

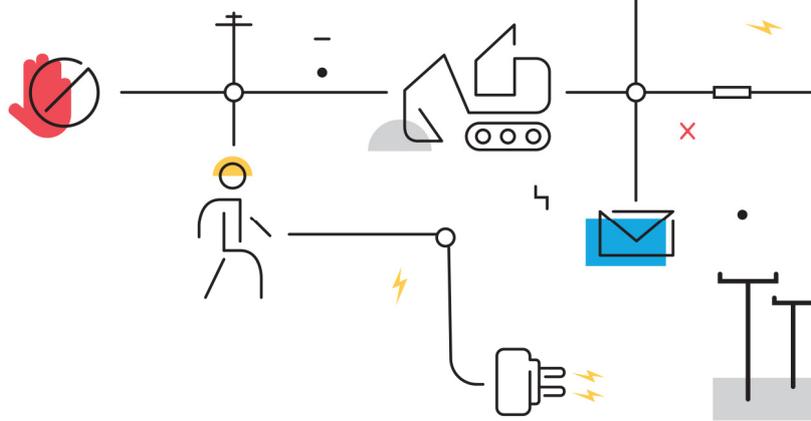
# INSTALLATION REQUIREMENTS FOR TELECOMMUNICATION EQUIPMENT ON EVOENERGY ASSETS

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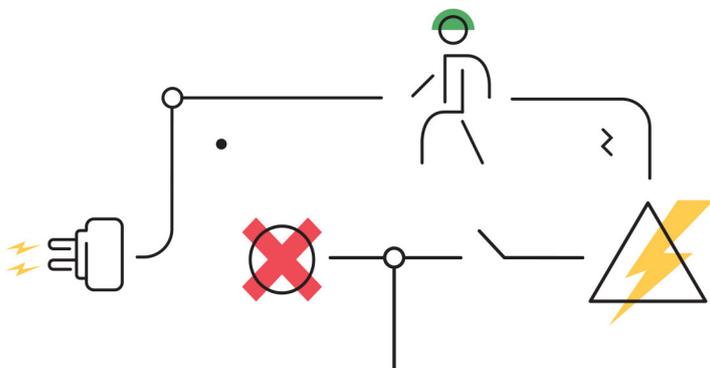
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**evo**energy

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## **Disclaimer**

Whilst this document contains material relevant to the electricity industry legislation, codes of practice and standards, it is not intended to provide legal advice on how electrical contractors can meet their own statutory obligations or comply with legislation, codes of practice or industry standards such as AS/NZS 3000 (Wiring Rules). Whilst care has been taken in the preparation of this document, Evoenergy does not guarantee that the information contained in this document is accurate, complete or up to date at time of publication. To the extent permitted by the relevant legislation Evoenergy will not be responsible for any loss, damage, cost or expense incurred as a result of any error, omission or misrepresentation in relation to the information contained in this document.

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## 1. PURPOSE

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This standard details the requirements for the attachment of third party communication equipment to Evoenergy assets.

The objective is to enable the installation of all communication equipment in a safe and efficient manner onto the Evoenergy network.

## 2. SCOPE

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This standard specifies the acceptable positioning of both narrowband and broadband communication equipment and cables to all Evoenergy assets. These cables and equipment are generally installed to provide communication services, including cable television (CATV), telephone and interactive data services. Communication cables are both broadband and narrowband (self-supporting or integral bearer). Communication equipment will include mobile phone cells, transmitters/receivers and any other radio devices.

The requirements for working on telecommunication equipment installed on Evoenergy structures; or, working on Evoenergy structures that have telecommunications equipment are outside the scope of this standard.

Clearances, pole loadings and all other conditions must also continue to meet the requirements of this standard for the entire life cycle of the communication cable and equipment, including during maintenance and removal.

## 3. EXPENSES

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In no case will any expense or fees incurred by the BCC in the preparation of any required assessments, studies, investigations and the like associated with this standard be borne by Evoenergy.

Evoenergy will neither be responsible for, nor pay for any expense or loss, which may be incurred by the BCC.

## 4. REFERENCES

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**TABLE 1.** SCHEDULE OF REFERENCES

STANDARD	DESCRIPTION
AS/NZS 7000	Overhead line design, Detailed procedures.
SM 1138	Distribution Earthing Design and Construction Manual
SM 1139	Distribution Overhead Line Design Manual
SM 4605	Evoenergy Electrical Safety Rules
SM 1114	Evoenergy Service and Installation Rules
ESAA NENS 04	National Guidelines for Safe Approach Distances to Electrical Apparatus
ENA Doc 005	Joint use of power poles – Model agreement
Drawing 390-018	Clearance Requirements Between Evoenergy Infrastructure and Telecommunication Carriers Cable Installation

It is the responsibility of the communications designer to ensure the latest version of the appropriate standards and drawings referred to in this standard is used in all designs and calculations.

