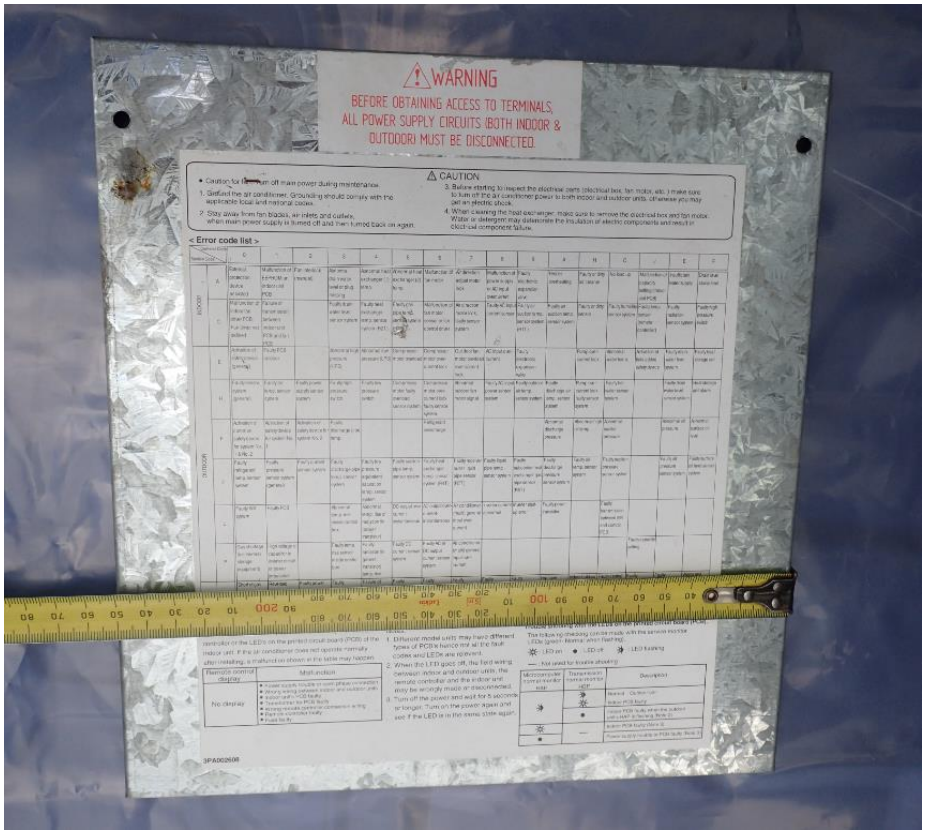


Figure 2: Indoor unit control box cover

16. The orientation of the control box facing north meant these stickers were not within direct line of sight from the manhole entry while the metal cover was in place. Whether Jordan could have visualised the warning and cautions from the manhole entry and his position with the roof space is discussed later.

17. The control box componentry and its layout are generally typical of that for ducted system indoor units. The size, position and construction of the terminal box containing two low voltage live terminals within the control box are key elements in how the electrical shock path was established (Figure 3).

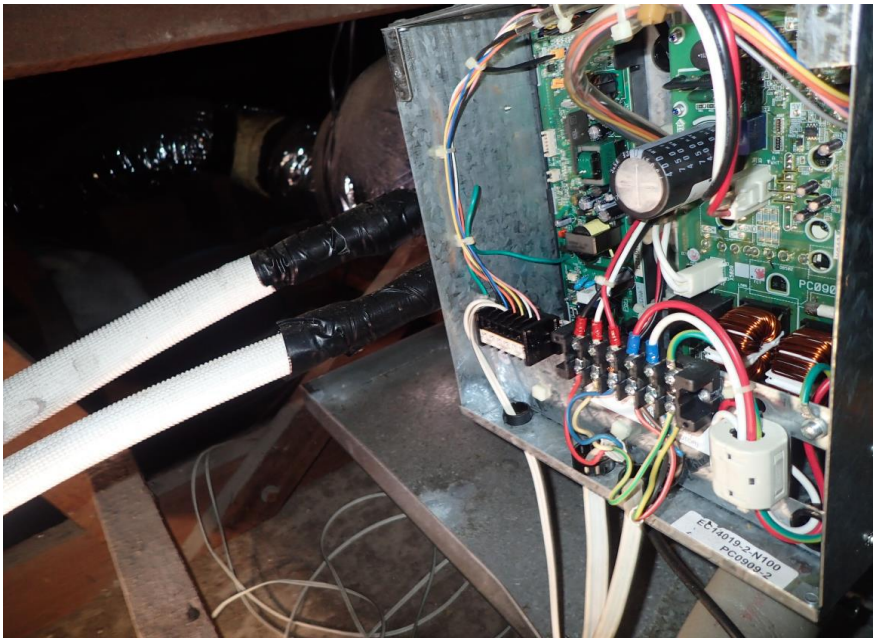


Figure 3: The inside of the indoor unit control box enclosure

18. The air conditioner circuit was protected by a Hager brand C32 amp circuit breaker. This device protects an electrical circuit by quickly cutting power when there is a high current fault or overload. It is different from a safety switch which shuts off electricity supply when it detects a leakage to earth. Circuit breakers are installed to protect circuit wiring and appliances; safety switches protect people.

19. The main switchboard was in the garage underneath the house. There was a single four pole safety switch protecting the final subcircuits labelled power, laundry and dishwasher. The final subcircuit for the air conditioner system was not protected by a safety switch.

How Jordan came to be fatally electrocuted

20. Jordan was tasked to attend a service call for the ducted air conditioner system at the property that occasionally showed a “UO-04” fault code. He was to perform a fault find on the system and clean/service the unit. A UO fault code indicated the system was short of gas.

21. This was Jordan’s second job for the day, having completed a two-man job with his colleague TB at Bellbowrie. The pair were scheduled to attend a different job together next but because they were running a bit behind and another electrician was running ahead of time, Jordan’s employer, Bradley Gall “balanced out the load” by arranging for the other electrician to pair with TB on the next job, freeing up Jordan to attend the Everton Park job on his way home. Mr Gall told the inquest he went out of his way to give Jordan jobs on the northside to reduce his commute home.

22. Mr Gall spoke with Jordan during a five minute phone call made at 1:58pm. He recalls Jordan was on his way to the Everton Park job during the call.

23. This was a routine job that a qualified and experienced electrician like Jordan could complete on his own. Mr Gall estimated Jordan had attended "hundreds" of these jobs while working with BG Electrical.

24. The weather was hot and humid, approximately 35°C with a forecast of high humidity and afternoon storms. The homeowner had booked the job because she wanted the air conditioning to flow better to keep her partner comfortable while he was recovering from back surgery performed the previous day. She was working from home that afternoon.

25. The homeowner and her partner told first response police officers Jordan arrived at around 2:30pm. This is consistent with the travel time between Bellbowrie and Everton Park, noting Jordan was on his way to Everton Park when he spoke with Mr Gall shortly before 2:00pm.

26. Once at the property, Jordan found the air conditioner system was displaying a different fault code – U4. This is a commonly encountered fault code indicating a problem with communication between the indoor and outdoor units. The inquest heard evidence that a qualified and experienced electrician would anticipate having to inspect both units to diagnose this fault.

27. The homeowner asked Jordan whether it was okay to go ahead with the job with a storm coming. Jordan responded to the effect it was "fine" and "should be all good". Jordan turned on the air conditioner system and the bathroom lights near the manhole. The customer recalls asking if Jordan wanted the power off due to the storm, but he told her no.

28. Jordan went up into the manhole for a short time and went out to his work vehicle for a while. Neither the homeowner nor her partner observed what Jordan was doing while he was outside.

29. During this time, Jordan accessed the Daikin application on his mobile phone to obtain information about the U4 fault code. The app confirmed the code indicated a possible communication error between the system's indoor and outdoor units, stating:

> "*Ensure all wiring is correct between indoor and outdoor units. Confirm if LED A (green) is pulsing steadily on both indoor and outdoor control PCBs – if not confirm correct power supply from both the incoming mains and transformer (if applicable). Additionally, if LED A is not present, eliminate possible faulty attached loads (compressor, fan motor(s), comms line (wire), EXV. Also and consider PCB corrosion or vermin infestation as possible contributors*."

