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Minimum Heights & Carriageway Definitions

Carriageway definitions and required height clearances for overhead plant

About this document ...

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Content approval

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Issue 1	16-Feb-2007	Nick Adams	Previously issued as ISIS EPT/NNS/V009 - reissued in ANS range of documents as part of new network standards documents

Table of Content

1 *Introduction*

It is important that wires & cables are installed at an appropriate height for the circumstances, as wires incorrectly fixed can present a considerable risk to the public, BT personnel and BT's network.

Therefore in order to improve the safety factors within the Access Network the following requirements have been set.

The height requirements will establish a common approach across BT that will ensure a single best practice when work is carried out by both BT personnel and contractors in the access network. An appropriate A1024 should be submitted for any plant which does not meet the standards detailed in this document

2 *Status*

These instructions are mandatory.

3 *Scope*

These instructions cover the height requirements to be met by BT people and contractors carrying out work in the overhead Access network. This document lists the definitions used for "main roads" and "minor road crossings" as per CENELEC document EN 50174-3. CENELEC document EN 50174-73 is an EC directive requiring utility/service providers to install their plant at certain heights in certain carriageway situations.

These standards became fully effective from 1st April 2003.

Section 4 of this document details the installation standards for newly installed plant, in various situations. There are some instances where concessions to those installation standards may apply, and these concessions are detailed in Section 6.1

There are differing standards applied to existing wires & cables. There is also now a Risk Assessment process for determining the priority of existing wires that fall below standard, and also whether those wires & cables will be actioned at all. Existing wires below standard are allocated A1024 defect codes, and detail on those codes and the respective heights can be found in ISIS NWK/NNS/V018.

4 *Minimum Heights, Carriageway & other Definitions*

Where wires or cables pass over roads, railways, field entrances etc., appropriate minimum clearance heights are required and are detailed within the following table. Other additional information is included to help the installer/planner.

Definitions within these tables:-

- "Road Crossings" are any wire or cable crossing a road defined as a carriageway.
- "Reasonably practicable" means the best result that can be achieved using a fair and reasonable amount of the resources available, and in the circumstances as they are.
- "Foreseeable hazards" means hazards that can be anticipated after conducting a reasonably thorough review of all the relevant circumstances.
- "Unrestricted vehicular access" means a vehicular access that is not subject to any form of permanent height restriction, – movable car park barriers, height flags or suspended wooden boards etc do NOT constitute a permanent restriction.
- "Restricted Height Access" means where the vehicle access is restricted by a permanent physical barrier to all entrances (i.e. Bridges, Subway or Underpass roof, Stone Arch etc) and there is no other possible access.
- "Driveway /hard standing" generally on private land and provides vehicle access or parking for one or two residential dwellings. These are generally parking areas or garage access points adjacent to houses /bungalows /maisonettes.
- "Private Roads or Drives" – these provide access to two or more separate driveways/hardstanding.
- The road surface is not the only determining factor in carriageway definition decisions

Crossing Type	*B.T. Minimum Clearance above Ground Level*	*Additional Notes*
1. Carriageway (public or private) with unrestricted vehicular access, classified as a road crossing.	**Install** dropwires at 5.9m & aerial cable at 5.6m **Retension** existing network at 5.5m for both dropwire and aerial cable	A/ Regulatory minimum (EPT/OAM/F011 refers). B/ All Class A, B & C roads including access to motorway service areas. C/ Unclassified roads i.e. housing estates, streets, caravan/mobile home sites. D/ Single track roads Service roads – public and privately maintained. E/ Lay-bys on any of the above roads. F/ Entrance to car parks with multiple use including lorries. G/ Where there is clear vehicular access either public or private
2. Field entrances & access to private land from carriageway with unrestricted vehicular access	**Install** dropwires at 5.9m & aerial cable at 5.6m **Retension** existing network at 5.5m for both dropwire and aerial cable	A/ You must consider foreseeable hazards in the use of land e.g. arable farming (combine harvesters etc), livestock showground etc. B/ Apparatus must not interfere with the conduct of any business carried out on the land. C/ All install heights are minimum unless previously agreed higher within wayleave documentation with landowner **Local conditions may dictate higher clearances**.
3. Entrances between fields and private land not involving a carriageway.	**Install** dropwires & aerial cables at minimum 4.0m	A/ You must consider foreseeable hazards in the use of land eg, arable farming (combine harvesters etc) livestock showground etc. B/ Apparatus must not interfere with the conduct of any business carried out on the land. C/ All install heights are minimum unless previously agreed higher within wayleave documentation with landowner **Local conditions may dictate higher clearances**.
4. Routes (multiple	**Install** dropwires &	A/ You must consider foreseeable