## 5. ABBREVIATIONS AND DEFINITIONS

**TABLE 2.** LIST OF ACROMYMS

TERM	DEFINITION
2CTW	2 Wire Twisted (1 phase) service
4CTW	4 Wire Twisted (3 phase) service
4WL	4 Wire Lateral (open wire 3 phase) service
AAAC	All Aluminium Alloy Conductor
AAC	All Aluminium Conductor
ABC	Aerial Bundled Conductor
ACSR	Aluminium Conductor Steel Reinforced
ACT	Australian Capital Territory
ADSS	All Dielectric Self-supporting (Communications cable—optical fibre)
AHD	Australian Height Datum
Al	Aluminium
Antenna	Transmitter, such as a wire or grid, sometimes mounted within a tube or panel, that emits and receives radio signals
Authorised person	A person with technical knowledge or sufficient experience who has been approved and authorised in writing by the Company to perform the function requiring authorisation.
BAZ	Bushfire Abatement Zone
BCC	Broadband Communication Cables
CATV	Cable television, that is, television provided by means of Broadband cable.
CBL	Calculated Breaking Load. In relation to a conductor, means the calculated minimum breaking load determined in accordance with the relevant Australian/New Zealand Standard.
CLAH	Current-limiting Arcing Horn, or gapped surge arrester
Communications Hardware	Communication hardware refers to the equipment associated with the transmitting device excluding the antenna, namely, the power supply, isolation device and any auxiliary equipment.
CSA	Cross-sectional Area

TERM	DEFINITION
Cu	Copper
EMF	Electromagnetic Field
Exclusion Zone	The safe working distance that has to be achieved from an energised radio frequency transmitter, which cannot be entered by any part of the body or metal object.
GL	Ground Level
HDC	Hard Drawn Copper
HV	High Voltage
IBC	Integrated bearer cable – an overhead cable used for telephone lines consisting of a metallic supporting strand or strands and a variable number of metallic telephone pairs
MEWP	Mobile elevated working platform
Microwave Dish	Dish-shaped transmitter device, used on some cells, that emits and receives radio signals that allow the cell to communicate with the telecommunications carrier's network
Mobile Phone Cell	Communications installation that communicates between mobile phones and the telecommunications carrier's network using radio signals
NENS	National Electricity Network Safety codes, issued by ENA
OPGW	Optical Ground Wire—an overhead earth wire with internal optical fibre/s
Radio transmitter	A device used to send radio signals. Such transmitters have associated communications hardware installed on the ground or the structure supporting the antenna
SC/GZ	Steel Conductor / Galvanized
SF	Safety Factor, also Strength Factor
SL	Street lighting
UG/OH	Underground to overhead transition structure
UTS	Ultimate Tensile Strength – the maximum mechanical load, which may be applied to a conductor, beyond which failure occurs.

## 6. CLEARANCES, SEPARATIONS AND ATTACHMENTS

### 6.1 General

Ground clearances for communications cables, structures attachment clearances, clearances between communication cable/equipment and electrical infrastructure, as well as safe working distances, shall not be reduced from those specified in this standard unless agreed to in writing by Evoenergy.

In the case of poles carrying 11 kV or 22 kV mains only, the minimum safe working distance is defined by Evoenergy - refer to Evoenergy drawing 390-018.

Before any communication cables or equipment are attached to an Evoenergy pole, a full detailed assessment of the pole strength is to be performed by the telecommunications provider. The proposed additional communication cable load, when combined with the existing electrical network conductor load, shall not exceed the rating of the pole under sustained loads and ultimate wind loads.

The pole strength shall be calculated in accordance with AS/NZS 7000 where the pole identification disk is not attached to the existing pole.

Where the communication provider has doubt concerning the condition of a pole, a special pole inspection shall be arranged at the expense of the telecommunications provider. Evoenergy authorised inspectors shall only carry out drilling of timber poles for the purpose of a pole decay assessment. Evoenergy must be notified prior to such assessment is carried out.

Evoenergy requires the following communication cable ground clearances.

