Holcim

Strength. Performance. Passion.

Electrical Safety - Bushfire Mitigation Plan (BFMP)

Oaklands Junction Quarry 2024-2025

Revision 7

Australia

REVISION/CHECKING HISTORY

REV No.	AUTHOR	DATE	CHECKED BY	DATE	CHECKED BY	DATE
0	M Konstantinidis	13 Nov 2018	D Sheldon	21 Jan 2019	D Jones	-
1	M Konstantinidis	31 Jan 2019	D Sheldon	-	D Jones	-
2	M Konstantinidis	11 April 2019	D Sheldon	4 July 2019	D Jones	4 July 2019
3	P Maaten	29th June 2020	D Sheldon	29th June 20	D Jones	29th June 20
4	M Konstantinidis	16th July 2021	D Sheldon	16th July 21	D Jones	16th July 21
5	M Konstantinidis	14th July 2022	D Sheldon	28th July 2022	D Jones	28th July 2022
6	M Konstantinidis	18th May 2023	D Sheldon	30th May 2023	P Maaten	30th May 2023
7	M Konstantinidis	27th May 2024	A Sheehan	28th June 2024	P Maaten	28th June 2024
8						
9						
10						
11						

REVISIONS

REV No.	DATE	DESCRIPTION OF CHANGE
0	13 Nov 2018	Development of document from draft for approval
1	31 Jan 2019	Updated post internal review for ESV comment
2	11 April 2019	Updated post initial ESV review
3	29 June 2020	20/21 Review – no changes
4	16 July 2020	21/22 Review & Updated following ICAM replace with Hfacs Work Permit change to Hazardous Work Permit INX change to Holcim Incident Management Data Inclusion of items post ESV review
5	14 July 2022	22/23 Review & Update
6	18 May 2023 28 August 2023	23/24 Review & Update Update post ESV review & comment
7	27 May 2024	24/25 Review & Update
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9		
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Contents

Bushfire Mitigation Plan (BFMP)

1. Purpose

Comply with the requirements of relevant Victorian legislation.

Relevant Legislation and Regulations
- **Electricity Safety Act 1998 (Vic) (Version No 025)**
- **Electricity Safety (Bushfire Mitigation) Regulations 2013 (Version No 62)**

As a business that has electric power lines above the surface of the land and in a hazardous bushfire area, Holcim Oaklands Junction Quarry meets the definition of a “specified operator”.

2. Scope

This plan details the practices and procedures in place at HOLCIM Oaklands Junction Quarry for the prevention of fire caused by overhead electrical assets and the mitigation of any fire incident that may occur. As most of the “at risk” electrical equipment is operated by the quarry, the main responsibilities for this plan are with quarry personnel.

3. Responsible Authorities

3.1 Operations Manager

a) Is accountable for the implementation of this BFMP
b) Ensure that the processes and procedures required to comply with the applicable regulations are in place and followed;
c) Ensure that this Electricity Safety – Bushfire Mitigation Plan is reviewed and updated at regular intervals in line with legislation, regulations and industry “Best Practices”; and
d) Have an audit process in place to ensure that the regulatory requirements are being met.

3.2 Quarry Manager

a) Is responsible for implementation of this BFMP
b) Ensure that all operational personnel and contractors understand their responsibilities and comply with this plan;
c) Ensure that a copy of the current plan is submitted to Energy Safe Victoria annually before 1 July each year: and
d) Confirm that each submission gains ESV approval.

3.3 Chief Electrical Engineer

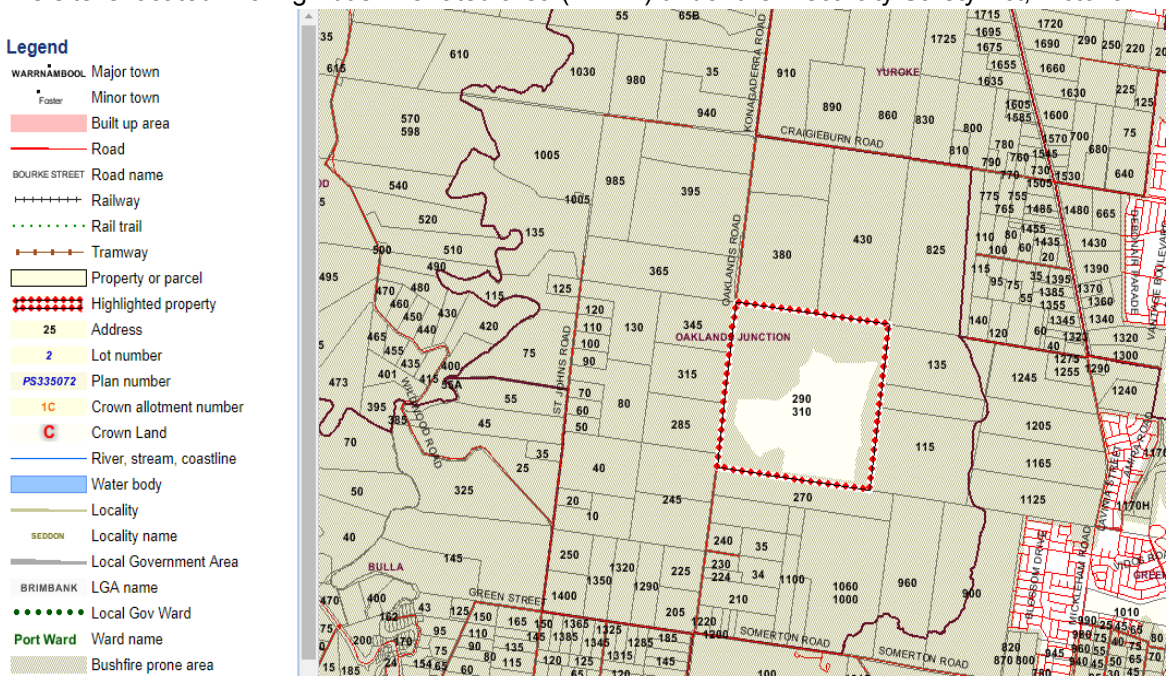
Ensure that this Electricity Safety – Bushfire Mitigation Plan is reviewed and updated annually to comply with the regulations and ensure that any changes to relevant operational procedures are compliant with the regulations and reflected in this Electricity Safety – Bushfire Mitigation Plan.

4. Prescribed Particulars

a) **The name address and telephone number of the specified operator;**

Name: Holcim (Australia) Pty Ltd
ACN: 099 732 297
ABN: 87 099 732 297
Site Name: Oaklands Junction Quarry
Address: Oaklands Rd, Oaklands Junction VIC 3063
Phone No: (03) 9303 3201

The site is located in a high bushfire rated area (HBRA) under the Electricity Safety Act, Victoria.



Source: http://services.land.vic.gov.au/maps/bushfire.jsp

b) **Person responsible for the preparation of the plan;**

National CAPEX Project Manager
milton.konstantinidis@holcim.com
Ph (03) 9286 2506
3rd Floor, 290 Burwood Rd, Hawthorn VIC 3122

c) **Persons responsible for carrying out the plan;**

Quarry Manager
Peter.Maaten@holcim.com
Ph (03) 9303 3203
Oaklands Rd, Oaklands Junction VIC 3063

Quarry Maintenance Manager
garvin.odonnell@holcim.com
Ph (03) 9303 3208
Oaklands Rd, Oaklands Junction VIC 3063

d) **Emergency contacts**

Quarry Manager (24 hours x 7 days per week)
Peter.Maaten@holcim.com
Ph (03) 9303 3203 / 0402 227 105

Oaklands Rd, Oaklands Junction VIC 3063

OR

Quarry Maintenance Manager, Ph (03) 9303 3208
garvin.odonnell@holcim.com
Oaklands Rd, Oaklands Junction VIC 3063

e) **Fire Policy;**

To ensure that Holcim Oaklands Junction Quarry electrical infrastructure is maintained in a fire safe condition through regular inspection and asset maintenance to minimise the risk of fire ignition. A further aim of the policy is to minimise the risk to public safety and the effect of the electric lines on the vegetation.

f) **The objectives of the plan;**

The objective of this strategy is to ensure that the risk of fire starting from Holcim Oaklands Junction Quarry electrical assets is minimised. This will be carried out by ensuring the assets are in a fire-safe condition prior to, and maintained in this condition throughout the respective Declared Fire Danger Periods (DFDP's) as declared by the Country Fire Authority (CFA). Electric lines are to be kept well clear of vegetation and an inspection and maintenance of the assets will occur to minimise the risk to public safety and the effect of the electric lines on the vegetation.

g) **Plan of the quarry showing overhead power lines;**

The Holcim Oaklands Junction Quarry is a hard rock quarry located 25 km north of the Melbourne CBD.

The quarry operation is bound by Oaklands Road to the west and surrounded by rural land to the north, east and south, with a horse auction complex on the western side of Oaklands Road, directly opposite the operations. The site lies very close to Melbourne's Tullamarine Airport.

Quarry operations are licensed under Extractive Licence 714 (obtained in 1978) and permitted under Planning Permits also obtained in 1978. Work Authority 176 was issued in 1998, and revised 2004 and 2007, with the last Work Plan Variation, dated 2018.

Drawing of quarry showing all overhead power lines – Appendix 1

Site Locality Map - Appendix 2

h) **Preventative strategies;**

Vegetation is removed from the vicinity of Quarry power lines whenever it is identified as an issue and in accordance with the Holcim Electric Line Clearance Plan Rev 1 (Draft). This would be during routine inspections by trained Electrical Asset Inspectors and / or annual / ad hoc inspections by quarry electrical personnel during normal operating procedures.

Annually (pre summer each August-September) and during a declared fire danger period or total fire ban day(s) a risk assessment is conducted visually assessing the condition of the assets, assessing the potential for a tree or branch to fall onto the overhead power line or any other condition that could lead to a fire. From these assessments actions are determined such as removal of branches, trees or assessment by power authority if required.

Further and specifically to this site for selected lengths (where practical and vegetation exists) of the overhead power line within the quarry a 10m wide easement composed of a 100mm deep crushed rock base will be maintained.

The power lines are routinely inspected by contracted inspectors. All preventative maintenance activities and faults are recorded into the maintenance management system by Oaklands Junction staff, and managed through, the Computerised Maintenance Management System. This allows Oaklands Junction management to ensure any required inspection or maintenance activity is performed and it provides for an independent review of all reported faults as an audit of the inspection work.

In addition to the visual inspections outlined, the following service / maintenance activities are completed;

- LV Air Circuit Breaker Main Switches every 12 months
- DGA testing of Transformer Oil every 12 months unless there is an issue and shorter testing periods are recommended
- Pole Mounted Airbrake switches in a dusty environment every 12 months
- At intervals not exceeding 37 months from the date of the previous inspection, the following are completed;
    - Pole inspections
    - Pole Line Thermography
    - Pole line maintenance

A Risk Assessment is to be completed for each defect or non-compliance identified in accordance with the process outlined in SHE Guideline 2.01 (Risk Management Process).

CONSEQUENCE

LIKELIHOOD	RISK RATING	5 Disaster	4 Severe	3 Serious	2 Significant	1 Minor
	A Certain	HIGH	HIGH	HIGH	MED	MED
	B Likely	HIGH	HIGH	MED	MED	LOW
	C Possible	HIGH	MED	MED	LOW	LOW
	D Unlikely	MED	MED	LOW	LOW	LOW
	E Rare	MED	LOW	LOW	LOW	LOW

The recommended timing for remedial actions are provided below, however these should be reviewed in conjunction with the risk assessment as well as other factors such as asset function and criticality, past failure history and various operational factors.

In general, it is recommend that:

HIGH RISK - Actions be implemented within 3 months, unless noted otherwise.

MED RISK - The risk should be reviewed and any mitigating actions deemed required should be implemented within 6 months.

LOW RISK - The risk should be reviewed and any mitigating actions deemed required should be implemented within 12 months.

Further supporting Holcim's commitment to bushfire mitigation, an isolation transformer was installed and commissioned in July 2022, as part of Holcim's requirements under the Victorian State Government's Rapid Earth Fault Current Limiter (REFCL) implementation. Concurrently with this project, Holcim has developed High Voltage Installation Safety Management Plan (HVISMP) and High Voltage Equipment Maintenance Schedule to support the ongoing inspection, testing and maintenance of Holcim's HV assets on site.

All areas of the network are accessible at all times.

