



Main Switchboard Thermal Imaging Inspection & Report

88 Sample St Suburb VIC 3000

- ✓ 30+ Years' Experience In Reporting Services
- ✓ Our Quality Reports Make Roscon The Number #1 Choice
- ✓ We conduct onsite audits including photos, not desktop audits
- ✓ ISO 9001 Accredited Systems & Procedures
- ✓ Domestic Unlimited Builders (DB-U 13329)
- ✓ Commercial Unlimited Builders (CB-U 4272)
- ✓ Member - MBAV Platinum Master Builder (5630)
- ✓ Member - Strata Community Australia
- ✓ Member - Australian Institute of Project Management
- ✓ Member - The Real Estate Institute of Australia

Roscon Property Services

Roscon Property Services is the first property services provider to introduce central streamlined systems integrating property maintenance and quality controlled reporting services accredited by International Certifications, dedicated to support Owners Corporation managers.

Since 1987 we have evolved from our history of developing and constructing prestigious residential and high profile commercial/ industrial landmark projects. We have extended our service capabilities through our extensive construction, strata management and professional property services experience gained over 25 years, and filled the void between three property industries.

Built on solid foundations our clients rest assured in the comfort of knowing they're supported by Registered Building Practitioners, qualified professionals, fully insured and committed in protecting their responsibility to valued clients.

Mission Statement

"It is the policy of Roscon Property Services to deliver property Maintenance services to its clients in the most efficient and timely manner while respecting legal and statutory requirements. Roscon Property Services Pty Ltd operates under ISO 9001-2000 in the completion of its services. All staff & sub-contractors are expected to work according to our policies and procedures. The system employed by Roscon Property Services Pty Ltd is reviewed annually in order to ensure its consistency".

Instructed By

Name	
Title	Building Manager
Address	

Inspected & Compiled by

Inspector ID	JOS-729
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5 October 2015

Dear XXXX,

Thank you for using Roscon Property Services Pty Ltd for your Switchboard Thermal Imaging Inspection and Report. I have attached a copy of the report that has been compiled by an experienced auditor.

Should you require further assistance or need clarification of anything that is contained within the report then please do not hesitate to contact us.

The attached report includes the following:

Part 1	Introduction
Part 2	Inspection Notes
Part 3	Detailed Thermal Investigation
Part 4	Terms and Conditions

The team at Roscon Property Services are available to assist you with any rectifications that may eventuate and look forward to your call. Thank you for your continued business.

Yours Sincerely

Roscon Property Services Pty Ltd



Paul Cummaudo
Managing Director
AREI, RBP, CRE, Licensed Estate Agent
Registered Building Practitioner DB-U 13329, CB-U 4272
Member REIV, MBAV, SCA, NCTI

Part 1 – Introduction

What is Thermal Imaging?

Thermal imaging is the non-contact detection and measurement of temperature differences and the assignment of colours based on temperature.

Any object that has a temperature above absolute zero (-273°C) emits infrared radiation. Thermography is a technique that uses thermal imaging cameras to visually represent the infrared energy emitted from a surface, transforming infrared measurements to construct a radiometric image.

The thermal imaging services offered by Roscon Property Services are an effective and efficient way of testing, some advantages are listed below:

- Minimises the downtime and labour costs associated with the more traditional forms of testing.
- Detect anomalies often invisible to the naked eye and allow corrective action to be taken before costly system failures occur.
- Infrared scans are non-intrusive eliminating lengthy downtime, causing loss in production to your business.
- Infrared thermography has become one of the most valuable diagnostic tools for predictive maintenance.
- Large areas can be scanned faster.
- Efficiently and accurately identify and target hot spots.
- Can assist in detecting areas of moisture or thermal inconsistencies.
- Energy efficiency.

How it works?

Thermal imaging does not "see" inside walls unlike an X-ray, CAT scan or MRI although you may have seen thermal images showing the framing inside walls. This is misleading as the darker lines of the frame are visible because the frame acts as a heat sink draining heat from the wall sheet and appearing as a dark spot. The frame lines on the image are actually colder sections of wall sheeting as a result of the heat being drained away from the surface of the wall sheet and not the frame itself being "seen" through the sheet.

Thermal imaging simply provides a temperature reading across a surface, building up a picture from thousands of temperature measurements in its field of view. It's also useful in displaying patterns of moisture which evaporates and cools surrounding material. Conversely, as termites maintain a constant temperature between 28 and 32 degrees Celsius in their workings, if there are enough of them and the ambient temperature is cooler, termite activity presents as a hot spot. Using thermal imaging is not a simple process and requires knowledge, skill, experience, and training. The process must take into account the climate, the current weather, the structure's use and occupancy, the time of day, the type of construction, heating and air conditioning, plumbing, wiring, construction materials, surface finish, and even colour. Other supporting technology includes Moisture Meters and Bore scope.

Heat

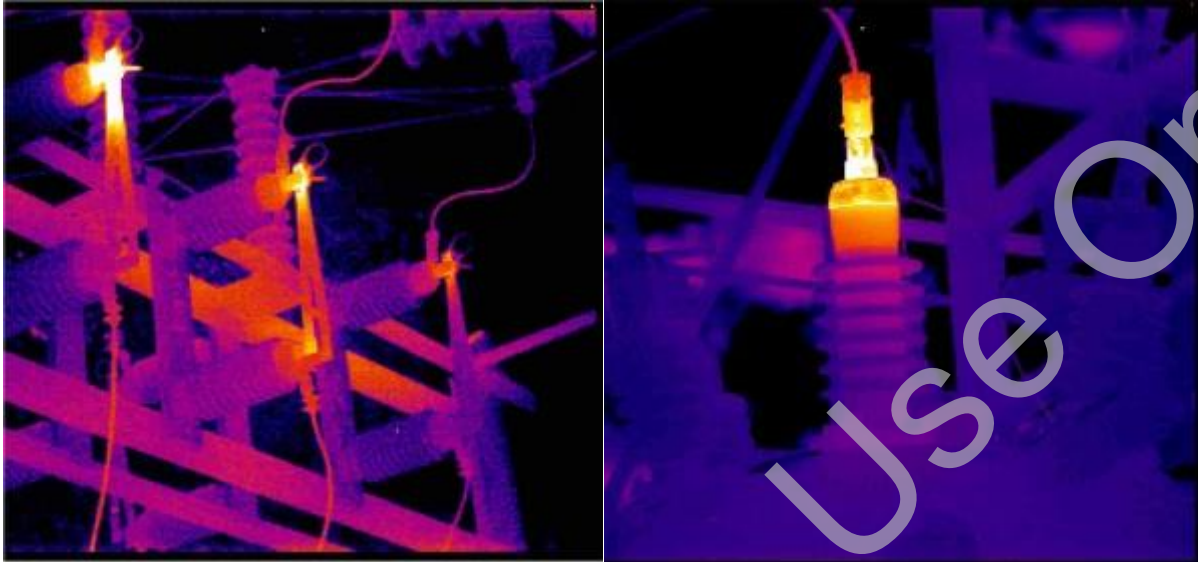
To fully understand infrared thermography, its applications, qualities and limitations, it is necessary to be familiar with the laws of physics that govern heat, heat transfer and the principles of infrared radiation. Heat is the transfer of energy from one material or substance to another. Heat is energy in transit; it always flows from the material at a higher temperature to that at a lower temperature until thermal equilibrium is reached. Heat may be transferred from one object or place to another by three modes; conduction, convection and radiation. It is the radiation mode that infrared thermography can detect. There are several basic factors that affect the accuracy of measurements using this technique and must all be taken into consideration for reproducible results. They are: surface emissivity, reflected temperature and ambient temperature.

Temperature

Temperature is arguably the most widely measured physical parameter in science and engineering and is a reliable indicator of an objects condition.

Infrared cameras

Here's an example of a thermal images of an electrical substation and lines:



Characteristics of Infrared Thermography Camera

- It captures as a temperature distribution on a surface, and it can display as visible information.
- Temperature can be measured from a distance without contacting an object.
- Temperature can be measured in real time.

Merits of Infrared Thermography Camera

- Relative comparison of distribution of surface temperature can be made over a wide area.
- Temperature can be measured easily for a moving object or an object which is dangerous to get close to.
- Temperature of small object can be measured without confusing the temperature.
- Temperature of food, medicine or chemicals can be measured in a sanitary fashion.
- Temperature of an object with drastic temperature change or a phenomenon during a short period of time can be measured.

Applications

- Moisture inspection
- Heat or cooling loss
- Water/ Steam leaks
- Construction quality
- Electrical installation
- Repair validation
- Termites and pests
- Electrical power distribution systems: Three-phase systems, distribution panels, fuses, wiring and connections, substations, electrical vaults
- Electro-mechanical equipment: Motors, pumps, fans, compressors, bearings, windings, gear boxes, and conveyors
- Process instrumentation: Process control equipment, pipes, valves, steam traps and tanks/vessels
- Facility maintenance: HVAC systems, buildings, roofs, insulation

Limitations

- Building construction materials can inhibit the use of the thermal imaging camera.
- Thermal imaging cameras do not see through walls & cannot determine the extent of any structural damage. It basically only detects the surface temperature of whatever is being scanned.
- Images can be difficult to interpret accurately when based upon certain objects, specifically objects with erratic temperatures, although this problem is reduced in active thermal imaging.
- Accurate temperature measurements are hindered by differing emissivity's and reflections from other surfaces.
- Most cameras have $\pm 2\%$ accuracy or worse in measurement of temperature and are not as accurate as contact methods
- Only able to directly detect surface temperatures.
- Condition of work, depending of the case, can be drastic: 10°C of difference between internal/external, 10km/h of wind maximum, no direct sun, and no recent rain.

Inspection method/criteria

Thermal intrusion testing is normally done by performing thermal imaging of the envelope components. When using a thermal imaging camera to find missing insulation or energy losses, the difference in temperature between the inside of the building and the outside should be preferably at least 10°C . These images will indicate areas of excess thermal intrusion in wall or roof areas and can indicate the presence of thermal bridging of structural elements and also the presence of air leaks when the building is under testing pressure.

Any thermographic survey can show differences in apparent temperature of areas within the field of view. To be useful, a thermographic survey must systematically detect all the apparent defects and assess them against criteria agreed between Roscon Property Services and the client. It must reliably discount those anomalies that are not real defects, evaluate those that are real defects and report the results to the client. On that count, the process generally consists of the following key steps.

- Step-1 Selecting the critical temperature parameter
- Step-2 Selecting maximum acceptable defect area
- Step-3 Measuring surface temperature difference caused by the defect
- Step-4 Measuring area of the defects

Thermal anomalies will only present themselves to the thermographer where temperature differences exist and environmental phenomena are accounted for. Generally, the below mentioned parameters may be considered as recommended prerequisite for the environmental conditions before proceeding with the thermal imaging for building diagnostics.

- Temperature difference across the building fabric to be greater than 10°C .
- Internal air to ambient air temperature difference to be greater than 5°C for the last twenty four hours before survey.
- External air temperature to be within $\pm 3^{\circ}\text{C}$ for duration of survey and for the previous hour External air temperature to be within $\pm 10^{\circ}\text{C}$ for the preceding twenty-four hours.
- In addition, external surveys should also comply with the following
- Necessary surfaces free from direct solar radiation for at least one hour prior to survey. No precipitation either just prior to or during the survey.
- Ensure that all building surfaces to be inspected are dry.
- Wind speed to be less than 10 metres / second during the operation.

Besides temperature, there are other environmental conditions that should be duly taken cognizance of when planning a thermographic building survey. External inspections for example, may be influenced by radiation emissions and reflections from adjacent buildings or a cold clear sky. Sun may also have a significant influence on surface temperatures.

Additionally, where background temperatures differ from air temperatures either internally or externally by more than 5K , then background temperatures should be measured on all effected surfaces to allow surface temperature to be measured with sufficient accuracy.

