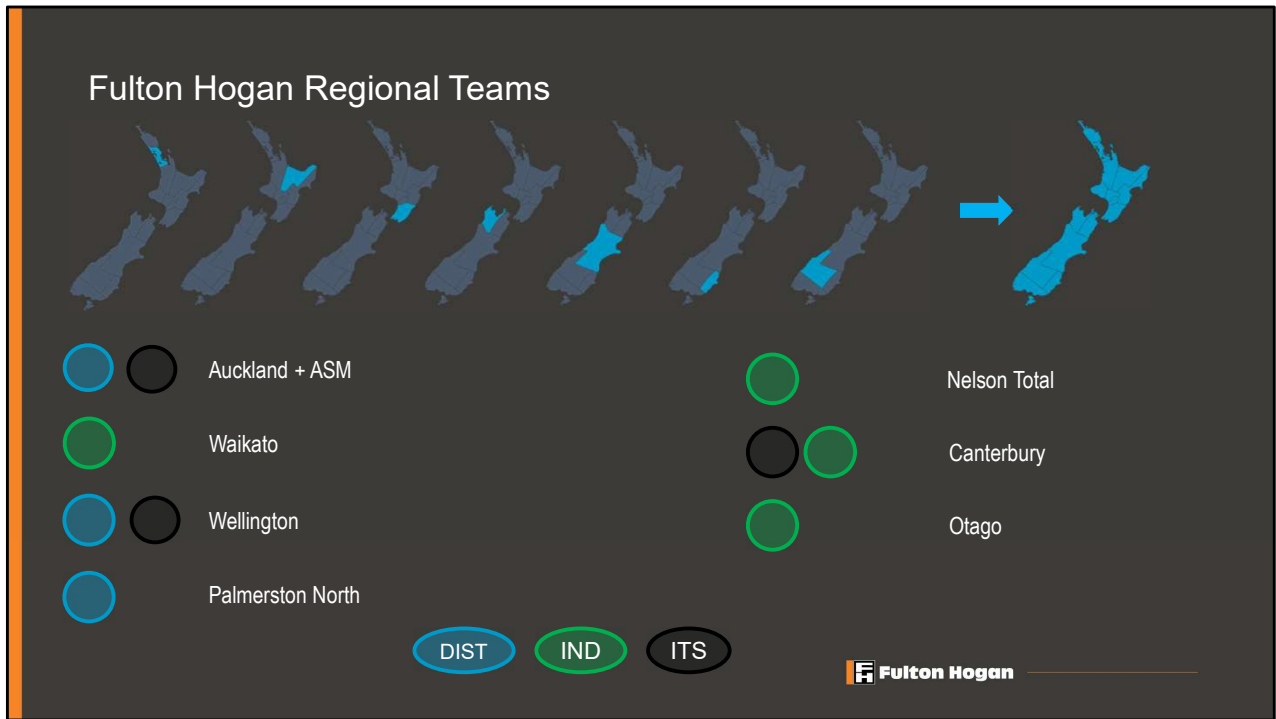




Introduction for Craig Fraser Philip Eade  
Thanks for the opportunity for Silver sponsorship  
Appreciate being able to talk to you all about FH Electrical Capabilities



We have Electrical business's in all of the major regions across New Zealand

ITS & Traffic Signals Maintenance and Infrastructure Upgrades  
 (CCTV, Webcams, VMS Signs, AWS, PLC Device Controllers, Traffic Counters, Road Side Cabinets, Private Utilities Network Maintenance)

Street Light Maintenance Contracts & Renewal Projects

Industrial Maintenance Asphalt Plant, Bitumen Plants (60 regional plants)

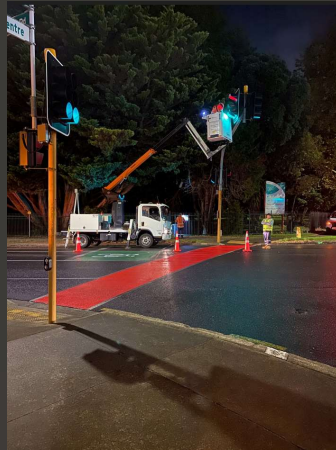
Industrial Maintenance Quarry Sites and Portables Crushing Sites

