



CORONERS COURT OF QUEENSLAND FINDINGS OF INQUEST

CITATION: **Inquest into the death of Dale Kennedy**

TITLE OF COURT: Coroners Court

JURISDICTION: Cairns

FILE NO: 2012/4500

DELIVERED ON: 28 February 2018

DELIVERED AT: Cairns

HEARING DATE(s): 23 April, 22 July, 7 October 2015, 19 February, 9 – 11 May 2016

FINDINGS OF: Kevin Priestly, Coroner

CATCHWORDS: Apprentice, non-electrical work, ceiling space, electrocution, interference with wiring by unknown persons, adequacy of ESO investigation, missed opportunities, level of electrical safety assurance under current standards and regulatory regime, prospect of greater use of RCD's

REPRESENTATION:

Counsel Assisting Family Babinda Electrics and John Smith and Delma Smith	Jesika Franco Daniel and Debra Kennedy Thomas Bradley QC with Geraldine Dann i/b Gadens Lawyers
Electrical Safety Office Dept of Education and Training Mr Wayne Goggin	Michael Drysdale i/b Crown Law Ben McMillan i/b Crown Law Aaron Anderson (Norton Rose Fulbright)

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Introduction

On 12 December 2012 Dale Kennedy, a 3rd year apprentice electrician, was working at Bentley Park College at Edmonton installing data cables in the ceiling space of G Block when he was electrocuted and died. The Office of Electrical Safety and Police investigated the circumstances of the death and provided reports to the Coroners Court.

The role of a coroner is to conduct an investigation and make findings about who died, when that person died, where the person died, what (medically) caused the person to die and how that person died (the required findings). A coroner also has a role in reviewing and analysing the circumstances of a death to identify any lessons that might be learnt to prevent a death in similar circumstances.

Based on the evidence gathered during the course of the coronial investigation, there is sufficient evidence for me to make findings about who, where, when and what caused the death of Mr Kennedy. No detailed analysis is required about these issues. However, further investigation and analysis is required for a better understanding about how Mr Kennedy died.

I approached the further investigation by considering:

- A detailed narrative about the circumstances of the electrocution;
- The adequacy, outcome and reasoning of the ESO investigation;
- Any missed opportunities in the ESO investigation to better understand the causes and contributing factors;
- The implications of the findings surrounding this death for the level of assurance that the current regulatory environment provides.

Narrative

It was toward the end of the school year. Bentley Park College was concerned about the prospect of vandalism over the school holidays. The College decided to improve security by installing security sensors and high pitched audio crowd control devices. It engaged Goggo's Electrical Service to do the installation. Mr Wayne Goggin was the principal. Work started early Tuesday 11 December. Later that day, Mr Goggin, Mr Kennedy, Victor Stout and David Hollis inspected G Block and discussed where the sensor was to be located, access points into the ceiling, the need to crawl through the ceiling space to run the data cable and the location of the switchboard.

At about 7am on Wednesday 12 December 2012 Mr Goggin, Mr Stout, Mr Hollis and Mr Kennedy returned to the College. Mr Goggin and Mr Stout left to another job while Mr Kennedy and Mr Hollis entered G block. Mr Kennedy opened the electrical cabinet containing the switchboard but did not switch the power off. Mr Kennedy drilled a hole in the soffit where the sensor was to be mounted. The pair went to room G118 and with a ladder, accessed a man hole. Both had a look in the roof space. They saw the rafters were wooden and air-conditioning plant and ducting was centrally located. The space was tight. Mr Kennedy then entered the ceiling space. He rested a wooden board across the trusses. He laid on the board and pulled himself along or crawled, depending on the available space.

Mr Kennedy asked Mr Hollis to fetch another board and pass it up to him at a manhole in room G117. Mr Hollis opened the man hole and went out to retrieve another wooden plank. On return, Mr Hollis saw Mr Kennedy moving the wooden board in the direction of the foyer. Shortly afterwards, he saw Mr Kennedy convulsing. Mr Hollis called out and pulled on Mr

Kennedy's pants, feeling a tingle. He called out for help. He realised what was happening and let go of Mr Kennedy. He continue to call for help. A staff member arrived, climbed the ladder and saw Mr Kennedy convulsing. She told Mr Hollis to switch off the power. Mr Hollis located a switchboard in an electrical closet at the end of the hallway, identified the main switch and shut it off. He then returned to Mr Kennedy and saw he wasn't convulsing any more¹. Two more staff attended and assisted. One called 000. Ms Van Harskamp saw that the plank was jammed between Mr Kennedy's legs and the roof. She wasn't able to move the plank. Ms Van Harskamp noted Mr Kennedy didn't have a pulse and was assisted by another staff member to perform CPR. A short time later paramedics arrived followed by Fire and Rescue, WHSQ inspectors, Police and Ergon Energy. Mr Kennedy was unable to be revived and was declared deceased.

Ergon Energy workers checked the distribution switch board for the main switch to confirm the main switch was off. They located the mechanical services switch board and turned the main switch off. Testing confirmed there was no supply to the building distribution boards at the main switch board for that complex². All electrical and mechanical services supplies were confirmed as correctly de-energised.

Principal Electrical Safety Inspector Darryl Stattmann, Senior Electrical Safety Inspector Paul Hutchinson and Senior Electrical Safety Inspector Anthony Prentis attended the scene along with Regional Investigations Manager Wayne Connors. Each climbed the ladder and inspected the roof space for damaged electrical wiring or other source of electrocution. It was not until Mr Hutchinson, the third to do an inspection, was a potential source found. Mr Hutchinson identified a damaged 1.5mm square TPS twin & earth ceiling fan supply cable where the active (red cable) conductor had been penetrated by a roof truss metallic gang nail plate on which it was apparently resting. The gang nail plate was in contact with a metallic bond beam top plate that bolts to the trusses and an air-conditioning support frame, creating a conductive path energising all metallic parts. See Appendix for photographs of scene.

The Inspectors concluded the cable, to become known as circuit 22, was recently damaged. The cable had a fresh contact blow mark with carbonisation soot from contact and a clean insulation tear³. The truss gang nail plate also had a clear blow mark where contact was made with the live part.

Mr Browne, a Consultant Electrical Engineer⁴, was briefed as an expert to assist the court in this matter. He considered the probability was very, very high that the damage to circuit 22 was initiated by pressure at the time of the incident⁵.

Mr Stattmann and Mr Prentis conducted various tests to determine the shock path⁶. Although unsure of the exact shock path, they concluded there had been contact between the live metallic parts and Mr Kennedy⁷. The damaged cable was cut out by Mr Stattmann⁸ it was left isolated, locked and tagged for repair. On 21 December 2012 Mr Stattmann and Mr Prentis returned to perform secondary testing to confirm initial results.

