Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

Building and Energy Western Australia

Workers guide to the

Code of practice for personnel electrical safety for vegetation control work near live power lines

May 2021

Contents

1. Introduction

This publication does not replace or override the *Code of Practice for personnel electrical safety for vegetation control work near live power lines*, referred to in this document as **the Code**. This publication extracts relevant information from the Code to assist users and provides simplified explanations for various aspects of the Code.

The user must refer to the Code for more explicit detail.

2. General principles (the Code Section 4)

Complying with the Code requires:

(a) local councils or contractors undertaking vegetation management work near powerlines to maintain an effective risk management process, as part of a safety management system;

(b) workplace hazard and risk assessments prior to the commencement of the work at each site;

(c) that safe approach distances match the designation of person, training and work to be performed;

(d) un-insulated tools or equipment in contact with a worker have the same safe approach distance as the worker;

(e) safe work method processes to be used;

(f) meeting all Code requirements;

(g) audit of administrative processes for compliance to the Code;

(h) regular field audits of vegetation management work near live overhead lines addressing worker competency records, safe work practices and compliance with documented techniques at intervals based on the findings of prior audits; and

(i) arboriculture techniques, where possible, should be in accordance with Australian Standards when pruning vegetation near live overhead lines.

3. Vegetation management workers (the Code Section 5.2)

The Code identifies workers who undertake vegetation management near live power lines, meeting competency requirements in Section 8 of the Code for the following designations:

a. Ordinary person

An ordinary person is a person with no knowledge on how to safely work near live power lines, so is not considered a vegetation worker and must work outside the 3m danger zone shown in Figure 1, or 6m if the powerline voltage is more than 33kV.

b. Ground worker

A ground worker has attained competency in training units in Section 8.3.1 of the Code and is considered as an ordinary person. However, ground workers who are under direct supervision and being instructed by an authorised person, are considered as instructed persons when determining safe approach distances in Table 1.

c. Safety observer

A safety observer has attained competency in training units in Section 8.3.2 of the Code and is specifically assigned the sole duty of observing and warning of an unsafe approach to electrical apparatus or other hazards.

d. Low voltage (LV) vegetation management worker (LV worker)

An LV vegetation management worker has attained competency in training units in Section 8.3.3 of the Code and is permitted to cut vegetation near live low voltage power lines provided the safe approach distances in Tables 2 to 5 are maintained.

e. High voltage (HV) vegetation management worker (HV worker)

An HV vegetation management worker has attained competency in training units in Section 8.3.4 of the Code and is permitted to cut vegetation near live high voltage power lines provided the safe approach distances in Tables 2 to 5 are maintained.

4. Safe approach distances and vegetation clearances (the Code Section 6)

(a) The safe approach distances in Tables 1 – 5 below, reproduced from the Code, are the minimum distance from the nearest powerline conductor to a person, mobile plant or tool that must be maintained during vegetation management work and apply to bare, covered and insulated conductors.

(b) The bare running earth or bare return neutral conductor on high voltage single phase and three phase overhead power lines forms part of the HV system and the safe approach distances to these conductors is 300mm.

(c) Un-insulated tools, equipment and extensions become part of the vegetation worker in applying safe approach distances from the Tables in the Code.

(d) When using insulated tools and equipment, the insulation length between the operating head attachment and the worker must be at least the safe approach distances listed in Tables 1–5

(e) Cut, pruned or falling vegetation, tools, equipment, persons and mobile plant must remain at distances greater than those listed in Tables 1–5.

(f) Vegetation being cut, felled or pruned must be controlled using an insulated stick with a gripping tool, by ropes, or cut so it falls away from the overhead line.

(g) Where such control of the vegetation is not possible, when working above the line to clearances in Table 5, Column E, vegetation must be cut into small pieces (feathering) to prevent damage or shorting out of the conductors as vegetation falls.

(h) When working within a tree or from the ground near live overhead power lines vegetation management workers must be instructed or an authorised person and use the distances listed in Table 2.

(i) Vegetation management workers must not climb any vegetation which may move closer than the vegetation clearance distances in Table 2 during vegetation work.

