# Network Standard

Document No.
NS262

Title:
Private mains bush fire risk audit

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Revision

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| **0** | 19/09/2015 | Initial | Manager T&DME | Head of AEP&S |
| **1** | 24/09/2015 | Apply Voltage Detector on pole clause: amended to be aligned with ESR | Duminda Thenuwara | Mark Ragusa |
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| **3** | 20/03/2026 | Comprehensive updating of format and document flow. Added training requirements. Defined relevant Maintenance Standards. Enhanced defect definitions and recording requirements. Enhanced safety precautions (new Annexure A). Revised conductor clearance and spreader requirements. Added defect notice criteria for aerial mains and poles. Clarified audit procedures for aerial mains (new Annexure C) and private poles (new Annexures D, F, G, H). Added allowable timber pole reinforcements and audit procedure / wall thickness criteria. Added scoping scenarios in Annexure B (was Annexure A). Added requirement to excavate stay anchors when corrosion is evident. Revised method for sounding of timber poles (new Annexure E) and steel poles. Added Annexure I for excavation and restoration. Revised process when any termites are identified (cease audit). Added ‘Unable to inspect’ exemption for steel poles constructed as per AS3000:2018. Removed NEG-EP05 references. | Greg Ross | Evan Riddell |
| **4** | 6/05/2026 | Revised LV spreader requirements (Clause 4.2.4 and Table 3). | Greg Ross | Evan Riddell |

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## Scope

This Network Standard outlines the requirements for the auditing process of low voltage Private Mains (aerial conductors, hardware and support structures) in bushfire prone areas for defects posing bushfire and safety risks. This Network Standard is aligned with the Ausgrid Maintenance Standards OH0115 'Private Pole and Line Hardware Audit' and OH0116 'Private Pole and Line Vegetation Audit'.

The primary objectives of this Network Standard are:

- To ensure that a consistent approach is applied to the auditing of Private Mains.
- To provide the defect criteria for Private Mains.
- To ensure that a consistent approach is applied to the issuing of defects notices on Private Mains.

This Network Standard does not include requirements for auditing of distribution mains owned by Ausgrid, private mains owned by high voltage customers (refer to the Service and Installation Rules of NSW) or mains owned by other authorities.

## Reference Documents

All work covered in this document shall conform to all relevant Legislation, Standards, Codes of Practice and Network Standards.

## Ausgrid Documents

Electrical Safety Rules

NEG-SE09 Management of CCA Impregnated Wood - Including Burning / Fire Damaged CCA Poles

NW000-P0168 Management of Overhead Private and Shared Mains

## Other Standards and Documents

Boaters' guide to electricity cable crossings of NSW Navigable Waters

ENA Doc 001-2019 National Electricity Network Safety Code

AS/NZS 3000:2018 Electrical installations "Wiring Rules"

AS/NZS6947 Crossing of waterways by electricity infrastructure

## Acts and Regulations

Electricity Supply (General) Regulation 2014 (NSW)

Electricity Supply (Safety and Network Management) Regulation 2014

ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets 2016

ISSC31 Guideline for the Management of Private Overhead Lines

Work Health and Safety Act 2011

Work health and Safety Regulation 2017

| Clause | Standard Requirements |
|---|---|

## 1 General

### 1.1 Network Technical Maintenance Plans

1.1.1 Ausgrid's Network Technical Maintenance Plan (NTMP) includes Maintenance Standard OH0115 primarily for auditing of Private Mains hardware in bushfire prone areas and Maintenance Standard OH0116 primarily for auditing of vegetation clearances to Private Mains in bushfire prone areas. The NTMP and Maintenance Standards OH0115 and OH0116 provide a detailed description of the required audit activities and the frequency of these audits.

1.1.2 An OH0115 private mains bushfire risk hardware audit ('private mains audit') includes the combined routine examination of the private aerial consumers mains ('private aerial mains'), the private pole and vegetation clearances.

1.1.3 An OH0116 private mains vegetation audit includes the assessment of vegetation clearances to private mains components and examination (patrol) for immediately dangerous hardware bushfire or safety risks.

1.1.4 The scope (extent) of the audit at each location shall be determined according to Annexure B.

1.1.5 Notifications for private mains audits are issued from SAP according to the NTMP

1.1.6 Maintenance Standard OH0115 and OH0116 shall be implemented according to the requirements of this standard.

1.1.7 Defects shall be rectified according to the requirements of procedure NW000-P0168.

### 1.2 Training and authorisation

1.2.1 Private mains audits shall only be performed by persons who have successfully completed all of the following courses and are authorised by Ausgrid to undertake the audit tasks.

- M1425 Asset Inspection, and
- TTPO0003 Private Pole and Aerial Mains Audit: Bushfire Risks, and
- TTDO1374 Introduction to Overhead Lines, and
- TTDO1375 Routine Overhead Lines, and
- UET20621 Certificate II 'ESI – Asset Inspection and Testing' (relevant modules).

### 1.3 Entry to private property

1.3.1 Only Authorised Officers with Certificates of Authority issued by Ausgrid are permitted to enter customer premises.

1.3.2 Private Mains Auditors shall immediately report confrontations with aggressive customers / dangerous animals while attempting entry to customer premises to their nominated representative.

### 1.4 Determine the scope (extent) of audit

1.4.1 Private mains audits shall include examination of the following:

- aerial consumers mains, and
- some aerial sub-mains and aerial sub-circuits (refer to Annexure B), and
- fixings, attachments and equipment associated with those mains, and
- private pole or posts supporting those mains and attachments.

1.4.2 Sub-mains and sub-circuits shall be assessed if they satisfy the following conditions:

- the sub-mains or sub-circuits form a continuous overhead line with the aerial consumers mains (i.e. the switchboard between the consumers mains and the sub-mains/circuits is mounted on a pole or a structure.

1.4.3 The private mains audit shall finish at the termination points of the continuous overhead line.

**Note:** there may be more than one termination point if there are tee-offs.

1.4.4 Refer to Annexure B for further details on determining which private assets shall be included in the private mains audit.

### 1.5 Rural subsidy schemes

1.5.1 Private mains installed under Rural Subsidy (RS) schemes are owned by the customers but are maintained as a part of Ausgrid's routine maintenance activities.

1.5.2 RS mains supported by RS poles shall be excluded from private mains audits.

1.5.3 Any aerial consumers mains connected to the RS mains shall be assessed.

**Note:** RS poles may be identified by the attachment of Ausgrid pole identification plates showing the pole's ID number (e.g. PY-12345).

### 1.6 Other types of supports

1.6.1 There may be situations where support structures (poles, crossarms or struts) do not fit within any of the categories detailed within this Network Standard. In these circumstances the structure shall be visually assessed for immediate bush fire or safety defects according to the principles prescribed within this Network Standard for the pole or strut type that most closely matches that support structure, including overloading of the structure.

1.6.2 The structure shall be recorded (photographed) from multiple perspectives.

1.6.3 The structure shall be considered defective and recorded as a bush fire or safety risk. A 'Defect Notice' shall be issued to the customer.

1.6.4 The customer shall be informed that Ausgrid is unable to confidently audit the condition of the structure. The customer shall be directed to replace the structure with supports that meet the requirement of AS/NZS 3000.

### 1.7 Pre-excavation assessment of reinstatement feasibility

1.7.1 Prior to performing below ground assessment of private poles when required according to this Network Standard, the Private Mains Auditor shall assess whether the site can be reinstated to an 'almost as found' condition. Excavation shall not be performed if:

- Below ground examination cannot take place without damaging customer property; and
- The site of excavation cannot be reinstated at minimal cost and effort (refer to Table 1).

1.7.2 In such situations, the customer shall be informed that Ausgrid is unable to satisfactorily assess the condition of the pole and the condition of the pole must be assessed by a suitably qualified contractor to be in a satisfactory condition for use until it is next audited (refer to Clause 2.2).

**Table 1 - Examples of when excavation shall or shall not take place.**

| Description | Excavate? | Notes on Reinstatement |
|---|---|---|
| **Grass / turf / dirt / soil / mulching** | Yes | Carefully remove and set aside top layer when excavating. Reinstate to an 'almost as found' condition by carefully placing the original top layer over the backfilled excavation. |
| **Vegetation near the pole** | Conditional | Excavation is required if vegetation can be removed by hand and set aside without damage. Reinstate to an 'almost as found' condition by carefully placing the vegetation in its original place in the backfilled excavation. |
| **Paving** | Conditional | Excavation is required if paving can be removed and set aside without damage. Reinstate to an 'almost as found' condition by carefully placing the paving in its original place in the backfilled excavation. |
| **Continuous paving / concrete** | No | Cutting of continuous paving / concrete shall not occur. Excavation is not required. |
| **Cold mix bitumen** | No | Removal of cold mix bitumen shall not occur. Excavation is not required. |

## 1.8 Unable to audit due to obstructions

1.8.1 There may be situations where circumstances prevent parts of private mains from being adequately assessed as a part of the Private Mains Bush Fire Risk Audit process, including (but are not limited to):

- Poles being concreted-in at groundline or restored with cold mix bitumen.
- Poles located in landscaped areas or garden beds where costly reinstatement prevents below ground pole assessment.
- Parts of the private mains being located in areas with poor or unsafe access.

1.8.2 In such situations, Private Mains Auditors shall issue an 'Unable to inspect' letter to the customer(s) detailing the reasons why parts of their private mains were not adequately audited (refer to Clause 2.2).

**Note:** an 'Unable to inspect' is not required for poles set in concrete (when new) that finishes 100mm above ground level in accordance with AS/NZS 3000:2018 unless other obstructions prevent assessment of the pole.

1.8.3 A generic non-mandatory recommendation for the asset to be assessed by a suitably qualified contractor shall be included in the 'Unable to inspect' letter.

1.8.4 Private Mains Auditors shall immediately notify their nominated representative and the nominated Ausgrid representative in circumstances where a customer is obstructing (not allowing) access to perform the audit.

## 1.9 Defect definitions

1.9.1 For the purpose of this Network Standard, any part of private mains or any vegetation clearance defect shall be considered as a bush fire defect at the time of auditing if the Private Mains Auditor is satisfied of the following conditions:

- The defective part of the private mains (or any portion of a span) is in a bush fire prone area or attached to an asset in a bushfire prone area, and
- The private mains part is in a dangerous condition (without requiring further degradation).

1.9.2 For the purpose of this Network Standard, any part of private mains shall be considered as a safety defect at the time of auditing if the Private Mains Auditor is satisfied of the following conditions:

- The private mains part is in a dangerous condition (without requiring further degradation), and

- Failure of the part may cause harm to human life or property (including animals).

1.9.3 For the purpose of this Network Standard, any part of private mains shall be considered as a maintenance issue at the time of auditing if it satisfies the following conditions:

- The private mains part is in a damaged or degraded state, and
- Further degradation in the condition of the part will result in a bush fire or safety defect unless the part is subjected to maintenance work.

# 2 Recording

## 2.1 Audit Recording

2.1.1 Private Mains Auditors shall use a Mobile Asset Management device (MAM device) approved by Ausgrid.

2.1.2 On the MAM device the Private Mains Auditor at each location shall:

- review and update the master data (refer to Clause C2.3), and
- enter all inspection details, and
- record identified defects on the overhead line and the pole, and defective poles according to Clause 2.2.

2.1.3 Synchronising of the device shall occur at least at the end of each working day, except when the pole is required to be immediately reported as specified in this Network Standard, in which case the device shall be synchronised from the site.

## 2.2 Recording Defects

2.2.1 Defect notices shall be managed in accordance with NW000-P0168 Management of Overhead Private and Shared Mains.

2.2.2 A ‘Defect Notice’ form shall be completed to record defects identified as posing bushfire or safety risks.

2.2.3 Completed ‘Defect Notice’ forms shall:

- Accurately record the bush fire or safety risk defects identified, the mandatory repairs or rectification work to be performed to address those defects (the ‘Required Work’) and whether it is a directive to perform ‘vegetation management’ work or ‘bushfire risk mitigation Work’ or ‘compliance of electrical safety’ work, and
- Be provided to the customer while at site (‘Customer Copy’ page), and
- Be submitted to the nominated Ausgrid representative (‘Ausgrid Copy’) within 24 hours, and
- Retained in the defect forms book (‘Book Copy’ page).

**Note:** for identified defects required to be immediately reported to Ausgrid, the ‘Ausgrid Copy’ (or a photograph of that page) shall be received by Ausgrid as soon as possible and by the close of business on the same day as the defect was found and preferably while at site.

2.2.4 A ‘maintenance issues advisory notice’ letter (maintenance advice letter) shall be completed to record defects identified as maintenance issues.

2.2.5 Completed maintenance advice letters shall:

- Accurately record the maintenance issues identified and a generic non-mandatory recommendation for repairs or rectification work to be performed, and
- Be provided to the customer while at site, and
- Be submitted to the nominated location (photograph) within 24 hours.

2.2.6 A ‘Bushfire safety inspection – Unable to access’ letter (Unable to access letter) shall be completed to record customer locations where initial audits could not be performed due to impediments (for example, gates, dogs, livestock) and access needs to be arranged with the customer by the nominated representative to complete the audit.

2.2.7 Completed 'Unable to access' letters shall:

- Accurately record the access issues identified, and
- Be provided to the customer while at site, and
- Be submitted to the nominated location (photograph) within 24 hours.

2.2.8 A 'Bushfire safety inspection – Unable to inspect' (Unable to inspect) letter shall be completed to record circumstances where private aerial mains or private poles which could not be adequately assessed due to obstructions (refer to Clause 1.8). The Unable to inspect letter shall include a recommendation (non-mandatory) for the private aerial mans or private pole to be inspected by a qualified contractor.

2.2.9 Completed 'Unable to inspect' letters shall:

- Accurately record the obstruction issues identified, and
- Be provided to the customer while at site and
- Be submitted to the nominated location (photograph) within 24 hours.

### 2.3 Defect photographs

2.3.1 Private mains defects shall be recorded (photographed) according to the audit finalisation procedures detailed in this Standard using a standard-definition digital camera with optical zoom (including mobile phone camera) when standing at the distance and angle required to review the relevant component or defect.

2.3.2 Photographs are required for all defects on a property and shall show the location of the defect.

2.3.3 Defect photographs shall be uploaded to the nominated location by the end of the next business day.

## 3 Safety Precautions

### 3.1 Electrical Safety Precautions

3.1.1 Private Mains Auditors shall implement safety precautions according to Annexure A prior to commencing the audit including:

- Visual examination for physical or electrical hazards and testing of the pole for the presence of hazardous voltages, and
- Visual assessment of the pole stability, or threats to pole stability.

3.1.2 Private Mains Auditors shall immediately report dangerous bushfire risks, electrical safety hazards or dangerous pole hazards to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

3.1.3 Private Mains Auditors shall then safeguard themselves and others against unsafe exposure to these hazards until it has been removed or Ausgrid staff attend to remove the hazard, or as agreed with the nominated Ausgrid representative.

### 3.2 Pole Precautions

3.2.1 Private poles may have structural performance and degradation characteristics that are more variable and less predictable compared to Ausgrid poles. When auditing private poles, auditors should therefore take into account a broader range of potential factors, including:

- They may not have been installed in accordance with any particular standard or defined embedment depth (particularly older poles).
- They may not have been designed or load rated in accordance with sound engineering practices.
- Their past maintenance regime is unknown and may not have been undertaken to maintain the pole in a serviceable condition.
- They may degrade faster than Ausgrid poles when subjected to factors such as termite attack, fungal decay and rust as the pole specification and age is unknown to Ausgrid.

3.2.2 Private aerial mains and private pole audits shall be performed from ground level or with other approved effective techniques which do not require climbing of the pole.

# 4 Audit Requirements – Private Aerial Mains

## 4.1 General Requirements

4.1.1 Private aerial mains shall be audited to identify degraded or damaged components which currently pose, or may be reasonably expected to pose within the period to the next inspection, the following risks:

- Components which pose a risk to the safety of the Ausgrid network, and
- Components posing bushfire risks, and.
- Components posing safety risks to human life or property, and
- Components which do not currently pose bushfire or safety risks, but which may pose these risks if left unmaintained, and
- Immediately dangerous bushfire or safety risks.

4.1.2 Private aerial mains audits may be performed in conjunction with (that is, overlapping with) the implementation of safety precautions or with the above ground examination of private poles.

4.1.3 Private aerial mains and private pole asset details shall be compared to those supplied by Ausgrid according to Clause C2.3 including, but not limited to, the following;

- Site details (for example, number of private poles on property, presence of sub-mains or sub-circuits, comparison to bushfire area boundaries).
- Recording any inconsistencies for correction in Ausgrid asset management system records.

4.1.4 Corrosion of steel components of private aerial mains shall be assessed against the steel condition rating criteria in Clause 6.6.

## 4.2 Aerial Mains

4.2.1 Private aerial mains (including conductors, crossarms / struts, insulators, fittings, connections, points of attachment, spreaders, accessories and terminations) shall be examined over their entire length between all structures or terminations.

4.2.2 Aerial conductor clearances on private mains shall be assessed for situations where conductors may make contact with nearby objects (or other conductors). Refer to Table 2 for the minimum aerial conductor clearances for new private mains.

**Table 2 – Minimum Low voltage aerial conductor clearances (source AS/NZS 3000:2018)**

| Minimum Clearance (m) | Bare aerial mains | Insulated / covered aerial mains |
|---|---|---|
| **Over areas used by vehicles** | 5.5 | 4.6 |
| **Over areas not used by vehicles** | 5.0 | 3.0 |
| **Over roofs used for traffic or resort** | 3.7 | 3.0 |
| **Over other roofs and structures** | 3.0 | 2.0 |
| **Horizontally from buildings / walls etc** | 2.0 | 1.0 |
| **From clothes lines, antennas, stay wires** | 2.0 | 2.0 |
| **From telecommunications lines** | 1.2 | 0.6 |
| **Over swimming pools** | Not permitted | 3.0 |
| **Over areas where sailing craft or irrigation pipes are used** | Not permitted | 5.5 |

4.2.3 Existing constructions built to an older standard may not need to comply with AS/NZS 3000 (until changes are made to the construction), therefore assessing conductor clearances shall focus on identifying defects likely to pose bush fire risks or risks to human life if they are not repaired.

4.2.4 In bushfire prone areas, low voltage spreaders are required in aerial consumers mains, sub-mains and sub-circuits consisting of spans with bare conductors over 30m long (horizontal or vertical construction) in accordance with Table 3:

**Table 3 - Low voltage spreader requirements.**

| Line Type | Horizontal Construction (Shorter cross arm length in span) | Vertical Construction (Vertical separation between outer conductors) | One spreader (mid-span) | Two spreaders (spaced equally) |
|---|---|---|---|---|
| **2 wire** | 1.8 m or less | 1.5 m or less | Span 30-45 m | Span > 45 m |
| **2 wire** | Greater than 1.8 m | Greater than 1.5 m | Span 55-110 m | Span > 110 m |
| **3 or 4 wire** | 1.8 m | 1.5 m | Span 30-45 m | Span > 45 m |
| **3 or 4 wire** | 2.1 m | 1.75 m | Span 45-90 m | Span > 90 m |
| **3 or 4 wire** | 2.4 m or greater | 2.0 m or greater | Span 55-110 m | Span > 110 m |

Where a single spreader is required, it should be installed mid-span (where reasonably practicable). Where two spreaders are required, they should be installed approximately 1/3 of the span length from the support structure at either end (where reasonably practicable).

4.2.5 The following tasks shall be performed during the assessment of private aerial mains (refer to Clause C2.3):

- Examination for aerial mains defects, damage, foreign objects and immediate risks posed by obsolete / redundant construction.
- Assessment for adequate clearances from each conductor to other conductors in the same span/bay and the need for low voltage spreaders to be installed.
- Assessment for adequate clearances from each conductor to the ground, trees / vegetation (refer to the following vegetation Clauses), buildings, fences and other objects, and spreader installation requirements.

## 4.3 Vegetation hazards

4.3.1 Private aerial mains and equipment shall be examined for grow-in and fall-in vegetation hazards. Refer to Figure 1.

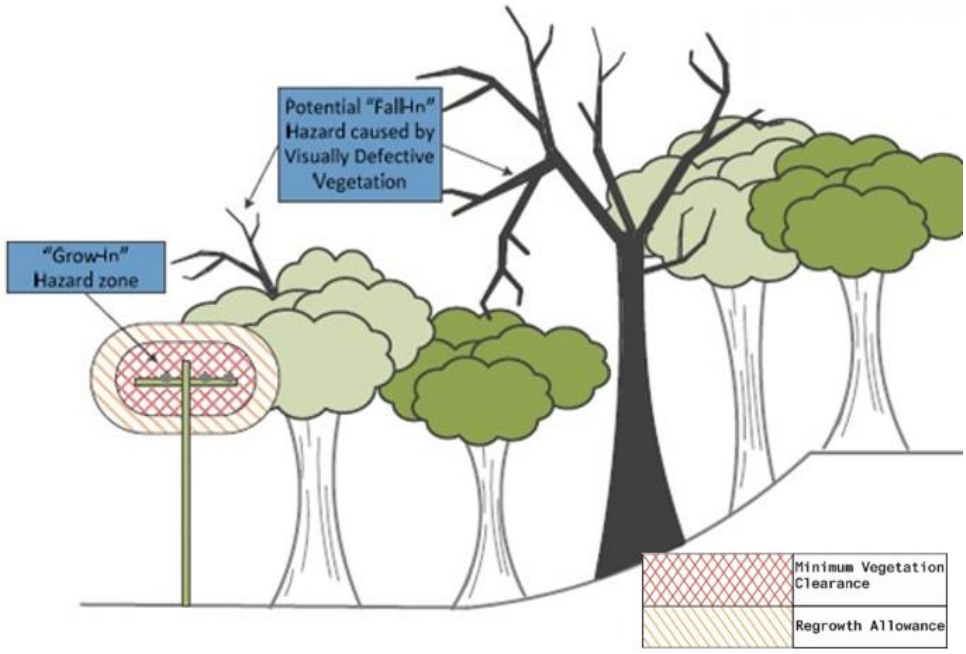



**Figure 1 - Diagram depicting vegetation hazards and their associated terminologies.**

4.3.2 A grow-in vegetation hazard is any vegetation that is within the minimum vegetation clearance from private mains as detailed in Table 4.

**Note:** Table 4 is based on relevant parts of Table 1 of ISSC3 and the assumption that span lengths do not exceed those specified in Table 3.9 of AS/NZS 3000:2018.

**Table 4 - Minimum Vegetation Clearances.**

| Voltage | Conductor Type | Bush Fire Prone Area Clearance (m) |
|---|---|---|
| LV | Bare conductors | 1.5 |
| | Covered / Insulated Conductors | 0.5 |

4.3.3 Fall-in vegetation hazards include visually defective vegetation (which is vegetation that is dead or dying and appears structurally unsound as identified from the perspective of the private property as far as it is reasonably practicable to do so), that is outside the minimum vegetation clearance (distances from electricity assets and which may require pruning, cutting, or removal to obviate the risk of it falling, dropping, and contacting the private aerial mains.

4.3.4 In assessing fall-in vegetation hazards consideration shall be given to the length of the vegetation beyond the potential breaking point compared to the distance from private mains assets.

4.3.5 Fall-in Vegetation Hazards shall be identified as either bush fire defects or maintenance issues subject to the assessment of the Private Mains Auditor.

### 4.4 Attached equipment

4.4.1 All components of equipment attached to poles (including UGOH arrangements, switchboards / meter boxes, control points, transformers, switches, links and lights) shall be examined.

4.4.2 The following tasks shall be performed during the examination of attached equipment (refer to Clause C2.3):

- Examination for attached equipment defects, damage, foreign objects and immediate risks posed by obsolete / redundant construction.

### 4.5 Earthing arrangements

4.5.1 All components of earthing arrangements (including cables, earth stakes, connections, conduits) shall be examined.

4.5.2 The following tasks shall be performed during the assessment of earthing arrangements (refer to Clause C2.3):

- Examination for earthing arrangement defects, damage, foreign objects and immediate risks posed by obsolete / redundant construction.
- Reporting of severed or missing earth cables / components immediately to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

**Note:** Private Mains Auditors shall not attempt to repair loose, broken or damaged earth system components as full phase to earth voltages may be present.

### 4.6 Climbing risks

Assess whether any objects located on or near the private pole may be climbed to allow persons to come into contact with energised electrical conductors.

### 4.7 Private aerial mains audit finalisation

4.7.1 Finalise the private aerial mains audit according to Clause C3.

4.7.2 Report immediately dangerous risks to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 4.8 Defect Notice Criteria – Private aerial mains

4.8.1 Audit results for private aerial mains shall be assessed against the defect notice criteria in Table 5 and Table 6 as well as the defect definitions in Clause 1.9 to determine whether the customer shall be notified of the existence of a defect.

**Table 5 – Defect Notice Criteria for Private Aerial Mains**

| Audit outcome | Required action if defect poses bushfire or safety risk (immediate or prior to next audit) | Required action if defect is not likely to pose bushfire or safety risk prior to next audit |
|---|---|---|
| **Access obstructions** | N/A | 'Unable to access' or 'Unable to inspect' letter |
| **Hazardous voltage / earthing** | Immediately report to the Ausgrid Emergency Line. | Maintenance letter if other issue but earth not broken / missing / loose. |
| **Open circuit neutral connection** | Immediately report to the Ausgrid Emergency Line. | N/A |
| **Spans - noticeable uneven tensions** | Bushfire risk defect notice if conductor clashing is likely. | N/A |
| **Timber Crossarms** | Bushfire risk defect notice if posing mains risks due to degradation / damage, loosely fitted or may detach. | Maintenance letter if split but insulators / fasteners are intact. |
| **Insulators and fittings** | Bushfire risk defect notice if detached / very loose, falling object risk, broken / damaged or steel condition according to Table 11. | Maintenance letter if loose but not causing mains risks, or steel condition according to Table 11. |
| **Conductors** | Bushfire risk defect notice if detached / very loose on insulator, annealed, stranding, corroded or in direct contact with pole or crossarm. | N/A |
| **Conductor connections / terminations** | Bushfire risk defect notice if evidence of overheating, missing or damaged insulation / covers, non-standard design. | Maintenance letter if defects are not immediately dangerous and are not accessible without climbing aids. |
| **Conductor clearances (other than to vegetation)** | Bushfire risk defect notice if conductors may contact nearby objects or other conductors, or bare conductor may contact telecommunications cable. | Maintenance letter if insulated or covered conductor may contact telecommunications cable. |
| **LV spreaders** | Bushfire risk defect notice if not installed or existing spreader is detached. | Maintenance letter if condition degraded or may become detached. |
| **Vegetation fall-in hazard** | Bushfire risk defect notice if possibility of fall-in contact | Maintenance letter if fall-in hazard is developing or will |

| | | |
|---|---|---|
| | with private aerial mains or pole if it fails. | not contact private mains if it falls. |
| **Attached equipment (including crossarms, switchboards / meter boxes)** | Bushfire risk defect notice if detached / very loose, risk to private mains, falling object or electrical risk, burnt / damaged or steel condition according to Table 11. | Maintenance letter if loose but not in proximity to mains or steel condition according to Table 11. |
| **Strut coupling** | Bushfire risk defect notice if detached / very loose, risk to private mains, falling object risk, burnt / damaged or steel condition according to Table 11. | Maintenance letter if loose but no falling objects risk or steel condition according to Table 11. |
| **Redundant / obsolete components** | Bushfire risk defect notice if imminent risk to private mains, risk of falling object or steel condition according to Table 11. | Maintenance letter if degraded but no risk to mains, no falling objects risk, or steel condition according to Table 11. |
| **UGOH's / conduits** | Bushfire risk defect notice if evidence of connection heating, cable damage or exposed cable risks. | Maintenance letter if cable covers degraded, detached or damaged but no cable damage or cable risk. |
| **Stay arrangements** | Bushfire risk defect notice if not effectively supporting pole, stranding / damaged, non-standard construction or steel condition according to Table 11. | Maintenance letter if loose but no pole movement or steel condition according to Table 11. |
| **None of the criteria above are met.** | Aerial mains are serviceable. Notice not required. | Aerial mains are serviceable. Letter not required. |

**Table 6 - Defect Notice Criteria - Vegetation Clearances**

| Conductor Type | Vegetation Clearance from Conductor | Bush Fire Prone Area Outcome |
|---|---|---|
| **Insulated / Covered** | 0.25m to 0.5m | Maintenance letter |
| | Touching to 0.25m | Bushfire risk defect notice |
| **Bare** | 1.2m to 1.5m | Maintenance letter |
| | Touching to 1.2m | Bushfire risk defect notice |

# 5 Audit Requirements – Timber Private Poles and Posts

## 5.1 General Requirements

5.1.1 All timber private poles or posts supporting private mains (including private UGOH's) shall be audited with focus on identifying:

- Defects that pose a risk to the Ausgrid network, and
- Defects that are likely to result in a bush fire, and
- Defects that may cause harm to human life or property, and
- Evidence of imminent pole failure.

