

Company Directive

STANDARD TECHNIQUE : OH4M/1

Anti-Climbing Devices for HV Lines Up to and Including 132 kV

This Standard Technique, which is based upon ENA TS 43-90, describes anti-climbing measures applicable to wood poles and lattice steel towers supporting high voltage overhead lines up to 132kV.

Author: Mike Chapman

Implementation Date: September 2020

Approved by



Carl Ketley-Lowe
Engineering Policy Manager

Date: 2nd September 2020

Target Staff Group	Applicable Staff include, Network Service Teams e.g. DMs, TMs, Planners, Technicians, OH teams and Inspectors and Helicopter Unit who are involved with Planning, Construction, Maintenance & Inspections on 11kV to 132kV OH Line and OH Line Trainers.
Impact of Change	Amber - The changes have an impact on current working practices that are safety critical, these changes bring this document into line with national guidance ENA TS 43-90. Communication at next team meeting and within one month of the issue date of this document.
Planned Assurance checks	OH Lines Teams accessing a structure shall on completion of the work ensure the structure meets the requirements of this ST. On completion of project related work the technician responsible for controlling the job shall ensure that ACDs have been installed in accordance with this ST. Inspectors shall when inspecting an OH structure ensure it conforms to this ST; and where it does not they shall assign the appropriate defect.

All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED

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IMPLEMENTATION PLAN

Introduction

This Standard Technique describes anti-climbing measures applicable to wood poles and lattice steel towers supporting high voltage overhead lines up to 132kV.

Main Changes

Following an investigation which identified that ACDs were not, in some cases, being fitted to poles where cable cover guards were installed this ST has been reviewed and the ambiguities within it in relation to what is considered to be broken pole surface, which is believed to have resulted in staff uncertainty, have been remedied.

To address this ambiguity WPD is adopting the principle requirements of the national guidance outlined in ENA TS 43-90 Anti Climbing Measures. Which requires that where the surface of a pole is broken e.g. attachment on a HV pole of a cable or single earth wire cover guard within 3m of the datum line then the pole shall be classed as climbable and an ACD installed.

In addition to the above change whilst the general requirements of the document have not changed the opportunity has been taken to update the ST so that it is more aligned to the national standard ENA TS 43-90 Anti Climbing Measures and to help readers further clarity is provided in Appendix 'A' with more example drawings and in Appendix 'B' an application matrix.

Impact of Changes

All poles covered by this ST shall, where single or multiple cable and / or earth wire cover guard is fitted to the pole within 3m of the Datum Line, be classified as a broken pole surface, classed as climbable and therefore requiring the attachment of an ACD.

Note: This requirement is not retrospective - i.e. programmes of work will not be instigated to identify and rectify locations which do not meet these requirements. They will however be identified during normal routine inspections.

Implementation Actions

Team Managers shall brief all relevant staff of the requirements of this document by 9th October 2020.

Inspectors shall, during routine inspections, identify structures that do not meet the requirements of this ST, assign the relevant defect code carry out the associated RA so that the defect is rectified within agreed timescales.

Team Managers shall arrange for the rectification of defects within timescales set in Crown.

OH Line Teams accessing a structure shall on completion of the work ensure the structure meets the requirements of this ST.

Technicians responsible for running projects shall ensure on completion of the construction stage that all structures meet the requirements of this ST.

All pole inspection jobs that have been created previous to the release of this document will need to be recreated to ensure the new questions relating to ACD's are available within the iPad app.

OH Line trainers to amend any training material affected by the changes to this document.

Implementation Timetable

The requirements of this ST come into force following being briefed as detailed within the implementation actions or from the 9th October.

REVISION HISTORY

Document Revision & Review Table		
Date	Comments	Author
September 2020	<ul style="list-style-type: none"> • Following an investigation which identified that ACDs were not in some cases being fitted to poles where cable cover guards were installed this ST has been reviewed and the ambiguities within it in relation to what is considered as a broken pole surface, which is believed to have resulted in staff uncertainty, have been remedied. • To address this ambiguity WPD is adopting the principle requirements of the national guidance outlined in ENA TS 43-90 Anti Climbing Measures. Which requires that where the surface of a pole is broken e.g. attachment of a cable or earth wire cover guard within 3m of the datum line then the pole shall be classed as climbable and an ACD installed. • In addition to the above change whilst the general requirements of the document have not changed the opportunity has been taken to update the ST so that it is more aligned to the national standard ENA TS 43-90 Anti Climbing Measures and to help readers further clarity is provided in Appendix 'A' with more example drawings and in Appendix 'B' an application matrix. 	Mike Chapman

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1.0 FOREWORD

This Standard Technique is designed to address the requirements of the Electricity Safety, Quality and Continuity Regulations with regards to the prevention of unauthorised climbing of supports such as wood poles, towers etc. carrying HV conductors.

The changes incorporated herein provide further reference to The Electricity Safety, Quality and Continuity Regulations (ESQCR) and clarification and expansion in a number of areas.

2.0 SCOPE

This Standard Technique, which is based upon ENA TS 43-90, describes anti-climbing measures applicable to wood poles and lattice steel towers supporting high voltage overhead lines up to 132kV.

This specification examines the need for the installation of anti-climbing devices in certain situations and should be read in conjunction the following Standard Techniques:-

- ST: OH3A and ST:OH5A - Inspection of Overhead Lines
- ST: OH3F - Overhead Line Records of Risks to Public and Risk Reduction Actions
- ST: OH4N - Notices, Signs & Labels for Overhead Lines

The document should be read with the understanding that it is not possible to defeat a determined effort to gain access to overhead lines. The purpose is to provide guidance on the appropriate concepts that should be employed to deter and adequately warn potential trespassers.

Where there are differences between this document and ENA TS 43-90 then this document shall take precedence.

3.0 DEFINITIONS

Datum Line

The level at which a person can stand in the proximity of a support. This may be the level of the ground or of a useable surface of an obstacle (see Figures 1 and 2).

Note: The datum line moves upwards when anything that will allow a person to stand on it exists in proximity to the support. On hillsides or where a change in ground level otherwise occurs, the datum line for portal structures or towers shall be that at the point of highest ground level.

Obstacle

Any man-made or natural feature, protruding above ground level, which cannot be removed and which could aid climbing of a support. This includes items attached to the pole that form a part of the overhead line (e.g. an auto-recloser control box).

Note: ‘Cannot be removed’ can mean either that it is physically impractical to remove or that removal is prevented by legal constraints.

Semi-permanent obstacles such as skips or material stacks shall be considered when assessing the datum line if they are regularly in the proximity of a support.

Portal structure

A support constructed of two or more poles where it is possible for a person to walk between poles as though through a portal.

Proximity

Within 1.5 m.

4.0 ASSESSMENT OF SITES

4.1 General

Although it is possible to assess categories of anti-climbing measures for different support types and generic situations, it is necessary to consider in what manner a particular support and situation may differ from those norms. Such assessment will take account of the

- land use,
- proximity to obstacles and
- type of structure.

4.2 Land Use

WPD has two classifications of land risk use in terms of anti—climbing devices “Normal” and “Higher than Normal” and although it is impossible to give a complete listing of “Higher than Normal” risk areas the following comprises of examples of areas which may require additional consideration:-

- i) Schools
- ii) Children’s play areas (authorised and unauthorised)
- iii) Areas of high vandalism
- iv) Caravan, Camping and Chalet sites
- v) Boating areas including boat storage parks, fishing areas
- vi) Recreational site, parks and leisure areas
- vii) Walls or Structures from which access to the support could be obtained

- viii) Permanent show grounds for agricultural, festival or similar purposes
- ix) Designated heavy goods vehicle lorry parks
- x) Designated take-off and landing areas for activities
- xi) Traveler encampments
- xii) Industrial estates, construction/demolition sites, agricultural sites

When carrying out this assessment it will be necessary to take into account any foreseeable situations that could change the way in which the land would be used.

4.3 Proximity to Obstacles

It is necessary to consider the proximity of obstacles to supports. Where an obstacle is in proximity of the support and may be used to aid climbing then the datum level shall be adjusted to take account of the obstacle.

The following is a non- exhaustive list of obstacles that may increase the probability of unauthorised climbing.

- i) Trees;
- ii) Fencing;
- iii) Buildings or other structures (particularly if they themselves are easily climbable):
 - walls
 - garages
 - garden sheds
 - bridges
- iv) Other plant structures such as:
 - cable termination supports
 - telecommunication poles

4.4 Type of Structure

- 4.4.1 As a general principle, an unbroken surface of 3 m above the datum level is considered unclimbable. This is an effective anti-climbing measure in all circumstances.

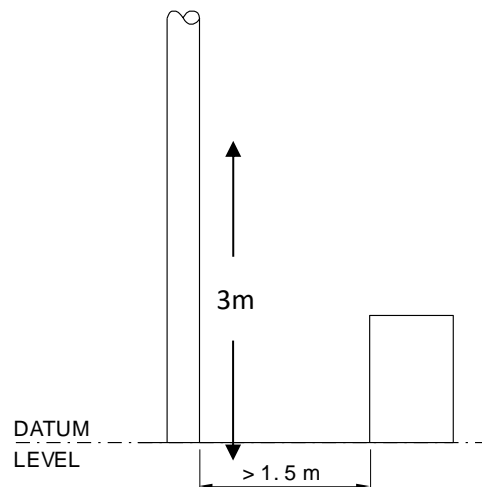


Figure 1: Datum level at ground with obstacle more than 1.5m from pole (If 3m of unbroken pole above Datum Level - Category P1)

Where an obstacle is within a distance of 1.5m of the structure then this is to be taken as the point of access (datum level) as shown in Fig 2.