**TABLE 3.** MINIMUM CLEARANCE REQUIREMENTS

CROSSING TYPE	MINIMUM CLEARANCE
Waterways	AS 6947
Ground clearance	AS7000
Railways and other utilities crossings.	Refer to relevant standards

All other clearances for telecommunication cables shall be in accordance with Evoenergy drawing 390-018.

### 6.2 Midspan Clearances

Midspan clearances between communication cables and the electrical infrastructure are to be determined under worst case operating conditions.

Clearances where a telecommunication cable is installed below electrical conductors are to be determined with the electrical network at maximum operating temperature and the communication cable at 5°C.

For ADSS cables installed above low voltage networks, where approval is given, a 0.1 m mid-span clearance must be maintained with both circuits at 5°C.

Crossing of communication cables between electrical network conductors is not permitted.

### 6.3 MEWP Access Window

A 600 mm attachment separation is required between an ADSS cable and LV ABC, bare LV or streetlight if the MEWP access window is 1500 mm. The ADSS cable is to be attached below the other cables.

Additionally, for an attachment above the LV, a minimum 1500 mm mid-span clearance to conductors for voltages up to 22kV located above the ADSS cable must be maintained with the electrical network at maximum operating temperature as specified by Evoenergy and the ADSS at 5°C.

## 6.4 Mains Ground Clearance

Mains ground clearances shall be as per AS/NZS 7000. If any locations are identified where clearances are not as per the latest standards, the designer shall determine if any remediation work to the existing overhead conductors will provide suitable ground and mid-span separation clearances to allow installation of communication assets. Works to be considered covers all available options including conductor re-tensioning, service main alterations and the replacement of the Evoenergy pole. The proposed remediation work is to be submitted to Evoenergy at the design stage for approval.

## 6.5 Asset Spacing

As a rule, all communications cables will be located lower than electricity cables/conductors and the only exception to this requirement shall be a non-conductive system where the cable may be permitted to be located above the service mains and street light cables/conductor. All proposals for this non-standard arrangement are to be submitted to Evoenergy for approval prior to works commencement.

Minimum separation distances between conductive communications cables and service cables are set out in Evoenergy drawing 390-018. In the case where there is the requirement for a second low voltage ABC to be installed where a single ABC exists additional allowances may be required for installation of communication assets.

### 6.5.1 Backyard Poles

In some ACT suburbs, the electricity supply to residential or commercial properties may be installed on poles located in the backyard of the property. All communications cable shall be installed facing the property side of the pole. Where multiple properties are supplied by a single pole, the communications cable owner shall decide the cable route for the length of the installation and ensure that all clearance requirements are met. The communications cable owner shall notify Evoenergy of the selected route.

### 6.5.2 Street Poles

All communications cable shall be installed on the roadside of the pole. Evoenergy may give approval for the attachment on the property side where road clearance may not be met under conductor blowout conditions if attached on the roadside.

## 6.6 Separation

### 6.6.1 Evoenergy Owned Poles

Evoenergy has installed non-conductive and conductive poles (steel reinforced concrete) in the electricity distribution systems. Hazardous voltages can be present on all types of poles during abnormal system conditions including, but not limited to; equipment failure, earth faults, weather conditions, etc.

When communication equipment is installed on:

-  Conductive poles, equipment must be insulated to a minimum of
  - LV Pole (BIL 15kV)
  - 11 kV (BIL 95 kV)
  - 22 kV (BIL 150 kV)
-  Conductive poles separately earthed (rural and urban) the equipment must be insulated to a minimum of
  - 11 kV (BIL 6.6 kV)
  - 22 kV (BIL 6.6 kV)
-  Common earthed LV, 11kV and, 22 kV conductive poles, all metallic components of the communication cable and equipment can be bonded to the pole along with LV neutral.

During the installation process, allowance must be made for the any potential rises on poles and appropriate installation methods and safe working procedures shall be adhered to when working on or near them.

### **6.6.2 Metallic Fittings**

Evoenergy poles may have unearthed, single insulated fittings installed, which can become live through the breakdown of the primary insulation (such as steel conduit, light fittings, street light outreach brackets and lantern choke boxes).

All persons working on structures must be made aware of the possibility of metallic fittings on non-conductive (wood and composite) poles becoming alive. Safe working procedures when working near unearthed, pole mounted, metallic fitting must be employed and shall include a voltage test to ensure that the work can be safely performed.

### **6.6.3 Service Cables**

The minimum separation between service cables and conductive aerial communications conductors is as per Evoenergy drawing 390-018. Communication providers are not allowed to connect any cables to LV cross-arms.