Yearly Inspections on Bitumen Tankers

3 Waters (Pumping Station Maintenance)

Airfield Lighting

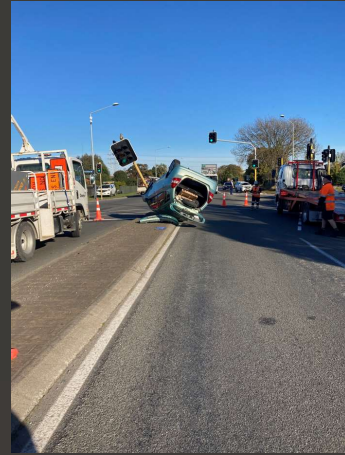
## What We Do



 **Fulton Hogan**

ITS & Traffic Signals

## What We Do



 **Fulton Hogan**

Traffic Signals & ITS

## What We Do



 **Fulton Hogan**

Street Lighting

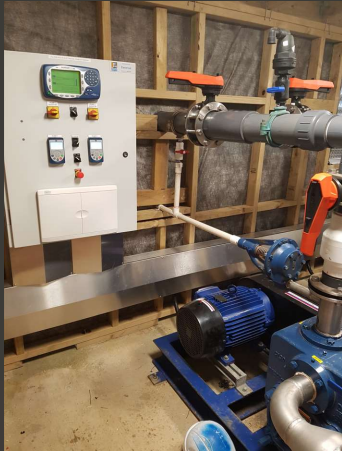
## What We Do



 **Fulton Hogan**

Brief on Region  
Industrial Maintenance

## What We Do



 **Fulton Hogan**

3 Waters

## What We Do



 **Fulcrum Hogan**

3 Waters



## What We Do



 **Fulton Hogan**

## Airport Lighting

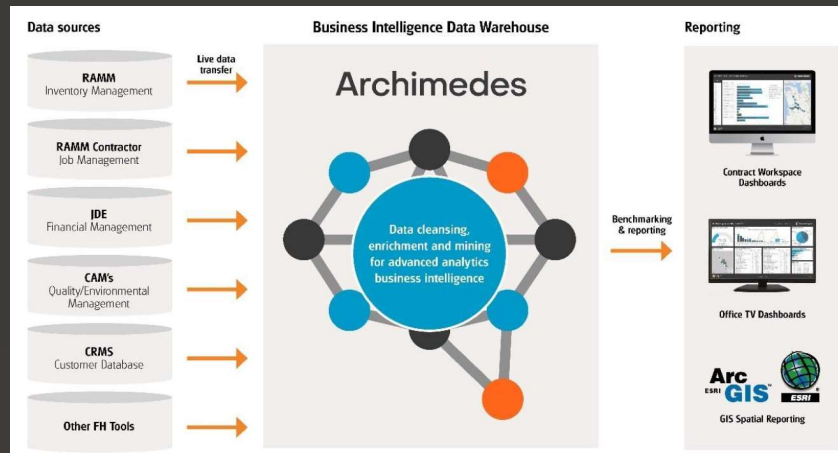
## How We Add Value



Fulton Hogan

Communication with Client followed up with Detailed Reports  
Understanding Clients Needs  
Smarter Traffic Management Solutions  
Development of Fault Management Platforms

## How We Add Value



Fulton Hogan

Communication with Client followed up with Detailed Reports  
Understanding Clients Needs  
Smarter Traffic Management Solutions  
Development of Fault Management Platforms  
Contract Workspace

# Electrical Compliance

## Category 21 - 8 cat form Minimum Electrical PPE Protection for Plant and Asset Operators

This category is intended for use by electrically qualified persons when working on or near energized electrical switchboards, control panels, kiosks, racks or Racks when an electrical worker needs to:

- Close circuit breakers
- Check or replace fuses in racks
- Read or operate panel meters

### Cat 21 Access and Arc Flash Boundary Limitations

Restrictions to access for Category 21 apply and is defined as work undertaken between the 'Limited Approach' and the 'Restricted Space' Boundaries shown in the yellow zone where no access to energized electrical circuits or parts exist.