30. The air conditioner system had to be energised to see whether the green LED light was pulsing.

31. Jordan sent a photograph of the wall control panel showing the U4 fault code and a screenshot of the Dakin app instructions to Mr Gall by SMS at 2:55pm and 2:56pm. There was no accompanying message. Mr Gall interpreted this as Jordan seeking to troubleshoot the job with him. He replied by text message at 3:32pm stating "Sorry you all good?". Mr Gall says he was on the phone when Jordan sent him the images and did not see them until about 30 minutes later.

32. In the meantime, Jordan re-entered the roof space to access the indoor unit control box. The homeowner and her partner told police they saw him go into the manhole at around 3:00pm.

33. Jordan had to remove the metal cover to observe if there were any pulsing lights on the communications printed circuit board (PCB) inside the control box. The power remained on.

34. Jordan was approximately 1.91m tall and 133.8kg. There was a roof truss to his left so space was very limited. He was prone with his upper torso across the edge of the metal drip tray to position himself close enough to open the metal cover. His head was likely very close to if not touching the edge of the control box.

35. He was wearing a head torch.

36. He was not wearing insulated protective gloves.

37. Jordan removed the metal cover by undoing the two top screws (left and right) using an insulated screwdriver.

38. He held the upper left side of the metal cover in his left (non-dominant) hand. He was likely semi-face down, holding the cover above his head and at an angle towards the control box. The cover was not hinged. Jordan had to slide the cover upwards a short distance before lifting it in the direction of the roof truss to his left, away from the front of the control box. The diagram in Appendix A depicts the Electrical Safety Office inspectors' interpretation of Jordan's position within the roof space.

39. While handling the metal cover, the edge or corner contacted the exposed live terminals in the terminal block inside the control box causing Jordan's left hand to contract, effectively squeezing the cover. Electrical continuity tests subsequently confirmed continuity between the air conditioner circuit breaker and the terminals of the red interconnect conductors at the control box, indicating the terminals were energised when the air conditioner system was running. This was the entry point for the electric shock.

40. Jordan could not free himself from contact due to his position within the tight roof space and the effects of electric shock. While there were plastic barriers between each terminal within the terminal block, there was no cover over the live terminals. There was a 10mm gap between each terminal. The edge of the metal cover measured approximately 8mm, meaning it could fit snugly in this gap, perhaps also explaining why Jordan was unable to free himself from contact.

41. The metal drip tray provided the return path for the electric shock causing an electrical exit wound on Jordan's chest.

42. The nature of Jordan's injuries suggest he was in contact with live parts for some time with his upper body and chest laying across the metal drip tray.

43. The C32 amp circuit protective device did not operate. It would not have detected the shock to Jordan's body because he would have been a high impedance load in the electrical circuit meaning there was insufficient current flow to trip the circuit breaker.

44. It was actively storming with heavy rain, thunder and lightning while Jordan was in the roof space. The homeowner's partner reported hearing a loud bang that wasn't lightning or thunder sometime around 3:15pm – 3:30pm. The OIR investigation subsequently confirmed that neither the house nor its electrical system received a lightning strike during the storm. It is possible Jordan may have been startled or distracted by storm-related activity while he was handling the metal cover, but this can never be known.

45. BG Electrical's submissions raised the possibility that, noting Jordan's history of asthma, he may have experienced a storm asthma attack or breathing issues which caused him to collapse onto the metal cover. BG Electrical's legal representatives did not raise this before or during the inquest, leaving no opportunity to test this theory with the forensic pathologist. Nonetheless, it is not supported by the pathologist's autopsy report which specifically documents there was no macroscopic or microscopic evidence of asthma in the lungs. It is possible Jordan may have coughed or sneezed while he was handling the metal cover, but this too can never be known.

When the nature of Jordan's work activity became known to the OIR investigation

46. It was not until three months into the OIR investigation when Electrical Safety Office inspector Darrin Hasemann and Work Health & Safety Queensland investigator Andrew Lucy met with Jordan's family that information about the U4 fault code came to light and the reason for Jordan entering the roof space became clear. They showed him the messages Jordan sent to Mr Gall. Mr Gall's text in reply was also there to be found. This knowledge significantly shifted the focus of the investigation because it showed Jordan died while undertaking a different work activity to that recorded on the job card.

47. I observe this information was there to be found on both Jordan and Mr Gall's mobile phones had they been examined by police or OIR at the outset of the investigations. The messages passing between Jordan and Mr Gall were in the possession of both Mr Gall and Jordan's family. Mr Gall's explanation for not alerting OIR to the existence of the messages is that he had not noticed the fault code in the message was different. Knowledge of these messages would have provided a clearer focus for OIR when conducting the electrical contractor safety audit and examining the contents of Jordan's work vehicle on 11 February 2022, issuing the 122C notice to BG Electrical on 31 March 2022, assessing BG Electrical's compliance with that notice and interviewing Mr Gall on 26 May 2022. Importantly it would have provided more timely answers with less distress for Jordan's family. That said, I am satisfied the delay did not impact the conclusions reached by the OIR investigation regarding the shock path and how Jordan came to be fatally electrocuted.

Jordan's conduct as a licenced electrical fitter mechanic

48. Jordan had been working as a fully qualified electrician since October 2018, after completing his apprenticeship with BG Electrical, a business specialising in installing, servicing and repairing ducted and split system air conditioning systems. He had also completed a certificate II in Split AC and Heat Pump Systems. He held an ARCtick refrigerant handling licence.

49. Jordan's employer and work colleagues universally describe him as a very safe, methodical tradesman who did not rush his jobs and did quality work. He was neat and his accuracy was the best. He took great pride in his work as an electrician.

50. One former colleague describes Jordan as "the safest of all of us" who "went above and beyond to be safe". Jordan knew exactly what he was and was not comfortable doing and was comfortable telling his employer if there was something unsafe about a job he was asked to attend.

51. I place significant weight on the undisputed evidence about Jordan's personal qualities and his cautious work practices as a fully qualified and experienced electrician of some years standing.

Jordan's training and experience working on Daikin air conditioner systems

52. Jordan's apprenticeship and subsequent full time employment with BG Electrical provided him with some years of exposure to working on Daikin and other manufacturers' air conditioner systems.

53. Material produced by BG Electrical estimated Jordan had been working on a minimum of one split air conditioner system per week. This material indicates he may not have worked on this specific model Daikin ducted air conditioner system during the 12 months preceding his death.

54. Jordan had not completed any formal training with Daikin; rather he received on-the-job training working with qualified electricians and training through regular Toolbox talks and pre-start meetings.

55. The Daikin Australia National Service Manager Mr Franswah explained that anyone holding a full ARCtick licence can work on Daikin units. Daikin Australia has a training academy and a free technical advice phone service. One of the electrician witnesses formerly employed by BG Electrical, LB, told the inquest this advice line was very helpful.

56. BG Electrical was not an authorised service agent for Daikin products. Mr Franswah explained that while this is not necessary for anyone working on Daikin products, being one would increase their experience with Daikin products and provide them with more access to Daikin service managers, supervisors and training.

57. BG Electrical employees attended monthly Toolbox talks run by Mr Gall. The evidence is these meetings provided an opportunity to talk about things arising during the previous month such as what they were doing right, what they needed to improve, and reinforcing accountability and safety. These meetings were also an opportunity to undertake specific skills or task training.

58. None of the Toolbox meeting minutes produced by BG Electrical documented discussion of how to diagnose a U4 fault code for a Daikin product and/or the risk of electric shock posed by the process of accessing the internal components of a control box on an energised air conditioner system in a roof space.

59. Mr Gall does not specifically recall talking to his employees about specific risk of inadvertently contacting live terminals while removing a metal control box cover from an energised air conditioner unit. However, given the obvious inherent risks of working with electricity, I accept his evidence the risk of anything metallic accidentally contacting live parts is "*a massive talking point of doing electrical work*" to ensure those sorts of things don't happen.

Should Jordan have appreciated the risk of electric shock posed by live terminals inside the control box of an energised ducted air conditioner unit?