(j) Climbers must be attached to the tree at all times by industry approved hardware such as a rope, sling or safety line and must not position themselves so that they could fall or swing into the conductors or be closer than the distances listed in Table 2.

(k) A safety observer must be used when plant is being positioned and for any other requirements of Section 5.11 of the Code.

(l) Vegetation management workers using mobile plant, tools and equipment near live overhead power lines must maintain the safe approach distances listed in Tables 3, 4 and 5.

(m) An un-insulated EWP can go higher than the lowest live conductor, **only if** working at distances greater than those in Table 1.

(n) The safe approach distances for tools and equipment are intended to prevent physical damage to conductors and insulators.

(o) Low voltage conductors can be considered a barrier to high voltage conductors above, where equipment and vegetation is below the LV conductors.

(p) Insulated mobile plant and fittings must be checked on-site for visual damage prior to allowing use and comply with all other requirements of Section 10 of the Code.

(q) The safe approach distances for the un-insulated sections of an EWP must be maintained as per Table 4 of the Code.

(r) The chassis of the crane or EWP must be connected to earth by means of a rated electrical cable and metal earthing spike, which should be driven 600mm into the ground, guided by dial-before-you-dig, when vegetation control work is carried out within the danger zone of a high voltage power line.

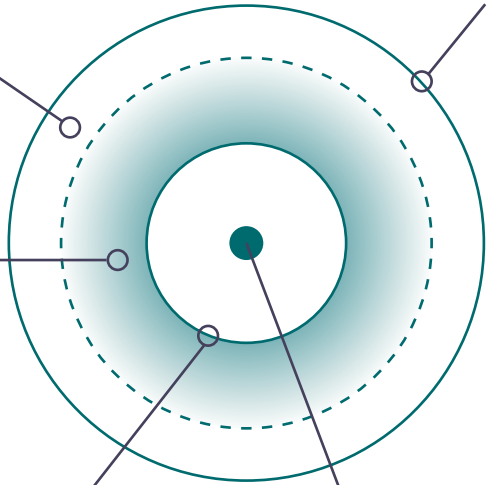
(s) Specialised insulated plant is permitted to operate from the ground if a competent operator is completely enclosed within the plant or can remotely operate the plant while always maintaining it beyond the safe approach distance (Table 5 Column C) and **only if** everyone maintains the minimum ground approach distance (GAD) from this plant (Table 5 Column B) and is outside the danger zone and the drop zone.

Approach Zones

This diagram explains the different approach distance zones for vegetation management, while maintaining vegetation clearances.

Vicinity means a situation where it is unlikely that a person will, either directly or through any conducting medium (e.g. via *mobile plant*), come within the relevant ***safe approach distances***.

Danger zone means anywhere that is within a specified distance of a live power line



Near means a situation where there is a resonable possibility of a person, either directly or through any conducting medium (e.g. via *mobile plant*), come within the relevant ***safe approach distances***.

Safe approach distance means the minimum distance in air from *exposed conductors* that shall be maintained by a person, ***vehicle*** or ***mobile plant*** (including its load, controlling ropes and any other accessories) when approaching ***electrical apparatus*** other than for work in accordance with an ***access authority***.

Conductor means a wire, *cable* or form of metal designed for carrying electrical current.

Code of practice for personnel electrical safety for vegetation control work near live power lines - Tables

The following tables contain values extracted from the Code for the most common vegetation management situations encountered.

In some cases, voltages requiring slightly different distances have been combined for simplicity, using the highest value.

Figures are direct reproductions of those in the Code.

Table 1

Safe approach distances and vegetation clearance for ordinary persons and instructed persons.

Nominal phase to phase ac Voltage (V)	Ordinary person, tools, equipment and mobile plant (mm) (A)	Instructed person, tools equipment and mobile plant (mm) (B)	Cannot cut vegetation that is Closer than (mm) (C)
LV Insulated	3,000	500	500
LV Bare	3,000	1,000	1,000
1,000 to 33,000	3,000	3,000	3,000
66,000 to 132,000	6,000	6,000	3,000
Over 132,000	6,000	6,000	6,000

Figure 1: Danger zone is inside the safe approach distance for ordinary persons.