poles spans) on private land, field's etc. (This does not cover flying wires).	aerial cables safely at safe heights and foreseeable hazards must be avoided	hazards in the use of land e.g. arable farming (combine harvesters etc) livestock showground etc. B/ Apparatus must not interfere with the conduct of any business carried out on the land. C/ As agreed within wayleave documentation with landowner if this is higher than the estimated height to avoid foreseeable hazards.
5. Bridleways, tow-paths, walkways, footpaths & cycle paths	**Install** dropwires & aerial cables at 3.7m	A/ Ways only used by pedestrians, equestrians, cyclists etc. B/ Local conditions may dictate higher clearances.
6. Private drives on individuals property Where only vehicular access is into garage/garaging space, where it is for cars and/or compact multi-purpose vehicle (MPV's), as opposed to larger vehicles.	**Install** dropwires & aerial cables as high as reasonably practicable on customer's property/building.	BT has a legal responsibility to install its plant safely at safe heights and foreseeable hazards must be avoided. See further guidance and example drawings in Section 5 below
7. Private drives/roads/garaging areas (where unrestricted vehicular access is required)	**Install** dropwires at 5.9m & aerial cables at 5.6m **Retension** existing network at 5.5m for both dropwire and aerial cable	For private drive/road situations where un-restricted vehicular access is required beyond the final dropwire span, 5.9/5.6m (as item 1 above) will apply. See further guidance and example drawings in Section 5 below
8. Back Alleys with permanently fixed access restrictions	**Install** dropwires & aerial cables safely at safe heights and foreseeable hazards must be avoided	For back alley or rear access lanes that were previously open to traffic, but where the relevant authority or landowner has fixed permanent gates or barriers which will not permit any vehicle access except cycles or motorcycles. If the gates can be unlocked to allow access by large vehicles then this does not apply. See example drawing below (Fig 6)
9. Private Property	**Install** dropwires &	The minimum requirement **on the private**

being served	aerial cables safely at safe heights and foreseeable hazards must be avoided	**property being served** is for installation to be at safe heights and foreseeable hazards must be avoided. There will be specific occasions when a greater clearance will be required, e.g. at a customers request or as agreed on written wayleave. See further guidance and example drawings in Section 5 below See NRI 102 for clarification on foreseeable hazards & safe heights and methods of height calculation.
10. Private Property being "flown" over (neighbours etc.)	**Install** dropwires & aerial cables at least 3m above ground & additionally at least 2m away from any building over which it passes.	The minimum requirement when serving a property by **crossing over a neighbouring private property** is for installation to be (over neighbouring private property) at least 3m above ground & additionally at least 2m away from any building over which it passes. A wire/cable is "flown" when it has no means of support on the relevant section of land. See further guidance and example drawings in Section 5 below As per Para 10 of Electronic Communications Code (Power to fly lines).
11. Alongside roads (none or minimal encroachment on road)	**Install** dropwires & aerial cables at 3.0m min or higher if other crossing types are involved	3m is a minimum height. Local conditions may dictate higher clearances as per items 2, 5, 6 & 7. BT has a legal responsibility to install its plant safely at safe heights and foreseeable hazards **must** be avoided.
12. Railway, light railway, tramway or trolley vehicle system crossings	**Install** dropwires & aerial cables at 7.0m above rails	Railways or any other system with overhead power catenaries must NOT be crossed with dropwire/aerial cables.
13. Railway crossings in goods yards where mobile cranes operate	**Install** dropwires & aerial cables at 9.1m above rails	Railways with overhead power catenaries must NOT be crossed with dropwire/aerial cables.
14. Non-navigable waterways	**Install** dropwires & aerial cables at 5.0m	Height required above water surface when water is at normal level.
15. Crossings over	**Install** dropwires &	As high is necessary so as not to impede

canals and other navigable waterways	aerial cables as required by authorities responsible for waterways and shipping	free navigation or other use of the canal or waterway.