Mr Browne was asked how Mr Kennedy was electrocuted. He reviewed the testing conducted by Mr Stattmann⁹ and raised no issues surrounding the quality of the testing. He examined photographs of the cable which showed the white sheath insulation, the damaged red

¹ Hollis statement C1)

² Page 441 of 2475 WHS

³ Page 420 WHS brief ESO Stattman

⁴ There was no doubt as to Mr Browne's electrical expertise.

⁵ F3 Browne report dated 12.9.16 at page 10 of 11 at circuit 22 questions and answers A

⁶ Page 70 and page 421 of the WHS brief

⁷ Test reports at page 424 if 2475

⁸ Page 73 at para 25 of transcript at A4 - day 2 transcript 2-24 at 6

⁹ F1 Page 4

conductor insulator and the exposed copper conductor¹⁰. He thought the pressure and movement of the cable across the gang nail plate pierced the cable and connected the 240V circuit 22 to the gang nail plate then to the connected plate and then to the air conditioning duct. The probable path was through Mr Kennedy's hand when it came into contact with the AC duct through to his back which was in contact with the earthed cable tray. This path is consistent with the injuries found at autopsy.

Circuit 22 exited a bundle of electrical cables within a catenary that ran adjacent to air-conditioning plant and passed through the gap between a vertical and diagonal supporting members of a rafter. There was a gang nail plate at the base where the vertical and diagonal supporting members met the horizontal member. Mr Kennedy was moving on a plank placed between rafters and directly above the gang nail plate. Unbeknown to Mr Kennedy, while he was repositioning the plank for another movement, it rested on the cable for Circuit 22.

There seem to be a number of possibilities. Mr Kennedy may have moved off the plank and inadvertently put his foot and body weight on the cable of circuit 22, penetrating the insulation and energising the metallic parts near him. When he relocated himself on the plank, he closed the circuit by providing a path between energised metallic parts and an earth. Alternatively, and more likely, he repositioned the wooden board onto the cable at the gang nail plate without noticing it and on relocating his weight back onto the board, the pressure pierced the insulation

The damaged cable was traced to a ceiling fan and the fan control switch for that fan was labelled circuit 22 at the block main switchboard. Inspection revealed that only power circuits (10) were fitted with single pole safety switches in accordance with the then requirements when the switchboard was fitted 12 years earlier¹¹. Circuit 22 had a sixteen (16) Amp circuit breaker, not a safety switch. There was no requirement for a safety switch to be fitted when the building was built under AS3000 -1991 wiring rules.

Inspector Stattmann reported ¹² that if wiring to the fan in room G117 wired along the face of the truss to the catenary, it would have been protected from mechanical damage. Instead, the wiring ran across the top of the metallic gang nail plate of the roof truss and then into the catenary.

Mr Browne reported that circuit 22, lying across the gang nail plate, was not mechanically protected and was an area likely to be disturbed, namely within less than 2 meters from a man hole and in a space greater than 600mms from the ceiling¹³. Mr Browne was of the opinion that this was a major noncompliance¹⁴, and circuit 22 ought to have been "located over the ceiling member or supported above the ceiling member but so that it was not likely to be subject to mechanical movement, not likely to be disturbed"¹⁵.

The immediate issue to arise was whether circuit 22 was installed in the manner that contributed to the death, or later repositioned due to alterations in the wiring.

ESO Investigation

The Electrical Safety Office conducted an investigation and reported that it appeared the cable for circuit 22 was originally installed in the position they found it shortly after the incident. It reported that inquiries were conducted in an attempt to establish if the cabling for circuit 22 may have been re-positioned after installation. ESO reviewed records obtained from

¹⁰ F1 Page 4

¹¹ Page 420 WHS Stattman incident report

¹² Page 422 2475 WHS brief

¹³ Wiring rules 2000: 3.9.5 – areas likely to be disturbed, installation support and fixing; 3.9.4: prevention of mechanical damage which requires 3.3.7 protection against impact. F2 Browne at 1.

¹⁴ F2 at 7b) as opposed to transcript Stattmann at 2-33 at para 40.

¹⁵ F2 at 8

Department of Housing and Public Works and did not identify any work in the ceiling space of G Block that required repositioning of cabling for electrical circuit 22 from where it was originally installed¹⁶. No records were located for work that would have caused cabling for circuit 22 to be re-positioned. This conclusion very much depends on the integrity and documentation about access and electrical work conducted at that location since construction.

I have serious concerns about a number of aspects of the ESO investigation and will return to this subject later.

Management of Access and Electrical Work from Construction

On completion of electrical work during the original construction of G Block in 2004, Babinda Electrics issued a certificate of test and connection. This certifies the electrical installation was tested and complied with the Electricity Act 1994, Electrical Safety Act 2002 and the Electrical Safety Regulation 2002¹⁷. The Department of Education relied upon certification to be satisfied as to the integrity of the electrical work done to the point of electrical completion¹⁸. The Department of Education also engaged licensed electricians to perform any later electrical work and relied on certificates that issued as warranting that the work was undertaken in compliance with relevant standards including the Wiring Rules.

Mr Mara, Assistant Director General for infrastructure, Department of Education, explained how maintenance was managed. There was a distinction between *emergent* maintenance and *general* maintenance work. Prior to 2012, Building and Asset Services (BAS) were responsible for *general* maintenance needs¹⁹ but once the school was allocated funds, it engaged contractors directly. BAS held a list of registered contractors who were eligible to tender for work at the College²⁰. From September 2012 the College was operating Direct to Market which allowed it the autonomy to manage and arrange for completion of its own planned and unplanned maintenance works (including electrical)²¹. However, any *emergent maintenance* such as a serious or dangerous fault, had to go through BAS.

Various attempts were made to review documents to establish who might have accessed G Block ceiling space to do work. ESO initially obtained documents from BAS²² to determine if any alternations had taken place. Further, records were sought as part of the coronial investigation²³. In short, it was an impossible exercise. The records reviewed did not provide a complete, continuous and reliable record of activity in the G Block ceiling space. Some records were not retained and destroyed per a Departmental disposal process, other invoices retrieved lacked detail including whether roof space was accessed.

In 2010 the Department of Education rolled out a Work Area Access Permit (WAAP) system as part of a contractor management system for "Asbestos Management teams" in schools. Although initiated for a different purpose, this did not provide a reliable source of evidence about who had access to ceiling space and for what purpose.