60. The electrician witnesses explained how the components of ducted air conditioner systems are broadly similar with the indoor unit typically made of metal and having a control box housing similar componentry including live terminals typically located at the bottom of the internal layout.

61. Jordan's family submitted there was no evidence he was experienced in or trained to meet the cumulative circumstances he encountered on 2 February 2022. It is not known whether he had ever diagnosed a U4 fault on this specific Daikin model ducted air conditioner system or another split system air conditioner previously. Whether he accessed the Daikin app for information about this fault code because it was the first time he had encountered it or he was refreshing his memory or double checking his understanding of what to do cannot ever be known.

62. However, as a fully qualified electrician working in a business specialising in air conditioning systems for several years post apprenticeship, I consider that regardless of system make or model, Jordan did have sufficient training and experience to anticipate there would be live parts behind a metal control box cover which posed an appreciable risk of electrical shock while the air conditioner system was energised, for which he needed to actively consider control measures.

63. The Electrical Safety Office inspectors felt that due to the absence of formal training from Daikin, it could not be established whether Jordan had knowledge of the specific internal layout of the electrical equipment within the control box of this specific model Daikin product including awareness of just how close the live terminal strip was to the front cover.

64. I do not accept that without specific training on Daikin air conditioner systems or diagnosing what is a commonly encountered fault in split system air conditioner systems that Jordan was not adequately trained or experienced to identify the risk of electrical shock while handling a metal cover near exposed live parts in a

restricted space. It is difficult to accept that an electrician of his years of experience would not have encountered jobs presenting one or more of these general hazards prior to the Everton Park job.

Did Jordan perform and document a risk assessment before proceeding with the job?

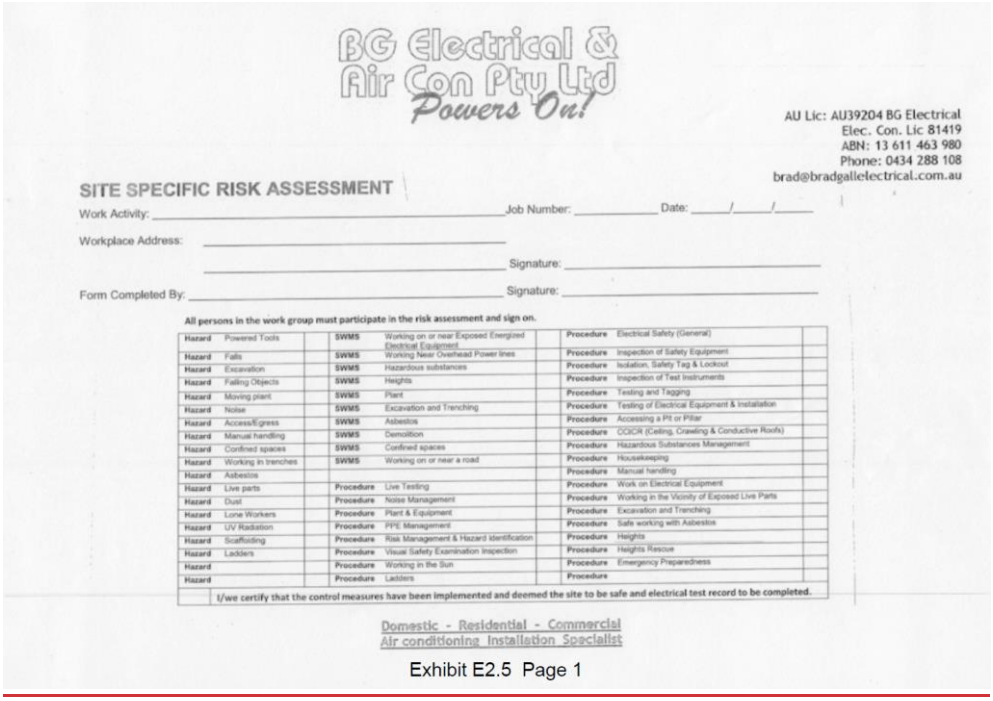
65. BG Electrical had a duty to conduct its business in a way that is electrically safe including having a detailed safe system of work and risk assessment process to identify hazards and implement controls to eliminate or minimise risk.

66. BG Electrical's Safe System of Work for all regular work policy conveyed a clear expectation that employees were to perform a risk assessment before starting any job. The policy instructed the "job must not proceed if there are any doubts about safe work procedures."

67. The risk assessment process required employees to identify hazards specific to the job and consider measures to control those risks, with reference to Safe Work Method Statements (SWMS) relevant to the nature of the work to be performed. Jordan had access to the full suite of BE Electrical SWMS and policies in a folder in his work vehicle.

68. These documents provided guidance about potential hazards, risks and control measures for employees to consider when undertaking their risk assessment of a job. They covered matters including working in confined spaces, electrical testing, working live, working on or near exposed energised electrical installations, basic fault finding on LV MCC or similar panels and isolation lockout test, and working on electrical equipment. Mr Gall had developed the Safe system of work for all regular works performed at BG Elec & Air Con document to distil the key requirements from these SWMS into an easy reference point for his employees.

69. Evidence provided by current and former BG Electrical employees indicates the practice was for employees to document a site specific risk assessment by identifying job specific hazards and relevant SWMS from the list on a template checklist (Figure 4), photographing the completed document and uploading the photograph to an online group chat. For two or more person jobs, it did not matter which employee completed and uploaded the completed risk assessment document. The uploading requirement was intended to keep employees accountable but was not constantly monitored.



BG Electrical & Air Con Pty Ltd
Powers On!

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SITE SPECIFIC RISK ASSESSMENT

Work Activity: _____ Job Number: _____ Date: ____/____/____

Workplace Address: _____

_____ Signature: _____

Form Completed By: _____ Signature: _____

All persons in the work group must participate in the risk assessment and sign on.

Hazard	Powered Tools	SWMS	Working on or near Exposed Energized Electrical Equipment	Procedure	Electrical Safety (General)
Hazard	Falls	SWMS	Working Near Overhead Power lines	Procedure	Inspection of Safety Equipment
Hazard	Excavation	SWMS	Hazardous substances	Procedure	Isolation, Safety Tag & Lockout
Hazard	Falling Objects	SWMS	Heights	Procedure	Inspection of Test Instruments
Hazard	Moving plant	SWMS	Plant	Procedure	Testing and Tagging
Hazard	Noise	SWMS	Excavation and Trenching	Procedure	Testing of Electrical Equipment & Installation
Hazard	Access/Egress	SWMS	Asbestos	Procedure	Accessing a Pit or Pillar
Hazard	Manual handling	SWMS	Demolition	Procedure	CCICR (Ceiling, Crawling & Conductive Roofs)
Hazard	Confined spaces	SWMS	Confined spaces	Procedure	Hazardous Substances Management
Hazard	Working in trenches	SWMS	Working on or near a road	Procedure	Housekeeping
Hazard	Asbestos			Procedure	Manual handling
Hazard	Live parts	Procedure	Live Testing	Procedure	Work on Electrical Equipment
Hazard	Dust	Procedure	Noise Management	Procedure	Working in the Vicinity of Exposed Live Parts
Hazard	Lone Workers	Procedure	Plant & Equipment	Procedure	Excavation and Trenching
Hazard	UV Radiation	Procedure	PPE Management	Procedure	Safe working with Asbestos
Hazard	Scaffolding	Procedure	Risk Management & Hazard Identification	Procedure	Heights
Hazard	Ladders	Procedure	Visual Safety Examination Inspection	Procedure	Heights Rescue
Hazard		Procedure	Working in the Sun	Procedure	Emergency Preparedness
Hazard		Procedure	Ladders	Procedure	

I/we certify that the control measures have been implemented and deemed the site to be safe and electrical test record to be completed.

Domestic - Residential - Commercial
Air conditioning Installation Specialist

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Figure 4: BG Electrical's Site Specific Risk Assessment form

70. BG Electrical employees interviewed by OIR provided positive responses regarding the company's safety culture including by way of induction, SWMS run through, company protocols, risk assessments and bonuses based on risk assessment compliance, Mr Gall's attendance at jobs, regular documented Toolbox talks, and clear advice about working in roof spaces and working live. Some of them said the safety induction they received at BG Electrical was better than what they received with other employers.