Survey and Analysis

Infrared cameras used for the survey must have sufficiently high resolution to detect small anomalies at a reasonable distance. The total pixel count should be sufficient enough for good results, and the camera should have a temperature sensitivity of at least 0.2°C (usually specified as NETD or noise equivalent temperature difference) so that surface anomalies with small temperature differences can be detected.

The survey must collect sufficient thermographic information to demonstrate that all surfaces have been inspected so that all thermal anomalies are reported and evaluated. Images of anomalies must be captured in such a way that they are suitable for analysis.

Some conditions are stated as under:

- The image is square to any features of the wall or roof.
- The viewing angle is nearly perpendicular to the surface being imaged.
- Interfering sources of infrared radiation such as lights, heat emitters, electric conductors, reflective elements are minimized to the extent possible.

Additional data that must be collected in the survey include

- Internal temperature in the region of the anomaly.
- External temperature in the region of the anomaly.
- Emissivity of the surface.
- Background temperature.
- Distance from the surface.

Part 2 - Investigation Brief & Inspection Findings

Roscon Property Services has been engaged by the Building Manager to conduct a Main Switchboard Thermal Imaging Inspection at 88 Sample St Suburb VIC 3000.

The report has been commissioned to:


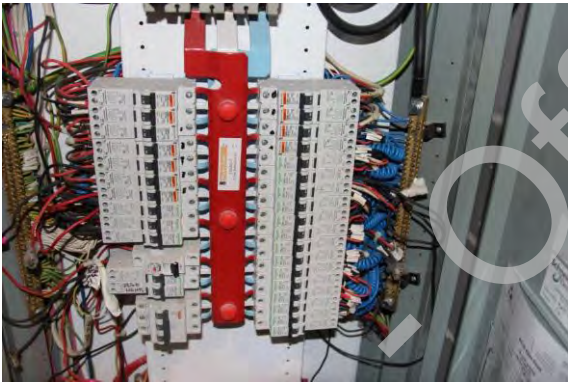
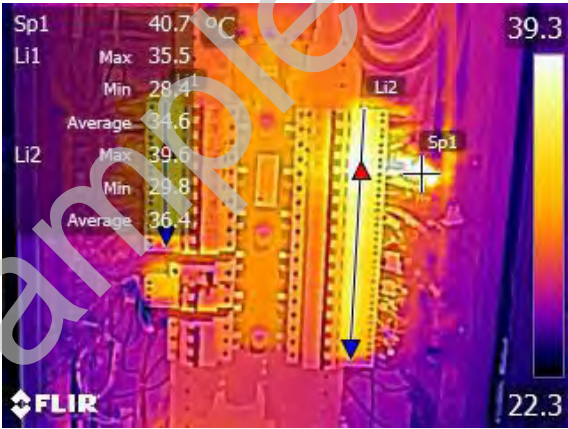

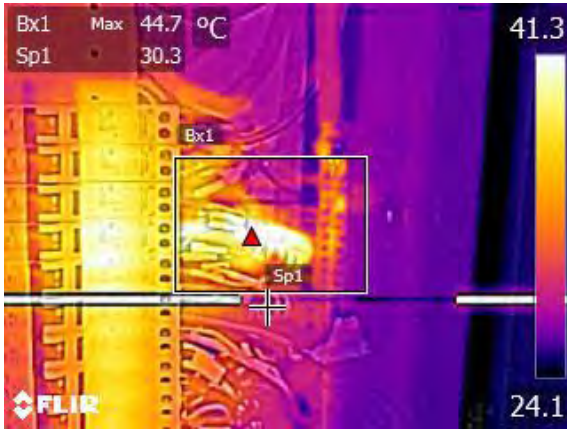
- Conduct a thermal imaging inspection of all electrical switchboards within the complex
- Provide a report on all switchboards
- Report on any abnormalities and provide recommendations for rectification

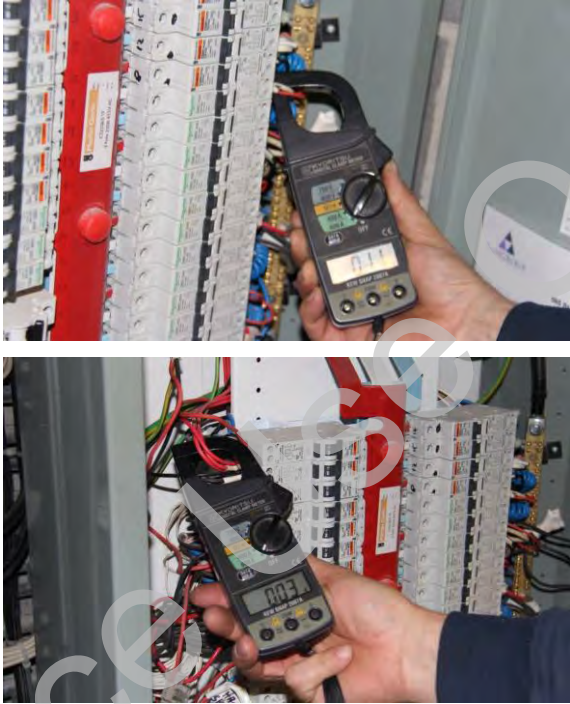
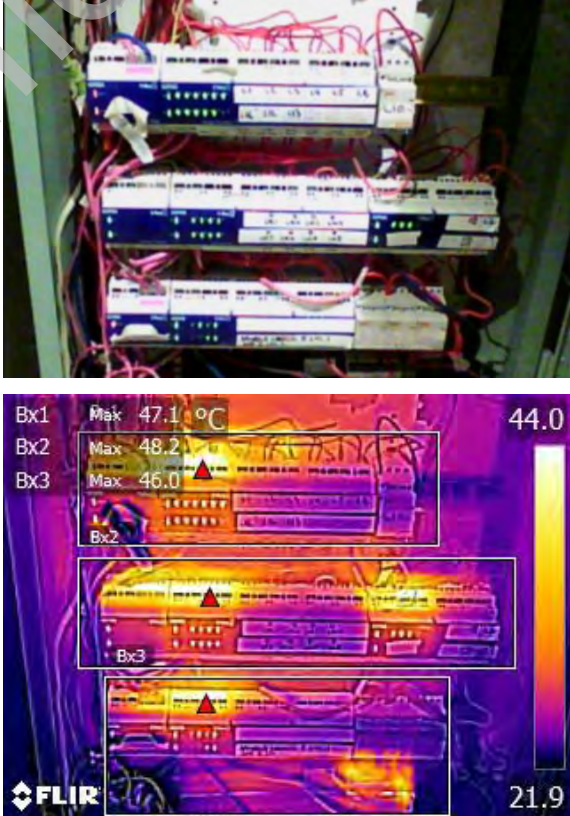
Roscon inspected the property on Friday 18th September 2015 at 9:00am. Access to the property was provided by the building manager. Prior to commencing investigation, Roscon personnel familiarised themselves with the property & exit routes.

Inspection Notes:

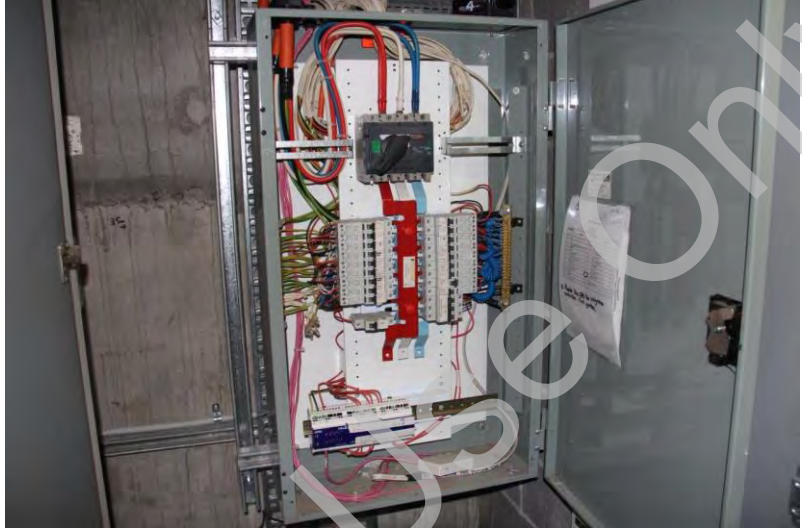
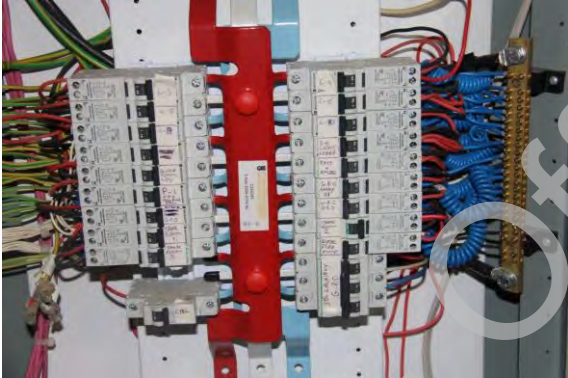
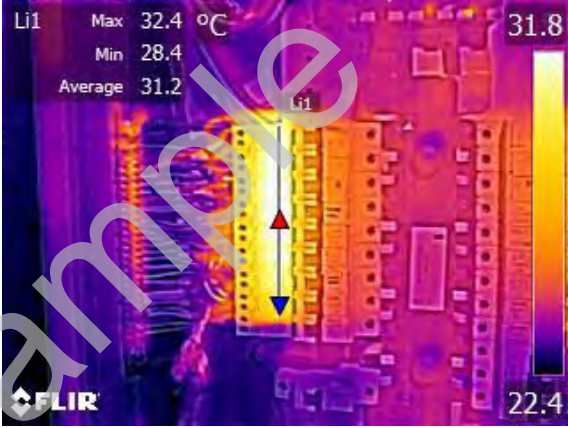
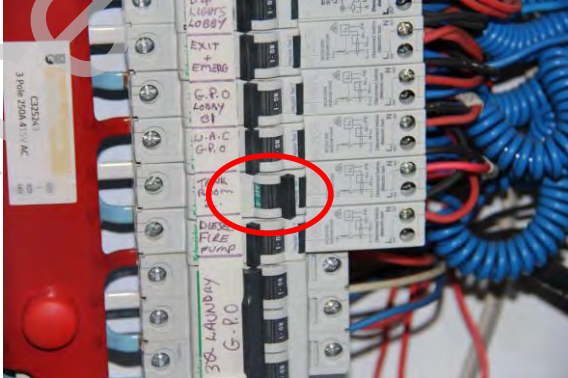
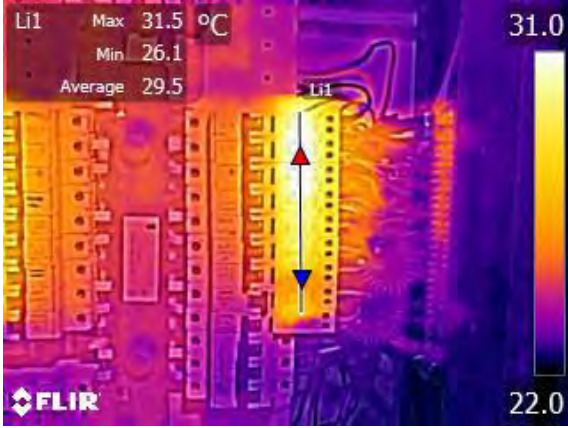
- Roscon inspectors conducted a thorough inspection of the Main Switchboards at 88 Sample St Suburb VIC 3000, which included the imaging of all distribution boards and isolator panels across all levels.
- The thermal imaging inspection throughout the building presented few anomalies, with only significant elevated temperatures found in the Ground Level West distribution board wiring & circuit breaker. The uncovered nature of the top panel box on L10 of the eastern tower was also noted as a concern.
- Distribution boards were found and inspected on levels G, B1, B2 & 5 of the west tower, and levels G, B1, B2, 5, 11, & 16 of the east tower.
- Tenancy isolators were found and inspected on all levels on which they were present. This did not include levels 1, 3, 4, 6, 7 & 8 of the west tower and B3, 17 & 19 of the east tower.
- The lift & fire evacuation box on L8 of the west tower, and the plant room on L20 of the east tower were also inspected.
- The lighting & blind control panel on L19 of the eastern tower was unable to be fully inspected without isolating the main switch.
- Please refer to the inspection details within Part 3, which show a photographic, step-by-step process of the investigation.



