

Substation Maintenance Instruction

Graffiti rectification and painting

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Substation Maintenance Instruction

ASSET STANDARDS AND DESIGN

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SMI 105 GRAFFTI RECTIFICATION AND PAINTING

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1.0 PURPOSE

To set out in detail the requirements for graffiti rectification and painting of electrical assets.

2.0 SCOPE

This instruction defines the requirements for graffiti rectification and painting of electrical assets.

This instruction is to be read in conjunction with SMI 100 for transmission and zone substation equipment and SMI 101 for distribution equipment.

3.0 REFERENCES

Internal

- Company Policy 4.0 – Environment
- Company Policy 9.9.1 - Network Asset Maintenance
- Company Procedure GSY 1066 - Worksite Hazard and Risk Assessment
- Substation Maintenance Instruction SMI 100 - Minimum requirements for maintenance of transmission and zone substation equipment
- Substation Maintenance Instruction SMI 101 - Minimum requirements for maintenance of distribution equipment
- Equipment Technical Specification ETS 0077 - Padmount substation cubicles
- Endeavour Energy Electrical Safety Rules
- Safe work method statements SWM 6.002 – Handling burnt or burning CCA timber

External

- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulation 2011*
- *Electricity Supply Act 1995 (No 94)*
- *ENA National Electricity Network Safety Code (Doc 01-2008)*
- *Safe Work Australia – “National code of practice for the safe handling of timber preservative and treated timber”*
- *WorkCover NSW – “Safe handling of timber preservatives and treated timber code of practice”*

4.0 DEFINITIONS AND ABBREVIATIONS

CCA	Pole treated with a copper chromium arsenate preservative, used to extend the operational life of the wooden pole.
Ellipse	Endeavour Energy asset database
EPA	NSW Environmental Protection Agency

5.0 ACTIONS

5.1 Precautions before commencing work

5.1.1 Safety standards

The contractor, their employees, and any subcontractors, must abide by the Endeavour Energy Safety Rules, and any amendments to these documents, for the duration of the works to be carried out as a result of this instruction.

5.1.2 Worksite hazard and risk assessment and Safe Work Method Statements

Prior to commencing any work on site, a Worksite Hazard and Risk Assessment (FSY 0118) is to be completed.

5.1.3 Duty of care

The contractor, their employees, and any subcontractors, must display a duty of care to the public, other Endeavour Energy contractors and Endeavour Energy employees, during the course of their work.

If a potential safety issue is identified, the Contractor must notify the Operations Manager, Substation Civil Maintenance.

5.1.4 Clothing & PPE

All employees, contractors or subcontractors must be appropriately dressed at all times in accordance with Company Procedure GSY0067 - Personal Protective Equipment.

5.1.5 Environment

All noise, waste materials, run off, cleaning solvents, and items such as water and oil, must be controlled to meet EPA and local council guidelines, and be in accordance with Company Policy 4.0 - Environment. All equipment must be suitable for the environment in which it will need to operate.

Any environmental incidents must be addressed in accordance with GPE 0060 - Environmental Incident Response and Management.

5.1.6 Voltage leakage check

Before commencing any activities on electrical assets or hardware, such as poles or distribution substations, the Contractor must carry out a voltage leakage check on the asset.

The Contractor must be suitably attired with low voltage insulating gloves worn on both hands to perform the voltage leakage test and to prove the pole safe to touch before direct contact is made with the pole and attachments.

The integrity of the meter must be checked in accordance with clause 5.4.10.1. After each pole check, the functionality of the device must be re-checked in accordance with the manufacturer's instructions.

5.1.7 Multimeter check

The multimeter used to perform the voltage check must have a function to measure both LOW and HIGH impedance (proximity test), for example, *Fluke 117*.

Prior to and after checking any pole for voltage leakage, the multimeter must be checked for integrity. This test must be performed in accordance with the manufacturer's instructions by either:

- using a known voltage point such as a power point or another known live circuit; or,



Figure 1 - Settings for multimeter check and high impedance check

- as this meter is sensitive to static electricity, it can be checked for functionality by vigorously rubbing the meter on a cotton shirt sleeve.

When used as a proximity tester (*Volt Alert* setting), the multimeter will indicate the presence of an electrical field with a light and an audible buzz.

A spare 9V alkaline battery must be carried by the Contractor as a back-up for the meter as replacement of the battery may be required at any time.

5.1.8 High impedance check

Approach the pole and visually inspect for burnt grass, electrical tracking on pole, or any other indication of an electrical failure.