71. WHSQ investigator Andrew Lucy explained how the OIR investigation obtained a "representative sum" of documents from BG Electrical and did not access the company cloud during the electrical contractor safety audit conducted on 11 February 2022. As noted in paragraph 46, this was before it was understood why Jordan was in the roof space and what had happened to him.

72. BG Electrical was subsequently compelled to provide the coronial investigation with all documents (including job cards, risk assessment and photographs) relating to jobs on Daikin air conditioner units attended by Mr Gall and his employees including Jordan during the period of Jordan's employment with the company. Mr Gall could not explain the absence of risk assessments in the material provided by BG Electrical.

73. By nature, Jordan was a safety conscious employee who was predisposed to follow procedure. The inquest received evidence of him having documented and uploaded risk assessments for some previous jobs. The available evidence does not show how many jobs Jordan attended alone for which he was solely responsible for documenting and uploading the risk assessment or when he attended those jobs. Without a more fulsome picture, I am unable to make a finding about compliance by Jordan or BG Electrical employees generally in conducting and recording risk assessments for every job. There is no evidence that Jordan *documented and uploaded* a risk assessment before proceeding with this job.

74. The first response police officers' search of Jordan's work vehicle was limited to efforts to confirm his identity. Andrew Lucy had a cursory look inside but did not search it thoroughly. He says it was almost impossible to know what to look for at that stage because they had no idea what Jordan was doing in the roof space or what happened to him. Police had removed the vehicle by the time he and the Electrical Safety Office inspector finished their scene inspection and electrical testing that evening. Police released the vehicle to Mr Gall who drove it back to the business premises. He says nothing was removed from the vehicle apart from some personal property returned to Jordan's family. Andrew Lucy says there was no risk assessment in the vehicle when he and Darin Hasemann searched it during the safety audit on 11 February 2022. There was no photo of a completed risk assessment for the job on Jordan's phone.

75. However, there is evidence that on arriving at the property at around 2:30pm, Jordan took appropriate steps to clarify the problem with the homeowner, identify the fault code and briefly visually inspect the roof space.

76. Between then and around 3:00pm, Jordan spent time outside the house during which he accessed the Daikin app for information about the U4 fault. The app instructions required the power to remain on for him to visualise the LED lights on the PCB inside the indoor and outdoor control boxes. With this knowledge, it appears Jordan took steps to troubleshoot the job by texting this information to Mr Gall.

77. I find these actions are consistent with Jordan taking steps to assess risk and plan how to approach the job before he re-entered the roof space at around 3:00pm. It is possible Jordan decided to get on with the job and attend to the paperwork later given the storm activity, but this can never be known.

What potential hazards did the job present?

78. The BG Electrical witnesses identified the following hazards:

    (a) the high humidity and active storm.
    (b) needing to enter and work within a 'tight' roof space with the power on.
    (c) the orientation of the indoor unit control box 90 degrees away from the manhole entry made accessing and visualising the control box cover and internal components awkward, especially for a person of Jordan's height and build within the tight roof space.
    (d) the presence of cables and ducting within the tight roof space.
    (e) the control box cover was metal.
    (f) the presence of live terminals inside the energised control box.
    (g) the air conditioning circuit was not protected by a safety switch.

79. Of these, the site-specific risk assessment template offered prompts for live parts, ladders and lone workers, with space to document additional hazards.

80. While none of the BG Electrical SWMS specifically addressed the risk of handling conductive parts near exposed live parts in a tight roof space, between them the documents available to Jordan that afternoon guided him to:

- look for hazards.
- complete an in depth visual inspection of any identified hazards that cannot be removed.
- evaluate the risks and decide if current precautions were adequate or need improvement.
- wear appropriate PPE at all times.

- when working in roof spaces – turn power off before entering a roof and visually inspect the space from the manhole looking for hazards such as vermin, snakes, dangerous wiring and extreme temperatures, ensure entry/exit points are easily accessible, stabilise and secure their ladder, wear appropriate PPE and if some power needed to be left on, minimise what is on and only energise after performing the visual inspection.

- when working on or near exposed live parts - if turning the power off was not reasonably practicable, to minimise the risk by factoring in the type of work and tools/equipment, proximity of the work to the energized part, environmental conditions such as confined space, wet surfaces or unfavourable weather and work that may impose additional risks.

81. The BG Electrical safe system of work for all regular works document guided Jordan to "Check the switchboard for location, condition and vintage of property keeping in mind older houses are more likely to have older standards of work and equipment" and *"*check RCD operation before using clients power*".*

82. BG Electrical also had a live work policy requiring employees to isolate the installation or lock off the relevant circuits where practical and to implement measures to eliminate or control the risk of inadvertently contacting any part that remains energised.

83. This guidance was superimposed on Jordan's training and experience working as a fully qualified electrician of some years standing.

84. Current and former BG Electrical employees said they knew they could call Mr Gall for guidance. I accept Mr Gall's evidence that Jordan had done so on previous jobs.

85. The OIR investigation identified some of the SWMS as "very generic" and issued BG Electrical with an improvement notice in this regard. Mr Gall has since amended the SWMS by adding the following statement to the front page in red text:

"*If you don't feel this SWMS covers the work you are about to undertake or can't apply it's* (sic) *logic to the task you must not proceed with the job and a custom made SWMS will be produced to ensure the work is carried out safely."*

What control measures were available to Jordan to manage these hazards and associated risks?

86. Most of Jordan's actions at the property were not witnessed, so it can never be known exactly what he did and what informed his risk assessment and decision making that afternoon.

87. Jordan spoke with the homeowner to clarify the problem to be fixed. The nature of the work activity changed once Jordan identified the U4 fault code. The electrician witnesses told the inquest it is not uncommon for jobs to change as they go along. As a fully qualified electrician of some years standing, I consider Jordan was sufficiently skilled and experienced to adapt to a change of circumstances and use his discretion about how to approach it.

88. The inquest heard evidence about the options available to Jordan when assessing how to approach the job and mitigate its specific risks.

Exercise discretion to reschedule the job given the storm activity

89. The storm hit Everton Park while Jordan was at the property. Mr Gall's evidence is that his five minute phone call with Jordan shortly before 2:00pm included discussion about this job in the context of the storm forecast. He says he told Jordan it was fine to rebook the job if he couldn't complete it, "just talk to the customer".

90. I accept the evidence of current and former BG Electrical employees that Mr Gall did not place pressure on his employees to get jobs done quickly or within a certain timeframe. Jordan had not spoken to any of them about feeling pressured to get his work done.

91. The homeowner's evidence indicates it was she, not Jordan, who was concerned about him proceeding while there was a storm. This suggests he was not under pressure from her to complete the job there and then.

92. That Jordan proceeded with the job while it was actively storming indicates he did not consider the weather conditions to render the job unsafe.

Check the switchboard to see whether the air conditioner subcircuit was protected by a safety switch and if not, exercise discretion not to proceed with the job unless or until one was fitted to the subcircuit

93. The BG Electrical witnesses including Mr Gall told the inquest they typically check the switchboard for the presence of safety switches when attending a job.

94. The inquest heard it is quite common for electricians to encounter switchboards where the circuit supplying an older style air conditioner system is not protected by a safety switch. This is not surprising given the mandatory requirement to install safety switches on air conditioning circuits which came into force on 1 January 2019 did not require property owners to retrofit circuits for existing air conditioner installations other than in limited circumstances.

95. As noted in paragraph 81, this is reflected in the BG Electrical safe system of work for all regular works document. I note the absence of a safety switch on the circuit supplying electrical equipment involved in the job was not identified as a hazard 'option' on the site specific risk assessment template.

96. As a fully qualified electrician of some years standing who worked in a business specialising in air conditioner systems, it is reasonable to expect Jordan to have previously encountered this scenario in the ordinary course of his work, and by extension to have anticipated it once at this property.

97. The switchboard was in a sheltered location in the garage underneath the house. It is not known whether Jordan visually inspected it, though I find there was sufficient time for him to have done so, protected from the weather, after speaking with the customer, visualising the roof space and before sending the images to Mr Gall shortly before 3:00pm.