4.1 Routes previously classed/known as High Load Routes

Previously, there were a number of pole routes classed as 'High Load Routes'; these were where we committed to maintain all road crossing wires at 6.5m. This was done in conjunction with the Dept of Transport.

This service is now no longer maintained, and it would not be appropriate for Openreach alone to maintain this.

Requests from Hauliers and police forces may still arise, but these will be dealt with on a 'case by case' basis, and PPOs will attend and arrange for cables to be lifted or temporarily removed, in conjunction with local TRC procedures, as necessary.

The Dept of Transport no longer maintains specific details of routes classed as High Load Routes, and instead works in conjunction with Hauliers and the Highways agency, to determine the best way to move oversize loads.

In view of this, it has been determined that it is no longer appropriate for Openreach to maintain the original concept of 'high load routes' – where all road crossing wires and cables were fixed at 6.5m.

4.1.1 Guidance for CSEs / Planners/ Poling teams / Contractors

When working on any pole, previously classed as a 'high load route', then standard installation or maintenance heights now apply:-

Wires installed at 5.9m /5.6m, or 5.5m and a Cat 4 A1024 raised

Wire renewal /retention 5.5m (retention to 5.2m only permitted by an OSRA competent person see 6.2.1)

Wires below 4.8 – Cat 1 A1024 should be raised

Wires between 4.8-5.2m – Cat 2 A1024 should be raised.

Cat 3 A1024s should no longer be raised for wires between 5.2 -5.5m

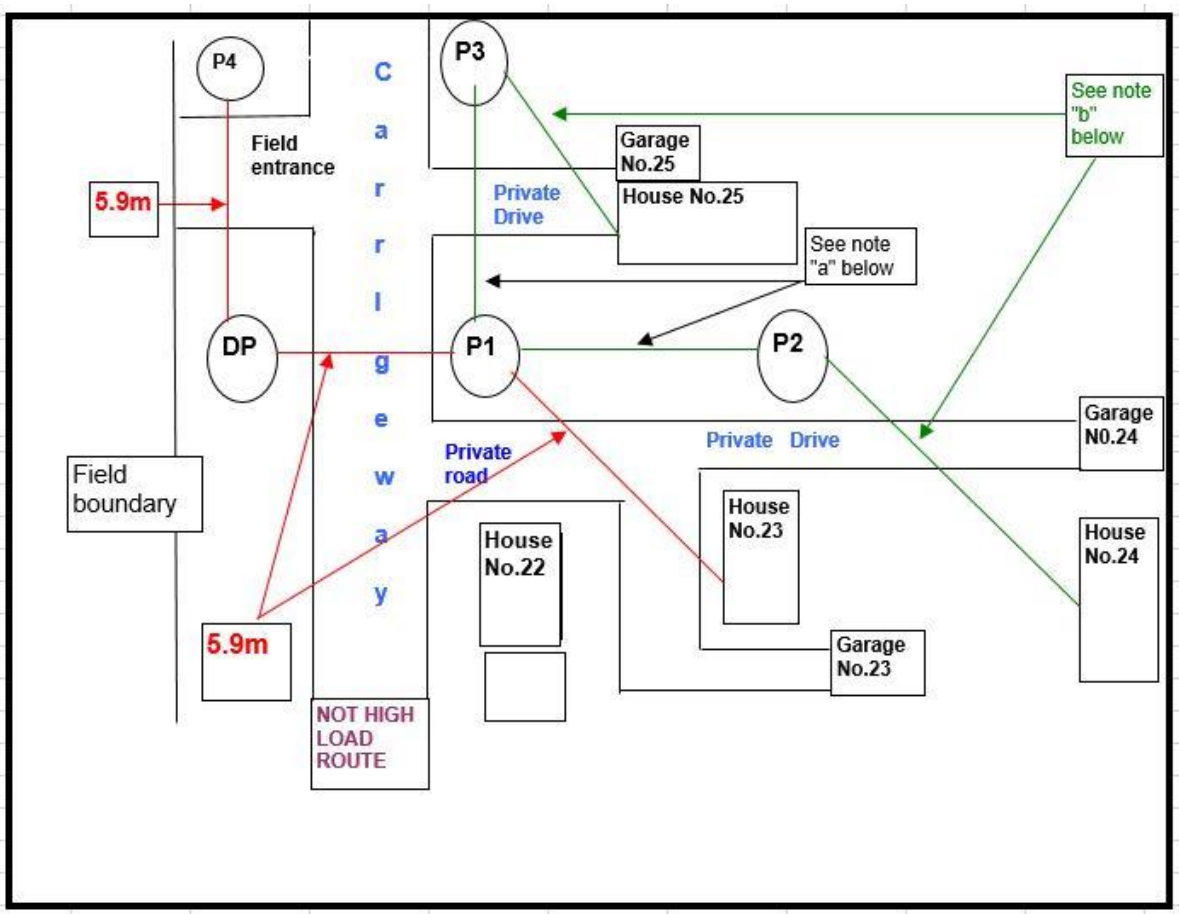
The safe climb height is 5.2m for ALL poles which have road crossing wires

