

Specification CP8 - Overhead

Attachment of Communication Providers Overhead Cables & Equipment on Openreach Poles

The purpose of this specification is to provide CPs with details of the Engineering Principles that apply where they wish to use Openreach poles pursuant to and in accordance with the terms of Openreach Physical Infrastructure Access (PIA) product. This specification contains in particular, details of the Engineering Principles on acceptable pole loadings, pole fixings and relevant cable clearances where CPs attach cables using PIA to Openreach poles. This document also provides requirements regarding safe access to poles. Nothing in this document removes obligations on the CP to comply with any and all health, safety and other laws and regulations and to comply with Good Industry Practice.

Please note that in line with the current Terms & Conditions of the PIA product, the attachment of Powered or Active equipment to Poles is not permitted.

1. General Notes

1.1 The first letter of a specification carries a number without a suffix letter. When a specification is re-issued a suffix letter is added and for each subsequent issue the suffix letter is advanced.

1.2 Except when a specification is completely re-written, an amended clause is indicated by a star adjacent to the clause number and the particular portion amended is indicated by a vertical line in the margin.

1.3 When a supplementary specification is quoted by number only the latest issue of that specification shall be followed, but if in addition to the number, a particular issue is quoted, that issue of the specification shall be followed.

1.4 If any further information in connection with this specification is required then you must submit a full written application to the Specifying Authority (SA) found in Section 23 setting out the information required and the reasons.

1.5 In this document where we use words “shall” and “must” then these are obligations which a CP has to satisfy when using PIA. If we use the word “should” then a CP must use all reasonable endeavours to satisfy the requirement but may deviate subject to the other requirements set out

2. General Cable Specifications

2.1 Cable requirements

All Drop Wires / Overhead cables used to connect to customer premises must meet the requirements shown in Table 1 below.

It is the CP's responsibility to ensure that any Cable and Clamp system they choose are, and remain, suitable for use in the range of weather conditions shown in Table 1 below.

In particular, that it is capable of supporting the cable aloft without slippage, or sag, which may result in the wire becoming dangerously low. See also section 10, for minimum in life wire heights.

| Requirement | Performance specification |
|--------------------------------------|---|
| Breaking load, or ultimate fail load | Max 2000N |
| Maximum Outer Diameter | Drop Wires must not exceed 7mm Ø |
| Cable colour | The outer sheathing of the cable shall be black, or black with a coloured marker line |
| Cable Insulation | The cable must be suitable for use under 11kV Power Lines (with a minimum vertical separation distance of 1.8 Metres) |
| Resistance to wind /ice | Cable must be able to withstand 97 kph wind, no ice. 0 kph wind, + 5mm ice. without appreciable sag |
| Sag due to temperature variation | Cable must be specified to operate in a temperature range of -15°C to +30°C |

Table 1 – Cable requirements

2.2 Verification of CP's Cables

The CP must ensure that it submits any cable type it intends to use and/or connect to a pole to Openreach for written approval. Openreach will review and physically test all CP cables it receives from CPs, to confirm their mechanical properties. In summary, this will involve:

- An initial review of the Cable Datasheet and other valid documents (Test reports etc) by the Openreach SA
- Physical Testing of cable samples at the Openreach Network Evaluation Centre (Martlesham)

Full details of the verification process which must be adhered to by the CP are provided at Appendix 1 of this specification.

All Overhead cables will fall into two categories:

Dropwires – These are cables with a maximum outer diameter of 7mm and /or, with an ultimate tensile load (breaking load) of 2kN or less. Dropwires may be deployed by the CP “unplanned”.

Aerial Cables – Are those which exceed the 7mm / 2kN limits. Aerial Cables will be subject to specific approval and bespoke Openreach surveys prior to each and every deployment. See section 2.3.

2.3 Non Standard cables

Any cable which does not meet the requirements of 2.1 above, will be subject to our prior written approval following application to the SA.

Such cables are likely to require a chargeable bespoke site survey, to determine if the pole is capable of supporting such a load. The survey will also help to determine what additional works may be required to either strengthen the pole, or modify the route.

Some small diameter overhead cables may have a break load >2kN. These may be considered suitable for use as a Dropwire by Openreach, provided that an associated shearing type clamp is used, to ensure per wire load on pole does not exceed 2kN. Where a CP wishes to deploy such a cable, the cable and clamp system must first be load tested by Openreach, to confirm mechanical performance and suitability.

3. Overhead Cable attachments to Wooden Poles

Openreach Poles fall into two general categories:

Distribution Poles (DP's) – These may be fed by underground or overhead cables and support feeds to individual properties

Carrier Poles (CP's) - These Poles (also referred to as Feeders) are typically used to carry Dropwires from a DP to Customer properties.

Openreach Distribution Point (DP) poles, and the majority of Carrier poles, are fitted with a steel ring (known as a Ring Head), 200mm from the tip of the pole.

3.1 Pole Top attachment

On Radial Distribution type poles, Dropwires must be attached to a Ring Head (where one is fitted) using a pre-formed spiral or wedge type clamp. NB: Clamps must not occupy a disproportionate amount of space on the ring, thereby preventing other attachments.

Where a Ring Head does not exist, the CP may install their own Ring Head but only where the equipment has been agreed in writing by the Openreach SA in advance of any deployment.

Alternatively, the CP may request Openreach to fit one, by submitting an order for Ancillary Services, which would be chargeable, unless Openreach decides to install a Ring Head to resolve a Network Adjustment.

Alternatively, on designated pole routes, Dropwires may be attached in vertical formation on one, or both sides of the Pole using a bracket and clamp. The first Dropwire attachment must be a minimum of 200mm from the Pole Top. Subsequent Dropwires must be provided with a 300mm vertical spacing. Where 300mm spacing cannot be achieved, the absolute minimum is 150mm. See attachment examples (Figure 1) below.

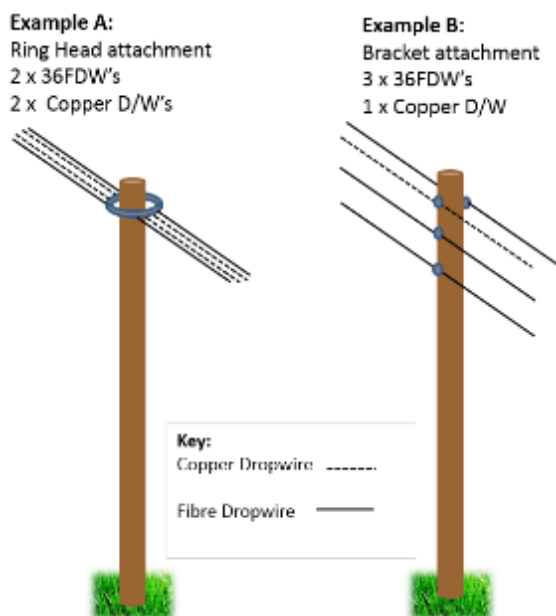


Figure 1 – Cable attachment examples

3.1.1 Dropwire attachments to Crown Ring Poles

Crown Type Rings were fitted to Distribution Poles prior to 1960. Attachment to these poles may be made using one of the following options:

- a) By using a “Bolt 25” which is threaded between the upper and lower apertures on the Ring and a “Hook Clamp Dropwire”²⁵. This is the recommended option.
- b) Alternatively, the wire may be attached directly to the upper or lower ring aperture
- c) Or, to the J Bracket (one wire per J Arm)

The Crown Ring is capable of accommodating up to 30 radially distributed Dropwires

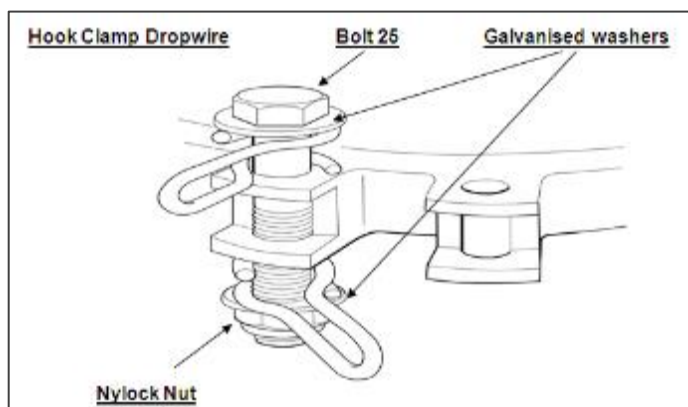


Figure 2 – Option (a)



Figure 3 – Option (b)



Figure 4 – Option C

3.1.2 Dropwire attachment to Cross Arm Poles

A relatively small number of poles may still be found with Cross Arms attached. These are typically (but not exclusively) Carrier Poles in rural locations, rather than Urban Distribution Poles.