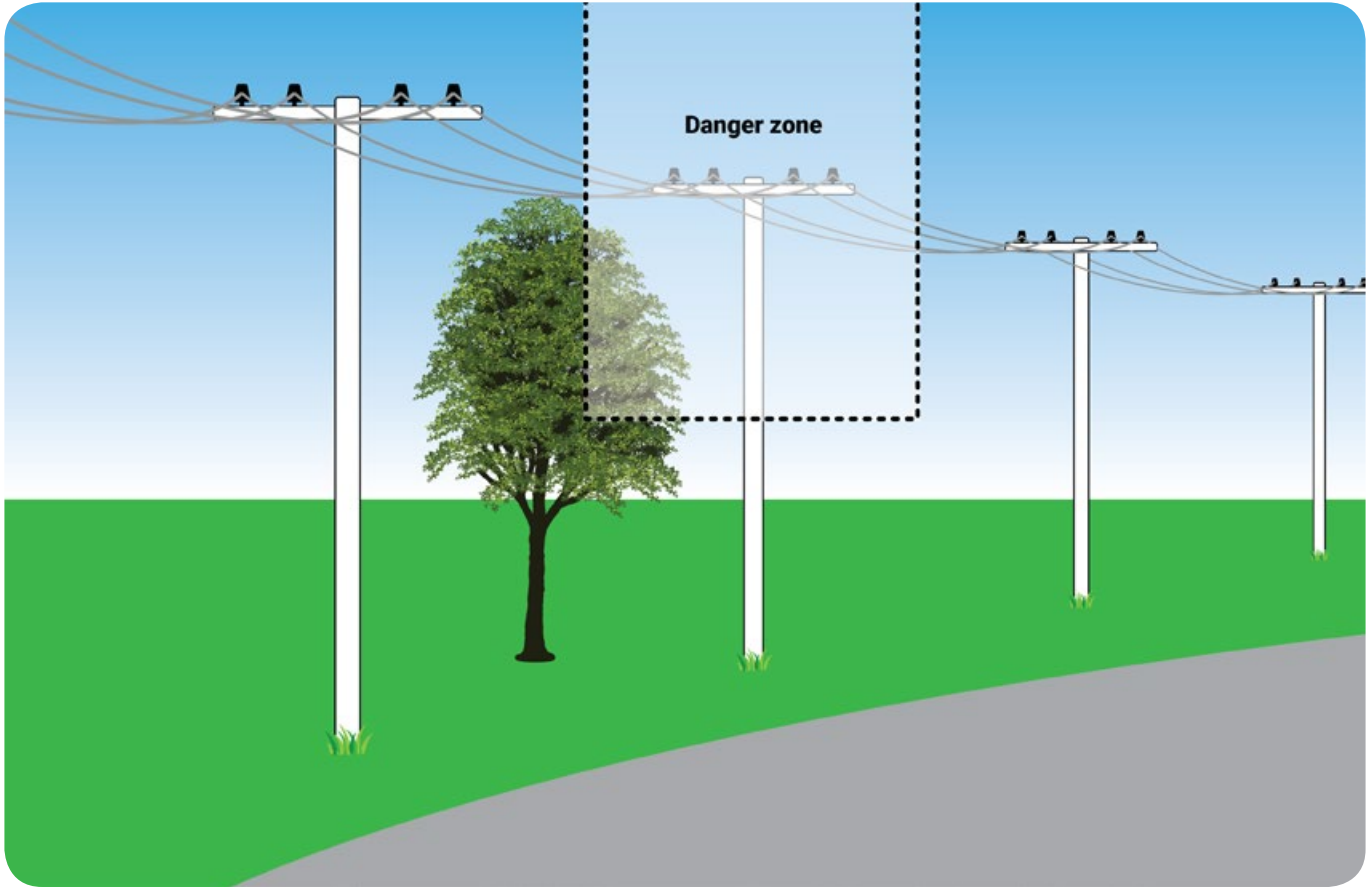


Table 2

Safe approach distances and vegetation clearances for vegetation management workers (climbing or from the ground).