Generally, Evoenergy aerial service cables are attached to the pole below LV mains. These cables are usually insulated; however, the minimum clearance between overhead service mains and aerial communication conductors is 600 mm.

The following situations, however, will require attention by those installing the communications cables if it is anticipated that BCC staff will be required to work within 500 mm of such wiring:

If there is exposed live metal, such as uninsulated connectors between mains and aerial service cables, those installing the communications cable shall cover the exposed metal with an Evoenergy approved insulating tape and a weatherproofing tape.

If the insulation on the service cables has deteriorated to the point that conductors are exposed, the overhead service to the customer will need to be replaced with a multi-core aerial bundled conductor. This type of insulation failure must be reported to Evoenergy immediately for remedial work.

If the number of services taken from a pole is large, and/or the connections between service conductors and the mains are untidy, the aerial service cables may impact upon the desired BCC location. The standard Evoenergy notification and outage processes to be followed to allow Evoenergy to carryout any remedial work.

## **6.7 Existing Infrastructure**

The Evoenergy network will continue to have enhancements carried out in order to provide a more reliable and safe electrical distribution system.

Evoenergy reserves the right to change its structures at any time. In the situation where a telecommunications carrier's cable or equipment are attached to a structure, which needs to be modified, the owner shall be notified. If Evoenergy deem the cable/equipment needs to be adjusted or removed from the structure, the telecommunication carrier shall carry out these works at their own cost.

Existing electricity and communication infrastructure, which may not comply with the latest standards, may be deemed acceptable except where a specific risk may be posed to Evoenergy staff or the public. New and replaced communication cables and constructions shall comply with the requirements of the latest standards.

## 6.8 Training

All persons working on Evoenergy poles near live mains must be authorised persons with appropriate accreditation for working on pole tops and with optic fibre cables.

The communications provider shall ensure that all personnel working on Evoenergy poles for the attachment of communications infrastructure would receive suitable training and familiarisation including but not limited to:

- 🔒 Evoenergy Electrical Safety Rules (Bluebook)
- 🔒 Evoenergy Access Permit Requirements
- 🔒 Evoenergy Network Outage Notification Lead Times
- 🔒 Identification of voltages and mains types
- 🔒 Knowledge of the hazards associated with pole top work
- 🔒 Identification of suspect and condemned poles
- 🔒 Working with fibre optic cables, NENS 04-2006 safe working distances
- 🔒 Knowledge of the hazards associated with stringing communication cables beneath energised electricity conductors
- 🔒 Awareness and knowledge of this Standard
- 🔒 Any other
- 🔒 required training

Required training can be obtained from industry training centres, including Evoenergy upon request and at an appropriate charge.

## 6.9 Tools and Equipment

All tools and equipment shall be kept in good working condition so that they are safe to use at all times. Tools, plant and equipment that require inspection shall be current in their period of inspection and tagged/logged accordingly.

MEWP and other equipment used by communication cable owners and their contractors shall be rated in accordance with standards issued by Standards Australia. A copy of the valid test certificates for all equipment must be available on request.

Work Safe ACT's guidance note, '*Working near Overhead Powerlines*', will be applicable for all MEWP, cranes, plant, vehicles, individual's tools and equipment used on or near Evoenergy electrical network.

## 6.10 Safe Approach Distances

Clearances in the Evoenergy Electrical Safety Rules must be maintained and all conductors, including insulated/covered conductors, shall be treated as energised.

## 6.11 Non-conductive Networks

It shall be the responsibility of the BCC system owner to satisfy Evoenergy that the system is non-conductive and provide a statement before the attachment of such a system to the Evoenergy network.

## **6.12 Special Situations**

### **6.12.1 UG/OH Poles**

Electricity cables rising up the pole do not pose any particular problem for the attachment of a steel catenary cable to the pole. To provide additional protection however, a non-conductive section guard is to be fitted to Evoenergy UG/OH cables centred on the BCC attachment point. This work shall be carried out by Evoenergy personnel with all costs at the communications carrier's expense. For these poles, a clearance of 150 mm from parts with single insulation or covering shall be maintained.

## **6.13 Restricted Constructions**

### **6.13.1 Pole Mounted Substations and Automated Switching Equipment**

No communications cables or equipment are to be installed on pole mounted substation or automated switching equipment. In these situations the communications cable must be installed on a freestanding pole providing 2200 mm clearance between the substation or automated switching equipment or pass the pole as an underground cable.

