WORKING UNDER OVERHEAD POWER LINES

BACKGROUND

Think Brick Australia (TBA) represents the clay brick and paver manufacturers of Australia. Safety is a major issue and concern for our members.

This document stipulates the regulations and guidelines safeguarding the health and safety of all personnel against the risks of working near overhead power lines or associated machinery and equipment. It includes legislative obligations imposed by the *Electricity (General) Regulations 2012* and *Safe Works Australia* concerning the proximity, or “unsafe distance” while working close to power lines and operating associated machinery.\(^{[1]}\)

SAFETY GUIDE

The information in this guide applies to the operation of plant, machinery and other equipment near overhead power lines, not limited to any type or class. Broadly speaking, the following are the guidelines for working under power lines: \(^{[9]}\)

- First make sure to follow the ABC rule when working near power lines:
  - Assess safe distances;
  - Be Cautious and seek assistance from an “Observer” or a “Spotter”; and
  - Contact electricity supplier to seek advice.

- Beware of ‘inattention blindness’ which develops when you are so focused on your work task, leading to temporary ‘blindness’ to what’s happening around you.

- Know the exact height of your equipment — more specifically, the exact height when it is fully raised or extended.

- The separation distances for operating plant, machinery or equipment, plant, machinery or equipment near overhead power lines must not be less than those shown in Table 1.

POWERLINE RISKS

The risk arises when a cable is struck by a machine or tool, which can cause fumes, hazardous fires and explosions to occur, resulting in serious injury, permanent disability or even death. Contact with live overhead power lines can lead to death and serious injuries.

Due to fatal hazards associated with power lines, it is crucial to communicate and follow all safety guidelines and regulations in the workplace to prevent such accidents from occurring.

---

\(^{[1]}\) Telephone: +61 2 8448 5500
Technical Hotline: 1300 667 617
thinkbrick.com.au
CRANES AND ELEVATING MACHINERY

To operate machinery to the prescribed distances of the Regulations, you also have to factor in the following:

- Power lines’ movement due to wind effects.
- Mechanical movement of machinery arm.
- Swinging of loads from momentum and wind effects.

Any breach of the prescribed clearances can lead to:

- Risk of electric shocks for you and any other persons in the vicinity.
- Release of toxic fumes.
- Hazardous fires and explosions.

These risks can result in serious injury, permanent disability or death, hence preventative measures must be carefully followed.

To estimate the height or voltage of the overhead electric lines, ask your Electricity Supply Authority for advice, or check Safe Work Australia - Electrical Safety Code of Practice for further information.

PRELIMINARY PROCEDURES (PRE-JOB RISK ASSESSMENT)

The following considerations must be made prior to working under power lines to avoid severe penalties:

- The location of the adjacent structure, its dimensional constraints and its functional utility (i.e. the purpose it serves, commercial, residential, industrial etc.).
- The voltage capacity of the power line must be determined since it mandates the required safety clearance.

Any specifications of the power lines (including voltage capacity) can be obtained from the electricity regulators of the region. A list of these regulators are provided by Safe Work Australia – Electricity Regulators.

It is important to be aware of the voltages when working under power lines, especially between buildings as voltages may vary (see Figure 2). Safety precautions vary under different voltage levels (see Table 1).

Figure 1: Low voltage overhead service lines

Figure 2: Common Power lines with difference in voltages

Figure 3: Possible movement of power lines and machinery

Figure 4: Conductor ‘sag or swing’
To operate machinery with an elevating component such as cranes, elevating work platforms and earthmoving equipment such as excavators the following safety requirements must be fulfilled:

- The voltage of the power line must be identified;
- A spotter (competent person who is suitably qualified by experience, training, or both with the sole duty of observing and warning against the unsafe approach of the crane, its lifting attachments or its load to power lines) carries out spotting duties always;
- A documented risk assessment is carried out before any work commences, in consultation with all relevant parties involved in the work;
- The electricity network operator is notified before commencing work; and
- Any conditions specified by the electricity network operator or Technical Regulator are complied with.

### Table 1: Safety Requirements for power lines

<table>
<thead>
<tr>
<th>Cranes</th>
<th>Machinery</th>
<th>Safe Approach Limits</th>
<th>Buildings and Structures, including Scaffolds</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI 9550.1 Crane Code</td>
<td>Electricity General Regulations 2012 Schedule 6, Table 4 – Distance to operation of machinery, vehicle, or vessel with elevating component or shear legs</td>
<td>Electricity General Regulations 2012 Schedule 6 Safe Approach Limits</td>
<td>Electricity General Regulations 2012 Schedule 1, Table 1</td>
</tr>
<tr>
<td>240</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.0m</td>
</tr>
<tr>
<td>415</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.0m</td>
</tr>
<tr>
<td>7,000</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.5m</td>
</tr>
<tr>
<td>11,000</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.5m</td>
</tr>
<tr>
<td>19,000</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.5m</td>
</tr>
<tr>
<td>33,000</td>
<td>6.4m</td>
<td>3.0m</td>
<td>1.5m</td>
</tr>
<tr>
<td>66,000</td>
<td>6.4m</td>
<td>3.0m</td>
<td>2.0m</td>
</tr>
<tr>
<td>132,000 pole</td>
<td>6.4m</td>
<td>3.0m</td>
<td>3.0m</td>
</tr>
<tr>
<td>132,000 tower</td>
<td>10.0m</td>
<td>6.0m</td>
<td>3.0m</td>
</tr>
<tr>
<td>275,000</td>
<td>10.0m</td>
<td>6.0m</td>
<td>4.0m</td>
</tr>
</tbody>
</table>

**Figure 5: Clearance zones for operating machinery in proximity to power lines**

**SAFE APPROACH LIMITS FOR PEOPLE**

The minimum safe approach limit is measured from the closest conductor on the power line to the closest part of the person or an object held by the person. Subject to a documented risk assessment considering the movement of tools, materials and structures, it is possible to use reduced approach limits as indicated in Table 1 below.
REFERENCES

[2] Safe Works Australia (2014), Guide for working near low voltage overhead electric lines near structures
[3] Safe Works Australia (2014), General guide for working in the vicinity of overhead and underground electric lines
[7] Be Energy Safe (2017), Building safely near power lines, Government of South Australia
WORKING UNDER OVERHEAD POWER LINES

PRELIMINARY PROCEDURES

☐ Have you contacted the electricity operator?

☐ Did the operator approve the work being carried out?

☐ Did the operator specify any operating conditions?

☐ Have you checked the power line’s voltage and function (e.g. residential) and taken appropriate precautions

SITE INSPECTION

☐ Has a risk assessment been carried out?

☐ Has it been documented and shared with all parties?

☐ Are cranes or elevating machinery needed on site?

☐ Have you noted the height of the machinery (fully extended)?

☐ Is there enough distance away from power lines? (Refer to Table 1 in Power line Factsheet)

☐ Is a spotter needed for the job?

☐ Have you assigned a spotter for the site? (Refer to Safe Work Australia General Guide For Cranes)

ABC GUIDE:

ASSESS SAFE DISTANCES

BE CAUTIOUS AND HAVE A SPOTTER

CONTACT ELECTRICITY SUPPLIER TO SEEK ADVICE