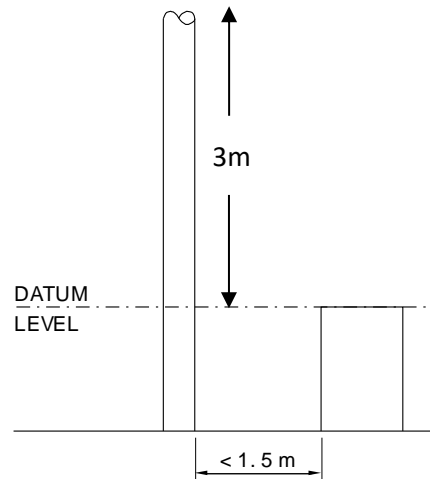


Figure 2: Datum level at height of obstacle where obstacle is within 1.5m of the pole
(If 3m of unbroken pole above Datum Level - Category P1)

4.4.2 Where a support has apparatus less than 3 m above the datum this may increase the probability of the support being climbed and therefore the structure shall be considered climbable. Examples are

1. A pole which has a single cover guard covering an earth wire may increase the probability of the support being climbed and shall therefore be considered climbable and classed as category P2 or P3.
2. A portal, "H", Rutter pole structure having centres having a spacing of less than 1.5m may increase the probability of the support being climbed and shall therefore be considered climbable and classed category P2 or P3.
3. Lattice towers are considered to be climbable.

4.5 **Combinations**

It is reasonable to suppose that the combination of any of the above may further increase the probability of the support being climbed. The combined effect should be considered in the assessment.

5.0 ANTI-CLIMBING DEVICE

5.1 General

Anti-climbing device requirements are selected based on land use risk, nearness of obstacles and support or stay type. Examples of the minimum requirements can be seen in Appendix A and further guidance is contained in Appendix B Tables.

Anti-climbing devices shall be designed to prevent, so far as is reasonably practicable, any unauthorised person from reaching a position at which the overhead line conductor would be a source of danger.

All climbable structures shall have an anti-climbing guard fitted with a minimum category P2 or T1 device.

The type of anti-climbing guard required should be chosen from the list below which will be dependent upon on the assessment carried out in Section 4.

5.1.1 Categories of Poles

Category P1

An unbroken surface for a height of 3 m above the datum level on a single pole or a portal structure with centres greater than 1.5 m separation.

Category P2

An anti-climbing device consisting of barbed wire wrapped directly onto the support.

Barbed wire shall not be applied within 2.15m of the datum line. Where it is to be applied to a pole it shall wrapped with 12 turns covering a minimum distance of 600mm and secured with sufficient staples to ensure it cannot easily be pulled off.

Category P3

An anti-climbing device consisting of an outrigger bracket supporting barbed wire or a prefabricated close wrapped outrigger or an equivalent device.

Where an outrigger bracket to drawing ENA TS 439516 is to be used it shall be attached to the wood pole using 10mm x 76mm coach bolts. Brackets for concrete poles shall be secured using M16 nuts and bolts. Barbed wire should be fitted taut in the bracket slots and made off by tightly winding it back on itself.

5.1.2 Categories for lattice towers and other climbable structures

Category T1

An anti-climbing device consisting of an outrigger bracket supporting barbed wire or a prefabricated close wrapped outrigger or an equivalent device. This shall be either a wrap-around device fitted around the whole tower body (see Figure 19) or fitted to individual legs (see Figure 20) depending on the tower size.

Category T2

An anti-climbing device as Category T2 above supplemented by barbed wire wrapped at all support angles and end frames (see Figure 21).

Category T3

An anti-climbing device consisting of two levels of outrigger bracket supporting barbed wire or prefabricated close wrapped outrigger or equivalent device.

5.2 Components

5.2.1 Barbed wire

Conventional constructed barbed wire fabricated to BS EN 10223 and coated to BS EN 10244-2 having a maximum space between barbs of 50mm and a minimum barb length of 12.5mm when measured from centre of wire.

5.2.2 Wire staples

Wire staples shall comply with BS 1494-1 and shall be galvanized to BS EN 10244-2.

Wire staples shall be of such a size as to ensure that the barbed wire is held firmly in place.

5.2.3 Outrigger brackets

Outrigger brackets shall be designed to fit securely to a pole or lattice tower so as to provide impediment to trespassers.

5.2.3.1 Poles and small lattice towers

Outrigger brackets for poles and small lattice towers shall provide slots for at least three parallel strands. The spacing between adjacent strands shall not exceed 150 mm.

5.2.3.2 Towers

Outrigger brackets for all other towers shall provide slots for at least five parallel strands on the outside face of the tower.

The brackets shall provide slots for at least three parallel strands on the inside of the tower.

Note: Additional strands may be required to meet the requirements below.

The spacing between adjacent strands or between strands and horizontal tower members shall not exceed 150 mm.

Outrigger brackets shall be capable of manual fitting without the need to drill, modify or damage the tower steelwork or protective coatings.

5.2.3.3 **Stranding outrigger brackets**

Once installed, barbed wire shall be fitted to the outrigger brackets, fitted in the appropriate slots and wrapped around the outrigger at each slot position.

Spacers shall be fitted where any run of barbed wire exceeds 2.0 m as shown in Figures 19 and 20. Spacers shall be positioned at intervals no greater than 1.5 m.

Note: Spacers are not normally needed for poles or small lattice towers.

The barbed wire shall be taut and the make-off end shall be tightly wound back on itself and separately tied.

Note: The tension in the barbed wire is correct if, when any necessary spacers are fitted, the gap between two adjacent strands is approximately 25 mm when pulled together by hand.

5.2.4 **Prefabricated anti-climbing devices**

Prefabricated anti-climbing guards shall be designed to fit securely to a support so as to provide impediment to trespassers.

Prefabricated anti-climbing guards shall offer the same degree of protection as fully stranded outrigger brackets as described above.

5.2.5 **Gates and end frames**

Note: Gates & frames shall normally be required on all towers except small lattice towers.

Gates and end frames shall be designed to fit securely to a tower so as to provide impediment to trespassers.

There shall be no unprotected space greater than 230 mm within the gate or end frame.

Once installed, gates and end frames shall be wrapped with barbed wire as shown in Figures 19 and 20.

Gates shall open upwards and shall be stable in the open position and not be liable to inadvertent closing.

Gates shall be capable of being secured and shall be secured in accordance with ST: OH3C with an approved device.

5.3 **Application of Anti-Climbing Devices to Poles**

Any anti-climbing device must be placed such that it does not constitute a hazard to personnel engaged in authorised activities on overhead line supports.

Appropriate PPE outlined in Section 7 shall be used and barbed wire / ACD should be handled with care and kept under positive control at all times positive.

5.3.1 **Wood Poles**

Category P1 (see Figures 1, 2, 3 and 4)

No anti-climbing device is required.

Category P2 (see Figures 5 to 11)

Wood poles shall be wrapped with twelve turns of barbed wire.

The barbed wire shall be stapled to the pole. The staples shall be such as to make difficult the displacement or removal of the barbed wire from the pole.

The barbed wire shall extend up the pole from a height of at least 2.15 m above the datum level for a distance of at least 0.60 m.

The barbed wire shall be continuous over any cables or earth connections attached to the pole however suitable precautions shall be taken to prevent damage to the cable or earth connection insulation e.g. application or extension of the cover guard

Category P3 (see Figures 12 to 16)

Outrigger brackets or prefabricated anti-climbing devices shall be secured to the pole as shown.

10 mm × 75 mm coach screws shall be used.

There shall be a height of at least 2.75 m above the datum level to the underside of the anti-climbing device.

5.3.2 **Other Poles**

Category P1 (Figures 1, 2, 3 and 4)

No anti-climbing device is required.

Category P2 (see Figures 5 to 11)

Where the barbed wire can be properly secured the basic requirements for wood poles in 5.3.1 shall apply.

Where the barbed wire cannot be properly secured Category P3 shall be used.

Category P3 (see Figures 12 to 16)

Outrigger brackets or prefabricated anti-climbing devices shall be secured to the pole as shown or by use of a suitable clamp fitting.

M16 nuts and bolts of suitable length, in accordance with ENATS 43-96, shall be used. There shall be a height of at least 2.75 m above the datum level to the underside of the anti-climbing device.

5.3.3 **Clause not used**

5.3.4 **Switch operating rods**

Category P1

Not applicable.

Categories P2 and P3 (see Figures 7, 11, 12 and 15)

Operating rods shall be wrapped with barbed wire separately.

Starting at the upper position of the pole mounted ACD, which should be at a minimum height of 2.75 m above the datum level, the barbed wire on the operating rod shall extend upward for a distance of 1.50 m when measured with the operating rod in the 'UP' position.

The barbed wire shall not encroach on the insulating insert and be secured such that it does not slip.

The ACD on the pole must not be in contact with any system earth clipped to the pole. Furthermore the barbed wire on the operating rod shall not be in contact with the ACD on the pole.

Note: there may be existing installations whereby the insulated insert in the operating rod is at a lower level than recommended or the operating rod is covered by a fibreglass housing at the position that an ACD would normally be installed. In these instances it is permissible to place the pole ACD immediately above the insulated insert (operating rod in the 'UP' position) and / or place the ACD around pole and fibreglass cover, it is important in these instances that the ACD is not in contact with any system earth or the operating rod.

5.3.5 **Cross-members**

Category P1

Not applicable.