5.1.2 Above ground assessments shall be performed on all timber private poles and posts.

5.1.3 Below ground assessments shall be performed on all timber poles and posts except for the following:

- Poles where active termites are identified during the above ground inspection or partial excavation, or
- Poles where stability will be affected by, or suspected to be affected by, excavation of the pole.
- Poles with immediately dangerous bushfire or safety hazards.

**Note:** all parts of the pole not obstructed by concrete below ground level shall be assessed when excavation is performed.

5.1.4 Timber private poles shall not be drilled, treated with preservative or termite treatments, or maintained (repaired) as part of the audit.

5.1.5 While AS/NZS 3000 does not allow for reinforcement of timber poles or posts, Ausgrid does not consider timber private poles to be a bushfire or safety risk if:

- The pole is strengthened with reinforcements that are an engineered commercially available and installed product, or
- The reinforcement type is the same as those used on Ausgrid poles (refer to NS145 Annexure B), and
- The minimum timber wall thickness of the pole meets Ausgrid requirements.

5.1.6 The following risks shall be immediately reported to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88);

- Immediately dangerous bushfire or safety hazards (imminent failure or less than 60% remaining width / diameter), or
- Any pole or post that is potentially unsafe for excavation.

## 5.2 Above Ground Assessment

5.2.1 Above ground assessment shall be performed on all timber private poles and posts to assess their condition and to determine that the pole or post is safe to excavate prior to performing excavation and below ground inspection.

5.2.2 The following tasks shall be performed prior to commencing the above ground assessment of each timber pole or post:

- Visual examination and testing for the presence of physical hazards according to Annexure A, and
- Visual assessment of the pole / post stability, or threats to pole / post stability, according to Annexure A including termites (past or present – refer to NS145 Annexure F), fungal decay, damage, reduced ground level or degradation of materials (including any reinforcement and pole head) and pole lean.

5.2.3 The following tasks shall be performed during the above ground assessment of timber private poles and posts:

- Examination for defects and termites, and condition assessment through sounding according to Clause D2.2.
- Measurement of the original diameter or width $D_0$ in the groundline area (refer to NS145 Annexure I). Record the measurement.
- Measurement of the reduced diameter or width $D_1$ at any location above ground where a defect has been detected (refer to NS145 Annexure I). Record the measurement.

5.2.4 The following additional tasks shall be performed during the above ground assessment of reinforced timber private poles which comply with Clause 5.1.5:

- Examination of the reinforcement for defects, and condition assessment through sounding according to Clause D2.2.

- Corrosion assessment of the reinforcement according to Clause 6.6.2.
- Internal assessment of the thickness of sound timber (if safe to do so) adjacent to the reinforced sections of the pole according to Clause D2.2 using existing holes where they are accessible.

5.2.5 The remaining diameter or width of the pole or post shall be calculated (as a percentage of the original) according to the following equation when any reduction has been identified and measured:

$$Remaining\ Diameter\ or\ Width\ (\%) = \frac{D_1}{D_0} \times 100\%$$

5.2.6 The pole shall meet the following criteria before excavation and below ground assessment is performed:

- The pole is not considered to be loaded close to or beyond its structural capacity (indicated by excessive lean or bending of the pole), and
- Actives termites were not found during the above ground assessment.
- Any reinforcement that has been installed complies with Clause 5.1.5.
- The pole, post or reinforcement which complies with Clause 5.1.5 does not have damage that reduces the structural integrity or stability of the pole or reinforcement, and
- The wall thickness of a reinforced pole which complies with Clause 5.1.5 is equal to or greater than the minimum wall thickness values in Table 8 or Table 9 (depending on the reinforcement type), and
- A CCA treated pole does not have fire damage, and
- Reinforcing splints, nails and securing bands / bolts which comply with Clause 5.1.5 do not have any steel condition requiring a defect notice in accordance with Clause 6.6.2 or folds and pole movement is not evident, and
- The remaining diameter or width of the pole or post exceeds 70% of the original diameter or width and
- Pole stability will not be affected by, or suspected to be affected by, excavation of the pole.

5.2.7 If a timber private pole or post is identified as immediately dangerous or potentially unsafe to excavate:

- Do not excavate the pole or post – finalise the private pole audit according to Clause D4, and
- Report the potentially unsafe pole or post immediately to the customer (where readily contactable) and to Ausgrid's Emergency Line (13 13 88).

## 5.3 Partial Excavation

5.3.1 Partial excavation and initial below ground assessment shall only be performed when the above ground assessment indicates that it is safe to proceed (refer to Clause 5.2.6) and when reinstatement is feasible (refer to Clause 1.6).

5.3.2 Continuous paving / concrete shall not be broken or cut or cold mix bitumen removed to perform the private pole audit.

5.3.3 Partial excavation and initial below ground assessment shall be performed on timber private poles and posts prior to performing the full below ground assessment to determine that the pole or post is safe to fully excavate.

5.3.4 Partial excavation and below ground inspection shall only be performed on reinforced timber private poles which comply with Clause 5.1.5 to determine the condition of the reinforcement. Full excavation and below ground inspection is not required.

5.3.5 If active termites are located during the partial excavation and initial below ground inspection, further excavation shall not proceed.

5.3.6 The following tasks shall be performed during the partial excavation and initial below ground assessment of timber private poles and posts:

- Record (photograph) the site prior to commencing excavation.
- Excavation, examination for defects and termites, and condition assessment through sounding according to Clause D3.2.
- Measurement of the assumed reduced diameter / width of the pole or post if one side is excavated, or actual reduced diameter / width of the pole or post if both sides are excavated, at locations where a diameter reduction has been detected (refer to NS145 Annexure I).
- Calculate the remaining diameter according to Clause 5.2.5 using the assumed reduced diameter (multiplied by 2) or actual reduced diameter of the pole when it has been measured.

5.3.7 The following tasks shall be performed during the partial excavation and initial below ground assessment of reinforced timber poles which comply with Clause 5.1.5:

- Excavation and examination for termites and reinforcement defects according to Clause D3.2.
- Corrosion assessment of the reinforcement according to Clause 6.6.2.

5.3.8 If a timber private pole or post is identified as potentially unsafe for full excavation;

- Do not excavate the pole or post – finalise the private pole audit; and
- Report the potentially unsafe pole or post immediately to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 5.4 Full Excavation and Below Ground Assessment

5.4.1 Full excavation and below ground assessment shall only be performed on timber private poles and posts when the partial excavation and initial below ground assessment indicates that it is safe to proceed (refer to Clause 5.2.6).

5.4.2 Full excavation and below ground assessment shall not be performed on reinforced poles.

5.4.3 If actives termites are located while excavating or during the below ground assessment the assessment shall cease.

5.4.4 The following tasks shall be performed during the full excavation and below ground assessment of timber private poles and posts:

- Excavation, examination for defects and termites, and condition assessment of the pole or post through sounding according to Clause D3.3.
- Measurement of the reduced diameter / width $D_1$ at locations where a defect has been located (refer to NS145 Annexure I).

## 5.5 Timber private pole audit finalisation

5.5.1 Finalise the timber private pole or post audit according to Clause D4.

5.5.2 Report immediately dangerous risks to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 5.6 Defect Notice Criteria –Timber Private Poles and Posts

5.6.1 Audit results for timber private poles and posts shall be assessed against the defect notice criteria in Table 7, Table 8 and Table 9 and the defect definitions in Clause 1.9 to determine whether the customer shall be notified of the existence of a defect.

**Table 7 – Defect Notice Criteria for Timber Private Poles and Posts**

| Audit outcome | Required action if defect poses bushfire or safety risk (immediate or prior to next audit) | Required action if defect is not likely to pose bushfire or safety risk prior to next audit |
|---|---|---|
| **Audit obstructions (pole cannot be fully assessed)** | Bushfire risk defect notice if causing reduced clearance risks / pole movement. | Unable to inspect letter if not causing reduced clearance risks / pole movement. |
| **Leaning or bending more than 10°** | Bushfire risk defect notice if causing reduced clearance risks / pole movement. | Maintenance letter if not causing reduced clearance risks / pole movement. |
| **Timber strut coupling degradation or damage.** | Bushfire risk defect notice if detached / very loose or steel condition according to Table 11. | Maintenance letter if loose or steel condition according to Table 11. |
| **Pole head splits** | Bushfire risk defect notice if split > 10mm or multiple splits > 5mm extend to attachment bolts. | Maintenance letter if splits do not extend to attachment bolts. |
| **Diameter / width reduction (any cause).** | Bushfire risk defect notice if < 70% of original diameter / width. Immediately report to the Ausgrid Emergency Line if ≤ 60% of original diameter / width. | Maintenance letter if 70-80% of original diameter / width. |
| **Fire damage to a CCA pole / post.** | Safety risk defect notice. | N/A |
| **Non-compliant reinforcement** | Bushfire risk defect notice | N/A |
| **Compliant reinforcement** | Bushfire risk defect notice if steel condition according to Table 11. | Maintenance letter if steel condition according to Table 11. |
| **Securing bands / bolts for compliant reinforcement** | Bushfire risk defect notice if missing / loose or if steel condition according to Table 11. | Maintenance letter if steel condition according to Table 11. |
| **Minimum wall thickness adjacent to the compliant reinforcement** | Bushfire risk defect notice if < 30mm | Maintenance letter if > 30mm but < values in Table 8 or Table 9 |
| **Termite activity** | Bushfire risk defect notice if termite activity is identified. | N/A |
| **Fungal decay / fruiting bodies** | Bushfire risk defect notice if internal defect identified or suspected, or fruiting body anywhere on pole. | N/A |
| **None of the criteria above are met.** | Pole is serviceable. Notice not required. | Pole is serviceable. Letter not required. |

**Table 8 – Minimum Wall Thickness Above Groundline for Splinted Reinforced Timber Poles**

| Splint Type | Pole Diameter (mm) | Height Above Groundline | | |
|---|---|---|---|---|
| | | 200mm | 800mm or 50mm below top bands | 1000mm or 50mm above top bands |
| **C-Truss (single)** | Any | 50mm (at G/L) | 50mm | 50mm |
| **C-Truss (double)** | Any | 25mm (at G/L) | 25mm | 25mm |
| **Powerbeam Micro** | 180 - 300 | 30mm | 30mm | 30mm |
| **Powerbeam Mini** | 240 - 400 | 35mm | 35mm | 35mm |
| **Powerbeam Small** | 260 - 500 | 50mm | 50mm | 50mm |
| **Powerbeam Large** | 280 - 600 | 60mm | 60mm | 60mm |
| **Oz C** | < 300 | 28mm | 40mm | 40mm |
| **Oz C** | 300 - < 400 | 34mm | 50mm | 50mm |
| **Oz C** | 400 - < 500 | 40mm | 60mm | 60mm |
| **Oz C** | 500 - < 600 | 46mm | 70mm | 70mm |
| **Oz C** | => 600 | 52mm | 80mm | 80mm |

**Table 9 – Minimum Wall Thickness Above Groundline for Nailed Reinforced Timber Poles**

| Nail Type | Pole Diameter (mm) | Height Above Groundline | | |
|---|---|---|---|---|
| | | 200mm | 800mm | 1000mm |
| **RFD Nail** | Any | 30mm | 60mm | 60mm |
| **Powerbeam Micro** | 180 - 300 | N/A | N/A | N/A |
| **Powerbeam Mini** | 240 - 400 | 40mm | 40mm | 40mm |
| **Powerbeam Small** | 260 - 500 | 50mm | 50mm | 50mm |
| **Powerbeam Large** | 280 - 600 | 75mm | 75mm | 75mm |

# 6 Audit Requirements – Steel Private Poles

## 6.1 General Requirements

6.1.1 All steel private poles supporting private mains (including UGOH's) shall be audited with focus on identifying:

- Defects that pose a risk to the Ausgrid network, and
- Defects that are likely to result in a bush fire, and
- Defects that may cause harm to human life or property, and
- Evidence of imminent pole failure.

6.1.2 Above ground assessments shall be performed on all steel private poles.

6.1.3 Below ground assessments shall be performed on all steel private poles according to Clause 1.1 except for the following:

- Any poles with perforations or folds evident above groundline, or

- Rag-bolt mounted steel poles where the mounting bolts have not been buried below groundline, or
- Poles set in concrete (when new) that finishes 100mm above ground level in accordance with AS/NZS 3000:2018.
- Poles where stability will be affected by, or suspected to be affected by, excavation of the pole.

6.1.4 Steel private poles shall not be tested with an ultrasonic meter, treated for corrosion or maintained (repaired) as part of the audit.

6.1.5 Reinforced steel private poles do not comply with the requirements of AS/NZS 3000:2018.

6.1.6 The following risks shall be immediately reported to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88);

- Immediately dangerous bushfire or safety hazards (imminent failure / folds or perforations), or
- Any pole that is potentially unsafe for excavation.

## 6.2 Above Ground Assessment

6.2.1 Above ground assessment shall be performed on all steel private poles to assess their condition and to determine that the pole is safe to excavate prior to performing excavation and below ground inspection.

6.2.2 The following tasks shall be performed prior to commencing the above ground assessment of each steel private pole:

- Visual examination and testing for the presence of physical hazards according to Annexure A, and
- Visual assessment of pole stability, or threats to pole stability, according to Annexure A including damage, corrosion, perforations, dents or folds, reduced ground level, and pole lean.

6.2.3 The following tasks shall be performed during the above ground assessment of steel private poles:

- Examination for defects and condition assessment through sounding according to Clause F2.2.
- Corrosion assessment according to Clause 6.6.2.

6.2.4 The following tasks shall be performed during the above ground assessment of rag-bolt mounted steel private poles:

- Removal of surrounding materials (excluding concrete / cold mix bitumen) covering the base plate or rag-bolt components (where required).
- Examination for pole defects and rag-bolt mounting defects, and condition assessment of the pole through sounding according to Clause F2.2.
- Corrosion assessment according to Clause 6.6.2.
- Check securing nut tightness and for missing nuts.

6.2.5 The pole shall meet the following criteria before excavation and below ground assessment is performed:

- The pole is not considered to be loaded close to or beyond its structural capacity (indicated by excessive lean or bending of the pole), and
- The pole does not have any steel condition requiring a defect notice accordance to Clause 6.6.2 or folds or perforations above groundline, and
- The base plate or mounting components of rag-bolt mounted steel poles does not have any steel condition requiring a defect notice according to Clause 6.6.2 or cracked welds, and
- The base plate of a rag-bolt mounting does not have two or more missing nuts, and

- The pole stability will not be affected by, or suspected to be affected by, excavation of the pole, standard or column.

6.2.6 If a steel private pole is identified as immediately dangerous or potentially unsafe to excavate:

- Do not excavate the pole – finalise the private pole audit according to Clause F4, and
- Report the potentially unsafe pole immediately to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 6.3 Partial Excavation

6.3.1 Partial excavation and initial below ground assessment shall only be performed when the above ground assessment indicates that it is safe to proceed (refer to Clause 6.2.5) and when site reinstatement is feasible (refer to Clause 1.6).

6.3.2 Continuous paving / concrete shall not be broken or cut or cold mix bitumen removed to perform the private pole audit, including poles set in concrete (when new) in accordance with AS/NZS 3000:2018.

6.3.3 Partial excavation and initial below ground assessment shall be performed on steel private poles prior to performing the full below ground inspection to determine that the pole or standard is safe to fully excavate.

6.3.4 Partial excavation or full excavation shall not be performed on rag-bolt mounted steel private poles other than minor excavation required to allow removal of surrounding material that has covered the base plate or rag-bolt components.

6.3.5 If any steel with a condition requiring a defect notice according to Clause 6.6.2, folds, or perforations are located during the partial excavation and initial below ground assessment, further excavation shall not proceed.

6.3.6 The following tasks shall be performed during the partial excavation and initial below ground assessment of steel private poles:

- Record (photograph) the site prior to commencing excavation.
- Excavation and examination for defects and condition assessment through sounding according to Clause F3.2.
- Corrosion assessment according to Clause 6.6.2.

6.3.7 If a steel private pole is identified as potentially unsafe for full excavation:

- Do not excavate the pole.
- Finalise the private pole audit according to Clause F4.

## 6.4 Full Excavation and Below Ground Assessment

6.4.1 Full excavation and below ground assessment shall only be performed when the partial excavation and initial below ground assessment indicates that it is safe to proceed (refer to Clause 6.2.5).

6.4.2 If any steel condition requiring a defect notice in accordance with Clause 6.6.2, folds or perforations are located at any stage while excavating, further excavation shall not proceed.

6.4.3 The following tasks shall be performed during the full excavation and below ground assessment of steel private poles:

- Excavation, examination for defects, and condition assessment through sounding according to Clause F3.3.
- Corrosion assessment according to Clause 6.6.2.

## 6.5 Steel private pole audit finalisation

6.5.1 Finalise the steel private pole audit according to Clause F4.

6.5.2 Report immediately dangerous risks to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 6.6 Defect Notice Criteria - Steel Private Poles

6.6.1 Audit results for steel private poles shall be assessed against the defect notice criteria in Table 10 and Table 11 and the defect definitions in Clause 1.9 to determine whether the pole remains serviceable or corrective action is required.

**Note:** an 'Unable to inspect' letter shall not be issued for poles set in concrete (when new) that finishes 100mm above ground level in accordance with AS/NZS 3000:2018, except for circumstances where issues other than the concrete prevent full assessment of the pole.

6.6.2 Corrosion of all steel components (including poles, reinforcements, rag-bolt mountings, attachments, fasteners and fittings) shall be assessed and actioned according to the steel condition rating criteria in Table 11.

**Table 10 - Defect Notice Criteria for Steel Private Poles**

| Audit outcome | Required action if defect poses bushfire or safety risk (immediate or prior to next audit) | Required action if defect is not likely to pose bushfire or safety risk prior to next audit |
|---|---|---|
| **Audit obstructions (pole cannot be fully assessed)** | Bushfire risk defect notice if causing reduced clearance risks / pole movement. | Unable to inspect letter if not causing reduced clearance risks / pole movement. |
| **Leaning or bending more than 10°** | Bushfire risk defect notice if causing reduced clearance risks / pole movement. | Maintenance letter if not causing reduced clearance risks / pole movement. |
| **Dents, folds, cracks / fractures or perforations (before or after sounding) at any location.** | Bushfire risk defect notice. | N/A |
| **Any flattened section of the pole or bending at a flattened section.** | Bushfire risk defect notice if flattened section is 50% or more of the diameter at that height or is causing reduced clearance risks. | Maintenance letter if flattened section is less than 50% of the diameter at that height and is not causing reduced clearance risks. |
| **Non-compliant reinforcement** | Bushfire risk defect notice | N/A |
| **Corrosion.** | According to Table 11, or if pole deforms or internal rust falls when sounded. | According to Table 11. |
| **Rag-bolt mounting** | Bushfire risk defect notice if 2 or more nuts are missing or if any steel condition according to Table 11. | Maintenance letter if 1 nut is missing or if any steel condition according to Table 11. |
| **Access covers.** | Bushfire risk defect notice if missing or allow unauthorised access or water ingress. | Maintenance letter if loose but do not allow unauthorised access without a tool. |
| **Pole cap** | N/A | Maintenance letter if pole cap is missing or allows water ingress |
| **None of the criteria above are met.** | Pole is serviceable. Notice not required. | Pole is serviceable. Letter not required. |

**Table 11 – Steel condition rating and defect notice criteria**

| Description of steel condition | Required action |
|---|---|
| **No indication of corrosion** | Nil - serviceable |
| **Corrosion stain / discolouring and galvanised coating is intact.** | Nil - serviceable |
| **Corrosion stain / discolouring and galvanised coating is compromised.** | Maintenance letter |
| **Corrosion (including fittings / fasteners) – flaking / scaly rust** | Defect Notice |
| **Corrosion – loss of metal / pitting / bubbling** | Defect Notice |
| **Corrosion – perforation or folding in steel wall of pole** | Defect Notice |

# 7 Audit Requirements – Concrete Private Poles

## 7.1 General Requirements

7.1.1 All concrete private poles supporting private mains (including UGOH's) shall be audited with focus on identifying:

- Defects that pose a risk to the Ausgrid network, and
- Defects that are likely to result in a bush fire, and
- Defects that may cause harm to human life or property, and
- Evidence of imminent pole failure.

7.1.2 Above ground assessment shall be performed on all concrete private poles.

7.1.3 Below ground assessment shall not be performed on concrete private poles.

7.1.4 Concrete private poles shall not be strengthened with an external reinforcement.

7.1.5 The following risks shall be immediately reported to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88);

- Immediately dangerous bushfire or safety hazards (imminent failure / exposed reinforcing bars).

## 7.2 Above Ground Assessment

7.2.1 Above ground assessment shall be performed on all concrete private poles to assess the condition of the pole.

7.2.2 The following tasks shall be performed prior to commencing the above ground assessment of each concrete pole:

- Visual examination and testing of the pole for the presence of physical hazards according to Annexure A, and
- Visual assessment of the pole stability, or threats to pole stability, according to Annexure A including damage, concrete spalling (particularly exposed reinforcing) or corrosion stains, reduced ground level, and pole lean.

7.2.3 The following tasks shall be performed during the above ground assessment of concrete private poles:

- Examination for pole defects according to Clause G2.2.

## 7.3 Concrete private pole audit finalisation

7.3.1 Finalise the pole audit according to Clause G2.3.

7.3.2 Report immediately dangerous risks to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

### 7.4 Defect Notice Criteria – Concrete Private Poles

Audit results for concrete private poles shall be assessed against the defect notice criteria in Table 12 and the defect definitions in Clause 1.9 to determine whether the pole remains serviceable or corrective action is required.

**Table 12 - Defect Notice Criteria for Concrete Private Poles**

| Audit outcome | Required action if defect poses bushfire or safety risk (immediate or prior to next audit) | Required action if defect is not likely to pose bushfire or safety risk prior to next audit |
|---|---|---|
| **Audit obstructions (pole cannot be fully assessed)** | Bushfire risk defect notice if causing reduced clearance risks / pole movement. | Unable to inspect letter if not causing reduced clearance risks / pole movement. |
| **Leaning or bending more than 10°** | Bushfire risk defect notice if causing reduced clearance risks / pole movement, or concrete cracks due to pole bending / loading. | Maintenance letter if not causing reduced clearance risks / pole movement. |
| **Concrete damage or degradation.** | Bushfire risk defect notice if full circumference of reinforcing bar is exposed or partly exposed with steel condition according to Table 11. | Maintenance letter if exterior cracking / rust stains, loose / damaged attachments (eg earth connections) or steel condition according to Table 11. |
| **Non-compliant reinforcement** | Bushfire risk defect notice | N/A |
| **Access covers.** | Bushfire risk defect notice if missing or allow unauthorised access or water ingress. | Maintenance letter if loose but does not allow unauthorised access without a tool or water ingress. |
| **None of the criteria above are met.** | Pole is serviceable. Notice not required. | Pole is serviceable. Letter not required. |

## 8 Audit Requirements – Fibre Composite Private Poles

### 8.1 General Requirements

8.1.1 All composite fibre private poles supporting private mains (including UGOH's) shall be audited with focus on identifying:

- Defects that pose a risk to the Ausgrid network, and
- Defects that are likely to result in a bush fire, and
- Defects that may cause harm to human life or property, and
- Evidence of imminent pole failure.

8.1.2 Above ground assessment shall be performed on all fibre composite private poles.

8.1.3 Below ground assessment shall not be performed on fibre composite private poles.

8.1.4 Fibre composite private poles shall not be reinforced.

8.1.5 The following risks shall be immediately reported to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88);

- Immediately dangerous bushfire or safety hazards (imminent failure / folds or exposed reinforcing fibres).

## 8.2 Above Ground Assessment

8.2.1 Above ground assessment shall be performed on all fibre composite private poles to assess the condition of the pole.

8.2.2 The following tasks shall be performed prior to commencing the above ground assessment of each pole:

- Visual examination and testing of the pole for the presence of physical hazards according to Annexure A, and
- Visual assessment of the pole stability, or threats to pole stability, according to Annexure A including damage, deformation / folds or deterioration of the external surface (missing or degraded cement or resin matrix).

8.2.3 The following tasks shall be completed during the above ground assessment of each pole:

- Examination for defects according to Clause H2.2.

## 8.3 Fibre composite private pole audit finalisation

8.3.1 Finalise the pole audit according to Clause H2.3.

8.3.2 Report immediately dangerous risks to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

## 8.4 Defect Notice Criteria – Fibre Composite Private Poles

8.4.1 Audit results for fibre composite private poles shall be assessed against the defect notice criteria in Table 13 and the defect definitions in Clause 1.9 to determine whether the pole remains serviceable or corrective action is required.

**Table 13 - Defect Notice Criteria for Fibre Composite Poles**

| Audit outcome | Required action if defect poses bushfire or safety risk (immediate or prior to next audit) | Required action if defect is not likely to pose bushfire or safety risk prior to next audit |
|---|---|---|
| **Audit obstructions (pole cannot be fully assessed)** | Bushfire risk defect notice if causing reduced clearance risks / pole movement or pole has a transformer. | Unable to inspect letter if not causing reduced clearance risks / pole movement or no transformer. |
| **Leaning or bending more than 10°** | Bushfire risk defect notice if causing reduced clearance risks / pole movement, or cracks / folds due to pole bending / loading. | Maintenance letter if not causing reduced clearance risks / pole movement. |
| **Surface damage or degradation.** | Bushfire risk defect notice if any surface cracks / damage, folds or fibre exposure. | Maintenance letter if UV degradation of resin matrix or loose / damaged attachments (eg earth connections). |
| **Non-compliant reinforcement** | Bushfire risk defect notice. | N/A |
| **None of the criteria above are met.** | Pole is serviceable. Notice not required. | Pole is serviceable. Letter not required. |

## Annexure A: Safety Precautions

### A1 General Requirements

Private aerial mains and private poles are installed in all types of terrain, from suburban areas to mountainous terrain and coastal marine areas. It is not possible for this Network Standard to account for all specific safety precautions for every situation.

Private mains audit work is normally performed with the aerial mains audit process completed first as a non-intrusive inspection to identify any other safety concerns not identified during the Hazard Assessment Conversation (HAC) process.

### A2 Ausgrid's Emergency Line

The results of some private mains audits can reveal the existence of a hazardous situation on the customer's premises or Ausgrid's network, or the possibility that such a situation exists.

In such circumstances, as detailed in the sections that follow, the Private Mains Auditor shall immediately contact the Ausgrid Emergency Line (13 13 88). The customer shall also be notified when they are readily contactable.

Upon contacting Ausgrid's Emergency Line due to a hazardous situation, work shall cease. Private Mains Auditors shall safeguard themselves and others against unsafe exposure to these hazards until the hazard has been removed, or Ausgrid staff attend to remove the hazard, or until directed otherwise by Ausgrid staff.

### A3 CCA and Creosote treatment

Private Mains Auditors shall use appropriate health precautions when working on CCA treated poles and poles treated with creosote.

Leather gloves shall be worn when contacting the pole. Private Mains Auditors shall not excavate CCA treated poles which have fire damage or are burning / smouldering.

Additional information regarding CCA treated poles is available in NEG-SE09.

### A4 Synthetic mineral fibres

Private Mains Auditors shall use appropriate health precautions when working on fibre composite poles where the synthetic mineral fibres have become exposed.

Disposable overalls, safety goggles, leather gloves and a disposable half-face particulate filter respirator shall be worn if contact needs to be made with fibre composite poles with exposed fibres.

### A5 Falling Objects

Appropriate personal protective equipment (e.g. hard hat) shall be used when working at the base of a pole. Private Mains Auditors shall also be aware that falling objects present a hazard to other parts of the body, as more of the body is exposed to falling objects when working in a bent over position than a standing position.

A pre-work visual assessment shall be conducted to identify above ground hazards such as:

- Loose sapwood.
- Loose streetlights.
- Loose nuts.
- Loose vertical construction.
- Tools left on crossarms.
- Cracked, loose or damaged insulators.