To ensure BFMP strategies and activities are conducted; The BFMP will be treated as a secondary site approval document and will be subject to the full extent of SHE Guideline 6.01: Permits, Licences and Approvals. This means;

1. A hard copy of the plan will be added to the site's permit compliance folder and an electronic copy will be added to the approvals database.
2. Recurring action items within the plan will be scheduled and added to the site's obligation register. The obligation register is a Google Drive scheduling tool that allows the Quarry Manager to plan for upcoming actions and for Management to follow up any outstanding or overdue actions if they are not signed off as complete by the Quarry Manager by the due date.
3. Contents of the obligation register flow into the Permit Compliance Assessment requirements. This system requires all sites to carry out a full self-audit of their approvals on a 2 yearly basis.
4. Contents of the obligation register also flows into the Holcim Environmental Audit Plan that requires all operational sites to be audited by a 2nd or 3rd party auditor against both the relevant SHEMS and Approval requirements on a 5 yearly cycle.

i) **Plan for inspection;**

All overhead high voltage power lines are visually inspected annually (By Zinfra). This is scheduled to be completed during September/October each year.

This is managed by a time based routine within the Computerised Maintenance Management System.

j) **Accreditation of Lines Inspectors;**

HOLCIM Oaklands Junction Quarry does not directly employ linesmen. When the line inspections are due each year, an order is placed on an external service provider, for the inspection of the plant and equipment due that year.

As part of Holcim's 3.11 SHE Guideline – Electrical Safety;

All electrical work performed on site, shall be performed by appropriately authorised persons - where authorisations are provided site/business representatives based on qualifications/competencies and experience. Where work is to be performed by an apprentice, this work shall be suitably supervised by a fully qualified person.

Competency or Licence Code		
Authorisation	**Pre-requisites**	**Theory and Assessment Progression**
Non-Electrical Worker working in "Production type areas"	Nil	Holcim Electrical Awareness Training **Refer:** Attachment 3.11B - Electrical Awareness Training
Authorised Electrical Worker	Electrical Licence (or equivalent) Current LV Rescue & CPR Area Familiarisations	
Safety Observer (Electrical) / Electrical Support Worker	Current LV Rescue & CPR Area Familiarisations	
Switch Room Entry	Area Familiarisations	Holcim Electrical Awareness Training **Refer:** Attachment 3.11B - Electrical Awareness Training
High Voltage Switching		See below table
HV Switching Assistant	Authorised Electrical Worker 2 yearly in-house refresher 5 yearly full HV training	Successful completion of HV Switching Course – Nationally Accredited Area Familiarisations
HV Switching Operator	HV Switching Assistant 2 yearly in-house refresher 5 yearly full HV training	Successful completion of HV Switching Course – Nationally Accredited Area Familiarisations Justification of experience and competency
HV Switching Recipient	Authorised Electrical Worker	Successful completion of HV Switching Course – Nationally Accredited Area Familiarisations
HV Switching Coordinator	HV Switching Operator 2 yearly in-house refresher 5 yearly full HV training	Successful completion of HV Switching Course – Nationally Accredited Area Familiarisations Justification of experience and competency

Other personnel carrying out ad hoc inspections, as part of normal operational activities on the power distribution system, are trained to the required Units of Competency noted above as Electrical Operators and authorised by HOLCIM Oaklands Junction Quarry to operate the quarry high voltage power distribution system. This gives them knowledge of the required line clearances.

A requirement of a contractor performing HV asset inspections will be to have completed 22109VIC or UET20612 - Certificate II in ESI - Asset Inspection.

To confirm operators / inspectors have the appropriate up to date licensing and training, Holcim uses "Damstra".

Damstra provides real-time, web-based workforce management solutions (TWMS) to ensure a safe and compliant workforce. Damstra terminals are installed at all Holcim sites across Australia and New Zealand. All visitors to the site (including visiting Holcim employees) and contractors must sign in/out at the Damstra terminals.

With regards to Contractor Management, Holcim Australia and New Zealand uses TWMS and the Damstra terminals for on site visitor registration and as part of the SHE contractor management process to ensure only approved contractors access the site.

Contracting companies must register with Damstra to:
- complete Holcim questionnaire
- submit applicable insurances
- add employees that will be attending a Holcim site
- submit qualifications in line with their job role for verification (qualifications include trade certificates and licences, noting expiry dates)
- complete Holcim SHE inductions prior to attending site

k) **Accreditation of other persons who will carry out works under this plan**

All Contractor or employee qualifications are checked by the person responsible for the contract works under this plan, as part of the Contract Management Process and Holcim SHE Management process.

The Responsible Officer on site for the contract controls access to the site, monitors progress and checks on site activities

l) **Operation and Maintenance Plans for at-risk electric lines;**

i. **in the event of a fire:-**

In the event of a major fire within the business, the Emergency Procedures at Oaklands Junction Site (refer to 1.07 SHE Guideline – Emergency Response, First Aid & Injury Management, and Emergency Procedures Flip Chart) would be implemented and actions necessary to protect the Quarry's power systems.

The site emergency team would work closely with any emergency services and if required the HV line will be de-energised if directed to do so. If deemed necessary the line will be inspected prior to re-energisation.

ii. **during a day of Total Fire Ban:-**

On a day of CFA-declared Total Fire Ban, any essential maintenance which is proposed to proceed is risk assessed to ensure that it did not constitute a fire risk.

iii. **during a fire danger period:-**

All inspections and high priority maintenance work would have been completed prior to the start of the fire danger period to minimise fire risk due to the power distribution network. Any required vegetation removal will also have been completed.

The quarry power distribution system ("at risk supply network") is expected to operate without substantial impairment.

All 'hot' work intended to be carried out on the Oaklands Junction Quarry requires a Hazardous Work Permit to be completed with risk assessment. Hot works are generally not expected to be carried out during total fire ban days. For the event of an emergency or critical maintenance Oaklands Junction Quarry may arrange permits allowing this work under particular circumstances.

m) **Investigations, analysis and methodology to be adopted for the mitigation of the risk of fire ignition from at-risk electric lines;**

All fires on site are recorded and investigated through the Oaklands Junction Quarry and Holcim incident management data system. Recommendations from the Holcim incident management data system are sent to the person responsible for action.

Note: At the time of preparation / revision of this plan no fire starts have occurred on site.

As per 5.01 SHE Guideline – Incident Reporting and Investigation, any fire event would be recorded and investigated.

The objective of this standard and guideline is to determine the contributing factors and causes of an incident and implement actions to prevent recurrence and reduce risk.

To achieve this objective, all incidents shall be reported immediately and recorded in the incident national database within 24 hours.

An investigation shall be completed on all incidents

Low Risk Investigations
For the purpose of low risk incidents, the “Immediate Actions” field will serve as the investigation of the incident. Where it is determined that a higher level investigation is needed, this incident shall be re-classified as a higher category incident.

Medium Risk Investigations
All medium risk incidents shall be investigated by a person who has completed the basic HFACS investigation training, the Holcim (ANZ) Investigation Training and following the steps as outlined in the “Incident Investigation Handbook”. These medium risk incident investigations are not required to be peer reviewed.

High Risk and Critical Investigations
For all high risk and critical incidents, a Human Factors Analysis and Classification System (HFACS) shall be conducted. The HFACS enables identification of systemic health, safety or environmental deficiencies, assists investigation teams to identify what really went wrong and ensures recommendations are focused on what needs to be done to prevent recurrence. It is directed towards building ‘error-tolerant’ defences against future incidents. The HFACS methodology sets out steps to guide the investigator sequentially through an investigation and includes event and condition charts and incident trees.

The outcomes and lessons from all investigations are shared with the business, and where required Holcim SHE Guidelines and/or standards are updated.

Achieving this objective will assist in reducing incidents and meet Holcim’s target of zeroHarm.

Further in the preparation of this BMP, Holcim reviewed other publically available BMPs identifying several design initiatives to limit the risk of fire ignition, that are also in place on site at Oaklands Junction;

1. All quarry feeders are installed with Sensitive Earth Leakage protection to protect personnel and plant in the event of a fault. This system limits the amount of energy delivered to an earth fault. By limiting the duration and magnitude of fault current, the chance of a fault causing a fire is minimised. Note: during days of total fire ban the protection system remains active.
2. The HV electrical line poles are of concrete construction with steel cross arms, providing greater durability and fire resistance than timber poles. There are 3 poles (installed post 2000) that are of timber construction leading to the location of the sand plant from the transport yard. An additional timber pole was “gifted” by Jemena to Holcim as part of the REFCL works in 2022.
3. A check of all fuses on site has confirmed that no Expulsion Drop Out (EDO) type K fuses remain from the original installation (known to start fires in the past). All fuses on site are Bussman powder type ‘British Standard Air Fuse Links’, except for those associated with the transport office transformer which are Boric acid and utilise the appropriate S&C fuse holders.

n) **Details of the processes and procedures by which the specified operator will;**

i. **Monitor the implementation of the bushfire mitigation plan**

As per Holcim's 3.11 SHE Guideline – Electrical Safety, no access or works to HV assets can be completed until a Hazardous Work Permit (HWP) has been completed along with a risk assessment and access permit.

As the PTW system requires formal supervision and inspection, monitoring of works as they progress and at completion will be completed.

Further specific actions identified in this BFMP complete with close out dates are uploaded into the site maintenance management system.

All asset issues or failures identified through routine inspections or otherwise are recorded in the Computerised Maintenance System operated by Holcim. Where the issue or failure poses a safety risk the item is also recorded as hazard in the Holcim incident management data system, and is managed in line with SHE Guideline 5.01 – Incident Reporting & Investigation.

Any item entered into the CMS enables Holcim to plan and track close out of all identified issues. Further it should be noted that the inspection process of assets is managed via the CMS in that a schedule for inspections is developed and the system automatically generates work orders when due for completion.

Any hazard entered into iCare is risk assessed complete with close out date and owner. Reports from iCare on open and closed hazards are developed for review by site, local and senior management.

ii. **Audit the implementation of the bushfire mitigation plan**

All elements of regulatory compliance are audited by Oaklands Junction internal auditors and regulators. These regulators have adopted a process of regular audits.

Site inspections specifically related to this BMP will be conducted both prior to and during the declared fire season.

As noted previously the implementation of the BFMP is audited by Holcim via the SHE Guideline 6.01: Permits, Licences and Approvals, meaning a;

1. A hard copy of the plan will be added to the site's permit compliance folder and an electronic copy will be added to the approvals database.
2. Recurring action items within the plan will be scheduled and added to the site's obligation register. The obligation register is a Google Drive scheduling tool that allows the Quarry Manager to plan for upcoming actions and for Management to follow up any outstanding or overdue actions if they are not signed off as complete by the Quarry Manager by the due date.
3. Contents of the obligation register flow into the Permit Compliance Assessment requirements. This system requires all sites to carry out a full self-audit of their approvals on a 2 yearly basis.
4. Contents of the obligation register also flows into the Holcim Environmental Audit Plan that requires all operational sites to be audited by a 2nd or 3rd party auditor against both the relevant SHEMS and Approval requirements on a 5 yearly cycle.

iii. **Identify any deficiencies in the plan or the plans effectiveness**

All fire policies and procedures are reviewed annually prior to the commencement of the Annual Fire Season declared for the Quarry.

In addition business processes ensure the update of policies and procedures based on input from any incident investigations, internal audits, external audits, regulator reviews, etc., by logging and monitoring of action items using the Holcim incident management data system.

The regulatory audits relating to fire preparedness conducted by regulators can also identify deficiencies in the plans or systems in use on site. Recommendations from the regulators are enforceable and have to be complied with.

iv. **Change the plan and the plans implementation to rectify any deficiencies identified**

As noted in point iii), the business has a process to capture and implement improvements for policies and procedures based on findings, recommendations and / or employee suggestions.

v. **Monitor the effectiveness of inspections carried out under the plan**

Contractors employed to perform inspections are regularly checked and audited.

Holcim procedures require a Responsible Officer to check the contractor on site and confirm that all health and safety requirements are being met, that the contractors' personnel are qualified and licensed for the work they are performing, and documented work procedures are being followed to the required standard.

To assist, Holcim utilises an online system (Damstra) to record and track currency of all contractor qualifications. All contractors upon arrival to site are required to sign into a Damstra terminal prior to commencement, at which point the currency of all required training, licensing, qualification etc. is checked.

Post completion of any HV asset inspection, a report is generated and reviewed with either the site quarry manager or maintenance manager to ensure a thorough inspection of all assets was completed and that a full understanding of the outcomes and actions is understood. Further to this regular oil sampling and analysis is conducted to determine the condition of transformers.