### Cat 21 Effects & Restrictions

- Includes criteria as defined in Category 11
- This Red Zone is active when access to the switchboard or panel is gained to operate switches and circuit breakers
- Only personnel located inside the Red Restricted Space is not permitted
- Working a panel meter while operating a switch
- Periodic hand functionality and other non-contact inspections outside of the restricted zone including examination of cables with no manipulation of cables
- Perform maintenance on single or multi-volt units for DC Systems
- Operation of circuit breakers, busbars and systems is permitted and includes equipment of PPE face shields and caps
- Higher levels of PPE may be required for duties and activities when maintenance is being done on the control panel of a piece of equipment, including a control panel that has high-voltage terminals
- Locking, tagging and hand tools need to be used
- Non-qualified persons entering the Restricted Approach Boundary shall be continuously monitored and advised of risks and must have the same PPE category as required

Category	Working and Restrictions	Minimum PPE
Category 21	<ul style="list-style-type: none"> <li>• Limited Approach</li> <li>• Restricted Space</li> <li>• Prohibited Zone</li> <li>• Locking, tagging and hand tools</li> <li>• Barrier and Warning Signs</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 8 ELP - Mandatory</li> <li>• Arc Flash Protection - Mandatory</li> <li>• Eye Protection - Mandatory</li> <li>• Head Protection - Mandatory</li> <li>• Hearing Protection - Mandatory</li> <li>• Fall Protection - Mandatory</li> <li>• Hand Protection - Mandatory</li> <li>• Foot Protection - Mandatory</li> <li>• Respiratory Protection - Mandatory</li> <li>• Skin Protection - Mandatory</li> <li>• Thermal Protection - Mandatory</li> <li>• Cold Protection - Mandatory</li> <li>• High Voltage Protection - Mandatory</li> <li>• Low Voltage Protection - Mandatory</li> <li>• Radiation Protection - Mandatory</li> <li>• Laser Protection - Mandatory</li> <li>• Ionizing Radiation Protection - Mandatory</li> <li>• Non-ionizing Radiation Protection - Mandatory</li> <li>• Noise Protection - Mandatory</li> <li>• Vibration Protection - Mandatory</li> <li>• Ergonomic Protection - Mandatory</li> <li>• Environmental Protection - Mandatory</li> <li>• Chemical Protection - Mandatory</li> <li>• Biological Protection - Mandatory</li> <li>• Mechanical Protection - Mandatory</li> <li>• Electrical Protection - Mandatory</li> <li>• Fire Protection - Mandatory</li> <li>• Explosion Protection - Mandatory</li> <li>• Corrosion Protection - Mandatory</li> <li>• UV Protection - Mandatory</li> <li>• Infrared Radiation Protection - Mandatory</li> <li>• Radio Frequency Radiation Protection - Mandatory</li> <li>• Microwave Radiation Protection - Mandatory</li> <li>• Laser Radiation Protection - Mandatory</li> <li>• Ionizing Radiation Protection - Mandatory</li> <li>• Non-ionizing Radiation Protection - Mandatory</li> <li>• Noise Protection - Mandatory</li> <li>• Vibration Protection - Mandatory</li> <li>• Ergonomic Protection - Mandatory</li> <li>• Environmental Protection - Mandatory</li> <li>• Chemical Protection - Mandatory</li> <li>• Biological Protection - Mandatory</li> <li>• Mechanical Protection - Mandatory</li> <li>• Electrical Protection - Mandatory</li> <li>• Fire Protection - Mandatory</li> <li>• Explosion Protection - Mandatory</li> <li>• Corrosion Protection - Mandatory</li> <li>• UV Protection - Mandatory</li> <li>• Infrared Radiation Protection - Mandatory</li> <li>• Radio Frequency Radiation Protection - Mandatory</li> <li>• Microwave Radiation Protection - Mandatory</li> </ul>