Nominal phase to phase ac voltage (V)	Vegetation management worker (climber) (mm) (A)	Insulated tool (mm) (B)	Un-insulated tool (mm) (C)	Vegetation below and beside overhead line (mm) (D)	Vegetation overhanging the overhead line (E)
Insulated LV	200	Physical Clearance	200	No clearance	No clearance
Bare LV	1,000	200	1,000		Not permitted
HV to 33,000	1,200	700	1,200	700	
Refer to the Code for detail for other voltages					

Figure 2: Safe approach distances for climbing Vegetation Workers (Refer Table 2).

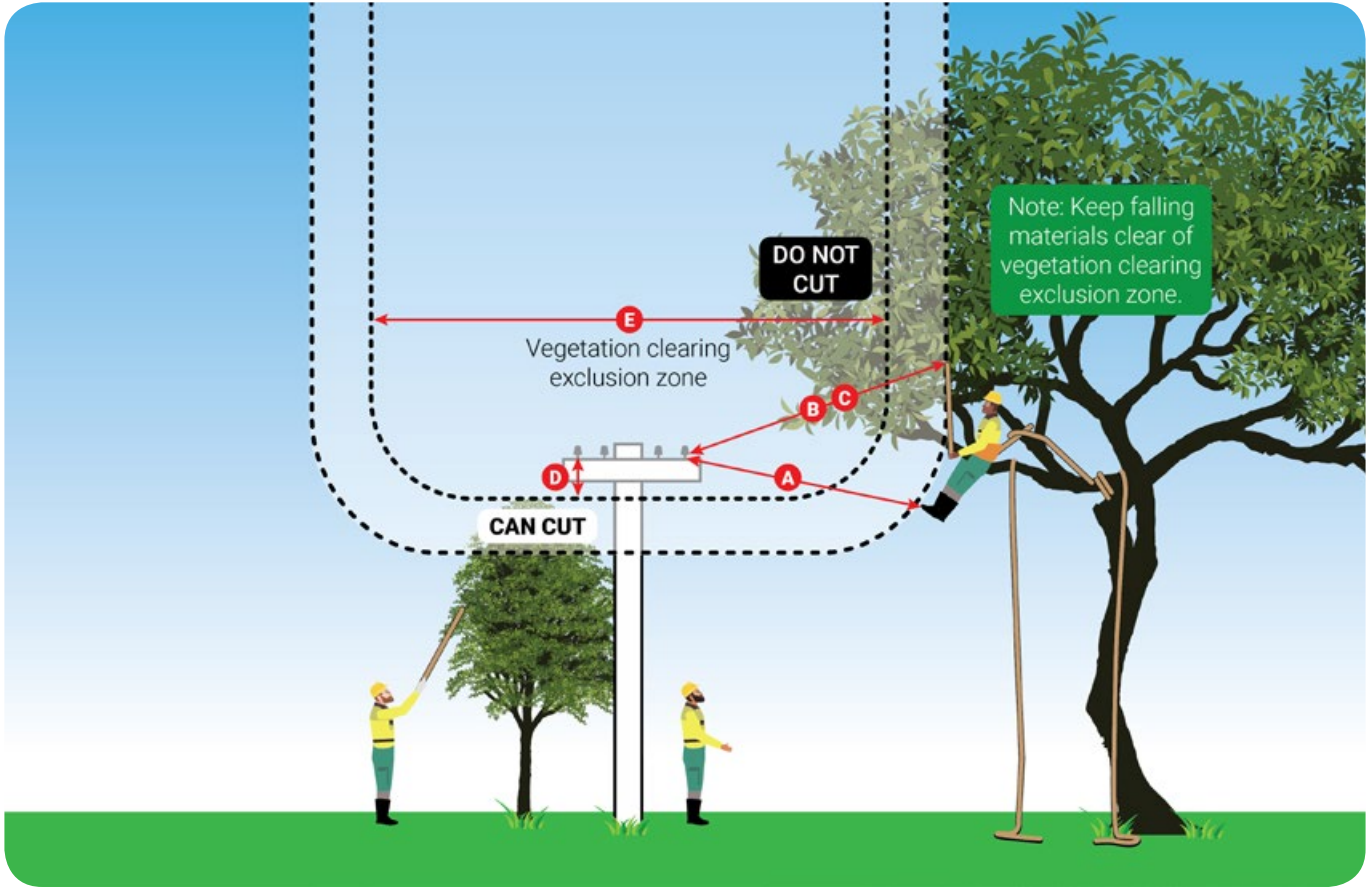


Table 3

Safe approach distances and vegetation clearance for vegetation management workers utilising un-insulated mobile plant, un-insulated tools and equipment.