Categories P2 and P3 (see Figures 9, 10 and 14)

All cross-members providing a potential hand-hold between 2 m and 3 m above the datum level shall be close wrapped with barbed wire.

5.3.6 **Stays**

Anti-climbing device requirements for stays are selected based on land use risk, nearness of obstacles and support or stay configuration. Examples can be seen in Appendix A Fig 17A-C and further guidance is contained in Appendix B Table B2 for minimum requirements.

These categories should be regarded as the minimum requirements – however individual site assessment may indicate that measures above the minimum are actually required.

Where used, the position of the barbed wire shall extend upward from a height of at least 2.15 m above the datum level for a distance of 1.50 m along the stay wire.

Both ends of the barbed wire shall be securely fixed to the stay wire.

The barbed wire shall not encroach on any stay wire insulators.

Single stay wires

In situations where an anti-climbing device is required, all single stay wires shall be securely wrapped with barbed wire.

Multiple stay wires

Multiple stay wires that are within 1.5 m of each other at the datum level and may facilitate climbing shall be securely wrapped with barbed wire. Multiple stay wires that do not facilitate climbing should each be treated as single stay wires.

5.4 Application of Anti-Climbing Devices to Lattice Towers

5.4.1 Small Lattice Towers (typically 33 kV)

Category T1

The anti-climbing devices for small lattice towers shall be in accordance with Figure 18.

Outrigger brackets or prefabricated anti-climbing devices shall be secured to the tower.

M16 nuts and bolts of suitable length, in accordance with ENATS 43-96, shall be used.

There shall be a height of at least 2.75 m above the datum level to the underside of the anti-climbing device.

Category T2

The anti-climbing devices shall consist of the Category T1 anti-climbing devices described above together with additional barbed wire such that the barbed wire is positioned to reduce the size of any unhindered space

Category T3

The anti-climbing devices shall consist of the Category T1 anti-climbing devices described above together with a second layer of barbed wired outrigger brackets or prefabricated anti-climbing devices positioned above the first layer and where most effective.

5.4.2 Lattice towers (other than small lattice towers)

Category T1

The anti-climbing devices for lattice towers shall be in accordance with Figures 19 and 20.

Anti-climbing devices shall be positioned at a height of at least 2.75 m above the datum level.

Anti-climbing devices shall not normally be positioned at a height greater than 3.5 m above the datum level.

Note: There may be special circumstances where the device will be more effective when raised above 3.5 m.

Anti-climbing devices shall, where practicable, be positioned no more than 400 mm above the level of a major horizontal tower member.

Note: This is to help prevent the horizontal tower member being used as a support platform for traversing or interfering with the anti-climbing device.

Gates suitable for safe, controlled access and egress for a linesman shall be fitted on designated climbing legs.

Note: This will normally be tower legs where step-bolts are fitted.

Support members adjacent to any gate shall be capable of supporting a load of 1.5 kN.

Category T2

The anti-climbing devices shall consist of the Category T1 anti-climbing devices described above together with additional close wrapped barbed wire at all support angles and end frames (see Figure 21).

Note: Particular attention should be given to the risk of access by children through gates.

Category T3

The anti-climbing devices shall consist of the Category T2 anti-climbing devices described above together with a second layer of barbed wired outrigger brackets or prefabricated anti-climbing devices, gates and end frames positioned above the first layer and where most effective.

5.4.3 Associated cable termination supports or other structures

Where there are cable termination supports or other structures likely to aid climbing of the tower, special consideration shall be given to the design and where necessary additional anti-climbing devices shall be fitted to the cable termination supports or other structures.

6.0 SAFETY SIGNS

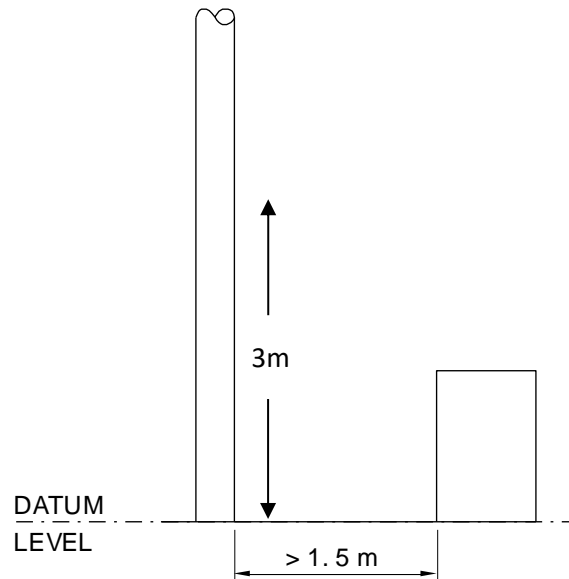
All supports shall be fitted with Safety signs in accordance with ST: OH4N.

7.0 PPE

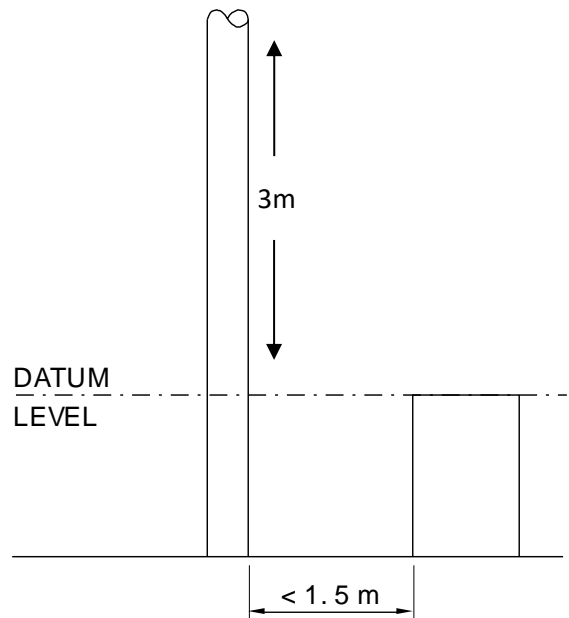
PPE outlined in POL: HS8 shall be used i.e. gloves suitable for barbed wiring and a full face shield whilst installing any barbed wire associated with an ACD. For specific details of appropriate PPE refer to the WPD Approved PPE catalogue.

FIGURES

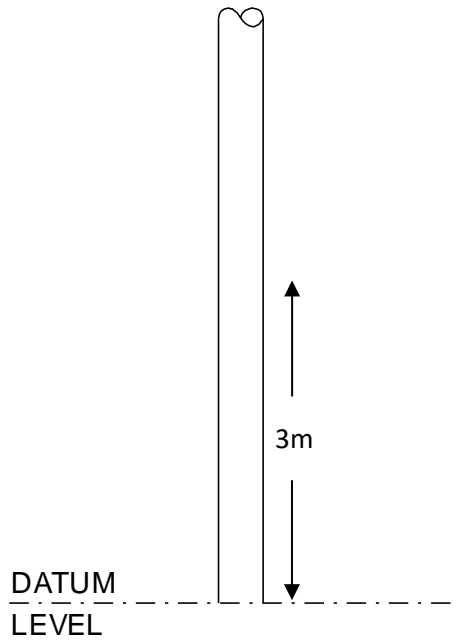
Category P1



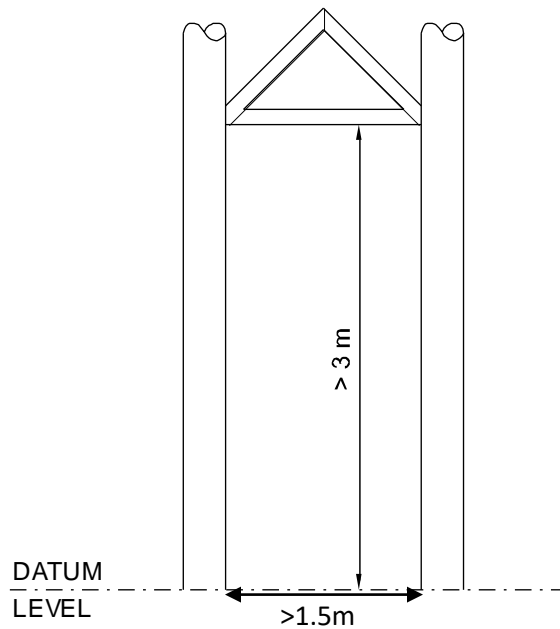
**Figure 1: Datum level at ground with obstacle more than 1.5m from pole
Anti-climbing Measure for Poles Category P1 - Single clean pole
(Inherently unclimbable if 3m of unbroken pole – All Land Uses - no anti-climbing device)**



**Figure 2: Datum level at height of obstacle where obstacle is within 1.5m of the pole
Anti-climbing Measure for Poles Category P1 - Single clean pole
(Inherently unclimbable if 3m of unbroken pole – All Land Uses - no anti-climbing device)**



**Figure 3: Anti-climbing Measure for Poles Category P1 - Single clean pole
(Inherently unclimbable if 3m of unbroken pole – All Land Uses - no anti-climbing device)**



**Figure 4: Anti-climbing Measure for Poles Category P1 - 'H' pole clean poles with centres greater than 1.5 m apart
(Inherently unclimbable if 3m of unbroken pole – All Land Uses - no anti-climbing device)**