### **6.13.2 Air Break Switches**

Where an Air Break Switch (ABS) is currently installed, the telecommunication carrier must allow for the future replacement of an ABS with an automated switching device. In these circumstances, the clearance from the top of the pole to the communication cable shall be a minimum of three meters.

### **6.13.3 Transmission Structures**

Telecommunication equipment shall not be attached to transmission structures (33kV to 132kV inclusive). Lines built for transmission but operating at lower voltages shall be treated as transmission lines for the purpose of this standard.

### **6.13.4 Streetlight Columns**

Evoenergy do not own the ACT streetlight network. Any proposed telecommunications cable or equipment connection to a streetlight must be approved by the asset owner.

### **6.13.5 Aerial Splices**

All splices shall be located in an underground pit. No splices shall be installed on the overhead network, due additional load on poles/structures, visual impact of splicing equipment and impediment to access for maintenance and operation of the Evoenergy distribution network.

### **6.13.6 Communication Equipment**

Communications associated equipment must not be located on conductive poles without explicit written permission from Evoenergy for each pole. The telecommunications provider shall assess each concrete pole separately.

### **6.13.7 Private Poles**

Evoenergy cannot provide approval to telecommunication carriers to install cable and equipment on these poles. The telecommunication carrier must negotiate directly with the owner of the pole to arrange access.

Notwithstanding this, the requirements of this standard still apply with respect to clearances and positioning of communications equipment relative to Evoenergy distribution mains or service cables/conductors.

## 6.14 Communication Hardware Attachment

### 6.14.1 Wood Poles

BCC infrastructure generally will be attached to the pole clamping the steel catenary to a king bolt on wood poles.

The communications cable, network amplifiers, and service tap boxes (which service individual customers) are attached to the catenary at a distance approximately 1.2 metres from the pole.

For non-conductive systems, the cable shall be supported by LV ABC hook-bolts and suspension clamps mounted on the pole. Connection to the LV cross-arm will only be allowed for Evoenergy ADSS. Cable terminations/strain constructions shall be attached to the poles by means of either LV ABC hook-bolts or eyebolts.

### 6.14.2 Other Poles

All connections on composite poles should be by means of an approved catenary clamp. Care must be taken to prevent any damage to the gel-coating during the installation of communication equipment. Under no circumstances, shall communications cabling/equipment installers drill any holes in to concrete, steel or composite poles.

On conductive pole, the communications cable will be attached in a manner agreed to by Evoenergy, such as stainless steel strapping around the pole.

Table 4 provides the acceptable methods of attachment.

**TABLE 4.** METHOD OF ATTACHMENT

POLE MATERIAL TYPE	TELECOMMUNICATIONS CABLING	TELECOMMUNICATIONS HARDWARE
Wood	Support Bracket attached with bolts. These fixtures shall be UV stabilised and not be affected by temperature cycle brittleness	Attached by 12mm x 75mm long galvanised coach bolts.
Fibre-Reinforced Composite (FRC)	Support Bracket attached with stainless steel straps. These fixtures shall be UV stabilised and not be affected by temperature cycle brittleness	Attached by stainless steel straps.
Steel	Support Bracket attached with stainless steel straps. (kingbolt hole not available) These fixtures shall be UV stabilised and not be affected by temperature cycle brittleness	Attached by stainless steel straps. (where a kingbolt hole is not available)
Concrete	Support Bracket attached with stainless steel straps. (kingbolt hole not available) These fixtures shall be UV stabilised and not be affected by temperature cycle brittleness	Attached by stainless steel straps. (where a kingbolt hole is not available)

POLE MATERIAL TYPE	TELECOMMUNICATIONS CABLING	TELECOMMUNICATIONS HARDWARE
Other Information	<p>Catenary shall be isolated from HV Conductive Poles with an insulator capable of withstanding the Pole's EPR under all weather and pollution conditions – with the following specs:</p> <ul style="list-style-type: none"> <li>☞ Wet power frequency withstand voltage of 28kV for 1 minute;</li> <li>☞ Dry power frequency withstand voltage of 28kV for 1 minute;</li> <li>☞ Lightning impulse withstand voltage of 95kV;</li> <li>☞ Flashover distance &gt; 120mm;</li> <li>☞ Creepage distance &gt; 230mm;</li> <li>☞ Cantilever strength of 6 kN.</li> </ul> <p>The catenary shall be attached to wooden Poles via an insulator where that Pole carries a HV earth conductor down the Pole, i.e. cable screen, switch earth, surge arrester earth etc.</p>	<p>All metallic equipment shall be either hot dipped galvanised or treated by other Evoenergy approved methods to prevent corrosion.</p> <p>The attachment brackets, clamps, ancillary hardware and equipment must not interfere with existing installation and the Operations.</p> <p>The attachment brackets, clamps, ancillary hardware and equipment must also be able to be detached from the Pole with the use of standard hand tools.</p>