Part 3 – Detailed Thermal Investigation Ground Level - West

Details	Photographic Details
<p>Location: Distribution Board - Ground Level West</p> <p>Finding: Wiring connected to circuit breaker number 10 exhibits an elevated temperature when compared to other wiring. This circuit breaker services the "Foyer Lts, Main Entry, Main Room, Lobby L1". Wiring for circuit breaker number 10 exhibited an elevated temperature (~14°C differential) when compared to similar elements. All other elements were operating within normal temperature condition limits. This circuit breaker was investigated further, see details overleaf.</p>	
 	 


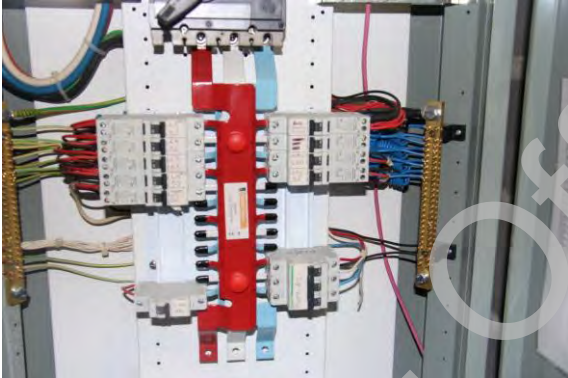

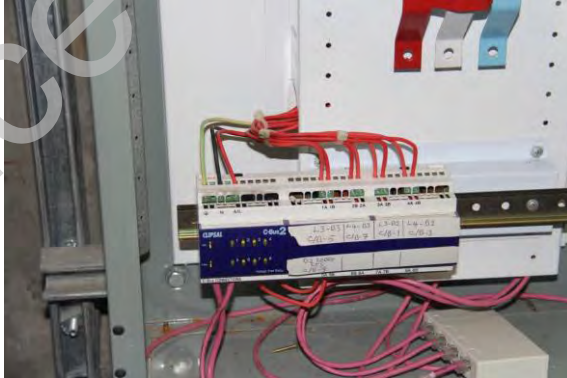

Details	Photographic Details								
<p>Location: Distribution Board - Ground Level West</p> <p>Finding: Current load on the wiring in question, adjacent to the connection to the circuit breaker, was found to be 11A. The circuit breaker is rated for a load of 16A. This has been compared to the 3A loading out of a capacity of 20A on circuit breaker number 1.</p> <p>Recommendation: During the next maintenance phase, it is recommended that the loading for circuit breaker number 10 be split, or the circuit breaker upgraded, in order to more evenly distribute the loadings across the panel.</p>									
<p>Location: Distribution Board - Ground Level West</p> <p>Finding: All four C-Bus2 units were operational at the time of inspection and were operating within normal conditions. Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C, as this is generally the point that thermal overload protection is enabled.</p>	 <p>Thermal image data:</p> <table border="1"> <thead> <tr> <th>Unit</th> <th>Max Temp (°C)</th> </tr> </thead> <tbody> <tr> <td>Bx1</td> <td>47.1</td> </tr> <tr> <td>Bx2</td> <td>48.2</td> </tr> <tr> <td>Bx3</td> <td>46.0</td> </tr> </tbody> </table> <p>Temperature scale: 21.9 to 44.0 °C</p>	Unit	Max Temp (°C)	Bx1	47.1	Bx2	48.2	Bx3	46.0
Unit	Max Temp (°C)								
Bx1	47.1								
Bx2	48.2								
Bx3	46.0								

Basement 1 - West


Details	Photographic Details
<p>Location: Distribution Board – Basement 1 West</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were operating within normal temperature conditions at the time of inspection.</p> <p>Note: Circuit breaker number 16, assigned to "Tank Room 2", was found manually isolated on the day of inspection.</p>	
 	 

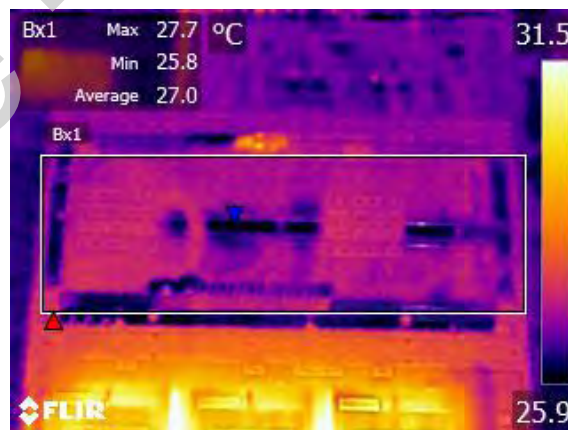
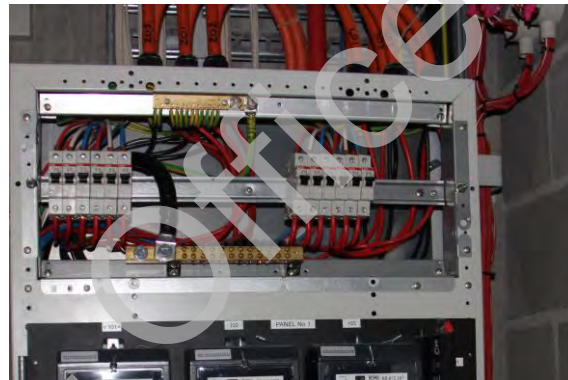
Details	Photographic Details
<p>Location: Distribution Board – Basement 1 West</p> <p>Finding: C-Bus2 relay unit was operational at the time of inspection and was operating within normal conditions. Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>	 

Basement 2 - West


Details	Photographic Details
<p>Location: Distribution Board – Basement 1 West</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were operating within normal temperature conditions at the time of inspection.</p> <p>C-Bus2 relay unit was operational at the time of inspection and was operating within normal conditions.</p> <p>Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>	
 	 

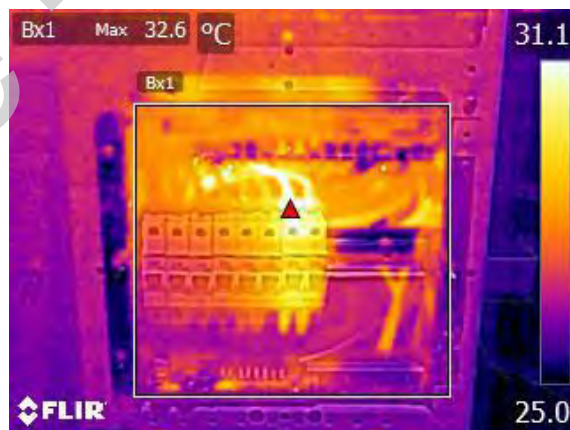
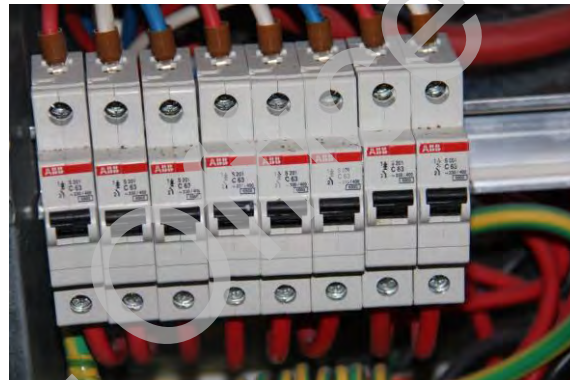
Level 2 - West

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 2 West</p> <p>Finding: Circuit breakers were observed to be at an ambient temperature at the time of inspection.</p> <p>Note: Isolators for Levels 1-4 are contained within this panel.</p>	



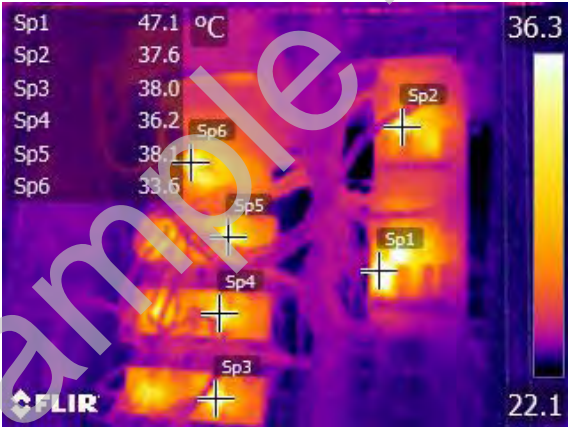




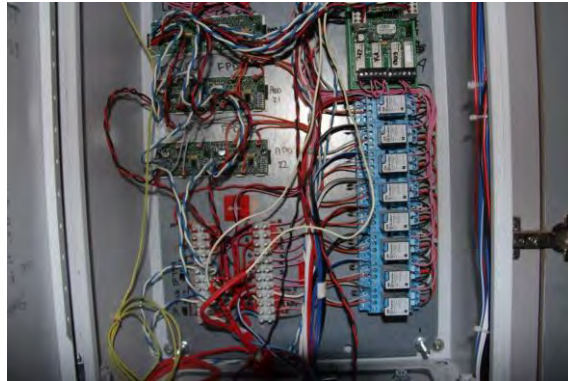
Level 5 - West

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 5 West</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>Note: Isolators for Levels 5-8 are contained within this panel.</p>	

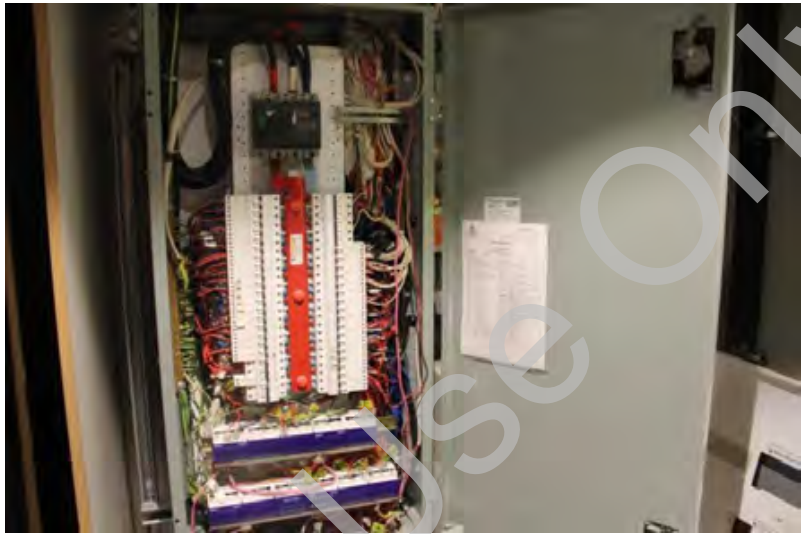
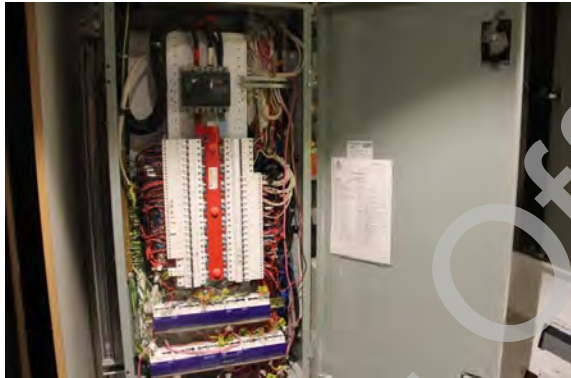
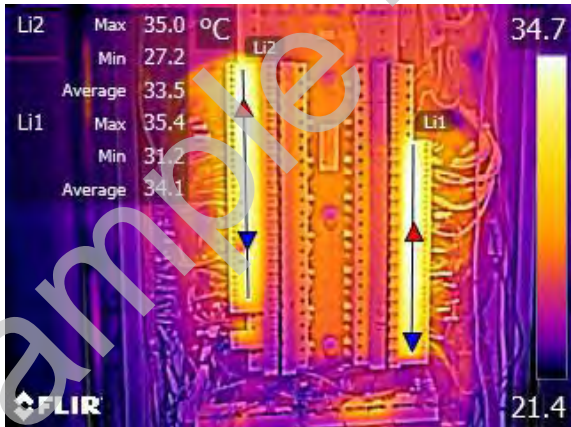
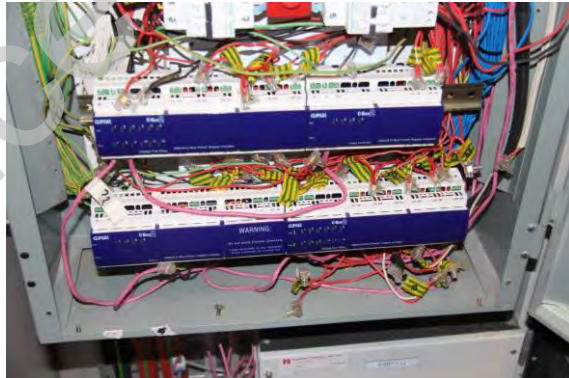