Category P2

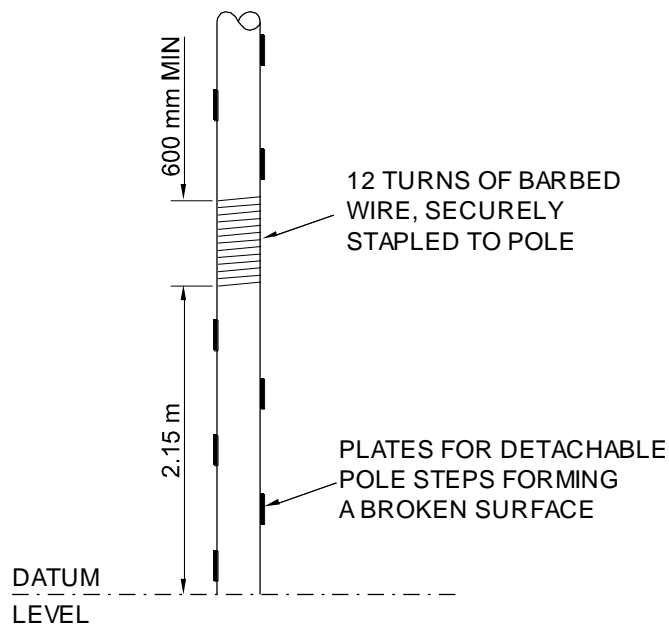


Figure 5: Anti-climbing Measure for Poles Category P2 – Single pole with broken surface e.g. with pole steps attached (Normal Land Use - Climbable)

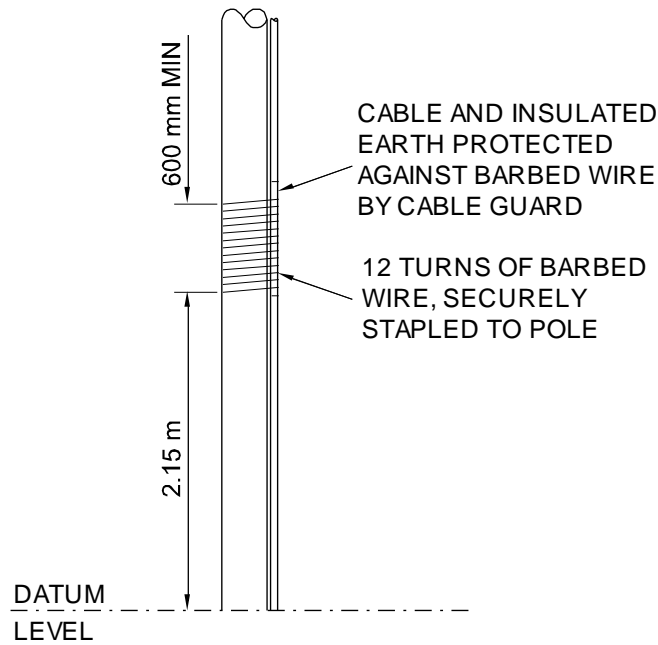
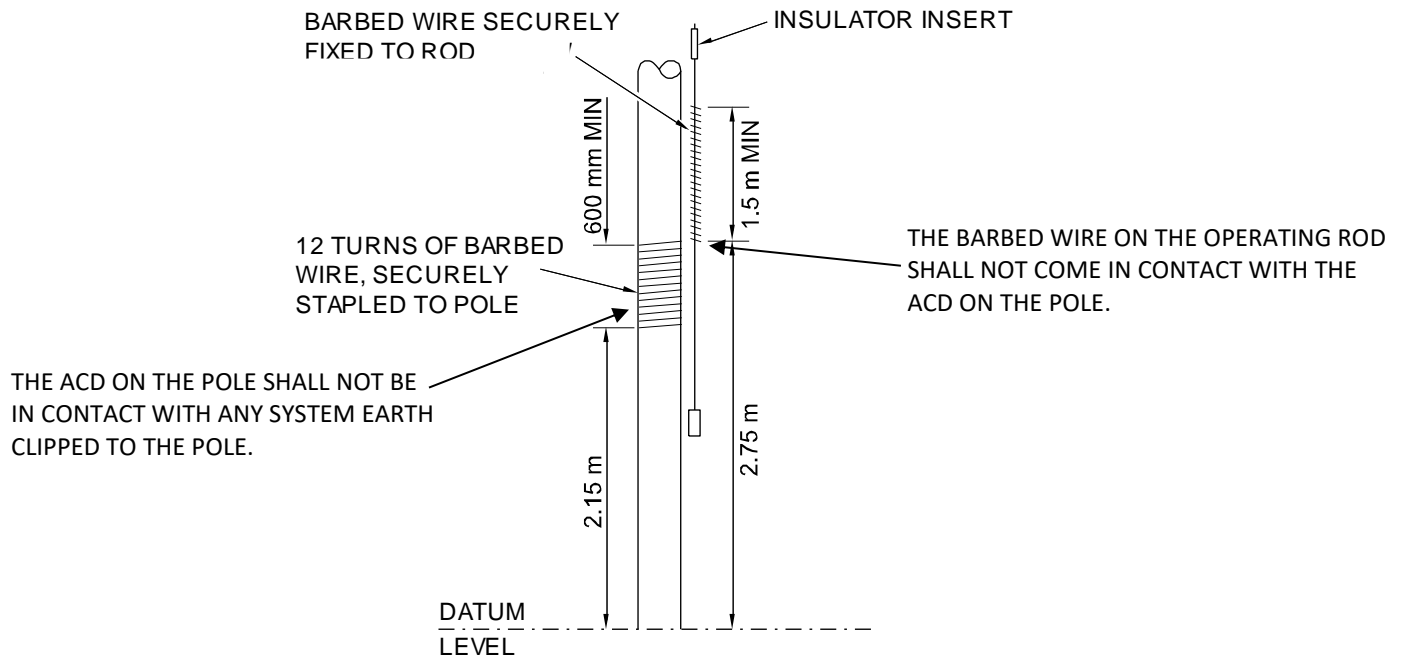
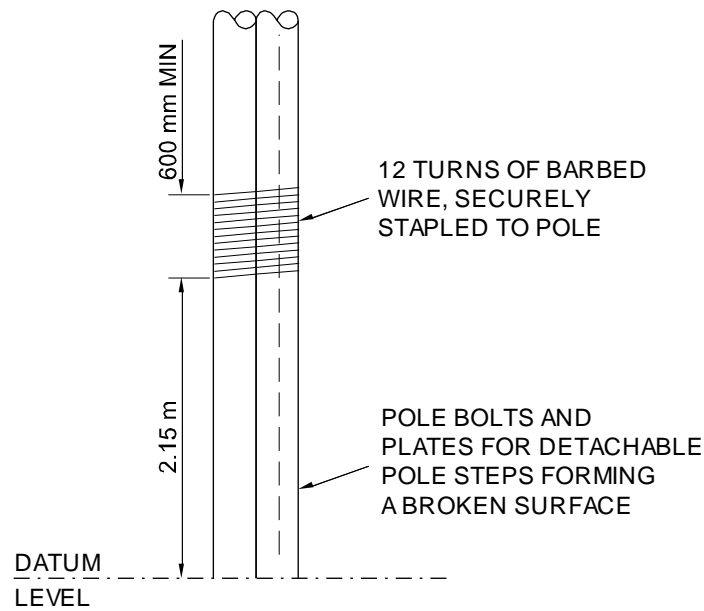


Figure 6: Anti-climbing Measure for Poles Category P2 – Single pole with broken surface e.g. with cable or earthwire attached (Climbable) (Normal Land Use - Climbable)



**Figure 7: Anti-climbing Measure for Poles Category P2 –
Single pole with rod operated switchgear
(Normal Land Use - Climbable)**



**Figure 8: Anti-climbing Measure for Poles Category P2 –
Twin / Rutter pole
(Normal Land Use - Climbable)**

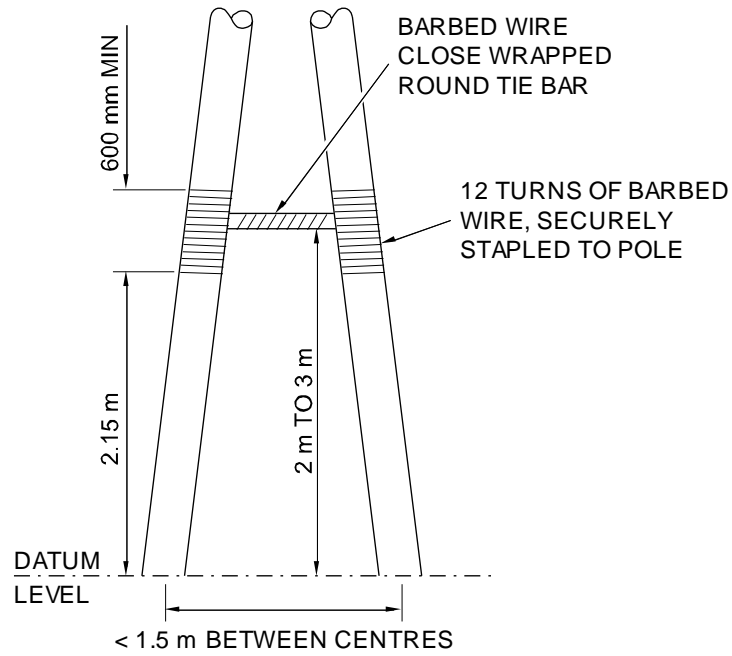


Figure 9: Anti-climbing Measure for Poles Category P2 – ‘A’ pole - Apparatus below 3m from Datum Level (Normal Land Use - Climbable)