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## Category 23 - 8 cat form Minimum Electrical PPE Protection for Plant and Asset Operators

This category is intended for use by electrically qualified persons when working on or near energized electrical switchboards, control panels, kiosks, racks or Racks when an electrical worker needs to:

- Close circuit breakers
- Check or replace fuses in racks
- Read or operate panel meters

### Cat 23 Access and Arc Flash Boundary Limitations

Restrictions to access for Category 23 apply and is defined as work undertaken inside the 'Restricted Boundary' shown in the red zone where access to energized electrical circuits or parts exist.



### Cat 23 Effects & Restrictions

- Includes criteria as defined in Category 11 and Category 21
- This Red Zone is active when access to the switchboard, panel meters and other equipment is gained to operate switches and circuit breakers
- Only personnel located inside the Red Restricted Space is not permitted
- Working a panel meter while operating a switch
- Periodic hand functionality and other non-contact inspections outside of the restricted zone including examination of cables with no manipulation of cables
- Perform maintenance on single or multi-volt units for DC Systems
- Operation of circuit breakers, busbars and systems is permitted and includes equipment of PPE face shields and caps
- Higher levels of PPE may be required for duties and activities when maintenance is being done on the control panel of a piece of equipment, including a control panel that has high-voltage terminals
- Locking, tagging and hand tools need to be used
- Non-qualified persons entering the Restricted Approach Boundary shall be continuously monitored and advised of risks and must have the same PPE category as required

Category	Working and Restrictions	Minimum PPE
Category 23	<ul style="list-style-type: none"> <li>• Limited Approach</li> <li>• Restricted Space</li> <li>• Prohibited Zone</li> <li>• Locking, tagging and hand tools</li> <li>• Barrier and Warning Signs</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 8 ELP - Mandatory</li> <li>• Arc Flash Protection - Mandatory</li> <li>• Eye Protection - Mandatory</li> <li>• Head Protection - Mandatory</li> <li>• Hearing Protection - Mandatory</li> <li>• Fall Protection - Mandatory</li> <li>• Hand Protection - Mandatory</li> <li>• Foot Protection - Mandatory</li> <li>• Respiratory Protection - Mandatory</li> <li>• Skin Protection - Mandatory</li> <li>• Thermal Protection - Mandatory</li> <li>• Cold Protection - Mandatory</li> <li>• High Voltage Protection - Mandatory</li> <li>• Low Voltage Protection - Mandatory</li> <li>• Radiation Protection - Mandatory</li> <li>• Laser Protection - Mandatory</li> <li>• Ionizing Radiation Protection - Mandatory</li> <li>• Non-ionizing Radiation Protection - Mandatory</li> <li>• Noise Protection - Mandatory</li> <li>• Vibration Protection - Mandatory</li> <li>• Ergonomic Protection - Mandatory</li> <li>• Environmental Protection - Mandatory</li> <li>• Chemical Protection - Mandatory</li> <li>• Biological Protection - Mandatory</li> <li>• Mechanical Protection - Mandatory</li> <li>• Electrical Protection - Mandatory</li> <li>• Fire Protection - Mandatory</li> <li>• Explosion Protection - Mandatory</li> <li>• Corrosion Protection - Mandatory</li> <li>• UV Protection - Mandatory</li> <li>• Infrared Radiation Protection - Mandatory</li> <li>• Radio Frequency Radiation Protection - Mandatory</li> <li>• Microwave Radiation Protection - Mandatory</li> </ul>

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## Category 22 - 8 cat form Minimum Electrical PPE Protection for Plant and Asset Operators

This category is intended for use by electrically qualified persons when working on or near energized electrical switchboards, control panels, kiosks, racks or Racks when an electrical worker needs to:

- Close circuit breakers
- Check or replace fuses in racks
- Read or operate panel meters

### Cat 22 Access and Arc Flash Boundary Limitations

Restrictions to access for Category 22 apply and is defined as work undertaken inside the 'Restricted Boundary' shown in the red zone where access to energized electrical circuits or parts exist.