Figure 5 – Cross Arm Pole

- Individual wires can be attached to the pole itself, or, providing the Cross Arms appear sound, to the J Bracket (as described for Crown Ring poles).
- Where it is required to open a Fibre Distribution point on an existing cross arm pole, a Ring Pole Head 1 must be provided. The Ring will be installed just above the uppermost cross arm, which will typically be located 230mm from the pole top. Hole for a new ring is drilled at approximately 100mm from the pole top.
- The above approach will help ensure that any Customer Connection Fibre wires will continue to reach the AFN position in the event that the Pole is renewed, which given their age, is likely.
- Where problems are encountered, further advice can be obtained from the SA.

3.2 Pole Top attachment (Non-Standard Cables)

Those cables which do not meet the requirements of 2.1 above must (as set out at 2.3) be subject to specific and prior written approval of Openreach SA. Part of the approval process will be acceptance of the fixing method. The method for fixing round cable types, is by spiral pre-formed clamps. The method for Figure of 8 cable types is to use sliding wedge type clamps, where the clamp fixes to the suspension member within the Figure of 8. Openreach use the Telenco range of clamps, and provided the correct size is used, and it is fitted in accordance with Telenco's installation instructions, then these will be considered suitable.

Aerial Cables with a breaking load of up to 6.5kN can be fitted to an existing Ring Head. Cables with a breaking load beyond this figure must be fitted to a separate attachment point – either the Telenco Universal Pole Bracket (UPB) fitted in accordance with their instructions, or by using a 16mm eyebolt, through-bolted to the pole.

3.3 Fixings at Customer premises

Fixings at customer's premises are solely the responsibility of the CP, but it is recommended that fixing points should be eyebolts or other closed ring methods, with a fixing strength of min 4.5kN.

CP Dropwire attachments must not be made to existing Openreach fixings (Brackets & Eyebolts) which already have a Dropwire attached.

3.4 Vertical Cable runs on wooden Poles

Any cables which run vertically on the pole must be fixed at a minimum of 450mm intervals and must not impede access to the climbing steps.

Standard cable cleats tend to get lifted off the pole by safety belts & ladders rubbing against them, which can lead to insecure/loose cables. Therefore the CP must fix cables using a 16mm aluminium strip (typically available in three length options 80mm, 120mm and 180mm). See Figure 6 below.



Figure 6 – Aluminium Strip

The CP must secure the strip using 38mm long galvanised bonding nails, along with galvanised steel flat washers (typically with a 6.5mm diameter centre hole).

Protection of cables are solely the responsibility of the CP but it is recommended to cover cables up to 2.3m minimum from the ground line, by fitting suitable capping.

Where a CP's cable shares the same duct space or run together with Openreach cable, the capping requirement is mandatory. If the existing capping is not large enough to accommodate the extra CP cable, the CP may replace the capping with a larger, Openreach approved capping. Any cables running between the upper and lower envelopes of spaces shown in Figure 8 (i.e. through the climbing area) must be suitably managed and in a manner agreed in writing, in advance with the Openreach SA. This is to avoid risk to climbers.

NB: Capping's must not be placed over the 3 Metre mark on the Pole.

3.5 Fibre warning labels

The CP shall provide a label – **“CAUTION OVERHEAD FIBRE”** on each pole where their fibre cables are deployed. In all cases, the label must be securely fixed to the pole at head height. The label shall be plastic, with black font on yellow background and be firmly fixed to the pole. NB: Care must be taken not to lean ladders etc. against fibre cables. Labels are available from: Colourplan Print, 14-20 Wharfedale Road, Ipswich, Suffolk, IP1, 4JP – Tel 01473 400 379

4. Overhead Cable attachments to Hollow Poles

Hollow Poles must not be climbed. In general, all operations on them are performed from ground level.

These Poles are fitted with an internal ring and this is the standard attachment point for Drop Cables.

Exceptionally, CPs may attach Dropwires externally, at the top of the hollow pole. This must be done using a Telenco Universal Pole Bracket (UPB), secured using Telenco Stainless Steel Banding. Please note, because of its load bearing nature, it is imperative that the UPB and Banding are installed correctly by a suitably trained and accredited person and using an approved Telenco Tool.

Similarly, an AFN can also be attached at the pole top using the above mentioned banding method. In such cases, any Dropwires running between the UPB to the AFN must be suitably managed, using cable fixing straps or similar.

Any wires or equipment provided in this way must not interfere with the standard method of Dropwire installation carried out from ground level. See Figure 7a.

Hollow Poles shall not be drilled or bolted, to accommodate the equipment.

Cables may only be brought down the pole on the inside.

Figure 7 below, illustrates a UPB attachment using Stainless Steel Banding on a wood pole, but the attachment method is the same for Hollow Poles.



Figure 7 – UPB attachment using SS Banding



Figure 7a – Dropwire install from ground level

Current Hollow Poles are of Galvanised Steel construction and may be of Light or Medium Class, whereas previous versions of Hollows (Stainless Steel and Glass reinforced Plastic) were only produced in Light Class.

The size and class of the pole is usually cold stamped onto the ring during manufacture. i.e. BT – 9 L – GS – 04 indicates a 9 Metre Light, Galvanised Steel Pole manufactured in 2004. NB: In some cases this information may be found on a tag which is attached to the ring.

Dropwire loadings on Galvanised Hollow Poles are the same as for their Wooden Pole equivalents (Tables 2 and 6 refer).

The conditions shown in section 3.2, 3.3 and 3.5 also apply to Hollow Poles.

5. Fixing of apparatus to Wooden Poles

Connection Boxes, Cable Joints, Fibre-locking devices may be fitted to wooden poles subject to the following:

- Items must be securely attached to the pole using appropriate materials
- New apparatus, shall only be installed on the pole in the areas shown in Figure 8 below. NB Existing equipment installed prior to April 2020, which does not meet the requirements shown in Figure 8, may remain in situ, providing that in BT's reasonable opinion, it does not prevent a handhold of the Bass Steps (see 50mm rule in fig 8)
- Customer connectivity apparatus e.g. CBT's shall only be provided in the Upper Space Envelope
- Where the Lower envelope is being used (for Joints etc), a vertical clearance of 450mm must be provided between the Lowermost Climbing Step and the uppermost part of the equipment (Figure 8 refers)
- Where the CP feels they are unable to comply with the envelope of space requirements, they must submit an Order for a Network Adjustment (NA) to Openreach who will review / verify the validity of the NA and if accepted, decide on an appropriate solution to create the necessary space
- Before seeking a Network Adjustment for no space on the Pole, the CP must have used best endeavours to use all available space, including the provision / use of Back to Back space saver brackets and (where the CP has suitably trained / accredited people to do so) shifting of the Bass Step. Examples of a Back to Back brackets are shown at Figure 9 below and further information on these can be obtained from the (SA).

NB: The sharp top edge of the Bracket must incorporate a UV Stable protector, to prevent possible shearing of the Climbers Safety Lanyard.