Do NOT replace or fit new high load route labels on poles which have been renewed.

5 *Examples & Further Detail on Categories*

Some of the situations above are depicted in the diagrams below.

Figure 1



Note: a – The wire/cable crossing the driveway to number 25 between the 2 poles, the wire/ cable between pole 1 and 2 must be placed at such a height that it will not interfere with the carrying out of any business on the customers land. As the wire cable is alongside a carriageway/private road above the verge/pavement the minimum height must be 3m or high enough to account for any crossing as defined above that is higher than the 3m minimum (as per sections 3, 6, 7 & 8 above). BT has a legal responsibility to install its plant safely at safe heights and foreseeable hazards **must** be avoided

Note: b – The wire/cable being the final span to number 24 or 25 must be placed at such a height that it will not interfere with the carrying out of any business on the customers land. Therefore the height must be as high as is practicable and could be as high as 5.6/5.9m (as per sections 6 & 7 above). BT has a legal responsibility to install safely at safe heights and foreseeable hazards **must** be avoided.

Figure 2 - Example of Cul-de-sac (Plan View)

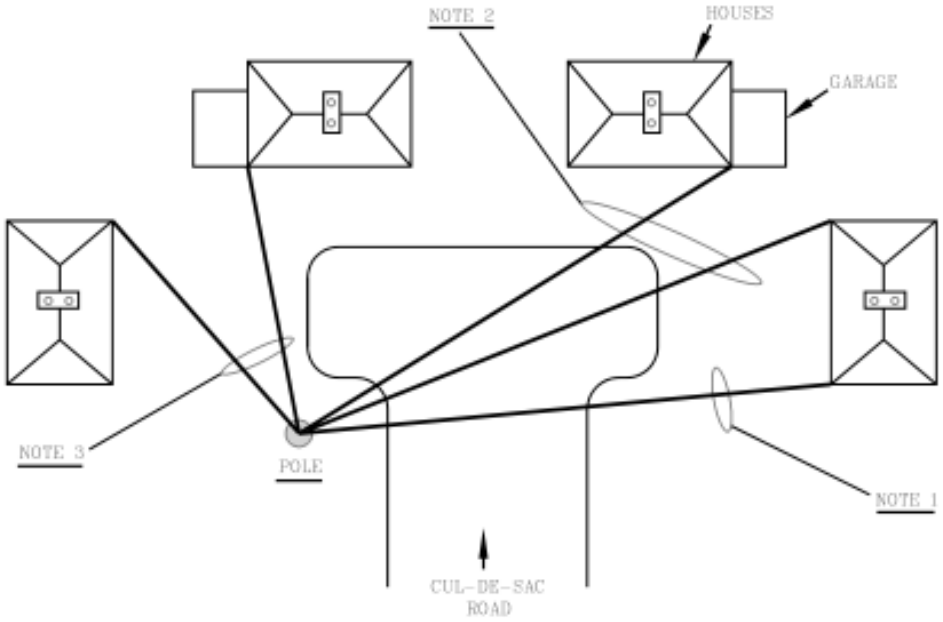
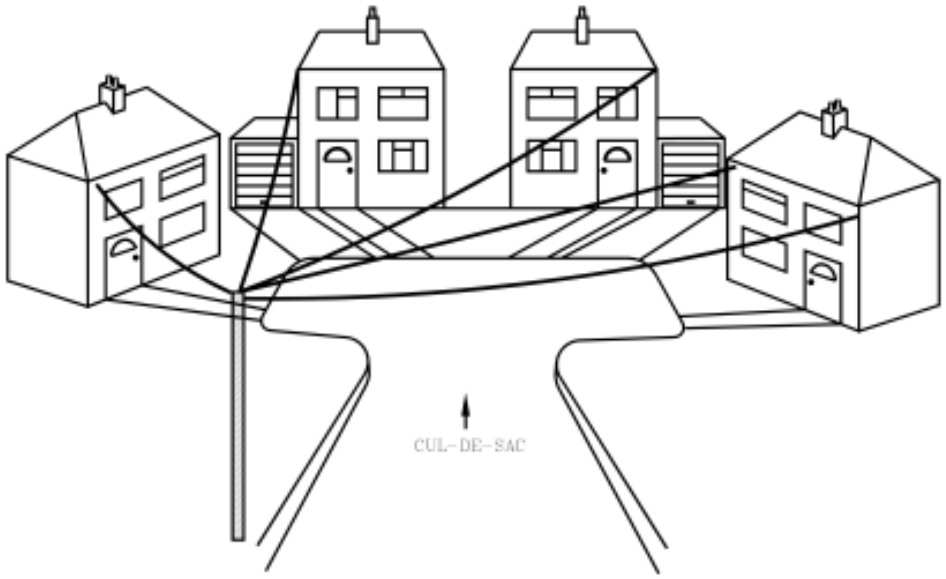