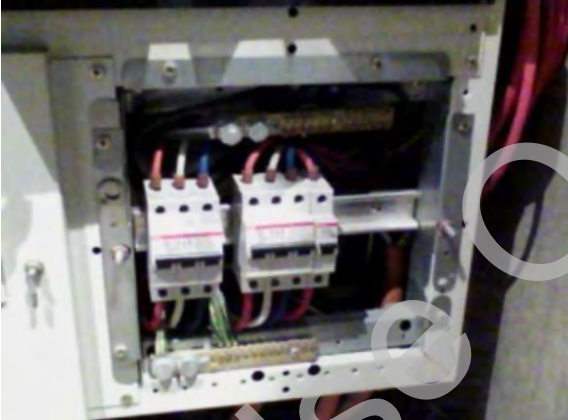
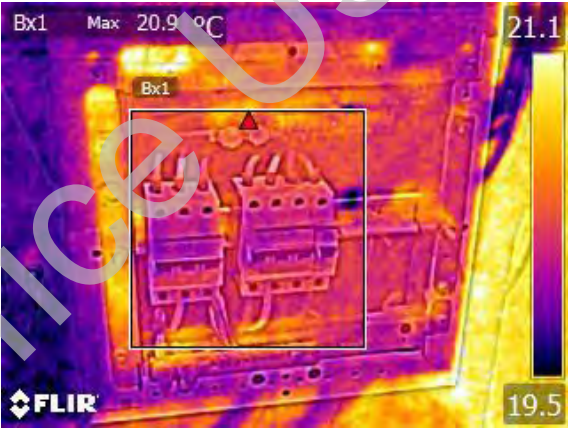
Level 8 - West

Details	Photographic Details
<p>Location: Lift & Fire Evacuation Panel – Level 8 West</p> <p>Finding: Circuit boards and associated wiring appear to be functioning within normal operating temperature conditions. One section showed a temperature differential of $\sim 10^{\circ}\text{C}$, which was not considered to be excessive.</p>	
 	 

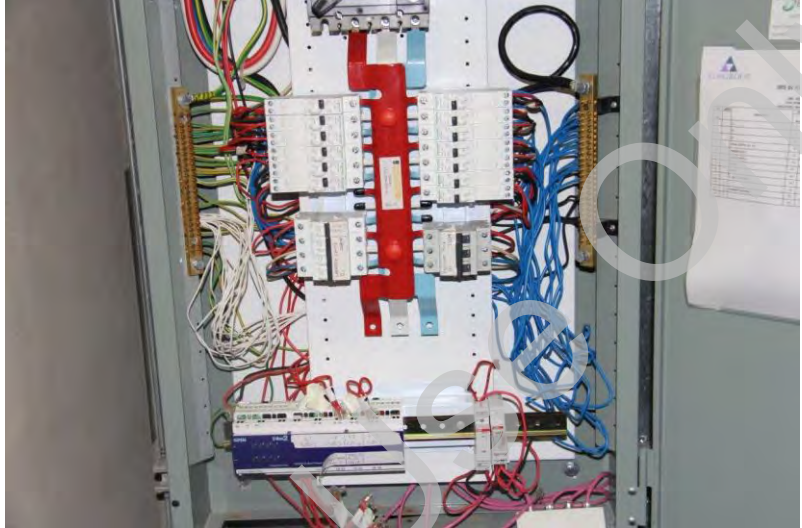


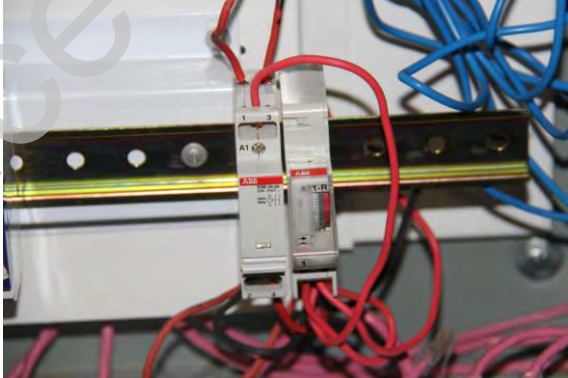
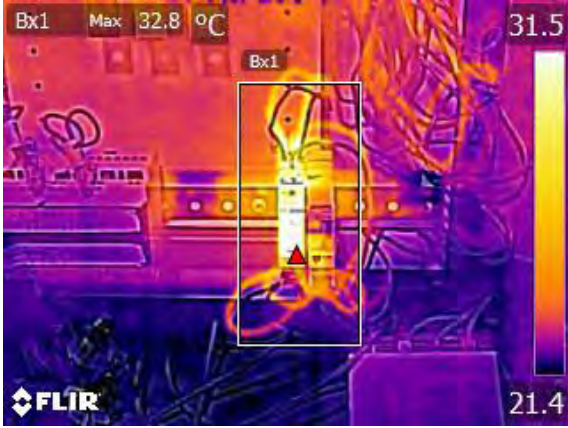


Ground Level - East

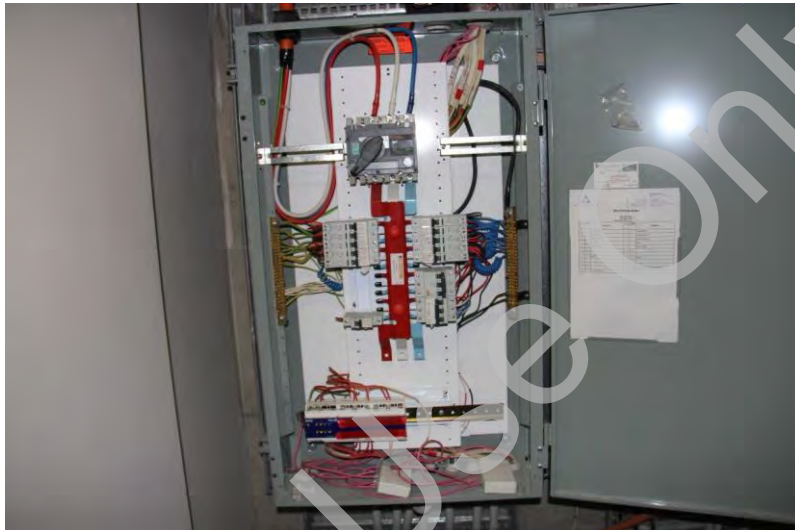

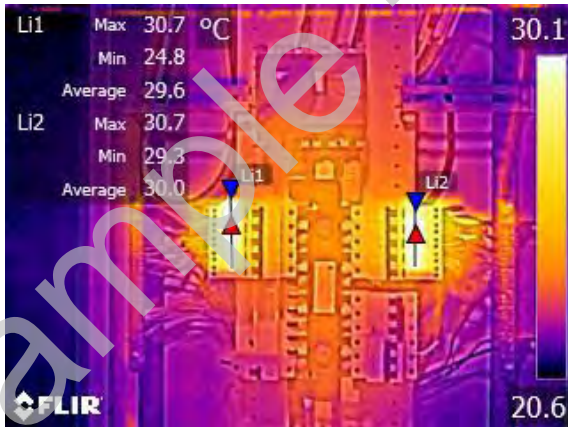
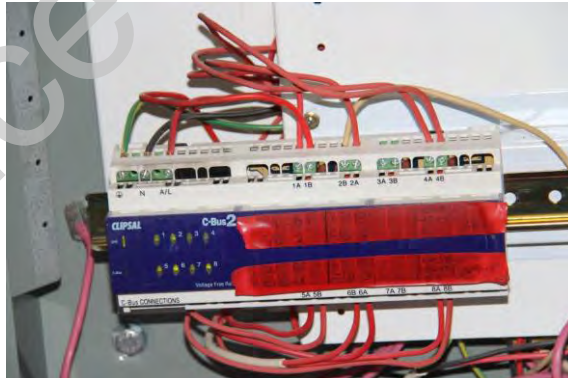
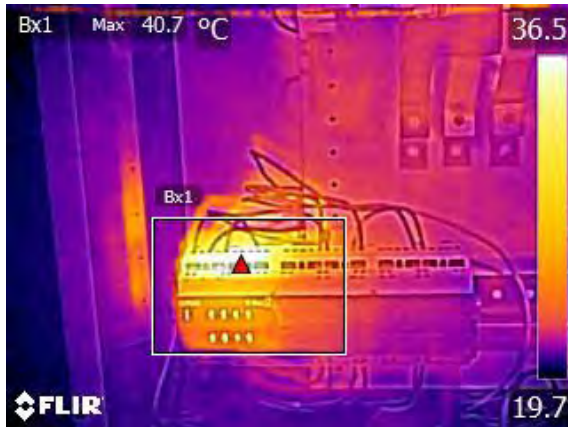
Details	Photographic Details																												
<p>Location: Distribution Board - Ground Level East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were operating within normal temperature conditions at the time of inspection. One C-Bus2 dimmer unit did not appear to be operational, the other three C-Bus2 relay units were operating within normal temperature conditions at the time of inspection. Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>																													
  <table><tr><td>Li2</td><td>Max</td><td>35.0 °C</td><td></td></tr><tr><td></td><td>Min</td><td>27.2</td><td></td></tr><tr><td></td><td>Average</td><td>33.5</td><td></td></tr><tr><td>Li1</td><td>Max</td><td>35.4</td><td></td></tr><tr><td></td><td>Min</td><td>31.2</td><td></td></tr><tr><td></td><td>Average</td><td>34.1</td><td></td></tr></table>	Li2	Max	35.0 °C			Min	27.2			Average	33.5		Li1	Max	35.4			Min	31.2			Average	34.1		  <table><tr><td>Bx1</td><td>Max</td><td>40.8 °C</td><td></td></tr></table>	Bx1	Max	40.8 °C	
Li2	Max	35.0 °C																											
	Min	27.2																											
	Average	33.5																											
Li1	Max	35.4																											
	Min	31.2																											
	Average	34.1																											
Bx1	Max	40.8 °C																											

Details	Photographic Details
<p>Location: Isolators - Ground Level East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	 



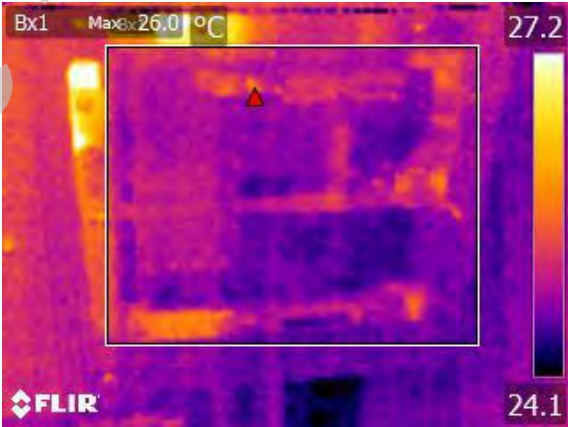
Basement 1 - East

Details	Photographic Details
<p>Location: Distribution Board – Basement 1 – East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were operating within normal temperature conditions at the time of inspection.</p> <p>Flood lights circuit breaker was present at the bottom of the board and was operating within normal temperature conditions.</p> <p>C-Bus2 relay unit was not operational at the time of inspection.</p>	
 	 