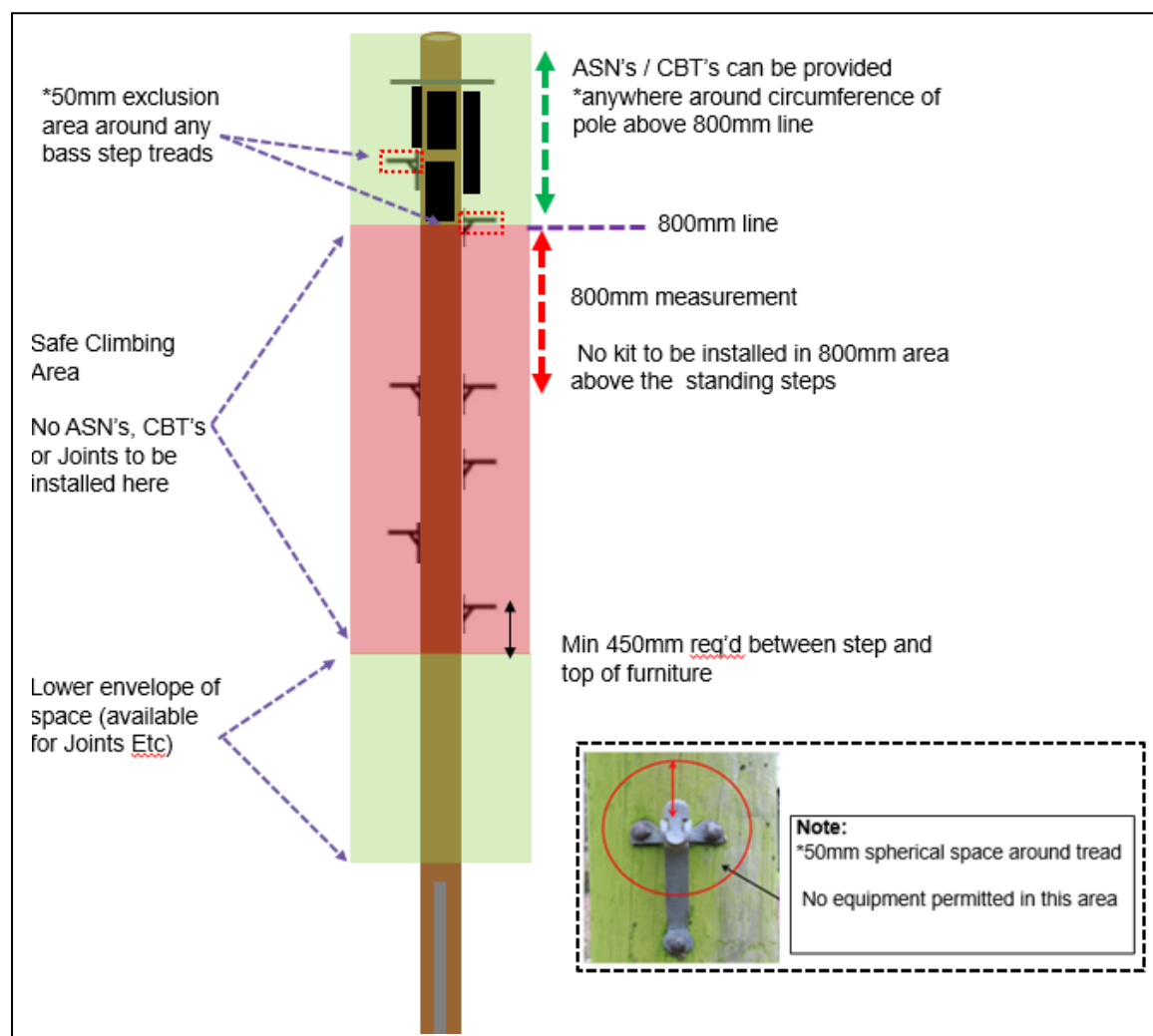


Figure 8 – Permitted envelopes of space on Poles

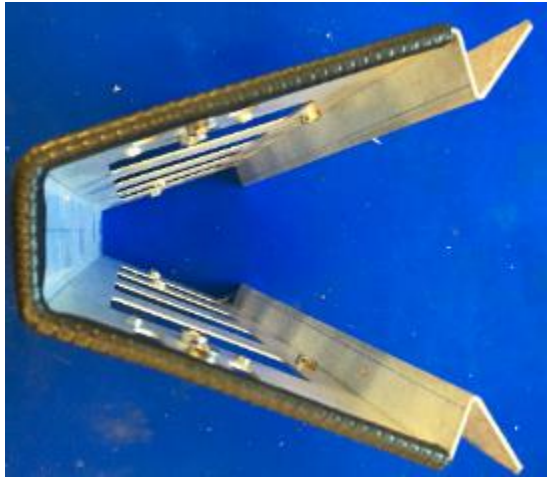


Figure 9: Example of Back to Back and triple Stand off Brackets

5.1. Fixing equipment / apparatus on Crown Ring Poles

- In some cases, the Crown Ring may have had some or all of its J Brackets and Insulators removed (See figure 10), which opens up space above and below the Ring.
- Providing the permitted envelope of space (800mm) rule can be complied with, new equipment can be added above or below the Crown Ring. See Fig 8 (above) for details of the envelope of space / 800mm rule.
- On Poles where most of the insulators and brackets are still in-situ, there will be less space and a Network Adjustment may be required.



Figure 10 – Possible AFN locations on Crown Ring Poles

6. AFN / CBT Installation on Hollow Poles

Internal Installation - A small flexible CBT (aka a Squid) can be mounted on the ring inside the pole. Because of the limited space available in the pole, only one CBT, with a maximum of 12 Ports may be fitted.

External Installation – AFN's / CBT's can be located in an adjacent Joint Box with individual Fibre Drop Cables running down and out of the pole via the Cable entry ports and to the Joint Box.

7. Pole Loading Dropwire Limits

7.1 Non radial (Sideways loaded) Poles

Non-radial poles are defined as those that are un-stayed and where all wires are attached in a single 180° Arc, with zero wires or stays in the opposing arc. Please see fig 11 below.

180° distributed or side loaded pole

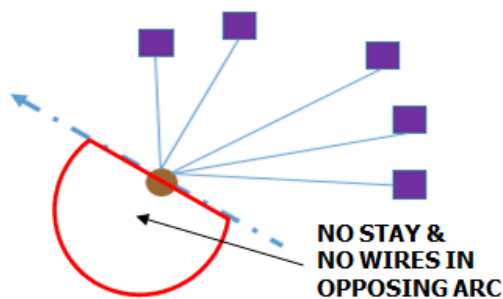


Figure 11 – Non Radial loading

The standard maximum loadings for these pole are shown below:

| Class of Pole | Max wires within 180° Arc |
|---------------|---------------------------|
| Light | 7 |
| Medium | 15 |
| Stout | 30 |

Table 2

Providing that the process below is followed, additional wires, beyond those shown in table 2 may be added to a pole.

Actions required (wood poles)

- Count the number of Dropwires attached to the pole (including any new wire you may be looking to attach)
- Note the class of pole (Light, Medium or Stout)
- Use the wire count and class of pole information and use Look up (Table 4 below) to determine the appropriate course of action
- Submit an appropriate A1024 to the Openreach Network Repair Team from site– Tel 0800 169 5098 – Option 1

Actions for Hollow Poles

The procedure is broadly the same as for Timber poles.

However please note that for Hollow's there are limits to the number of wires, beyond which, no more wires can be added.

These are:

- 14 for Light Class Hollow Poles
- 25 for Medium Class Hollow Poles

Where these limits are reached, no more wires may be added and a Network Adjustment must be submitted if the pole is to be used by the CP.

Note: On a hollow pole, the size and class are usually cold stamped onto the inner ring i.e. BT – 9 L – GS – 04 = a 2004 Galvanised 9 Metre Light class Pole.

Appropriate A1024 Defect and Remedy codes

As mentioned above, whenever the CP encounters a one side loaded pole that they wish to use, they must carry out an onsite wire count and submit an A1024.

Even where there is an existing A1024 on the pole, a new wire count and A1024 must be submitted by the CP, to capture the increasing load on the pole. The A1024 defect category is Pole/Fittings, with a defect code of 578.

As there are differing scenarios in terms of Pole type, wire loading etc, a range of remedy codes are used to enable Openreach to suitably prioritise affected Poles (see Table 3). Where, having reviewed the A1024 details, Openreach consider the risk to be low, the Pole will simply be monitored, but where the risk is higher, the Pole will be entered into a works program for remedial action. See Table 4 for further details.

Example: A light class wood pole with less than 10° lean and with a total of 15 wires.

In this scenario, wires may be added, but an A1024 (with a Defect Code of 578 and Remedy code of 72) must be submitted by the CP from site.