There were systems in place to control access of trades to school grounds. This typically involved trades persons reporting to the school office to obtain a visitor tag and keys. Again,

¹⁶ Page 30 A 1 ad see 4.12.1

¹⁷ Page 1026 of WHS brief and Mr Smith

¹⁸ G6 Mara report 24.3.16 at para 29

¹⁹ Pursuant to a partnership agreement between BAS and DET (as with other Qld Government agencies) under the Maintenance Management Framework in place since 1999 which set out the agreed maintenance services as approved by DET.

²⁰ G6 para 14

²¹ Exhibit H1 Graham Atkins a p2

²² Mr Connors, WHS obtained documents from BAS showing who had accessed the ceiling space of G Block: (1086 or 1088)

²³ Mr Atkins encloses H1 at 10-13: searches of system of works done since construction. Attachments 10-13 (page 930):

the reliability and specifics reflected in any retained documents was not sufficient to assist this investigation.

Neither the College or BAS was able to accurately identify who accessed the roof space of G Block since construction and for what reason, let alone if anyone had cause to “move” or “reposition” the wiring relevant to circuit 22. Mr Browne reported there was no evidence to track what alterations have been made to the electrical wiring in G Block ceiling space after installation, save for an electrical change added to circuit 30 reflected in the changed circuit schedule²⁴. Any approved alterations to circuit 22 should be reflected in the circuit schedule, or by reference to a work order²⁵. Inspector Prentis agreed as a general proposition, the older the building, the more likely it had alterations with the roof space and that work might lead to more risk²⁶.

In terms of electrical safety, the Departments of Educations approach included a reactive component²⁷. Once a defect/ hazard is identified, the school isolates and reports the issue, and repairs undertaken as required²⁸. That information is only reported to the Departments Regional Office if deemed necessary by the school²⁹. In terms of “proactive maintenance”, there are two mechanisms in place:

- A Department of Housing and Public Works Maintenance Management Framework provided that all Qld Government buildings be assessed by site inspection at least every three years, depending on the facility. DET engaged BAS to undertake these condition assessment reports³⁰. From 2006-2014 annual condition assessment reports were undertaken on all schools which identified maintenance needs. Those assessments include electrical safety checks, as they “look at everything in relation to issues at the school and what is functional and not functional”³¹ and they are undertaken by appropriately qualified tradesman. However, the inspections do not include ceilings spaces unless there is a specific need to get into the ceiling space³².
- There was also a program of periodic testing and tagging of specified electrical equipment including RCD’s. However, this did not extend to electrical inspection of electrical wiring inside ceiling spaces which would be the responsibility of a qualified electrician and would only be undertaken if there is reason to suspect a defect.

Therefore, the system (primary controls) for ensuring electrical safety as it applied to the College was:

- Initial construction involved installation and certification as to compliance of all electrical wiring;
- Later alterations or maintenance that involved electrical work was completed by a licensed electrical contractor and certified as compliant;

By way of secondary controls, only trades with work to do in the ceiling space were allowed access.

²⁴ F2 Browne Report 10.9.16 at para 43

²⁵ F 2 Browne report at 44

²⁶ Transcript at 2-25 at 20 and 25.

²⁷ G6 Mara 24.3.16 at 35

²⁸ G6 Mara 24.3.16 at 35.

²⁹ G2 Geoff West, Statement dated 21.9.2015 at 7 to 8.

³⁰ G 2 Geoff west 21.9.15 at 7 to 8.

³¹ Mara transcript at page 3-50 at 40

³² Transcript at 3-51 10 Mara.

Mr Goggin and Electrical Safety Management

On Monday 10 December 2012 Mr Mark Rainey, the College Facilities Manager, issued a Work Permit to Mr Goggin to perform modifications and installations to security and after hours lighting systems. Mr Rainey had a number of conversations with Mr Goggin and the consensus was that the works be performed in a manner that did not to interfere with the day to day operation of the school³³.

Mr Rainey gave evidence³⁴ that he didn't stipulate that it had to be done in work hours, however it couldn't interrupt the daily routine of the school. Mr Goggin had permission to undertake the work at whatever time he wanted or as early as he wanted³⁵. Mr Goggin completed a risk assessment for the entire job, identifying the 'ceiling space' as a hazard and concluding the 'risk acceptable'³⁶. Control measures were listed as 2 men onsite and training to staff.

Mr Goggin explained at the inquest why he didn't turn the power off prior to conducting work that morning. He said that teachers were working and they didn't want the power off. Most importantly it was not mandatory or even industry practice at the time to de-energize or isolate power when performing non electrical work in ceiling space. This remains the case today. When asked how the practice has changed, Mr Goggin offered:

"It hasn't. It's not mandatory. If I would be able to have a piece of paper, walk up to my client and say it's mandatory to isolate power whenever we work in a ceiling space and put that in their face and say I'm sorry but I do have the right to do this. There's nothing. It's only advisory by the Electrical Safety Office as a, how would you say, for them they – they try and make sure that you do that but there's nothing in writing in the regulation, the Act or on their website saying it is mandatory. There's nothing. There's nothing to help us as electricians in the industry to work safer in a ceiling yet. I'm hoping from this coronial it comes out."³⁷

Notwithstanding the power remained on, Mr Goggin was not concerned about working in the roof space as he had worked in the other three buildings of G Block and experienced no issues. The buildings were built to the project services standard with a timber truss ceiling, clipped cables to trusses and checked by an electrician, electrical contractor and an electrical engineer. Mr Goggin said "[w]e felt safe." Mr Goggin made a point of telling Mr Kennedy and Mr Hollis to keep the cables away from the power cables located in the ceiling and to let him know if there was something in the ceiling preventing him from crawling past. Mr Goggin did not look into the ceiling space of G Block prior to work starting. He was questioned on whether he would have identified the dropped catenary in the ceiling space as a hazard. After being pressed, Mr Goggin confirmed he wouldn't have identified that as a risk.³⁸ This is consistent with the fact that none of the Electrical Inspectors detected the dropped catenary, notwithstanding what they presumably thought was a thorough scene investigation,.

Later Action: the Department of Education

Following the incident, Mr Blanckensee, Business Manager at the College, completed an incident report and sent it through to regional and central offices of the Department of Education. Inspector Stattmann returned to the College on 20 December and rectified circuit 22. Inspector Stattmann reported to Mr Geoff West, Acting Infrastructure Manager for FNQ

³³ Page 101 of WHS brief Mr Rainey statement

³⁴ at the prosecution of Mr Goggin

³⁵ page 39 para 25 of transcript of prosecution A4

³⁶ See the risk assessment is at page 456 of 2475

³⁷ Transcript at 1-13 at 17-25.