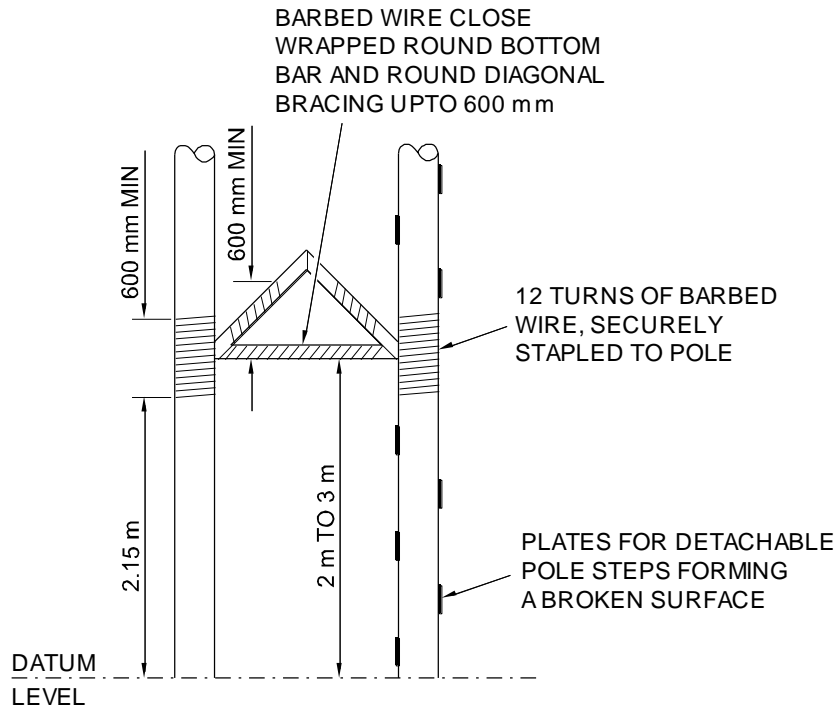


Figure 10: Anti-climbing Measure for Poles Category P2 – ‘H’ pole - Apparatus below 3m from Datum Level (Normal Land Use - Climbable)

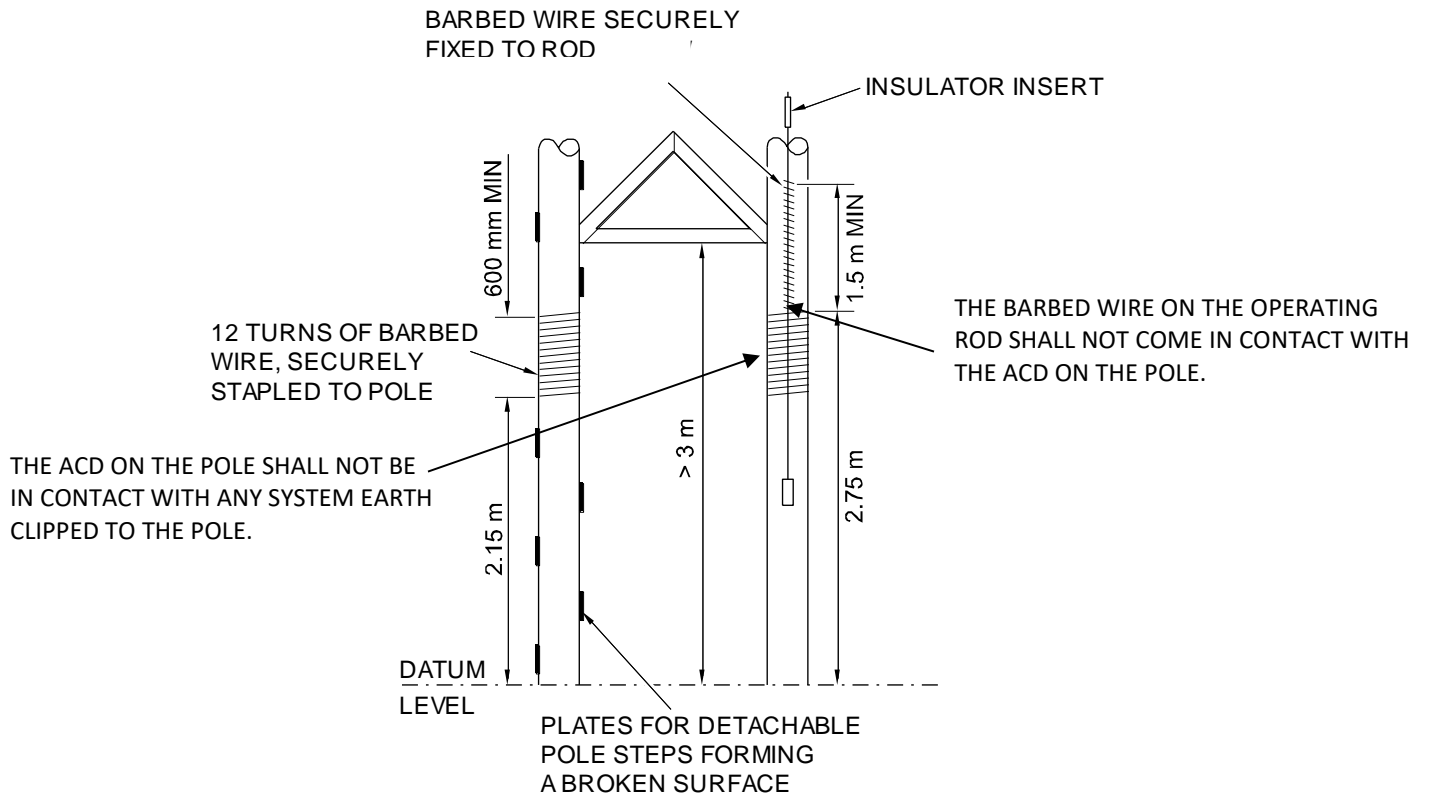
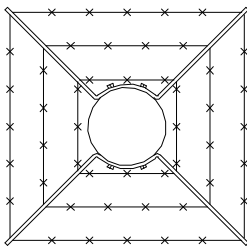
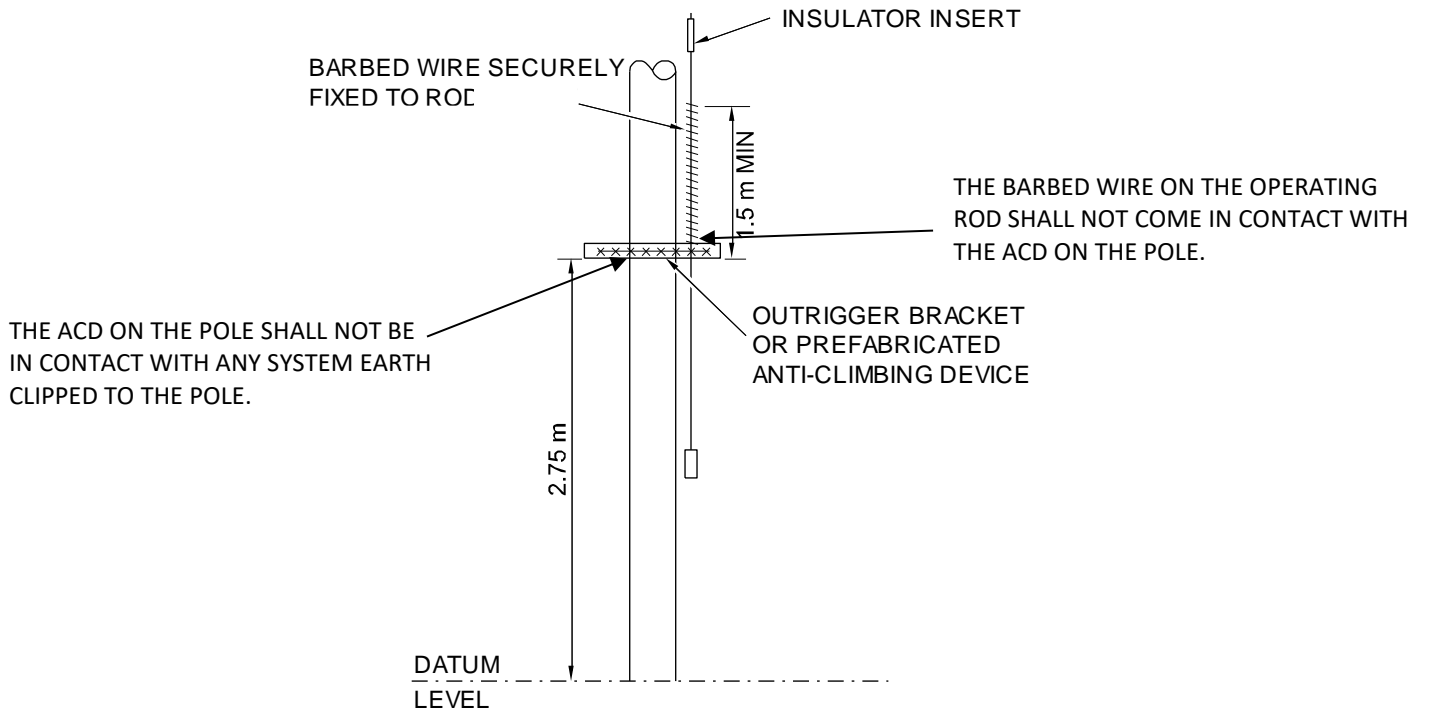
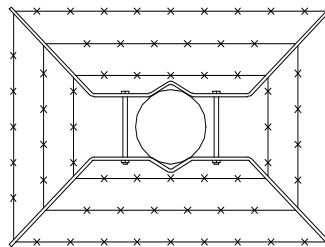


Figure 11: Anti-climbing Measure for Poles Category P2 – ‘H’ pole with rod operated switchgear - Apparatus below 3m from Datum Level (Normal Land Use - Climbable)

