

QC Guide 2020 v2

CityFibre



Revision History

Date	Version	Author	Department	Notes
08/07/2019	1	AH	Architecture	Initial release
24/06/2020	2	JP/DH/MM/AS	LLD team	Updated to align with new architecture document

Reference material

This document is a guide, always refer back to the source material listed below

Document Name	Version	Date of Release
Well Planned City Architecture Reference Design 5 v1.0	1.0	15/06/2020
A&E Bulletin - Openreach CP08 Revision L – Guidance Notes	1.0	16/04/2020
A&E Bulletin - Fibre Allocation Sheet Update v1.0	1.0	15/06/2020

Filling in the QC Checklist

City / FEX / PN		CITYFIBRE CityFibre LLD QC Checklist v7.0
Design Partner		
CF QC'er Name		
Date CF QC'ed		
Q.C Result		

- The different sections must be populated with the relevant information. When it comes to going through the checklist, the 'CF Check' column must be filled in with either **Y**, **N** or **N/A**. When putting **N** in the 'QC Check' column, a relevant comment must be added to explaining the defect. This comment might point to comments placed on other documentation.

Ref	QC Description	QC Check	Comments
1	PN Civils Map		
1.1	PN/SN/ASN Location, Boundary & Label Shown and correct		
1.2	Feeder Network Highlighted & matches core design		
1.3	Feeder FW4 chambers captured (200m or turning points)		
1.4	Correct Feeder duct count (2way/3way/4way/5way)		
1.5	Feeder exit point labels shown and correct		
1.6	Indicate Distribution Routes (PN to ASN/SNs) (7D/14D)		
1.7	Correct Pole symbol used		
1.8	Indicated Drop Routes (SN to property)		
1.9	Spare Sub Duct (20/16 to EOL) shown only on new CF build		
1.10	MDUs - Building outline highlighted (3+ demand points)		
1.11	LOC Area types recorded - <i>Coloured highlight</i>		
1.12	Existing CF network fully utilised		
1.13	Existing BT network fully utilised		
1.14	Five Elements Rule (Drop trenches conform)		
1.15	Minimise Dead Dig		
1.16	Street Names shown		
1.17	SED & POI references (Highlighted on map & Detailed in table)		

QC Fails/Queries

Submission Fails

- Submissions which break the guidelines set out in this document, will likely result in the submission being Failed. If this is the case the re-submission must be a V2.
- There is a discretion that the resubmission can be a V#.1, but this decision sits the CityFibre design team.
- All fails are open for discussion, CityFibre have set in place daily DP QC calls, where the fails can be discussed, so that everyone is in agreements on how to resolve the failure.

Submission Queries

- Any questions or concerns can be raised through our 'Design Forum' this is used so all DP's are aware of the questions being asked, so can all learn and avoid common issues across all DP's.
- CityFibre LLD QC'ers are also available to assist with any more complex question which require a call, to discuss the issue.



1. Civils Drawing

1	PN Civils Map		
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PN/SN/ASN Location, Boundary & Label Shown and correct