### A6 Hazardous Voltages

Private Mains Auditors shall be aware of voltage gradients (differences in voltage) that can exist on or near a pole (both above ground and below ground) and which can potentially cause electrical safety hazards. Hazardous voltages may occur due to damage or degradation of the pole and overhead mains or underground cables, including;

- Conductors not being properly fixed to insulators (eg broken tie wires).
- Low ground clearance of conductors.
- Broken or missing earth wires, or loose earth connections.
- Cracked or damaged insulators.
- Conductive foreign objects (eg vegetation, fencing wires, metal conduits).
- Underground cable damage or degradation.

Private Mains Auditors shall take precautions to safeguard themselves and others against inadvertent contact with hazardous voltages.

Testing of each pole and any attached conductive structure shall be performed according to Ausgrid's Electrical Safety Rules to confirm the absence of hazardous voltages prior to initial contact with the pole or any attached conductive structure.

Any hazardous voltages identified shall be immediately reported to the Ausgrid's Emergency Line.

## A7 Visual Inspection of Earth Wires

Earth wires form part of an earthing system which can become damaged or degraded over time.

Prior to making initial contact with the pole, Private Mains Auditors shall visually assess above ground sections of earth wires to assess its condition and whether the earth wire is intact. Earth wires shall then be tested according to Clause A6 to confirm the absence of hazardous voltages.

If earth wires are present on a pole, the below ground condition of the earth wire shall also be assessed and continuously monitored by visual assessment and retested according to Clause A6 to confirm the absence of hazardous voltages during and after excavation.

Private Mains Auditors shall not attempt to tighten loose earth connections or re-join broken / missing earth wires as full phase to earth voltage may exist between the severed ends and to other objects.

Any loose earth connections or broken / missing earth wires identified shall be reported immediately to the Ausgrid's Emergency Line.

## A8 Insufficient Depth in Ground

Landscaping, excavations, subsidence or erosion can result in a pole having less depth in ground compared to when it was originally installed. This can severely reduce the stability of the pole and pole movement may be evident. Refer to Clause I1.2 for further details. NS145 Annexure B also describes the correct height of pole discs, which are a good indicator of pole sinking depth.

Immediately dangerous pole situations (for example, poles with excessive lean / significantly reduced depth in ground, causing mains clearance risks, or imminent pole failure) shall be reported to the Ausgrid Emergency Line. The customer shall also be notified when they are readily contactable.

## A9 Excavation Precautions

Pole excavation shall only be performed where the above ground audit indicates that it is safe to proceed according to the criteria in this Standard. Extreme caution shall be exercised when excavating around a pole, particularly those poles that have cables (UGOH's) and other items attached to them. Contact with cables shall be minimised.

Private Mains Auditors shall use non-conductive tools or tools with non-conductive handles, or wear insulating gloves, when electrical assets are located. Underground cables shall be tested according to Clause A6 prior to, and after, excavation to confirm the absence of hazardous voltages.

Where a cable tests positive to hazardous voltages or is observed as having damaged insulation (e.g. where the outer covering is partially removed exposing the underlying material) it shall be immediately reported as a dangerous electrical safety hazard. Refer to Clause I1 for further details on precautions to be taken when excavating poles.

## Annexure B: Guide to Scoping the Extent of Audit and Responsibility for Risk Mitigation Work

In most circumstances, private mains inspectors shall conduct Private Mains Bush Fire Risk Audits only on aerial consumers mains.

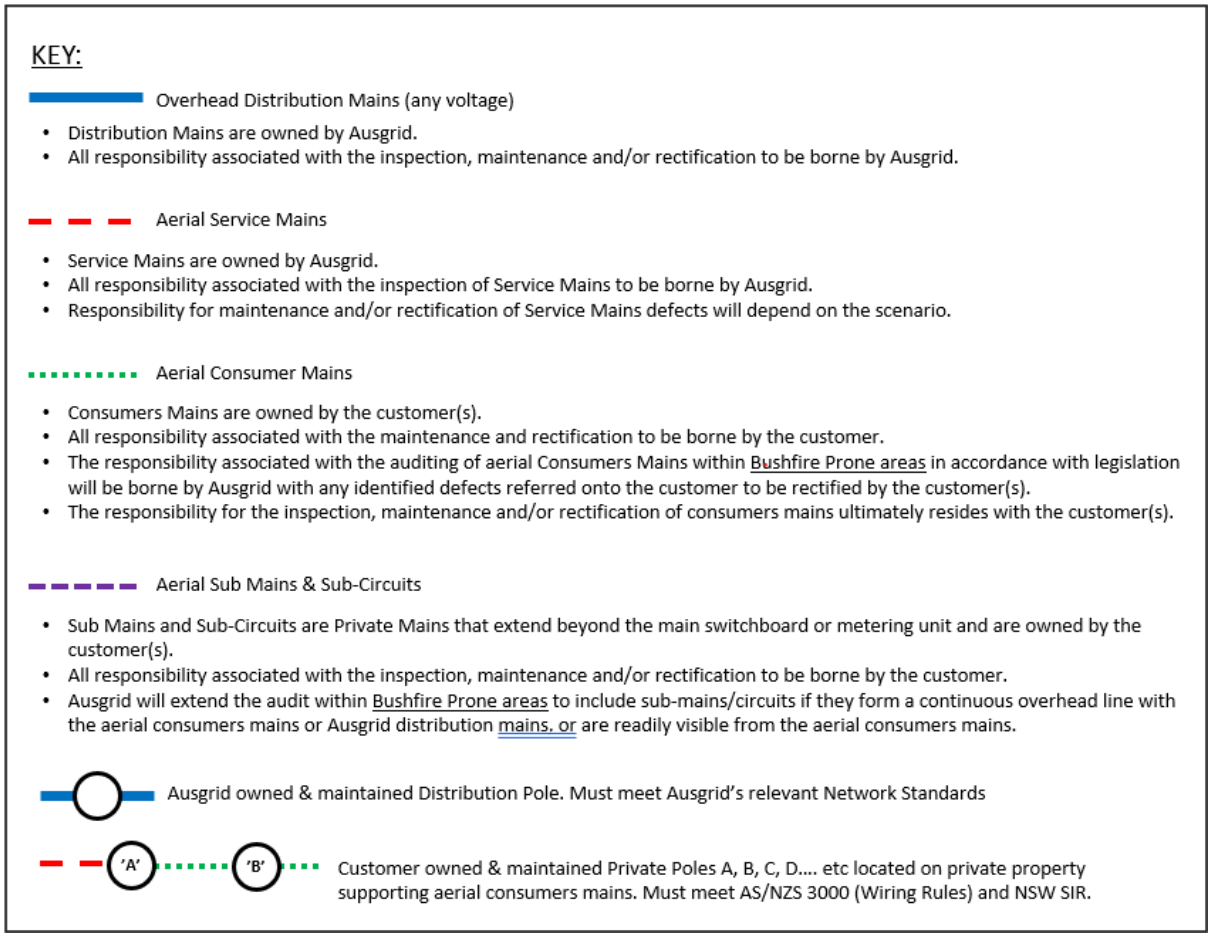
The primary purpose of conducting a Private Mains Bush Fire Risk Audit is to identify unsafe aerial consumers mains installation with bush fire defects and make the owner aware of their obligation to rectify any defects that make them unacceptable risks to the safety of Ausgrid's network and the wider community. Ausgrid will also satisfy itself that any Required Work is undertaken and if required undertake the Required Work necessary to make the aerial consumers mains installation safe.

However, there are instances where Ausgrid will extend the audit function past the main switchboard or metering unit to achieve this objective; namely, where the aerial sub-mains/circuits form a continuous overhead line with the aerial consumers mains (i.e. the main switchboard is mounted on a pole) or Ausgrid-owned distribution mains (i.e. instances involving pole top transformers) or are readily visible from the aerial consumers mains.

Inspection of Ausgrid owned mains (e.g. Service and Distribution Mains) are not undertaken as part of the Private Mains Audit as they are already covered by other routine maintenance cycles.

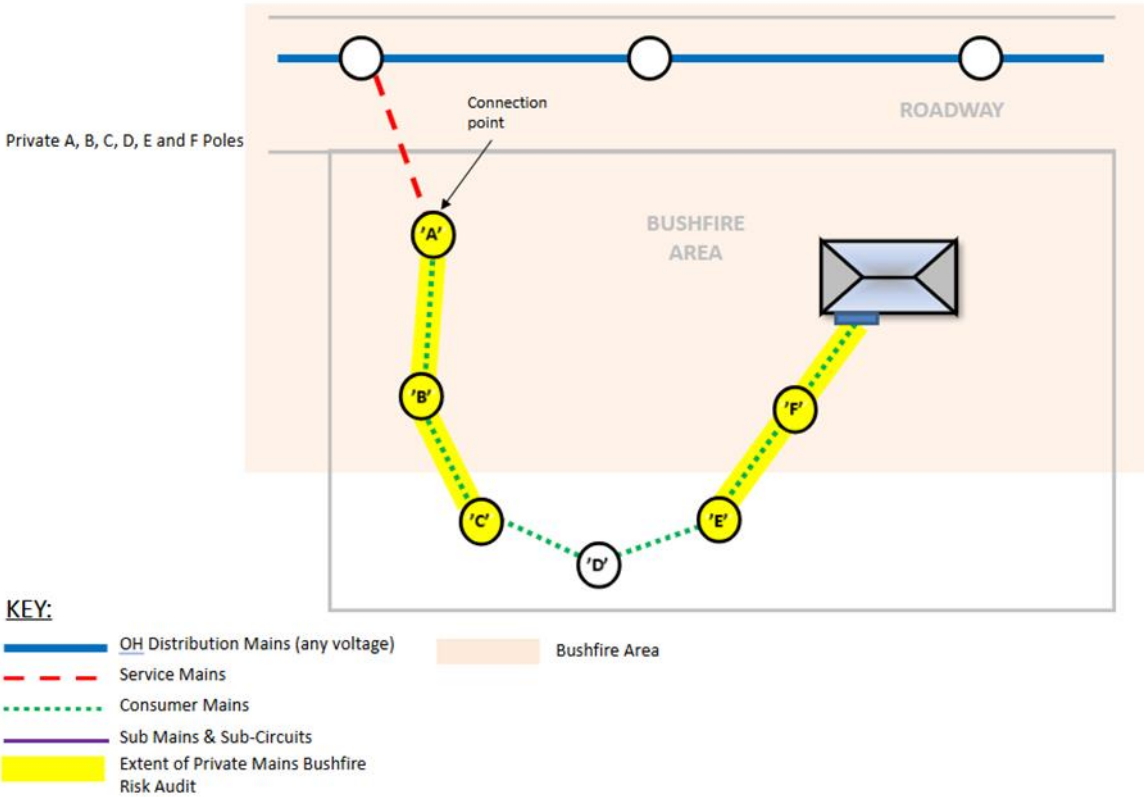
This guide provides a number of example scenarios and the extent to which Ausgrid may undertake audit activities into a customer's premises. These scenarios also provide examples of where responsibilities lie for conducting bushfire risk mitigation work.

The following key depicts how specific distribution and consumers mains poles are represented in all the example scenarios following.



## B1 SCENARIO INVOLVING SERVICE MAINS AND CONSUMERS' MAINS

**Consumers Mains Inside and Outside of Bushfire Areas**

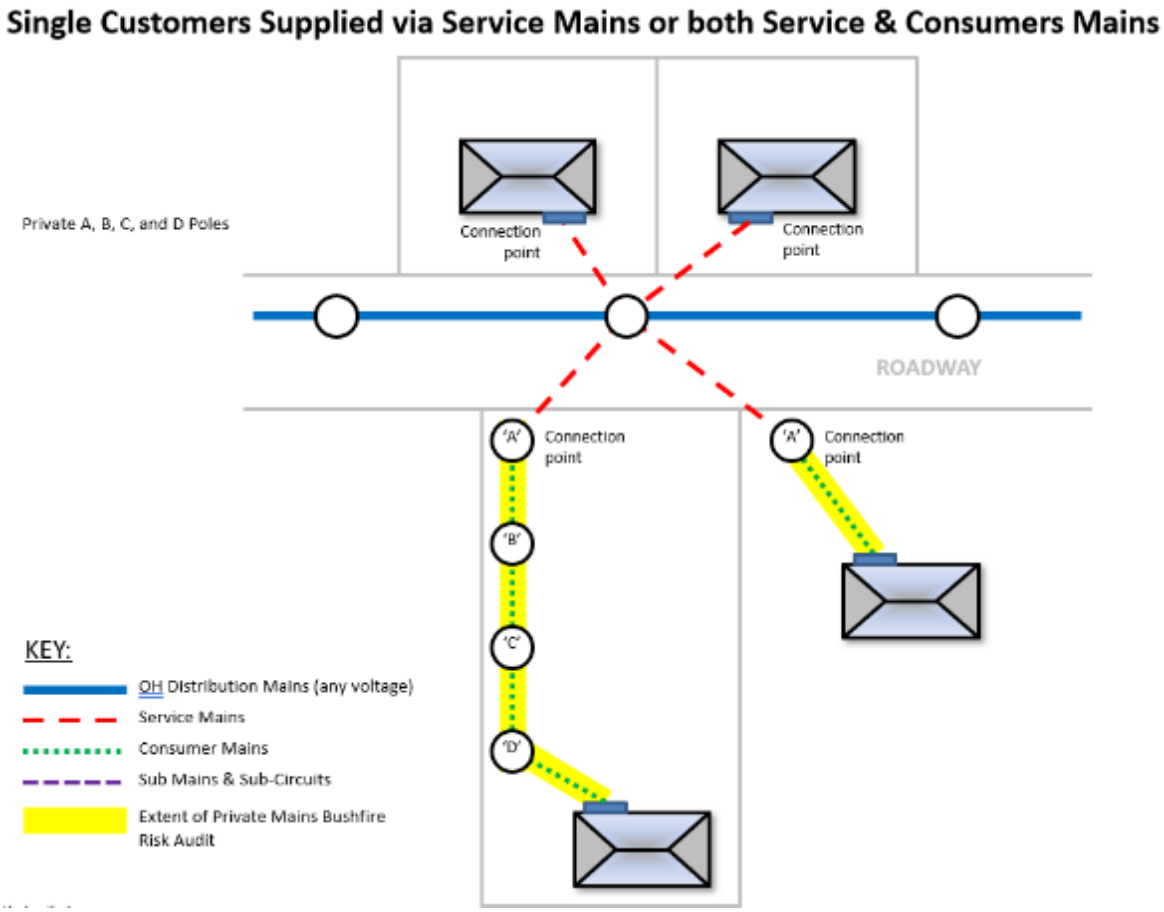



### Extent of audit

All aerial consumers mains located in bushfire prone areas (including any portion of a span and supporting structures for those spans) shall be audited.

In the scenario above, the consumers mains from the connection point at pole 'A' to pole 'C' and the consumer mains from pole 'E' to the customer main switchboard shall be audited. Although poles 'C' and 'E' are not in the bushfire area, they shall be audited because they support consumer mains which are in the bushfire area.

The consumers mains from pole 'C' to pole 'E', and pole 'D', shall not be audited as they are not in bushfire areas.



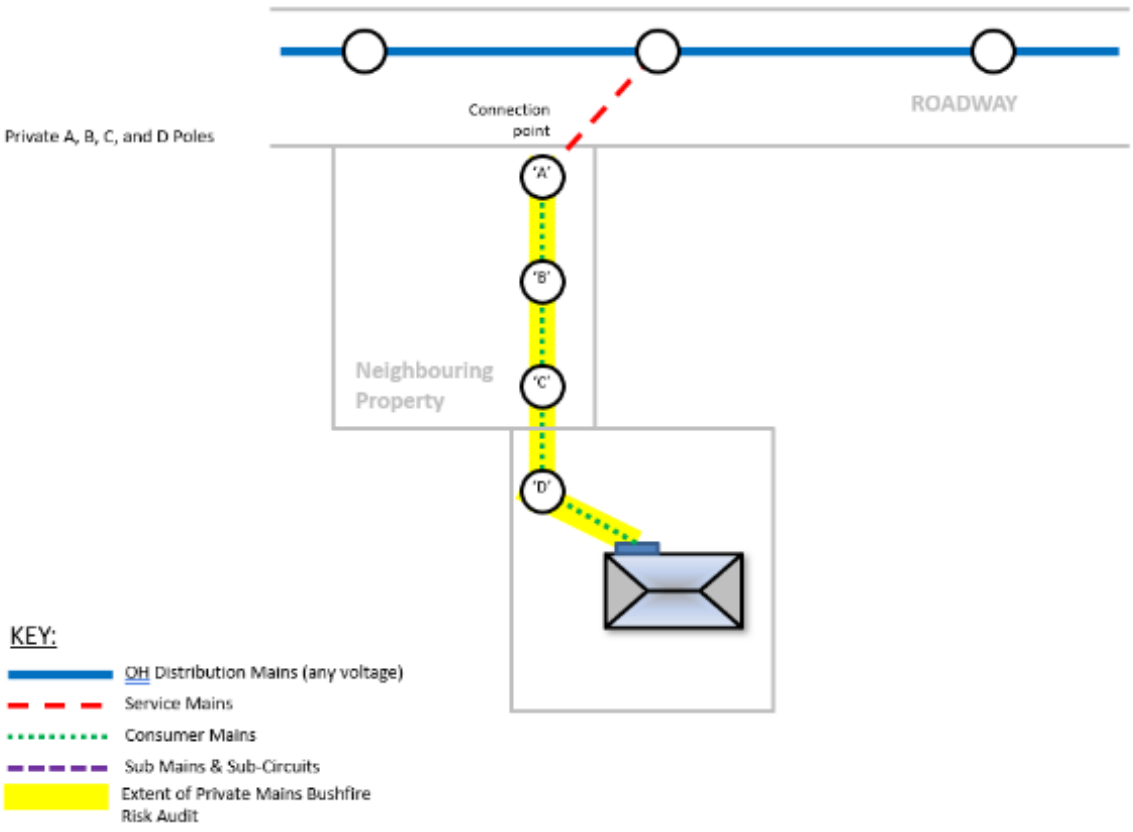

## Extent of audit

All aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Points (i.e. 'A' Pole) and the various customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer at the supplied property with the premises where the defect is located shall receive the Defect Notice.

**Single Customer Supplied via Neighbouring Property**



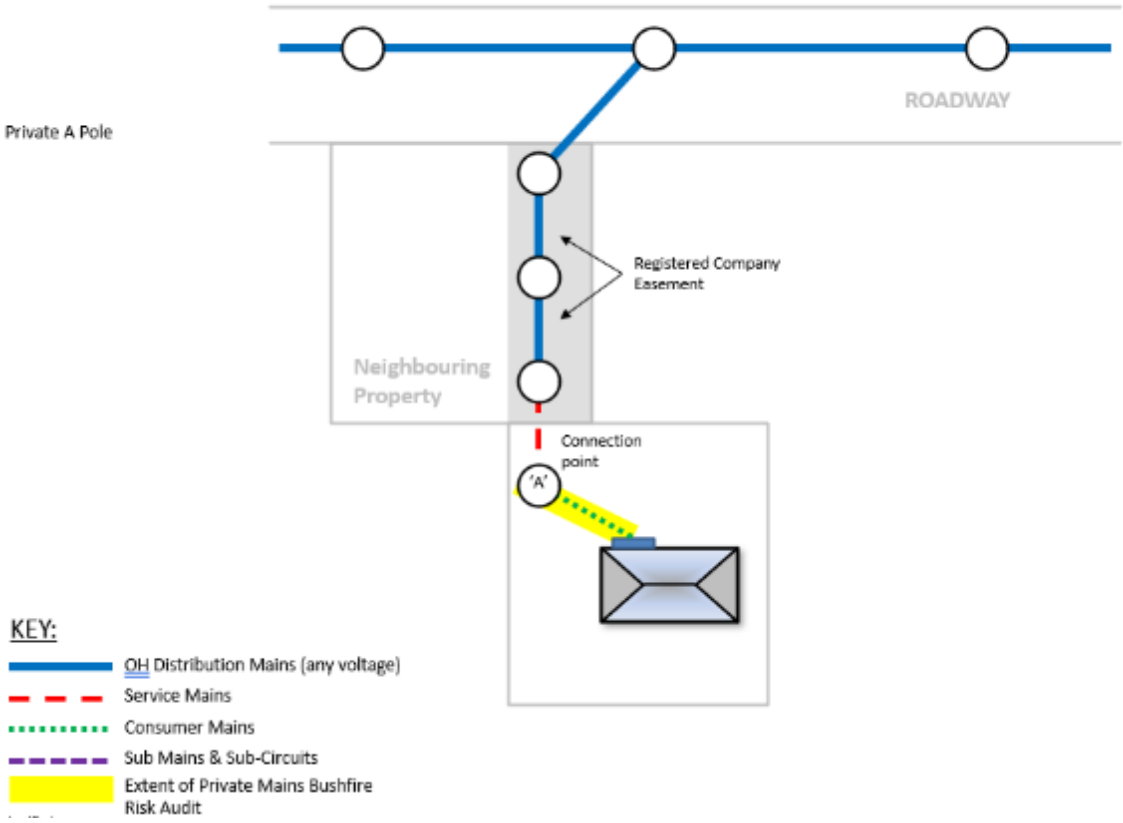

## Extent of audit

All aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the customer main switchboard.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer at the supplied property shall receive the Defect Notice.

**Single Customer Supplied via Neighbouring Property with Easement in Favour of Ausgrid**



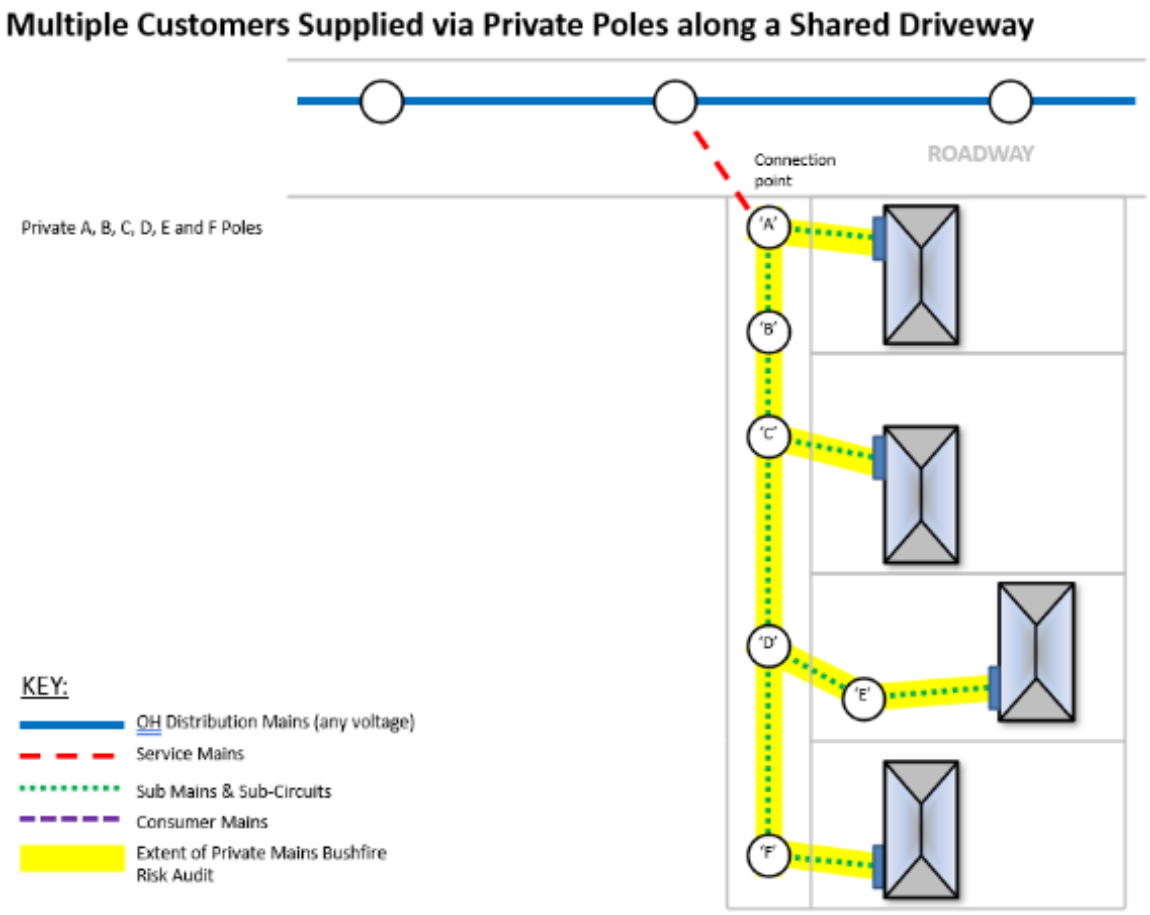

## Extent of audit

Only aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the customer main switchboard.

For access to the registered Ausgrid easement, follow the terms and conditions of the easement.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.




## Extent of audit

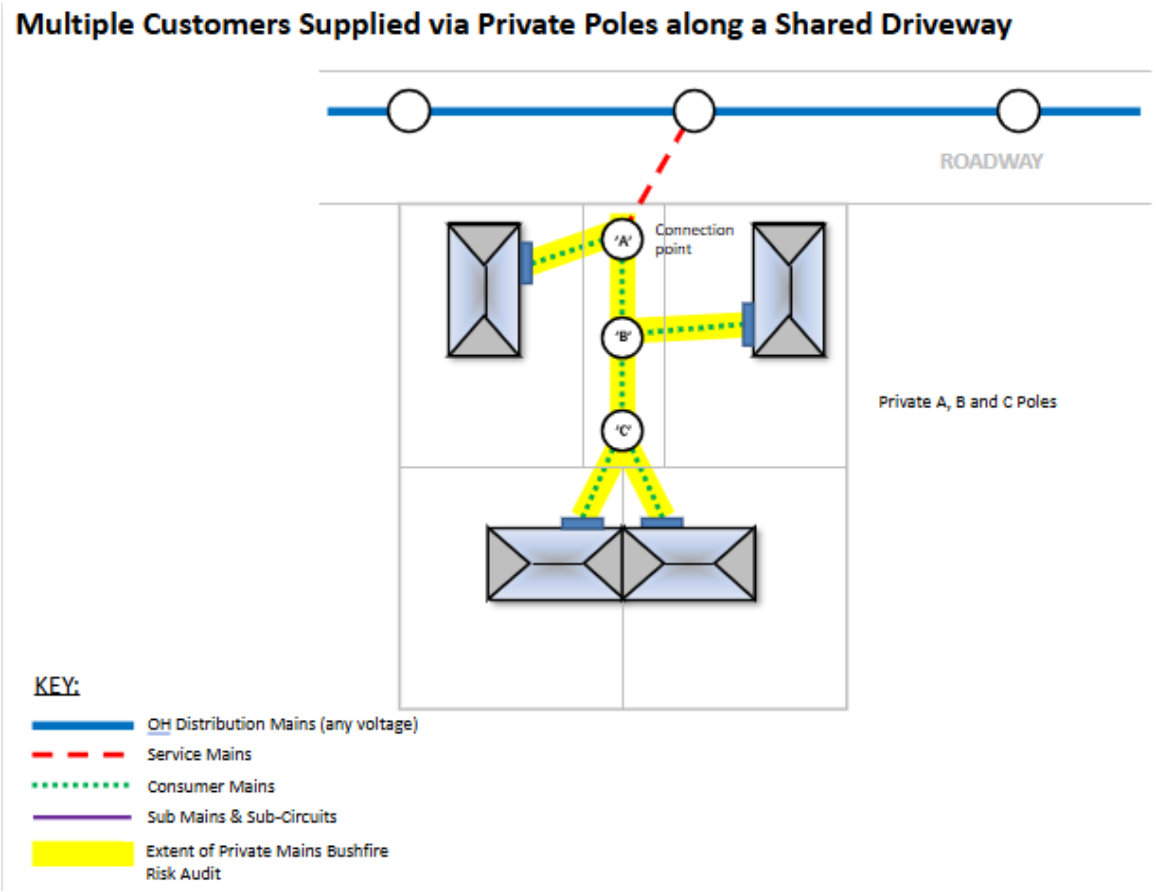
Only aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and each of the customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

<u>If defective private mains are located in the shared driveway:</u>
As co-owner of the shared driveway, each property owner with the defective private mains located on their shared driveway shall receive the Defect Notice.

<u>If defective private mains are located on one of the private properties:</u>
The property owner with defective private mains on their property shall receive the Defect Notice.




## Extent of audit

Only aerial consumers mains (including supporting structures) shall be examined. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and each of the customer main switchboards.