Nominal phase to phase ac voltage (V)	Un-insulated mobile plant (see 6.5.1) (mm) (A)	Vegetation management worker (mm) (B)	Un-insulated tool (mm) (C)	Vegetation below and beside line (mm) (D)	Vegetation over-hanging the overhead line (mm) (E)
Insulated LV	200	200	200	No clearance	No clearance
Bare LV	1,000	1,000	1,000	Physical clearance	Not permitted
HV to 33,000	1,200	1,200	1,200	700	
Refer to the Code for detail for other voltages					

Figure 3: Safe approach distances and vegetation clearances utilising un-insulated mobile plant, tools and equipment (refer to Table 3).

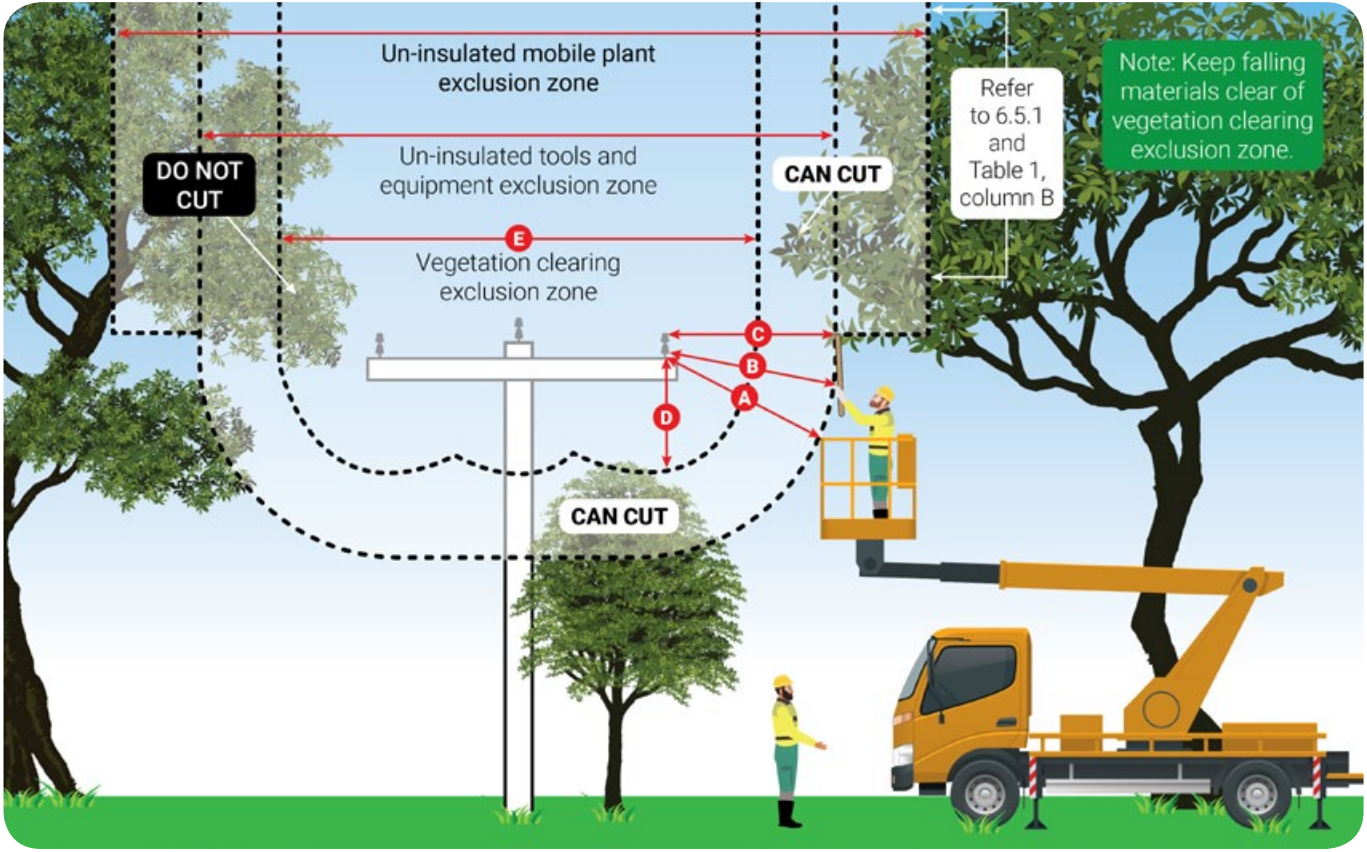


Table 4

Safe approach distances and vegetation clearances for vegetation management workers utilising un-insulated mobile plant, with insulated tools and equipment.

Nominal phase to phase ac voltage (V)	Un-insulated mobile plant (see 6.5.1) (mm) (A)	Vegetation management worker (mm) (B)	Insulated tool (mm) (C)	Vegetation below and beside line (mm) (D)	Vegetation over-hanging the overhead line (mm) (E)
Insulated LV	200	200	No clearance	No clearance	No clearance
Bare LV	1,000	1,000	Physical clearance	No clearance	Not permitted
HV to 33,000	1,200	1,200	400	400	
Refer to the Code for detail for other voltages					

Figure 4: Safe approach distances and vegetation clearances utilising un-insulated mobile plant, with insulated tools and equipment (refer to Table 4).