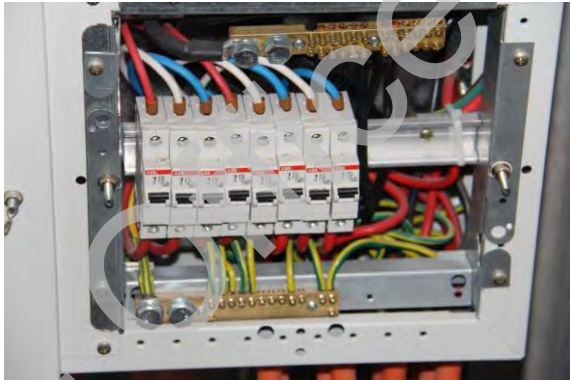
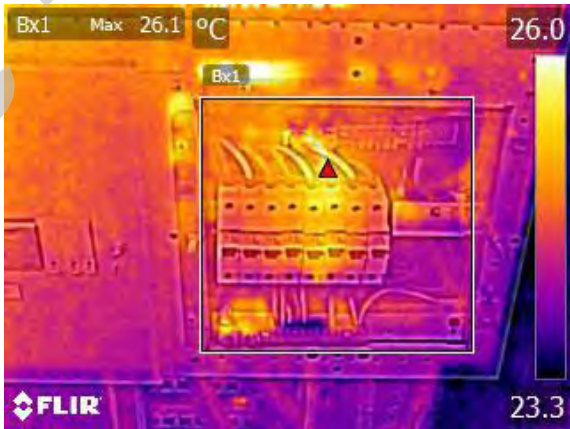
Basement 2 - East

Details	Photographic Details																																
<p>Location: Distribution Board – Basement 2 – East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>C-Bus2 relay unit was operational at the time of inspection and was operating within normal conditions.</p> <p>Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>																																	
  <table><tr><th>Li1</th><th>Max</th><th>30.7 °C</th><th>30.1</th></tr><tr><td></td><th>Min</th><td>24.8</td><td></td></tr><tr><td></td><th>Average</th><td>29.6</td><td></td></tr><tr><th>Li2</th><th>Max</th><td>30.7</td><td></td></tr><tr><td></td><th>Min</th><td>29.3</td><td></td></tr><tr><td></td><th>Average</th><td>30.0</td><td></td></tr></table>	Li1	Max	30.7 °C	30.1		Min	24.8			Average	29.6		Li2	Max	30.7			Min	29.3			Average	30.0		  <table><tr><th>Bx1</th><th>Max</th><th>40.7 °C</th><th>36.5</th></tr><tr><td></td><th>Min</th><td></td><td>19.7</td></tr></table>	Bx1	Max	40.7 °C	36.5		Min		19.7
Li1	Max	30.7 °C	30.1																														
	Min	24.8																															
	Average	29.6																															
Li2	Max	30.7																															
	Min	29.3																															
	Average	30.0																															
Bx1	Max	40.7 °C	36.5																														
	Min		19.7																														




Level 1 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 1 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
<div>  </div> <div>  </div>	


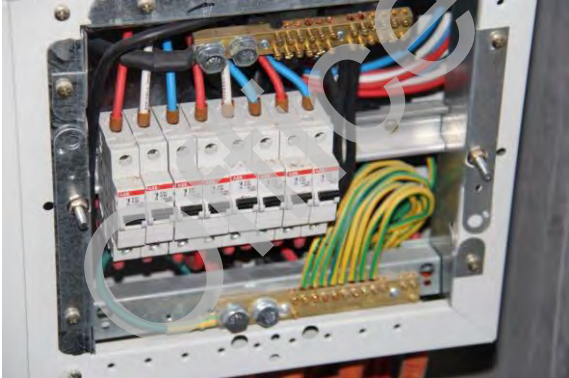

Level 2 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 2 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
<div>  </div> <div>  </div>	


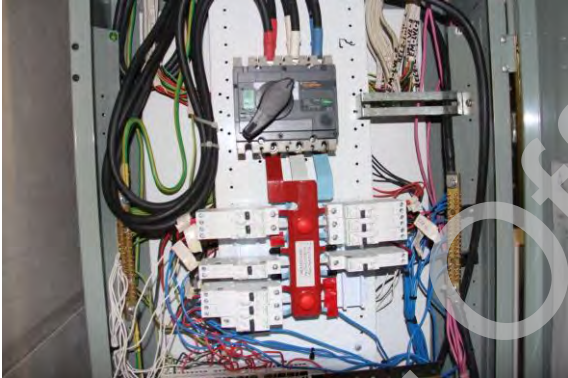



Level 3 - East


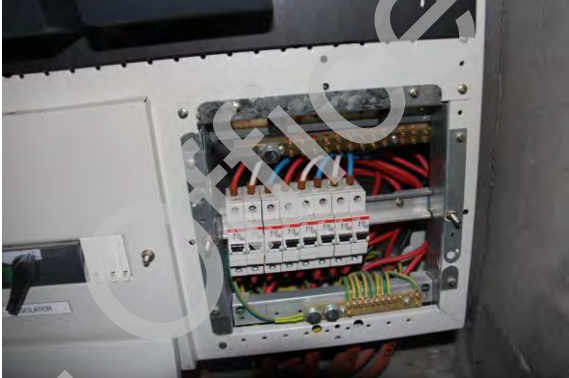
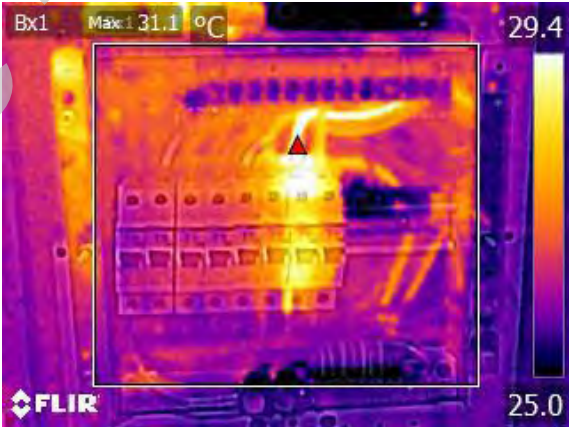
Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 3 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	

Level 4 - East


Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 4 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
<div>  </div> <div>  </div>	

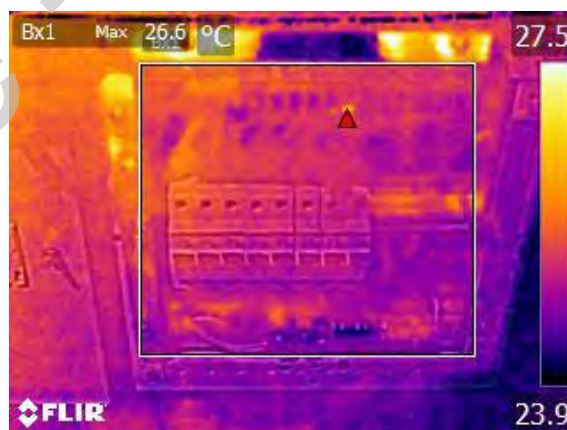
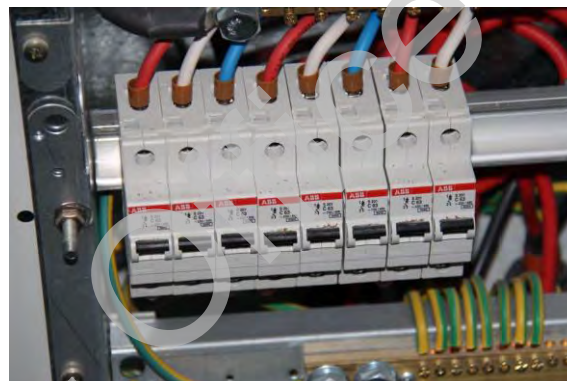
Level 5 - East

Details	Photographic Details
<p>Location: Distribution Board – Level 5 East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>C-Bus2 relay units were operational at the time of inspection and were operating within normal conditions.</p> <p>Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>	
 	 




Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 5 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	

Level 6 - East


Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 6 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	

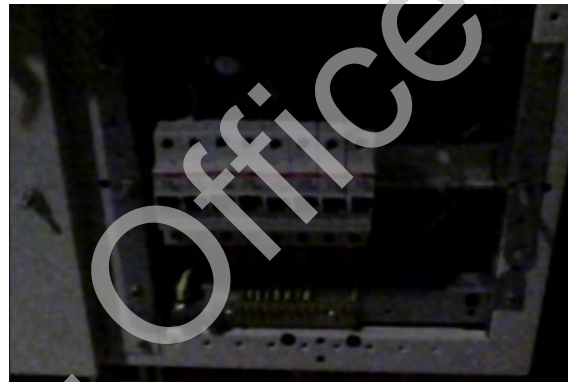


Level 7 - East


Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 7 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	

Level 8 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 8 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	



Level 9 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 9 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	



Level 10 - East


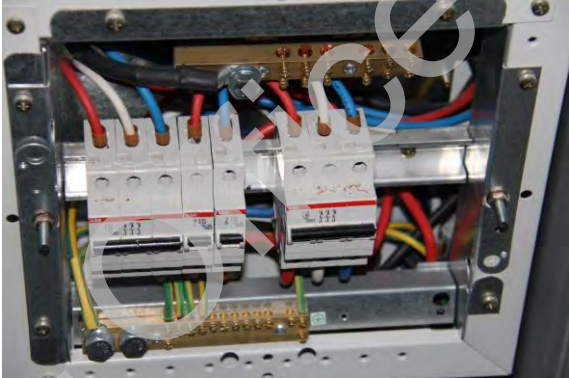

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 10 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>Circuit board and associated wiring, located above meter board, is not covered appropriately.</p>	
 	 

Level 11 - East


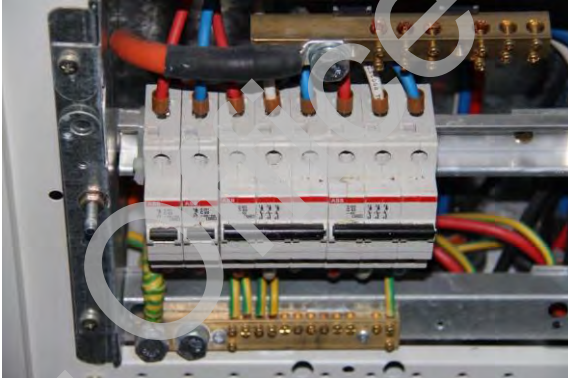
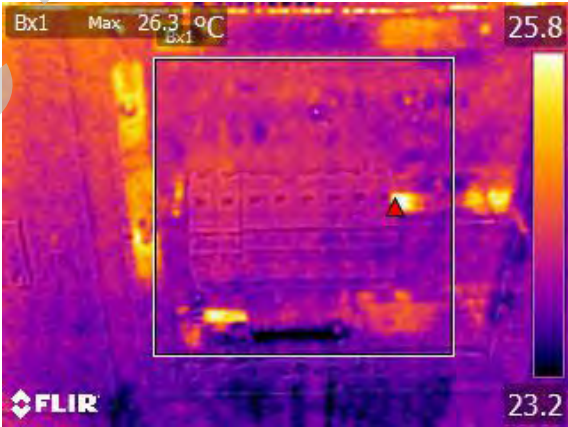
Details	Photographic Details
<p>Location: Distribution Board – Level 11 East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>C-Bus2 relay units were operational at the time of inspection and were operating within normal conditions.</p> <p>Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>	
 	 