³⁸ Transcript day 1-20 at 16

region, Department of Education that repairs were completed and the building was safe for normal use³⁹. Mr West recalls discussing the incident with Inspector Statmann who commented that RCD's should be installed on all power circuits as preferred options as that was considered by industry as best practice at the time. The installation of the external motion sensors was completed by Goggos in April 2013 as per his original quote.

Neither the Department of Education nor ESO investigated whether there were other locations in that ceiling space or other buildings where wiring crossed over gang nail plates in a like manner. I would have thought that line of investigation was obvious and a way of checking whether it was an isolated or systemic issue, which in turn might assist in identifying who might be responsible.

In August 2014 Goggos was contracted to check the data projectors that were not working in the Technology and Science (TS) building. Goggos provided an invoice to the College noting:

*"the wiring in this ceiling cavity is very dangerous as most of the cables are run over the steel trusses (sharp metal edges) I urge you to install safety switches and try to install catenary wires to support cables to make it safer in the ceiling space"*⁴⁰.

Mr Rainey immediately took steps to ensure no staff or contractors entered the ceiling space or went on the roof⁴¹. He emailed Mr West (Department of Education) outlining the concerns and advice from Mr Goggin to install safety switches as well as to install catenary wires to support cables to make it safer in the ceiling. Mr Rainey suggested the work be scheduled for next holidays at the latest and any work in the ceiling should involve isolating power. Mr Rainey requested assistance with the funding⁴².

Mr West responded to Mr Rainey that day agreeing the issues need to be addressed: "[t]he electrical wiring is important and the restriction into the ceiling space is to be advised to all users of the building to be vigilant about people entering the ceiling space. The engineering solution is to put an RCD on the circuit and then have an electrician rectify the wiring"⁴³.

The College did not obtain funding to install catenary wires to support the cables. Goggos was contracted to fit safety switches to all power, light and fan circuits in the TS building. The funding of over \$7,000 came from the unplanned maintenance allocated funding⁴⁴. Mr West said the fitting of RCD's on every circuit in this building went above what was required by the Electrical Safety Standards that schools are required to meet⁴⁵.

The report of Mr Goggin about cables over steel trusses was not forwarded beyond Mr West at regional office either through DET or to BAS⁴⁶. When asked why not, Mr West said:

"I didn't escalate that email centrally for a – a couple of reasons. One is, in my experience as being Facilities Officer, when you're looking at a new building construction time and knowing the understandings of how a building is designed, how a building is engineered from the different elements of a point of construction, the processes around certification, the processes around the installation in compliance with the wiring act in this particular instance, the wiring act, from the time that I received that email, I thought that – I thought, as a non-technical layperson – I thought that that

³⁹ Rainey also notes this at 7 of G1

⁴⁰ Invoice at page 9 G 1

⁴¹ G1.1 at page 2.

⁴² page 4 of 9 of G1.1

⁴³ page 3 G1.1

⁴⁴ Mr Blanckensee (G4- BPC)

⁴⁵ G 2 west statement dated 21.9.15 at 33.

⁴⁶ BAS has no record of receiving notification in August 14 re TS building nor has BAS been requested to directed to undertake rectification of any defects from these parties- (H1 Mr Atkins).

was quite a – that position wouldn't be the case. When you do a building construction process, there are engineering control measures around the building. There's documentation that's provided to construct the building to. Those documents are reviewed by engineers. Engineers certify what the installation looks like and is that is that installation compliant. Once you go through the building construction process, there are still ongoing checks during the construction period around compliancing. There's still ongoing observations around the point in time certifications of a building construction including the electrical fit-off. In my mind, knowing that process, then knowing that there is a certification around electrical wiring, and knowing that the age of the building is less than 10 years old, my risk management process was to clearly eliminate the risk, give advice around the elimination of the risk, put in additional solutions which Mr Rainey implemented correctly about advising staff. That email message went out to all staff. The second – the – the third part of the risk management process was to install the suggested RCDs which would give another layer of engineering control or a mechanism of control to eliminate the wiring. As part of my prior training to join the Department of Education, once you get through the engineering solution, it is a monitoring process to see if that engineering solution has resolved the issue by the way of installing RCDs. My understanding is that if there are electrical faults within the building or within – within a building, the RCDs will trip and that will be the reason why the electrician or whoever it be, trade-competent electrician will go through and track – find where the fault is, repair the fault and then reinstate the RCD as it's designed to be put on”.

Mr West also told the court he didn't understand the process of escalation as he hadn't received any training around escalation management of such a serious issue and wasn't aware there was the ability to escalate the issue centrally.

Mr Mara informed the court that steps were taken to improve incident reporting: “.. the broad change is in terms of who within the department gets notified of significant or serious incidents. It's trying to put some structure around that and automate that as much as possible so that decisions around who should be notified are not left to individuals.”⁴⁷

On 19 August 2014 Mr Rainey sent an email to Workplace Health and Safety, advising them of the reported hazard in TS block and formally requesting an inspection by ESO as a matter of urgency. The email provided context, outlining that an electrician had been electrocuted and died due to the position and wiring in the ceiling. Another building has been identified with similar issues. Mr Rainey requested advice from Electrical Safety Board and an inspection of all buildings at the college as a matter of urgency. A written response was requested as to the integrity of the electrical installations as well as a list of required repairs and alternations to ensure that such a tragic event can never again occur at the College.

There is some evidence before the court Mr West was trying to arrange a meeting with the ESO and WHSQ to further address the concerns⁴⁸. It doesn't appear this eventuated, at least there is no evidence of the outcome of such a meeting if it was held.

On 22 August 2014 ESO responded by email to Mr Rainey advising that consideration should be given to engaging a person competent in electrical installations practices to audit and assess the electrical installation and provide the College with a report. The College did not engage a contractor to carry out an audit and assess the electrical installation as suggested by ESO in 2014.

⁴⁷ 3-53 at 35 Mr Mara

⁴⁸ G1.1 at page 7 of 9 email from Mark Rainey to Principal Peter Krugal

In August 2015, Mr Rainey provided a statement in the course of the coronial investigation and attached a copy of the quote/invoice of Mr Goggin, bringing to light the discovery in TS Block.

During the course of the coronial investigation, I became increasingly concerned that the issue about how circuit 22 came to be positioned across the gang nail plate and whether there were other instances of like positioning in that or other ceiling spaces at the College, and now why this more recent finding was not immediately investigated by ESO as a possible like occurrence. That line of investigation was important for two reasons. Firstly, were there systemic issues with the wiring that went to electrical safety, and secondly, might there be some forensic advantage in help identify who might be responsible – possible similar fact evidence.