The information generated from the HV asset inspections and transformer oil analysis, then feeds into the asset strategy that has been developed for HV assets.

vi. **Audit the effectiveness of inspections carried out under the plan**

All elements of regulatory compliance are audited by Oaklands Junction internal auditors and various regulators. This would include both the processes used and documentation created under point (v).

All faults identified by the inspectors would be planned for rectification by Oaklands Junction employees and as a result physically inspected by Oaklands Junction employees. This allows HOLCIM Oaklands Junction Quarry to audit the findings of the contracted inspectors.

o) **The policy in relation to assistance to be provided to fire control authorities in the investigation of fires near the specified operator's at-risk electric lines**

Holcim and its contractors will provide all necessary assistance to fire control authorities with respect to investigation of fires near its assets. As indicated previously Holcim will liaise with local fire authorities prior to and during any fire investigation or danger period

If the CFA required access to the power line corridor they would have full access.

The Oaklands Junction Quarry site has a 50,000 litre water truck on site manned which can be used in response to a fire, as well as heavy earth moving machinery and quarry materials.

All buildings have fire extinguishers located in and around them. Also there is typically a significant volume of water contained in dams on site that is readily accessible.

Contact to the CFA is made by dialling our site emergency number or you can call 000. All employees are trained as per our emergency management plan.

If there was a serious incident on site the CFA would work closely with our management team as per our crisis management plan.

5. Accessibility of Documents

- The current approved version of this document is kept on the site
- A copy of the version approved by ESV is placed on site at the Oaklands Junction's Quarry.
    - As per the Electrical Safety Act 1998 Version 071 Clause 83BA Paragraph (1) – BushFire Mitigation Plans, this plan will be reviewed and re-submitted prior to 1st July in each year.
    - An electronic copy is assessable via the following link; https://www.holcim.com.au/oaklands-junction-quarry
- Holcim's principal state office is located at 290 Burwood Rd, Hawthorn VIC 3122
- Office hours are 8:30am to 4:30pm.

6. References

SHE Guidelines

- 1.05 SHE Guideline – Contractor Safety Management (Jan 2023)
- 1.07 SHE Guideline – Emergency Response, First Aid & Injury Management (Jan 23)
    - Emergency Procedures Flip Chart - Oaklands Junction Quarry
- 2.01 SHE Guideline - Risk Management Process (Aug 2022)
- 3.09 SHE Guideline - Hot Works (Oct 23)
- 3.11 SHE Guideline - Electrical Safety (March 2022)
- 5.01 SHE Guideline – Incident Reporting & Investigation (Aug 23)
- 6.01 SHE Guideline – Permits, Licences & Approvals (June 2021)
- Occupational Health and Safety Regulations 2017

7. Exemptions

At the time of this plan Holcim no ESV exemptions have been requested or granted for this site.

Appendix 1: Quarry Overhead Power lines Drawing

Line (feeder) denomination	Jemena feeder C0011	
Voltage (kV)	22	22
No. Spans	23	3
Length (m)	1546	270
Insulated Conductor (Y/N)	N	N
If insulated, type of insulated conductor		
No. Poles	23	3
Pole material	Concrete 1 x Wood	Wood
Year of construction	1988/89 1988	2001

TABLE SHOWING DEPTHS AS AT 04/08/2006

Ref.	Depth
A172	0.5
A174	0.8
A175	0.9
A176	0.8

TABLE SHOWING DEPTHS AS AT 06/01/2015

Ref.	Depth
A240	1.2
A241	1.3
A242	1.2
A243	1.2
A244	0.9
A245	1.5
A246	1.5
A247	1.4
A248	1.0
A249	1.1
A250	1.1
A251	1.0
A252	0.8

TABLE SHOWING DEPTHS AS AT 25/07/2006

Ref.	Depth
155	1
156	1
157	0.9
186	0.4
187	0.5
188	0.7
189	0.6
190	0.5
191	1
192	0.5
193	0.5
194	0.5
195	0.9
196	0.8
197	1.3
198	1
199	1.4
200	1.1
201	0.6
202	0.7
203	1.1
204	0.4
205	0.4
210	1.2
211	1.3
212	1.2
213	1
216	0.5
217	0.5
218	0.3
223	1.3
224	1.4
225	1.2
226	1.4
227	1.5
228	1.4
230	1.1
232	1.1
233	1
234	1
235	1.1
236	1.1
237	0.85
246	1.1
501	0.3
502	0.5
503	0.5
504	0.8
506	0.8
510	0.7
511	1.0
514	0.7
516	1.1
517	1.3
519	1.0
520	0.7
521	0.7
524	0.8
525	1.0
526	1.3
527	0.9
528	0.9
529	0.7
530	0.4
531	0.5
532	0.5
533	0.5
535	0.4
536	0.6
537	0.6
538	0.8
539	1.2
540	0.5
541	0.5
542	0.5
543	0.5
544	0.5
548	0.5
A2	1.5
A3	1.6
A4	2.0
A5	2.0
A6	2.0
A7	2.0
A8	3.0
A9	3.0
A10	2.7
A11	2.3
A12	1.5
A13	1.5
A14	1.5
A19	1.3
A24	1.3
A26	1.0
A27	1.0
A28	0.8
A32	1.0
A33	1.2
A34	1.3
A35	1.4
A36	1.2
A37	1.4
A39	1.4
A40	1.4
A41	1.4
A42	1.3
A43	1.2
A44	1.4
A45	1.4
A46	1.2
A47	1.2
A49	0.8
A50	0.5
A51	0.9
A52	0.4
A54	1.0
A55	1.0
A56	0.9
A57	0.5
A58	0.7
A59	0.7
A60	0.9
A61	1.0
A65	1.1
A68	0.4
A70	0.7
A72	0.5
A73	0.5
A74	0.7
A76	0.7
A77	0.8
A78	0.4
A79	0.6
A80	0.6
A81	0.7
A82	0.9
A83	0.9
A86	1.0
A89	1.0
A164	0.6
A167	1.0
A168	1.0
A200	1.0
A203	0.2
A204	0.2
A207	0.2
A208	0.4
A209	0.8
A210	1.0
A211	0.6
A212	0.6
A213	0.3
A215	0.2
A217	0.6
A219	0.7
A220	0.9
A222	0.5

NOTATIONS

LEVELS TO THE AUSTRALIAN HEIGHT DATUM VIDE PM 349

UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 25/07/2006, 04/08/2006, 04/11/2004 & 01/02/2005 WERE LOCATED BY GIPPSLOCATE & UNDERGROUND LOCATING SERVICES.
UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 08/07/2009 WERE SHOWN ON-SITE BY STUART TATE OF HOLCIM.
UNDERGROUND ELECTRICITY CABLES MEASURED ON 28/02/2012 WERE SHOWN ON-SITE BY ROB WOOD OF HOLCIM.

UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 20/05/2014 WERE SHOWN ON-SITE BYJOHN PICKERING OF HI-TECH ELECTRICAL SERVICES.

Services shown hereon have been located using information supplied by GIPPSLOCATE & UNDERGROUND LOCATING SERVICES. Landair Surveys can accept no responsibility for the location or completeness of data supplied by GIPPSLOCATE & UNDERGROUND LOCATING SERVICES. Prior to any demolition, excavation or construction on the site, additional investigations should be made for possible location of further underground services.

LEGEND

- OVERHEAD ELECTRICITY
- ELEC LINES UNDERGROUND
- POSSIBLE ELEC LINES UNDERGROUND
- PROPOSED UNDERGROUND HV LINE
- JUNCTION PIT
- GRATED PIT
- SIDE ENTRY PIT
- PROPOSED UNDERGROUND LV LINE

OAKLANDS ROAD
QUARRY ACCESS ROAD
DBX-A
CONTINUES SOUTH TO POWER POLE
OTHER CABLES LIKELY TO BE IN AREA
TO OAKLANDS ROAD
OLD T1
P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P10A P10B P10C P11 P12 P13 P14 P15 P16 P17 P18 P19 P20 P21 P22 P23 P24
13 m 17 m 93 m 100 m 100 m 100 m 80 m 75 m 100 m 98 m 100 m 71 m 63 m 71 m 68 m 89 m 71 m 75 m 91 m 57 m 42 m 45 m 70 m
NOTE 1 NOTE 2 NOTE 3
ISOLATION TRANSFORMER T1
LV
HV
HV
FENCE
T1 T2 T2A T2B T3 T4 T5
OFFICE
WORKSHOP
TERTIARY CRUSHER
TERTIARY CRUSHER CONTROL ROOM
SWITCH ROOM
SWITCH ROOM
PRIMARY CRUSHER
SECONDARY
FINAL SCREEN
WATERTANK
WIDE TRENCH
BLENDING PLANT
DIESEL BOWSER
WATER AND ELEC IN SAME TRENCH
WIDE TRENCH
WEIGHBRIDGE
SWITCHBOARD
POWER BOX
TRUCK WASH
WHEELWASH CONTAINER
TRANSPORT OFFICE
TRUCK MAINTENANCE SHEDS
WASH SHED
PUMP SHED
SWITCHBOARD
MINIMUM DEPTH OF TRENCH = 0.6m
SANDPLANT SWITCHBOARD
made redundant

NOTES
1. HV SWITCHBOARD RATED UP TO 36 kV WITH METERING/PROTECTION/ISOLATION
2. 22 kV / 22 kV 4000 kVA ISOLATION TRANSFORMER RATED UP TO 33 kV
3. 22 kV HV SWITCHBOARD FOR SITE NETWORK PROTECTION & NEW T1A INDOOR DRY TYPE TRANSFORMER 22 kv / 400V

SCALE
0 15 30 45 60 75m
1:1500 (A1)
LENGTHS ARE IN METRES

REV	DESCRIPTION	DRN	CHK	APP	DATE
C	MINOR CHANGES	MV	AJ		01/04/2019
B	MINOR CHANGES	MV	AJ		28/03/2019
A	PRELIMINARY ISSUE	CG	AJ		04/12/2018

X:\ARA 1\Projects\ACAD\ELabels\ara_logo_colour6.jpg
Factory 10, 23 Susan St. Eltham , Vic. 3095.
Ph : (03) 9431 3229 - Fax: (03) 9439 2122
www.araelec.com.au

DESIGN: A. JEFFREY
DRAWN: C. GUNATHILAKE
STATUS: PRELIMINARY

HOLCIM (AUSTRALIA) OAKLANDS JUNCTION QUARRY
REFCL OPTION 3: ISO TXF \ 22 kV OVERHEAD LINE RETICULATION DIAGRAM

AI
DRAWING NUMBER: 8614-DWG-251
REV: C

Date: 29/07/2022 10:38:39 AM
C:\Users\mkonstan\Downloads\8614-DWG-251RevC.dwg

Appendix 2: Oaklands Junction Quarry – Locality Plan

Appendix 3: Inspection & Maintenance

HOLCIM QUARRY OAKLANDS JUNCTION 2024

- Thermographic Survey Completed 1st May 2024
- Asset - Pole Inspection Completed 23rd October 2023
- High Voltage Equipment Inspection was last completed 6th June 2021 with the HIGH VOLTAGE EQUIPMENT - MAINTENANCE REPORT 1635-RPT-900 issued to Holcim on the 18th September 2021 (Extract Attached)

Note:

High Voltage Equipment Inspection is planned for completion July 2024

HOTSPOTTHERMOGRAPHY

THERMOGRAPHIC SURVEY RESULTS

ARA ELECTRICAL SERVICES

HOLCIM
290 OAKLANDS ROAD
OAKLANDS JUNCTION.

1 MAY 2024

HOTSPOTTHERMOGRAPHY

ARA Electrical services
Factory 10,
23 Susan Street
Eltham
VIC 3095

8 May 2024

Attn: Andrew McKenzie

Dear Andrew,

RE: THERMOGRAPHIC SURVEY RESULTS

Please find attached results from the Thermographic Survey carried out at Holcim – 290 Oaklands Road Oaklands Junction on 1 May 2024

No items of concern were detected.

Section A contains the Thermographic survey report.
Section B contains a schematic of the electrical system which was surveyed.
Section C contains Contact / qualification details, Thermal exception definitions, and Camera details.

The temperatures shown in the reports should only be used as a guide. The science of thermography requires consideration of material surface characteristics (emissivity) and the ambient environment of the object, and unless the survey is carried out under controlled conditions, an exact temperature is not possible.