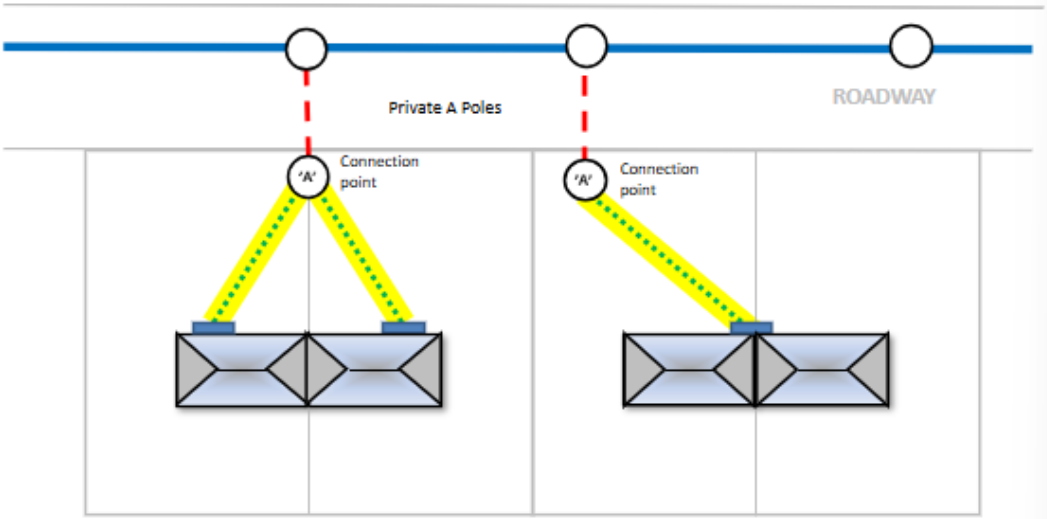
## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

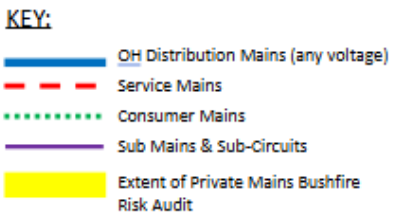
The customer with the premises where the defect is located shall receive the Defect Notice.

If defective private mains are located in the shared driveway:
As co-owner of the shared driveway, each property owner with the defective private mains located on their shared driveway shall receive the Defect Notice.

If defective private mains are located on one of the private properties:
The property owner with defective private mains on their property shall receive the Defect Notice.

**Multiple Customers Supplied via Single Private Pole**




## Extent of audit

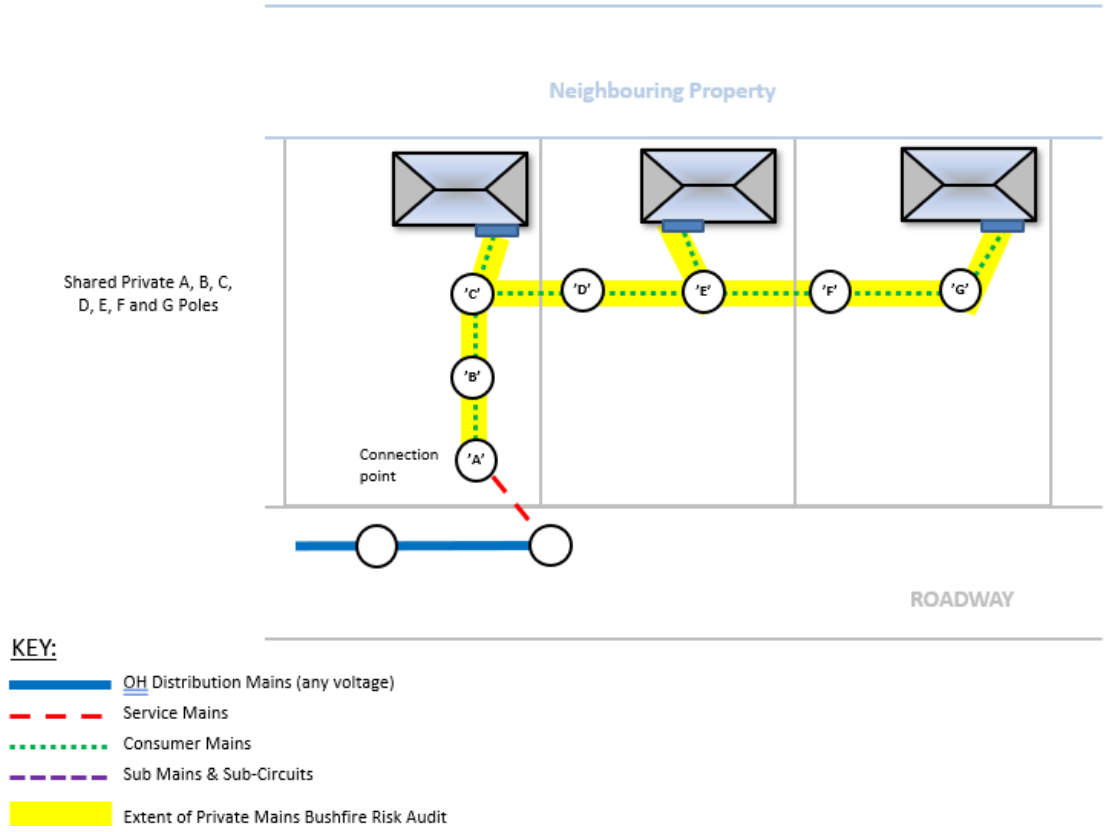
Only aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Points (i.e. 'A' Poles) and each of the customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

For vegetation defects - the customer with the premises where the defect is located shall receive the Defect Notice.

For pole defects - all customers supplied from a defective pole (or body corporate for larger installations), shall receive the Defect Notice.

**Multiple Customers Supplied via Private Poles through Neighbouring Properties**



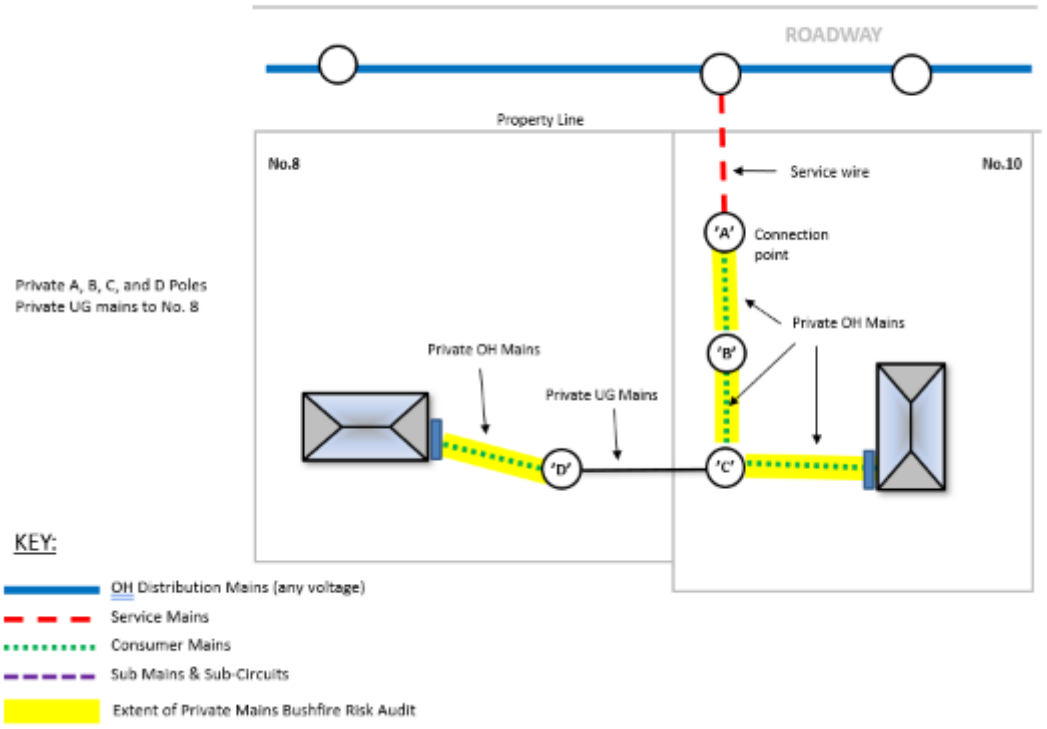

## Extent of audit

Only aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and each of the customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

**Multiple Customers Supplied via Private Poles and Underground Private Mains**



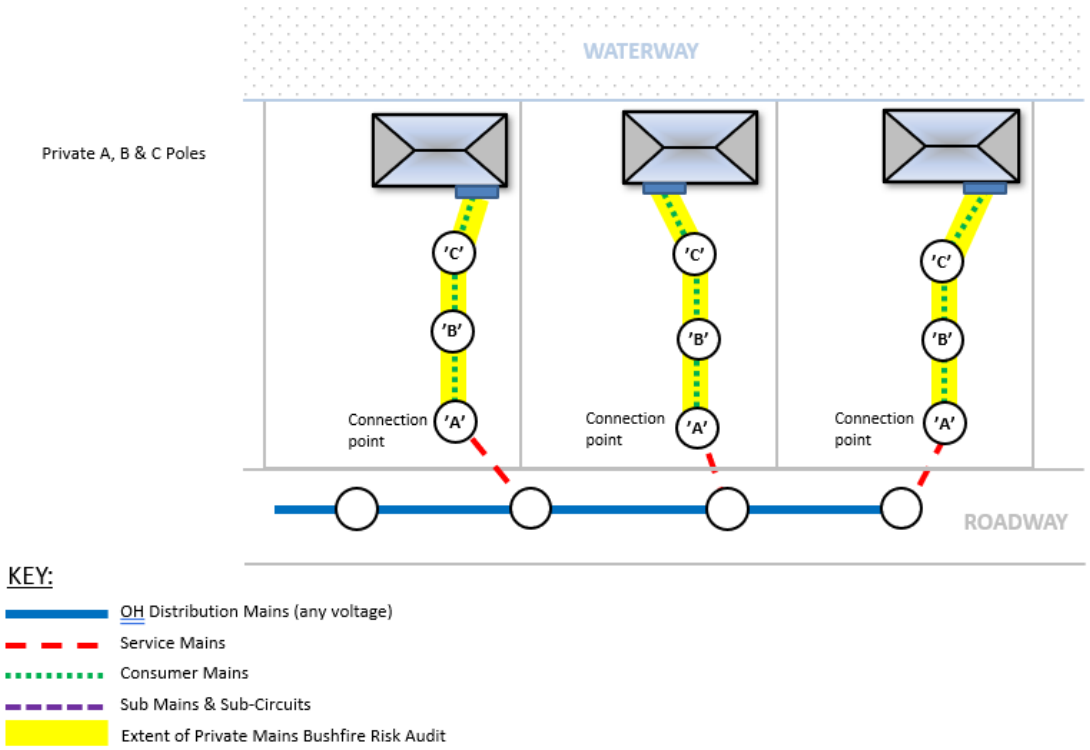

## Extent of audit

Only aerial consumers mains (including supporting structures) shall be audited, including the above ground portions of the private underground mains. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and each of the customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice. The customer with the premises at No.8 shall receive any Defect Notice related to the private underground mains.

**Single Customers Supplied via both Service & Consumers Mains**



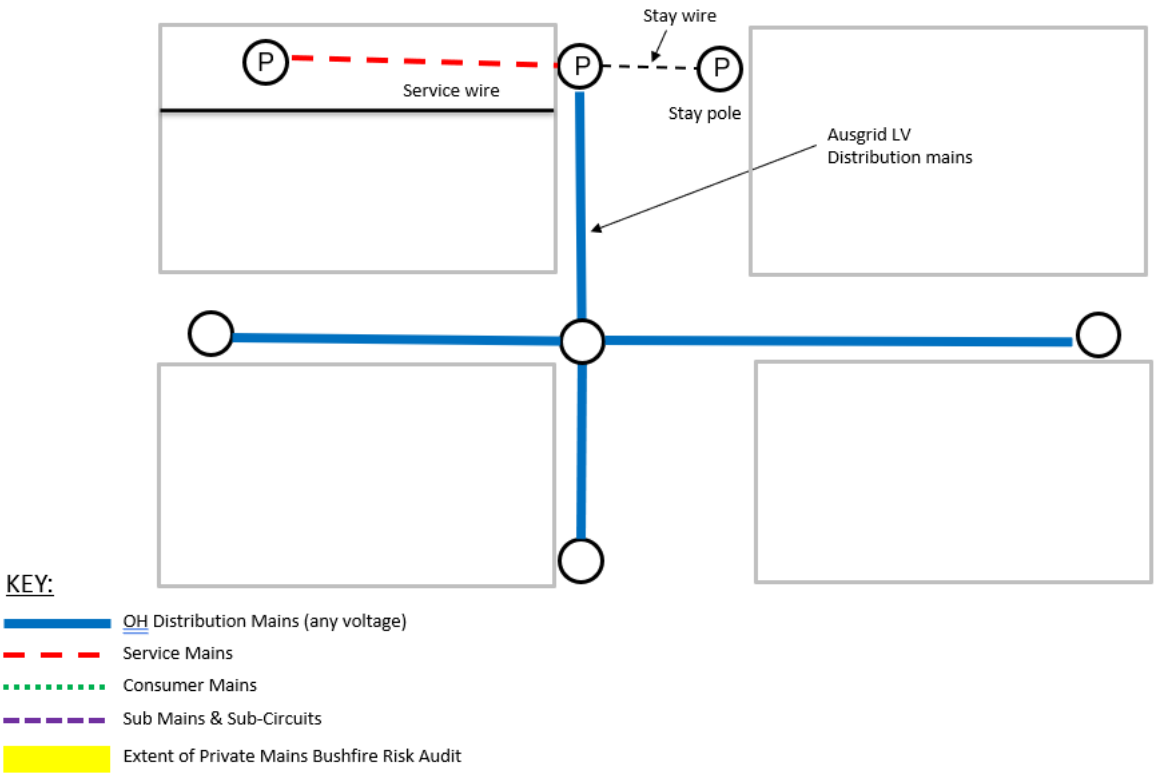

## Extent of audit

Only aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Points (i.e. 'A' Poles) and each of the customer main switchboards.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive Defect Notice.

## Poles on Proposed Road Verge (No road exists – Paper Roads)



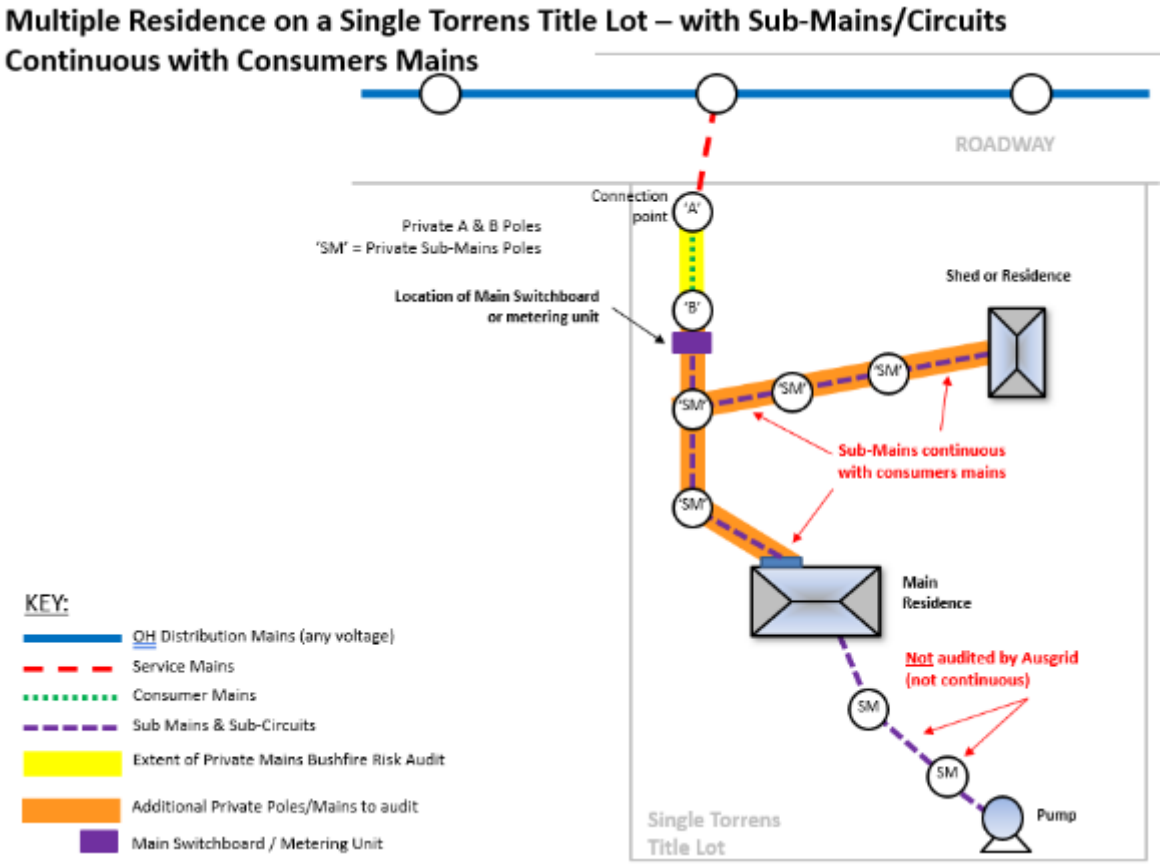

### Extent of audit

For this scenario, further clarification may be required from the nominated Ausgrid representative as pole ownership can be ambiguous.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice. Report situations where responsibility for defect rectification is unclear to the nominated Ausgrid representative.

## B2 SCENARIO INVOLVING SUB-MAINS/CIRCUITS CONTINUOUS WITH CONSUMERS' MAINS




### Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the first customer main switchboard or metering unit.

The sub-mains in this scenario forms a continuous overhead line (i.e. the first main switchboard or metering unit is mounted on a pole), therefore the extent of auditing is extended to include the sub-mains. Auditing shall end at the main switchboard or termination point attached to the main residence and the shed.

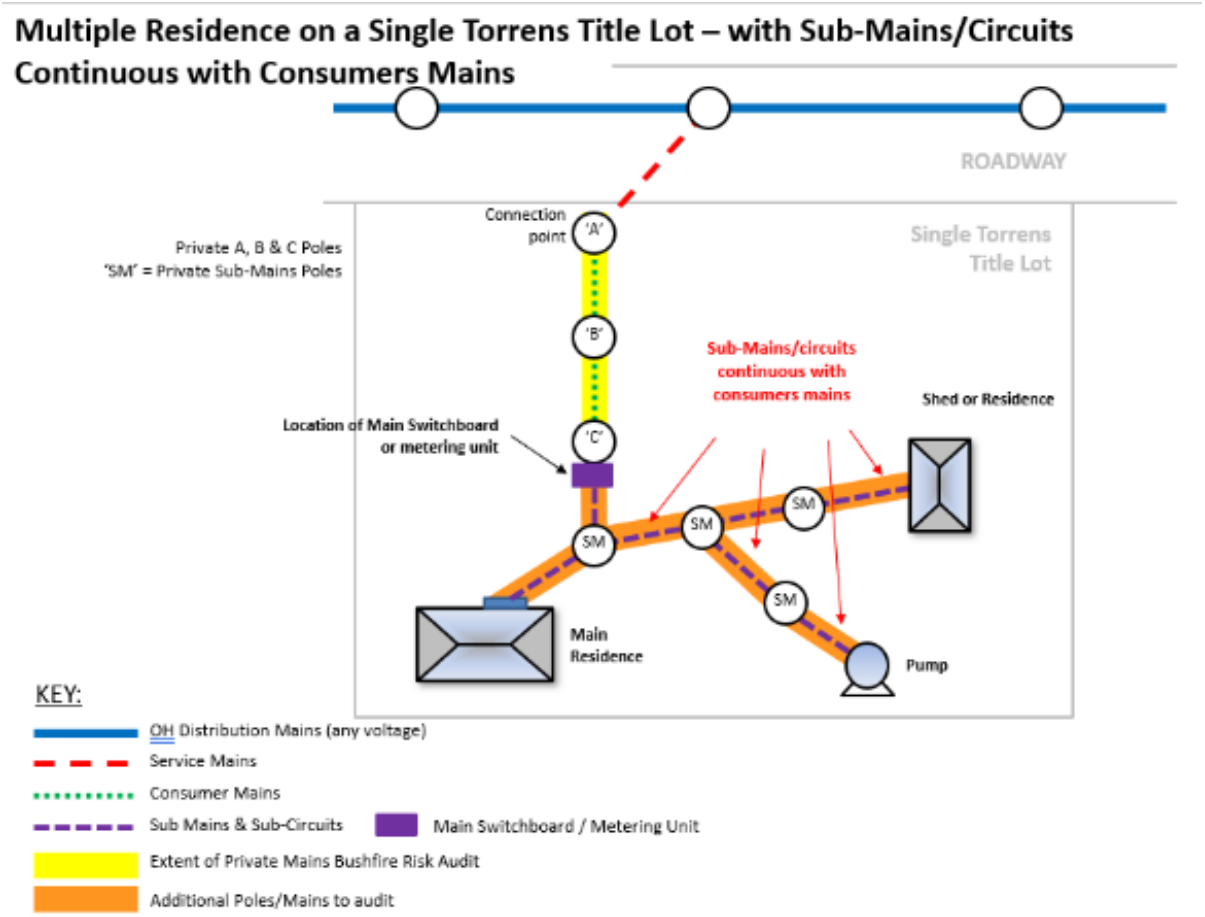
The sub-mains to the pump is excluded from auditing because it does not form a continuous overhead line with the aerial consumers mains.

### Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.




## Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the first customer main switchboard or metering unit.

The aerial sub-mains in this scenario forms a continuous overhead line (i.e. the first main switchboard or metering unit is mounted on a pole), therefore the extent of auditing is extended to include the sub-mains.

The aerial sub-mains to the pump is included in the audit because it also forms a continuous overhead line with the aerial consumers mains.

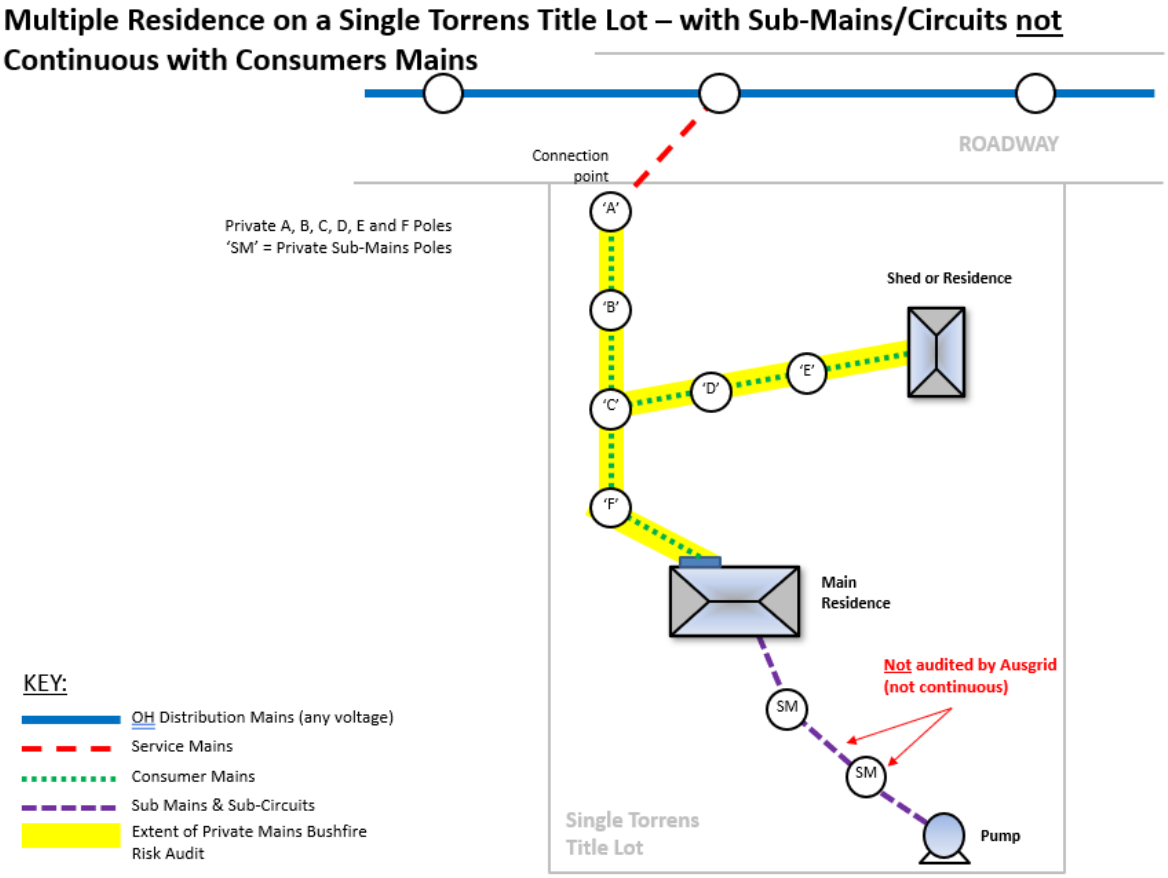
## Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

## B3 SCENARIOS INVOLVING SUB-MAINS/CIRCUITS NOT CONTINUOUS WITH CONSUMERS' MAINS




### Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the first customer main switchboard or metering unit.

The sub-mains in this scenario does not form a continuous overhead line (i.e. the first main switchboard or metering unit is not mounted on a pole), therefore the extent of auditing is not extended.

### Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

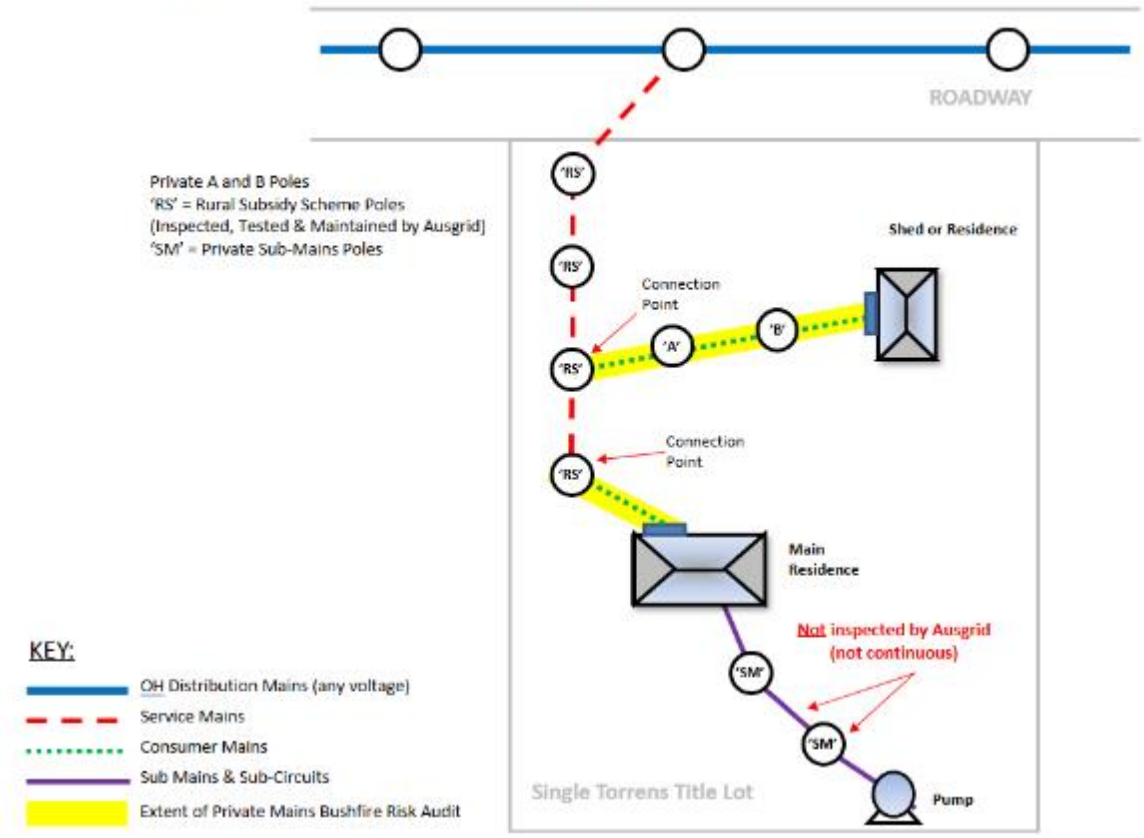
### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

## B4 SCENARIOS INVOLVING RURAL SUBSIDY SCHEMES

The following scenarios involve rural subsidy (RS) scheme poles and overhead mains. RS poles and overhead mains are owned by the customers, but they are maintained as a part of Ausgrid's routine maintenance activities and are excluded from Private Mains Bush Fire Risk Audits.