On 17 August 2015, I directed ESO attend and inspect the reported electrical concerns in TS Block along with a Police Scenes of Crime officer to photograph and note relevant findings.

The Electrical Wiring Audit

As the coronial investigation progressed, concerns came to light about other buildings at the College with wiring issues. Mr Rainey reported electrical defects in KA and PA blocks namely, cables draped over sharp edge steel trusses⁴⁹. In response, KA and PA blocks had safety switches installed to all power, light and fan circuits in this building over the September school holidays.⁵⁰

Mr Mara told the court he was notified on 1 September 2015 of the incident in 2012 and the concerns raised in 2014 at a school and regional level. A decision was made to undertake a comprehensive audit of the College and address any identified issues⁵¹. He said he was responsible for infrastructure and the incidents and concerns had implications for the suitability and fitness for purpose⁵².

On 30 September 2015, Department of Education engaged BAS to co-ordinate an electrical inspection of all buildings at the College. The inspection was undertaken between 1 and 5 October 2015.

The purpose of the audit was to:

- Ensure current installations were safe and if deemed necessary, to ‘make safe’ – meaning the minimum maintenance rectification works necessary to be undertaken immediately to ensure the personal safety and welfare of the building occupants was maintained at all times.
- Reconcile for compliance against electrical standards applicable at the time of construction and against current electrical standards; and

Make risk based recommendations on any work required due to standard changes since construction

The resulting audit report also noted non compliances could arise from design changes or modifications, changes in standards over time, degradation over time, etc.⁵³ Electricians checked about 70 building structures. The audit identified 111 non compliances of which 35 were high risk non-compliances that were made safe and reduced to low risk, 65 moderate risk non-compliances which were reduced to low risk, and 11 low risk non-compliances. The

⁴⁹ G4 para 53

⁵⁰ RB15 and RB-16

⁵¹ Mara 3-53 at 45

⁵² Mara 3-54 at 1-5

⁵³ G5 at page 6 list a comprehensive list of how non compliances can arise.

items identified as high risk were defined as providing an electrical risk and these items were made electrically safe as soon as possible. There were 82 maintenance items, of which 48 were high risk, 21 were moderate risk and 13 were low risk. There were 79 future maintenance issues of which 10 were moderate risk, and 69 were low risk. The audit revealed a total of 21 issues arising from G Block. Four of those were high risk non-compliances.

Babinda Electrics, the original installer at construction for many of the buildings, and ESO disputed the findings and categorisation of some of the non – compliances. For example, TS Building was reported to have cables run over sharp edges⁵⁴ and were considered high risk noncompliance. Mr Smith from Babinda Electrics gave evidence that it was low risk⁵⁵

“... we’ve used – we’ve installed double insulated cable, and that double insulated cable provides the mechanical protection that’s required by the rule book so that it complies. Now the other thing that must be understood about this block is that it is built – the ceiling cavity is built entirely of steel. Now the ceiling cavity is earthed, and it’s earthed via water pipes, refrigerant pipes. All the light fittings are bolted to the frames. Now if one of those cables was to short onto that truss, it would trip the circuit breaker. ...”

Mr Browne disagreed with the proposition that double insulated cables provide mechanical protection⁵⁶. He reported the “ceiling cavity is not earthed- technically it is bonded by water pipes, not earthed by water pipes, and unless there is a separate connection to the structure it is not earthed. Re trip- if short circuit was not an arcing fault this would be true. If earth fall loop was correct to clause 1.7.4.3.4 of 2000 it requires a 400 millisecond disconnection time for a direct connection fault. However, if there was an arcing fault the current level reduces to approximately 30%. And the fault to the gang nail plate was an arcing fault (doesn’t matter what building). As occurred in the other building it would be 30%. In which case the breaker may not trip.^{57”}

Similarly, ESO’s Mr Stattmann was of the view the issue in TS building was compliant. He pointed to the fact that there were safety switches installed and that the cable was double insulated meaning there was mechanical protection. The RCDs were a secondary protection measure⁵⁸. Mr Browne disagreed with Mr Stattmann, reporting the photographs show cables over sharp edges, they would have required mechanical protection. RCD’s are additional protection to make it safer⁵⁹.

It was logistically impossible for the inquest to separately consider each item of ‘non-compliance’ reportedly found in the Department of Education audit. Even if that was possible, the next steps were to consider who installed it, when and against what wiring standard. The experts are already arguing the interpretation of the wiring standards in relation to cables on sharp edges. It is important to note that there may be many reasons for the non-compliance that does not reflect on the original installer or the quality of later work.

The issue is not the level of compliance or non-compliance with the wiring rules, it is the level of assurance about electrical safety that the current regulatory system provides. The audit report looks at risk associated with non-compliance and other issues. A great deal of work was required to reduce that level of risk to an acceptable level. That does not reflect well on the level of assurance about electrical safety, particularly in ceiling space that our current system of regulations and standards supports.

⁵⁴ Exhibit G 5 at page 104 (photographs) and page 50 description of issues (reference 43.1).

⁵⁵ transcript 1- 43-44 at 45 and 1-44 lines 25 – 34) and at page 12 of the Babinda Electrics Report (exhibit D9.2)

⁵⁶ F2 Browne report dated 10.9.16 at 61(b)

⁵⁷ F2 Browne report dated 10.9.16 at 61(b)

⁵⁸ exhibit A12.1, page 4, and further (transcript day 2, page 43 para 20-35) and further F2 Browne report dated 10.9.16 at 62 (a)

⁵⁹ F2 Browne report dated 10.9.16 at 62(b)

In response to the audit, the Department of Education approved the immediate installation of an additional 538 RCDs to unprotected circuits rated 20amps or below⁶⁰. Buildings constructed prior to 2007 had a limited number of circuits protected by RCDs. The wiring rules prior to 2007, only required RCD protection to socket outlets used for the connection of electrical equipment that may present an increased risk of electrical shock⁶¹. RCDs were not installed on stove circuits or 3 phase equipment circuits due to potential nuisance tripping in line with current Australian Standards⁶²

Very importantly, the Department of Education took another significant step and reviewed the rate of RCD protection in School's across the state. It completed further audits of 19 schools across the state, commencing in February 2016, engaging BAS to undertake these audits of both primary and secondary sites spread over the DET's seven regions with construction dates of buildings spanning several decades. The results relevant to RCD's indicate the Department is meeting the regulatory guidelines under *AS/NZS 3000:2007* Australian New Zealand Wiring Rules. However, the Department decided to implement "the Electrical Safety Program" to increase the rate of RCD protection on single and dual phase circuits to 100% over the next four years to cover all of 1,500 Early Childhood Education and Care Centres, State Schools and TAFE sites. The funding for the program is \$52 million over five years.