Note: For all categories, providing a successful pre-climb check (inc hammer test) is undertaken, the pole can be climbed.

| Defect Code 578 Remedy code look up | | | |
|--|-----------------|----------------------|-------------|
| Wood Poles | | | |
| | Pole leaning by | With a wire count of | Remedy code |
| Light Class Poles | Any amount | 28 or more | 70 |
| | 10° Or more | 12 or more | 71 |
| | Less than 10° | 12 to 28 | 72 |
| | Any amount | 8 to 11 | 73 |
| Medium Class Poles | Any amount | 45 or More | 74 |
| | 10° Or more | 23 or more | 75 |
| | Less than 10° | 23 to 45 | 76 |
| | Any amount | 16 to 22 | 77 |
| Stout Class Poles | Any amount | 55 or more | 78 |
| | 10° Or more | 43 or more | 79 |
| | Less than 10° | 43 to 55 | 80 |
| | Any amount | 31 to 42 | 81 |

| Hollow Poles | | | |
|--------------------|-----------------|----------------------|-------------|
| Pole class | Pole leaning by | With a wire count of | Remedy code |
| Light Class Poles | Any amount | 12 or More | 82 |
| | 10° Or more | 10 or more | 83 |
| | Less than 10° | 10 to 12 | 84 |
| | Any amount | 8 to 9 | 85 |
| Medium Class Poles | Any amount | 20 or More | 86 |
| | 10° Or more | 19 or more | 87 |
| | Less than 10° | 19 to 20 | 88 |
| | Any amount | 16 to 18 | 89 |

Table 3 – A1024 Remedy codes

| Remedy Codes | Status / Logic | Priority level | Openreach Action |
|---|---|----------------|--|
| <u>CAT 4</u> N/A | Pole is currently within the standard 180° unstayed loading limit. | 0. None | No action required |
| <u>CAT 3</u> 73, 77, 81, 85 & 89 | Pole is at, or slightly exceeds the designated un-stayed loading limit, but (assuming reasonable weather conditions) is within the loading limit. | 3. Low | Record, but currently, no action required |
| <u>CAT 2</u> 72, 76, 80, 84 & 88 | Pole is more significantly loaded. | 2. Medium | Place in program for remedial action. Target timescale 2 years |
| <u>CAT 1</u> 70, 71, 74, 75, 78, 79, 82, 83, 86 & 87 | Pole is heavily loaded Or is Cat 2, also displaying physical signs of strain (leaning >10°). | 1. High | Place in program for urgent remedial action. Target timescale 9 Months |

Table 4 – A1024 Prioritisation

One side loaded poles with Aerial Cable and multiple Dropwires

For Poles that are one side loaded with Aerial Cable and multiple Dropwires and with no back stay fitted, or wires running in the opposing 180° Arc. The following actions must be taken.

Providing that the standard wire loading limits (7 for Light, 15 for Medium, 30 for Stouts) will not be exceeded, additional wires may be added, providing that the CP submits an A1024 for the pole. See remedy codes below.

| Wood Poles | Remedy Code |
|--------------|-------------|
| Light | 70 |
| Med | 74 |
| Stout | 78 |
| | |
| Hollow Poles | Remedy Code |
| Light | 82 |
| Med | 86 |

Table 5 – Remedy codes for A/C & Dropwires

Where the standard wire loading will be exceeded, then the CP may not attach additional Dropwires to the pole and must submit a Network Adjustment request to Openreach. The pole may still be accessed, providing a full pre-climb check has been conducted.

Please note: The above 180° loading rules are for non-defective poles only. Not for D Poles, or Shallow Climable Poles, which each have their own specific loading rules. See “Working on D Poles” and “Dropwire Loading on SC Poles” elsewhere in this Doc for full details.

7.2 Radial Poles:

Where a stay wire, or one or more dropwires are attached within an opposing 180° arc, the pole can be considered as radially distributed. Figures 12, 13 and 14 show examples of radial loading.



Figure 12 & 13 – Typical Radial wire loading

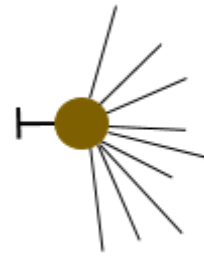
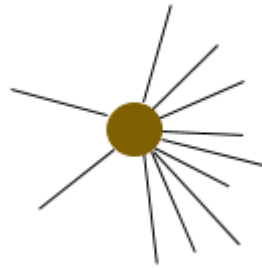


Figure 14 Non Radial, but stayed

The standard wire loading limits for Radial distributed Poles are shown in Table 5,

| Light Poles | Medium Poles | Stout Poles |
|-------------|--------------|-------------|
| 40 Wires | 40 Wires | 50 Wires |

Table 6

Radially loaded poles are excluded from the A1024 process described above and currently no action is required where standard wire limits are currently exceeded, or, are to be exceeded through the provision of additional wires.

Where a Pole has other issues which may prevent attachment of wires / equipment, i.e. lack of pole top space, a Network Adjustment may be appropriate.

8. Dropwires in Line of Route

The maximum number of Dropwires permitted in line of route, is dependent on the site circumstances. Please see illustrations and tables below, for guidance.

8.1 Un-Stayed Poles / Poles with no opposing wire load

Where multiple wires are running to an un-stayed Pole, or the Pole has no wires opposing that load, then the DILOR consideration applies. See illustration below.

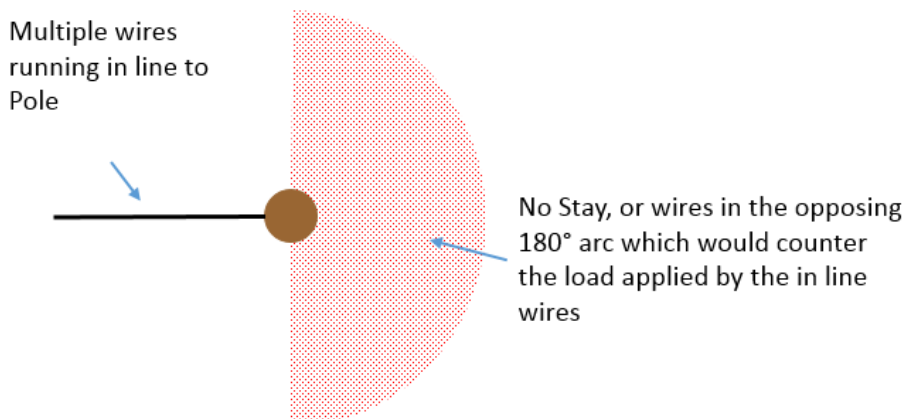


Figure 15 – Pole with no opposing load

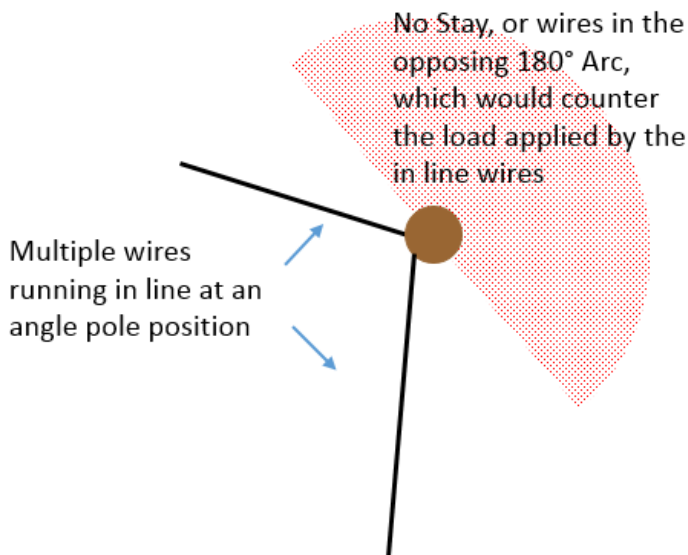


Figure 16 – Angle Pole with no opposing load

Intermediate / In line Poles (with no stays or opposing wire load).

In general, In Line Pole poles need not be considered for DILOR, except where there is a deviation in the route. In such cases, DILOR should then be considered and an illustrative indication of the maximum permitted angles before such consideration applies are shown below.

Where the angle is tighter than that shown by the blue lines i.e. For example, those shown in dotted red, then DILOR applies

Trigger Angle for Light Class Poles:

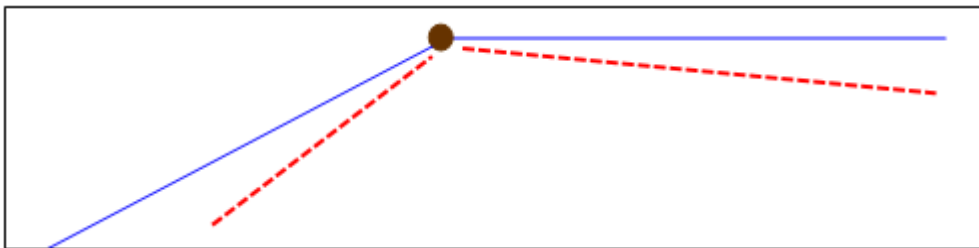


Figure 17 – Angle, Light Pole

Trigger angle for Medium Class Poles:

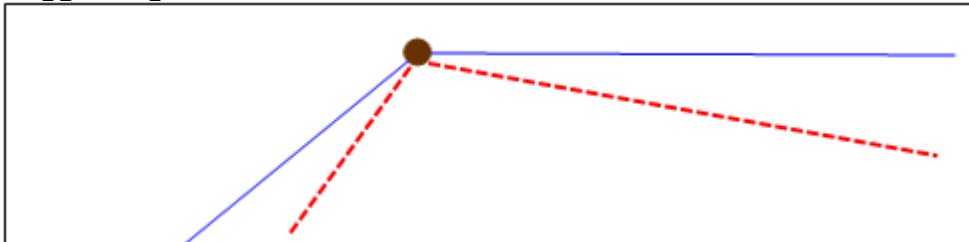


Figure 18 – Angle, Med Pole

Loading limits for poles with no stays or opposing wire load.