**Rural Subsidy Scheme Scenarios on a Single Lot**




### Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the Connection Points (i.e. 'A' Poles) and the first customer main switchboard or metering unit.

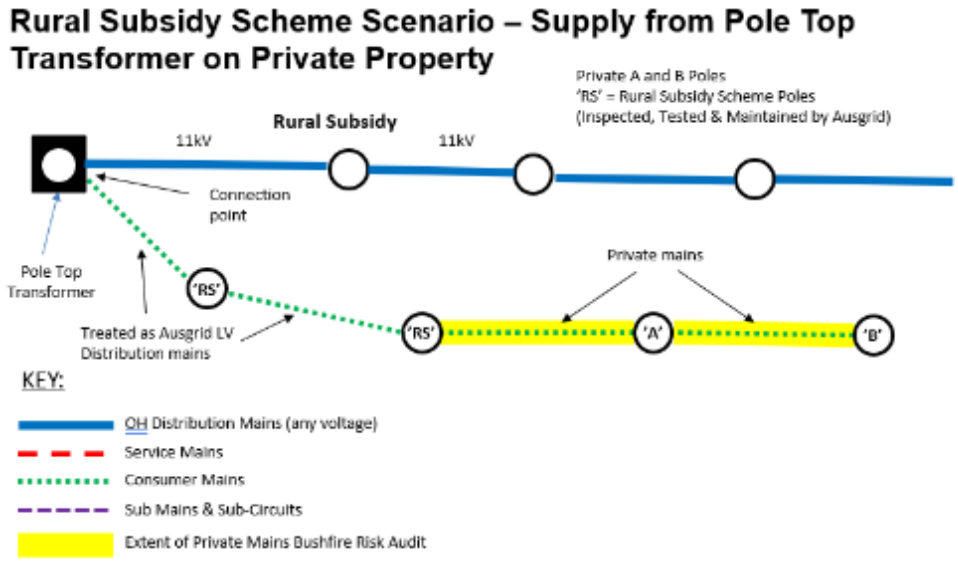
The sub-mains in this scenario does not form a continuous overhead line (i.e. the first main switchboard or metering unit is not mounted on a pole), therefore the extent of auditing is not extended.

### Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

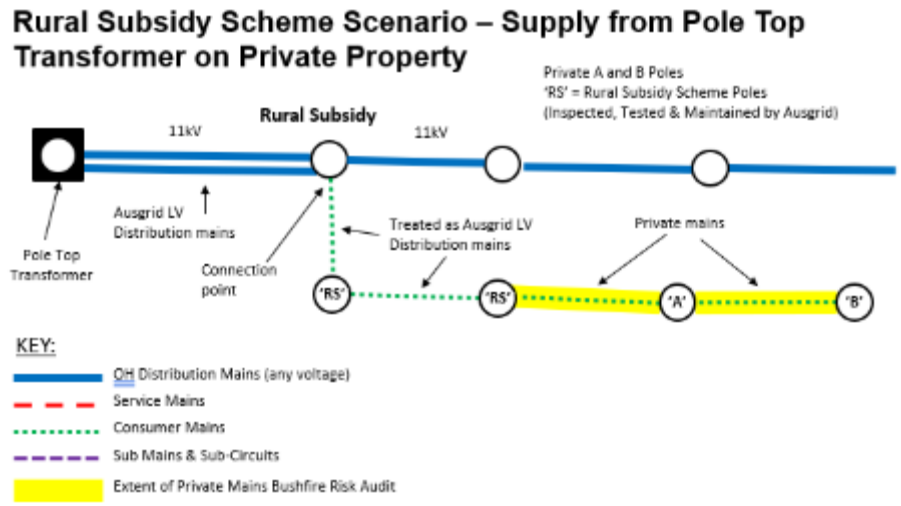



## Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the last rural subsidy scheme pole and the first customer main switchboard or metering unit.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.




## Extent of audit

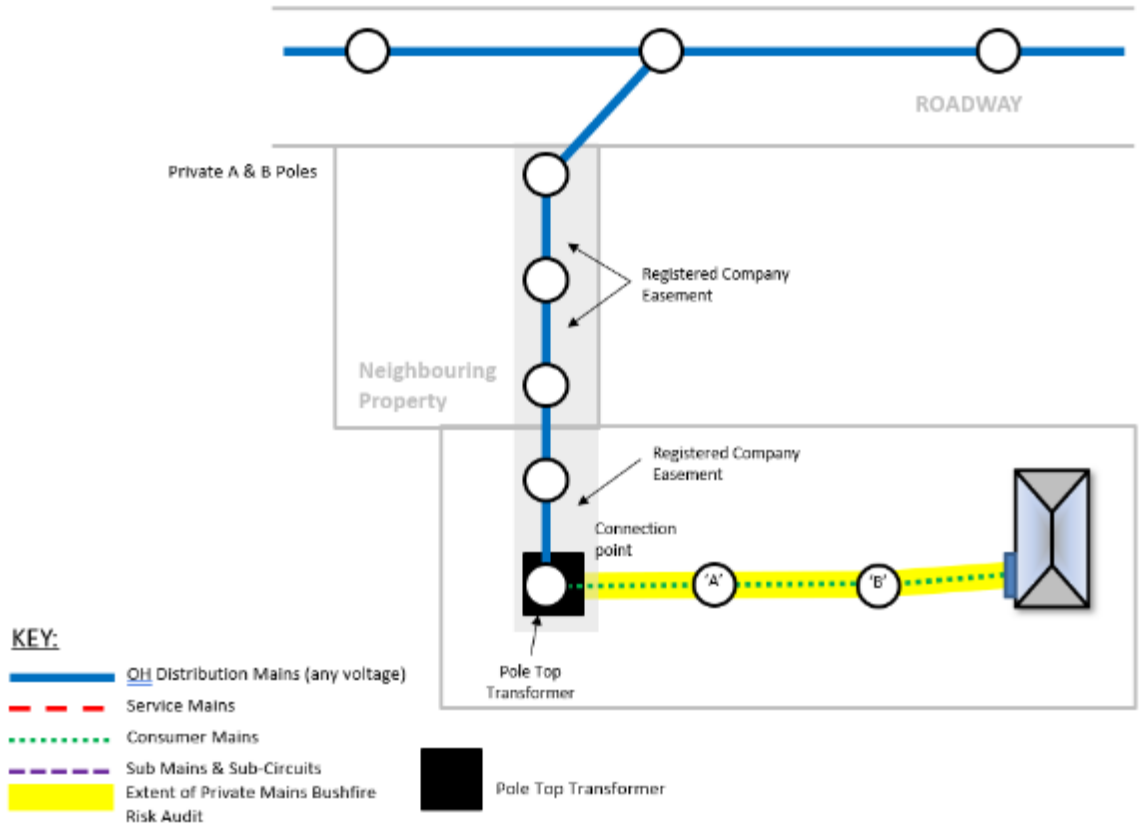
In this scenario, the LV mains between the two Ausgrid poles and to the last RS pole are treated as Ausgrid distribution mains. Aerial consumers mains (including supporting structures) shall be audited. The consumers mains in the scenario above are the conductors between the last rural subsidy scheme pole and the first customer main switchboard or metering unit.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

## B5 SCENARIOS INVOLVING POLE TOP TRANSFORMERS ON PRIVATE PROPERTY

**Residence with a Pole Top Transformer**




### Extent of audit

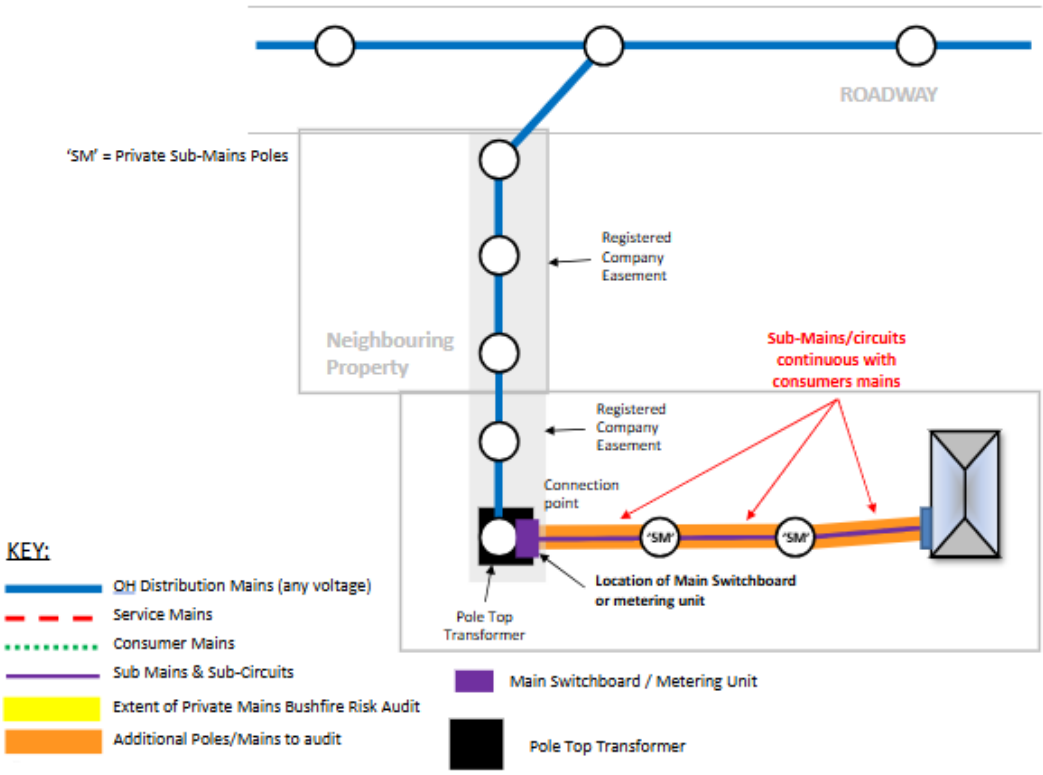
Aerial consumers mains (including supporting structures) shall be audited. The consumer mains in the scenario above are the conductors between the Connection Point (i.e. the pole transformer) and the first customer main switchboard or metering unit.

For access to the registered Ausgrid easement, follow the terms and conditions of the easement.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The owner of the consumer/private mains would receive the Defect Notice.

**Residence with a Pole Top Transformer – with Sub-Mains/Circuits Continuous with Distribution Mains**




## Extent of audit

In this scenario the Connection Point and the first main switchboard or metering unit are located at the same place (i.e. the first main switchboard or metering is mounted on a pole). In this case the extent of auditing shall be extended to include the sub-mains between the Connection Point and the customer main switchboard located at the main residence.

For access to the registered Ausgrid easement, follow the terms and conditions of the easement.

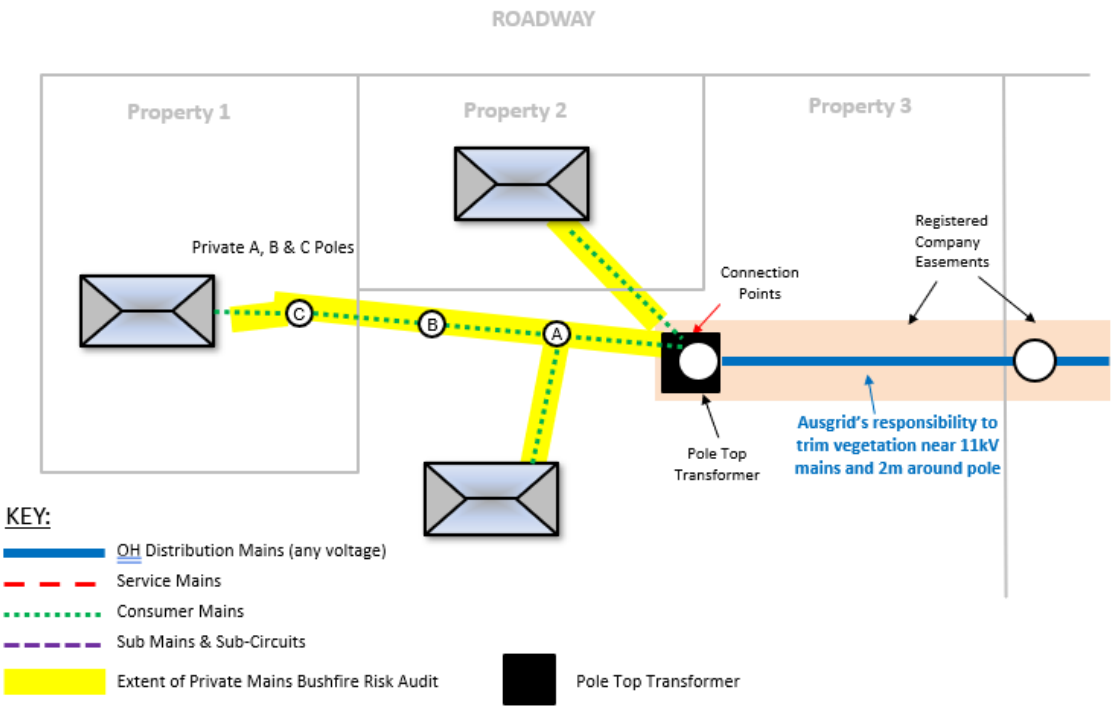
## Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

**Residence with a Pole Top Transformer in Bushfire Prone Land – with Consumers Mains To Adjacent Residences (not Rural Subsidy Scheme)**




## Extent of audit

In this scenario the Connection Points for two residences are located at the pole transformer and a further Connection Point (to Property 3) is at pole 'A'. In this case the extent of auditing shall be between the Connection Points and the customer main switchboard located at each residence.

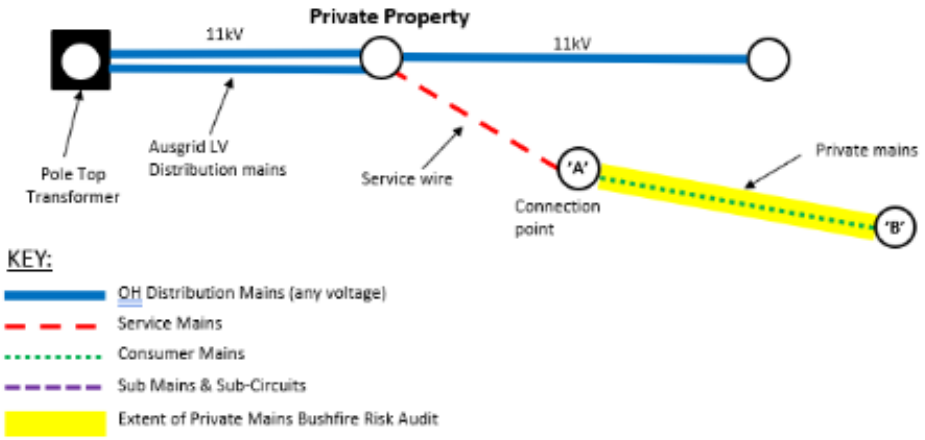
Ausgrid, as part of the routine clearing program would be expected to cut the vegetation as per above figure. Any vegetation defects on the private/consumer mains would be identified as part of the annual private mains audit (bushfire prone area) and notified to the customer for rectification.

For access to the registered Ausgrid easement, follow the terms and conditions of the easement.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice. Property 2 shall receive the notice for any defects on the aerial mains supplying it directly from the pole transformer.

**Pole Top Transformer on Private Property with both Service and Consumer Mains**



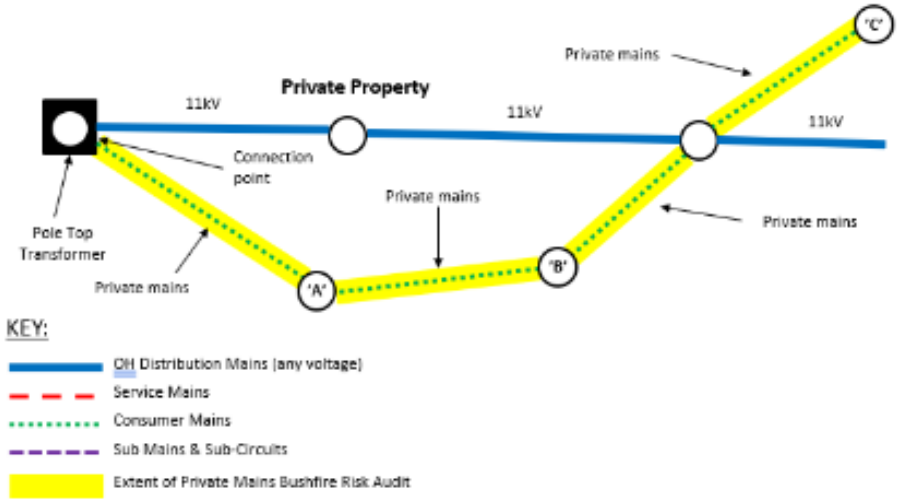

### Extent of audit

In this scenario, the LV mains between the two Ausgrid poles and the span to the customer 'A' pole are treated as Ausgrid distribution mains and service mains. In this case the extent of auditing includes the consumer mains from the Connection Point (i.e. 'A' Pole) and the customer main switchboard located at the main residence.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

**Pole Top Transformer on Private Property – Consumer Mains Attached to Ausgrid Poles**



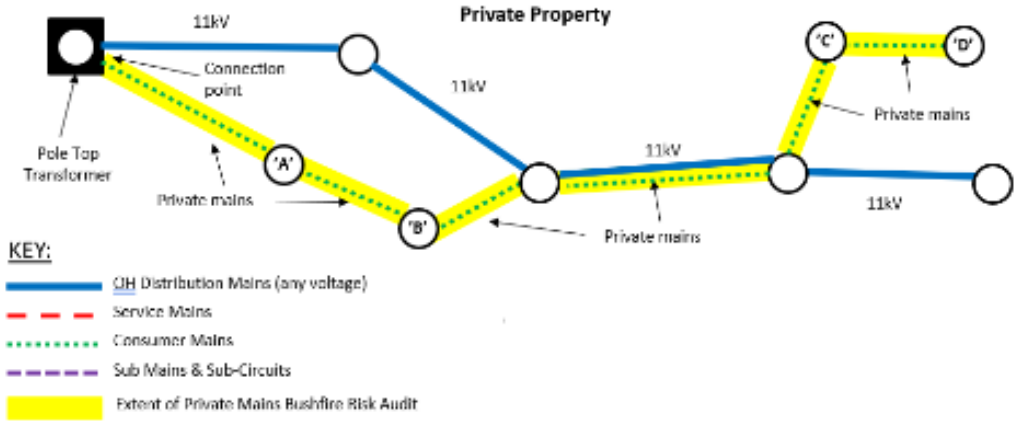

### Extent of audit

In this scenario, the Connection Point is located at the pole transformer and the aerial consumer mains are attached to an Ausgrid pole further along the private circuit. In this case the extent of auditing shall be between the Connection Point and the customer main switchboard.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

**Pole Top Transformer on Private Property – Consumer Mains Attached to Ausgrid Poles**

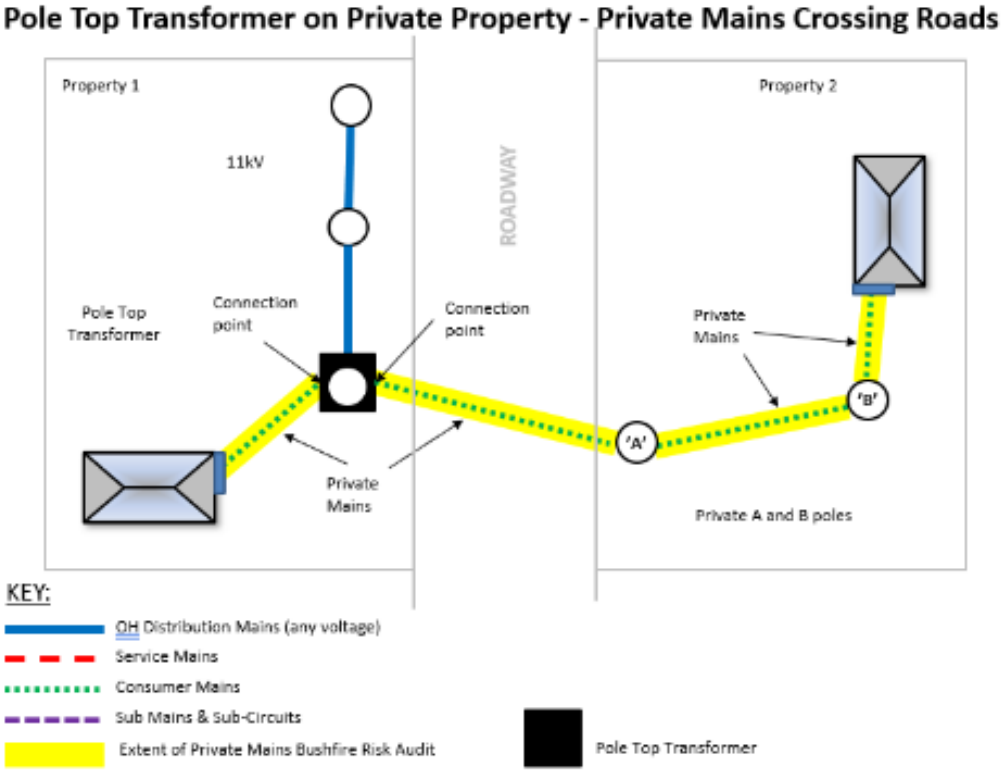



## Extent of audit

In this scenario, the Connection Point is located at the pole transformer and the aerial consumer mains are attached to Ausgrid poles further along the private circuit. In this case the extent of auditing shall be between the Connection Point and the customer main switchboard, including the span connected between the two Ausgrid poles.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.




## Extent of audit

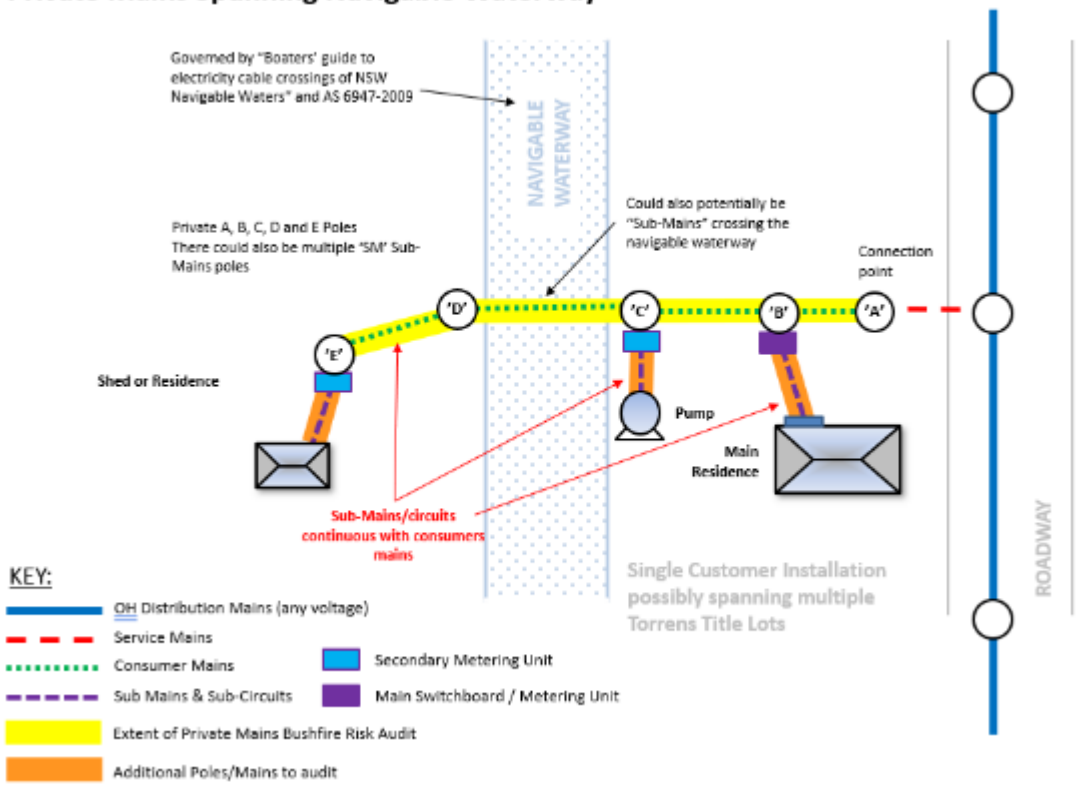
In this scenario, the Connection Points are located at the pole transformer. In this case the extent of auditing shall be between each Connection Point and the customer main switchboard, including the span crossing the road.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the defect related to their supply from the pole transformer shall receive the Defect Notice. Where defects are caused by vegetation on the roadway, the customer shall negotiate defect rectification with the road authority (for example, local Council).

## B6 SCENARIOS INVOLVING WATERWAYS

**Private Mains Spanning Navigable Waterway**




### Extent of audit

The consumer mains shown in the above scenario are the conductors between the Connection Point of Supply and the pole mounted customer main switchboard or metering point. All aerial consumers mains (including supporting structures) shall be audited. Aerial consumer mains crossing navigable waterways are also governed by 'Boaters' guide to electricity cable crossings of NSW Navigable Waters' and AS/NZS 6947, but they shall be visually examined.

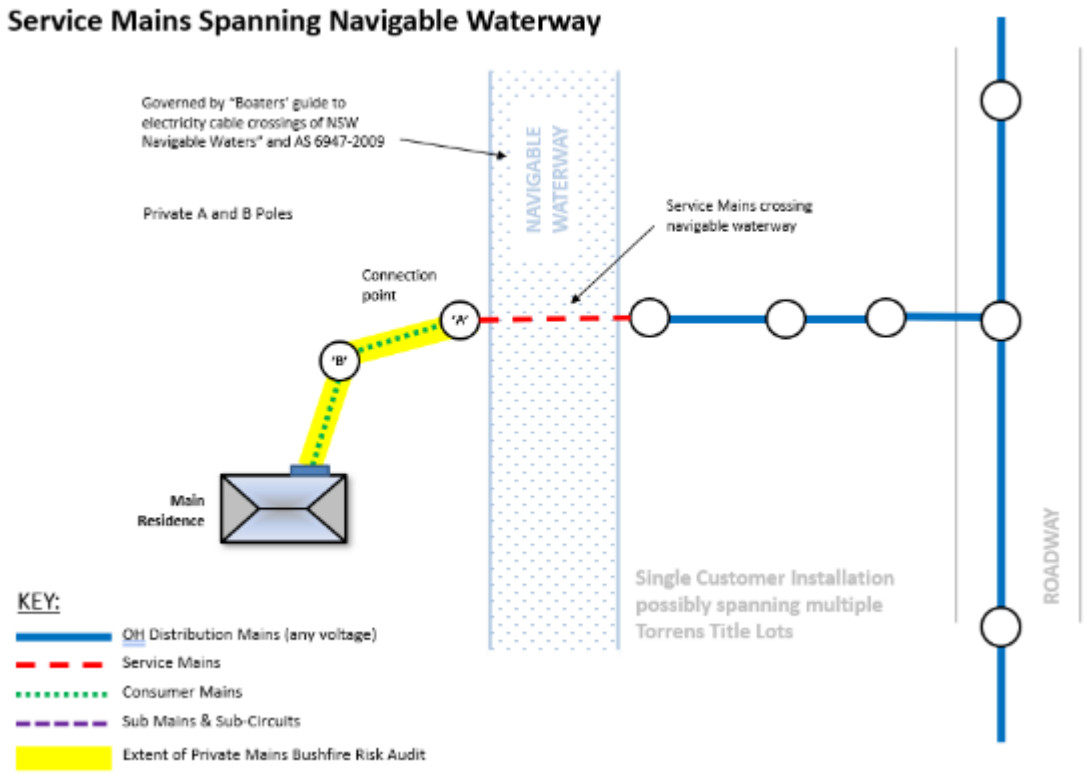
In this case the extent of auditing shall be extended to include the sub-mains that form a continuous overhead line with the aerial consumers mains (i.e. where metering units or switchboards are mounted on poles) through to the various points of attachments on the property.

### Sub Mains and Sub-Circuits

In addition to the aerial consumers mains, Ausgrid will audit the aerial sub-mains that form a continuous overhead line with the aerial consumers mains through to the sub-mains various termination points on the property. Sub-mains and sub-circuits that do not form a continuous overhead line with the aerial consumers mains are excluded from auditing.

### Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.



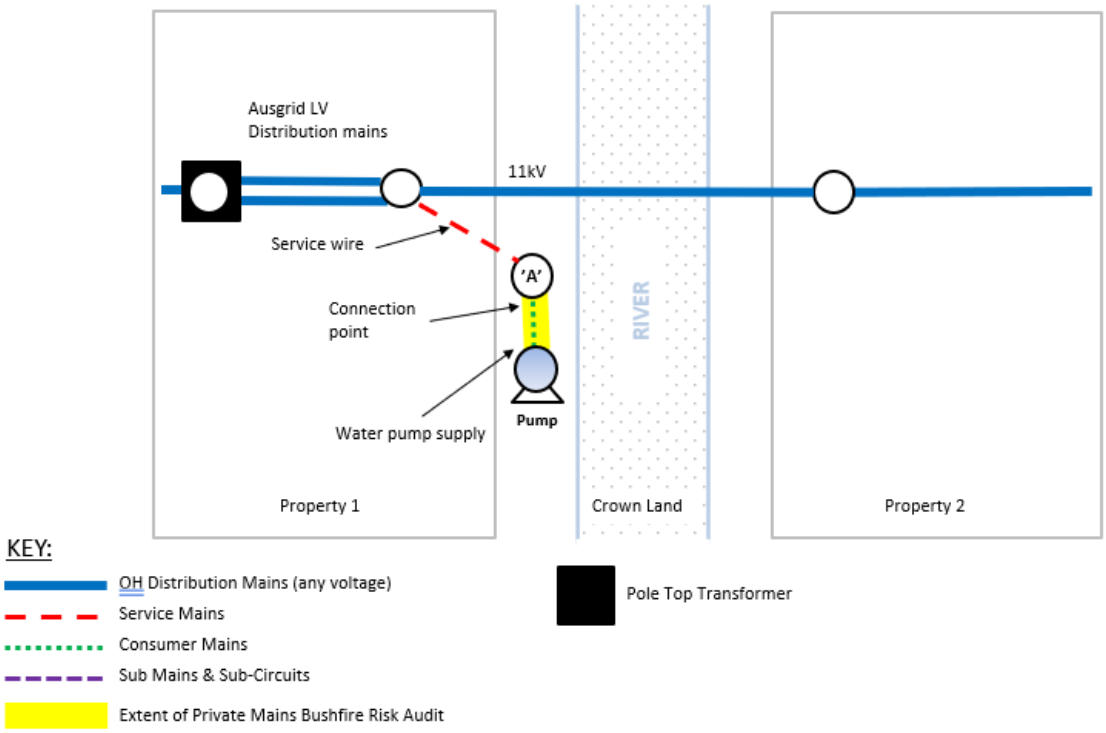

## Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumer mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the first customer main switchboard or metering unit.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

**Service wire close to riverbank**




## Extent of audit

Aerial consumers mains (including supporting structures) shall be audited. The consumer mains in the scenario above are the conductors between the Connection Point (i.e. 'A' Pole) and the first customer main switchboard, metering unit or pump.

## Who receives the Defect Notice for bushfire or vegetation risk mitigation?

The customer with the premises where the defect is located shall receive the Defect Notice.

# Annexure C: Private Aerial Mains - Audit Process

## C1 General Requirements

The audit process from ground level for private aerial mains consists of:

- Assessment of access to the private aerial mains and poles according to Clause C2.2.
- Implementation of appropriate safety precautions according to Annexure A.
- Visual assessment of conductors, pole top arrangements, attached equipment and fittings according to Clause C2.3.
- Assessment of conductor clearances according to Clause C2.3.
- Audit finalisation according to Clause C3.

The primary purpose of private aerial mains audits is to identify defects that pose a bushfire or safety hazard to people, property, the environment and the Ausgrid distribution network before the next audit is performed. It is also used to identify and report non-conforming use of materials (non-standard construction or materials not typically commercially available). The scope (extent) of the private aerial mains audit shall be determined at each location according to Clause 1.4. Above ground assessment of the private pole or post supporting the private aerial mains shall be performed according to the Annexures below.

Auditing of all above ground assets is to be performed visually, and from the ground only. Installations with the UGOH connection being the only private aerial mains shall also be audited. As not all defects will be visible or identifiable from a single viewpoint, Private Mains Auditors shall move around the pole to get the best view of each asset or assembly to improve the effectiveness of the audits. Audits may be performed utilising other effective technologies that do not require climbing a pole (for example, binoculars, cameras).

Private Mains Auditors shall not attempt to repair identified private mains defects. Private Mains Auditors shall report any immediately dangerous defects to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

Private aerial mains audits may proceed when immediately dangerous defects are identified if the audit can be performed without risk to the Private Mains Auditor or others in the vicinity of the pole and only after reporting the immediately dangerous defect to the Ausgrid Emergency Line.

## C2 Private Aerial Mains Audit Process

### C2.1 General Requirements

It is the Private Mains Auditors responsibility to make sure that an effective audit is performed to detect all private aerial mains defects. Some components of the private aerial mains audit process may be performed when implementing the safety precautions according to Annexure A. The private aerial mains audit may also be performed before, during or after the above ground inspection of a pole. Private aerial mains audits shall be performed without disturbing termites on timber poles where termite activity is detected.

Vegetation shall be assessed for grow-in and fall-in hazards according to Clause 4.3. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.

### C2.2 Access to private mains / poles

Access to the private pole / aerial mains shall be audited enroute to and on arrival at the private pole / aerial mains.

The audit procedure for access to the private pole / aerial mains shall be performed as follows:

- Examine the access route and site for vegetation, obstructions, changes to the built environment (for example, new buildings, landscaping or fences) or surface degradation which prevents (or limits) walking or vehicle access to the private aerial mains or pole.
- Record (photograph) obstructions or limitations to access.

**Note:** Private Mains Auditors shall not continue with an audit when accosted by aggressive customers / property owners or animals, or when the site is unsafe due to other reasons. Private

Mains Auditors shall immediately remove themselves from the situation and report it to their nominated representative.

### C2.3 Aerial Mains Audit Procedure

The audit procedure for private aerial mains shall be performed as follows:

1) Determine the audit scope for that site according to Clause 1.4.
2) Implement safety precautions according to Annexure A.
3) Verify that the asset details (including sub-mains and sub-circuits) within the scope of the audit are correctly recorded in the Ausgrid asset management system. Missing or incorrect information shall be recorded and updated in the asset management system. Asset details include, but are not limited to, the following:
   - Asset numbers and labels (where installed).
   - Position details (including comparison to bushfire area boundaries).
   - Asset ownership.
4) Perform a visual assessment of private aerial mains for vegetation hazards including, but not limited to, the following:
   - Vegetation in contact with (touching) any part of the private aerial mains.
   - Vegetation that is within the Minimum Vegetation Clearance requirements in Table 4 (grow-in hazards).
   - Vegetation fall-in hazards, including estimation of the length of the vegetation beyond the potential breaking point compared to the distance from private mains assets (refer to Clause 4.3.3).
5) Perform a visual assessment of the full length of the conductors to adjacent support structures or terminations in all directions from the pole (including connection points, points of attachment, bonds, tee-offs, droppers, jumpers, transpositions, and tails) for defects including, but not limited to, the following:
   - Degradation – examine the conductors for corrosion, stranding / breakages, annealing, entanglement, foreign objects (for example, branches, balloons / kites, shoes) and deterioration of the conductor insulation or covering.
   - Damage – examine the conductors for damage due to conductor clashes, lightning strikes, fires / burning / overheating, vegetation contact, birds or vehicle impact.
   - Uneven sag – examine conductors for exceedingly uneven / excessive sag which may result in conductor clashes or excessive tightness within each span / bay.
   - Reduced clearances – examine each conductor for adequate clearances to ground, adequate clearances to (or clashing with) all other conductors in the same span / bay and for circuit crossings (private mains or owned by authorities including Ausgrid and telecommunication cables), and adequate clearances to objects including buildings, other structures and fences.

     **Note:** An insulated height measuring device may be used to confirm the actual clearance if the Auditor is authorised for its use.
   - Low voltage spreaders – assess each span / bay for installation of spreaders according to Clause 4.2.4.
   - Redundant or obsolete construction – assess whether any obsolete / redundant conductors pose immediate bushfire or safety risks.
6) Perform a visual assessment of all crossarms, struts and fittings for defects including, but not limited to, the following:
   - Crossarm / strut mounting – examine all crossarms / struts for evidence of twisting, bending or rotation away from the pole surface due to conductor loading, loose or tilted (misaligned) attachment to the pole, or crossarms that have fully detached from the pole.

- Damage and contamination – examine all crossarms / struts for breakage or damage due to burning / fire, lightning strikes, vehicle contact or conductor overloading (including crossarm bending), and surface contamination or foreign objects (for example, branches, moss, lichen, salt, bird droppings, bird nests).
- Timber degradation – examine timber crossarms / struts for loss of strength due to rot, fungal decay, termites, cracks or splits.
- Steel strut degradation – examine steel struts for loss of strength due to corrosion and surface degradation (for example, moss, lichen, salt).
- Steel fitting degradation – examine steel earth risers, raiser brackets, bracing, gain blocks, pole bands, pole caps and fasteners (bolts, screws, nuts and washers) for loss of strength due to corrosion, missing components and correct seating (not jammed, twisted, loose or incorrectly attached).
- Redundant or obsolete construction – assess whether any obsolete / redundant crossarm or strut (no attached overhead lines) pose immediate bushfire or safety risks.

7) Perform a visual assessment of all insulators (including surge arrestors) for defects including, but not limited to, the following:

- Insulator degradation – examine all insulators for cracks / breakage, corroded pins / caps / disc couplings / supports, tracking or surface degradation, misalignment or bending due to conductor loading, loose or misaligned attachment to the crossarm / pole, or insulators that have fully detached from the crossarm / pole.
- Damage and contamination – examine all insulators for breakage or damage due to burning / fire, lightning strikes, vandalism or bird attack (polymeric insulators), and surface contamination or foreign objects (for example, branches, salt / pollution, bird nests).
- Termination degradation – examine all insulator termination fittings for corrosion, overheating, breakage, correct seating / securing of the conductor, evidence of twisting or damage due to conductor loading, loose attachment to the insulator, and conductors that have fully detached from the termination fitting.

  **Note:** termination fittings include tie wires, helical ties (preforms), bolted terminations ‘U’ bolts, wedge clamps, snail clamps).
- Attachment degradation – examine insulator steel attachment fittings (attaching the insulator to the pole, or the conductor to the insulator) for loss of strength due to corrosion, and correct seating (not jammed, twisted, loose or incorrectly attached).

  **Note:** insulator attachment fittings include thimbles, clevis-tongues, bow shackles, K-straps (flat steel shackles), clearance hangers and post / stand-off insulator bases.
- Redundant or obsolete construction – assess whether any obsolete / redundant insulator is (no attached overhead lines) pose immediate bushfire or safety risks.

8) Perform a visual assessment of all conductor connections and accessories for defects including, but not limited to, the following:

- Connection degradation – examine all conductor connections for corrosion, overheating, conductor breakage, correct seating / securing of the conductor and evidence of damage due to conductor loading.

  **Note:** conductor connections include parallel groove clamps, split bolts, wedge clamps, insulated piercing connectors, bail clamps, live-line clamps, sleeves / compression fittings, inter-distributor tee’s, ‘U’ bolts, and earth clamps / connectors.
- Accessory degradation – examine all conductor accessories for corrosion, overheating, conductor breakage, correct seating / securing of the conductor and evidence of damage due to conductor loading.

  **Note:** conductor accessories include points of attachment, joints, low voltage spreaders, mains connection boxes and temporary insulation.

- Redundant or obsolete construction – assess whether any obsolete / redundant conductor connections pose immediate bushfire or safety risks.

9) Perform a visual assessment of equipment attached to the pole / posts for defects including, but not limited to, the following:

   - Degradation – examine all attached equipment for corrosion, loose or overheating connections, conductor breakage / disconnection at terminations, cracking / tracking / surface degradation on insulators and surge arrestors, loose or disconnected earth downleads / connections.

     **Note:** attached equipment includes switchboards / meter boxes, transformers, switches, links, operating mechanisms and lights.

   - Degraded mounting – examine all equipment mountings for evidence of corrosion (including fasteners), twisting or rotation away from the pole surface, or loose or tilted (misaligned) attachment to the pole.
   - Damage and contamination – examine all attached equipment for missing or damaged covers / doors, breakage or damage due to burning / fire, lightning strikes, vandalism (including earth downleads and connections) or vehicle contact, and surface contamination or foreign objects (for example, branches, moss, lichen, salt, balloons, insects, bird nests, fauna).
   - Cable entries / conduits – examine for secure fixing of conduits / cable entry and exposed or damaged cables.
   - Redundant or obsolete construction – assess whether any obsolete / redundant components pose immediate bushfire or safety risks.

10) Perform a visual assessment of UGOH's for defects including, but not limited to, the following (without removing covers or excavating):

   - Cable cover degradation – examine the mechanical protection for the cable (cable covers, conduits) for corrosion (including fasteners), UV degradation (plastic conduits), secure fixing to the pole or post and exposed cables at ground level.
   - Cable degradation – examine attached cables for corrosion (including cable armour, saddles, fasteners), UV degradation, secure fixing to the pole or post, and splits / rot. Also examine for clearance between the cable and the top of the cable cover (that is, the cable is not rubbing against the top edge of the cable cover).
   - Cable termination degradation – examine terminations for corrosion (including brackets, fasteners), UV degradation (polymeric terminations), secure fixing to the bracket / pole / post, loose or overheating connections, conductor breakage / disconnection at terminations, and cracking / tracking / surface degradation on insulators and surge arrestors.
   - Damage and contamination – examine all UGOH components for breakage or damage due to burning / fire, lightning strikes, vandalism / third party / vehicle impact, and contamination or foreign objects (for example, branches, salt, insects, bird nests, fauna).
   - Redundant or obsolete construction – assess whether any obsolete / redundant UGOH components pose immediate bushfire or safety risks.

11) Perform a visual assessment of earthing arrangements (without removing battens or covers) for defects including, but not limited to, the following:

   - Earthing degradation – examine all earth cables and conduits for corrosion (including fasteners and connections), continuity (between switchboards / meter boxes and earth stakes / main earths), secure fixing to the pole, stranding / breakages, deterioration or UV degradation of the conductor insulation or conduit, loose or disconnected earth connections.
   - Damage and contamination – examine all earth system components for breakage or damage due to burning / fire, lightning strikes, vandalism or vehicle contact, and contamination or foreign objects (for example, termites, bird nests, insects / spiders).

- Redundant or obsolete construction – assess whether any obsolete / redundant earthing components pose immediate bushfire or safety risks.

  **Note:** Private Mains Auditors shall not attempt to repair loose, broken or damaged earth system components as full phase to earth voltages may be present.

12) Perform a visual assessment of pole stay (guy) arrangements for defects including, but not limited to, the following:

- Stay wire degradation – examine the stay wire for broken strands, corrosion and damage. Check that the stay wire is tight and correctly supporting the pole. Where corrosion is identified, assess the steel condition according to Clause 6.6.2
- Anchor degradation. Examine the anchor attachment and anchor rod for corrosion and damage. Check that the anchor arrangement is correctly embedded in the ground. If corrosion is evident on the anchor rod near or at groundline, excavate to a depth of 200mm to assess the extent of corrosion. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
- Non-standard construction – record (photograph) staying arrangements that are not a commercially available or engineered arrangement.
- Redundant or obsolete construction – assess whether any obsolete / redundant staying components pose immediate bushfire or safety risks.

13) Perform a visual assessment of all aerial mains and poles / posts for objects located on or near the private pole that may be climbed to allow persons to come into contact with energised electrical conductors.

### C3 Finalising the Audit Process

After the audit procedure has been completed, the audit process shall be finalised as follows:

1) Record (photograph) the following:

- Identified defects.
- Attachments, fittings, trees or structures that may facilitate unauthorised climbing or access.

2) Assess the audit outcomes against the private aerial mains defect notice criteria in Clause 4.8.

3) Record audit results and create defect records in the Ausgrid Asset Management System. This shall be performed using relevant forms or letters, photographs or direct entry into a MAM device (refer to Clause 2.2).

4) Notify the customer of identified defects or audit obstructions using relevant forms or letters (refer to Clause 2.2). Record (photograph) notifications provided to customers.

Private aerial mains posing imminent safety, environmental or bushfire risks shall be reported immediately to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

# Annexure D: Timber Private Poles / Posts - Audit Process

## D1 General Requirements

The audit process for timber private poles (including posts) consists of:

- Implementation of appropriate safety precautions according to Annexure A.
- Above groundline visual assessment and sounding according to Clause 0.
- Partial excavation and assessment according to Clause D3.
- Full excavation and below ground assessment according to Clause D3.
- Audit finalisation according to Clause D4.

Timber private poles or posts supporting private mains (excluding common-use poles) shall be audited according to the following procedures. They shall not be drilled for internal inspection and shall not have preservative or termite treatments applied to them. When auditing private poles, the focus shall be on identifying defects which could pose a risk to Ausgrid's network, defects that are likely to result in a bush fire, defects that may cause harm to human life or property and signs of imminent pole failure.

Private Mains Auditors shall not attempt to repair identified private pole defects. Private Mains Auditors shall report any immediately dangerous defects to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

Private pole audits may proceed when a pole has been identified with immediately dangerous defects if the audit can be performed without risk to the Private Mains Auditor or others in the vicinity of the pole and only after reporting the immediately dangerous defect to the Ausgrid Emergency Line.

## D2 Above Ground Audit Process

### D2.1 General Requirements

The above ground portion of all timber private poles or posts shall be audited. Some components of the above ground audit of a pole may be performed when implementing the safety precautions according to Annexure A. The private pole audit may also be performed before, during or after the private aerial mains audit process.

Timber private pole audits shall be performed without climbing the pole or disturbing termites where termite activity is detected.

Any non-standard type of timber private pole or post shall only be audited above ground. Non-standard types include poles / posts that are not a commercially available engineered product or those made of numerous sections bolted together (for example, 'split posts' used for temporary supplies during construction).

### D2.2 Above Ground Assessment Procedure

The above ground assessment procedure for timber private poles shall be performed as follows:

1) Determine the audit scope for that site according to Clause 1.4.
2) Implement safety precautions according to Annexure A.
3) Perform a visual assessment of the full length of the pole for signs of termites.
4) Perform a visual assessment of the full length of all poles for the following external defects (refer to Clause D5):
    - Depth in ground - examine the pole for evidence of pole movement at ground level and evidence on the pole of an old 'ground level' mark or 'high tide' mark to indicate that the pole is no longer as deep in ground as originally installed.
    - Vertical alignment (lean) – assess the vertical alignment of the pole. Where a pole is leaning, the angle of the lean shall be accurately measured using a digital level (1 metre minimum length). Where a pole is identified as leaning excessively (ie, more than 10 degrees from the vertical position) look for causes of the leaning – causes may include

subsidence, erosion or alterations to the natural ground level / excavations, excessive load, pole degradation below ground or a poorly designed/constructed installation.

- Fire / lightning damage – examine the pole for evidence of fire or lightning damage to the pole, including the areas where cross arms are mounted. Assess the depth of damage into the timber (for example, is it just surface charring or has it penetrated through the sap wood). Where fire damage is identified on CCA treated timber poles, refer to Clause A3.
- Damage – examine the pole for evidence of damage caused by vehicles (bites in the timber) or animals
- Fungal decay / fruiting bodies - examine the pole for decayed timber (rot) and fruiting bodies on the pole. Where fruiting bodies are identified which can be reached from ground level, the pole is to be sounded in that region of the pole.
- Knot holes, grub holes, and checks – examine the pole for knot holes, grub holes or checks (splits) anywhere on the surface of the pole.
- Pole head degradation - examine the pole for any splitting at or near the top of the pole. This includes splitting which extends through the full diameter at or near the centre of the pole, or which is in line with or extends past attachment bolts, or which is greater than 10mm wide.
- Pole bending – examine the pole for excessive curvature or bending.

5) Perform an assessment of reinforced / non-standard construction timber private poles for the following defects:
   - Compliant reinforcement / non-standard construction – determine whether the pole or reinforcement is a standard design or compliant type (refer to Clause 5.1.5) or is a non-standard construction (for example, split posts, modified / non-standard design). Record (photograph) all pole reinforcements and non-standard construction poles.
   - Degradation – examine compliant steel reinforcements and securing bands / bolts for corrosion or thinning of the cross-section. Check that the securing bands (where used) are holding the pole tightly against the reinforcement and that there is no movement in the bands. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
   - Damage - examine compliant steel reinforcements and securing bands / bolts for damage (for example, due to vehicles, vandalism).
   - Reduced timber wall thickness – measure the thickness of sound timber in the pole adjacent to compliant reinforcements (if safe to do so) using existing drilled inspection holes where they are accessible. Immediately contact the nominated Ausgrid representative if there are no accessible existing inspection holes in poles with compliant reinforcements.
6) Sound the pole above groundline according to Annexure E.
7) Measure the original diameter / width of the pole ('$D_0$') in the groundline area (refer to NS145 Annexure I).
8) Measure the reduced diameter / width of the pole ('$D_1$') at any location above ground where a defect has been located (refer to NS145 Annexure I).
9) If a reduced diameter has been identified during the above ground audit, calculate the remaining diameter according to Clause 5.2.5.
10) Compare the above ground assessment results against the timber private pole defect notice and reinforced pole minimum wall thickness criteria in Clause 5.6 to determine whether the pole is defective prior to excavation and below ground assessment. If the pole does not meet the safe to excavate criteria in Clause D3.1, finalise the pole audit according to Clause D4.

## D3 Excavation and Below Ground Audit Process

The objective of the below ground audit process is to subject each timber private pole (where it is safe to do so) to a thorough assessment between groundline and 200mm or 250mm below

groundline. Excavation and below ground assessment shall only be performed where it does not involve damaging private property and where reinstatement is feasible and minimal cost. Concrete / continuous paving (including below ground concrete) shall not be cut or damaged and cold mix bitumen shall not be removed.

Extreme caution shall be exercised when excavating around timber private poles as their design and past maintenance is largely unknown (refer to Clause 3.2). It shall not be assumed that attached cables or services (including earth cables) enter vertically from a depth below 250mm or perpendicular to the pole from an adjacent asset, or that any cable is clear of the remaining assessment area around the pole. These cables can be easily damaged by digging implements and this may cause a hazardous situation. Refer to Annexure A for safety precautions when excavating around poles and attachments, and Clause I1 for excavation procedures.

Full excavations on poles shall be performed in such a way that a thorough testing of the pole can be performed using the rounded point bar from groundline down to 200mm or 250mm below groundline. Where the full below ground surface of the pole cannot be exposed due to obstructions (for example, concrete, tree roots, pipes), the pole shall be carefully probed in areas adjacent to the obstruction because these areas will retain moisture and are more likely to suffer fungal decay damage than other areas around the pole.

### D3.1 Safe to Excavate Criteria

Excavation and below ground inspection shall only be performed if the pole meets all of the following criteria;

- Termites have not been located during the above ground assessment or while excavating, and
- The pole or post is not considered to be loaded close to or beyond its structural capacity (indicated by excessive lean or bending of the pole), and
- Any reinforcement that has been installed complies with Clause 5.1.5.
- The pole reinforcement which complies with Clause 5.1.5 does not have any defect or damage that reduces the structural integrity or stability of the pole or reinforcement, and
- The wall thickness of a reinforced pole which complies with Clause 5.1.5 is equal to or greater than the minimum wall thickness values in Table 8 or Table 9 (depending on the reinforcement type), and
- Reinforcing splints, nails and securing bands / bolts which comply with Clause 5.1.5 do not have any steel condition resulting in a defect notice according to Clause 6.6.2 or folds and pole movement is not evident, and
- A CCA treated pole does not have fire damage, and
- The remaining diameter or width of the pole or post exceeds 70% of the original diameter or width, and
- Pole stability will not be affected by, or suspected to be affected by, excavation of the pole.

If a pole is identified as potentially unsafe prior to excavation or during excavation:

- Do not proceed with excavation of the pole – finalise the audit according to Clause D4, and
- Report the potentially unsafe pole immediately to the Ausgrid Emergency Line.

### D3.2 Partial Excavation Procedure

The partial excavation and initial below ground assessment procedure for timber private poles shall be performed as follows only when the above ground inspection indicates that it is safe to proceed (refer to Clause D3.1):

1) Assess whether excavation and reinstatement is feasible according to Clause 1.7. Where excavation is not feasible, finalise the audit according to Clause D4. Record (photograph) the site irrespective of whether excavation is to proceed.

2) At the location chosen for the initial below ground assessment, expose the groundline area adjacent to the neutral axis. This may require removal of paving tiles or filling material at ground level or below ground level.

3) Excavate timber private poles as follows:

   - For timber private poles less than 200mm diameter or 175mm square section – excavate to a depth of 200mm in the neutral axis on one side of the pole.
   - For all other unreinforced timber private poles – excavate to a depth of 250mm in the neutral axis on one side of the pole.
   - For timber private poles with a compliant reinforcement – excavate to a depth of 100mm adjacent to the reinforcement.

4) Examine the excavation, the pole and the excavated soil for termite activity while performing the excavation. The below ground assessment shall cease if active termites have been identified in the partial excavation.

5) Perform a visual assessment of the exposed section of the pole for the following external defects (refer to Clause D5) and determine the extent of any external defect:

   - Fungal decay – look for brown rot, white rot, soft rot and white pocket rot.
   - Knot holes, grub holes, and checks.
   - Reduction in the pole diameter / width (waist) – measure the reduction in diameter or width in the exposed section of the pole assuming any reduction in diameter continues completely around the pole. This shall be the 'assumed' reduced diameter / width if excavation on the opposite side of the pole does not need to be performed. Any reduction on one side of the pole shall not exceed 15% of the original diameter or width.

6) Perform a visual assessment of the exposed section of compliant pole reinforcements for corrosion or thinning of the cross-section. Where corrosion is identified, assess the steel condition according to Clause 6.6.2. Do not excavate beyond 100mm below groundline.

   **Note:** sounding and measurement of diameter reduction below groundline or excavation on the other side of the pole according to the next steps is not required on reinforced poles

7) Sound the pole according to Clause E2.2.

8) Where identified external defects appear to extend beyond the exposed area of the pole, excavate to the same depth below groundline in the neutral axis on the opposite side of the pole (where safe to do so) and repeat the visual assessment for defects and sounding where defects are identified.

9) Where both sides of the pole have been excavated, measure the actual reduced diameter or width 'D1'.

10) If diameter / width reduction has been identified, calculate the remaining diameter or width as below, and record the results.

    - If only one side of a pole has been excavated or is only able to be excavated, multiply the diameter reduction measured on that side by 2, or
    - When both sides of a pole have been excavated, use the actual reduced diameter measured.

### D3.3 Full Excavation and Below Ground Assessment Procedure

The full excavation and below ground assessment procedure for unreinforced timber private poles shall be performed as follows only when the partial excavation assessment indicates that it is safe to proceed (refer to Clause D3.1):

1) Fully excavate around the pole as follows:

   - For timber private poles less than 200mm diameter or 175mm square section – excavate to a depth of 200mm.
   - For all other unreinforced timber private poles – excavate to a depth of 250mm.

2) Examine the excavation, the pole and the excavated soil for termite activity while performing the excavation. The below ground assessment shall cease if active termites have been identified in the full excavation.

3) Perform a visual assessment of the exposed section of the pole for fungal decay / rot and reduction in the pole diameter / width (waist).

4) Use a rounded point bar to test the soundness of the exposed section of the pole according to Clause E2.2.

5) Measure the reduced diameter / width $D_1$ of the pole according to NS145 Annexure I.

## D4 Finalising the Audit Process

After the above ground and below ground assessment procedures have been completed, the audit process for timber private poles shall be finalised as follows:

1) Record (photograph) the following external above or below ground defects:
   - Evidence of active termites.
   - Pole lean, pole bending or evidence of pole movement at groundline.
   - Fire and third-party damage.
   - Pole head degradation (excluding missing pole caps).
   - Fungal decay, rot, fruiting bodies, knot holes, grub holes and checks / bites.
   - Pole reinforcements (compliant and non-compliant types), corrosion on the reinforcement and non-standard construction poles
   - Obstructions preventing effective auditing of the pole.
2) Restore the excavation to an 'almost as-found' condition and record (photograph) the restored site.
3) Calculate the remaining diameter according to Clause 5.2.5.
4) Compare the above ground and below ground audit results and remaining diameter / width values against the defect notice and reinforced pole minimum wall thickness criteria in Clause 5.6.
5) Record pole audit results and create defect records in the Ausgrid Asset Management System. This shall be performed using relevant forms / letters, photographs or direct entry into a MAM device (refer to Clause 2.2).
6) Notify the customer of identified defects or audit obstructions using relevant forms or letters (refer to Clause 2.2). Record (photograph) notifications provided to customers.