The ESO Investigation Revisited

The focus of the ESO inspectors was to establish the cause of the shock path resulting in the death of Mr Kennedy. Inspector Mr Stattmann told the court: "We were so busy with what we had to do already, at that point in time, obviously we wanted to identify what the shock path was for this particular electrocution. We – we were satisfied that we'd found the issue with regards to that event".⁶³

Mr Hutchinson stated that the primary goal and priority was testing and finding a shock path.⁶⁴

It will be recalled that three ESO inspectors conducted the initial scene investigation. It will be recalled that Mr Stattmann and Mr Prentice had the benefit of another inspection of the scene on 21 December 2012, when they returned to conduct further testing. Mr Stattmann also rectified cable 22 by rerouting, reconnecting it into a J-box, labelled it as required, tested and reenergised making sure it was safe⁶⁵.

Mr Stattmann was asked whether he had concerns there might have been other buildings with similar wiring problems. He responded that at that particular time he was there to investigate a shock incident. When pressed if after the fatality he had concerns there might be issues in the other roof spaces- he told the court "not really because it's the duty of the school to anticipate that. I mean, there possibly could've been but, as I said, my – my job at that time was to go and investigate a shock incident."⁶⁶ He said the ESO was quite reactive in these types of events and that they "don't go creating other events based on one other event". Mr Stattmann conceded he didn't consider investigating the possibility of like wiring issues in other buildings as a means of assisting in the identification of who might be responsible for the wiring and positioning of circuit 22.

In addition to missing the opportunity to check for like positioning of circuits, the Inspectors missed finding very important evidence during the scene investigation.

⁶⁰ G5 audit report at page 11

⁶¹ G5 audit report at page 11

⁶² G 5 at page 11

⁶³ Transcript Stattman at 2-41 at 40

⁶⁴ Transcript Kennedy at 2-17

⁶⁵ 2-36 at 45 Stattman

⁶⁶ Transcript at 2-41 at 15

The coronial team and I studied the photographs that police took at the scene to try and understand the general layout of the wiring, including where and how circuit 22 left the catenary. It became apparent from studying the photographs that circuit 22, at the point where it rested on the gang nail plate, was NOT in its 'as installed' position. The catenary (steel wire) was constructed to support a bundle of cables for the length of that building (eye bolts at each end), running adjacent to air-conditioning plant. The span of the catenary was supported at regular intervals with support saddles fixed to trusses to prevent the steel wire sagging. From the photographs, it was apparent that the catenary was lower than expected near where circuit 22 left the bundle of cables. On closer investigation, it was discovered that a support saddle nearest where circuit 22 contacted the gang nail plate was not supporting the catenary. The catenary hung lower under the weight of the cables, lowering circuit 22 from its original position above and clear of the gang nail plate.

This discovery led to further investigation to seek to understand how and why the catenary was lowered. It became clear that someone had unscrewed one of two screws securing the saddle, permitting the catenary supporting wire to be released and the catenary lowered.

Mr Smith of Babinda Electrics said that at construction the wiring for the project was installed in accordance with the specification and the "for construction" drawings provided by the consultant engineers, Ashburner Francis, which included "requirements of the cable and conduit support system, e.g. how the wiring system must be supported and cables were to be fixed by cable ties and supported by saddles".

Mr Smith confirmed the original wiring installation had been disturbed or altered in a number of ways⁶⁷ including the support saddles have been dislodged as a result of its upper screws being removed; the saddles have been bent out of shape; the catenary wires have been removed from the saddles and the tension on the catenary wire has been slackened to allow the catenary wire to lie across the ceiling rafters.

Mr Browne reported that it is unlikely that the catenary wire would pull down on the saddle causing the top to become loose without human intervention and it would take an intentional act to remove the top screw, open the saddle and release the catenary wire⁶⁸. It may have had to do with the length of the cable, or that it was routed after the ceiling was installed⁶⁹. Mr Browne remarked, "Before the catenary dropped it wouldn't have been good workmanship if it was run in place above a gang nail plate"⁷⁰.

I find it incredulous that laypersons such as myself and my coronial team could find what now seems obvious and should have been found by the ESO Inspectors, who are presumed to have the required technical expertise. There are clearly limited possibilities about what trade persons may have needed to lower the catenary and for what purpose given the equipment located in that space. There may still have been difficulties in identifying who, when and why that catenary was lowered, BUT those investigations were far more likely to be productive in 2012. This was a serious missed opportunity on the part of the ESO's.

Wayne Connors, Regional Investigations Manager with Workplace Health and Safety (WHS) attended the scene of the incident. He understood his role was to take statements from witnesses. He did not look into the roof space. He agreed he was reliant on the technical advice relating to electrical issues from ESO inspectors. He confirmed that the conclusion reached in the WHS report, that circuit 22 was not mechanically protected was based on advice given to him by ESO inspectors⁷¹. Further, the conclusion that circuit 22 was originally

⁶⁷ JDS-15 of Mr Smith's statement

⁶⁸ F2 Browne dated 10.9.16 at 24, 25 and 27 and at 34 a

⁶⁹ F2 Browne at 39 and 40

⁷⁰ F2 at 55 Browne report 10.9.16

⁷¹ Transcript at 2-73 at 35

installed in the position in which it was found was based on a “desk top investigation” by examining the documentation provided from BAS to see what work had been done in the ceiling space that may have led to that cable being repositioned⁷².

Mr Connors told the court that he looked at photographs of the scene and spoke with ESO inspectors about what was depicted. The focus of the discussion was why cable 22 was in the position in which it was found, nothing about the position of the catenary was mentioned. When asked if he was aware the catenary was supposed to support the cable to circuit 22 above the gang nail but not on it, and whether that would have likely changed the direction of the investigation, Mr Connors replied: “Okay. Yeah. Well, I suppose, then we’d be looking at all – how did it come to be pulled down from that location.”⁷³

Mr Connors agreed when shown the Police photographs, and the proximity the supporting member to an air-conditioning unit, that fresh lines of investigations might have arisen but had not because these technical matters were not brought to his attention⁷⁴.