The thermographic survey results are valid at the time the survey was taken and under the equipment loading at the time of the survey. No responsibility can be taken for loss or damage, due to faults not detected during the survey or post survey faults. In the event that survey results can be shown to be inaccurate at the time of testing, the liability of Hotspot Thermography Pty Ltd, shall be restricted to a repeat survey and supply of revised results.

Please advise if you require any further details or assistance.

Yours truly,

Wolfgang Forke

Hotspot Thermography Pty Ltd ABN 20 094 264 810
P.O. Box 218 Mount Beauty Victoria 3699. Ph 03 57544317 Mob 0409216269 Fax 03 99236146 Email wforke@hotspotthermo.com

INDEX

SECTION A

THERMOGRAPHIC SURVEY

HOTSPOTTHERMOGRAPHY

THERMOGRAPHIC SURVEY RESULTS

ARA ELECTRICAL SERVICES

HOLCIM
290 OAKLANDS ROAD
OAKLANDS JUNCTION.

1 MAY 2024

HOTSPOTTHERMOGRAPHY

MAINTENANCE REQUIRED	MEDIUM	NEXT MINOR SHUTDOWN	10 - 20 DEG C
	LOW	NEXT MAJOR SHUTDOWN	0 - 10 DEG C
	NO ACTION		
SHUTDOWNS REQUIRED	DANGEROUS	SHUTDOWN IMMEDIATELY	70 + DEG C
	URGENT	SHUTDOWN ASAP	40 - 70 DEG C
	HIGH	ORGANISE SHUTDOWN	20 - 40 DEG C

THERMOGRAPHIC SURVEY INDEX AND RESULT SUMMARY

SHEET NO.	CATEGORY	DETAILS	
1	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.2	
2	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.3	
3	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.4	
4	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	MSB 5	
5	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.1 - (0UTSIDE FENCE - UNDER OPERATIONAL CONTROL OF GEMINA)	
6	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.10	
7	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NUMBER 11 - TOP OF	
8	EQUIPMENT	SWITCH BOARD	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NUMBER 11 - TRANSFORMER	
9	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NUMBER 14	
10	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.17	
11	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.24	
12	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.18	
13	EQUIPMENT	TRANSFORMER	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.19	

HOTSPOTTHERMOGRAPHY

MAINTENANCE REQUIRED	MEDIUM	NEXT MINOR SHUTDOWN	10 - 20 DEG C	
	LOW	NEXT MAJOR SHUTDOWN	0 - 10 DEG C	
	NO ACTION			
SHUTDOWNS REQUIRED	DANGEROUS	SHUTDOWN IMMEDIATELY	70 + DEG C	
	URGENT	SHUTDOWN ASAP	40 - 70 DEG C	
	HIGH	ORGANISE SHUTDOWN	20 - 40 DEG C	

THERMOGRAPHIC SURVEY INDEX AND RESULT SUMMARY

SHEET NO.	CATEGORY	DETAILS	
14	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NO.22	
15	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NUMBER 23	
16	EQUIPMENT	POLE	NO ACTION
	LOCATION	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	
	COMPONENT NAME	N/A	
	COMPONENT CODE	POLE NUMBER 10C	

HOTSPOTTHERMOGRAPHY

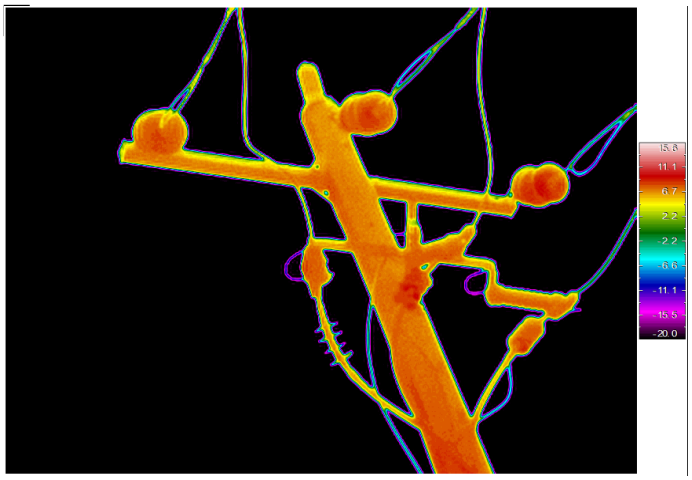
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NO.2							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1058



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

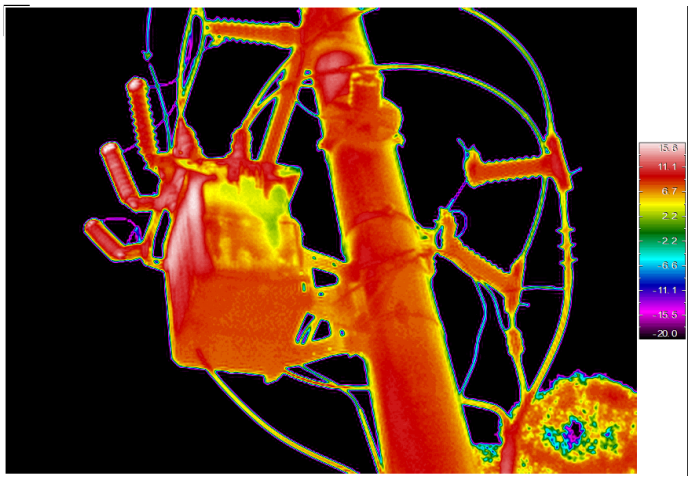
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NO.3							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1059



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NO.4							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1061

TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

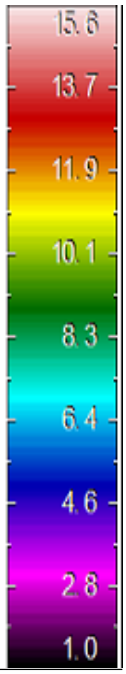
EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	MSB 5							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1062

TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED



REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NO.1 - (0UTSIDE FENCE - UNDER OPERATIONAL CONTROL OF GEMINA)						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1063

TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

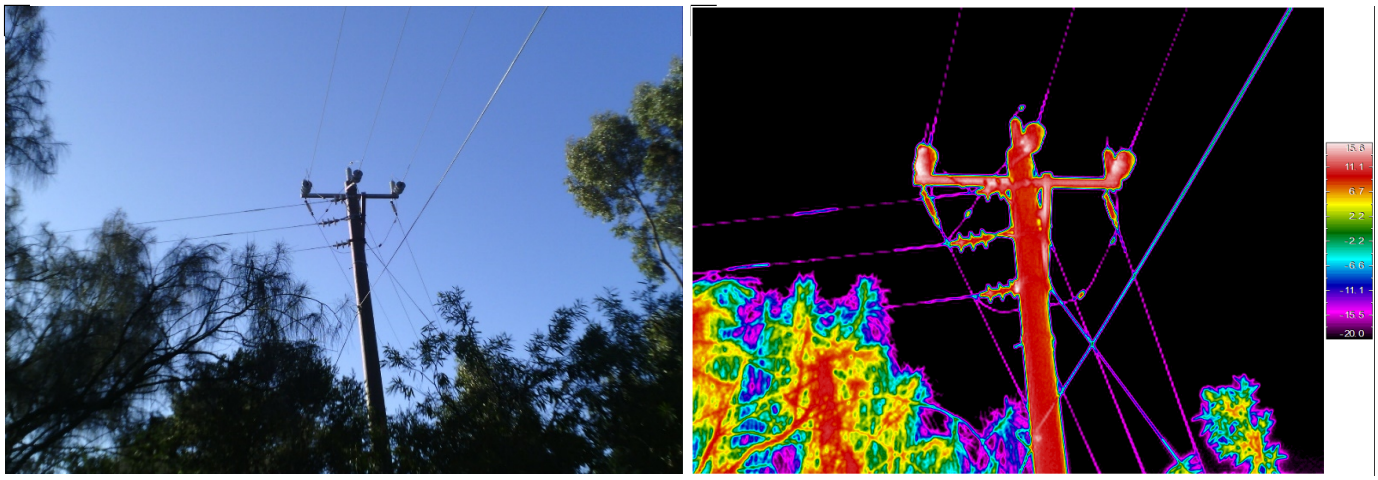
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NO.10							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1065



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

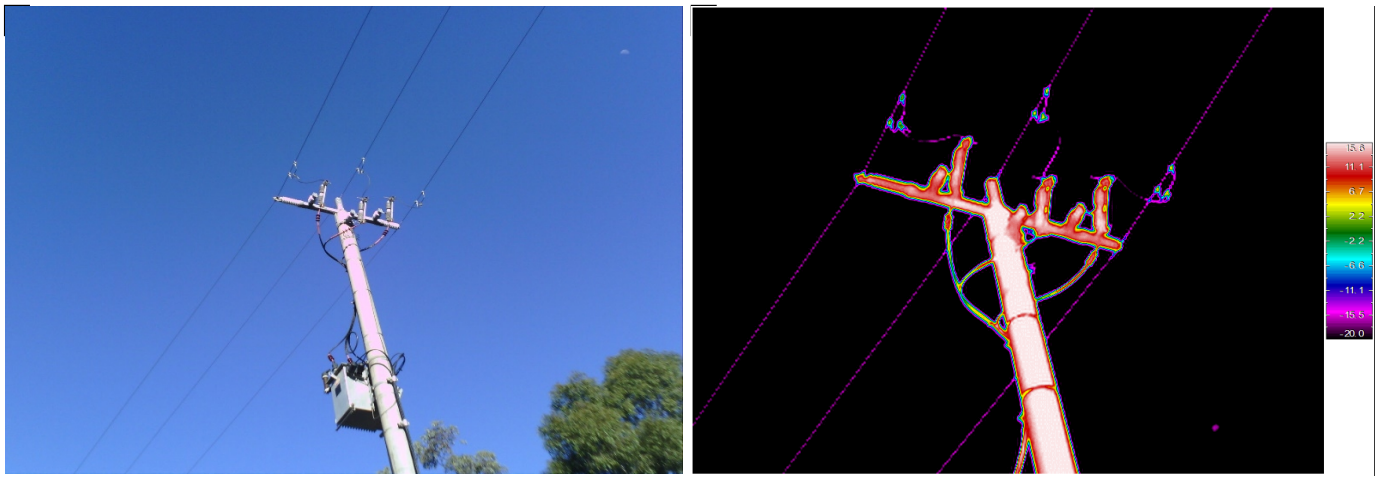
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NUMBER 11 - TOP OF							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1066



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

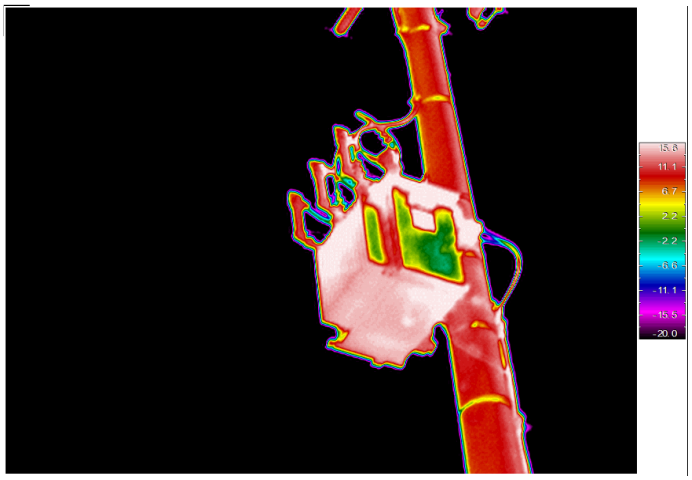
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	SWITCH BOARD						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NUMBER 11 - TRANSFORMER						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1067



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

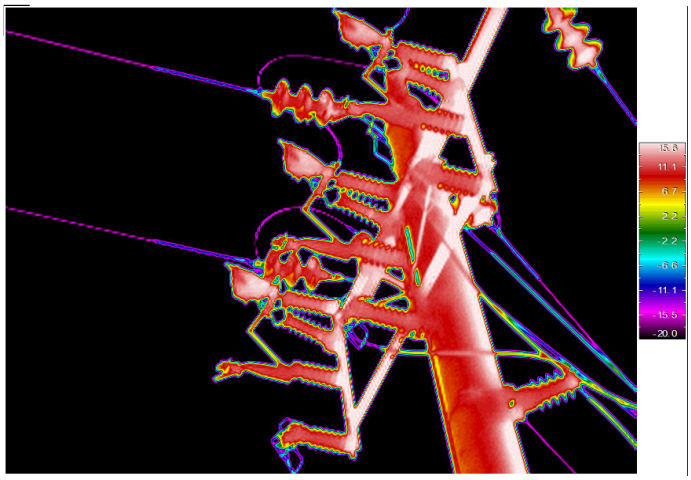
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NUMBER 14							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1068