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 11 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
	 


Level 12 - East

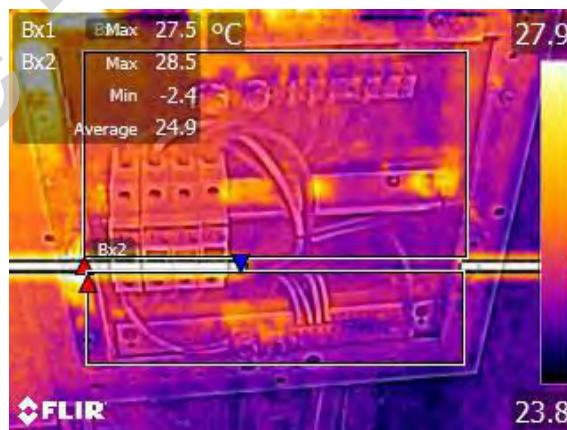
Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 12 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	

Level 13 - East


Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 13 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
<div>  </div> <div>  </div>	

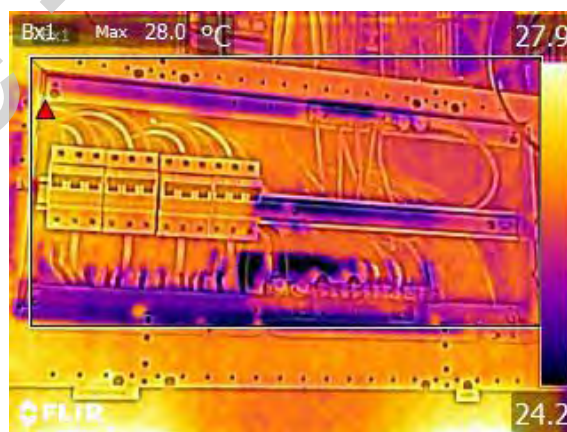
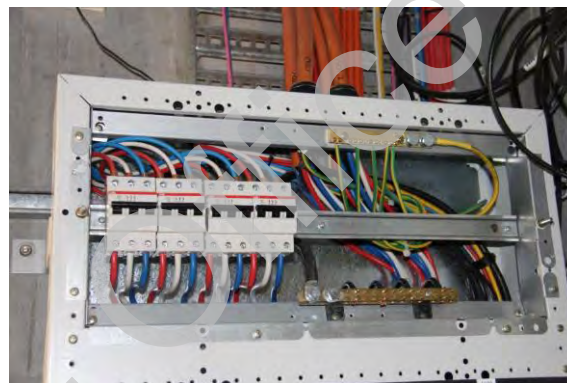
Level 14 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 14 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	


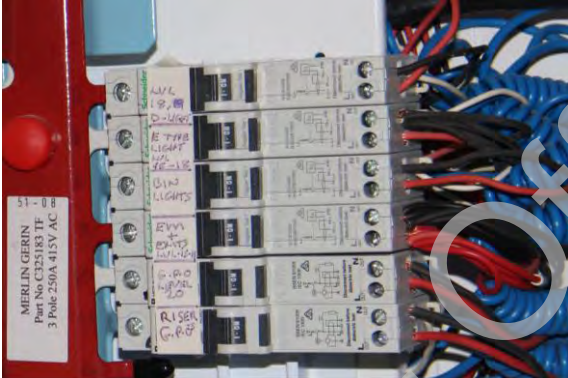
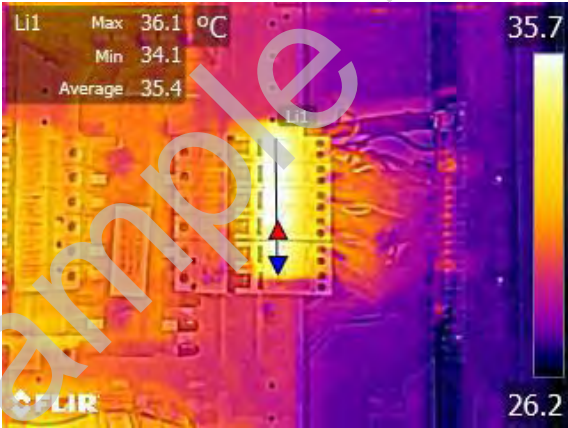
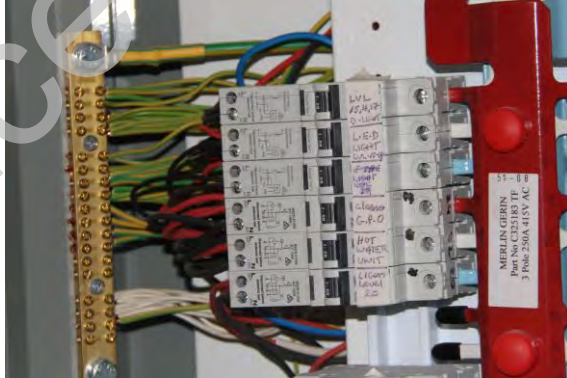
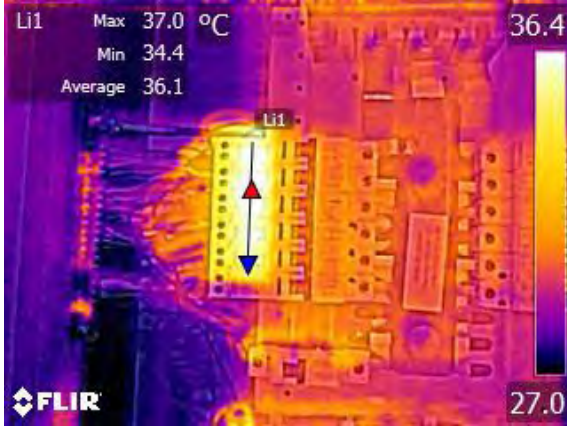





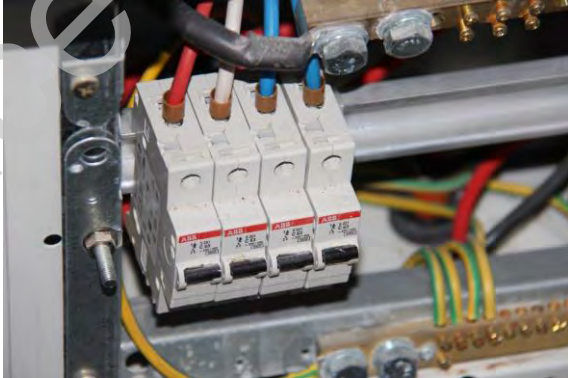

Level 15 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 15 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p> <p>Note: Isolators for L17 are included within this panel.</p>	


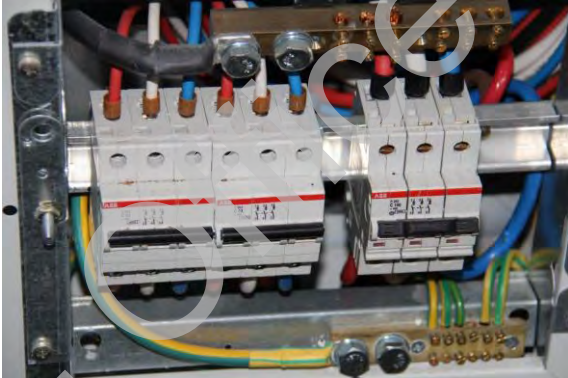



Level 16 – East

Details	Photographic Details
<p>Location: Distribution Board – Level 16 East</p> <p>Finding: All circuit breakers, associated connections and wiring within the distribution board were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	 

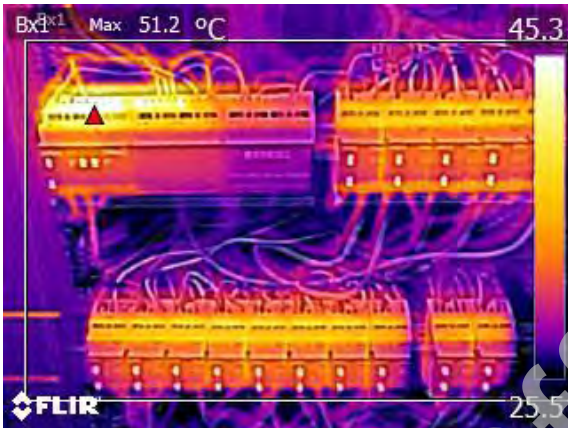
Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 16 East</p> <p>Finding: C-Bus2 relay units were operational at the time of inspection and were operating within normal conditions. Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p> <p>Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	 

Level 18 - East

Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 18 East</p> <p>Finding: Circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
<div>  </div> <div>  </div>	



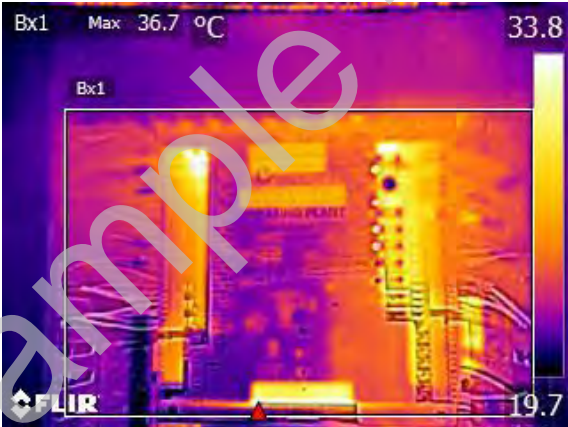


Level 19 - East

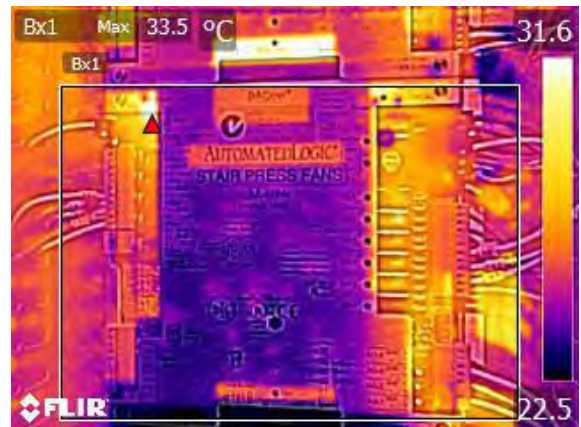
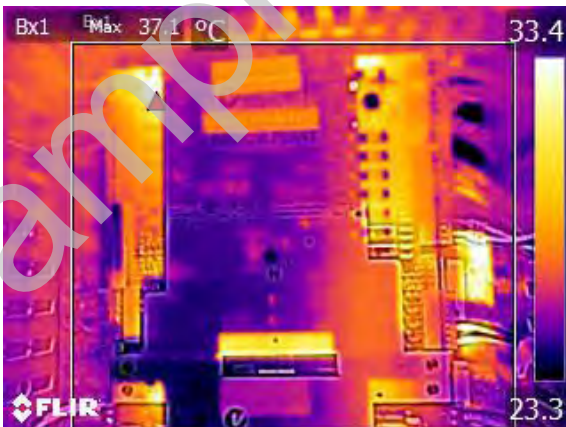
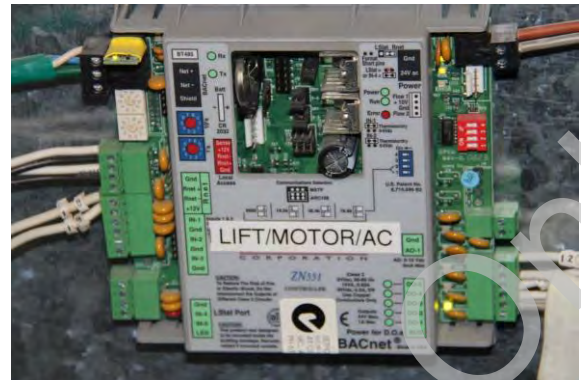
Details	Photographic Details
<p>Location: C-Bus2 Board – Level 19 East</p> <p>Finding: 39 C-Bus or C-Bus2 units were operational at the time of inspection and were operating within normal conditions. Note: Normal operating conditions for C-Bus units are considered to be between ambient temperature and 70°C.</p>	
 	 