98. Mr Gall and two BG Electrical witnesses told the inquest they would not have commenced work on that subcircuit without putting a safety switch on it before re-energising the circuit. Mr Gall's evidence was he would expect his employees to have a conversation with the customer about this before doing any work on that circuit. He said it was something they spoke about at Toolbox talks and pre-start meetings. The fourth BG Electrical witness who no longer works with the business said the absence of a safety switch on this circuit would not have concerned him when approaching this job.

99. It is important to recognise the 2018 Wiring Rules did not require Jordan to install a safety switch on the air conditioner subcircuit in preparation for the type of work he was performing that day. Fitting a safety switch prior to re-entering the roof space was a safety measure for his protection.

100. Several of the electrician witnesses explained the cost and time required to upgrade a single circuit to fit a safety switch is 'small' or 'insignificant' in the context of an electrician who is already at the property to do work on equipment supplied by that circuit.

101. There is no evidence that Jordan spoke to the homeowner about upgrading the air conditioner subcircuit before he proceeded with the job.

102. This was a significant control measure that could have saved Jordan's life. It can never be known whether he actively considered it.

Consider alternative access to the indoor unit control box

103. The awkward access arising from the orientation of the indoor unit within the restricted roof space would have become very evident to Jordan given his size as he positioned himself within the roof space before he proceeded to remove the metal cover and as he started the task of removing the screws.

104. Mr Gall identified there was 'bad access' to the roof space, suggesting the preferred approach would be to create better access from above by removing roof tiles. He acknowledged this would not have been possible in a storm.

105. Former BG Electrical employee LB told the inquest if he didn't feel comfortable crawling into the roof space, he would book the job for a time when there wasn't rain and he could open the roof.

106. It cannot be known whether Jordan actively considered this option though the prevailing weather conditioners were such that it was not feasible that afternoon.

Wait for advice or assistance from his employer or colleagues before proceeding with the job

107. Jordan sent the images to Mr Gall at 2:55pm and 2:56pm, shortly before he was seen going back into the manhole at around 3:00pm.

108. The Daikin technical support phone service was also available, but Jordan did not use it. Former BG Electrical employee LB identified this as a readily available source of clarification about what to do. It is not known whether Jordan was aware of its existence or had used it previously.

109. Jordan did not try to contact any of his colleagues for advice or assistance pending a response from Mr Gall.

110. At around 3:15pm – 3:30pm, the homeowner's partner heard a loud bang that was not lightning or thunder. It is possible though not proven this is when Jordan was fatally electrocuted.

111. The timing of this sequence of events shows Jordan did not wait very long for Mr Gall to respond before proceeding with the job. Being a safety conscious experienced senior employee, the fact Jordan did not wait or seek advice or request assistance from any of his colleagues indicates he felt comfortable proceeding without their input or presence.

112. The family's submission that Jordan should not have been required to work on this job alone that day is not supported by the evidence.

Check the outdoor unit control box first

113. The BG Electrical witnesses explained they would have checked the outdoor unit control box first as it was more easily accessed. In their experience, geckos or ants are the most likely cause of PCB damage and this is something that can be visualised without the power needing to be on.

114. It is possible Jordan did check the outdoor unit first. However, the outdoor unit was installed in an exposed location on the external wall of the house. While there was sufficient time for Jordan to have checked this unit first, it was actively storming while he was at the property.

115. The Daikin app advised technicians to check if the LED lights were pulsing "on both the indoor and outdoor control PCBs". These instructions refer to the indoor unit first. It is possible Jordan interpreted this instruction as requiring him to check the indoor unit first. Mr Franswah agreed with the proposition that by following that instruction 'to the letter' the first thing would be to look for a pulsing light on the indoor control printed communication board (PCB).

De-energise the air conditioner system before opening the control box

116. The metal control box cover was a conductive hazard.

117. The Daikin app did not state the power needed to be on when removing the control box cover.

118. Three of the four BG Electrical witnesses including Mr Gall said they would have isolated the air conditioner system before removing the metal cover. This step would have required Jordan to enter the tight, awkward and humid roof space, remove the control box cover, exit the roof space to re-energise the air conditioner system and re-enter the roof space to visualise the LED light.

119. Jordan's close friend and current BG Electrical employee BGF told the inquest "sometimes people do" remove metal covers from control boxes with the power on, suggesting this was "probably a bit of both" wanting to make their job a little easier and not appreciating the risk of electric shock. That said, he had not ever seen a BG Electricial employee do this or had to speak to them about having done so. Former BG Electrical employee TB appreciated the risk of electric shock in relation to the live terminals but said he had previously removed a metal cover from an energised air conditioner unit control box without wearing protective gloves while working with BG Electrical. He could not recall who he may have been working with when he did that. Mr Gall's evidence is that he was not aware of any employee having done this. All the BG Electrical witnesses said they had never seen Jordan do so.

120. The inquest considered evidence about the effect of de-energising the system on clearing the fault. Mr Franswah confirmed that de-energising the air conditioner system could clear the fault but clarified this would not make it impossible to diagnose the fault. He explained that when the system is turned off and on again, it checks all its signals and protocols, communicating to the indoor and outdoor units. Sometimes if everything is communicating, the system can start up and operate as normal. Sometimes it can take up to three or four tries before the system brings up the fault again, so there can be a delay for the fault to reoccur. The U4 fault code won't happen instantly unless there is a major failure on the circuit board. Mr Franswah estimated it can take maybe another 15-20 minutes before the fault occurs again.

121. It is not known whether Jordan was aware this could occur if he de-energised the system, and potentially delay his ability to diagnose the fault.

122. Changes to the *Electrical Safety Act 2002* took effect on 1 January 2025 requiring businesses and workers to de-energise certain electrical installations when entering or carrying out work in a domestic roof space. This requirement applies across all industries. The changes recognise there are circumstances in which the power needs to be left on but impose additional safety requirements to conduct and record a risk assessment and prepare a SWMS on how the work is to be performed. This statement must identify the work, specify the hazards and associated risks, describe the measures to be implemented and describe how those measures will be implemented, monitored and reviewed. One measure is to include a partial de-energising of the electrical installation. The risk assessments are required to be kept for specified periods.

123. When asked how this new requirement would have applied to the work activity Jordan was undertaking, Director of Field Services within the Electrical Safety Office Michael Gibson advised the roof space would not have to be de-energised as the requirement to leave the power on to observe the LED lights would be a 'prescribed circumstance' meaning additional safety requirements apply. The worker must conduct and record a risk assessment and prepare a SWMS specific to the task of removing the control box cover as it requires them to work near or close to live energised parts. Mr Gibson identified consideration might be given to turning off all the other power apart from the air conditioner circuit.

124. BG Electrical's system of safe work already required Jordan to conduct and record a risk assessment. The additional requirement to prepare a SWMS specific to the task should direct the worker to think through task-specific hazards, risks and control measures rather than by reference to generic SWMS, as were available to Jordan. BG Electrical has since implemented a template statement for working in a roof requiring workers to isolate power to the main switch and install an appropriate lockout device, perform a visual inspection before entering the roof and deem the work safe before proceeding. The template directs workers to consider the nature and temperature of the roof space and document what the work to be performed involves, the identifiable hazards and control measures.

Use suitable personal protective equipment (PPE)

125. Jordan was not wearing any insulated protective gloves, nor were any found in the roof space.

126. Electrical Safety Office inspector Hasemann identified class 00 insulated gloves as an effective control measure for Jordan to have managed the risk of electric shock when handling the metal cover while the system was energised. He explained these are smaller and allow more dexterity than the heavier class 0 gloves which form part of switchboard rescue kits. They comprise an inner glove that absorbs sweat and leather outers which act as a protective barrier.

127. While BG Electrical's SWMS for Basic Fault Findings on LV MMC or Similar Panels instructed staff to wear "*low voltage insulating 00 gloves when preparing and conducting testing and fault finding*", this SWMS did not address the nature of the work activity Jordan undertook on 2 February 2022.

128. Mr Gall maintains each of his employees were issued with class 00 gloves and leather outers. This was corroborated by the other BG Electrical witnesses.