The PN boundary is represented by a thick black line around the PN



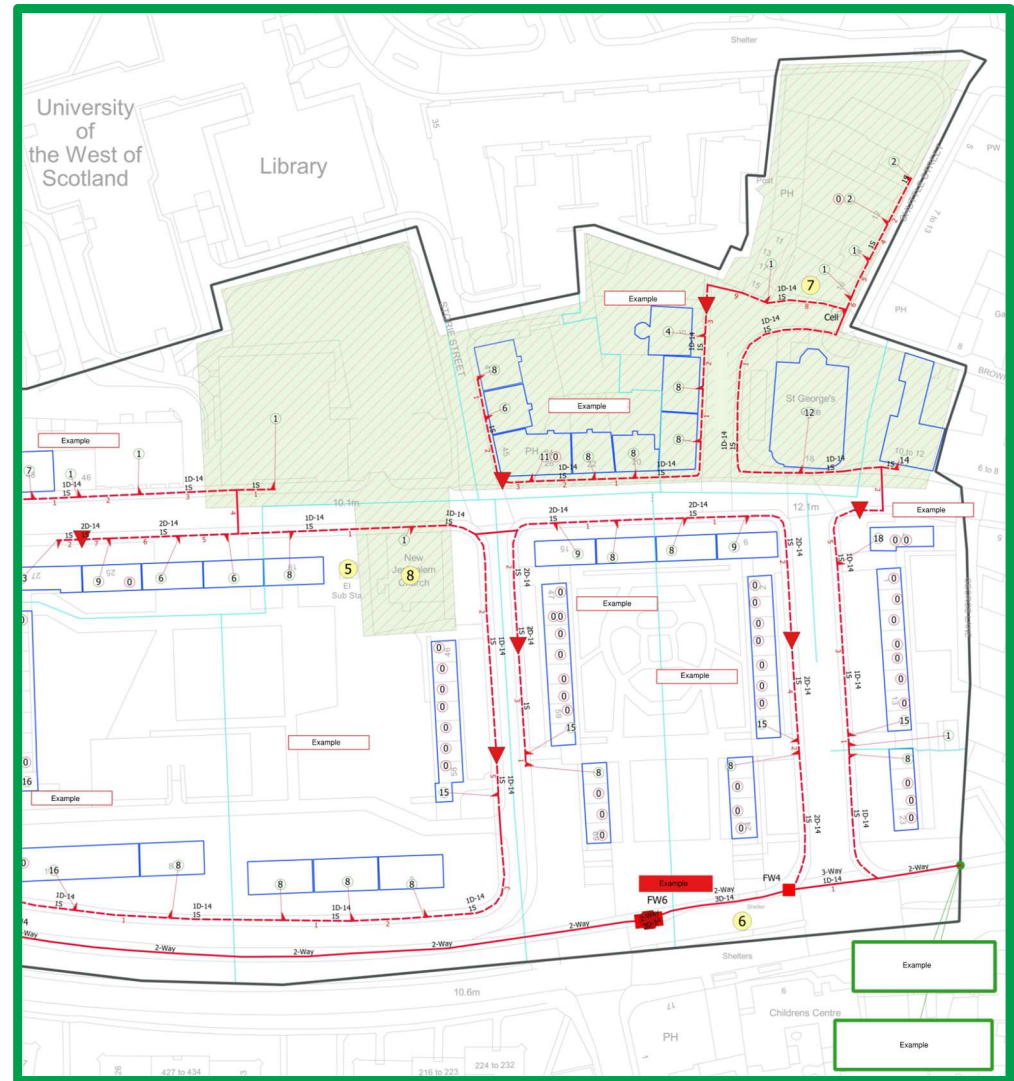
The PN on a Hybrid design (Including Aerial) is in a cabinet. This is represented by a red hexagon with a chamber



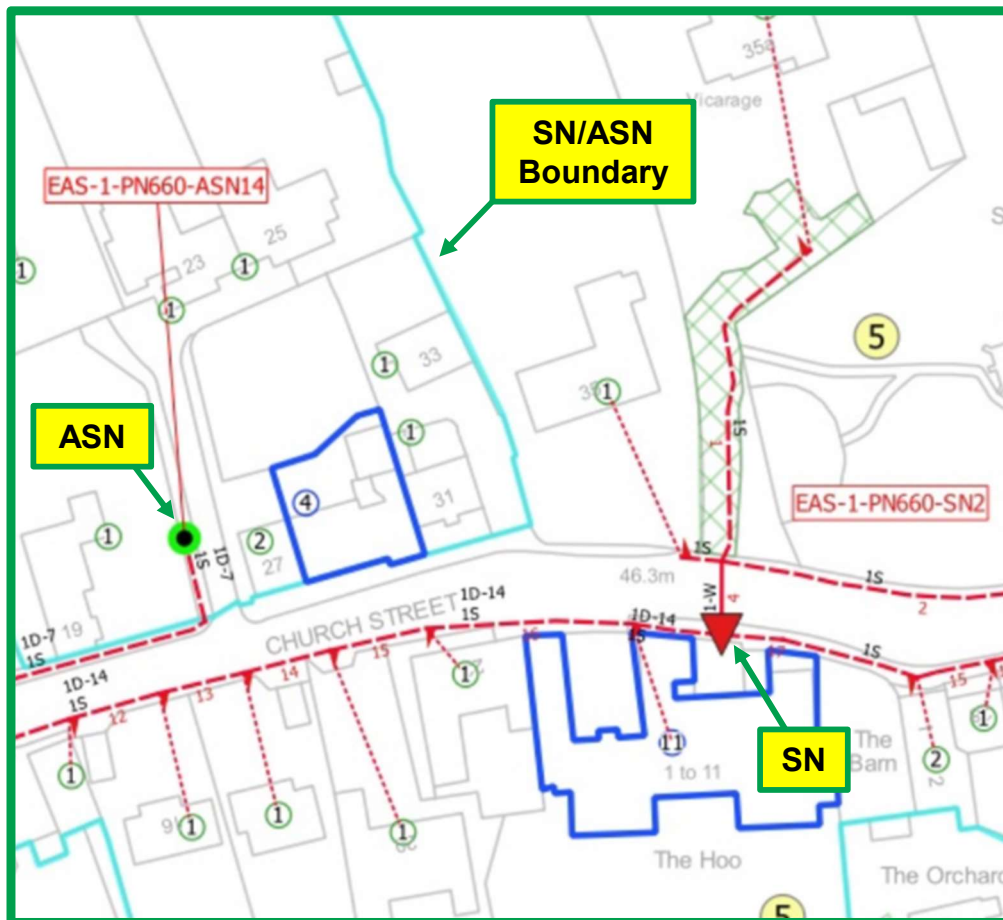
The PN on a Hybrid design (Excluding Aerial) is in an enclosure. This is represented by a red hexagon with two chambers