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

NOTE THAT THE TRANSFORMER ASSOCIATED WITH POLE 14 IS OOS DUE TO A LIGHTNING STRIKE

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NO.17						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	NO LOAD	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1070

TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

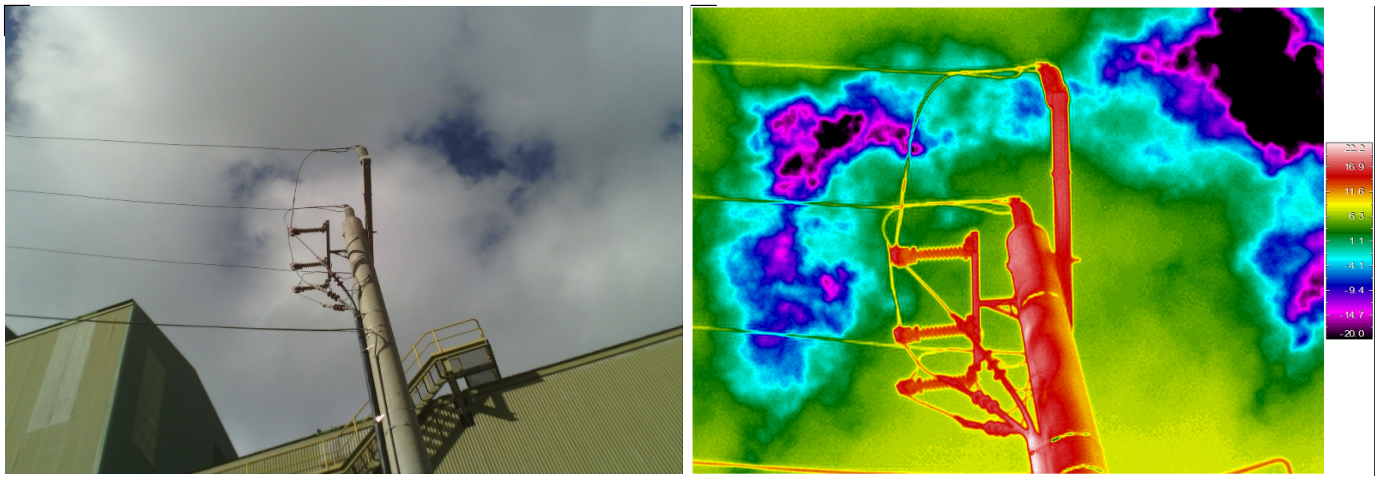
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NO.24						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1071



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

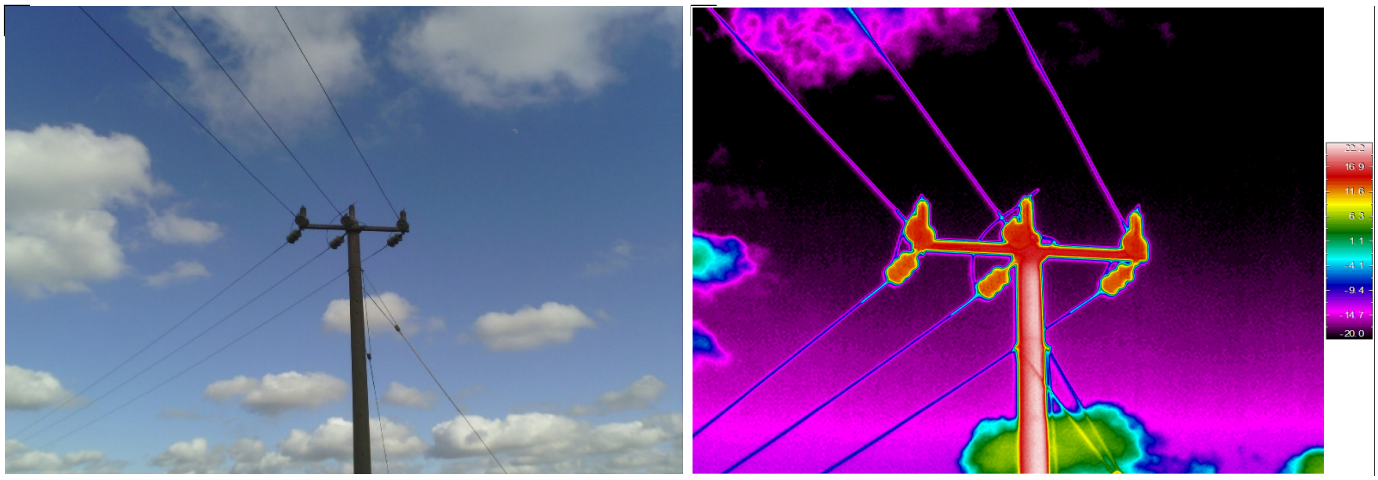
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NO.18							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1074



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

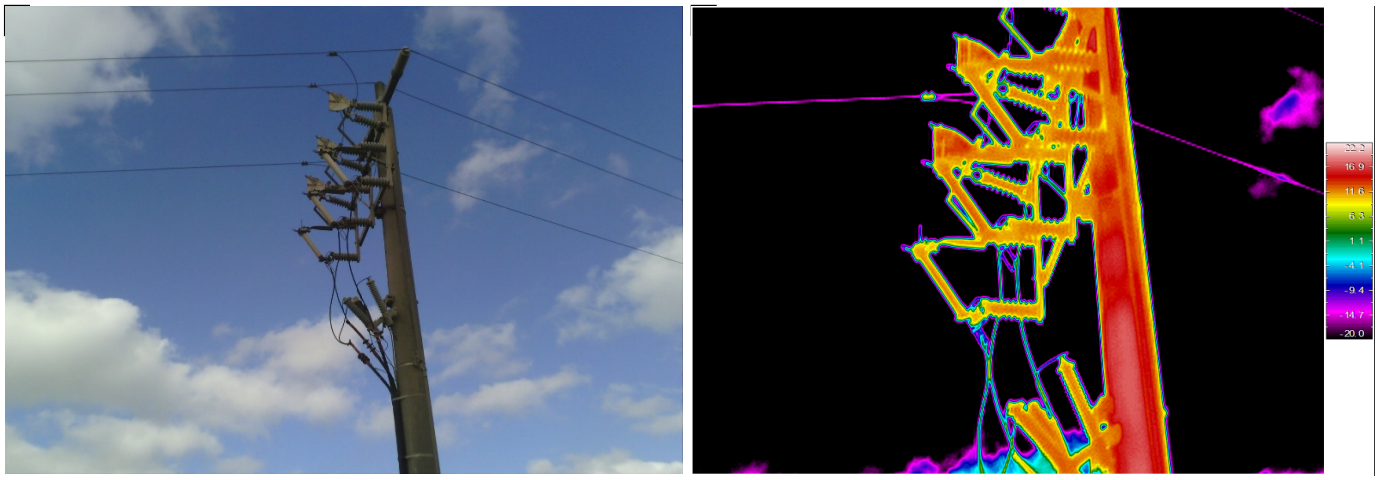
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	TRANSFORMER						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NO.19						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

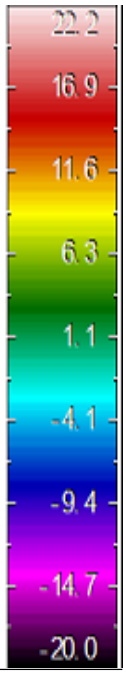
1075



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED



REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

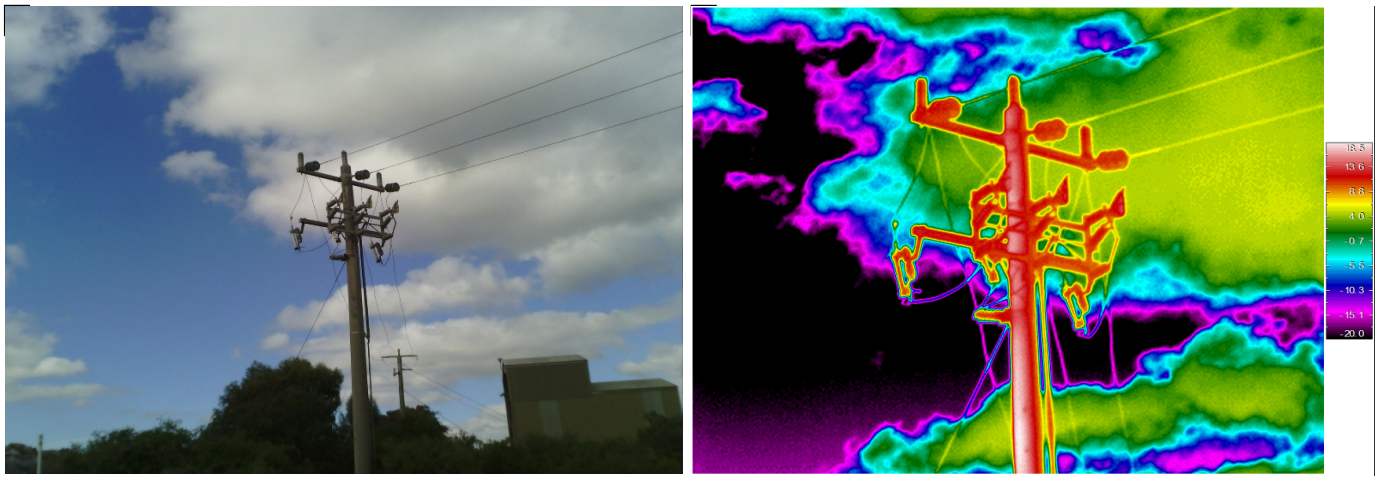
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NO.22						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1076



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

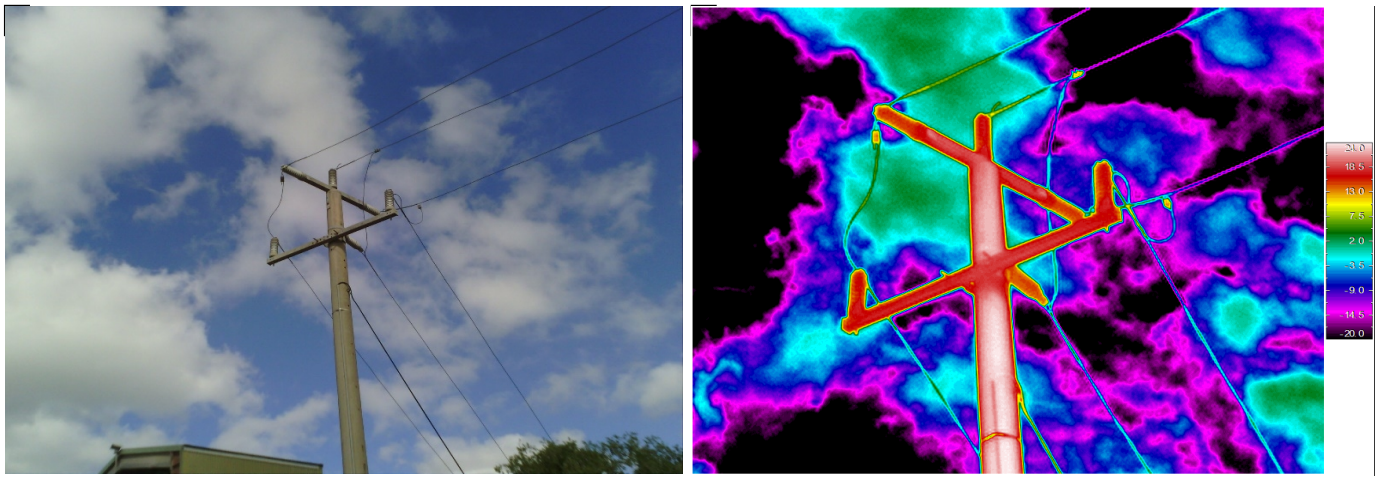
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE							
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION							
GOOGLE MAPS LAT LONG	N/A							
COMPONENT NAME	POLE NUMBER 23							
CODE	N/A							
SERIAL No.	N/A							
MANUFACTURER	N/A							
RATING	VOLTS	22KV		AMPS	N/A		KW/HP	N/A
ELECTRICAL LOADING	RED PHASE	N/A	AMPS	WHITE PHASE	N/A	AMPS	BLUE PHASE	N/A AMPS