129. Mr Gall described Jordan as being very particular about his kit and keeping his work truck very tidy.

130. Mr Gall was present when Andrew Lucy and Darin Hasemann accessed Jordan's work vehicle as part of the safety audit conducted at the BG Electrical premises on 11 February 2022. He recalls seeing them pulling out gloves which still had the leather outers over them. He wasn't certain whether they were class 00 gloves but says there were gloves in addition to the rescue kit gloves. Andrew Lucy recalls they located low voltage rescue kits which contained gloves, but he could not recall what type they were.

131. I observe the improvement notice regarding PPE issued to BG Electrical following the safety audit related to the company uniform. It makes no mention of gloves, suggesting the safety audit did not identify the provision of protective gloves to employees as an issue of concern. That said it was not yet known to the OIR investigation why Jordan had entered the roof space so the significance of him having access to protective gloves was not in focus at that time.

132. OIR inspected four other company work vehicles on 14 July 2022. Each vehicle contained the low voltage rescue kits and a pair of class 0 gloves. There were no leather outers in three of the four kits. These gloves were all one size rather than individually fitted to the employee. The employees interviewed that day had left jobs to attend the interviews on short notice.

133. Current BG Electrical employee BGF described how protective gloves can be frustrating, annoying or difficult to use when you're not used to them because they are bulky and reduce dexterity.

134. As noted in paragraph 119 above, one of Jordan's former colleagues told the inquest that while working with BG Electrical he had handled a metal control box cover without wearing protective gloves while the system was energised.

135. Unfortunately, neither the police nor the OIR investigation comprehensively documented the contents of Jordan's work vehicle. The limitations of the evidence collected and documented during the safety audit on 11 February 2022 leaves me unable to make a finding about whether Jordan did have access to 00 gloves in his work vehicle when he attended the Everton Park job.

136. However, even if Jordan did not have access to protective gloves at that time, it was still open to him as a fully qualified and experienced electrician to exercise discretion not to proceed if he felt he needed them to perform the job safely. That he proceeded without gloves suggests he felt comfortable doing so.

Findings required by s. 45

Identity of the deceased: Jordan Robert Crocker

How he died: Jordan was fatally electrocuted when he inadvertently contacted exposed live parts, creating an electrical shock path, while trying to diagnose a U4 fault code by inspecting the control box components of the indoor unit of a Daikin ducted air conditioner system inside a domestic roof space. The manufacturer's instructions for diagnosing this fault required the power to be on to visualise pulsing LED lights on the printed communications board inside the indoor and outdoor units.

Jordan was a very safety conscious employee. He took steps to assess risk and plan how he was going to approach the job.

As a fully qualified electrician of some years standing who worked with a business specialising in air conditioner systems, Jordan had the skills and experience to have appreciated the risk of

electric shock when handling a metal cover near live parts within the control box while the air conditioner system was energised. This risk was compounded by the orientation of the indoor unit within the tight awkward humid roof space which impacted Jordan's ability to clearly visualise and easily access the internal components of the control box. It was further compounded by the absence of a safety switch on the final subcircuit supplying the air conditioner system. Jordan was not wearing insulated protective gloves.

It is not possible to know whether Jordan did not fully appreciate the risk or whether he did but felt he could manage it safely because he was by nature a very careful worker.

There was a range of control measures to mitigate the risk that ultimately manifested for Jordan. It can never be known whether and to what extent he actively considered these measures before proceeding with the job.

While there is evidence of one of Jordan's former work colleagues having previously removed a metal cover from the control box of an air conditioner unit in a roof space without wearing protective gloves, the totality of the evidence available to me does not support a finding there was a broader unsafe work culture in respect of the issues arising from Jordan's performance of this work activity.

Place of death:	1 Colbert Street EVERTON PARK QLD 4053 AUSTRALIA
Date of death:	02/02/2022
Cause of death:	1(a) Electrocution

Comments and recommendations

137. Jordan's family proposed a series of recommendations requiring employers to have safe systems of work preventing employees from:

    (a) working on a circuit not protected by a safety switch.
    (b) working on a job that may become unsafe due to localised storm activity.
    (c) accessing a restricted roof space other than by removing roof panels.
    (d) working alone or without full PPE including 00 gloves when working on a live appliance.

138. BG Electrical sought a recommendation for legislative change to prevent electrical tradespeople working on a circuit not protected by a safety switch.

139. The situation in which Jordan was working presented cumulative risk arising from working in a restricted roof space near live parts of electrical equipment supplied by a circuit not protected by a safety switch. It demonstrates the fundamental importance of electrical contractors taking proactive steps to teach and reinforce

the skill of identifying risks and appropriate control measures to make an informed decision about whether to proceed with a job which is or may become unsafe due to a combination of hazards. This can be achieved through having robust SWMS, Toolbox meetings and pre-start meetings.

Opportunities to improve product safety

140. In response to suggestions made by Jordan's family, OIR submitted a paper to the Electrical Equipment Safety System Stakeholder Reference Group (SRG)[2] proposing a range of product design options that may eliminate or reduce the electrical safety risks that manifested for Jordan.

141. The inquest explored the feasibility of these proposals with the electrician, Electrical Safety Office and Daikin Australia witnesses.

Product design

142. The product design proposals explored include:

(a) designing and manufacturing the indoor unit so that faults can be diagnosed when the unit is de-energised.

(b) designing and manufacturing the split system so that fault indicators are visible on both the indoor and outdoor units.

(c) designing and manufacturing the indoor unit so that signals are visible without needing to remove the control box cover for example by mounting them behind cut-away portions of the enclosure or a clear panel such as a Perspex window within the enclosure or mounting signals on the outside of the enclosure.

(d) designing and manufacturing the internal control box layout to avoid or minimise the risk of inadvertent contact with live parts, for example by:
   (i) covering or enclosing the terminal block with non-conductive material
   (ii) reducing the relative size of the terminal block
   (iii) recessing the terminal block within the control box to provide greater clearance from the opening.

(e) using non-conductive materials for the control box cover.

(f) fixing an earth strap to provide earth protection to control box covers made from conductive materials.

143. Mr Franswah told the inquest that Daikin Australia's Research and Development team is actively examining design changes to reduce the risk of access to live parts within the control box.

[2] The SRG membership comprises industry body representatives including the Consumer Electronic Suppliers Association and the Australian Industries Group, between them representing the majority of air conditioner manufacturers and importers in Australian. Daikin Australia is not a member of either group.

144. The Consumer Electronic Suppliers Association held internal working groups during 2024 to consider ways to improve equipment design. It has provided feedback provided to the Electrical Safety Office for consideration by the Australian Standards committee EL-002 Safety of Household and Similar Electrical Appliances and Small Power Transformers.

145. The Electrical Safety Office has made submissions to this committee to consider Australian Standard changes to require a test before during or removal of any conductive panel to check the panel cannot touch any live parts of the equipment, and if it can, to require the panel to be permanently and reliably connected to earth before, during and after removal so that protective devices in wiring installation will operate to protect against electric shock. The Electrical Safety Office is leading a working group to progress this submission.

146. The way in which Jordan came to be fatally electrocuted demonstrates there are design features that can be improved. I strongly encourage Daikin Australia to continue to advance design improvements to eliminate or reduce the risk of inadvertent contact with live parts within its split system air conditioner products.

147. The product design issues explored at the inquest are of broader application to manufacturers of split system air conditioner units sold in Australia. Their relative benefits and implications are most appropriately considered through the Australian Standards technical committee process with a view to progressing changes to the relevant Standards following public consultation.

Recommendation 1:
I recommend that the Australian Standards committee EL-002 Safety of Household and Similar Electrical Appliances and Small Power Transformers actively considers the design issues explored by this inquest with a view to assessing the need for Standards changes to improve the safety of split system air conditioner products.

Installation

148. The orientation of the indoor unit control box within the roof space was a significant factor in the sequence of events leading to Jordan's death. To remove the metal cover, he had to manoeuvre himself very close against a roof truss to his left. In this position he was not directly facing the front of the cover or the internal layout.

149. Notwithstanding the unit's awkward orientation, the Electrical Safety Officer inspectors assessed it complied with the Wiring Rules.

150. Mr Franswah told the inquest this and other ducted system models specified in the installation manual were designed for installation in Australian homes considering the installation environments presented by older style homes, including restricted roof space.