## 6.15 Earthing of Communication Equipment

When the communication cable system installed adjacent to electricity aerial mains has metallic components such as sheath and catenary, these are required to be earthed at regular intervals. The External Telecommunications Carrier must design, install and maintain the earthing system to be sufficiently robust and well configured to maintain safety from hazardous voltages.

Evoenergy Earthing standard requires compliance with allowable step and touch potential as per AS/NZS7000. Evoenergy may permit BCC (including sheath and catenary) to be connected to the MEN system (LV neutral) to form one earthing system for electricity and BCC systems. This earth sharing arrangement is only allowed in common earthed areas where the LV neutral (MEN) is connected with a large number of customer's MEN.

Any situation that would not comply with this earthing requirement shall be brought into line with this standard or removed at the expense of the BCC installer.

## 6.16 Mechanical Protection of Communications UG/OH Cables

Communication cable shall be mechanically protected with a non-conductive material where it is likely that it will be damaged due to Evoenergy operations. Evoenergy takes no responsibility for damage to any unprotected cables during Evoenergy's normal operational activities.

Mechanical protection is required on all poles for all cables forming part of an overhead to underground connection, as follows:

- ☞ Suitable mechanical protection is required to be attached to the pole from a depth of 500 mm below ground to 4 m above ground level.
- ☞ Connection pits in the ground near poles must be a minimum of 1500 mm from pole.

Mechanical protection (conduit, U guard or similar) is required to protect telecommunications cables that run up the pole where a ladder or pole platform may be placed for work on the pole, its equipment or mains.

This is required from 500 mm below the highest electricity mains on the pole to at least 2500 mm below the lowest electricity mains on the pole.

## 6.17 Hazards

### 6.17.1 Safety Hazards

Evoenergy may restrict the attachment of communications equipment to its network at any location deemed unsafe. This includes condemned or nailed poles, poles in a less than satisfactory state of repair or condition, and termite affected poles. This may be due to:

- 🔌 Access, maintenance or operational difficulty
- 🔌 Environmental risk
- 🔌 Visual amenity or other community impact
- 🔌 Future capital works
- 🔌 Future customer connection or relocation works

### 6.17.2 Electrical

Electrical hazards that could be associated with the installation of communications infrastructure include:

- 🔌 earth return paths through coaxial cable screens due to open circuit neutrals or shared return paths during LV short circuits
- 🔌 elevated neutral voltages
- 🔌 power voltage injection
- 🔌 voltage back-feed through communications system power supply transformers
- 🔌 down earths on poles

Appropriate design, safety, training and risk management practices shall be implemented to prevent the exposure of these potential hazards to all staff, the community and equipment.

## 6.18 BCC Identification

The BCC owner shall at each pole, clearly identify the cable by an Evoenergy approved sign. Where a sign is installed for this purpose, it shall comply with the following requirements:

1. Up to a six (6) letter word or acronym identifying the owner of the cable only
2. A clear code to indicate the nature of the cable, NC for a non-conductive cable, and C for a conductive cable
3. Mounting of signs will be according to the methods set out in Table 4. Attachment using cable ties is not acceptable. Attachment to poles to be approximately 100mm below the cable
4. The sign material shall be aluminium sheet with an edge sealer
5. Reflective Class 2 individual numbers and letters, 30 mm high, are required.
6. The sign shall not impact any works to be carried out on Evoenergy assets by Evoenergy staff.

## 6.19 Make Ready Preparation Requirements

In some instances, there will be a requirement for redressing or replacement of some Evoenergy aerial facilities before they will be suitable for the attachment of communication infrastructure. The communication cable owner is responsible for all costs associated with this make ready work.

### 6.19.1 Pole Replacements

The agreements between various communication cable owners and Evoenergy define the process to be followed by both Evoenergy and the communication cable owners' staff. In general, Evoenergy staff are not permitted to interfere with the communication cable owners' equipment and cabling. The communication cable owner will make arrangements for the relocation of their assets where reasonable notice of the proposed works is given. The current arrangement with telecommunication provider's equipment is that Evoenergy staff will remove equipment from existing poles and tie/strap it to the new pole. Evoenergy will notify the relevant telecommunications provider who shall affix it as per the requirements of this standard. Replacement poles will generally be installed in the same position as the previous poles.