If the pole appears to be loaded close to or beyond its available capacity (indicated by excessive pole lean or bending of the pole), or appears to be in danger of collapse, it shall be reported immediately to the customer (where readily contactable) and the nominated Ausgrid Emergency Line.

## D5 Inspection of External Defects on Timber Poles

When inspecting for external defects, minimal defective timber shall be removed for the defect to be assessed and measured. Pay particular for fungal decay.

Every effort shall be made to avoid the 'hourglass' effect by tapering off chipped areas and excessive reshaping of the pole which may be interpreted as damage to the pole by a customer.

Once the defect is reasonably exposed, measure and record the reduced diameter of the pole in that location '$D_1$' according to NS145 Annexure I.

# Annexure E: Timber Private Poles – Sounding

## E1 General Requirements

Each timber private pole shall be sounded as part of the above ground assessment, and again as part of the below ground assessment. Private poles shall not be drilled for internal inspection. Where poles have external timber above ground or below ground that is in 'as new' condition a reduced amount of sounding may be appropriate. Care should also be taken to not overly damage the pole as a damaged appearance may result in customer complaints. However, it is the Private Mains Auditor's responsibility to make sure sufficient sounding is performed to detect all defects in the assessment area.

## E2 Guidance on Sounding

Sounding of timber poles above groundline shall be performed with a ball pein hammer. Sounding of timber poles below groundline shall be performed with a rounded point bar. When performing sounding of a timber pole, a Private Mains Auditor shall concentrate on:

- The sound that is developed.
- The amount the hammer or rounded point bar rebounds. This can also be described as the 'feel' of the pole.
- Whether or not the rounded point bar penetrates through the outer timber into an internal defect.
- Using a rigorous and methodical process to make sure defects are not missed.

## E2.1 Guidance on the Use of a Ball Pein Hammer

The ball of a 16oz / 450g (or heavier) ball pein hammer shall be used to sound the above ground portion of timber poles as well as that area at and just below groundline where it is practical to do because it generates a more consistent sound regardless of the angle at which the ball strikes the pole. The weight of the hammer is important for the feel and sound of the centre of the pole as well as for the heartwood condition behind decayed or loosened sapwood. Tools other than a ball pein hammer, such as a flat faced hammer, or the back of an axe, shall not be used for sounding.

The following guidance shall be followed when using a ball pein hammer:

- Test the timber pole by striking it firmly.
- A good pole will 'ring' or resonate when correctly struck with a hammer. The hammer blow will generate a distinctive solid sound, a sharp 'whack' or hard 'tap', and a noticeable rebound of the hammer when struck against solid timber.
- A degraded pole will not normally 'ring' or resonate when struck. Instead, it will give a dull 'thud' or a soft 'thump' sound, or a distinctly 'hollow' or 'drummy' sound. There may only be a small rebound of the hammer, or no rebound at all. The hammer may become embedded in the timber of poles in very poor condition.
- Where the timber surface is affected by minor decay it will be necessary to hit the pole harder in order to compress the decayed timber and generate an indicative sound. Where a 'good' sound cannot be generated this generally indicates a defect.
- Loose sapwood should generate a defective sound and further assessment of the pole will be needed to confirm if there is an underlying internal defect. The defective area shall be investigated by removal of decayed timber if on the outside of the pole.

Sounding prior to excavation (above ground sounding) shall extend from groundline (with additional focus on the portion within 50mm of groundline) to as high as can comfortably be reached (generally 2m above groundline). Sounding of the pole shall be thoroughly performed near groundline because this is the most likely location for defects to occur.

To sound a pole so that an internal defect is not missed it is necessary to perform at least 4-8 soundings (strikes) around the circumference of a round pole (depending on the diameter and assumed age of the pole), or one on each flat face of a dressed or square pole, within 50mm of groundline, then repeat this at least 4 times around the pole at each 500mm interval above groundline to as high as can be comfortably reached. Sounding is only required up to 500mm

above groundline on poles assumed to be less than 10 years old (based on a pole disc, retained colour or appearance of the pole).

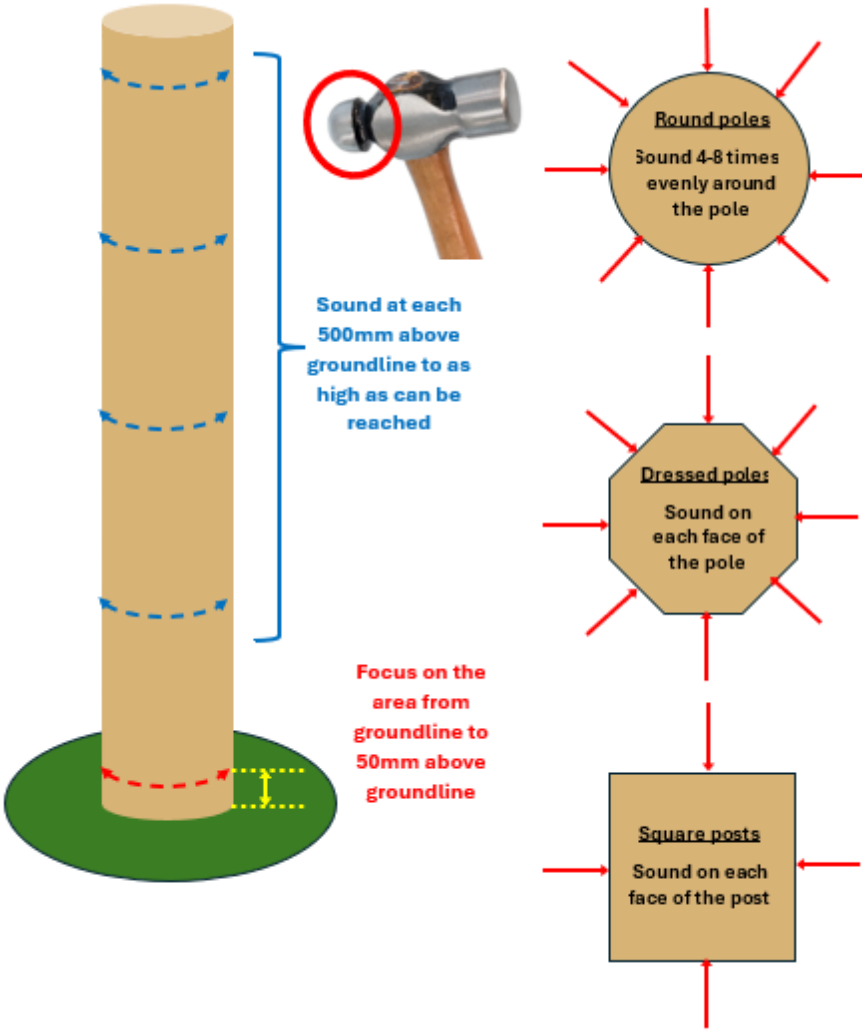



**Figure 2 – Sounding above groundline with a ball pein hammer**

Some poles will need to be sounded at much closer intervals than the minimum specified above, particularly where a defect is indicated at groundline. Where defects such as fruiting bodies, knots, checks, termite damage, loose sapwood, or other visual indicators are seen on the pole, a more thorough sounding shall be performed around and nearby the defect indicator (particularly at ground line).

## E2.2 Guidance on the Use of a Round Pointed Bar

A 6kg rounded point bar with a 15mm hemispherical point shall be used to test the external below ground surface of the pole. The rounded end shall be used to test for areas of external decay and internal decay covered by a thin layer of good wood (typically less than 15mm). The bar may be dual purpose with a chisel point one end and the rounded point on the other end.

Timber private poles set in concrete that finishes higher than 250mm below ground level shall be identified and all parts of the pole not obstructed by concrete below ground level shall be sounded.

When the pole has been partially excavated to a depth of 200mm or 250mm (depending on the pole diameter or width), the exposed portion of the pole shall be struck with the rounded point to thoroughly sound the pole for internal defects below groundline.

Timber private poles set in concrete that finishes higher than 250mm below ground level shall be identified and all parts of the pole not obstructed by concrete below ground level shall be sounded.

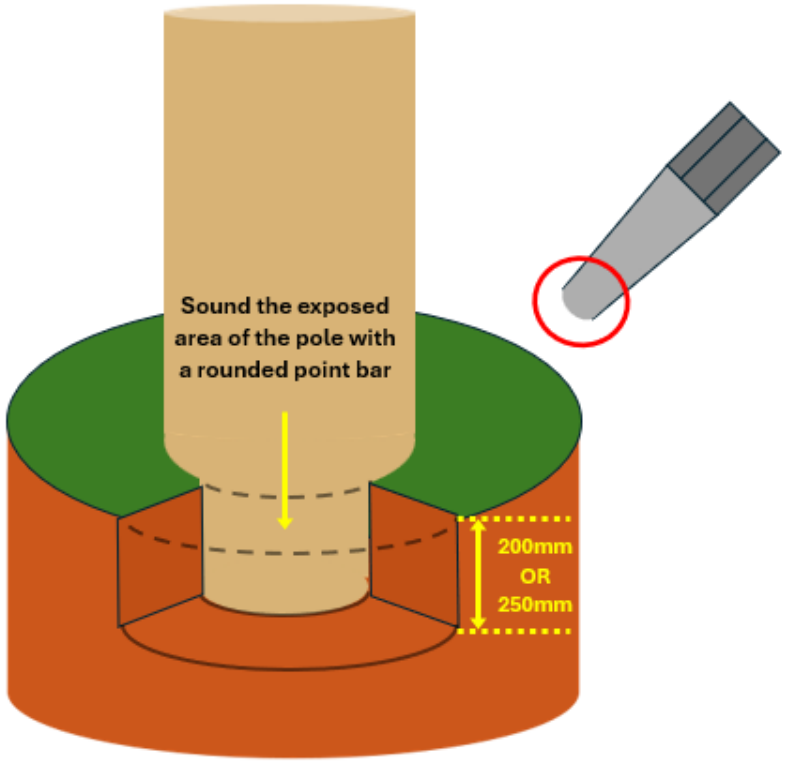



**Figure 3 – Initial sounding below groundline with a rounded point bar**

When the pole is fully excavated, strike the external below ground surface of the pole with the rounded point from the bottom of the excavation up to groundline. The chisel-end can be used to scrape soil and decayed timber from the pole.

Use of the bar shall not result in permanent damage to the face of the pole where the timber is in good condition, particularly CCA poles. A sharp point that will damage sound timber shall not be used under any circumstances.

The following guidance shall be followed when using a rounded point bar (refer to Figure 4):

- Use a rigorous, methodical process so that localised defective timber areas are not missed. Newer defect-free poles may not require as much sounding as older poles. The amount of sounding performed shall be sufficient to locate any defect.
- Strike the pole firmly at the base of the excavation so that the bar strikes the pole where it meets the soil. The bar shall deflect off the pole if it is solid, the rounded point of the bar embedding itself into the soil at the base of the excavation.
- After testing at the base of the excavation, the bar shall then be used to impact the pole immediately above this point, then test again every 50-100mm in a vertical line up to groundline. The pole shall be tested in this manner at least every 150-200mm around the pole (or 50-75mm for smaller diameter poles). It is critical that this procedure be performed rigorously and methodically to make certain of the safety and strength of the pole.

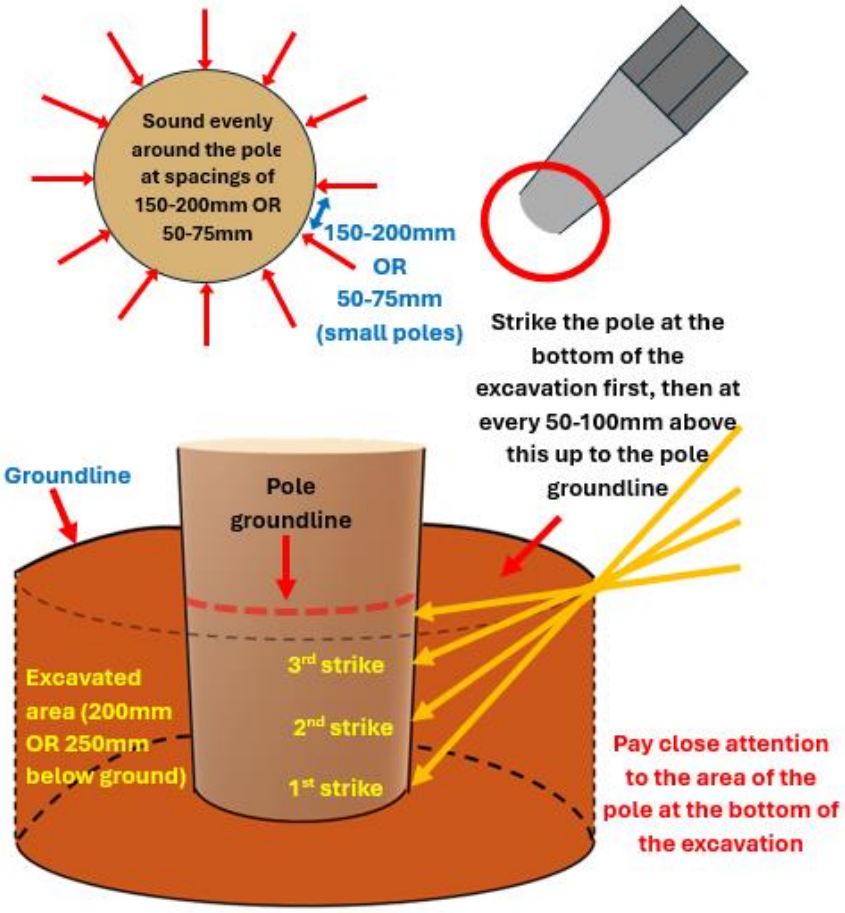



**Figure 4 – Sounding below groundline with a rounded point bar**

- Particular attention shall be paid to the area of the pole at, and just below, the bottom of the excavation and adjacent to assets or other obstructions attached to the pole such as UGOHs or concrete. If severe decay exists deep below the excavated area or behind an obstruction, there should commonly be detectable decay near the bottom of the excavation or adjacent to the obstruction. In most instances the pole's condition will improve with depth, however under some conditions the pole will deteriorate below the excavated area.
- A pole with a significant defect below the bottom of the excavation may also be loose in the ground, The Private Mains Auditor shall be alert for any movement of the pole in-ground when struck with a bar at the base of the excavation.
- Where the pole sounds hollow, the bar shall be driven vigorously into the suspect area. This should result in either the bar penetrating the thin wall and into the defect or bouncing off adequate sound timber.
- By testing a pole in the manner described, the rounded point of the bar can penetrate decayed timber to reveal the true extent of the remaining sound timber
- The pole shall not be hit excessively hard unless a defect is suspected, in which case the pole shall be hit very firmly. A bar with the correct rounded point will bounce off sound hardwood timber but will penetrate defects existing close to the surface of the pole. This procedure is critical to ensuring confidence in the soundness of the pole.

# Annexure F: Steel Private Poles - Audit Process

## F1 General Requirements

The audit process for steel private poles consists of:

- Implementation of appropriate safety precautions according to Annexure A.
- Above groundline visual assessment and sounding according to Clause F2.2.
- Partial excavation and initial below ground assessment according to Clause F3.
- Full excavation and below ground assessment according to Clause F3.3.
- Audit finalisation according to Clause F4.

Steel private poles supporting private mains (excluding common-use poles) shall be audited according to the following procedures. When auditing private poles the focus shall be on identifying defects which could pose a risk to Ausgrid's network, defects that are likely to result in a bush fire, defects that may cause harm to human life or property and signs of imminent pole failure. Aluminium private poles shall also be audited according to this process. Strength assessment by direct wall thickness measurement using an ultrasonic meter and corrosion treatment is not required on steel private poles.

Corrosion of the steel wall may be internal or external and therefore a severely corroded wall may appear to be in good condition when visually assessed. A corrosion stain by itself with no loss of metal or bubbling is not a defect but could be an indication that a defect exists behind a thin exterior coating of material such as paint or galvanising. A corrosion stain could also be an indicator of a possible future rust defect. Any corrosion bubbling (including under epoxy coatings) or staining needs to be carefully investigated visually and physically with a hammer to assess any metal loss or flaking.

Private Mains Auditors shall not attempt to repair identified private pole defects. If perforations (holes of any size) or folds become evident at any point during the audit, or if corrosion appears to extend beyond 250mm below groundline, the site shall be secured to ensure the safety of the public and property in the event of a pole failure, and the situation reported to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

Private pole audits may proceed when a pole has been identified with immediately dangerous defects if the audit can be performed without risk to the Private Mains Auditor or others in the vicinity of the pole and only after reporting the immediately dangerous defect to the nominated Ausgrid representative.

## F2 Above Ground Audit Process

### F2.1 General Requirements

Steel poles may be concreted around the base below groundline, or to a level of 100mm above groundline (when new) according to AS/NZS 3000:2018. Some steel private poles may have a protective epoxy coating in the below ground section of the pole. This coating is designed to lengthen the life of the pole and shall not be removed or damaged except for circumstances where corrosion is suspected beneath the coating (for example, bubbling of the coating).

Any non-standard type of steel private pole or post shall only be audited above ground. Non-standard types include poles / posts that are not a commercially available engineered product or those made of numerous sections bolted together (for example, 'split posts' used for temporary supplies during construction).

### F2.2 Above Ground Assessment Procedure

The above ground assessment procedure for steel private poles shall be performed as follows:

1) Implement safety precautions according to Annexure A.
2) Perform a visual inspection of the full length of the pole (without climbing) for the following defects:
    - Depth in Ground - examine the pole for evidence of pole movement at ground level and evidence on the pole of an old 'ground level' mark, or 'high tide' mark to indicate that the

pole is no longer as deep in ground as originally installed. Also look for exposed conduits or cable entry holes as an indicator of ground level changes.

- Vertical alignment (lean) - where a pole is leaning, the angle of the lean shall be accurately measured using a digital level (1 metre minimum length). Where a pole is identified as leaning excessively (ie, more than 10 degrees from the vertical position) look for causes of the leaning – causes may include subsidence, erosion or alterations to the natural ground level / excavations / trenches within 1.5m.
- Pole reinforcements or non-standard construction – record (photograph) poles which are reinforced or a non-standard construction.
- Dents, folds and bending - examine the pole for denting, folds or bending. Where dents, folds or bending is identified, measure the dent or bend according to Clause F5 where:
  - the dented section of the pole is 50% or more of the diameter of the pole at that height, or
  - a 1 metre steel straight edge placed along the back of the pole where a dent is located shows a bend in the column.
- Perforations – where perforations are identified they shall be immediately reported to the Ausgrid Emergency Line.
- Corrosion - examine the pole for evidence of corrosion including rust stains, pitted or scaling rust and surface bubbling (refer to Clause F7). Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
- Rusting, loose or damaged fittings and attachments, etc - examine for corroded, loose or damaged attachments, such as conduits or earthing connections. Loose earth connections shall not be tightened and shall be immediately reported to the Ausgrid Emergency Line.
- Damage - examine the pole for vehicle damage, fire damage and unauthorised attachments. Measure any identified damage according to Clause F5.
- Missing or severely damaged access covers – when these defects are identified they shall be immediately reported to the Ausgrid Emergency Line. Where an access cover cannot be fully closed or secured with gaps of 12mm or more (excluding missing covers), multiple layers of 50mm electrical insulating tape shall be applied around the full circumference of the pole to secure the cover against unauthorised access.
- Pole caps – examine the pole for missing caps which allow moisture entry into the pole.

3) Perform a visual assessment of the rag-bolt mounting (where installed) for the following defects:
   - Depth in Ground – examine for reduced ground level around the rag-bolt mounting and exposed conduits or cable entry holes as an indicator of ground level changes.
   - Buried base plate and rag-bolt mounting – if the surrounding ground has covered the base plate or the rag-bolt hold-down bolts / threaded foundation rods or nuts, remove any surrounding materials covering these components.
   - Missing / loose nuts – examine for missing nuts on the rag-bolt mounting. Check that the nuts are tight. If two or more rag-bolt nuts are missing immediately report the pole to the Ausgrid Emergency Line and record the defect.
   - Corroded hold-down bolts / threaded foundation rods and nuts - examine these components for evidence of corrosion including rust stains or scaling corrosion. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
   - Cracked or corroded base plate / base plate welds - examine these components for evidence of corrosion (rust stains or scaling corrosion) or cracked welds. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
4) Sound the pole according to Clause F6.

5) Compare the above ground assessment results against the defect notice and steel condition rating criteria in Clause 6.6 to determine whether the pole is defective prior to excavation and below ground inspection. If the pole does not meet the safe to excavate criteria in Clause F3.1, finalise the pole audit according to Clause F4.

## F3 Excavation and Below Ground Audit Process

The objective of the below ground audit process is to subject each steel private pole (where it is safe to do so) to a thorough assessment between groundline and 250mm below groundline. The below ground section of steel private poles shall only be exposed if the above ground audit indicates that it is safe to proceed. Concrete / continuous paving (including below ground concrete or concrete above ground level surrounding steel private poles installed according to AS/NZS 3000:2018) shall not be cut or damaged, and cold mix bitumen shall not be removed. Refer to Annexure I for further details.

Steel private poles commonly corrode very close to groundline, however where substantial corrosion exists near groundline, it is not always visible above groundline. Excavation and below ground assessment shall only be performed where it does not involve damaging private property and where reinstatement is feasible and minimal cost (refer to Clause 1.7).

Extreme caution shall be exercised when excavating around steel private poles as their design and past maintenance is largely unknown (refer to Clause 3.1.4). It shall not be assumed that attached cables or services (including earth cables) enter vertically from a depth below 250mm or perpendicular to the pole from an adjacent asset, or that any cable is clear of the remaining assessment area around the pole. These cables can be easily damaged by digging implements and this may cause a hazardous situation. Refer to Annexure I for further details.

### F3.1 Safe to Excavate Criteria

Excavation and below ground assessment shall only be performed if the pole meets all of the following criteria;

- The pole is not considered to be loaded close to or beyond its structural capacity (indicated by excessive lean or bending of the pole), and
- The pole is not encased in concrete or cold mix bitumen at or above groundline, and
- The pole does not have any steel condition rating resulting in a defect notice according to Clause 6.6.2, folds or perforations, and
- Pole or standard stability will not be affected by, or suspected to be affected by, excavation of the pole.

If a pole or standard is identified as potentially unsafe prior to excavation or during excavation:

- Do not proceed with excavation of the pole or standard – finalise the inspection according to Clause F4, and
- Report the potentially unsafe pole or standard immediately to the Ausgrid Emergency Line.

### F3.2 Partial Excavation Procedure

The partial excavation and initial below ground assessment procedure for steel private poles shall be performed as follows only when the above ground inspection indicates that it is safe to proceed (refer to Clause F3.1):

1) Assess whether excavation and reinstatement is feasible according to Clause 1.6. Where excavation is not feasible, finalise the audit according to Clause F4. Record (photograph) the site irrespective of whether excavation is to proceed.
2) At the location chosen for the initial below ground assessment, expose the groundline area adjacent to the neutral axis. This may require removal of paving tiles or filling material (excluding cold mix bitumen) at ground level or below ground level.
3) Excavate to a depth of 250mm below groundline in the neutral axis on one side of the pole.
4) Examine the pole for evidence of corrosion (including corrosion extending further than 250mm below ground) or folds in the steel wall. Where corrosion is identified, assess the steel condition according to Clause 6.6.2. If the pole has any steel condition rating resulting in a

defect notice according to Clause 6.6.2, corrosion extending further than 250mm below ground, folds or perforations do not continue with the below ground assessment - finalise the audit according to Clause F4.

### F3.3 Full Excavation and Below Ground Assessment Procedure

The full excavation and below ground assessment procedure for steel private poles shall be performed as follows only when the partial excavation and initial below ground assessment indicates that it is safe to proceed (refer to Clause F3.1):

1) Excavate the full circumference of the pole to a depth of 250mm below groundline. If folds or perforations are detected while excavating do not continue with excavation or the below ground assessment - finalise the audit according to Clause F4.
2) Examine the surface of the full circumference of the pole for evidence of corrosion, folds in the steel wall or perforations from the base of the excavation to immediately above groundline. Where corrosion is identified, assess the steel condition according to Clause 6.6.2.
3) Where corrosion is found, sound the pole according to Clause F6.

## F4 Finalising the Audit Process

After the above ground and below ground assessment procedures have been completed, the audit process for steel private poles shall be finalised as follows:

1) Record (photograph) the following external above or below ground defects:
   - Pole lean, pole dents / bending or evidence of pole movement at groundline.
   - Corrosion, folds or perforations.
   - Fire and third-party damage, including painted poles.
   - Missing or damaged access covers.
   - Rag bolt defects or damage.
   - Pole reinforcements / non-standard poles
   - Obstructions preventing effective auditing of the pole.
2) Restore the excavation to an ‘almost as-found’ condition and record (photograph) the restored site.
3) Compare the audit results against the defect notice criteria for steel private poles in Clause 6.6 to assess whether the pole remains serviceable or corrective action is required.
4) Record audit results and create defect records in the Ausgrid Asset Management System. This shall be performed using relevant forms / letters, photographs or direct entry into a MAM device (refer to Clause 2.2).
5) Notify the customer of identified defects or audit obstructions using relevant forms or letters (refer to Clause 2.2). Record (photograph) notifications provided to customers.

Notify the customer (where readily contactable) and the Ausgrid Emergency Line immediately if:

- The pole appears to be in danger of collapse, or
- The access cover is missing or cannot be secured to prevent unauthorised access, or
- Perforations or folds are evident at any point during the above ground or below ground inspection, or
- Any steel condition rating resulting in a defect notice according to Clause 6.6.2 which extends beyond 250mm below the groundline, or
- Rag bolts have 2 or more missing nuts.

## F5 Measuring Above Ground Dents and Bends in Steel Poles

Steel private poles may become dented or bent due to damage by vehicles or third parties, or due to mechanical stresses from wind or overhead mains. Bending typically occurs on the directly

opposite side of a dent in a pole. Damage or mechanical stresses may also cause deformation (folds) in the steel cross-section. Where dents or bending are identified during inspections, they shall be measured as follows (refer to Figure 5):

- Dents shall be measured horizontally using a ruler or measuring tape on the flattened face of the pole, standard or column and compared against the original diameter of the pole in the same horizontal plane as the middle of the dent.
- Bends shall be measured vertically using a straight edged tool not shorter than 1 metre in length. The straight edged tool is to be held against the side of the pole to assess whether there is any bending of the pole.

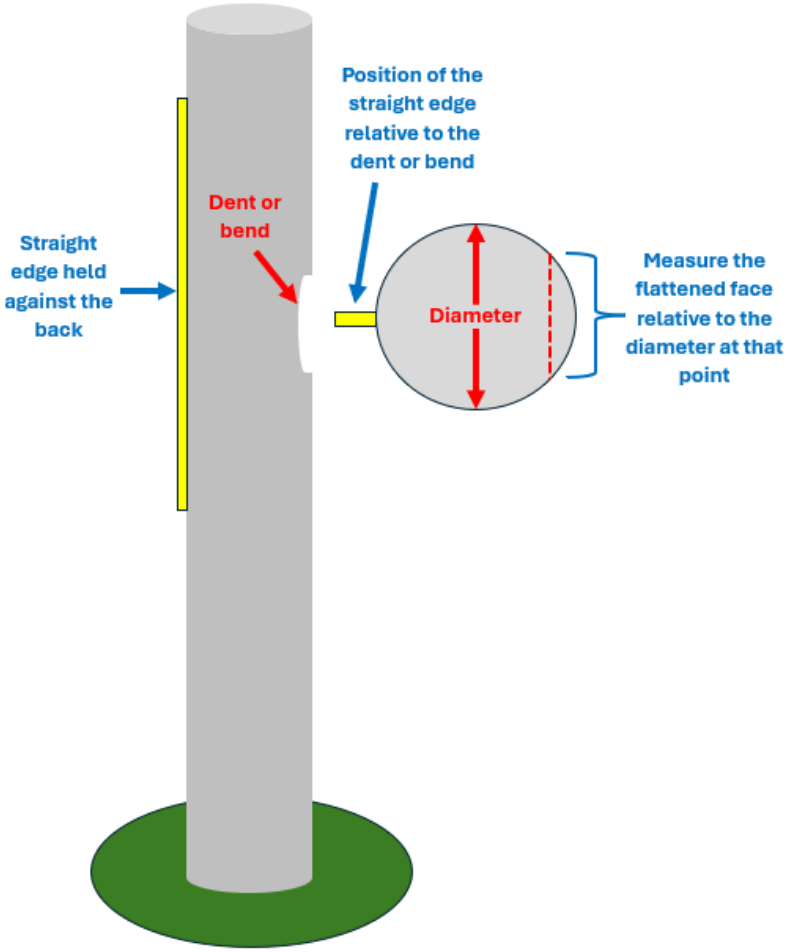



**Figure 5 – Steel Pole Dent Measurements**

## F6 Sounding Steel Poles

### F6.1 General Requirements

Each steel pole shall be sounded as part of the above ground assessment, and again as part of the below ground assessment if defects are suspected or identified. Poles shall be sounded sufficiently to detect any defect present.