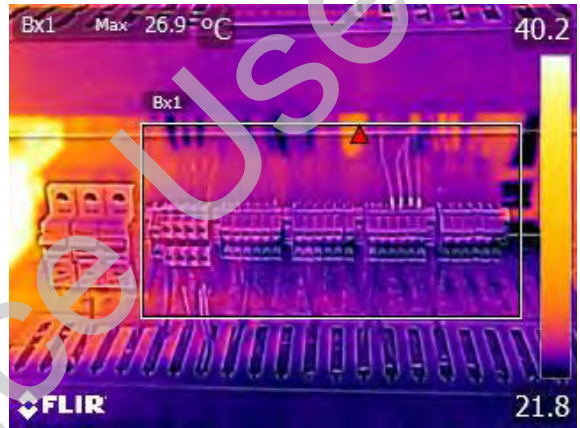







Details	Photographic Details
<p>Location: Lighting and Blinds Distribution Board – Level 19 East</p> <p>Finding: Panel was not able to be removed by Roscon technicians without isolating the main switch.</p> <p>All visible circuit breakers were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
	
	

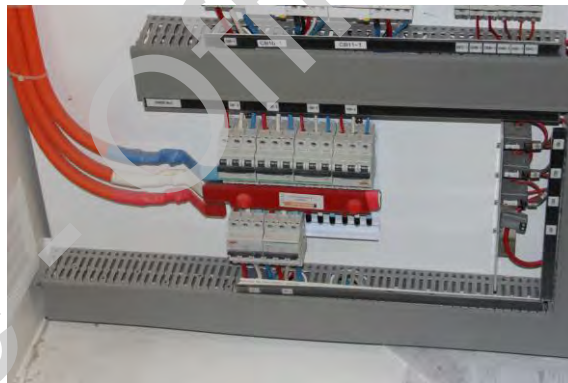
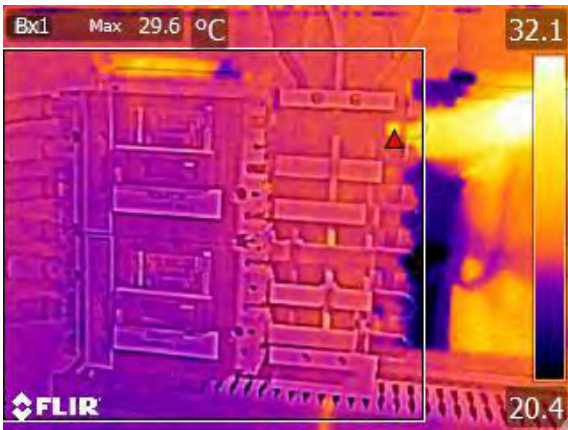
Level 20 - East

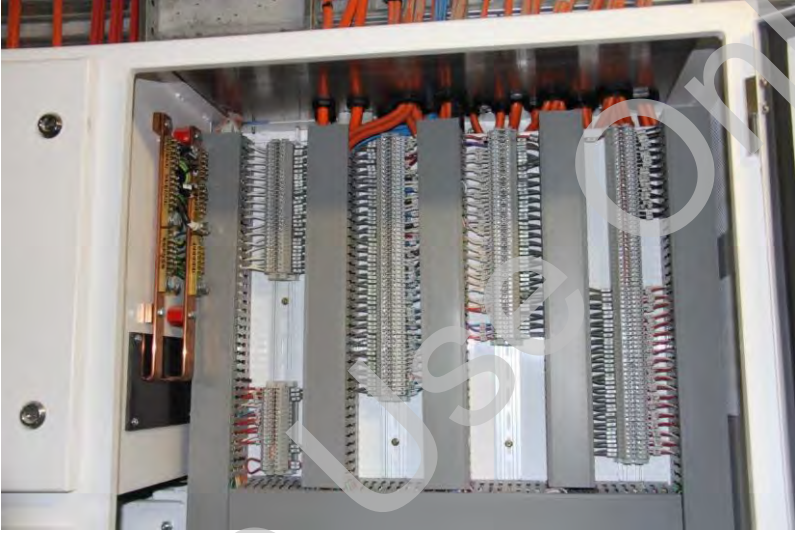

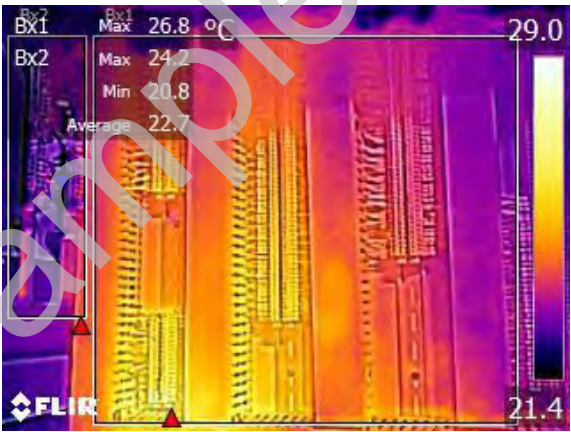

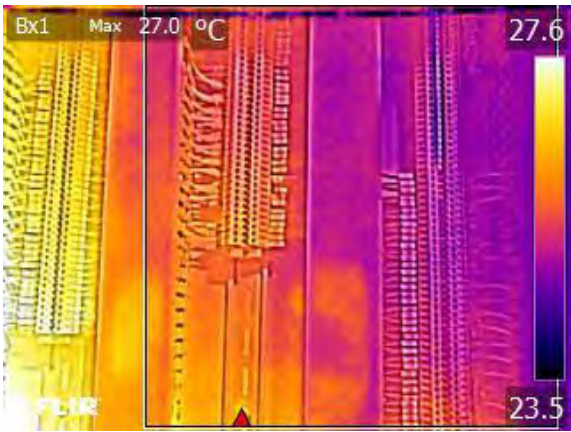
Details	Photographic Details
<p>Location: Automated Logic Control Board – Level 20 East</p> <p>Finding: Circuit boards, and associated connections, were observed to be operating within normal temperature conditions at the time of inspection.</p> <p>Altro control transformer is rated to have a temperature rise of 60°C, temperature of the transformer was found to be ~40°C, corresponding to a temperature rise from ambient of ~20°C. This transformer is operating within normal temperature conditions.</p>	
 	 

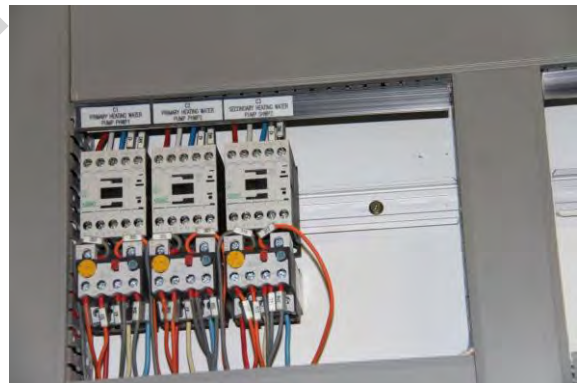
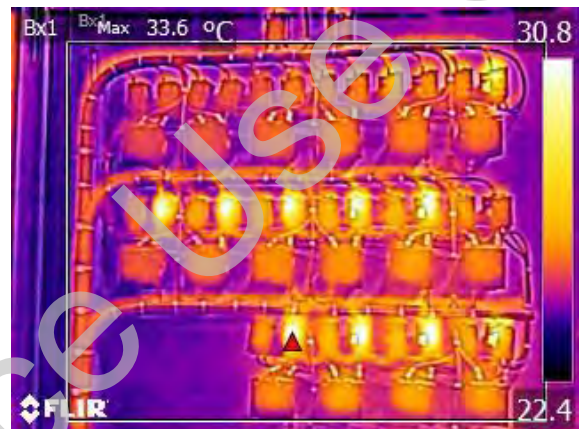
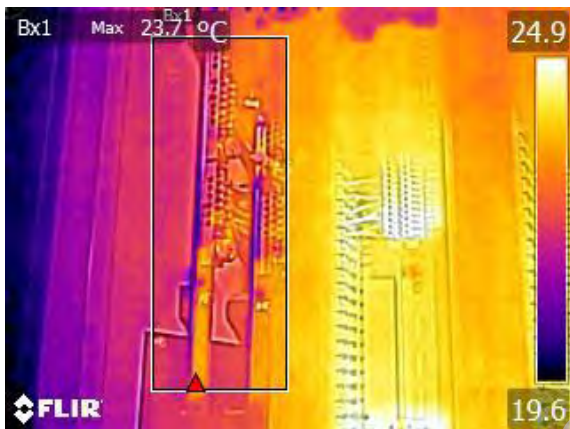


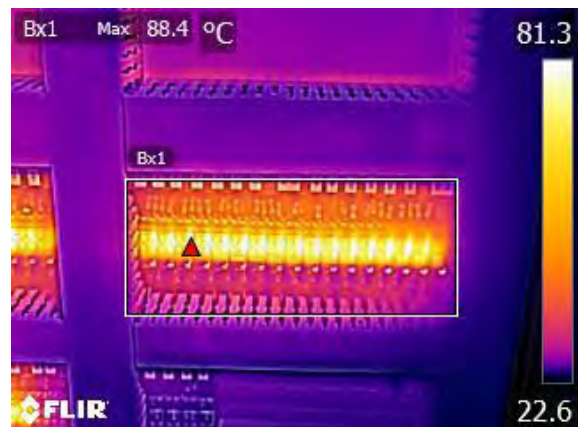
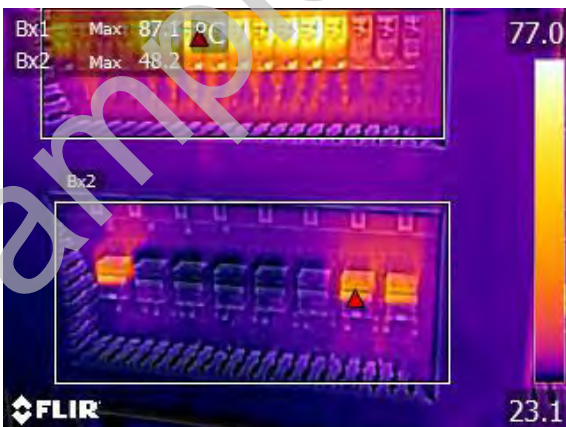
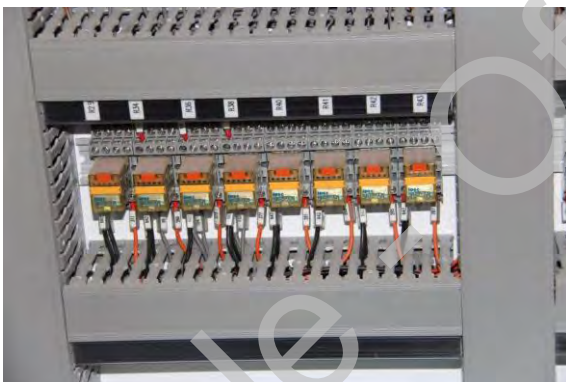
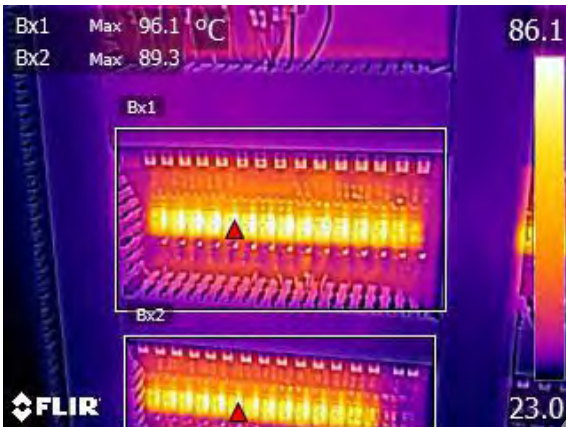


Details	Photographic Details
<p>Location: Circuit breaker cabinet – Level 20 East</p> <p>Finding: Phase connections were found to be operating within normal temperature conditions at the time of inspection.</p> <p>All circuit breakers, associated connections and wiring within the cabinet were observed to be inoperative or operating within normal temperature conditions at the time of inspection.</p>	
 	 



Details	Photographic Details
<p>Location: Switchboard & Tenancy Isolators – Level 20 East</p> <p>Finding: Control panel wiring and associated connections were found to be operating within normal temperature conditions.</p> <p>Class-B transformer is rated to have a temperature rise of 80°C, temperature of the transformer was found to be ~50°C, corresponding to a temperature rise from ambient of ~30°C. This transformer is operating within normal temperature conditions.</p> <p>IDEC power relays are rated to have a temperature rise of ~105°C from ambient when loaded. Maximum temperature rise from ambient observed on day of inspection was found to be ~80°C.</p>	
 	 





Part 4: Terms and Conditions

The following information is very important and forms an integral part of this report.