Where a pole has no Stay or wires in an opposing arc and it has been determined that DILOR applies, the maximum number of Dropwires permitted in line of route is shown in Table 7 (below).

NB: These limits apply to Copper, Fibre wires, or a mixture of both types.

| | Wires crossing carriageway | | | Wires not crossing carriageway | | |
|---------------------|-----------------------------------|-----------------------------|----------------------------|-----------------------------------|-----------------------------|----------------------------|
| | One or both poles are Light class | Both Poles are Medium class | Both Poles are Stout Class | One or both poles are Light class | Both Poles are Medium class | Both Poles are Stout Class |
| Max permitted wires | 3 | 4 | 5 | 4 | 5 | 6 |

Table 7 – Maximum wires in line of route

Note:

These standards do not apply to poles classified SC, or any pole with a planting depth less than 1.2m, which is waiting an SC assessment –*The limit for these Poles is 2 wires.*

The rules also apply on Joint Use (JU) poles. NB: All JU poles will be a minimum of **MEDIUM** gauge.

The A1024 process *cannot be* used to report the provision of an additional wire in excess of the limit.

8.2 Stayed Poles, or poles with an opposing wire load

The DILOR wire limits in Table 7 above assume that poles are un-stayed, or have no wires opposing the load applied by the in line wires.

Where Stays can be provided, or there are one or more wires present which oppose the in line wire load, a higher number of wires are permitted in line of route. See illustrations and Table 8 below.

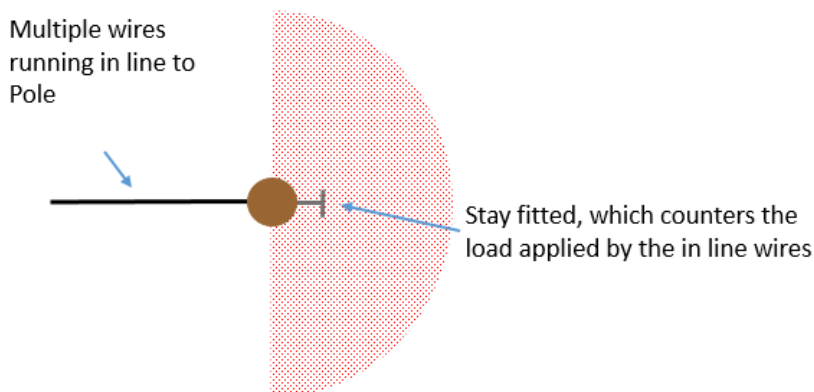


Figure 19 – Stayed Pole

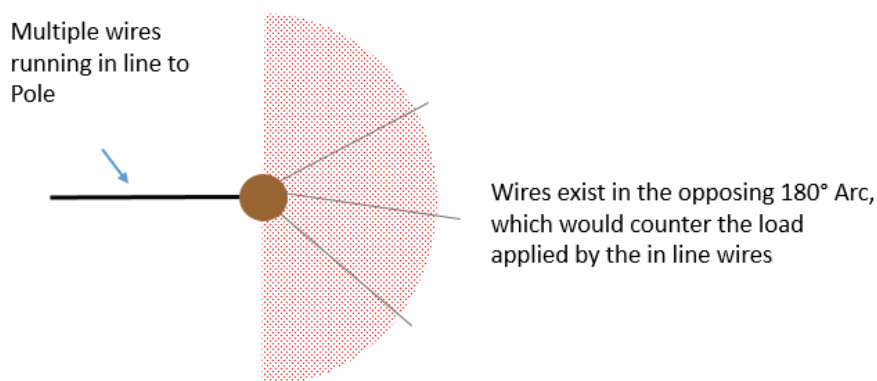


Figure 20 – Pole with opposing wires

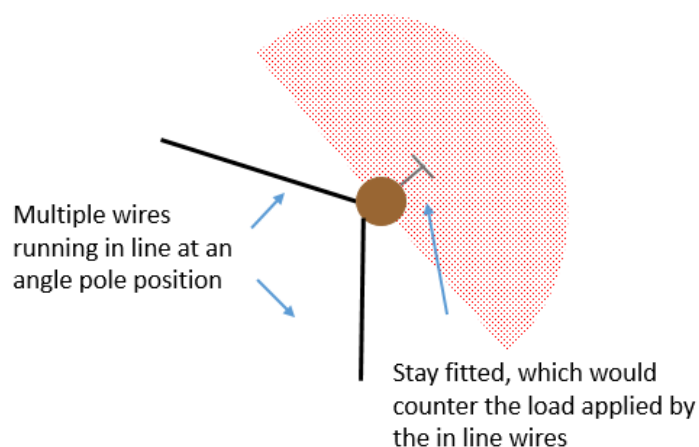


Figure 21 – Angle Pole stayed

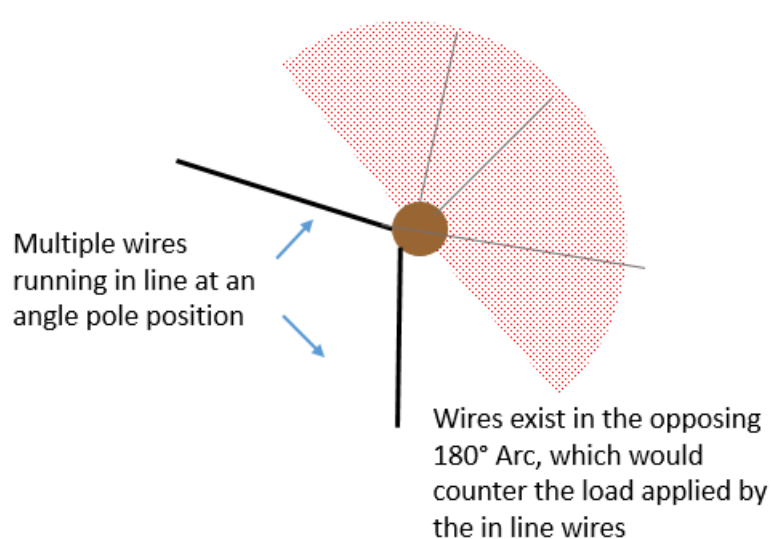


Figure 22 – Angle Pole with opposing wires

Loading limits (Stayed Poles / Poles with opposing load)

Where the Pole has a Stay fitted, or wires applying an opposing load, the following loading limits apply.

NB: These limits apply to Copper, Fibre wires, or a mixture of both types.

| | Where one or both poles are Light Class | Where both Poles are Medium or Stout Class |
|---------------|---|--|
| Maximum wires | 8 | 12 |

Table 8 – Max wires - Stayed Poles / Poles with opposing load

8.3 Dropwires and Aerial Cable running alongside each other

Where Aerial Cable and Dropwires are running together in line of route and the Terminal and Angle Poles are not stayed, the CP must submit a Network Adjustment, for a Route Stability evaluation and possible pole strengthening work by Openreach.

NB: In this context “Aerial Cable” means a cable which exceeds the limits shown in Table 1 and more typically, Openreach Figure of 8 shaped cables.

9. Overhead installation Clearances

Cables shall be installed in accordance with the minimum ground clearances detailed in Table 9.