Sounding shall not be performed if dents, bending, folds or perforations have been identified during the above ground assessment or when the pole is being excavated. Where sounding creates a dent, fold or perforation within the steel material, further sounding or assessment of the pole shall not proceed.

Where steel poles have steel above ground or below ground that is in as new condition a reduced amount of sounding may be appropriate. However, it is the Private Mains Auditor's responsibility to make sure sufficient sounding is performed to detect all defects in the assessment area.

## F6.2 Guidance on Sounding

The purpose of sounding steel poles is to dislodge both internal and external rust and to expose any perforations in the steel. When performing sounding of a steel pole a Private Mains Auditor's shall concentrate on:

- Listening for falling or dislodged internal rust.
- Looking for dislodged external rust and dislodged galvanising / paint exposing rust.
- Looking for denting or perforating of the steel when the hammer strikes.

Steel poles shall be sounded by tapping the steel gently with the flat face of the hammer as the galvanised or painted surfaces may be damaged if the pole is hit too firmly. Pay close attention to the area from groundline to within 50mm above groundline when sounding (or at the top of above ground concrete) as this is where corrosion typically occurs however, it is not always visible above groundline.

Sounding prior to excavation (above ground sounding) shall be performed as follows (refer to Figure 6);

- 1 or 2 soundings (strikes) around the area just above groundline, and
- additional sounding at each location where surface bubbling, rust stains or scaling / pitted rust has been identified or is suspected.

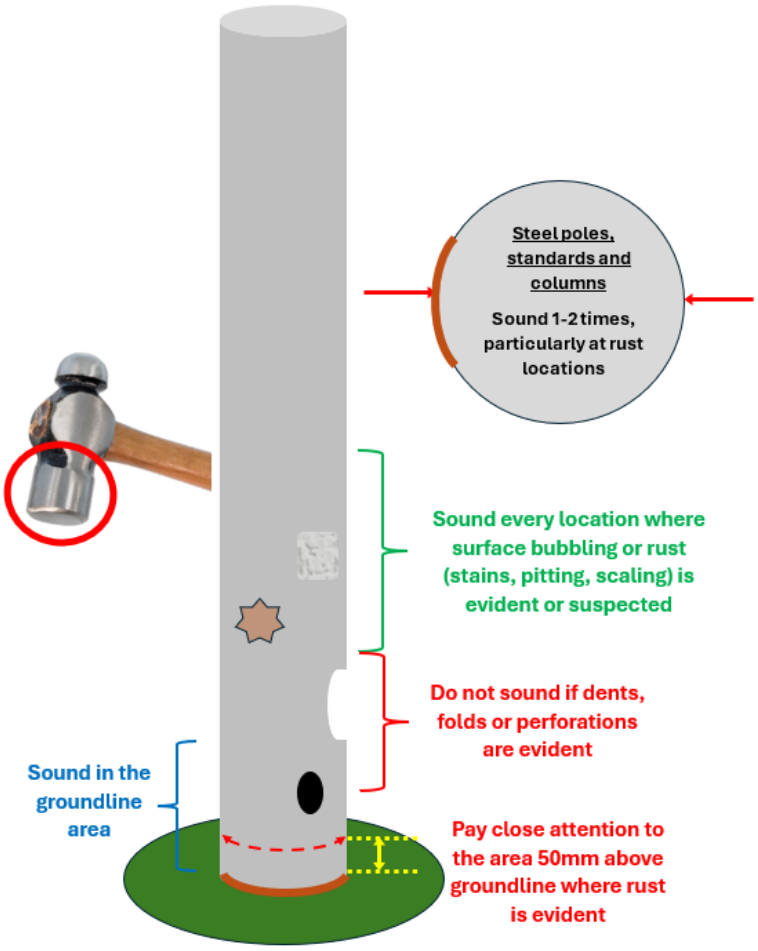



**Figure 6 – Sounding Steel Poles, Standards and Columns Above Groundline**

When the pole has been fully excavated, sounding below ground shall be performed at each location where surface bubbling, rust stains or scaling / pitted rust has been identified or is suspected (refer to Figure 7).

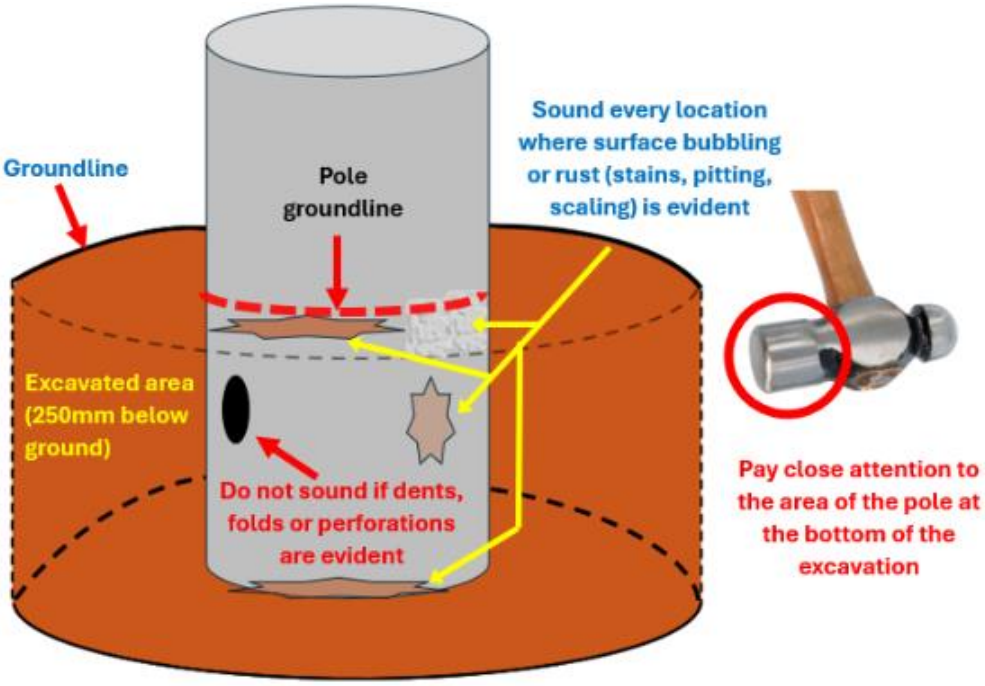



**Figure 7 – Sounding Steel Poles, Standards and Columns Below Groundline**

## F7 Common Steel Pole Defects

Steel corrosion defects commonly found on the below ground section of steel poles, standards and columns are shown in Figure 8. This corrosion may also be found on above ground sections of steel poles, standards and columns, and also rag-bolt or pile mountings. The steel condition shall be assessed according to Clause 6.6.2 whenever corrosion is identified.

Figure 8 (a), (b) and (c) shows surface rust. The steel is not pitted and there is no loss of the steel cross-section. The pole is serviceable. An 'Unable to inspect' letter is to be issued where concrete or other material prevents full examination (example shown in (c)).

Figure 8 (d), (e), (f) and (g) shows deep surface rust with minor loss of the steel cross-section, noting that (d) and (g) are concreted up to ground level. These defects shall be reported to the customer by issuing a maintenance letter.

Figure 8 (h), (i) and (j) shows deep pitting, surface bubbling and scaling / flaking rust reducing the steel cross-section and strength of the pole, noting that (h) and (j) are concreted up to ground level. These defects shall be reported to the customer by issuing a Defect notice.

Figure 8 (k) shows scaling rust and perforations, significantly reducing the steel cross-section and strength of the pole. These defects shall be immediately reported to the Ausgrid Emergency Line and reported to the customer notified by issuing a Defect notice.

Figure 8 (l) shows a perforation and denting, both of which significantly reduce the strength of the pole. These defects shall be immediately reported to the Ausgrid Emergency Line and reported to the customer by issuing a Defect notice.

**(a) Pole is serviceable**

**(b) Pole is serviceable**

**(c) Pole is serviceable**

**(d) Maintenance letter**

**(e) Maintenance letter**

**(f) Maintenance letter**

(g) Maintenance letter

(h) Defect notice

(i) Defect Notice

(j) Defect notice

(k) Emergency Line and Defect notice

(l) Emergency Line and Defect notice

**Figure 8 – Common steel pole defects**

# Annexure G: Concrete Private Poles - Audit Process

## G1 General Requirements

The audit process for concrete private poles consists of:

- Implementation of appropriate safety precautions according to Annexure A.
- Above groundline visual assessment according to Clause G2.2.
- Audit finalisation according to Clause G2.3.

Concrete private poles supporting private mains shall be audited according to the following procedures. When auditing private poles, the focus shall be on identifying defects which could pose a risk to Ausgrid's network, defects that are likely to result in a bush fire, defects that may cause harm to human life or property and signs of imminent pole failure.

The design of concrete private poles is such that the bending strength of the pole is provided by the steel reinforcement within the concrete and the compressive strength by the concrete. The life of the steel reinforcement is heavily reliant on the depth of concrete coverage over the steel reinforcement.

The most common degradation process for concrete private poles occurs as a result of rusting of the steel reinforcing bars, which then causes the bars to expand and push out the concrete - this is commonly known as 'spalling'. Spalling is cracking and outward movement of pieces of concrete caused by expansion of the internal reinforcing steel due to corrosion (rust). It is generally caused by water infiltrating through hairline cracks in the concrete resulting in rusting of the steel reinforcement.

The pole's susceptibility to corrosion is related to the depth of concrete cover over the reinforcement. Significant strength loss does not occur until large sections of concrete have been displaced, and one or more steel reinforcing bars become fully exposed.

Private Mains Auditors shall not attempt to repair identified private pole defects. Private Mains Auditors shall report any immediately dangerous defects to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

Private pole audits may proceed when a pole has been identified with immediately dangerous defects if the audit can be performed without risk to the Private Mains Auditor or others in the vicinity of the pole and only after reporting the immediately dangerous defect to the Ausgrid Emergency Line.

## G2 Audit Process - Concrete Private Poles

### G2.1 General Requirements

The audit process for concrete private poles shall be performed according to the following Clauses. Below ground excavation and assessment is not required.

Any non-standard type of concrete private pole shall only be audited above ground. Non-standard types include poles / posts that are not a commercially available engineered product.

### G2.2 Above Ground Assessment Procedure

The above ground assessment procedure for concrete private poles shall be performed as follows:

1) Implement safety precautions according to Annexure A.
2) Perform a visual assessment of the full length of the pole (without climbing) for the following defects:
    - Depth in ground - examine the pole for evidence of pole movement at ground level and evidence on the pole of an old 'ground level' mark, or 'high tide' mark to indicate that the pole is no longer as deep in ground as originally installed. Also examine the pole for exposed conduits or cable entry holes as an indicator of ground level changes.
    - Vertical alignment (lean) - where a pole or column is leaning, the angle of the lean shall be accurately measured using a digital level (1 metre minimum length). Where a pole is identified as leaning excessively (ie, more than 10 degrees from the vertical position) look

for causes of the leaning – causes may include subsidence, erosion or alterations to the natural ground level.

- Pole reinforcements or non-standard construction – record (photograph) poles which are reinforced or a non-standard construction (for example, modified / non-commercial design).
- Spalling and/or cracking of the concrete – examine the pole for spalling or cracking and whether this has caused the reinforcing bars to become fully exposed and full depth sections of the concrete wall to fall out (refer to Figure 9).
- Corrosion – examine the pole for evidence of corrosion including rust stains or bubbling of the concrete surface.
- Rusting, loose or damaged fittings, etc – examine the pole for loose or damaged attachments, such as earthing connections. Loose earth connections shall not be tightened and shall be immediately reported to the Ausgrid Emergency Line.
- Damage - examine the pole for damage including vehicle damage (checks in the concrete or signs of impact including cracks) and fire damage.

## G2.3 Finalising the Audit Process

After the above ground assessment procedure has been completed, the audit process for concrete private poles shall be finalised as follows:

1) Record (photograph) the following external defects:
   - Pole lean, pole dents / bending or evidence of pole movement at groundline.
   - Corrosion, spalling or cracking of the concrete.
   - Fire and third-party damage.
   - Missing or damaged access covers.
   - Obstructions preventing effective auditing of the pole.
2) Compare the audits results against the defect notice criteria for concrete private poles in Clause 7.3.2 to assess whether the pole remains serviceable or corrective action is required.
3) Poles where concrete spalling is in the early stages of degradation and reinforcing bars are not fully exposed shall be reported to the Ausgrid Emergency Line (including approximate area or percentage of the pole affected) according to the following guidelines so the poles can be professionally assessed for remedial treatment;
   - Significant cracking in concrete.
   - Cracking with rust stains from the cracks (refer to Figure 9 (a)).
   - Concrete bulging but not displaced.
4) Record audit results and create defect records in the Ausgrid Asset Management System. This shall be performed using relevant forms / letters, photographs or direct entry into a MAM device (refer to Clause 2.2).
5) Notify the customer of identified defects or audit obstructions using relevant forms or letters (refer to Clause 2.2). Record (photograph) notifications provided to customers.

Notify the customer (where readily contactable) and the Ausgrid Emergency Line if:

- The pole appears to be in imminent danger of collapse, or
- Attachments such as earthing connections are loose or damaged, or

## G3 Common Concrete Pole Defects

Figure 9 shows concrete degradation defects commonly found on concrete private poles.

Figure 9 (a) shows cracking of the concrete surface with rust stains starting to develop however spalling has not yet occurred and steel reinforcement bars are not exposed. Cracking may be vertical (as shown in Figure 9 (a)) or horizontal. Horizontal cracking may be caused by loading

applied by overhead mains or damage by vehicle contact. These defects shall be reported to the customer by issuing a maintenance letter.

Figure 9 (b) shows spalling which has progressed to the point where the steel reinforcement bars are exposed and have corroded. The concrete spalling has not yet penetrated the full depth or cross-section of the concrete pole. These defects shall be reported to the customer by issuing a Defect notice.

Figure 9 (c) shows spalling which has progressed to the point where spalling has penetrated the full depth or cross-section of the concrete pole, and the reinforcing bars are fully exposed. These defects shall be reported to the customer by issuing a Defect notice.

**(a) Maintenance letter**

**(b) Defect notice**

**(c) Defect notice**

**Figure 9 – Common Concrete Private Pole Defects**

# Annexure H: Fibre Composite Private Poles - Audit Process

## H1 General

The audit process for fibre composite private poles consists of:

- Implementation of appropriate safety precautions according to Annexure A.
- Above groundline visual assessment according to Clause H2.2.
- Audit finalisation according to Clause H2.3.

Fibre composite private poles supporting private mains shall be audited according to the following procedures. When auditing private poles, the focus shall be on identifying defects which could pose a risk to Ausgrid's network, defects that are likely to result in a bush fire, defects that may cause harm to human life or property and signs of imminent pole failure.

The design of fibre composite poles is such that the pole's bending strength is provided by the glass-fibre reinforcement. There are two types of manufactured fibre composite poles:

- Fibre cement poles, and
- Fibre plastic poles.

Fibre composite poles are thin-walled structures that are relatively lightweight compared to timber or concrete poles. They are highly susceptible to damage from applied excessive wall pressure. Both types of poles may be damaged by mechanical/physical impact, for example, contact by motor vehicle.

There is no natural degradation process known for fibre cement poles at the time this document was published. The natural degradation process for fibre plastic poles is ultraviolet (UV) deterioration over time caused by normal exposure to weather. Fibre plastic poles may also be damaged from exposure to fire.

While normally bonded within the cement or resin matrix, the fibres may become exposed (unbonded) due to deterioration of, or damage to, the pole material. Private Mains Auditors shall avoid contact with fibre composite poles with exposed fibres.

Private Mains Auditors shall not attempt to repair identified private pole defects. Private Mains Auditors shall report any immediately dangerous defects to the customer (where readily contactable) and Ausgrid's Emergency Line (13 13 88).

Private pole audits may proceed when a pole has been identified with immediately dangerous defects if the audit can be performed without risk to the Private Mains Auditor or others in the vicinity of the pole and only after reporting the immediately dangerous defect to the Ausgrid Emergency Line.

## H2 Audit Process – Fibre Composite Private Poles

### H2.1 General Requirements

The audit process for fibre composite poles shall be performed according to the following Clauses. Below ground excavation and assessment is not required.

Any non-standard type of fibre composite private pole or post shall only be audited above ground. Non-standard types include poles / posts that are not a commercially available engineered product.

### H2.2 Above Ground Assessment Procedure

The above ground assessment procedure for fibre composite poles shall be performed as follows:

1) Implement safety precautions according to Annexure A.
2) Perform a visual assessment of the full length of the pole (without climbing) for the following defects:
    - Depth in ground - examine the pole for evidence of pole movement at ground level and evidence on the pole of an old 'ground level' mark, or 'high tide' mark to indicate that the pole is no longer as deep in ground as originally installed. Also examine the pole for exposed conduits or cable entry holes as an indicator of ground level changes.

- Vertical alignment (lean) - where a pole is leaning, the angle of the lean must be accurately measured using a digital level (1 metre minimum length). Where a pole is identified as leaning excessively (ie, more than 10 degrees from the vertical position) look for causes of the leaning – causes may include subsidence, erosion or alterations to the natural ground level.
- Missing cement or resin matrix (including assessment of the depth of penetration into the pole surface) – if defects are identified, determine whether the defects are in the neutral axis or critical axis.
- Loose, cracked or weakened cement or resin matrix – if defects are identified, determine whether the defects are in the neutral or critical axis.
- Ultra-violet (UV) degradation of the resin matrix and fading of the pole surface.
- Fibre reinforcing which is unbound / exposed from the cement or resin matrix.
- Rusting, loose or damaged fittings, etc - look for loose or damaged attachments, such as earthing connections. Loose earth connections shall not be tightened and shall be immediately reported to the nominated Ausgrid representative.
- Damage - examine the pole for damage including stress or vehicle damage (checks in the concrete, cracks or deformation) and fire damage.

### H2.3 Finalising the Audit Process

After the above ground assessment procedure has been completed, the audit process for fibre composite private poles shall be finalised as follows:

1) Record (photograph) the following external defects:
   - Pole lean, pole dents / bending or evidence of pole movement at groundline.
   - Damaged or degraded concrete or resin matrix (including king bolt pull-through).
   - Fire and third-party damage, including painted poles.
   - Unbound or exposed fibre reinforcing.
   - Obstructions preventing effective auditing of the pole.
2) Compare the above ground inspection results against the defect notice criteria for fibre composite poles in Clause 8.4 to assess whether the pole remains serviceable or corrective action is required.
3) Record pole audit results and create defect records in the Ausgrid Asset Management System (refer to Clause 2.2). This shall be performed using relevant forms / letters, photographs or direct entry into a MAM device.
4) Notify the customer of identified defects or audit obstructions using relevant forms or letters (refer to Clause 2.2). Record (photograph) notifications provided to customers.

Notify the customer (where readily contactable) and the Ausgrid Emergency Line immediately if:

- The pole appears to be in danger of collapse, or
- Deformations or folds are evident at any point during the inspection, or
- Significant damage becomes evident at any point during the inspection, or
- Degradation of the cement or resin matrix which may result in imminent failure of the pole.

# Annexure I: Excavation and Restoration

## I1 Excavating around poles

### I1.1 General

When excavation is required around a pole to perform below ground assessments according to this Network Standard the excavation shall only be performed when the site can be reinstated to an 'almost as found' condition (refer to Clause 1.6). Excavation may be 'partial excavation' to a shallow depth (typically done in a neutral axis on one side of a pole) to enable an initial below ground assessment of the pole condition, and 'full excavation' (where required) to perform a full assessment of the below ground condition of the pole.

Any excavation around a pole affects the stability of the pole to some extent. Electrical assets, including cables and earthing connections may also be attached to the pole, or in the ground near the pole, posing safety risks to the Private Mains Auditor. Due to these factors, extreme caution shall be exercised when excavating around a pole, particularly those poles that have cables and other items attached to them.

Obstructions that are close to or hard up against the below ground portion of the pole such as cables, cable covers, pipes and concrete may assist moisture retention that causes pole degradation faster than other areas of the pole (particularly timber poles) and may prevent assessment of the full below ground circumference of the pole. All soil shall be removed from around these obstructions to fully expose the asset and the adjacent pole material to improve the effectiveness of the below ground assessment. Concrete or continuous paving / concrete (for example, decorative concrete driveways) shall not be cut or damaged by excavation. Cold mix bitumen shall not be removed.

Excavation shall be performed according to the following Clauses and only when the above ground assessment of the pole indicates that it is safe to proceed with excavation.

For immediately dangerous situations, Private Mains Auditors shall safeguard themselves and others against unsafe exposure to these hazards until the hazard has been removed or Ausgrid staff attend to remove the hazard.

### I1.2 Pole Depth and Stability

When poles are installed, they are 'sunk' to a depth sufficient to provide suitable stability against the effects of wind and pole-top loading due to overhead mains or other apparatus. The stability of a pole can be severely affected by reductions in its depth in the ground as shown in Figure 10.

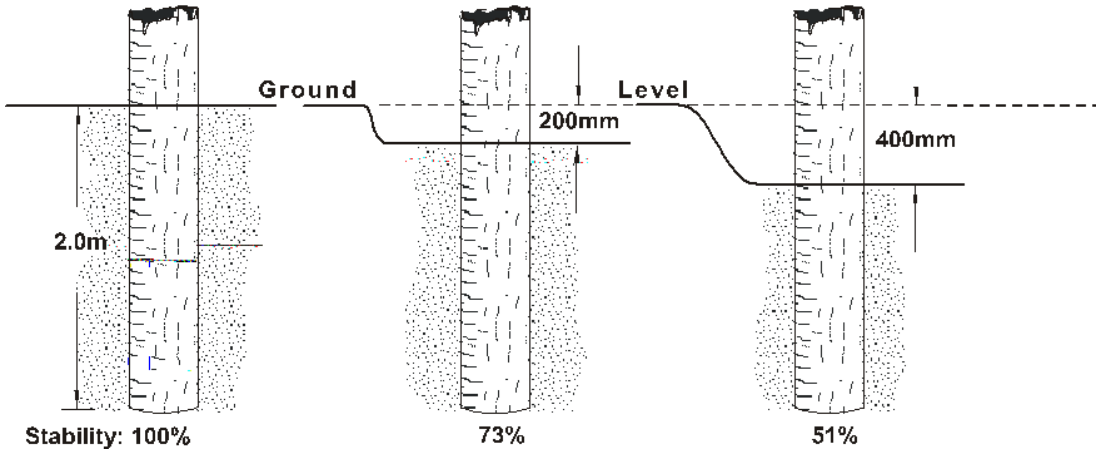



**Figure 10 – Effect of Depth in Ground on Pole Stability**

Reduced depth in ground compared to when the pole was originally installed can be caused by road re-alignment work, landscaping of the footpath, trenching within 1.5m of the pole, natural subsidence or erosion of the ground, and other causes. The position of the pole disc is a good indicator of pole sinking depth (refer to NS145 Annexure B for examples of detailed pole disc height on poles owned by Ausgrid. Excavation around a pole to perform below ground assessments also temporarily reduces pole stability and shall be restricted to the depths stated in

the relevant Clauses within this Network Standard. Reduced depth in the ground will typically result in the pole leaning and may eventually result in failure of the pole.

Private Mains Auditors shall assess pole depth in ground, pole lean (vertical alignment) and pole stability (including pole movement) prior to excavation and shall stop further excavation if there is any pole movement or evidence of pole instability while it is being excavated. Poles that are leaning 10 degrees or more, or where the depth in ground has been reduced by 250mm or more below the original ground line, shall not be excavated. Immediately dangerous pole situations shall be reported to the customer (where reasonably contactable) and the Ausgrid Emergency Line (13 18 18).

### I1.3 Excavating Around Electrical Assets

Where a cable enters the ground from a pole (for example, an underground to overhead connection, known as a UGOH), it shall not be assumed that the cable enters vertically from a depth below 250mm or perpendicular to the pole from an adjacent asset, or that it is clear of the remaining assessment area around the pole. These cables can be easily damaged by digging implements and this may cause a hazardous situation.

UGOH cables may coil around the pole below ground and may be laid adjacent to poles that do not have these above ground cable installations (UGOHs) attached. Where it is suspected or confirmed that such cables exist near the pole that is being worked on, hand excavation shall be performed with care. If there is a high risk of cable damage, the pole assessment shall not proceed. The nominated representative shall be contacted to determine the most appropriate course of action before work can proceed.

Excavation of steel private poles shall be performed in a similar manner to UGOH cables. Cables and conduits may enter these assets from any side below ground, or from underneath the poles.

When excavating or cleaning a pole around electrical assets Private Main Auditors shall use non-conductive tools or tools with non-conductive handles or wear insulating gloves when working around electrical assets attached to a pole or electrical assets exposed below ground level.

Poles shall be thoroughly checked for defects immediately adjacent to attached cables as it is more likely that defects will exist in these areas.

As underground LV cables may be subject to breakdown of insulation, the precautions detailed in the Ausgrid's Electrical Safety Rules shall be observed, including testing to confirm the absence of hazardous voltages.

Where a cable is observed as having damaged insulation (e.g. where the outer covering is partially removed exposing the underlying material) it shall be immediately reported to customer (where reasonably contactable) and the Ausgrid Emergency Line. Private Mains Auditors shall safeguard themselves and others against unsafe exposure to these hazards until the hazard has been removed or Ausgrid staff attend to remove the hazard.

### I1.4 Cable Protection Covers

Electrical assets installed underground may be covered with a cable protection cover. Private Mains Auditors shall not remove cable protection covers found in the excavation area surrounding a pole to enable the pole to be fully exposed for assessment.


**Figure 11 – Cable Protection Covers**

### I1.5 Excavating Paved / Bitumen Surfaces

Direct buried timber and steel private poles shall be accessible for below ground assessment. Where they are found in locations where they cannot be correctly assessed (an example is shown in Figure 12), the situation shall be reported to the customer (where reasonably contactable) and the customer notified with an 'Unable to inspect' letter (excluding steel poles originally installed according to AS/NZS 3000:2018).

**Figure 12 – Inaccessible Pole**

Paved surfaces around direct buried poles shall be removed to allow below ground assessment, however concrete / continuous paving or cold mix bitumen shall not be cut or damaged.

## I2 Restoring Excavations

### I2.1 General

When restoring (reinstating) the excavated area around private poles following assessment it is essential that the methods adopted achieve a clean and tidy 'almost as found' condition so as not to attract complaints. The excavation site shall be recorded following reinstatement (photographed 'as left') in case of complaints regarding reinstatement of the site.

The excavated material (excluding paper or rubbish) shall be used as backfill.

Backfill the excavation in layers of 100mm, ramming each layer to firmly compact the soil until fully reinstated. The backfill material shall be firmly tamped with a suitable tool so that it finishes:

- Slightly below groundline for unpaved areas.
- Approximately 50mm below the level of the pavement for paved areas.

Where cable covers are found when excavating they shall be reinstalled when restoring the excavation.

### I2.2 Restoring Unpaved areas

Where possible, the top surface shall be tamped down so that it is sloped away from the pole to groundline and the vegetation originally covering the backfill placed over the backfill material in an 'almost as found' condition.

Under no circumstances shall divots and potholes be created that may present a hazard.

### I2.3 Restoring Paved Areas

All excess backfill material shall be cleaned from the surface of the pole and from the edge of the surrounding paving. Paving originally covering the backfill shall be placed over the backfill material in an 'almost as found' condition. The work area shall be cleaned with a broom and all surplus material removed from the site.