1077



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

HOTSPOTTHERMOGRAPHY

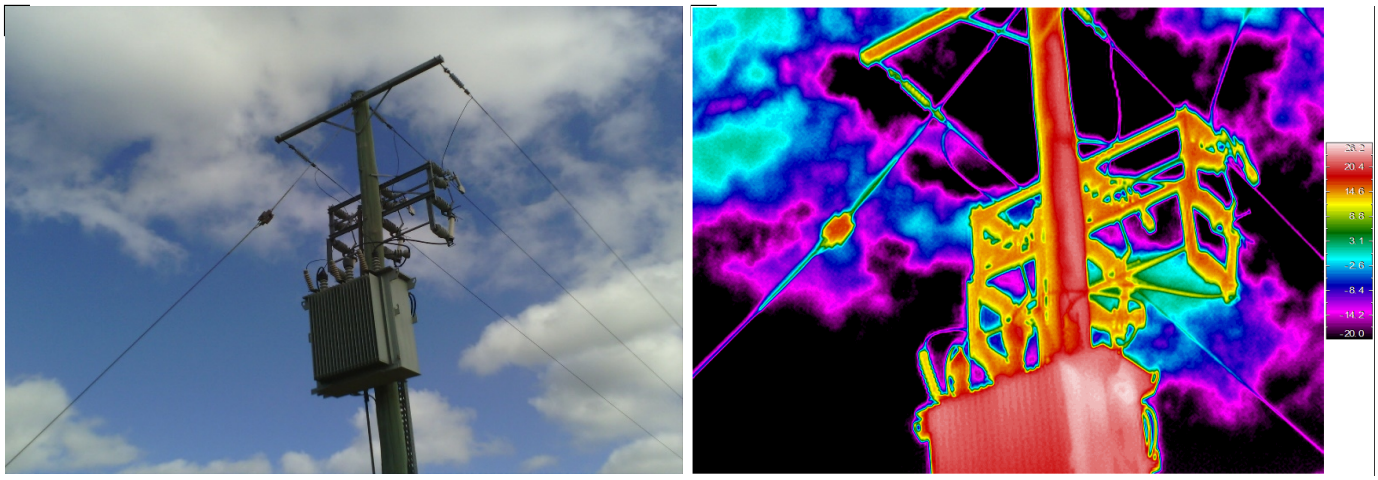
PRIORITY	NO ACTION

REPAIRED	DATE	BY

CUSTOMER:	ARA ELECTRICAL SERVICES	DATE	1/5/24
SITE:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION	TIME	
CONTACT PERSON:	ANDREW MCKENZIE	JOB NO.	
PHONE:	0432 049 829	SURVEYOR	W. FORKE

EQUIPMENT SURVEYED:	POLE						
LOCATION:	HOLCIM 290 OAKLANDS ROAD OAKLANDS JUNCTION						
GOOGLE MAPS LAT LONG	N/A						
COMPONENT NAME	POLE NUMBER 10C						
CODE	N/A						
SERIAL No.	N/A						
MANUFACTURER	N/A						
RATING	VOLTS	22KV	AMPS	N/A	KW/HP	N/A	
ELECTRICAL LOADING	RED PHASE	N/A AMPS	WHITE PHASE	N/A AMPS	BLUE PHASE	N/A AMPS	

1078



TEMPERATURES MEASURED - SHOWN IN DEGREES CENTIGRADE

THERMOGRAPHERS COMMENTS:

NO ITEMS OF CONCERN DETECTED

REPAIRERS COMMENTS		PRIORITY	RECOMMENDATION
		DANGEROUS	SHUTDOWN IMMEDIATELY
		URGENT	SHUTDOWN ASAP
		HIGH	ORGANISE SHUTDOWN
		MEDIUM	NEXT MINOR SHUTDOWN
		LOW	NEXT MAJOR SHUTDOWN
	X	NO ACTION	

SECTION B

ITEMS SURVEYED
AND
SURVEY HISTORY

TABLE SHOWING DEPTHS AS AT 04/08/2006

Ref.	Depth
A172	0.5
A174	0.8
A175	0.9
A176	0.8

TABLE SHOWING DEPTHS AS AT 06/01/2015

Ref.	Depth
A240	1.2
A241	1.3
A242	1.2
A243	1.2
A244	0.9
A245	1.5
A246	1.5
A247	1.4
A248	1.0
A249	1.1
A250	1.1
A251	1.0
A252	0.8

TABLE SHOWING DEPTHS AS AT 25/07/2006

Ref.	Depth	Ref.	Depth	Ref.	Depth	Ref.	Depth
155	1	234	1	A2	1.5	A56	0.9
156	1	235	1.1	A3	1.6	A57	0.5
157	0.9	236	1.1	A4	2.0	A58	0.7
186	0.4	237	0.85	A5	2.0	A59	0.7
187	0.5	246	1.1	A6	2.0	A60	0.9
188	0.7	501	0.3	A7	2.0	A61	1.0
189	0.6	502	0.5	A8	3.0	A65	1.1
190	0.5	503	0.5	A9	3.0	A68	0.4
191	1	504	0.8	A10	2.7	A70	0.7
192	0.5	506	0.8	A11	2.3	A72	0.5
193	0.5	510	0.7	A12	1.5	A73	0.5
194	0.5	511	1.0	A13	1.5	A74	0.7
195	0.9	514	0.7	A14	1.5	A76	0.7
196	0.8	516	1.1	A19	1.3	A77	0.8
197	1.3	517	1.3	A24	1.3	A78	0.4
198	1	519	1.0	A26	1.0	A79	0.6
199	1.4	520	0.7	A27	1.0	A80	0.6
200	1.1	521	0.8	A28	0.8	A81	0.7
201	0.6	524	0.8	A32	1.0	A82	0.9
202	0.7	525	1.0	A33	1.2	A83	0.9
203	1.1	526	1.3	A34	1.3	A86	1.0
204	0.4	527	0.9	A35	1.4	A89	1.0
205	0.4	528	0.9	A36	1.2	A164	0.6
210	1.2	529	0.7	A37	1.4	A167	1.0
211	1.3	530	0.4	A39	1.4	A168	1.0
212	1.2	531	0.5	A40	1.4	A202	1.0
213	1	532	0.5	A41	1.4	A203	0.2
216	0.5	533	0.5	A42	1.3	A204	0.2
217	0.5	535	0.4	A43	1.2	A207	0.2
218	0.3	536	0.6	A44	1.4	A208	0.4
223	1.3	537	0.6	A45	1.4	A209	0.8
224	1.4	538	0.8	A46	1.2	A210	1.0
225	1.2	539	1.0	A47	1.2	A211	0.6
226	1.4	540	0.5	A49	0.8	A212	0.6
227	1.5	541	0.5	A50	0.5	A213	0.3
228	1.4	542	0.5	A51	0.9	A215	0.2
230	1.1	543	0.5	A52	0.4	A217	0.6
232	1.1	544	0.5	A54	1.0	A219	0.7
233	1	548	0.5	A55	1.0	A220	0.9
						A221	0.5

NOTATIONS

LEVELS TO THE AUSTRALIAN HEIGHT DATUM VIDE PM 349

UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 25/07/2006, 04/08/2006, 04/11/2004 & 01/02/2005 WERE LOCATED BY GIPPSLOCATE & UNDERGROUND LOCATING SERVICES.

UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 08/07/2009 WERE SHOWN ON-SITE BY STUART TATE OF HOLCIM.

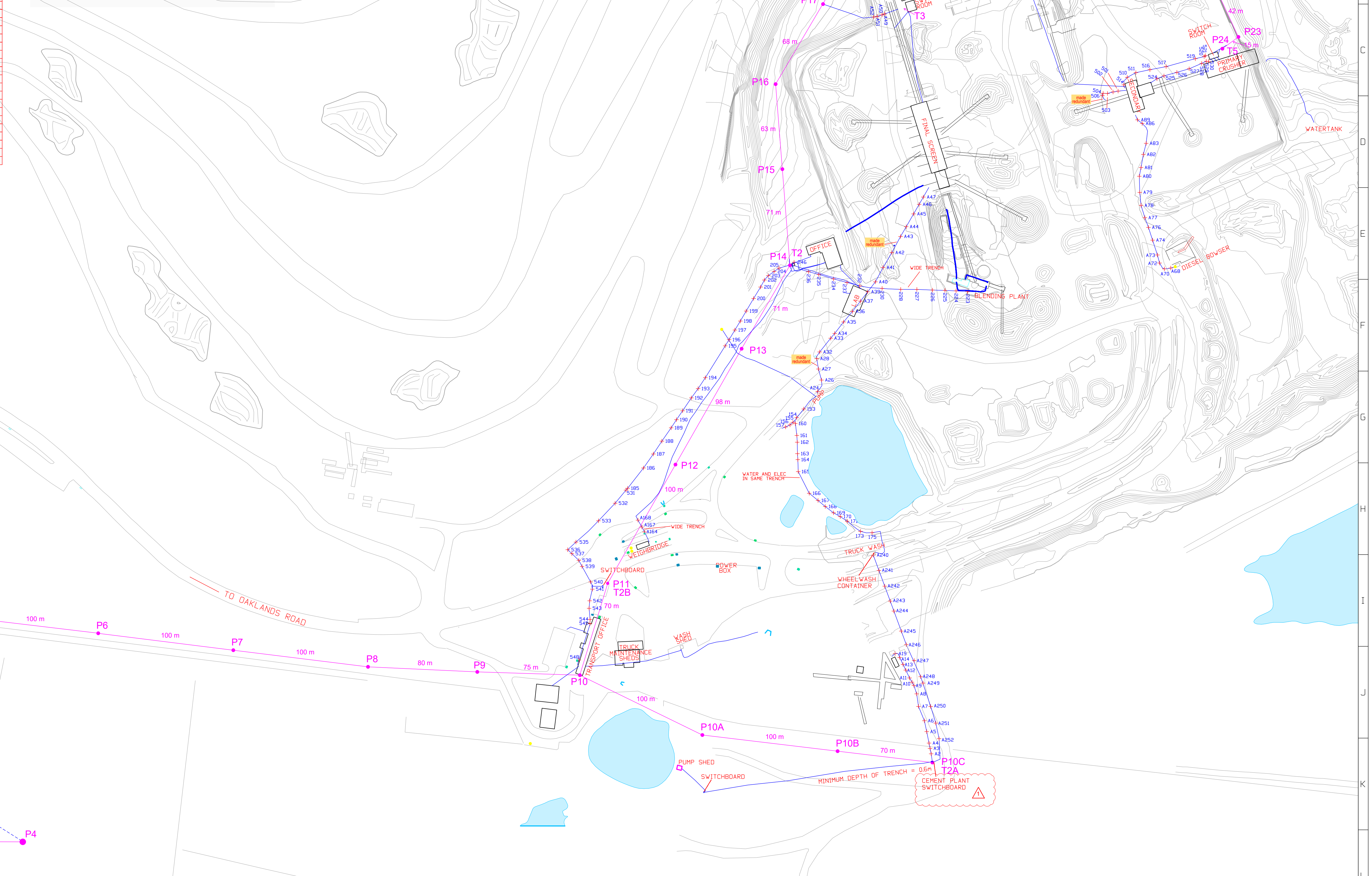
UNDERGROUND ELECTRICITY CABLES MEASURED ON 28/02/2012 WERE SHOWN ON-SITE BY ROB WOOD OF HOLCIM.

UNDERGROUND ELECTRICITY & COMMUNICATIONS CABLES MEASURED ON 20/05/2014 WERE SHOWN ON-SITE BYJOHN PICKERING OF HI-TECH ELECTRICAL SERVICES..

Services shown hereon have been located using information supplied by GIPPSLOCATE & UNDERGROUND LOCATING SERVICES. Landair Surveys can accept no responsibility for the location or completeness of data supplied by GIPPSLOCATE & UNDERGROUND LOCATING SERVICES. Prior to any demolition, excavation or construction on the site, additional investigations should be made for possible location of further underground services.

LEGEND

- OVERHEAD ELECTRICITY
- ELEC LINES UNDERGROUND
- POSSIBLE ELEC LINES UNDERGROUND
- PROPOSED UNDERGROUND HV LINE
- JUNCTION PIT
- GRATED PIT
- SIDE ENTRY PIT
- PROPOSED UNDERGROUND LV LINE



NOTES

1. UNDERGROUND CABLE TO BE 19/33kV 3C 185mm² Al/XLPE/CWS/PVC/SWA/PVC/NY/PVC
2. UNDERGROUND CABLE TO BE 12.7/22kV 3C 185mm² Al/XLPE/CWS/PVC/SWA/PVC/NY/PVC
3. ISOLATION AND EARTH SWITCHES INTERLOCKED
4. CASTELL KEY INTERLOCK REQUIRED BETWEEN ISOLATION TRANSFORMER INCOMER AND DOWNSTREAM EARTH SWITCHES.