Figure 3 - Example of Cul-de-sac – (Front view)



Note: **1:** – This wire is crossing the main carriageway and must be at 5.9m/5.6m

Note: **2:** – Although these wires are only crossing the end of the cul-de-sac they must still be at 5.9m/5.6m

Note: **3:** – These wires are only crossing the drives/ hardstanding of the houses, and even though they may be shared or multiple drives, they fall into Category 6 in the table above.

Figure 4 - Straight line of houses with various access points (Plan View)

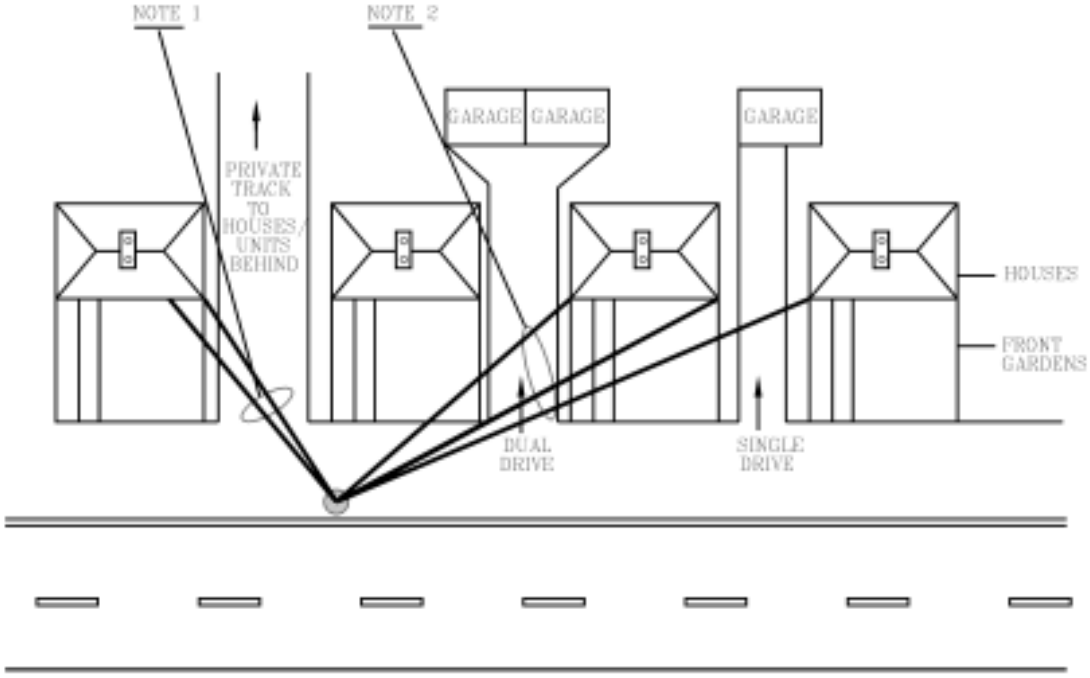
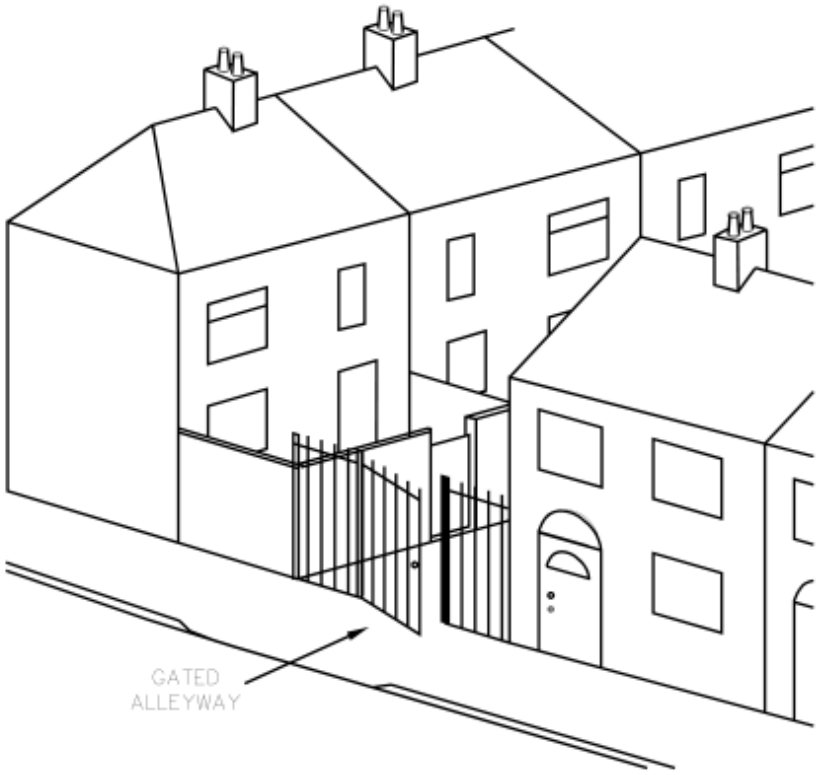