Using a high impedance (Z) capacitively coupled measuring device, such as a *Fluke 117* meter on the **Volt Alert** setting and on **Lo** RANGE, stand approx one (1) metre from the pole and extend at elbow height, moving towards the pole, and touch the surface:

- Repeat for all metal (conductive) surfaces.
- A *positive* indication (light and buzz sound) must be treated with caution and the voltage level confirmed using the *Fluke 117* meter set to the **AUTO-V LoZ** setting, as described in the voltage test below.

5.1.9 Voltage test

Upon receiving a positive high impedance indication, perform a *voltage test* measurement using a low impedance resistively coupled device, such as the *Fluke 117* set to **AUTO-V LoZ**. Probes are to be connected between an earth/ground stake or similar driven into the ground a minimum of approximately one (1) metre from the pole and the pole surface. Where available, the test is to be performed at a metallic fitting, such as a pole disk indicator or pole number aluminium plate tag.



Figure 2 - Pole disc indicator and pole number plate

If the voltage on the **AUTO-V LoZ** setting is less than 5V, no further action is required and work may proceed on the pole.

If the voltage on **AUTO-V LoZ** is equal to or greater than 5V, guard the pole and immediately report the problem for attention by qualified employee.

If a hazardous condition and/or an unsafe situation is found, such as a live or failed steel pole, it must be reported immediately as set out in section 5.3.

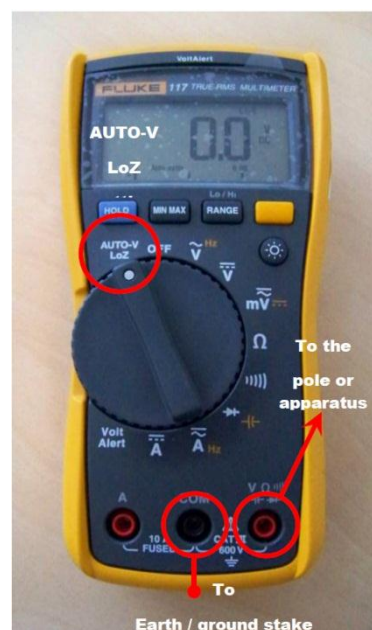


Figure 3 - Settings for voltage test

In addition, the following action must be taken:

The Contractor must:

- cordon off the area where the hazardous conditions exists;
- prevent the public from entering the area;
- notify the Operations Manager, Substation Civil Maintenance that a hazardous condition has been found;
- stand by until emergency responders have arrived;
- not proceed with any further work on the pole until advised that it is safe by an authorised person, and a further voltage leakage check confirms that the pole is safe.

If the asset is found to have a voltage present, no work is to commence and the Operations Manager, Substation Civil Maintenance must be **notified immediately**.

If non Endeavour Energy employees are to enter an Endeavour Energy Substation, they must be accompanied by an authorised Endeavour Energy employee, as directed by the Operations Manager, Substation Civil Maintenance.

5.2 Training and Qualifications

All persons undertaking work in accordance with this standard must hold the following qualifications:

- Certificate III in Painting and Decorating or equivalent;
- UETTDREL14A - Working safely near live electrical apparatus as a non-electrical worker;
- hold a current WorkCover NSW 'General Induction for Construction Work in NSW';
- completed appropriate Traffic Management Training

5.3 Traffic Management Plan

The Contractor must enact traffic management plans as required when working on Endeavour Energy assets. The Contractor will provide such plans to the Civil Operations Manager. A copy of the traffic management plan is to be kept on site at all times.

5.4 Paint requirements

Paint surfaces that have badly deteriorated or have been tagged with graffiti that is offensive, must be rectified. Non-offensive graffiti will only be rectified if a complaint is received.

Minor graffiti will be removed by either using approved cleaning agents or painted over using spray paint of a matching colour, while surfaces bearing major graffiti or major paint deterioration must be repainted.

Anti-graffiti coatings can be used on surfaces that are regularly tagged, provided the cost and life of the coating is acceptable when compared with other options.

5.5 Painting of enclosures

The Contractor must also take all reasonable steps to prevent damage, specifically:

- must not use high-pressure jet washers or steam cleaners on the electrical assets, e.g. padmount substations;

- must not use high-pressure jet washers or steam cleaners where this will cause irreversible damage to property or historic buildings;
- must take all due care to prevent damage to brickwork or stonework;
- must not use paint or sealant that restricts or blocks the flow of ventilating air to equipment; and
- must not use paint or sealant that may seize locks or hinges.

All surfaces that require repainting must be painted using only a roller or brush in the same colour as the existing surface and the finish colour of distribution cubicles must be in accordance with ETS 0077. When repainting, care must be taken to prevent the painting of locks and asset numbers and surrounding items and surfaces are not contaminated.

The existing surface colour can be changed if a government department such as a local council or Department of Housing wishes to paint a certain colour or theme such as a landscape scene on the surface. This is subject to approval from the Asset Standards and Design Manager.