A decision was made to prosecute Mr Goggin for failing to ensure that a person’s business was conducted in a way that was electrically safe⁷⁵, evidenced by Mr Goggin failing to ensure there was an adequate risk assessment and not ensuring control measures necessary to prevent a person exposed to electrical risk. Essentially, WHS alleged the risk assessment completed by Mr Goggin was not adequate as he didn’t look into the roof space of G Block which would have led to him identifying potential hazards and de-energising the building before non-electrical work was started. The matter proceeded to hearing and at the conclusion of the prosecution case, the defence submitted there was no case to answer. The court agreed and the charges were dismissed with ESO ordered to pay the costs of Mr Goggin.

It was farcical that a prosecution of Mr Goggin was pursued, based substantially on an allegation of inadequate inspection and risk assessment on his part, when ESO’s conducting a scene investigation following a fatality, miss finding critical evidence relevant to that risk.

Electrical Safety Assurance

Who would have thought that an electrical safety audit of a government school constructed in 2004 would reveal so many items warranting attention? It is not necessarily a reflection on the persons responsible for original installation, or later repairers and maintainers. It is more a reflection of the increasing complexity of constructing and maintaining public buildings. The building is also a product of the current electrical safety regulatory regime. The electrical design and construction is certified as compliant. Subsequent repairs or modifications are certified as compliant. But when a tracing exercise becomes necessary, like here, the reality of tracking back through invoices to check ‘who did what work when’ at a particular location, with the passage of time, is very difficult. Therefore, accountability is difficult to achieve. While these standards within the regulatory regime are important, so too is supplementary forms of additional protection.

Mr Browne reported that if a 30mA residual current device (a safety switch) been fitted to circuit 22 Mr Kennedy would not likely have been electrocuted. He stated:

“if a 30mA RCD had been fitted as supplementary protection there was sufficient current to initiate a trip and prevent a current flow for sufficient time to cause ventricular fibrillation” (page 2 of his report at F1).

⁷² Transcript 2-74 at 5

⁷³ Transcript at 2-76 Connors WS

⁷⁴ Transcript at 2-77 at 1-8

⁷⁵ (page 430 WHS brief) A1

The wiring rules in place at the time of installation (AS/NZS 3000:2000) did not require an RCD to be fitted to circuit 22, a fan circuit. The 2000 rules only required an RCD be fitted to a socket outlet (not circuit) not exceeding 20A in high risk areas. In 2007 the wiring rules were amended to AS/NZS 3000:2007 which required RCD's be fitted to all final sub circuits not exceeding 20A supplying socket outlets and lighting. The rules did not require a retrofitting of circuits that were not previously fitted.

The Department of Education has embarked on a major electrical safety initiative in our schools to ensure RCDs are retrofitted.

The State Coroner of Queensland conducted inquests into the deaths of Matthew James Fuller (14/10/09), Reuben Kelly Barnes (18/11/09) and Mitchell Scott Sweeney (4/2/10), delivering findings and recommendations on 4 July 2013. These deaths were associated with the Federal Government Home Insulation Program. A recommendation related to RCD's and read:

Recommendation 3 – Extension of requirement for residual-current devices.

The various options for the extension of the requirement for the mandatory fitting of residual current devices involve the balancing of the costs involved against the resulting improvements to electrical safety. The State Government is best placed to assess the competing policy considerations with expert advice from the Electrical Safety Office. I recommend the matter be actioned as a matter of urgency.

The Qld Government formally responded to the recommendation:

In response to these recommendations, a range of regulatory and non-regulatory options were examined in relation to the extension of mandatory safety switch requirements. The cost benefit analysis conducted indicated that increases in electrical safety achieved by further regulatory requirements for safety switches in homes did not justify the additional cost this would impose on homeowners, and on this basis the then Government opted for a public awareness campaign rather than further regulatory intervention. In addition in March 2014, the Electrical Safety Office sought to determine the current voluntary uptake of safety switches on other final sub-circuits. The statistically significant results show a positive trend in industry to provide safety switch protection above existing legislative requirements. Findings were 58 per cent of stove circuits, 48 per cent of hot water circuits, 47 per cent of air conditioner circuits and 76 per cent of miscellaneous circuits (e.g. pool pumps) had safety switches installed.

The public awareness campaign is scheduled to be launched in mid-2015 and will encourage the uptake of additional safety switches by homeowners. The campaign will raise awareness of the risk of electric shocks in homes and will encourage homeowners to make their homes safer by installing safety switches. The new campaign will involve television, radio, online and outdoor advertisements and will build on the success of a recent campaign about the dangers of working in a ceiling space.

I also note that extensive material was tendered on behalf of ESO about public awareness programs conducted about electrical safety in ceiling spaces, both for the protection of the consumer and electrical contractor, encouraging the de-energisation of ceiling spaces before entering them.

It is interesting that in every risk management model, when it comes to identifying and selecting appropriate control measures, there is a hierarchy of controls. In order of decreasing effectiveness, the hierarchy involves:

- Elimination – physically removing the hazard;
- Substitution – replacing with something less hazardous;
- Engineering controls – isolating people from hazards;
- Administrative controls – procedures training and warnings to limit exposure; and

- Personal protective equipment.

I would consider an RCD an engineering control vis-à-vis electrocution – no brainer! Just about every safety regulator insists on higher order controls if reasonably practicable. But when it comes to a government and a financial impost on building owners, including home owners, the sensitive issue of cost effectiveness arises. Or to put it more directly, how many deaths does it take to justify the costs of mandating RCD's on all circuits where that is practicable (some circuits serve a purpose not amenable to RCD protection). Only government can answer that question.

Conclusion, Findings and Recommendations

1. I find Dale Kennedy died on 12 December 2012 in the ceiling space of G Block at Bentley Park College, Cairns due to electrocution.
2. He was installing data cables and moving through the ceiling space using a plank between rafters to support himself. In the vicinity of a access hole in room G118, and unbeknown to Mr Kennedy, a double insulated cable that was part of a fan circuit (circuit 22) lay across a gang nail plate on a truss beneath the plank on which he was manoeuvring. His body weight and or movement of the plank caused the metal gang nail plate to penetrate the insulated cable thereby energising the gang nail plate, and air-conditioning support frame in contact with it and the air-conditioning unit. When Mr Kennedy came into contact with the air-conditioning unit and an earth, he was electrocuted.
3. The Electrical Safety Office inspectors focused on investigating the shock path and did not examine the scene more broadly to determine how and why circuit 22 came to be located lying on a gang nail plate. The integrity of the catenary, from which circuit 22 ran, was not checked. The ESO investigation concluded that circuit 22 was installed in the manner in which it was found, namely lying across the gang nail plate. Neither the ESO inspectors nor Department of Education property managers considered inspecting that or other ceiling spaces for any other like hazards. The local Department of Education officers appeared to take their lead from and rely on the advice of the ESO inspectors. It was reasonable to assume the ESO inspectors had the requisite expertise and had conducted a thorough investigation.
4. In August 2014, further electrical hazards in a ceiling space were reported to the College and ESO. While the Department of Education locally took immediate remedial action, ESO decided not to investigate the matter.
5. ESO prosecuted Mr Goggin, in essence, for failing to conduct an adequate inspection and risk assessment, and for failing to de-energise the ceiling space, thereby causing the death of Mr Kennedy. The charge was dismissed on the basis the prosecution failed to disclose a prima facie case.
6. IN August 2015, I directed ESO, in company with Police, to attend the College and investigate the electrical concerns that were earlier reported. Shortly afterwards, a Senior Executive within the Department of Education was informed of the 2012 fatality and August 2014 report of wiring concerns and directed a full electrical audit be conducted. A great many non-compliances were found in the 70 building that were inspected and high to moderate risk items were immediately addressed.
7. Further, the coronial investigation revealed that circuit 22 was originally suspended above and clear of the gang nail plate by the catenary from which it ran. However, someone undid a supporting saddle on a nearby truss, deliberately freeing the catenary and allowed it to lower to the ceiling floor under its own weight. It was left in