### Cat 22 Effects & Restrictions

- Includes criteria as defined in Category 11 and Category 21
- This Red Zone is active when access to the switchboard, panel meters and other equipment is gained to operate switches and circuit breakers
- Only personnel located inside the Red Restricted Space is not permitted
- Working a panel meter while operating a switch
- Periodic hand functionality and other non-contact inspections outside of the restricted zone including examination of cables with no manipulation of cables
- Perform maintenance on single or multi-volt units for DC Systems
- Operation of circuit breakers, busbars and systems is permitted and includes equipment of PPE face shields and caps
- Higher levels of PPE may be required for duties and activities when maintenance is being done on the control panel of a piece of equipment, including a control panel that has high-voltage terminals
- Locking, tagging and hand tools need to be used
- Non-qualified persons entering the Restricted Approach Boundary shall be continuously monitored and advised of risks and must have the same PPE category as required

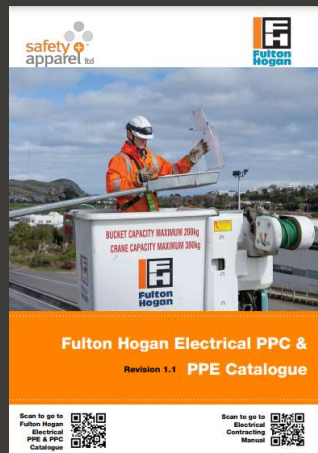
Category	Working and Restrictions	Minimum PPE
Category 22	<ul style="list-style-type: none"> <li>• Limited Approach</li> <li>• Restricted Space</li> <li>• Prohibited Zone</li> <li>• Locking, tagging and hand tools</li> <li>• Barrier and Warning Signs</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 8 ELP - Mandatory</li> <li>• Arc Flash Protection - Mandatory</li> <li>• Eye Protection - Mandatory</li> <li>• Head Protection - Mandatory</li> <li>• Hearing Protection - Mandatory</li> <li>• Fall Protection - Mandatory</li> <li>• Hand Protection - Mandatory</li> <li>• Foot Protection - Mandatory</li> <li>• Respiratory Protection - Mandatory</li> <li>• Skin Protection - Mandatory</li> <li>• Thermal Protection - Mandatory</li> <li>• Cold Protection - Mandatory</li> <li>• High Voltage Protection - Mandatory</li> <li>• Low Voltage Protection - Mandatory</li> <li>• Radiation Protection - Mandatory</li> <li>• Laser Protection - Mandatory</li> <li>• Ionizing Radiation Protection - Mandatory</li> <li>• Non-ionizing Radiation Protection - Mandatory</li> <li>• Noise Protection - Mandatory</li> <li>• Vibration Protection - Mandatory</li> <li>• Ergonomic Protection - Mandatory</li> <li>• Environmental Protection - Mandatory</li> <li>• Chemical Protection - Mandatory</li> <li>• Biological Protection - Mandatory</li> <li>• Mechanical Protection - Mandatory</li> <li>• Electrical Protection - Mandatory</li> <li>• Fire Protection - Mandatory</li> <li>• Explosion Protection - Mandatory</li> <li>• Corrosion Protection - Mandatory</li> <li>• UV Protection - Mandatory</li> <li>• Infrared Radiation Protection - Mandatory</li> <li>• Radio Frequency Radiation Protection - Mandatory</li> <li>• Microwave Radiation Protection - Mandatory</li> </ul>

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2019 Fundamental Changes to the Electrical Regulations  
 Introduced National directive to manage compliance in the regions  
 Minimum requirements introduced  
 Compliance work shops  
 Training and competency frameworks and guides  
 PPE roll out in  
 Canterbury 18k estimated 100k nationally



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