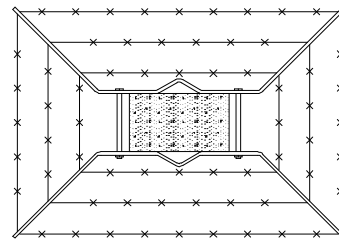
Category P3



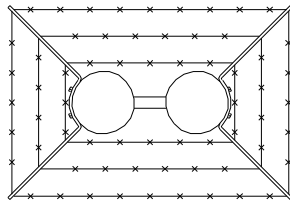
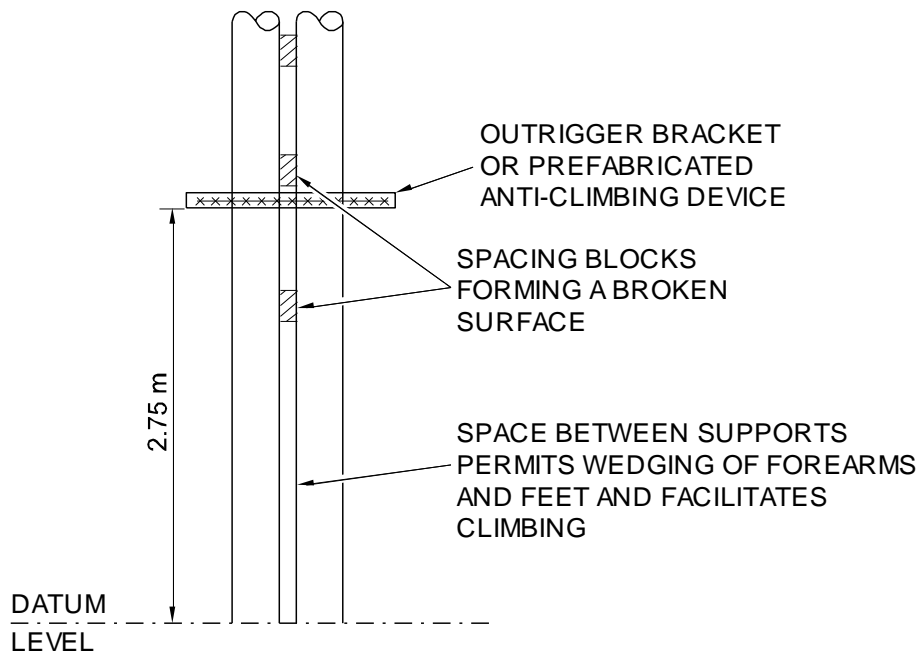
Outrigger arrangement for wood pole using anti-climbing bracket to ENATS 43-95 Drg. No. 439516
E5 Code 35105



Outrigger arrangement for reinforced concrete or tubular pole using anti-climbing bracket to ENATS 43-95 Drg. No. 439517
E5 Code 35852

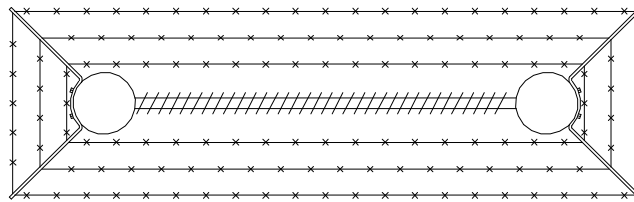
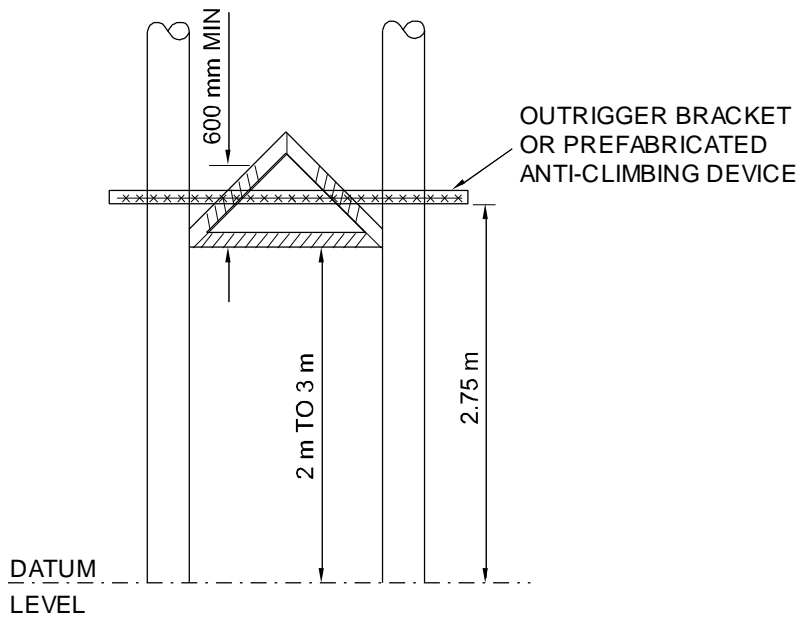


**Figure 12: Anti-climbing Measure for Poles Category P3 –
(Rod operated switchgear shown)
(Single pole - Higher than Normal Land Use - features that facilitate climbing)**

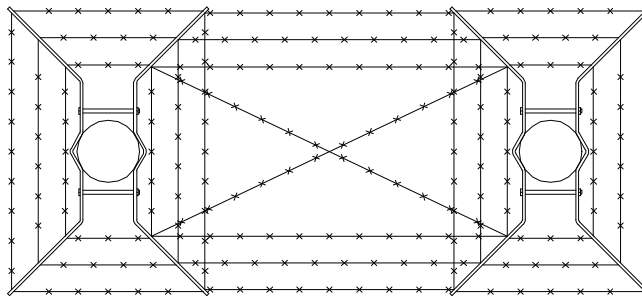


Outrigger arrangement for twin wood
pole using anti-climbing bracket to
ENATS 43-95 Drg. No. 439516
E5 Code 35105

**Figure 13: Anti-climbing Measure for Poles Category P3 –
(Twin / Rutter pole - Higher than Normal Land Use - features that facilitate climbing)**



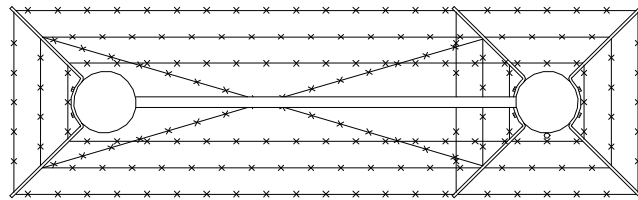
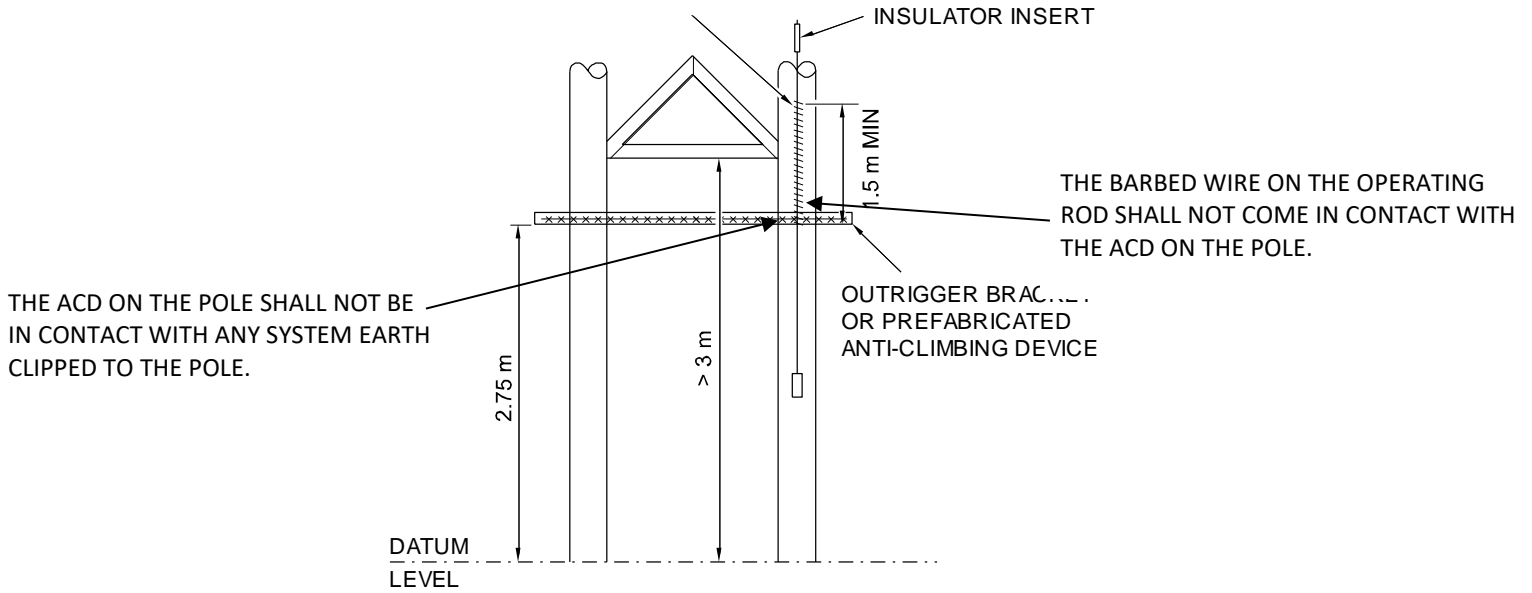
Outrigger arrangement for wood pole with pole centre spacing < 1.5 m using anti-climbing bracket to ENATS 43-95 Drg. No. 439516
E5 Code 35105