Cubicle doors do not have to be removed when repainting cubicles that contain in service equipment; however the cubicle returns and door jambs must be painted as far as possible during this application.

All painting, anti-graffiti coatings and graffiti removal must be performed in accordance with the manufacturer's instructions.

5.6 CCA Treated Poles

Timber treated with CCA is generally identifiable by its green appearance, but weathering, timber species and formulation differences will sometimes make the identification difficult. If in doubt, check the pole identification disc and confirm with Endeavour Energy employees before commencing any work on the pole.

The method of restoring the surface of a CCA-treated timber pole which has been vandalized by graffiti will be to paint the affected section of the pole with copper naphthenate (CN) paint.

When working or handling Endeavour Energy CCA treated poles, the contractor must not damage or disturb the treated pole surfaces. The following methods **are not allowed** for CCA-treated timber poles:

- pressure cleaning
- steam cleaning
- sawing
- machining or sanding
- application of chemicals to remove the graffiti

When working with CCA-treated timber pole, leather gloves must be worn to avoid splinters and the unlikely absorption of any surface residues from the CCA pole. Before eating, drinking, smoking, or using toilet facilities, persons handling CCA-treated timber should thoroughly wash exposed areas, such as hands and face, with soap and water.

As a result of burning CCA-treated timber, the fumes and residues are harmful. If a CCA-treated timber pole is found to be burnt, immediately report this to the Civil Operations Manager. The Contractor will provide a photo of the burnt area of the pole and the pole number. The Contractor **must not perform any** work on the burnt section of the pole.

In all cases, if any person is inadvertently exposed to residues, particles or sawdust their work cloths must be washed separately. For safety information regarding CCA-treated timber, refer to

Safe Work Australia's "National code of practice for the safe handling of timber preservative and treated timber" and WorkCover NSW's "Safe handling of timber preservatives and treated timber code of practice".

5.7 Painting requirements

Painting requirements	Painted surfaces			Unpainted surfaces	CCA poles	Wooden (non-CCA) poles
	Fibreglass	Metallic	Other			
1.0 INSPECTION						
Inspect condition of paintwork.	x	x	x			
Inspect surface for graffiti. Only offensive graffiti will be entered as a defect.	x	x	x	x	x	x
2.0 CONDITION BASED MAINTENANCE						
2.1 Minor graffiti – cleaning						
This generally applies only to unpainted surfaces, small amounts of graffiti or where the surface has a suitable anti-graffiti coating applied.						
Remove graffiti using recommended solvent/graffiti remover.	x	x	x	x		
2.2 Major graffiti or paint deterioration – re-painting						
Surface preparation						
Wash down with low foam detergent followed by pure water wash.	x	x	x			
Repair defects on surface.	x					
Remove all loose paint and feather back.	x	x	x			
Cut out or treat rust.		x				
Abrade the entire surface, until no trace of gloss or sheen remains.		x				
Abrade the entire surface, until no trace of gloss or sheen remains being careful not to abrade through the 400 micrometre (micron) thick gel coat.	x					
Dust off and wipe clean.	x	x	x			
Paint						
Undercoat using approved undercoat.	x	x	x			
Finish coat - paint using exterior grade 100% gloss acrylic water based paint.	x		x*			
Finish coat - paint using exterior grade enamel gloss paint.		x	x*			
Finish coat – paint using exterior grade opaque wood paint.						x
Finish coat – paint using CN paint.					x	
Paint application limits						
Do not apply when rain threatens or the ambient temperature is below 10 deg. C.	x	x	x			

Do not apply paint to the following areas: Warning/identification signs and labels, gauges or indicators, vents, locks or locking mechanisms and trim.	x	x	x		x	x
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* Either type can be used, depending on surface

6.0 AUTHORITIES AND RESPONSIBILITIES

General Manager Asset Management has the authority and responsibility for approving this instruction.

Asset Standards and Design Manager has the authority and responsibility for making recommendations to the **General Manager Asset Management** in respect to this instruction.

Network Maintenance Manager is responsible for keeping the content of this instruction up to date.

Operations Manager, Substation Civil Maintenance has the responsibility for:

- confirming that the inspectors are aware of their responsibilities under this instruction;
- co-ordinating graffiti rectification work;
- confirming that contractors engaged to perform the work have the appropriate qualifications

The **Contractor** undertaking the work will be responsible for:

- meeting the requirements of this instruction.
- working in accordance with local and statutory requirements.
- maintaining a high level of public safety;
- working in accordance with Endeavour Energy's Electrical Safety Rules.
- confirming that employees engaged to perform the work have the appropriate qualifications

7.0 DOCUMENT CONTROL

Documentation content coordinator: **Network Maintenance Manager**

Documentation process coordinator: **Branch Process Coordinator**