151. Installing the ducting and its attachments to the indoor unit to optimise air flow into the home by minimising kinking is a significant factor in decisions about siting and orienting the unit within a restricted space.

152. The inquest examined the Daikin installation manual. It begins by setting out a series of safety warnings, cautions and precautions. None of these sections

mentioned installing the indoor unit to allow safe access and good visibility of the warning sticker on the front of the control box cover. Mr Franswah agreed with the proposition that warnings to this effect would have been a good idea.

153. The section on selecting an installation site provides guidance about the importance of factors including strong structural support, unobstructed air passage, proper condensate drainage and ensuring "sufficient clearance for maintenance and service". The latter instruction is supplemented by diagrams showing the minimum recommended service spaces above (300mm or more) and in front (450mm or more) of a unit suspended from a structure. There is a notation that in some restricted space installations it may be necessary to reduce this distance, which in turn may necessitate additional service work should maintenance or repair be required. The section did not say anything about installing the indoor unit so that any warning sticker on the unit can be readily observed. Mr Franswah agreed with the proposition that the manual was not very helpful in identifying risks associated with the distance between the control box and some other item in the installation space.

154. The circumstances in which Jordan died demonstrate the importance of selecting an installation site for the indoor unit that enables safe access relative to the most likely access point (in most circumstances a manhole) with sufficient clearance from surrounding structures, and oriented so any warning stickers on the unit can be easily seen and read. If this cannot reasonably be achieved due to the restricted space available, then installers should be guided by the manufacturer's installation manual not to install the unit in that space.

155. During 2024, the Electrical Safety Office submitted a proposal to the Australian Standards committee EL-001 Wiring Rules to introduce a dedicated clearance from the control panel and supply terminals of fixed air conditioner equipment installed in a roof space to provide adequate and safe access to parts during operation, maintenance, fault finding and repair. This is being progressed together with the submissions discussed in paragraph 145 above.

Recommendation 2:
I recommend that the Australian Standards committee EL-001 Wiring Rules carefully considers changes to facilitate safe access to parts during operation, maintenance, fault finding and repair of split system air conditioner products.

Safety warnings

156. The inquest considered the content of the warning and cautions on the control box cover.

157. The warning in large red type to disconnect all power supply circuits (both indoor and outdoor) was directed to the task of obtaining access to the terminals.

158. Beneath this warning were a number of cautions in smaller black type including "*Before starting to inspect the electrical parts (electrical box, fan motor, etc) make sure to turn off the air conditioner power to both indoor and outdoor unit, otherwise you may get an electric shock*".

159. On questioning by Counsel for Daikin Australian Electrical Safety Office inspector Kevin Sparkes said it was possible the warning sticker was within Jordan's line of sight when he was taking the screws out but felt he would probably have trouble reading it from up close in the cramped space. Daikin Australia submit it is possible Jordan did see the front of the control box and the warning sign when he did his initial visual inspection. Jordan's family submit he would not have had a clear view or been able to read the warning and cautions given the confined space, poor lighting, the small size of the print and the orientation of the indoor unit. I find the orientation of the control box was such that the warning and cautions were not directly or easily observable and read from the manhole entry or Jordan's prone position in the tight roof space.

160. Mr Franswah told the inquest that Daikin's Research and Development team is considering changes to the warnings on control box covers to advise that the power should be turned off before removing the cover and instructions about allowing time for the capacitors to discharge.

161. Notwithstanding the warning and cautions on the metal cover, the caution to turn off power to both units before starting to inspect the electrical parts was not reflected in the instructions Jordan accessed on the Daikin app which required both units to be energised.

162. Mr Franswah acknowledged changes can be made to the app to incorporate safety warnings. I urge Daikin Australia to update the app instructions for the U0-04 fault code by improving the description of its cause and providing safety information to alert users to the risk of electric shock when accessing the control box to diagnose the fault while the unit is energised.

Safety switches on circuits supplying air conditioner systems

163. The inquest examined whether there was a missed opportunity to have fitted a safety switch to the final subcircuit supplying the air conditioner system prior to 2 February 2022.

When the air conditioner system was installed

164. It is not known exactly when or by whom the air conditioner system was installed, though it was sold in Australia in October 2015 at which time the AS/NZ 3000:2007 Wiring Rules applied. Those Rules did not contain a specific requirement to install a safety switch on air conditioner circuits. However, section 1.7.1 of those Rules made it an essential requirement to install electrical equipment to operate in a safe and reliable manner, not cause a danger from electrical shock (and other specific risks) and be installed in accordance with the manufacturer's instructions.

165. The Daikin installation manual instructed the installer to "*Be sure to install an earth leakage breaker*."[3] The manual specifically warned the installer that a failure to install one may result in electric shock, serious injury or death.

[3] The inquest heard that 'earth leakage breaker' is another term for Residual Current Device (RCD) or safety switch.

166. This was a missed opportunity by the installer to have protected the air conditioner subcircuit with the safety switch.

When electrical work was performed at the property

167. The inquest examined whether there was a legal requirement to upgrade the air conditioner subcircuit with a safety switch under the updated Wiring Rules AS/NZS 3000:2018. These rules required safety switches on all final subcircuits including those supplying air conditioner systems in new installations and only in certain circumstances where there were electrical alterations or additions to existing premises. This requirement came into effect on 26 June 2018 but did not come into force until 1 January 2019, providing a six month grace period for industry to adapt to new requirements under the Wiring Rules generally.

168. DB Electrical Pty Ltd performed work at the Everton Park property on nine occasions between 2014 and 2017 and another three occasions during 2018.

169. In his capacity as Director of Field Services within the Electrical Safety Office Mr Gibson also sits on Wiring Rules Committee. In his opinion work performed at the property on 30 December 2016 to supply and install two photoelectric 240V smoke alarms would have triggered a requirement for a safety switch on the subcircuit supplying this equipment in the event it was installed on the lighting circuit. It is not known whether it was. However, the requirement extended only to that circuit and did not mandate the fitting of a safety switch to the air conditioner circuit.

170. The work performed during 2018 involved the following:

    (a) 24 May 2018 (before the 2018 Wiring Rules took effect) – swapping out a 12-volt smoke alarm and swapped a downlight in the hallway to an LED.

    (b) 7 August 2018 – supplying and replacing 14 existing fluoro lights with 14 LED downlights to be fixed by plug sockets (this being the connection for the light fitting).

    (c) 25 October 2018 – replacing one downlight, supplying and replacing two lights on the patio with LED downlights and an exterior light at the front door entrance.

171. The inquest examined whether these works would have triggered the forthcoming safety switch requirement by being an ‘alteration’ or ‘addition’ within the meaning of the 2018 Wiring Rules, as opposed to a ‘like for like’ replacement or ‘repair’ which is not caught by the safety switch mandate.

172. I find that while each of these attendances presented an opportunity for DB Electrical to recommend that the previous owner consider upgrading the switchboard in anticipation of the new safety switch requirements, the work performed was not captured by either the 2007 or 2018 Wiring Rules as they related to the circuit supplying the air conditioner system. At best, the work performed in August and October 2018 may have triggered the new requirement to fit a safety switch to the lighting circuit. Even had one been fitted to the lighting circuit on either of these occasions, it would not have saved Jordan’s life on 2 February 2022.

173. Jordan's family submits that on each of these occasions a prudent contractor would have recommended that the air conditioner circuit be upgraded given the imminent 2018 Wiring Rule changes, and had that occurred, it is more likely than not the previous owner would have followed that advice. On the available evidence this states the probability of this outcome too highly. It is not known what information the electricians who performed those works gave the previous owner about the status of the switchboard on those occasions. Even if such a recommendation was made, the previous owner was not legally obliged to upgrade the switchboard or install safety switches other than in the specific circumstances prescribed by the 2018 Wiring Rules. I take note of the evidence given by several of the electrical witnesses that while it is good practice to let the customer know safety switches are not installed on certain circuits, customers often perceive this as an 'up sell' and choose to think about it rather than authorising the additional work 'there and then'. This highlights why the public need to understand that one safety switch is not enough.

174. The evidence heard on this issue highlights the fact that even if the air conditioner system was replaced today in a 'like for like replacement' circumstance, the 2018 Wiring Rules still do not mandate the fitting of a safety switch on the air conditioner circuit.