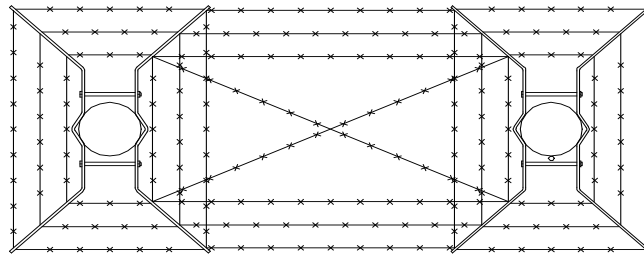
Outrigger arrangement for tubular pole with pole centre spacing < 1.5m using anti-climbing bracket to ENATS 43-95 Drg. No. 439517 (cross bar not shown)
E5 Code 35852

Figure 14: Anti-climbing Measure for Poles Category P3 – (“H” pole - Higher than Normal Land Use - features that facilitate climbing)

BARBED WIRE SECURELY
FIXED TO ROD



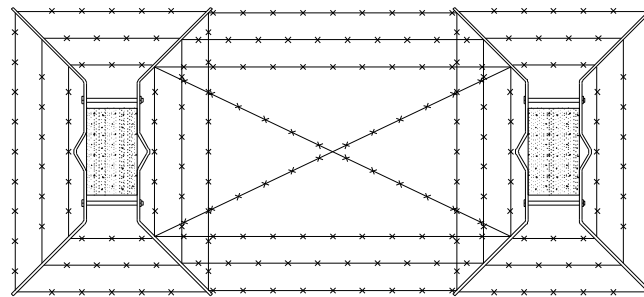
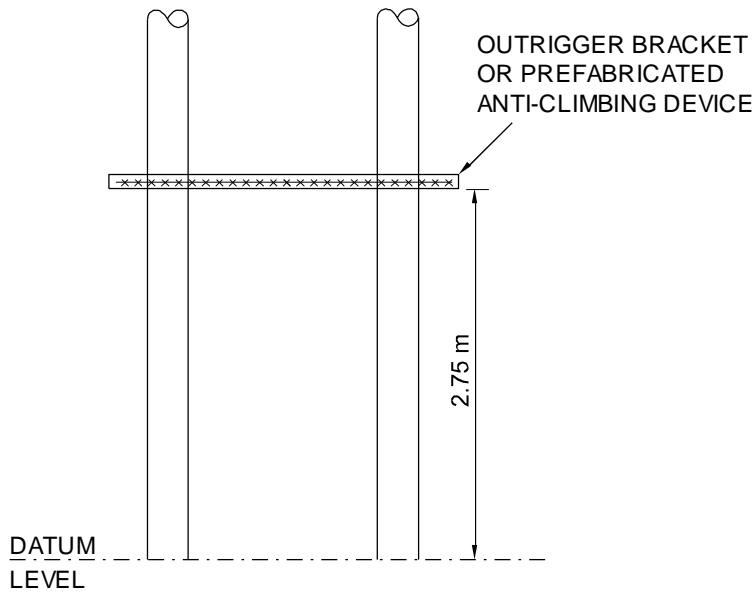
Outrigger arrangement for wood pole with pole centre spacing < 1.5m and with rod operated switchgear (right-hand pole) using anti-climbing bracket to ENATS 43-95 Drg. No. 439516
E5 Code 35105



Outrigger arrangement for tubular pole with pole centre spacing < 1.5m using anti-climbing bracket to ENATS 43-95 Drg. No. 439517 (cross bar not shown)
E5 Code 35852

Note: Where pole centre spacing > 1.5 m then each pole can be treated as a single pole.

Figure 15: Anti-climbing Measure for Poles Category P3 (“H” pole - Higher than Normal Land Use - features that facilitate climbing including rod operated switchgear)



Outrigger arrangement for reinforced concrete pole with pole centre spacing < 1.5m using anti-climbing bracket to ENATS 43-95 Drg. No. 439517

E5 Code 35852

Note: Where pole centre spacing > 1.5 m then each pole can be treated as a single pole.

Figure 16: Anti-climbing Measure for Poles Category P3 – Reinforced concrete ‘H’ pole - Higher than Normal Land Use - features that facilitate climbing (With or without rod operated switchgear)

Stay Wires All Categories

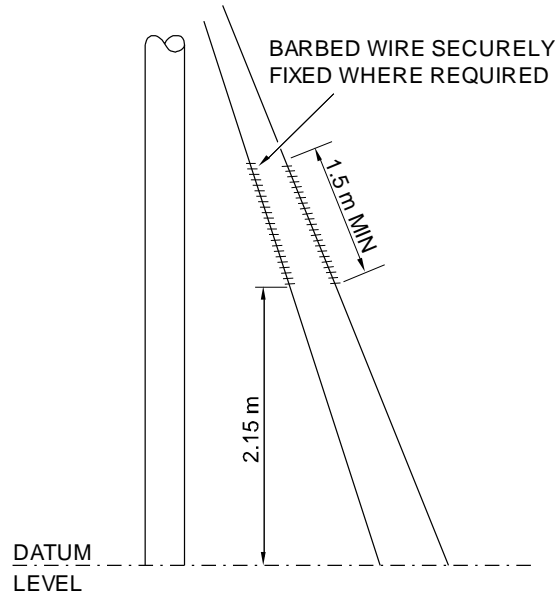


Figure 17A: Anti-climbing Measure for Stay Wires

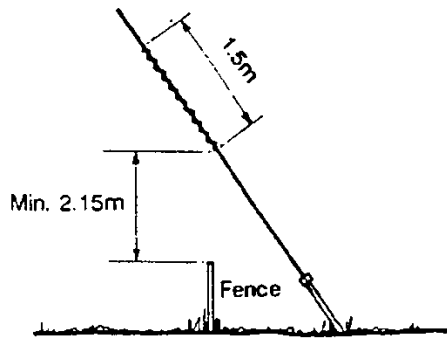


Figure 17B: Anti-climbing Measure
Stay Close to obstacle
All Land Uses

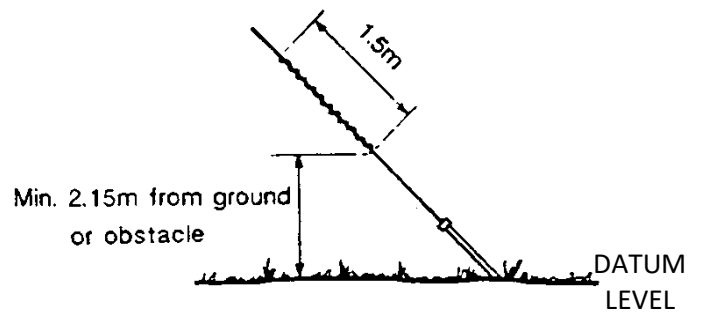
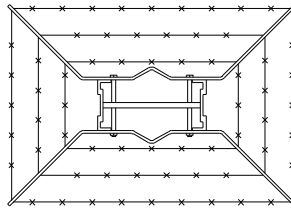
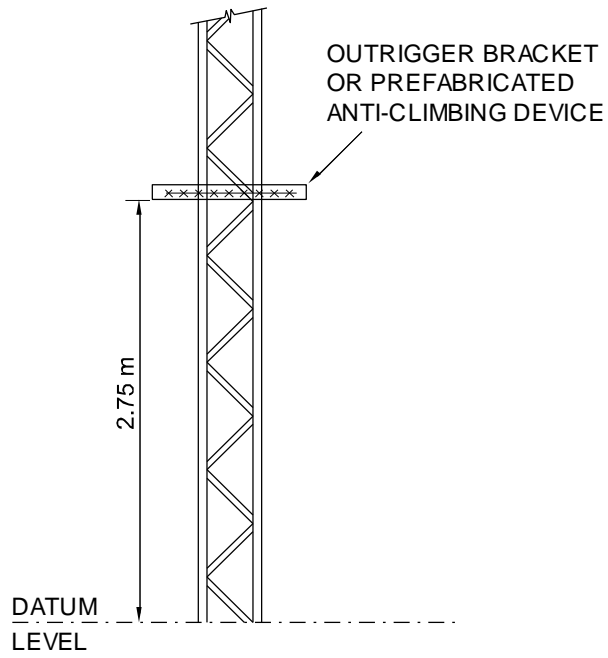


Figure 17C: Anti-climbing Measure
Stay in Higher than Normal Land Use

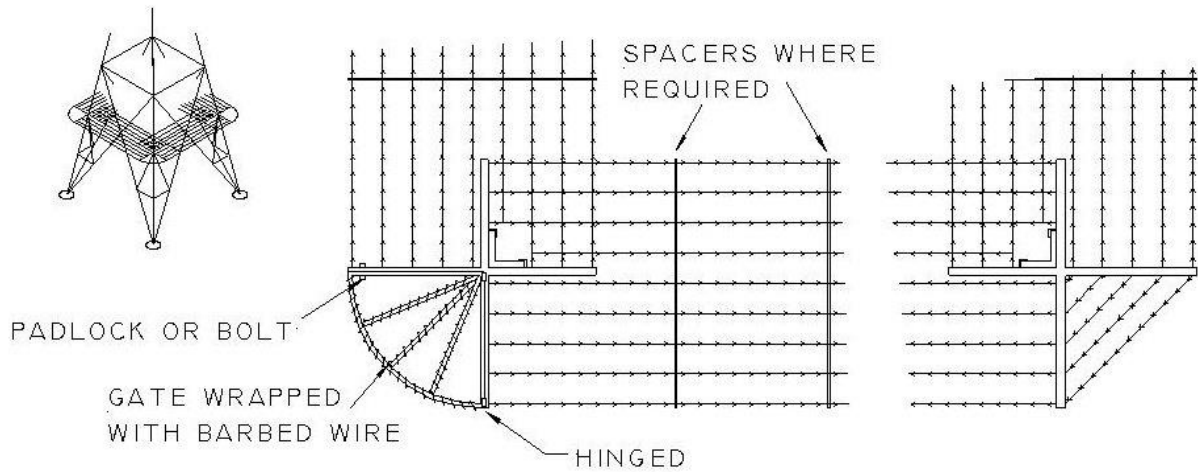
Category T1



Outrigger arrangement for small lattice tower using anti-climbing bracket to ENATS 43-95 Drg. No. 439517
E5 Code 35852