Before you decide to purchase this property you should read and understand the following important information. It will help explain what is involved in a Standard Property Inspection, the difficulties faced by an inspector and why it is not possible to guarantee that a property is free of defects, latent or otherwise. This information forms an integral part of the report. The general adequacy of site drainage is not included in the Standard Property Inspection Report. Comments on surface water drainage are limited as where there has been either little or no rainfall for a period of time, surface water drainage may appear to be adequate but then during periods of heavy rain, may be found to be inadequate. Any comments made in this section are relevant only in light of the conditions present at the time of inspection. It is recommended that a Smoke Test be obtained to determine any illegal connections, blocked or broken drains.

1. This is a Visual Inspection only and in Accordance with AS4349.1

Roscon Thermal Imaging Inspections and Reports in Accordance with AS4349.1. The visual inspection is limited to those areas and sections of the property fully accessible and visible to the Inspector at the time and on the date of Inspection. The inspection DID NOT include breaking apart, dismantling, removing or moving objects including, but not limited to, foliage, mouldings, roof insulation/sarking membrane, floor or wall coverings, sidings, ceilings, floors, furnishings, appliances or personal possessions. The Inspector CAN only see thermal images of inside walls, between floors, inside skillion roofing, inside the eaves, behind stored goods in cupboards, or other areas that are concealed or obstructed.

The inspector DID NOT dig, gouge, force or perform any invasive procedures. In an occupied property it must be understood that furnishings or household items may conceal defects which may only be revealed when the items are removed. No detailed inspection is inferred to external areas over 3.6 metres above the natural ground level.

Should comply with customers' requirements and as a minimum include the Information required by BSEN 13187. The following data is normally required so that survey can be repeated following remedial action.

2. Reporting

- Background to the objective and principles of the test
- Location, orientation, date and time of survey
- A unique identifying reference
- Thermographer's name and qualifications
- Type of construction
- Weather conditions, wind speed and direction, last precipitation, sunshine, degree of cloud cover.
- Ambient temperatures inside and outside before, at the beginning of the survey and the time of each image. Air temperature and radiant temperature should be recorded
- Statement of any deviation from relevant test requirements
- Equipment used, last calibration date, any known defects.
- Name, affiliation and qualifications of tester
- Type, extent and position of each observed defect
- Results of any supplementary measurements and investigations
- Reports should be indexed and archived by thermographers

3. Scope of Report

The Standard Property Report is not intended as a certificate of compliance of the property within the requirements of any Act, regulation, ordinance or by-law, or, as a warranty or an insurance policy against problems developing with the building in the future.

4. Limitations

Nothing contained in the Report implies that any inaccessible or partly inaccessible area(s) or section(s) of the property being inspected by the Inspector on the date of the inspection were free from defects latent or otherwise.

No responsibility can be accepted for defects which are latent or otherwise not reasonably detected on a visual inspection without interference with or removal of any of the structure including fixtures or fittings within the building.

This Standard Property Report does not contain any assessment or opinion in relation to any item, which is the subject of a Special Purpose Property Report (as defined in AS4349.1), or any matter where the inspection or assessment of which is solely regulated by Statute. Special Purpose Property Reports include comment on the following: Common property areas, environmental concerns such as sunlight, privacy, streetscape and views. Proximity of property to flight paths, railways and busy traffic or other neighbourhood issues. Noise levels, health and safety issues including the presence of asbestos or lead. Heritage concerns. Security or fire protection. Analysis of site drainage apart from surface water drainage. Swimming pools and spas. Detection and identification of illegal and unauthorised building and plumbing work. Durability of exposed finishes.

5. Important Information

Any person who relies upon the contents of this Report does so acknowledging that the above clauses, definitions and disclaimers that follow define the Scope and Limitations of the inspection and form an integral part of the report.

6. Disclaimer of Liability

No liability shall be accepted on account of failure of the Report to notify any problems in any area(s) or section(s) of the subject property physically inaccessible for inspection, or to which access for Inspection is denied by or to the Inspector (including but not limited to any area(s) or section(s) so specified by the Report.

7. Disclaimer of Liability to Third Parties

This report is made solely for the use and benefit of the Client named on the front of this report. No liability or responsibility whatsoever, in contract or tort, is accepted to any third party who may rely on the Report wholly or in part. Any third party acting or relying on this Report, in whole or in part does so at their own risk.

8. Report Definition

This report is limited to a visual inspection of areas where reasonable access is available at the time of inspection. It does not purport to be geological as to foundation integrity or soil conditions, engineering as to structural, nor does it cover the condition of plumbing, gas or motorised appliances. It is strongly recommended that an appropriately qualified contractor check these services prior to purchase.

As the date of this report we have identified the items as listed herein, we do not accept any responsibility for items which may be damaged after the inspection has been completed.

This report is limited to (unless otherwise noted) the main structure on the site and any other building, structure or outbuilding specifically named within the report.

This Report attempts to assist in judging a building according to its age and level of maintenance and in providing relative comparisons. This inspection and report is not to be considered all-encompassing dealing with a building from every aspect. Rather it should be seen as a reasonable attempt to identify any significant defects visible at the time of the inspection. It is unrealistic to expect comment on minor defects or imperfections in the Standard Property Report. If this is required, a Special Purpose Property Report is recommended.

Whilst buildings may have many pleasing features there are few without defects and many are due naturally to age deterioration. Subject to the level of maintenance on the building it is common for the number of faults to have increased with age.

All items that are considered to be concealed or latent defects are excluded.

Shower Recesses: Tests may be made on shower recesses to detect leaks (if water is connected). The tests may not reveal leaks or show incorrect waterproofing if silicone liquid or masonry sealant has been applied prior to the inspection. Such application is a temporary waterproofing measure and may last for some months before breaking down. The tests on shower recesses are limited to running water within the recesses and visually checking for leaks. As showers are only checked for

a short period of time, prolonged use may reveal leaks that were not detected at the time of inspection. If there is no evidence of a current leak during inspection that does not necessarily mean that the shower does not leak.

Glass Caution: Glazing in older houses (built before 1978) may not necessarily comply with current glass safety standards AS1288. In the interests of safety, glass panes in doors and windows especially in trafficable areas should be replaced with safety glass or have shatterproof film installed unless they already comply with the current standard.

Stairs & Balustrades: Specifications have been laid down by the Australian Building Code - Section 3.9 covering stairs, landings and balustrades to ensure the safety of all occupants and visitors in a building. Many balustrades and stairs built before 1996 may not comply with the current standard. You must upgrade all such items to the current standard to improve safety.

Swimming Pools: If a swimming pool is present it should be the subject of a Special Purpose Property Report. A detailed inspection on the status or serviceability of any swimming pool or associated pool equipment has not been carried out and is not within the scope of this report. Additionally, to adequately inspect a swimming pool, the water must be completely drained and all internal surfaces must be fully accessible.

This report may contain notable observations, together with what is considered to be helpful information and advice.

This report does not identify timber-destroying pests. A timber pest inspection report should be obtained from a qualified timber pest inspector. If any cost of work estimates is given, these are merely opinions and should be taken as a general guide only. In the building industry, experience has shown that prices vary considerably and you must obtain independent quotations on any significant notable item from several contractors prior to purchase.

The operation of fireplaces, chimneys, alarm systems, intercom systems, electrical and mechanical appliances, air conditioning systems, smoke detectors and residual current devices have not been tested and are the subject of a Special Purpose Property Report. Should you require an inspection to be carried out on any item not specifically covered by this report, please request a Special Purpose Property Report on the specific item required.

No report is made on the presence, operation, installation or cabling of any free to air or pay television system.

9. Lighting Installations

It should be noted that this inspection was done during daylight hours and therefore the adequacy of lighting in darkness could not be directly assessed.

10. Plumbing, Gutters & Downpipes and Roofs

We have carried out a thorough visual inspection of the common property and assets visible from the common property areas. If there were any visible plumbing, gutters and downpipes or roof issues they have been included in this section of the report. We have not carried out a thorough inspection of the plumbing, gutters and downpipes and roof, as we are not qualified to do so, please ensure that a suitably qualified plumbing contractor (who is qualified to undertake roof inspections) carries out a thorough regular inspection. We will recommend a qualified plumber to inspect if an issue is found.

11. Lifts

Please ensure that if lifts are in the building(s) that regular maintenance programs are in place. This report does not cover lifts.

12. Painting

Painting surfaces not exposed to the elements/corrosion should be included in the next painting cycle. Painting for aesthetic purposes is not included in this report.

13. Air Conditioning

Only a general external inspection of air conditioning units is carried out where installed, therefore please ensure that if the Owners Corporation has air conditioner(s) in the building(s) they have regular maintenance programs in place. This report does not cover air conditioning units and air condition cooling towers.

14. Glass

This report only addresses glass requiring obvious replacement. It does not cover the Building Code, Australian Standard and safety requirements of glass installed in the common property.

15. Plant and Equipment

Please ensure that if the Owners Corporation has plant and equipment in the building(s) that regular maintenance programs are in place for each piece of plant and equipment. This report does not cover plant and equipment.

16. Balcony Balustrades

Wherever balcony balustrades are installed, please be advised that a comprehensive inspection of balcony railings was not carried out as part of this report. Also this report is only a visual inspection of areas accessible from the common property; therefore all balcony balustrades are not viewed. If there are any visible signs of corrosion on the balustrade including fixings and/or if the balustrades are over 10 years old a detailed inspection and testing of balustrades should be undertaken.

17. Pest Reports

If there are any visible signs of termite damage it is included in this report. We have not carried out a pest inspection of the site; as we are not qualified to do so, please ensure that a suitably qualified pest inspection contractor carries out thorough regular inspections.

18. Fire Fighting Equipment and Statutory Requirements

It has been assumed that any building needing firefighting equipment to meet legislative requirements such as the Building Code of Australia 1996 did meet those requirements at the time of construction. We have not examined the fire safety requirements for the building and make no comment as to the adequacy of the measures found in the complex. We have not and do not assess the condition of any firefighting equipment within the complex. If the Bodies Corporate wishes to ascertain its position with respect to fire safety compliance it may carry out its own assessment. These guidelines should be placed on the Owners Corporation notice board. We have visually inspected the firefighting equipment but have not carried out any testing and therefore cannot determine if the equipment has been tampered with or will be effective in case of fire.

Rooms below ground level: If there are any rooms under the house or below ground level (whether they be habitable or non-habitable rooms), these may be subject to dampness and water penetration. Drains are not always installed correctly or could be blocked. It is common to have damp problems and water entry into these types of rooms, especially during periods of heavy rainfall and this may not be evident upon initial inspection. These rooms may not have council approval. The purchaser should make their own enquiries with the Council to ascertain if approval was given. Where the property is covered by an Owners Corporation (Strata Title), we strongly recommend that an Owners Corporation search be conducted to ascertain the financial position, the level of maintenance and any other relevant information available through the conduct of such an inspection.

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