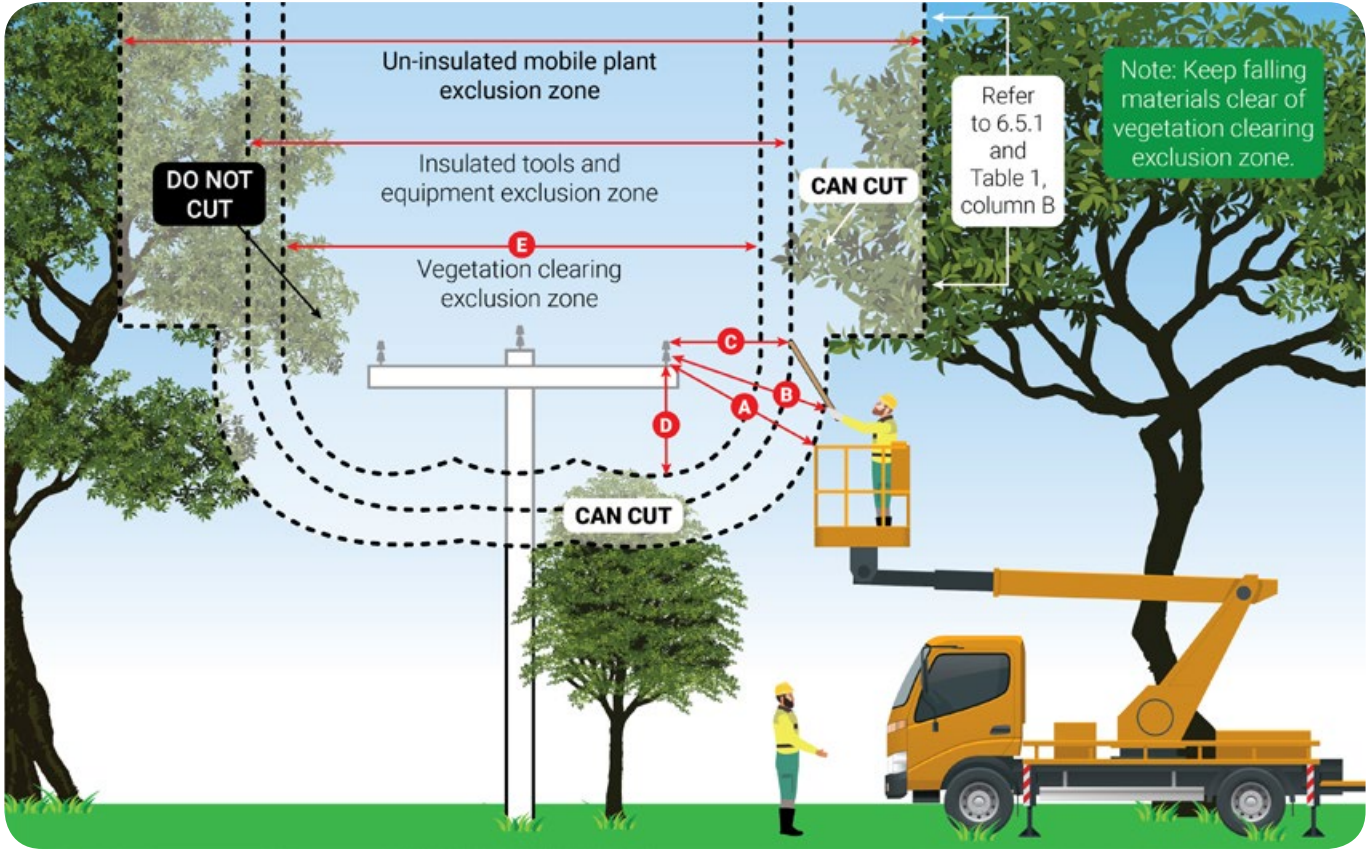