Note Cable ground clearance are measured at the lowest point in the span

| Crossing Type | Minimum Clearance | |
|--|---|---|
| Cable or Dropwire crossing a carriageway (Public or Private) | 5.9m (wherever possible) | |
| Private drives, with access to other properties | Where 5.9m is not achievable, the best achievable height above 5.5m shall be obtained, with the following as an absolute minimum: <ul style="list-style-type: none">Dropwires 5.5mAerial Cables 5.6m | |
| Field Entrances and access to private land from Carriageway with unrestricted vehicular access | | |
| Private drive (No access to other properties) | No set minimum. Instead, wire should be erected as high as reasonably practical, taking into account foreseeable hazards / risks and any requirements of the land owner | |
| Private Land (owned by the property being served) | | |
| Private Land being “Flown Over” | See Electronic Communications Code | |
| Back alleys with permanently fixed access restrictions | Install Dropwires & Aerial Cables at a safe practical height which avoids foreseeable hazards | |
| Alongside roads (Grass verges etc) | Install Dropwires & Aerial Cables at min 3m | |
| Footpath, Bridleway, Cycle route or Towpath | 3.7m | |
| Railway, light railway, tramway or trolley vehicle system crossings | 7.0m above the rails | NB: Railways with overhead power catenaries must NOT be crossed with Dropwire /Aerial cables. |
| Railway crossings in goods yards where mobile cranes operate | 9.1m above the rails | |
| Canals and other navigable waterways | Install as required by authorities responsible for waterways and shipping | |
| Non-navigable waterways | 5.0m | |
| For any other circumstances | Contact the SA for Guidance | |

Table 9: Overhead clearances

10. Maintenance of minimum clearances, and working on poles

Any pole which has wire's or cables with less than 5.2m of clearance across a carriageway must NOT be climbed. The only acceptable method of working on a pole with ANY wire below 5.2m is by Mobile Elevating Work Platform (MEWP) or by scaffolding.

CPs shall report any Openreach wires below 5.2m using the A1024 process, the details of which can be found in the PIA Product Description.

Wires belonging to CPs must not be allowed to sag or dip below 5.2m. Any wire below this height shall be rectified by the CP as a matter of urgency, with an expected maximum clearance timescale of thirty (30) days.

CPs must provide a Contact Point that will allow easy reporting of any such low wires. The detail for contact points must be logged with the Openreach Customer Service Centre (CSC) and kept up-to-date in the Customer Service Plan (CSP).

11. Minimum clearances between cables

Where cables supported by spiral clamps are located directly alongside each other on a Ringhead. One or more must be protected, typically using a 500mm length of Telenco Protector Cable Abrasion, or a similar product.



Figure 23 – Clamp protection

Where Dropwires are to be attached on the side of the pole, a minimum vertical separation distance of 300mm shall be provided. In exceptional circumstances where 300mm separation is not achievable, a reduced separation distance of 150mm is permitted.

12. Clearances from Overhead Power Lines

All wires must be erected and maintained to achieve the required clearance from Overhead Power Lines.

The clearances and specifications are published in Energy Networks Association Document - Technical Specification PO5 (as updated and revised from time to time), which is available from the ENA.

<http://www.energynetworks.org/info/find-us/contact-us.html>

Within Openreach, a Glovebox Guide is used to inform engineers of power rules and this is also provided for CP's below:



12.1 Overhead Lines in the vicinity of Sub-Stations

Sub Stations are High Voltage, typically operating at >33kV. Under no circumstances should a Dropwire or Aerial Cable (Copper or Fibre) be erected over an area that lies within an Electricity Substation compound containing exposed power equipment (Transformers etc).

DO NOT – Enter an Electricity Sub-Station compound, unless accompanied by DNO staff.

DO NOT – Attempt to erect a new wire, or to move an existing wire, where the path of the wire takes it within the boundary of a Sub Station compound, even if it does not pass directly over the High Voltage equipment within.

13. Joint Use of Electricity Poles

DNO Poles are not owned by Openreach so do not form part of the PIA product. CP's wishing to attach to Electricity Poles as part of their deployment will need to strike a Joint User agreement with the relevant DNO.

The technical requirements (inc separation distances on poles) for Joint Use of Power Poles are provided in Energy Network Association document EB/TP3 "Telecommunications Providers / DNO's Joint Use of Poles".

14. Maximum Span Lengths

The standard maximum span length for pole to pole, pole to premises is 68 Metres.

Exceptionally, spacing between existing poles may be found longer than 68 metres. Where this is the case and where the span in question does not cross railway or carriageway, spans of up to 85m are permitted. In all such cases, the standard minimum install height clearances (Driveway, Verge etc.) must be provided.

Where the span crosses Carriageway, spans of up to 75m are permitted. In all such cases, a minimum wire install height of 6.5m must be provided over the carriageway section.

Where the span involved runs from pole to premise, or, where the CP may intend to erect a new pole of their own that may create span length greater than 68m, they must first consult the Openreach SA, who will consider the specific site circumstances before advising in writing whether the installation may proceed. The following information is key to any consideration and will need to be supplied by the CP:

- Length of proposed span
- Maximum achievable height of cable
- Whether the cable will cross carriageway or railway
- Gauge of Openreach pole (Light, Medium or Stout)
- Whether the pole is stayed / can be stayed

15. Cable Marking / Labelling

The cable sheath must be marked in such a way as to uniquely identify the owning CP at all pole attachment / termination positions (including intermediate poles). The markings must be clearly visible and remain for the period of use of Openreach poles.

- Cables bearing the ownership markings of BT or Openreach must not be deployed by CP's.
- The CP must have and maintain an up-to-date record of all uses of Openreach poles including location, type of fixing and usage.

16. Shallow Climbable Poles

16.1. Special Instructions for Shallow Climbable (SC) Poles:

Shallow Climbable or 'SC' poles are marked with a green 'C' label (see Figure 20). All SC poles have been tested and subjected to a risk assessment by fully qualified pole testers. They are safe to climb and work on, provided that the conditions detailed below are observed.

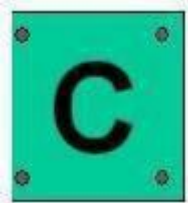


Figure 20: Shallow Climb label

16.2. Dropwire Loading on SC Poles

SC Poles will have a white rectangular white label attached (A559 Label – See Figure 24). This details the maximum number of Dropwire spans that can be fitted to the pole in any 180 degree arc.

To check that the wire limit has not /will not be exceeded, follow steps below:

Step 1:- Count all the Dropwires in the fullest 180° arc. (A)

Step 2:- Count the remaining Dropwires in the opposing 180° arc. (B)

Now subtract B from A – This figure should be no greater than the number punched out on the white A559 label.

Where the number either already exceeds or will be exceeded by the addition of another wire, the pole cannot be climbed, but can be accessed via a MEWP.

NB: Normal pole loading limits do not apply for SC Poles. Use the limit shown on the A559 label (Figure 24).

Where a CP's deployment is likely to take the wire count above the limit shown on the A559, the CP shall obtain Openreach's prior written consent before connecting any wire above the limit.

The CP shall not use the pole until it receives written approval from Openreach to do so.



Figure 24: A559 Maximum Load label

16.3. Climbing Limitations on SC Poles

- We strongly advise CPs not to climb or attempt to climb a pole if there is a Severe Weather Warning in force in the area
- No more than one climber permitted on the pole at any time

16.4. Pre-use Checking of SC Poles

All poles - including SC poles - must be checked prior to climbing. See Pole Pre-Use Check Procedure elsewhere in this document.

The only variance in the check is with regard to the 3m mark. SC poles will have a 3m mark between 1.8m and 2.05m (2.08m for imperial poles) above ground. It is essential to check that the 3m mark is between these limits.

17. Pole Labelling

17.1. Pole Test Label

Poles will have a plastic test label fitted (A558), indicating the year/month of last examination by a dedicated Openreach Pole Tester. The colour of the label may vary, depending on the test cycle. Poles with these labels were considered fit to remain in service at time of test.

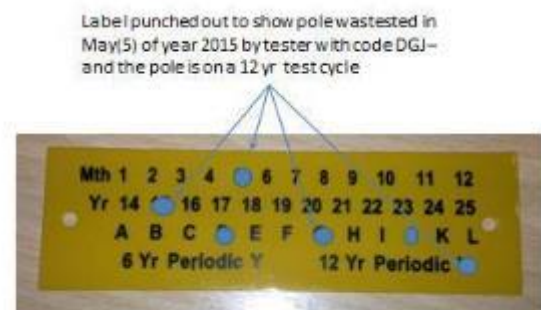


Figure 25: A558 Label

Poles less than 17 years old may not have test labels fitted, as programmed periodic pole testing does not begin until a pole reaches 17 years old.

A pole older than 17 years, with no label on it must not be climbed, but may be worked on from a MEWP or Scaffold Tower subject to a satisfactory risk assessment including a “Pre Use Check” by the CP.