REV	DESCRIPTION	DRN	CHK	APP	DATE
1	CEMENT PLANT	AD	AJ		18.14.2024
0	ISSUED FOR CONSTRUCTION	JZ	AJ		01.12.2021

ARA Electrical Services P/L
ABN 94 088 300 270 REC 8473
ELECTRICAL ENGINEERS AND CONTRACTORS
Factory 10, 23 Susan St. Eltham , Vic. 3095.
Ph : (03) 9431 3229 - Fax: (03) 9439 2122
www.araelec.com.au

DESIGN: A. JEFFREY
DRAWN: J. ZHAI
SCALE: NTS

HOLCIM AUSTRALIA
OAKLANDS JUNCTION QUARRY
REFCL OPTION 3: ISOLATION TRANSFORMER \ 22 kV OVERHEAD LINE
RETICULATION DIAGRAM

A3

DRAWING NUMBER: 212063-DWG-251

REV: 1

Date: 18/04/2024 2:03:48 PM

SECTION C

CONTACT / QUALIFICATION DETAILS
THERMAL EXCEPTION DEFINITIONS
CAMERA DETAILS

THERMAL EXCEPTIONS

PRIORITY DEFINITIONS

CLASSIFICATION		RECOMMENDED MINIMUM REPAIR ACTION	DELTA T DEG C
0	**NO ACTION**	DESCRETIONARY	DESCRETIONARY
1	**LOW**	NEXT MAJOR SHUT	0 - 10
2	**MEDIUM**	NEXT MINOR SHUT	10 - 20
3	**HIGH**	ORGANISE SHUT	20 - 40
4	**URGENT**	SHUT ASAP	40 - 70
5	**DANGEROUS**	SHUT IMMEDIATELY	70 +

Reference temperatures determined by Thermographer.
Delta T values are deviations from Reference temperatures.

CONTACT / QUALIFICATION DETAILS

HOTSPOTTHERMOGRAPHY PTY LTD
ABN 20 094 264 810

CONTACT: Wolfgang Forke
Managing Director

Electrical Technician (Higher Technician Certificate)
Thermographer Level 2 (AS 3998-2002)

CONTACT DETAILS: PH Mob 0409216269
EMAIL wforke@hotspotthermo.com
WEB www.hotspotthermo.com

ADDRESS: P.O. Box 218
Mount Beauty,
Victoria 3699

OPERATING FROM MELBOURNE AND ALBURY WODONGA

InfReC
InfraRed Camera

Avio

High Resolution - Multi-Purpose Infrared Thermal Imaging Camera

InfReC R300SR series

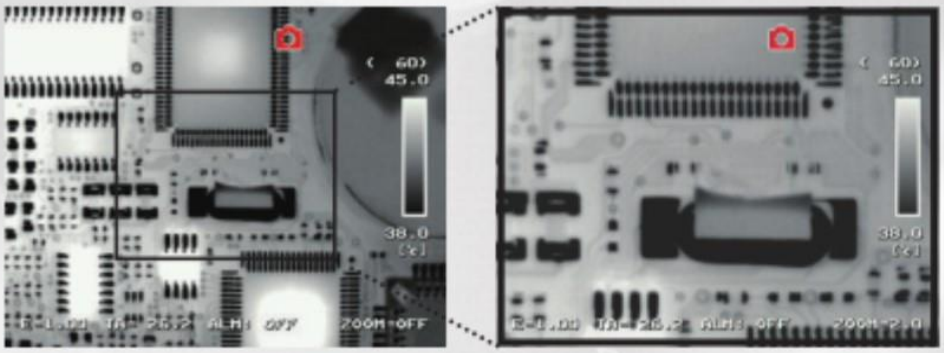
Highly Sensitive, High Resolution, High Quality Thermal Image Capturing for Thermographers.

World's First Development (1)

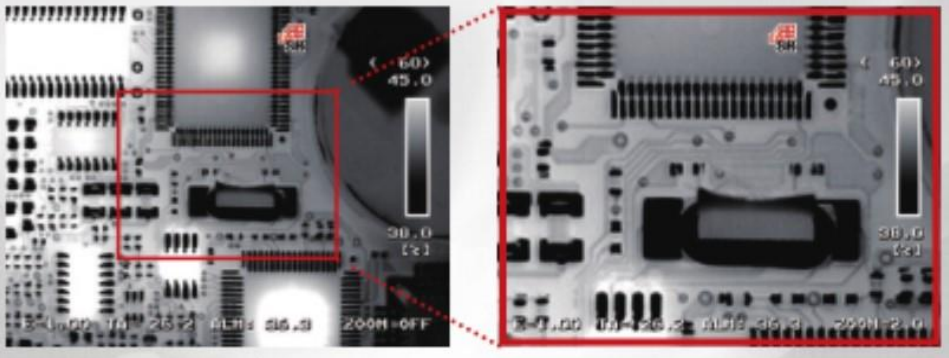
Onboard Super Resolution Processing Improves Thermal Image Quality Using 4x Pixel Count Enhancement.

Super Resolution Images are Instantaneously Replayed on Camera View Screen Immediately After Shooting Without a PC.

Sensor format image (320 x 240 pixels)



Super Resolution mode image (640 x 480 pixels)



(1): As of 2012 November 14th according to our research.

Model R300SR High Resolution Thermal Images Surpass ALL Infrared Thermal Imaging Cameras in this Class by use of Avio's Multi-Frame Super Resolution Processing.

- Super Resolution (SR) mode 640 x 480 pixels.
- Highest in Class Thermal Sensitivity (NETD) of 0.025℃ (Model R300SR-S) .
- Spatial Resolution corresponds to 0.8mrad (Super Resolution (SR) mode).
- Additional Super Resolution Image Clarity is Provided by Included PC Software.

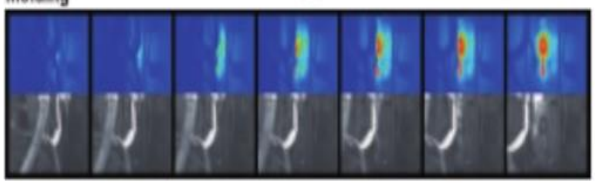
NIPPON AVIONICS CO.,LTD.
An NEC Group Company

Both Thermal and Visual Images are Captured Simultaneously

Transfer Thermal Images to a PC at 60 fps via USB2.0. *5

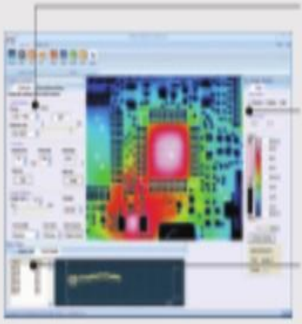
Capture Real-time and Visual Images and Simultaneously Analyze Thermal Image.

Molding



On-line Analysis Software is Standard accessory.*

Rich functions in both On-line and Off-line

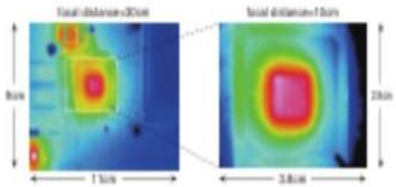


- **Camera Control**
  Control focus, set temperature measuring range and perform calibration, etc. via PC.
- **Real-time image display and recording**
  Display thermal image, visual image and fusion image simultaneously in real-time and record to PC (HDD).
  *Optional for R300SR-S/R300SR-SD
- **Real-time measurement**
  Display temperatures of measuring points and max/min/average in specified boxes.

Close-up Focus with Standard Lens

Realize 80µm Minimum Spatial Resolution at 10 cm distance (SR mode)

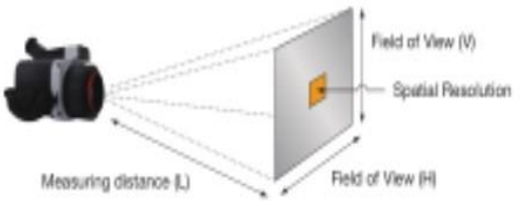
Use the Model R300SR series standard Lens with 10 cm close-up focus lens capability, 80µm Spatial Resolution is Achieved with Avio's Multi-frame Super Resolution Technology.



Measuring Distance and F.O.V.

Field of View and Spatial Resolution are the same magnification with measuring distance.

Lens Type			2x Telephoto Lens	Standard Lens	0.5x Wide Angle Lens
L=1m	Field of View (H) x (V)		19x15cm	38x29cm	76x57cm
	Spatial Resolution	Normal Mode	0.6mm	1.2mm	2.4mm
		Super Resolution (SR mode) *1	0.4mm	0.8mm	1.6mm



Specifications

Item			R300SR	R300SR-D	R300SR-H	R300SR-HD	R300SR-S	R300SR-SD
Basic Performance	Measuring Range		-40 to 500°C		-40 to 2000°C		-40 to 120°C	
	Sensitivity (NETD)		0.03°C at 30°C (with S/N improvement)				0.025°C at 30°C (with S/N improvement)	
	Accuracy		±1°C *2				±2°C or ±2%	
	Frame Rate		60Hz	8.5Hz	60Hz	8.5Hz	60Hz	8.5Hz
	Spectral Range		8 to 14µm					
	Detector Pixels		320(H)×240(V) pixels					
	Recording Pixels		Standard : 320(H)×240(V) pixels, SR mode : 640(H)×480(V) pixels *3					
	Field of View		22°(H)×17°(V) (with standard lens)					
	Spatial Resolution		Standard : 1.2 mrad, SR mode : equivalent to 0.8 mrad *1 (with standard lens)					
	Focal Distance		10cm to infinity (with standard lens) *4					
Image Display	Auto Functions		Auto-scale, Auto-focus, Full-auto					
	Color Pallet		Olive, Rainbow, Iris, Brightness, Hot iron, Hot white, Hot black					
	Gradation		256/32/16bit tones					
	Visual Camera		CMOS camera 3.1M pixels Fusion, Picture-in-Picture, Alpha Blending, Split-Screen					
	Display Functions	Digital Zoom	1 to 4 times continuous zoom (with display positioning scroll)					
		Grid Overlay	Provided					
		Multi-Image-Display	Display 9 images (replay mode)					
	Image Quality Improvement	Averaging	Off / 2A/ 2B/ 2(16)(with ghost rejection)					
		Edge Enhancement	Provided					
Measure Function	Point Temperature		10 Movable Points					
		Temperature Search	MAX, MIN					
		Delta Temperature	Provided					
	Temperature Display in Assigned Region		MAX, MIN and AVG in Box (for up to 5 Boxes)					
	Line Profile		Horizontal, Vertical or Horizontal & Vertical					
	Alarm function		Alarm Sound, Alarm Display, Color Alarm(ISO), Ext Alarm Output, Alarm Recording					
	Temperature Correction Function		Emissivity, Environment/Background, Distance, NUC					
		Emissivity	Multi-Point Correction, Emissivity Reverse Calculation, Emissivity Table					
Storage / Output	Storage Device		SD Card, Compatibility SDHC					
	Data Storage		Still Image : JPEG with Temperature Data (14 bit), Movie : SVX file (exclusive), Visual Image Simultaneously Recorded					
		Super Resolution	Provided					
		Quick Panoramic Image	Horizontal Equivalent to 70°, Vertical Equivalent to 52°					
		External Trigger	Provided					
		Internal Recording	3s to 60min, Visual Image Simultaneously Recorded					
		Movie Recording	Max 10 fps in SD Card	Max 8.5 fps in SD Card	Max 10 fps in SD Card	Max 8.5 fps in SD Card	Max 10 fps in SD Card	Max 8.5 fps in SD Card
		Voice Annotation	30sec Recording/Replay per Image					
		Text Annotation	Annotate up to 128 Characters with each Thermal Image Import Characters from SD Card					
	Interface	USB2.0	Mass-Storage/Image Transfer (Thermal Image Max 60Hz, Visual Image Max 7.5Hz/*5*6				Mass-Storage *6	
		Video output	NTSC or PAL					
		Alarm output	Provided (Contact Closure, No Voltage)					
		External trigger input	Provided (Pulse Signal)					
User Interface Setup	Graphical User Interface's Supported Language		English, French, Spanish, German, Italian, Portuguese, Russian, Finnish, Danish, Norwegian, Swedish, Dutch, Chinese (Traditional, Simplified), Korean and Japanese.					
	Display		3.5" LCD Monitor (with Tilt and Brightness Adjustment), Color View Finder (with Tilt Mechanism)					
	Auxiliary	Laser Pointer	Provided (Class-2 Red color)					
		LED Light	Provided					
		Wired Remote Control Unit	Provided					
Others	Environment Resistance	Operating temperature / Humidity	-15°C to 50°C, 90%RH					
		Vibration / Shock	29.4m/sec²(3G), 294m/sec²(30G)					
		Dust / Splash Proof	IP54					
	Battery Operation		3hours (typ), Rechargeable Li-Ion battery					
	Dimensions		Approx. 121mm(H) × 105mm(W) × 193mm(D) (excluding projections)					
	Weight		Approx. 1.3kg (including Battery Pack)					
	Standard Accessories		AC Adaptor x1, Battery Charger x1, Rechargeable Li-Ion Battery x1, SD Card x1, USB Cable x1, Wristband x1, Grip Belt x1, Software x1, Operation Manual x1, and Carrying Case x1					
	Standard Software		IrPleC Analyzer NS9500Pro(Including NS9500Std)				IrPleC Analyzer NS9500Std	