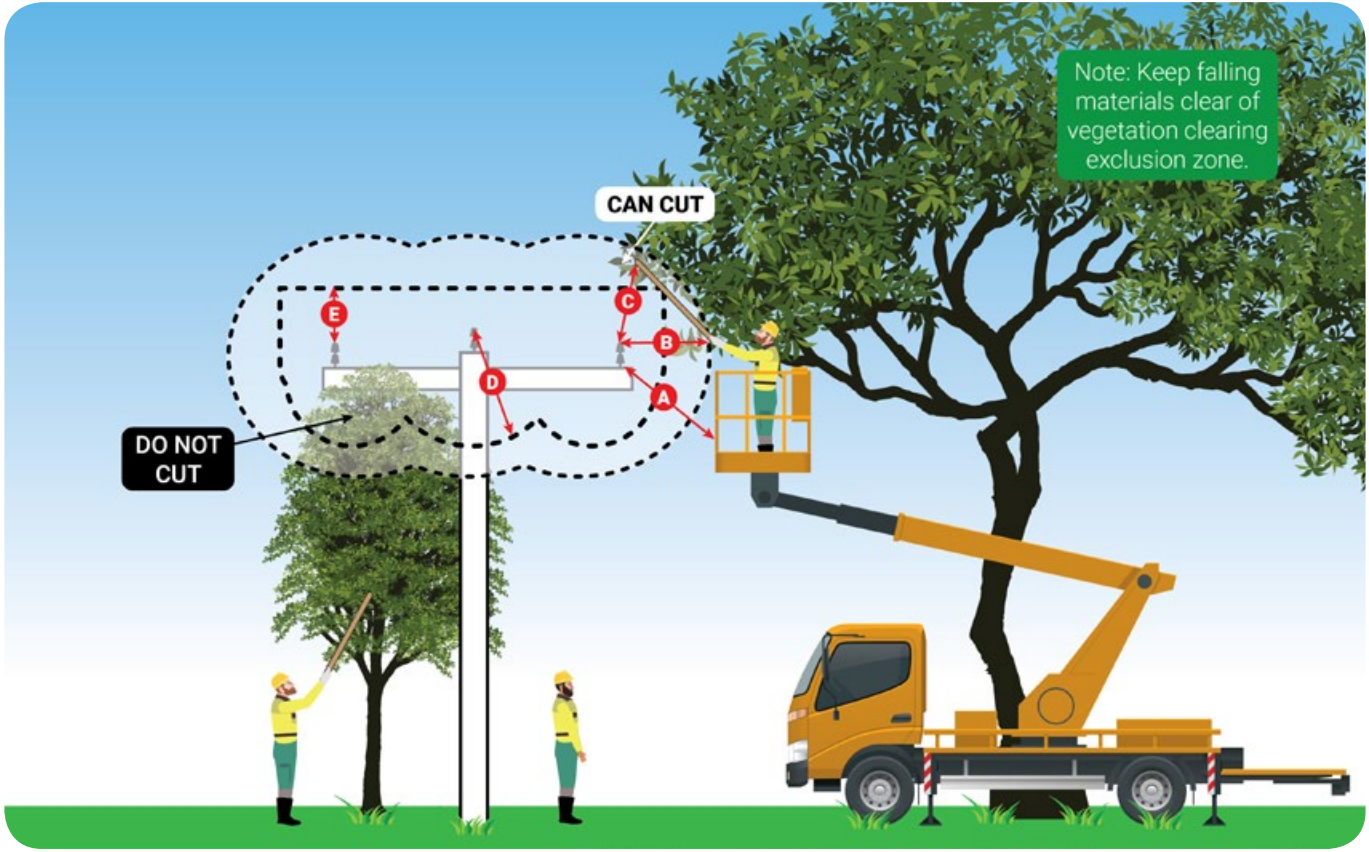