- The PN boundary must not cutting off any premises, and goes around all of the SN/ASN boundaries
- All boundaries and the PN location must match against the KMZ/PDF filed for the FEX area.
Please Note: This may be slightly different as the KMZ is a high level design, and the PN area/boundaries are optimised by the design partner when they are designing individual PN areas
- The PN must be located on the core route and has diverse connectivity East and West
- Each PN must have a maximum of 480 premises excluding any point to point connections



PN/SN/ASN Location, Boundary & Label Shown and correct



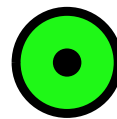
- Each SN/ASN must have a label showing the PN and SN/SN number
- When installing a new CF pole next to an existing BT pole which is unusable, then we must make sure that there is a 2m clearance between the pole heights to make sure that any crossed wires meet BT ruling.



SN/ASN boundaries are represented by a solid blue line around the SN/ASN area



SN cabinet is represented by a red triangle



ASN is represented by a black circle. This will be within a green circle which represents a pole. **(See key on drawings for different types of poles)**
The correct symbol must be used for the type of pole.

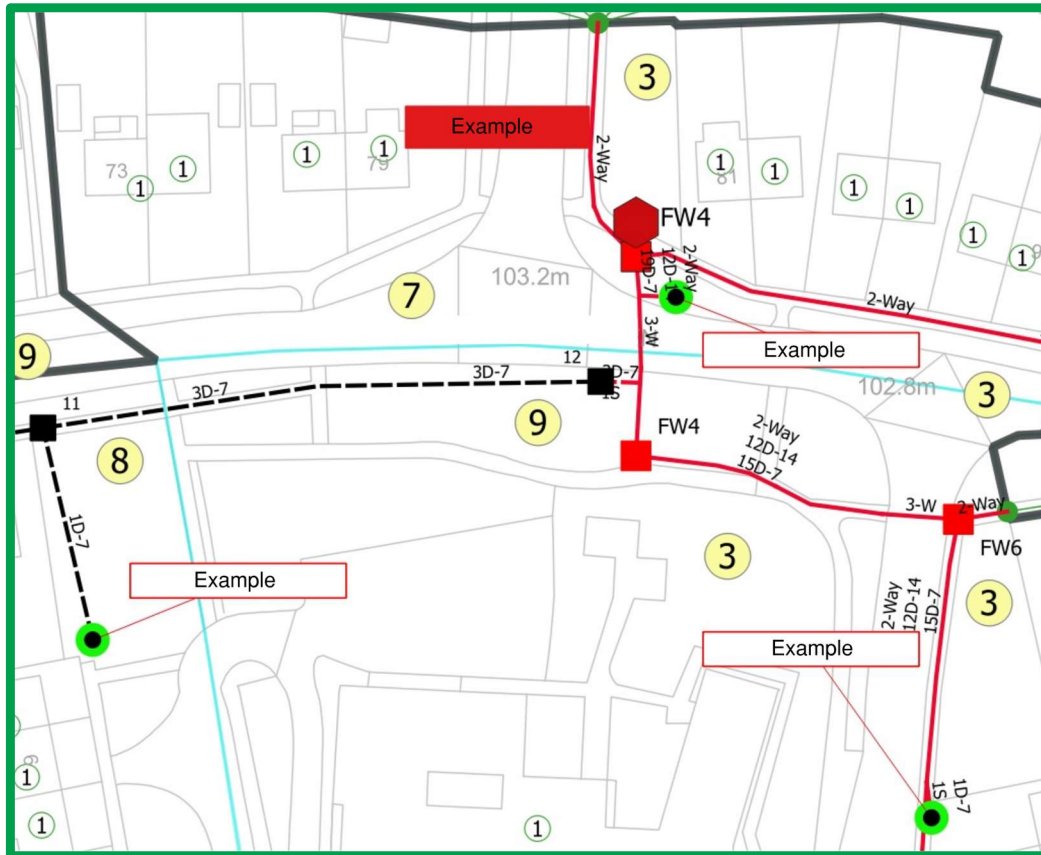


Correct Pole symbol used

Planned pole is represented by an orange circle **(See key on drawings for different types of poles)**

- All new poles are included in the cab/pole siting document and in the data capture sheet.
- The ASN/SN boundaries must sit fully within the PN boundary and are not cutting off any premises
- Each SN requires have a maximum of 48 premises