Figure 5 - Straight line of houses with various access points (Front View)

Note: **1:** - These wires are crossing a track/access road (whether public or private) and therefore must be at 5.9m/5.6m

Note: **2:** - These wires are crossing the gardens and drives to houses/garages only. Therefore irrespective of how may drives are being crossed, the wires must meet category 6 at the points where they cross the drives, and ALSO be a minimum of 3m at the points where they cross any gardens or other private land being 'flown over'.

Figure 6 - Example of Category 8 – Gated back alley



6 *Concessions and Deviations from the Detailed Standard*

6.1 Table in Section 4 (category 1)

The table in Section 4 (category 1) specify a clearance height of 5.9m for dropwires and 5.6m for aerial cables, over carriageways. This requirement is beyond the clearance height detailed in the Communications Code 2003 – which specifies a minimum height of 5.5m. The additional height specified in Section 4 includes an allowance to give increased assurance that wires/cables will not degrade beyond the safe climb height of 5.2m, which would then necessitate further rectification.

There are instances where it is permitted to install both dropwires and aerial cables at 5.5m. These concessions are to allow for provision of customer service on due date even if the full height cannot be achieved, or to prevent proliferation of 'feeder poles' which may be needed simply to ensure the full height on ALL wires/cables, during renewal/upgrade work.

These concessions are detailed fully in ISIS EPT/ANS/A010.

6.2 On Site Risk Assessment (OSRA) process, to determine application of carriageway standards (existing wires/cables only)

6.2.1 Introduction

This section describes the methods and rules which competent individuals should apply to determine whether carriageway rules do or do not apply, and the minimum wire/cable height that is acceptable in those situations and where they do not.

There are certain situations in the network where overhead dropwires and aerial cables cross a road/route that has multiple vehicular access. Despite this, carriageway rules may not apply due to the nature of the specific site.

Note: A competent individual is classed as being an Openreach employee, fully conversant with overhead construction methods, has a full understanding of both the OSRA flowchart and overhead wire heights found in ISIS EPT/ANS/A013.