The BCC owner shall meet any requirement for the replacement of a pole for either clearance requirements or mechanical loadings due to the attachment of communication infrastructure, the cost of the pole replacement and associated works. In addition, any requirement to straighten leaning poles prior to the attachment of communication infrastructure shall be the responsibility of the communication cable owner.

The installation of a communication cable onto the electrical network shall utilise the existing poles where possible. Any requirement for the installation of additional network poles and stay poles is to be avoided and will only be approved if no other practical alternative arrangement is available

The conditions as stated in the agreements between various communication cable owners and Evoenergy set out the process to be followed by both Evoenergy staff and the various communication cable owners' staff.

### 6.19.2 Evoenergy Requirements

If Evoenergy choose to remove an overhead section of overhead mains line and replace it with an underground section the telecommunication has two options:

-  BCC owner can take ownership of the pole
-  Augment the telecommunications line underground

Any cost associated with the changes will be for the account of the communications owner.

Any upgrading of the network proposed by the BCC owner shall allow for any future proposal that Evoenergy may have for that structure. Evoenergy's right to install a structure on public land is dependent upon its use for electricity distribution. Undergrounding of all electrical circuits may require removal of the pole, or transfer of its ownership to the carrier.

### 6.19.3 Pole Movement with Existing Communication Cables

The variable nature of ground conditions and pole footings may prevent their accurate assessment at the time of assessing a pole's suitability for carrying communication cables. All costs are to be borne by the communication cable owner in the case where any corrective action is required to any infrastructure following the installation of communications cables.

## **6.20 General Requirements**

### **6.20.1 Network Records**

The communication cable owner shall provide GIS data in electronic format of the proposed alteration and additions in a form compatible with the Evoenergy GIS.

Annual rental received by Evoenergy is determined from Evoenergy network data and mapping records, which contain details of the communications networks. Evoenergy is to be informed within 30 business days when attachments occur to ensure the correct rental assessment.

### **6.20.2 Tree Trimming**

Evoenergy maintenance crews do not make allowance for communication cables in the extent of the tree trimming undertaken. Any requirement by communications infrastructure owners for the trimming of trees, if any, will only be done if payment for such work is negotiated separately.

### **6.20.3 Aesthetics**

Evoenergy is aware that its overhead electricity network will be implicated in any adverse community reaction due to the addition of communication infrastructure and accordingly, the telecommunications owner and Evoenergy staff involved in this exercise are to ensure the completed network is as aesthetically pleasing as possible.

The communication cable owner shall obtain the required approvals from the relevant authority and inform the residents before proceeding with the installation of any communications equipment. Evoenergy shall be provided this information prior to any works commencing.

## 7. ATTACHMENT OF COMMUNICATION TRANSMITTERS

### 7.1 Suitability of Structures

In order to ensure the minimum disruption to its customers Evoenergy retains the right to use its structures primarily for the purpose of the distribution of electricity.

The suitability of an Evoenergy structure for communication equipment will depend upon but not limited to the following:

- 🔌 The possible impact of the equipment on Evoenergy ability to perform its operation of its network
- 🔌 Evoenergy's future plans for augmentation, relocation and maintenance of the electricity network
- 🔌 The proposed additional loading due to the communication equipment and the mechanical strength of the pole structure. All designs and calculations shall be submitted with all application showing the structure can support the additional mechanical load as per AS/NZS 7000

In addition to the above, some sites may have further restrictions and limitations due to unavoidable emergency outages, higher voltage and higher power capacity sites tend to be more critical.

The carrier's application shall include consideration of voltage rise, the imposed step and touch potentials due to fault conditions on the electricity network at the structure and the impact on the communications asset and their staff during installation and operation of the equipment.

### 7.2 Pole and Column Requirements

#### 7.2.1 General Conditions

All carrier installations shall be designed so not to unduly interfere with Evoenergy activities during construction and maintenance of electricity networks. If an antenna is installed beneath an Evoenergy assets or streetlight outreach arms and connections, these locations could be subject to outages due to regular maintenance activities.

All designs shall be as per AS/NZ 7000 and as per the requirements of Evoenergy Standards.

Special design for the mounting of a transmitter may be required where an antenna is mounted below a mains circuit in order to provide access to Evoenergy assets by ladder for maintenance purposes. Permission for these installations will be on a case-by-case basis.