- Each ASN requires have a maximum of 24 premises
- If there are any MDU's over 24 they would be fed directly from the FEX and not included in the max count.

Feeder Network Highlighted & matches core design



- The design must have the core network shown within the PN boundary and the route matches with the overall KMZ/PDF file for the FEX area. **Please Note:** This may be slightly different as the KMZ is a high level design and the Design Partner may change the route slightly to optimise the design when surveyed/planned. For example, they may choose to put the core route on a different side of the road to avoid S58 or congested F/W.
- All chambers must be a FW4 minimum however this may be a FW6/FW10 if there are other feeder enclosures within the chamber. An enclosure will be shown as a blue circle on the cable drawing and will have a joint name/label.
- Chambers are required every 200m, at turning points or if there are any road crossings. Chambers are only required on one side of the road crossing, unless it is a major crossing.

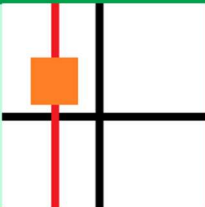
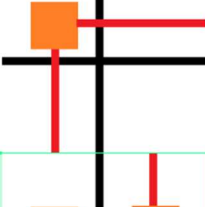
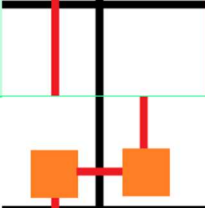
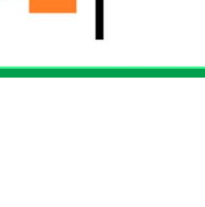
Joints	Chamber Size
0	FW4
1-2	FW6
3	FW10

Correct Feeder duct count (2way/3way/4way/5way)

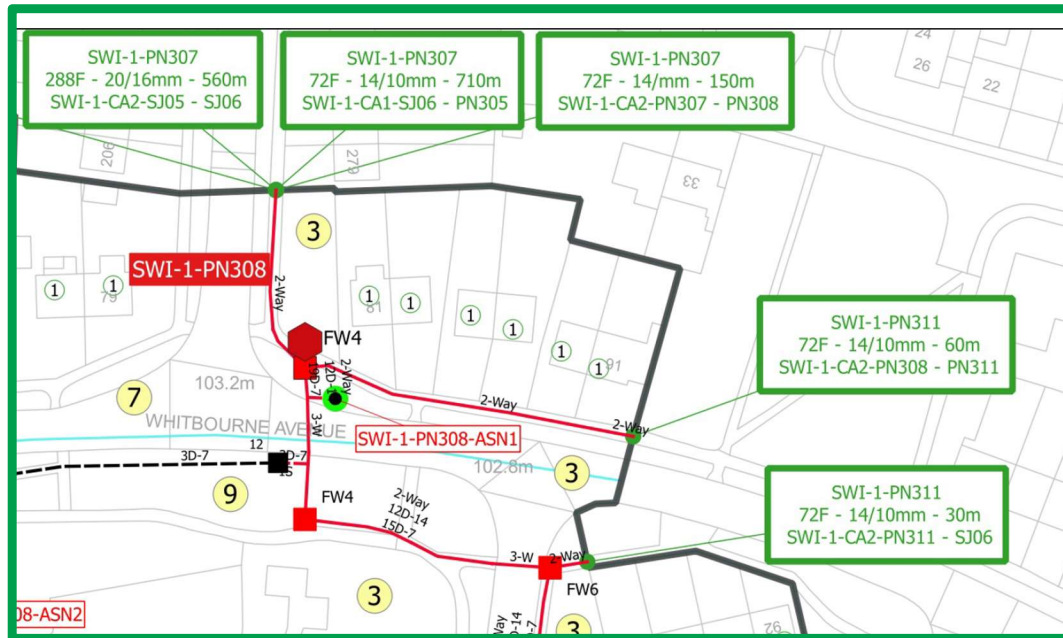
For all new Core network, this is to be a minimum 2-Way except for road crossings which include any distribution or drop tubes. This will then need to be a 3-way minimum. Maximum 6x288F to be used within a 2-way. Duct quantity to increase if the number of cables is greater than 6.