that position with the result that circuit 22 lay across the gang nail plate. Presumably this was done for a maintenance related purpose.

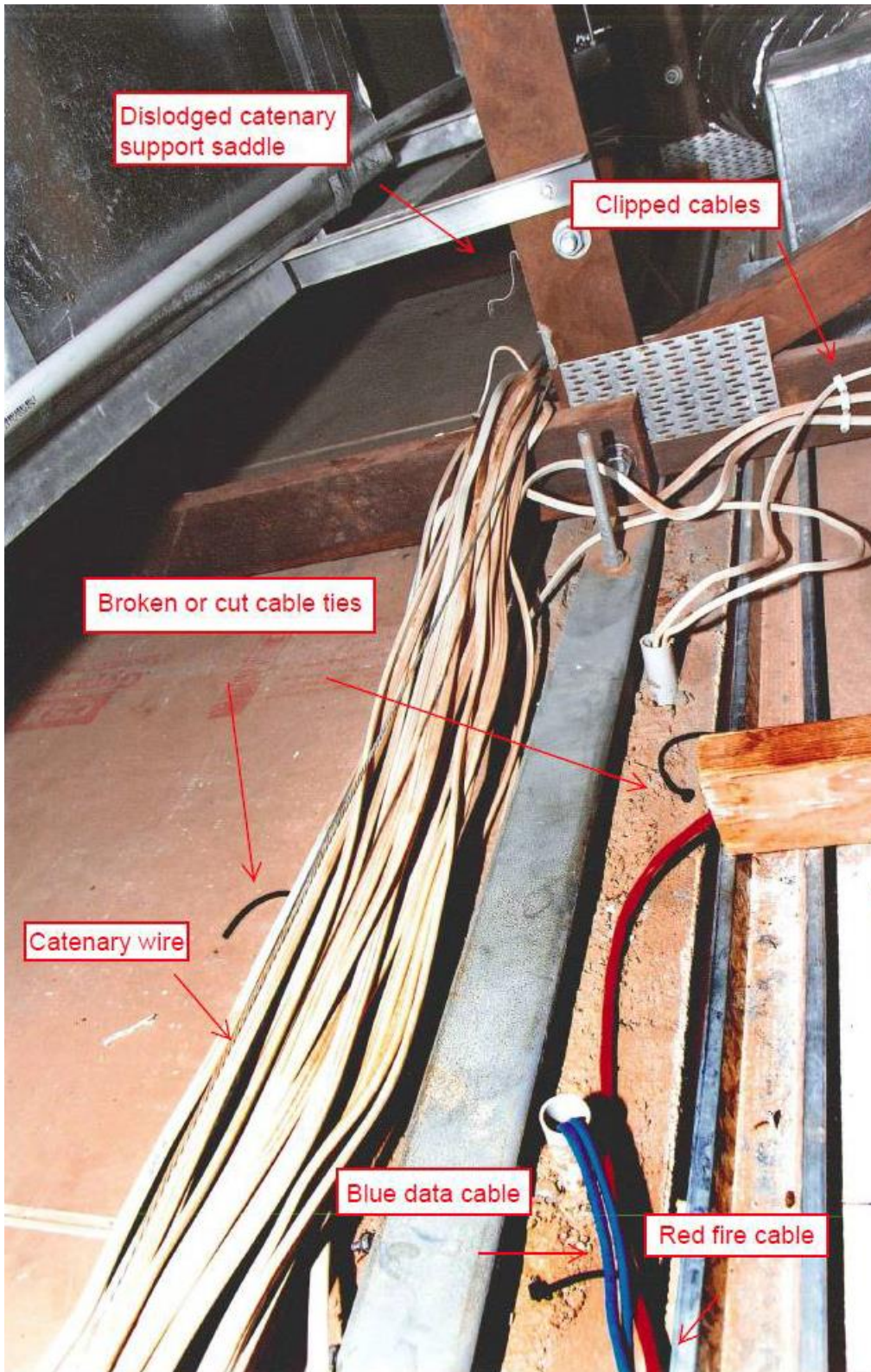
8. The person responsible for undoing the saddle and releasing the catenary was unable to be identified. However, there was a better prospect of identification if the full forensic ability of ESO was properly and competently engaged at the time of the scene investigation. It may be that that person did not appreciate the risk created by their action.
9. The Department of Education has committed funding and advance its program of ensuring all schools were retrofitted with RCD's on most circuits.
10. ESO missed a number of opportunities. Inspectors failed to notice that the catenary from which circuit 22 originated had been released from its supporting saddle. It missed the consequential opportunity to investigate who and why the catenary was released from the supporting saddle. Nonetheless, and somewhat ironically, it prosecuted Mr Goggin, asserting he failed to properly inspect the ceiling space for electrical hazards. It also missed the opportunity to check whether there was any like or other electrical hazards in the ceiling space that might have assisted forensically or in mitigating the risk of electrocution. All of the inspectors who gave evidence impressed as experienced, conscientious and hardworking; but their investigative knowledge and skills need better organisational support and backup.
11. I recommend ESO reconsider the various options for the extension of the requirement for the mandatory fitting of residual current devices (including cost benefit analysis), and a draft discussion paper be circulated to key stakeholders and the public for consultation prior to finalisation of its policy position or advice to State Government.

Kevin Priestly
Coroner
Cairns
28 February 2018

Appendix



Photograph depicting circuit 22 cable positioned above the gang nail plate



Photograph depicting various features including catenary and dislodged saddle