175. To address this, the Electrical Safety Office has put a proposal to the Wiring Rules committee to change the 2018 Wiring Rules to mandate the fitting of a safety switch when the work involves replacing the electrical installation. I urge the committee to endorse this proposal for the next revision of the Rules.

176. Should this change be made, it will still leave a statutory gap where the work involves replacing only part of the electrical installation. I acknowledge the limitation to full unit replacement as a repair represents an easily understood delineation for industry and consumers alike. Mr Gibson explained how extending the requirement to all repairs, regardless of extent, would carry a disproportionate financial impost on consumers. The argument is that where a component part of an electrical installation, for example replacing a heating element in a hot water system, can be safely repaired and returned to service with minimal cost to the customer, a mandatory safety switch requirement is unnecessary.

177. Following the close of evidence, the previous owner located an invoice from Excel Air Conditioning dated 17 January 2019 for attendance at the property "to replace filter". The business owner clarified the scope of work was the sale of a new clean filter. I accept Counsel Assisting's submission that the task of supplying a new clean filter, presumably for the air conditioner unit, appears to be a routine maintenance activity with no indication the scope of work involved any interaction with the switchboard or the unit's electrical components.

When or after the property was sold in 2019

178. The Everton Park property was sold on 28 May 2019.

179. At that time, the previous owner had to provide the new owner with written notice about whether an approved safety switch had been installed for the general purpose socket outlets installed in the house.[4] This was confirmed in the contract of sale.

180. The air conditioner system was supplied by a dedicated circuit, not from a general purpose socket outlet. Consequently, the previous owner was not obliged to fit a safety switch on this circuit or provide notice that it was not protected by a safety switch at the time of sale.

181. After purchasing the property, the new owner was not legally obliged to fit a safety switch to the air conditioner system unless work involving alterations, repair or adding sockets was performed. She stated there were no significant alterations or additions to the electrical installation following the property purchase.

182. Jordan's family propose a recommendation that would prevent electricity retailers supplying mains power to premises not sufficiently protected by safety switches. By way of example, they identify section 29 of the *Electricity Regulation 2006* which obliges customers to comply with a requirement by electricity suppliers to ensure their electrical installation has a circuit breaker. Mr Gibson identified difficulties with the proposal given the complexities of the State and Federal legislative framework for the safe supply of electricity. I do not have information about the broader legislative framework or more significantly the human rights considerations attaching to such a proposal with which to make a properly considered recommendation to this effect.

183. Had the point of sale triggered a requirement to fit safety switches to all final subcircuits, this would have ensured the air conditioner circuit was protected by a safety switch. It would have saved Jordan's life.

184. Sale and entry into a residential tenancy agreement are obvious enforceable trigger points at which to require owners of domestic properties to retrofit safety switches on more than just general-purpose socket outlets. Extending the current legislative requirement to capture all final subcircuits would achieve parity with the broader safety switch mandates for new installations, providing progressively greater protection to more Queensland residents, their visitors and the tradesmen working at their homes.

Recommendation 3*:*
I recommend that the Queensland Government carefully considers extending the operation of the *Electrical Safety Regulation (Qld) 2013,* Part 6, Division 4 beyond general purpose socket outlets to cover all final subcircuits.

185. I acknowledge this recommendation carries a broad regulatory impact for owners of homes built prior to 2000, requiring a regulatory impact analysis involving industry and community consultation.

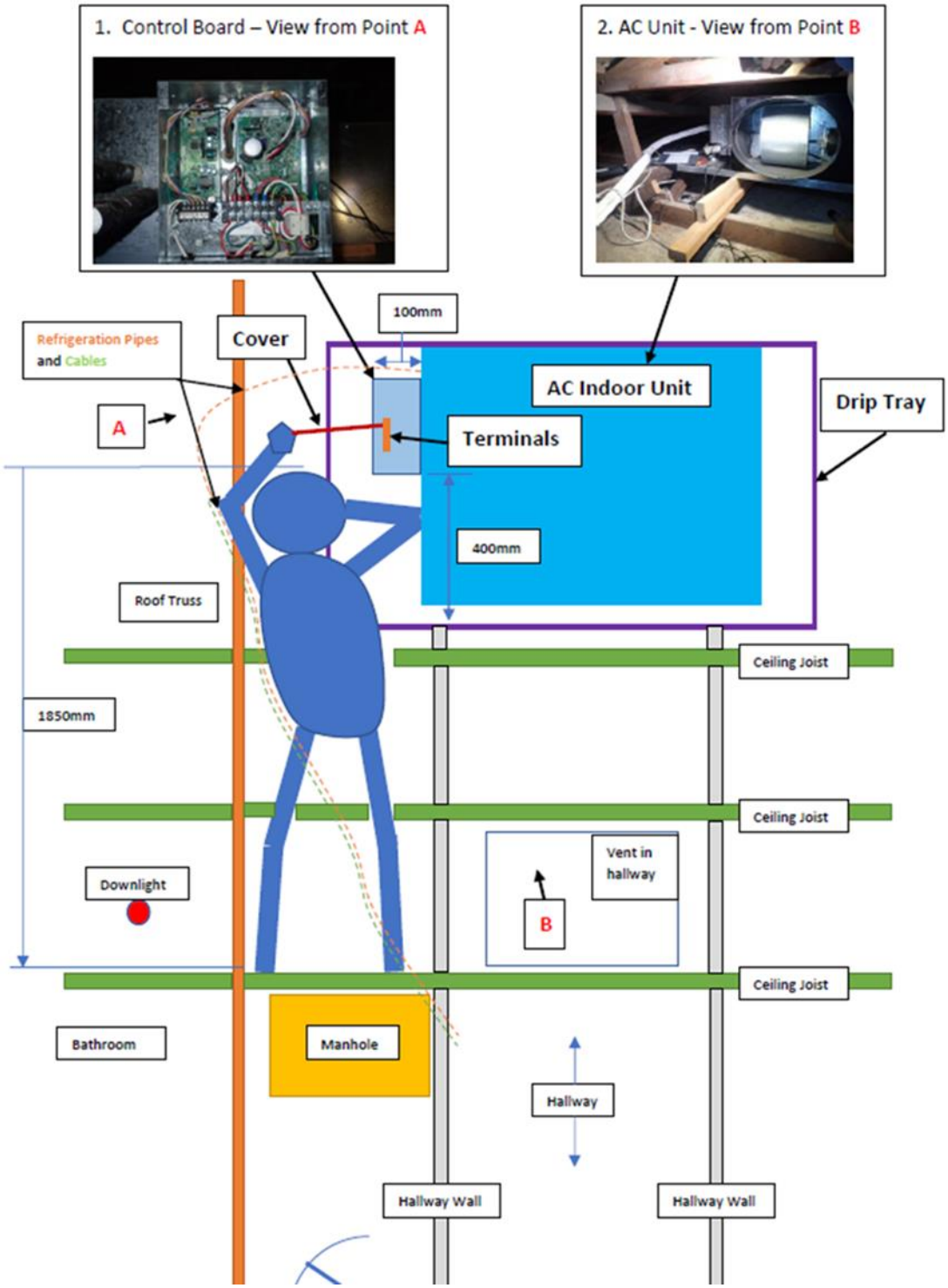
[4] *Electrical Safety Regulation 2013* (Qld), section 82.

186. While I appreciate this requires regulatory impact analysis especially when Queenslanders are experiencing increasing cost of living pressures, the analysis need not be a dispassionate one. Jordan's death is more than just a devastating loss to his family; it is the loss of a young man with valuable trade skills who was actively contributing to the Queensland economy. Let this be a consideration for policymakers going forward.

187. I close the inquest.

Ainslie Kirkegaard
Coroner
BRISBANE

Appendix A


1. Control Board – View from Point A
2. AC Unit - View from Point B
100mm
Refrigeration Pipes and Cables
Cover
AC Indoor Unit
Drip Tray
A
Terminals
400mm
Roof Truss
Ceiling Joist
1850mm
Ceiling Joist
Vent in hallway
Downlight
B
Ceiling Joist
Bathroom
Manhole
Hallway
Hallway Wall
Hallway Wall