Feeder chambers captured (200m or turning points)

- By default, in both **Drop** and **Distribution** civils designs, we must aim to have zero chambers within the design. Where there is a sound reason to include a chamber in distribution, such as to host a spur joint enclosure, we must note on the civils drawing the rationale for including a chamber and for the chamber type selected. This is true for both trench routes and road crossings. Being a blown fibre tube network, a chamber is not required at either side of the road crossing as the excavation itself will provide the minimum bend radii required for the blown fibre tubes.
- In the case of **Feeder** network road crossings, which must always have 2 Way 110mm ducts a FW4 must be included at one end of a road crossing. Where there is a sound rationale to increase the size and number of chambers from a FW4, we must note this on the civils drawing. The table below presents common configurations of Feeder network road crossings.

Feeder cable direction		FW4 Chamber location
1 road crossing; straight		Manhole can be placed on either side of the road crossing
2 road crossings; 1 turn		Manhole must be placed in the corner
2 road crossings; 2 turns		Manholes must be placed on the corners
2 road crossings; 3 turns		Manholes must be placed on the corners An attempt should be made to put one manhole on the bottom-right corner and use the other two road crossings instead (thus saving on chamber costs), but in some cases this may not be possible

Feeder exit point labels shown and correct



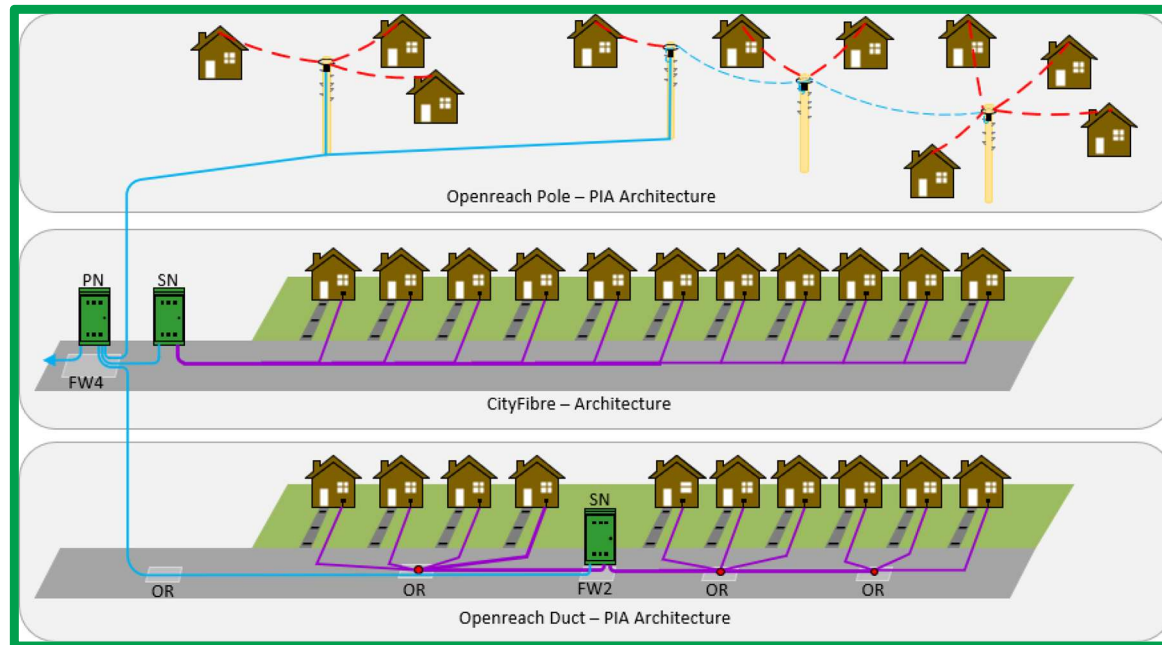
- The core route must enter and exit the PN area at different locations to provide diversity (minimum 5m separation ideally 8m unless stated in Exception Log). There must be a green label on all exit points into the adjacent PNs, with the core cable names and fibre counts clearly labelled. These are shown on all drawings.
- The labels must match with the HLD KMZ and SLD to ensure they are labelled correctly. This is important as it enables the build contractors & city teams to plan ahead for the next PN along the line when caballing the PN