6.2.2 On site Risk Assessment (OSRA)

There are 3 key areas in assessing whether carriageway rules should be applied when working in the overhead network.

These are in line with the OSRA flowchart document.

- Is the site a road?
- Is the site defined as a special circumstance?
- Does the site have restricted access?

Definitions of the above and their application are expanded upon in the OSRA Flowchart.

How to carry out an On Site Risk Assessment (OSRA)

The flowchart describes the thought process to be applied when determining whether carriageway rules apply to a particular site and is the only process to be used for reaching such a decision. The flowchart MUST be read in conjunction with its associated notes and definitions.

The OSRA Flowchart.

Note: All sites where an OSRA assessment has been applied MUST have an A1024 raised using the unique defect codes of 567 for a Dropwire and 566 for an Aerial cable.

Note: This is an On Site risk assessment so a site visit MUST take place and not assessed from an office using electronic media such as Google street view.

Example 1 – A restricted entrance to a car park which is permanent and has no other vehicle access/entrance into the car park (height requirement in the car park area - a minimum of four (4) meters ground clearance

Example 2 – A permanent gateway which cannot be unbolted or removed to allow a taller vehicle to pass through. This is classed as non-carriageway under OSRA rules

Example 3 – Non removable width restriction such as a large tree branch (which cannot be brushed past by a vehicle), concrete step, and accessibility to turn around at the end of the drive

6.3 Special rules for D pole renewals under OSRA

The following process should be used when 'D' poles are encountered on sites where normal wire height carriageway clearance cannot be achieved and where it is thought that reduced clearances under the carriageway low wire risk assessment (ORSA) process may be applicable:-

6.3.1 Initial Survey Stage:

Where, prior to a 'D' pole being changed, the initial survey identifies that normal carriageway height clearances will be unachievable by simply installing a larger pole (i.e. additional poles / Civils or U/G work required); the surveyor may consider whether reduced wire height clearances might be possible by use of the carriageway low wire risk assessment (OSRA) process.

Typically, this will be situations where there appears to be restricted vehicular access to the site.

Note: Refer to ISIS EPT/ANS/A013 - section 6.2 for more information on the carriageway low wire risk assessment (OSRA) process.

6.3.2 Requesting a Low Wire OSRA 'D' pole survey:

Where it is felt that the site circumstances are such that a carriageway low wire OSRA may be applicable, the poling planner/surveyor should first contact the Asset Assurance Program Office (AAPO) to ascertain whether an A1024 exists for low wires at that location.

If no A1024 exists, the AAPO will create one. The A1024 reference should then be quoted on a carriageway low wire OSRA request form attached for download with this ISIS

OSRA request form.xls

The OSRA request form

The form should have the "D Pole with Low Wires" option selected from the drop down menu.

All other relevant information and supporting photos should be included on within the form. The completed form should be submitted to asset.assurance.osra@bt.com

6.3.3 Processing an OSRA request

Upon receipt of the form, the OSRA team will instigate a detailed site survey by an individual who is competent in the Low Wire OSRA process. The

competent individual should carry out the survey, decide whether to classify the affected site as OSRA (A1024 Cat Code 566 / 567 or 580) and advise the AAPO of the outcome.

If the request is approved: - The AAPO will enter the details on the A1024, issue an ARTISAN slip number and disconnect the A1024 from the 'D' pole. The poling team will be advised to proceed with the job as an approved carriageway low wire OSRA work, with wires over the approved area erected to the best possible height achievable and with a minimum of four (4) meters ground clearance.

Note: Under no circumstances should the poling team execute works to OSRA heights without this authority.

If the request is rejected: - The AAPO will enter details on the A1024, issue an ARTISAN slip number and advise the poling team to proceed with the 'D' pole and low wire works to standard carriageway height rules.

6.3.4 Completion of works

When undertaking works, the poling team should ensure that the relevant OSRA wire heights are met Following completion, the A1024 / ARTISAN slip number confirming the site as 'Low Wire (L/W) OSRA applicable' should be clearly entered onto the closing job pack notes. The 'D' pole job will be closed by the AAPO, but the A1024 will remain open for audit / reference purposes.