Any future corrective action required on the structure, due to pole foundation movement that has been established as caused by the addition of a carrier's equipment, shall be for the carrier's expense.

**TABLE 5.** SCHEDULE OF REFERENCES

VOLTAGE	INSULATION	LOCATION OF TRANSMITTER	CLEARANCE FROM TRANSMITTER TO THE LOWEST CIRCUIT
33 kV – 132 kV	Not allowed	Not allowed	Not allowed
11 kV – 22 kV	Bare, ABC and CCT	Below	2.1 m
LV and Street lights	Bare, ABC and Insulated Street Light	Below	0.75 m
BCC	Insulated	Above or below	0.3 m

Notes: Antennas are not permitted above bare conductors on tower structures.

### 7.2.2 Multi Circuit Poles

The antenna shall be installed below the lowest circuit and the clearance of this circuit, as indicated in Table 5, shall apply.

## 7.3 Attachment of Line Power Supplies

Where it is necessary to provide line power supplies to drive amplifiers and it need to be powered by the low voltage electricity system, this will be subject to an Evoenergy supply agreement.

Any devices that are required for the cable TV network will need to be powered by the low voltage electricity system, and will be subject to a special supply agreement with Evoenergy.

It is critical that the location of these devices is recorded in Evoenergy network data system. The communication hardware and associated power supply equipment shall be located:

- 📍 Outside the vertical exclusion zone distance for the type of antenna installed
- 📍 A minimum of 3.0 metres from the bottom of the equipment and ground. If this cannot be achieved, the hardware may be installed lower, however, a clearance of 3.0 metres above the equipment is required.

## 7.4 Prohibited Locations

- 📍 Antenna and associated equipment shall not be installed in the following situations:
- 📍 On conductive structures
- 📍 On hinged streetlight columns
- 📍 Where the non-industry worker emission zone from the antenna comes within 500 mm of where a worker can be during works on Evoenergy assets.
- 📍 Pole mounted substations
- 📍 Pole mounted automated switching equipment
- 📍 Pole mounted capacitors banks
- 📍 HV switching equipment
- 📍 Tee-off and UG/OH poles
- 📍 Above bare, covered and PVC insulated conductors (not including on tower installations)
- 📍 Any Evoenergy cross-arms

Evoenergy network communications equipment associated with the electricity distribution network shall not be subject to the restrictions as listed above provided relevant clearances are maintained as per the applicable standards.

## 7.5 Relocation and Modification of Current Evoenergy Network

### 7.5.1 Cell Owner Requested

At the request and expense of the owner, Evoenergy can carry out relocation and modification works on structures. The telecommunications owner may negotiate the relocation of other assets, including communication assets, which may be already attached to the pole. The cell owner will be required to get an agreement from all owners affected.

Where no alternative structure exists, a carrier may propose a different overhead construction of an Evoenergy structure to be able to install their communications equipment. Any changes will be for the account of the cell owner

## 7.5.2 Evoenergy Initiated Network Changes

Evoenergy reserves the right to change its structure at any time. In the situation where a cell owner's transmitters are attached to a structure, which needs to be modified, the cell owner shall be notified and has the responsibility to disassemble and remove the transmitter(s). The undergrounding of all electrical circuits would normally require the removal of all associated poles however, where the carrier requests, the pole ownership may be transferred to that carrier.

## 7.5.3 Multiple Antenna

When installing additional antenna on a structure, it is the responsibility of the carrier to Negotiate with owners of existing cells.

## 7.5.4 Mobile Cell Identification

The carrier shall clearly identify the cell by a nameplate, attached to the pole or to hardware on the pole. The nameplate shall be readable from the ground with the following information included:

-  The name of the carrier owner.
-  The carrier's Network Operations Centre phone number.
-  The carrier's Site Reference Number

## 8. VERSION HISTORY

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REV	DATE	CHANGE MADE
1	22 March 2017	Initial document
2	15 September 2017	Minor amendment (Section 7.1)
3	15 January 2018	Minor amendments (Rebranding)
3.1	17 January 2019	Disclaimer, note and copyright added

**APPENDIX A – DRAWING 390-018**

A copy of the aforementioned documentation has been included in this appendix for information as identified within this standard. The attached documentation is current as at the date of the standard and may be subject to amendment outside of this standard. Evoenergy does not warrant the accuracy of the content. The BCC shall be responsible for obtaining the current copy of all appended information directly from Evoenergy.