17.2. D Poles

Marked with a red D (aluminium, approx. 45mm x 45mm), and also a red date label. These poles **must NOT be climbed**, but may be accessed from a MEWP or Scaffold Tower.



Figure 26: D and A558 Labels

17.3. Other Pole labels (aluminium, 45mm x 45mm)

SD (RED) – Pole is planted at shallow depth – These are not currently prioritised for renewal. See section 18 for detailed information on access and permitted works on these poles.

C (GREEN) – **Shallow Climbable** - Pole is marginally shallow, but is OK to climb as long as additional rules are followed (see additional info for “C” Poles in section 16).

H (ORANGE) – **Hazard** – The Pole is within 1m of a defined Hazard (spiked railings etc) – MEWP access only, but full range of engineering activities are permitted.

Z (GREEN) - Safe Climb Zone Pole – The Pole is within 1m of a defined hazard, but has been assessed as having a Safe Climb Zone, which allows those who have obtained accreditation (details of which are available via the Accreditation Guidelines) in the use of a Z pole to climb the Pole. For those that do not have the accreditation in the use of Z poles, these poles shall only be accessed and used via MEWP. A full range of engineering activities are permitted.

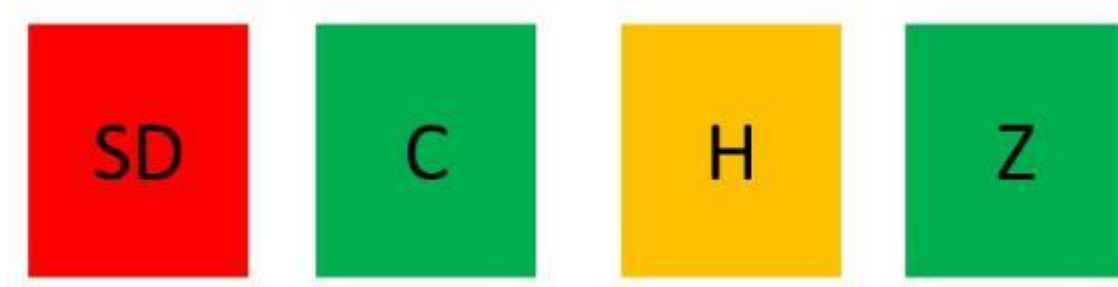


Figure 27 - Other Pole Labels

Note: Labels, especially D labels must never be removed by anyone, other than a designated Openreach Pole Tester!

17.4 Lamp Post Style Hollow Poles

Some non-standard, Lamp Post Style Hollow Steel Poles may be encountered (see fig 1 below). There are very few of these in the Network, but if encountered, they must not be used. Instead, a Network Adjustment request should be submitted. The Pole will then be made “D” by Openreach and renewed.



Figure 28 – Lamp Post style Hollow Pole

17.5. A1024 labels

Poles or associated plant with identified defects (but which do not make the pole 'D') will have a Purple or yellow, plastic A1024 label fitted.

The detail of the defect is written onto the label, and also recorded on the Openreach A1024 database. This label is removed when a defect is cleared.

NB: In cases where an A1024 Label carries the message "Do not climb" or similar. Then the Pole should not be accessed and no attachments should be made to it, until prior written consent has been obtained from Openreach



Figure 29: A1024 Label

18. Working on D Poles

Prior to starting any work on a D Pole, a full On-Site Risk Assessment must be undertaken.

It is also necessary to understand the reason why the Pole has been declared "D" as that will determine the level of work permitted. Pole status information can be obtained via SDED's.

A typical test result would be D – DEC, which would indicate that the pole has been made D for Decay. The tables below detail the various test results and associated levels of work permitted for each category.

18.1 Range of work permitted

Once the D test result has been ascertained for the pole in question, use tables 10, 11 & 12 (below) to identify the level of work that is permitted.

The permitted works fall into two main categories.

- A. Test and repair work, removal or replacement of existing Blocks / CBT's / Joint's and the replacement of Dropwires (Copper or Fibre) and Aerial Cables.
- B. Addition of new equipment – Blocks / CBT's/ Joints and Dropwires (Copper or Fibre), but not Aerial Cable.

Important!

Work may only be carried out where the relevant pre-requisite conditions have been met. See “Mandatory Conditions for permitted works” below for those conditions.

| Pole label | Test result | Description | Permitted works | Renewal policy |
|--|-------------|-----------------------------|---|--|
| D | COR | Corrosion (Hollow Pole) | (A) Test / Repair + Replacement of existing Blocks, CBT's, Joint's, Dropwires & Aerial Cable | Included in Asset Assurance renewal program. NB: These are known as Policy Poles. |
| D | DEC | Decay | | |
| D | DAM | Damage | | |
| D | DMO | Damage - move | | |
| D | NOR | No repair possible (Damage) | | |
| D | RPD | Recover pole - defective | | |
| D | *COL | Priority 1&2 (PIDOC) | | |
| D | *DOC | Priority 3 (PIDOC) | | |
| <i>* Dropwire / Aerial Cable replacement work is excluded from permissions for COL & DOC (PIDOC) Poles. However, other Cat (A) type work is permitted.</i> | | | | |

Table 10

| Pole label | Test result | Description | Permitted works | Renewal policy |
|------------|-------------|-------------|---|--|
| D | UNS | Unstable | (A) Test / Repair + Replacement of existing Blocks, CBT's, Joint's, Dropwires & Aerial Cable | Non AAP Policy Poles. Driving program to fund pole renewal (if required). |

Table 11

| Pole label | Test result | Description | Permitted works | Renewal policy |
|------------|-------------|--------------------------------|---|--|
| D | UTT | Unable to Test | (A) Test / Repair + Replacement of existing Blocks, CBT's, Joint's, Dropwires & Aerial Cable | Non AAP Policy Poles. Driving program to fund pole renewal (if required). |
| D | UNR | Pole damaged – Repair possible | | |
| D | DEP | Depth | | |
| SD | SD | Shallow depth | | |
| D | TNC | Tested not climbed | (B) Provision of new / additional equipment inc Blocks, CBT's and Dropwires, but not Aerial Cable | |

Table 12

18.2 Mandatory Conditions for permitted works

See relevant conditions for Cat A & B work below.

Note: In all cases, access to the Pole is by MEWP or Scaffold only!

18.2.1 Cat A - Test, Repair & Replacement work

In cases where the D test result indicates that Test, Repair and Dropwire / Aerial cable replacement work is possible, the work may be undertaken, subject to the following mandatory conditions:

- Site specific risk assessment has not identified any circumstances, which may make work unsafe
- For work involving replacement of a Dropwire or Aerial Cable - A Visual, Hammer and Probe test does not indicate that Pole has become in danger of collapse.
- The pole is only accessed by MEWP or Scaffold. Under no circumstances should a ladder be placed against it
- Caution is taken to ensure that the pole is not hit or jarred by the MEWP
- No removal of wires that appear to be providing critical support to the Pole
- **Important** - Any Aerial cable being recovered as part of replacement work, is de-tensioned slowly, not bolt cropped!
- Renewal of Aerial Cable is like for like only (i.e. Lightweight for Lightweight)
- Any Aerial cable which is replaced, is recovered immediately, not left in place (No significant permanent change of loading introduced)

18.2.2 Cat B - Provision of additional equipment (inc Dropwires)

Where the D test result indicates that it is possible to add equipment. Then in addition to Cat A work, new equipment – Blocks, CBT's and Dropwires (but not Aerial cables), may also be added, subject to the following mandatory conditions:

- Site specific risk assessment has not identified any damage or other circumstances, which may make work unsafe
- The pole is subject to a successful on the day standard hammer test (no decay identified)
- The pole is only accessed by MEWP or Scaffold. Under no circumstances should a ladder be placed against it
- Caution is taken to ensure that the pole is not hit or jarred by the MEWP
- No removal of wires that appear to be providing critical support to the Pole
- Where, using an angle finder app, the pole is shown to be leaning by more than 10°, no additional wires are to be added
- With any new wires added, the total number of wires on the pole does not exceed those shown in the tables below

18.2.3 Limitations to permitted additional wires on D & SD Poles

New Dropwires may only be added, where the conditions in table 11 and 12 can be met.

Radially distributed Poles

When added, additional wires **must not exceed** 75% of the maximum load of the pole (see table 13 below).

| Light & Medium | | Stout Poles | |
|----------------------|--------------------|----------------------|--------------------|
| Original max loading | 75% of max loading | Original max loading | 75% of max loading |
| 40 | 30 | 50 | 38 |

Table 13 – 75% Loading limits

Non-Radial (One side loaded Poles)

Non-radial poles are defined as those where all wires are attached in a single 180° Arc, with no wires or Stays in the opposing arc.