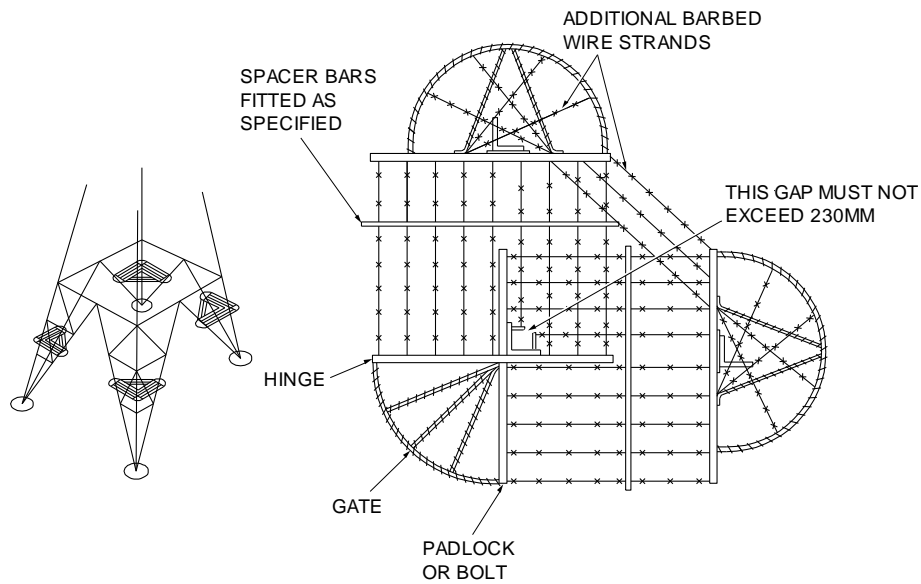
Figure 18: Example of Anti-climbing Measure for Small Lattice Towers Category T1 (Normal Land Use)

Category T2



Note: Both climbing leg (left) and non-climbing leg (right) shown

Figure 19: Example of Anti-climbing Measure for Lattice Tower Category T2 – Arrangement for attachment to towers at the level of the main horizontal member (Higher than Normal Land Use)



Note: Climbing leg only shown.

Figure 20: Example of Anti-climbing Measure for Lattice Tower Category T2 – Arrangement for attachment to towers at each leg (Higher than Normal Land Use)

Category T3

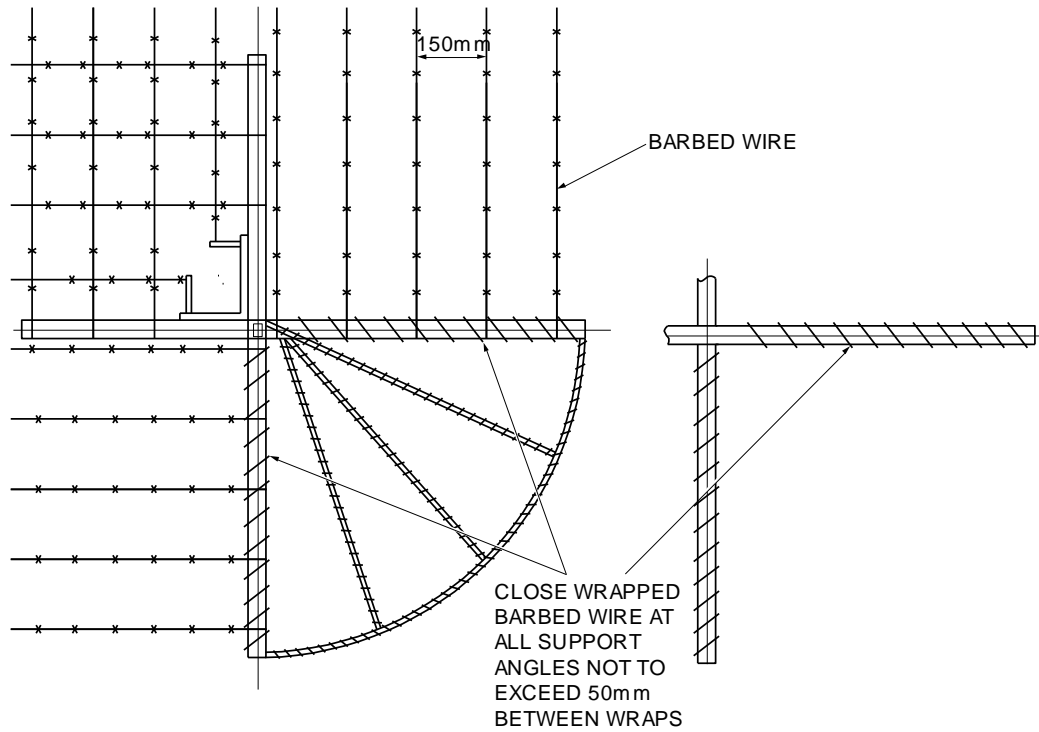


Figure 21: Example of Anti-climbing Measure for Lattice Tower Category T3 (Higher than Normal Land Use)

Categories T1, 2 & 3

If possible guard to be level with a tower horizontal member.

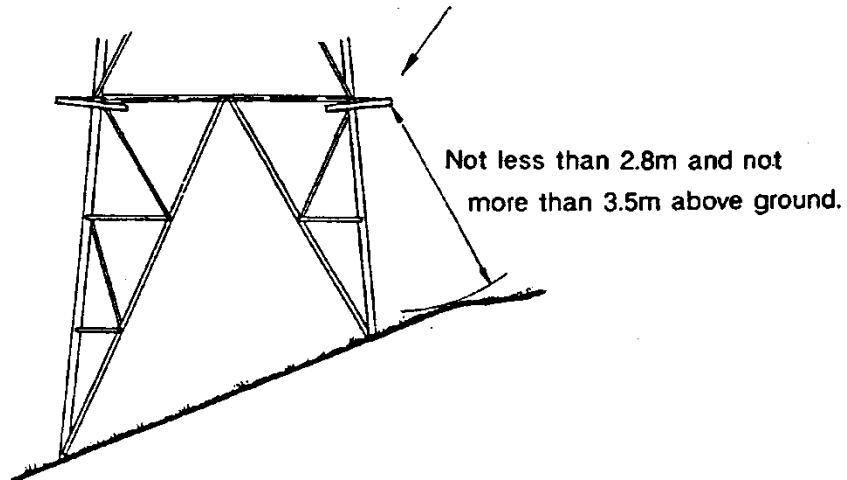


Figure 22: Anti-Measure for All

Example of climbing Lattice Tower Categories –

Application on Sloping Ground

ANTI-CLIMBING DEVICE APPLICATION MATRIX

The tables below give an indication of how a particular category of anti-climbing device might be selected based on land use risk, nearness of obstacles and support or stay type.

These categories should be regarded as the minimum requirements – individual site assessment may indicate that measures above the minimum are actually required.

Support type	Land use risk	Obstacles in proximity	Category of anti-climbing device
Unclimbable pole (3m of unbroken pole)	Normal	No	P1
	Normal	Yes	P1
	Higher than normal	No	P1
	Higher than normal	Yes	P1
Climbable pole	Normal	No	P2
	Normal	Yes	P2
	Higher than normal	No	P3
	Higher than normal	Yes	P3
Lattice mast or tower	Normal	No	T1
	Normal	Yes	T1
	Higher than normal	No	T2 or T3
	Higher than normal	Yes	T2 or T3

Table B1 - Selection of anti-climbing devices for supports

Stay type	Land use risk	Obstacles in proximity	Anti-climbing device required
Single	Normal	No	No
	Normal	Yes	Yes
	Higher than normal	No	Yes
	Higher than normal	Yes	Yes
Multiple climbable	Normal	No	Yes
	Normal	Yes	Yes
	Higher than normal	No	Yes
	Higher than normal	Yes	Yes

Table B2 - Selection of anti-climbing devices for stays

APPENDIX C

SUPERSEDED DOCUMENTATION

This document supersedes ST: OH4M dated April 2008 which has now been withdrawn.

APPENDIX D

RECORD OF COMMENT DURING CONSULTATION

[ST: OH4M 1 - Policy Feedback Comments Sheet.xlsx](#)

APPENDIX E

ASSOCIATED DOCUMENTATION

ST: OH3A Inspection of Overhead Lines

ST: OH3F Overhead Line Records of Risks to Public and Risk Reduction Actions

ST: OH4N Notices, Signs & Labels for Overhead Lines

ST: OH5A Inspection of Overhead Lines

ENA TS 43-90 Anti-Climbing Measures and Safety Signs for Overhead

APPENDIX F

KEY WORDS

Anti-climbing devices