6.3.5 OSRA wire height requirements

- All wires and aerial cables on the site that are covered by L/W OSRA must be installed at the best possible height achievable and with a minimum of four (4) meters clearance.
- Any other individual wires on the same pole which are not covered by L/W OSRA, and which cross a separate road/carriageway, must meet the standard carriageway clearance requirements.
- If the initial site survey identifies that a minimum 4 meters of height clearance is not achievable on all wires and cables that are proposed to be covered by L/W OSRA, then an alternative solution must be planned.
- If when surveyed by an L/W OSRA competent individual, the site is deemed to not meet the necessary criteria, then an alternative solution must be planned.

The L/W OSRA Assessment process is detailed in ISIS EPT/ANS/A013 section 6.2

6.3.6 Quality Audit

When carrying out a quality standards check, Auditors will recognise carriageway rules do not apply on de-classified sites identified contained in the OSRA flowchart (i.e. sites where it has been determined that carriageway rules should not be applied).

All sites where an OSRA assessment has been applied MUST have a unique A1024 defect code held within Artisan of 566 for an Aerial cable and 567 for a Dropwire. Auditors can validate this by checking on the A1024 system or by contacting the Asset Assurance programme office and quoting the Exchange, DP number and address.

D pole renewals under OSRA quality audits

Where the pole is subsequently subject to quality standards check, the audit will be carried out using the Carriageway Low Wire OSRA reduced wire height clearances, providing the A1024/ARTISAN slip number confirming the site as L/W OSRA, is made visible on the closed job notes.

Jobs which have **not** been approved as L/W OSRA applicable and jobs without a slip number will be audited to normal wire height rules.

6.4 Use of Technical Departures from Standard (TDFS) or Sub Optimal Solutions

Only applicable to Asset Assurance Low wire and D pole programmes

If it is not possible to complete the Overhead/Poling work to current quality standards at a reasonable cost as specified in ISIS instructions or using the OSRA process, a Sub optimal solution may be applicable at a site.

The criteria for this are defined by the Plant safety team and MUST be agreed and registered before work can proceed.

Authorisation for these can only be given by the Openreach Plant Safety Team.

This Sub optimal process is to be followed where the Poling/Overhead surveyor identifies, during the survey, and prior to starting any work as a result of site conditions or the constraint of existing O/H network, the current quality standards for D pole /Low wire/OSRA cannot be met. Or would require excessive work for the benefit gained.

Examples of where a sub optimal solution **may** be applicable, but are not limited to, include:-

Pole positioning issues & proximity to hazards, current D/W span rules, 14/40 m A/C rule for Unstayed Construction, listed buildings, Heritage sites,

NT, GDPO, Building structures, Accessibility to wires/ cable fixings where specialist access equipment cannot be utilised to exact current Quality Standards.

This process **is not** to be used in situations where poor quality workmanship or inadequate site set up/preparation has resulted in a non-conforming product.

Photographic evidence, relevant survey documentation and completed Sub optimal Data Collection form must be submitted via plant.safety.optimal.solutions@openreach.co.uk before any permission is granted. A follow up e mail to the plant safety team is required to advise them.

The Data Collection form

The Data Collection form.xlsx

7 *Height Measuring and Height Calculation*

For details of how to measure existing wire heights or measure and calculate new wire heights see ISIS EPT/OHP/B011 - Overhead Distribution regarding the use of Fixing Height Calculator and Rods Clearance.

8 *If in Doubt*

In any situation where doubt exists as to the required clearance, engineers should consult with their line management and together ascertain the correct height.

9 *Pole Test Specific*

Pole Testers carry out checks on wires and cables as part of pole testing activity. The criteria laid out in this document and the Onsite Risk Assessment are relevant to this team although Pole testers are not carrying

out provision or repair work. The exception is that dropwires on non high load routes that are 5.2m or higher are no longer recorded as Category 3 low wires.

Pole Testers must no longer raise Cat 1 A1024s for wires on high load routes below 6.5m – the standard heights and categories should be used.

All existing labels detailing high load routes are to be removed.

10 *References*

A wider range of information on Access Network can be found on the Technical Library.

General information regarding pole layout, heights and loadings can be found in ISIS EPT/OHP/B058 & EPT/ANS/A010

All craft practises are contained in the appropriate ISIS documents that are available from your Manager or BT representative.

11 *Enquiries*

Enquiries and document change request should be made to the author of this document.

END OF DOCUMENT