The standard wire loading limits are shown below and should not be exceeded.

| Pole Class | Light | Medium | Stout |
|------------|-------|--------|-------|
| Max wires | 7 | 15 | 30 |

Table 14 – Standard wire loading limits - One side loaded Poles

18.2.4 Emergency work (Radial & Non Radial)

The introduction of additional loadings beyond the limits shown in Tables 13 & 14 are not permitted. The only exception being Emergency Work, which is defined as work for hospitals, ambulance, police, fire or similar circuits.

Commercial necessity is not a valid reason for carrying out work classified as an emergency.

19. Pole Pre-Use Check Procedure

It is essential that CPs must check the integrity of all poles before they are worked on and/or used. This is a mandatory requirement, and must be completed irrespective of how the pole is to be accessed. It must be completed both for any access to and use of a pole, whether climbing, MEWP or Scaffold Tower.

The Accreditation Guidelines require any Customer Personnel using poles to have the appropriate accreditation and be able to demonstrate that they are able to complete a pre-use check.

The Openreach network is comprised of many different pole types, and some poles will have a differing test regime. It is part of the Pre-Use Check to ensure that the pole is compliant with Openreach's test regime, by checking the applicable test history.

To help with this part of the pre-work check, a PDF handout is available below. This can also be printed and laminated if required.



Pre Climb Pre-Work
check for PIA CPs.doc

In addition to the focussed Pre-Climb / Work check described above, and in line with standard health and safety practice, a Site Specific Risk Assessment must always be carried out by the CP. This to identify any additional indicators of risk, such as (but not limited to) physical damage to the pole and / or Overhead wires, possibly caused by a vehicle strike. Also, warning labels on the pole and barriers around it, which may provide indication of a problem.

Infrastructure KCI messages sent to Suppliers by Openreach are intended to provide a useful indicator of the state of the infrastructure only. These are not in any way, a replacement for a robust onsite risk assessment."

20. Attachment to Chimney Stacks

The house end attachment of any newly provided CP Dropwire running from a pole must not be made onto a Chimney Stack.

For clarity. On a Gable end situation, attachment may be made further down the stack, providing it is no higher than the roof line. See figure 29 below for illustration. Further information on the background to this requirement is available from the Openreach SA.



Figure 30 – Attachment to gable end chimney stack

21. Cable Coils on Poles

Where a cable coil is to be left permanently on a pole, it must be suitably housed within a coil management bracket. See example below. Unmanaged / loose coils are not permitted.



Figure 31 – Coil Bracket



Figure 32 – Coil brackets installed

The example bracket shown above is a Malicoil product, supplied by [Sicame UK](https://www.sicame.co.uk/). Other alternative types of coil bracket (i.e. smaller) may be used, subject to prior approval by the Openreach SA.

21.1 Coil Bracket installation requirements

Any coil bracket fitted must:

- Be fitted in the lower pole envelope and be above the capping, or a minimum height of 2m above ground and a minimum of 450mm below the first climbing step. It must also not project above or below these points.
- Not project into the highway/footway or any other area of hazard.
- Be easily removable for the purpose of pole testing.
- Not impede safe ladder placement / climbing of the pole
- Have cable coil secured to the bracket arms with cable fixing straps

Wherever possible, multiple cable feeds from the CP's AFN's/CBT's should be contained within a single Coil Bracket. Only where the amount of cable exceeds the capacity of a single Coil Bracket should another bracket be introduced.

22. Equipment on Openreach Poles

22.1 Additional requirements for CP's Equipment

- Wire / Equipment provided on poles must not inhibit access to Openreach or other CP's Equipment (Block Terminals / CBT's)
- Equipment must be deployed in a way which is respectful of the limited envelope of permitted space (particularly at the Pole Top). This to facilitate maximum usage of the pole by other CP's and Openreach.
- CP's Cables / Network equipment and the services provided through them shall not cause, or have the potential to cause interference or disruption to the services of Openreach, or other CP's.
- All Equipment used shall be designed to withstand unfavourable weather conditions. i.e. Steel items shall be either stainless or galvanised steel and all Plastic components shall be UV stable.
- It is recommended that where an underground AFN feed is provided up a Pole, that two to four metres of cable slack is provided in the adjacent joint box (where possible / practical). This to provide sufficient length of cable to reposition the CBT (without need for splicing work) when the pole is renewed at some stage in the future.

23. References

- ENA Documents -TS PO5, EB/TP3.
- Telenco Products - <http://www.telenco-networks.com/en>

23. Change Record

| Issue | Date | Author | Change |
|-----------|-----------------------------|--------------|--|
| N | 17 th Sept 2021 | Glen Barford | Amendment to section 3.3 – Fixings. New wire loading rules included in section 7. New information on Lamp Post type Hollow Poles added at 17.4 |
| .M | 27 th April 2021 | Glen Barford | Numerous changes to content throughout document. |
| L | 6th April 2020 | Glen Barford | Introduction amended (Page1). New envelope of space policy – Sec 5 (Bullet 2) and Figure 3. New span length policy – Sec 14 |
| K | 17 th Feb 2020 | Glen Barford | Full review – issued after consultation with OTA, CP's and Openreach stakeholders |
| J | 23rd Jan 2019 | Glen Barford | Full document review, with numerous changes throughout |
| H | July 2017 | Glen Barford | Sec 2.1 Cable performance requirements amended. Sec 7 – A558 info updated. Sec 8 - Latest version pre-climb check included. |
| G | February 2016 | Nick Adams | New section 8 and other minor revisions |
| F | November 2011 | John Pearson | Section 7 revised on no test label |
| E | November 2011 | John Pearson | Section 7 revised on D Pole working |
| D | October 2011 | John Pearson | Inclusion of DILOR table at 3.8; New section 6 – Shallow Climable poles: Amendments to 3.4 a new 3.5 Fibre labelling; Amendment to sec 5 Cable marking |
| C | May 2011 | Nick Adams | Change to Ice /Wind data and inclusion of pole labelling information |
| B | April 2011 | Nick Adams | Addition of section 4.3 – clearances between cables |
| A | December 2010 | Nick Adams | New Document |

23. Specification Authority (SA)

Openreach – Overhead Network Policy and Standards Manager
 First Floor - Telephone Engineering Centre
 Grimsby
 North East Lincolnshire
 DN31 2TJ
 Mob 07802 195 363
 Email: Glen.barford@openreach.co.uk

24. Appendix 1 – CP Cable Testing

Wherever Overhead deployment is to be used, CP's shall submit details and samples of the cables to be deployed to Openreach, for testing / approval. Under no circumstances must an overhead cable be deployed which has not received prior written sign off from the Openreach SA.

This is a one off requirement that only needs to be repeated if the CP decides to change the type of cable used at some future point in their deployment.

To facilitate sign off, the following is required by Openreach:

An electronic Copy of the Manufacturers Data Sheet - which must be sent to the Openreach SA and include the following:

- The Cables Type / Part No
- Confirmation of the cables' ultimate tensile load (the load at which the cable breaks). This information may be provided in the Data Sheet, but if not, a Load Test report from a reputable Testing House will suffice.
- Confirmation of the cables suitability for use under overhead power lines of up to and including 11kV, with a minimum vertical clearance of 1.8m. Again, this information may be provided within the Manufacturers Data Sheet, or alternatively, a HV Test Report from a reputable Testing House.

Cable samples – To facilitate physical testing, the following must be supplied to Openreach in a waterproof bag:

- A 50 metre sample of each cable
- 10 x Clamps for each cable type
- 2 x Fibre Locking Bollard – If these are used within the CP's architecture
- A copy of the Cable Datasheet, which must be attached to the cable sample, stating the specific Cable Type / Part No
- The name of the CP and contact details

A downloadable process flowchart is available as set out below.

Where a CP feels that the cable they are looking to deploy is identical to one already tested / approved / used by Openreach, they may request that their cable is not subject to the physical testing element of the cable evaluation, but this is only permitted where the cable the CP is looking to use is on the approved list of Openreach cables, which is available for download below and in such cases only where Openreach receives written confirmation from the cable Supplier / Manufacturer, that the CP and Openreach cables are identical.

a. Downloadable files



CP8 - Cable Testing
- Proposed - Octobe



Openreach
Overhead Cables.doc

End