*1 This increased resolution results from detecting characteristic points within all frames acquired by the SR process and removing such effects as those caused by hand vibration.
*2 Operating Temperature : 18 to 40°C *3 Static image only *4 For specified Temperature Accuracy : 30 to cm to infinity
*5 R300SR-D/R300SR-HD: Thermal Image Max 8.5Hz, Visual Image Max 7.5Hz
*6 Real-Time Image Transfer for PC monitor and capture supported when used with NS9500Pro
(bundled with R300SR/R300SR-D/R300SR-H/R300SR-HD, optional for R300SR-S/R300SR-SD)

Options

Options	Model	Specifications / Remarks
2x Telephoto Lens	IRL-TX02C-B	11°(H) x 8.5°(V)
0.5x Wide Angle Lens	IRL-WX02C-B	44°(H) x 34°(V)
72µm Close-up Lens	IRL-C072UB-B	Working distance: 56mm For R300SR/R300SR-D/R300SR-H/R300SR-HD Only
AC Adaptor	RC45-09-110V/220V	110v or 220v
Rechargeable Battery Pack	T2UR18650F5928	(2500mAh) Driving Hours:2 Hours(typical)
Battery Charger	NC-LSC05-110V/220V	110v or 220v
LCD Hood	IRU-F01A	
Tripod(medium)	104118	
NS9500Std Upgrade	NS9500 PRO-B-U	From NS9500Std to NS9500Pro

ASSET INSPECTION REPORT

UTILITY ASSET MANAGEMENT Downer Relationships creating success

DATE	INSPECTOR	LOCATION
Mon 23/10/2023	Craig Cousland	Holcim Quarries

Pole Nbr	Type	Material	Species	Year	Size	Girth	Good Wood Ground	Good Wood 1m	Maint Priority 1	Maintenance 1	Maint Priority 2	Maintenance 2	Maint Priority 3	Maintenance 3	Condition	Comments
P15	HV	Concrete		1989	12.5m, 12kN										Serviceable	
P16	HV	Concrete		1989	12.5m, 12kN										Serviceable	
P17	Switch	Concrete		1988	12.5m, 8kN				Low	Animal proofing required on edo, s powder filled fuses					Serviceable	
P13	HV	Concrete		1989	17ft, 12kN										Serviceable	
P12	HV	Concrete		1989	17ft, 12kN										Serviceable	
P11	SUB POLE	Concrete		1989	17ft, 12kN				Medium	Underground cover required (2 out of 3)	Low		Low	Underground cover required (2 out of 3)	Serviceable	
P10	HV	Concrete		1989	17ft, 12kN				Medium	Underground covers required (1 out 3)	High	Bees in pole (top xarm brackets)	Low	Chipped concret (supervisory cable bracket)	Serviceable	
P9	HV	Concrete		1989	17ft, 12kN				High	Bees in pole (near top)	Medium	Supervisory cable tied on by rope and cable ties (inappropriate fixing)	High	Bees in pole (near top)	Serviceable	
P8	HV	Concrete		1989	17ft, 12kN				Low	Hole in chipped concrete at top of pole (exposed rio)	Low	Hook required for supervisory cable on pole	Low	Hole in chipped concrete at top of pole (exposed rio)	Serviceable	
P7	HV	Concrete		1989	17ft, 12kN				Low	Hook required for supervisory cable on pole					Serviceable	
P6	HV	Concrete		1989	17ft, 12kN				Low	Chipped concrete and exposed rio at top of pole	Low	Hook required for supervisor cable on pole	Low	Chipped concrete and exposed rio at top of pole	Serviceable	
P5	HV	Concrete		1989	17ft, 12kN				High	Bees in pole	Low	Hook required for supervisor cable on pole	High	Bees in pole	Serviceable	
P4	HV	Concrete		1989	17ft, 12kN								Low	Rusty support bolts holding up sub and switch	Serviceable	
P3	Switch	Concrete		1989	17ft, 12kN										Serviceable	
P2	Switch	Wood	GI	1988	12.5m, 12kN		150	999							Serviceable	
10A	HV	Wood	IB	2001	14m, 12kN	1060	150	999	Medium	Nails loose in pole cap					Serviceable	
10B	HV	Wood	SG	2001	14m, 8kN	980	150	999							Serviceable	

10 C	SUB POLE	Wood	SG	2001	14m, 12kN	980	150	999	Medium	Nails loose in pole cap					Serviceable	
P18	HV	Concrete		1989	12.5m, 8kN				Low	Guy cover required					Serviceable	
P19	Switch	Concrete							High	Underground cover required (2 of 3) hv cable head					Serviceable	
P20	HV	Concrete		1989	12.5m, 8kN				Low	Low supervisory cable					Serviceable	
P21	HV	Concrete		1989	12.5m, 8kN				Low	Low supervisory cable					Serviceable	
P22	Switch	Concrete		1989	12.5m, 8kN										Serviceable	
P23	HV	Concrete		1989	12.5m, 8kN										Serviceable	
P24	HV	Concrete		1988	12.5m, 12kN				High	New pole required					Unserviceable	May have to be relocated
P14	SUB POLE	Concrete		1989	12.5m, 8kN				Medium	Animal proofing required on 5 shed insulator on pole					Serviceable	

INSPECTION FINDINGS	26 poles were inspected in total.
	25 Poles are Serviceable, 1 pole is not serviceable
	Poles: P11, P10, P9, P8, P6, P5, 10A, P17, P7, P18, P19, P20, P21, P24, P14, 10C, P14 require maintenance

note: 13th June 2024 - Pole 24 Replacement - Engineering and Design in progress to facilitate relocation.

Expectation from the industry is that a pole inspection is performed at least every four years.

4.3 OVERHEAD LINE MAINTENANCE

The Overhead line maintenance was performed during the HV shut on Sunday 6th June 2021 by OHMS (Overhead Maintenance Services). The following activities were undertaken on the day:

- Tighten and clean (Insulators) 27 poles during the shutdown
- Tighten and clean 4 aerial substations
- Tighten and clean 6 airbrake switches and underground cable heads
- Reconnect surge diverters

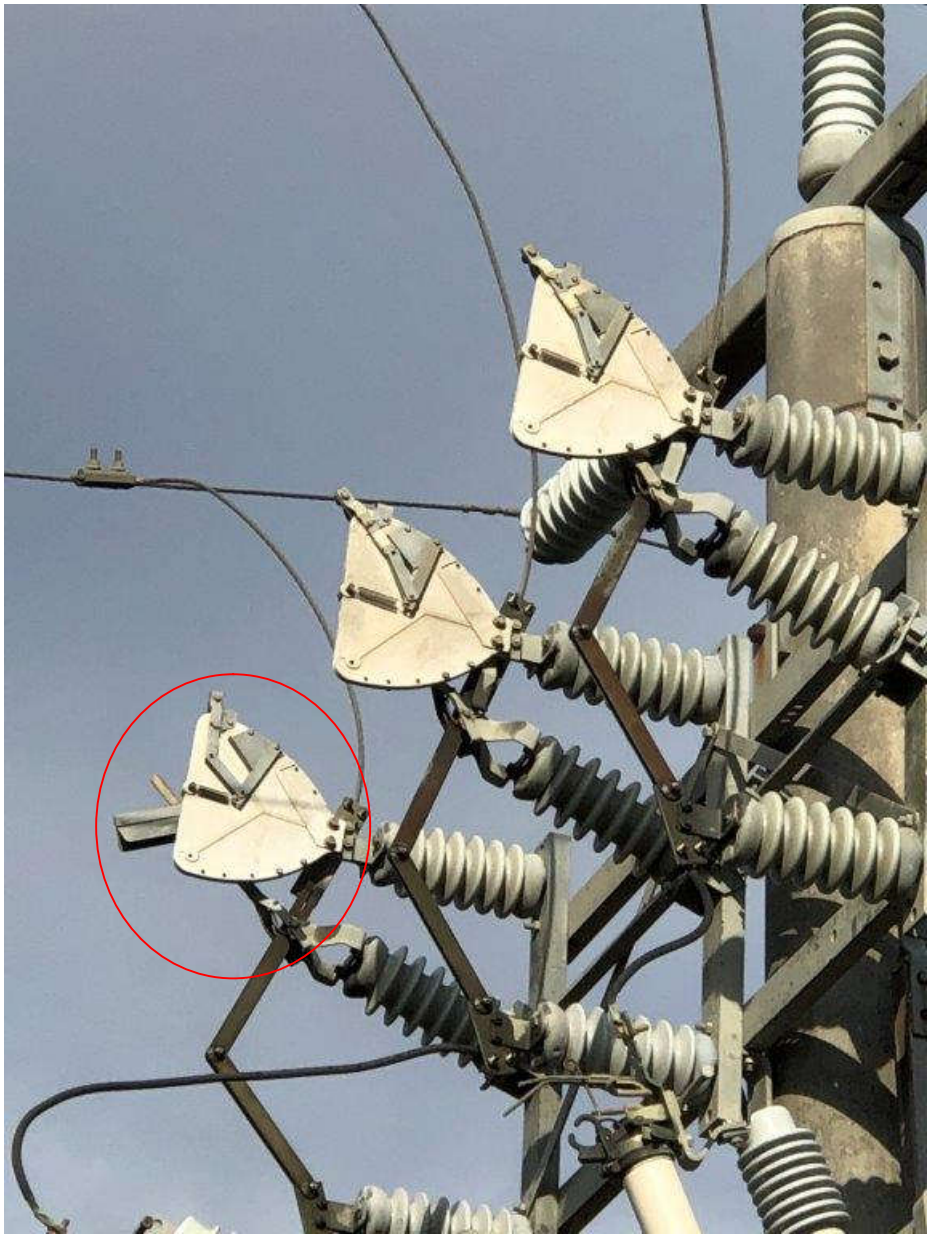
Refer to appendix D4 for the OHMS OHL inspection report.

Poles 2 and 3 were visually inspected, but since the isolation point was the Nulec Auto Recloser on pole 3, maintenance of this pole was not possible. Note that when the REFCL associated isolation transformer is installed in 2022 this auto recloser will be retired.

Pole 14 associated airbrake switch operator handle was split through and was replaced by a fibreglass version.

All airbrake switches were cleaned, aligned and lubricated profusely. This is the normal service requirement, however in the dusty Quarry environment all lubrication applied will attract dust quickly and within a short period of time the airbrake switches will seize.

Airbrake switches on Poles 14 and 17 still suffer from alignment issues and took several attempts to close all three switches (Phases) at the same time. Picture below shows the distant phase not aligning properly.



These airbrake switches must not be operated live.

Oaklands Junction, even after the installation of the Isolation transformer next year will still only have a single isolation point at the front of the property.

All parties (ARA, OHMS and PCS) involved recommend replacing these airbrake switches with pole mounted gas switches purely from a safety perspective which would also provide individual isolation for each transformer without having to isolate the entire site before operating one of the airbrake switches (Open or close).

Pole 21 (P33470) was visually inspected as access from the EWP truck was not possible.

Pole 22 (P33471) access was provided by the removal of the road embankment via a front-end loader, however this only provided access to the near side of the pole mounted equipment for cleaning and servicing. Refer photo.

HOLCIM QUARRY OAKLANDS JUNCTION 2023
Tree Assessment

Notes:

- Last Assessment September 2023 assessment completed and no issues or actions identified
- 2024 Assessment due September 2024