Each PN label must follow the below template:

Adjacent PN
Cable Size – Duct Size – Length
Cable Name

Indicate Distribution Routes (PN to ASN/SNs) (7D/14D)

- Throughout the City Fibre build, there are three methods of providing a distribution network within a single PN area. Please see below diagram.



- The three methods are:

Openreach Pole – PIA Architecture: Distribution from PN cabinet through CityFibre or Openreach ducting to ASNs, or Distribution transported to ASNs pole-to-pole.

CityFibre – Architecture: Distribution from PN to SN cabinet through CityFibre built and owned UG network.

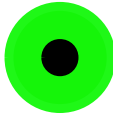
Openreach Duct – PIA Architecture: Distribution from PN to SN cabinet through Openreach ducting and chambers (or Mixture with CityFibre ducting and chambers)

Note that only on a PN area where aerial is deployed a PN cabinet must be used. Where there is no aerial deployment within a PN, then an underground PN is the default.

CityFibre

Indicate Distribution Routes (PN to ASN/SNs) (7D/14D)

- Indicate the distribution routes - You will need the Civils map, Cable map and the SLD open in conjunction. You will check the routes on the SLD against the civils map to ensure they follow a logical order, i.e. a single core fibre doesn't cross back over itself unnecessarily (redundant loops), or take uneconomical routes or that SN's are correctly 'daisy chained' to utilise the amount of cables exiting the PN.
- Hybrid designs differ from UG designs when it comes to indicating the distribution routes as the distribution routes can route aerially as well as UG. Aerial distribution utilises both 7/3.5mm duct and 14/10mm duct as some poles are fed directly (i.e.. Singletons) so only need a 7mm duct to be able to blow a 4F/12F to it. You should expect to see a break down of the labels below

Each duct label will highlight the quantity of each subduct type. The example on the right hand side shows that there are two lots of 14/10mm subduct, and one 7/3.5mm subduct in this section of network.	2D-14 1D-7
For aerial sections of the design, a 14/10mm subduct will be left at a pole if there is a multi-span to other ASNs. This will also be used to serve SN's with a 96F blown cable. A 7/3.5mm subduct would only be left at singleton poles. If a singleton pole has two ASN's, then 1 x 7/3.5mm subduct will need to be left at the pole which will be fed by a 12F. If there are 2 ASNs on a pole with a multi-span, then a 36F cable will be required in 14/10mm subduct. The poles have different symbols if they are UG fed or Aerially fed. This can be used to identify the distribution route.	 Standard UG Fed  Standard Aerial Fed