Table 5

Safe approach distances and vegetation clearances for vegetation management workers utilising insulated mobile plant, tools and equipment

Nominal phase to phase ac voltage (V)	Insulated mobile plant (mm) (A)	Vegetation management worker and GAD (mm) (B)	Insulated tool (mm) (C)	Vegetation below and beside line (mm) (D)	Vegetation over-hanging the overhead line (mm) (E)
Insulated LV	Physical clearance	200	No clearance	No clearance	No clearance
Bare LV	Physical clearance	700	No clearance	No clearance	Physical clearance
HV to 33,000	700	1,000	400	200	700
Refer to the Code for detail for other voltages					

Figure 5: Safe approach distances and vegetation clearances utilising insulated mobile plant, tools and equipment (refer to Table 5).



5. Work procedures (the Code Section 7)

Local Councils or contractors must develop and document approved work procedures in accordance with the Code to ensure the safety of their workers and the public, when vegetation management work is undertaken near live overhead lines.

Approved work procedures must not be changed on site without the approval of the Local Council or contractor.

The approved work procedures must include the following:

(a) A description of vegetation management principles and requirements.

(b) Instructions on caring for the tools and equipment.

(c) Testing requirements for plant, insulated tools and equipment.

(d) A set of vegetation management work techniques or procedures.

(e) The safe approach distances applicable to the worker and the voltage.

(f) The minimum vegetation clearances to all voltages.

(g) Emergency procedures.

6. Work notification (the Code Section 5.12)

(a) Where vegetation management work is likely to come within the safe approach distances (specified in Table 2) for live exposed high voltage overhead power lines, the network operator must be notified. The network operator will require a safe work notification as determined and controlled by the network operator.

Some network operators operate different permit systems as per their operation procedures. In some instances, the network operator may issue an authority before work can commence.

(b) Where safe approach distances to high voltage power lines cannot be maintained, the situation must be reported to the contract principal to refer to the network operator or reported directly to the network operator where required.

It is important for the service provider to include in their operational procedures the means by which the network operators is to be notified, particularly if vegetation is in direct contact with high voltage power lines.

Network operator contact numbers

Western Power	13 13 51
Horizon Power	13 23 51
Rio Tinto	1800 992 777
BHP	(08) 9175 3303

7. Audits (the Code Section 8.6)

There can be up to two levels of auditing required by the Code. As listed below, the first is mandatory and the second will not be applicable should the local council use its own day workers to manage vegetation:

(a) Audits by the vegetation service provider who could be the local government works group or vegetation management contractors.

(b) Audits by local government authority when they engage contractors to undertake vegetation management.

Audits by the vegetation service provider

These audits ensure the service provider has the appropriate systems and processes to ensure:

i. Workers training and authorisation is current.

ii. PPE is fit for purpose.

iii. Mobile plant and equipment is fit for purpose and compliant within test dates.

iv. Work procedures have been documented and evidence of compliance provided.

v. Hazard identification and risk assessments are adequate, compliant and recorded.

Audits by local government authority

These audits ensure there are the appropriate systems and processes to ensure:

i. Accredited contractors are engaged.

ii. The contractor has an audit system in place as prescribed above.

Government of Western Australia

Department of Mines, Industry Regulation and Safety

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