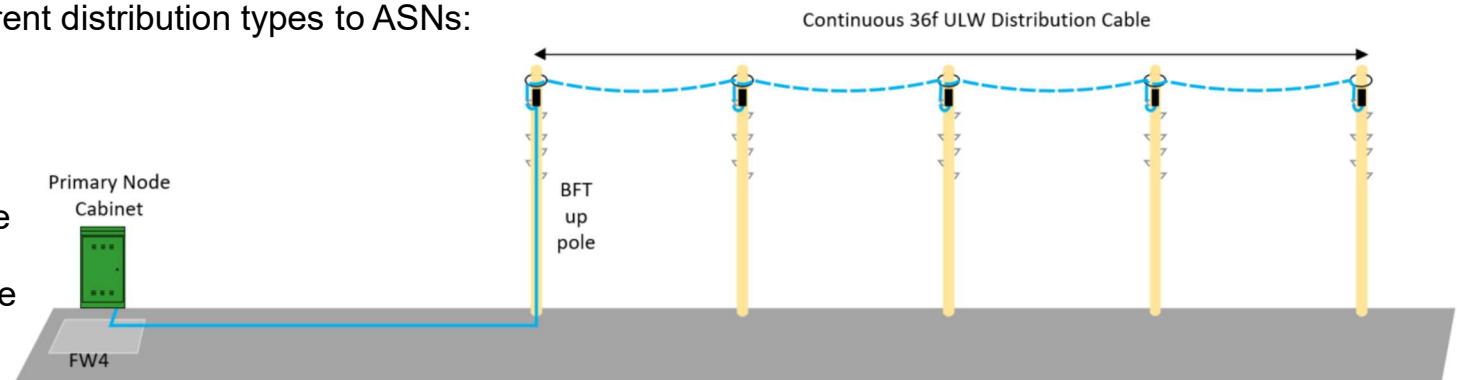
Indicate Distribution Routes (PN to ASN/SNs) (7D/14D) (Aerial)

- In an aerial infrastructure, the distribution network is between a Primary Node cabinet and an ASN.
- The infrastructure between the Primary Node cabinet and the poles may be provided by a number of delivery methods including ducted trench, narrow trench, 3rd party and PIA assets.
- The maximum number of ASNs in a multi-span distribution route is 12 and this is to include any spurs present on that distribution route. The only limitation to this is the amount of fibres used. In any multi-span we can not exceed 24F, this may mean that less than 12 ASNs are used if ASN3's are used within the design.
- On a multi-span distribution route, if the first pole is a carrier pole (no ASN) then this must be fed with a 36F. An ASN0 will be used to transition from the 36F to the 36FULW. The architecture document shows a 36FULW running underground from the PN, this method will not be shown on the design, the City Team can make this change if they believe it is necessary during build.
- Between an aerial span, we can have no more than 4 City Fibre distribution cables between 2 poles. This is dependent upon DILOR rules. This has been increased from the previous ruling which was 2

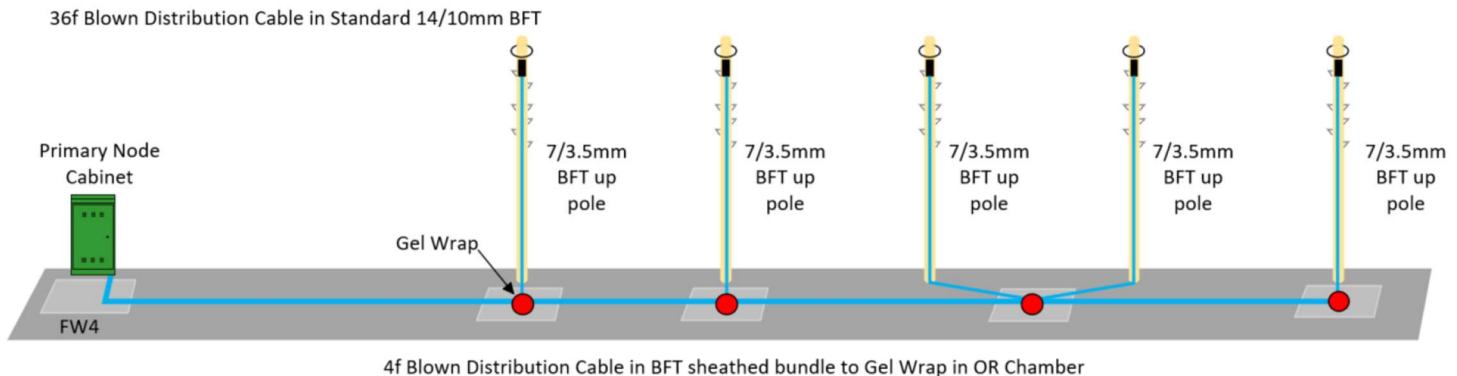
Indicate Distribution Routes (PN to ASN/SNs) (7D/14D) (Aerial)

- See below examples of the different distribution types to ASNs:

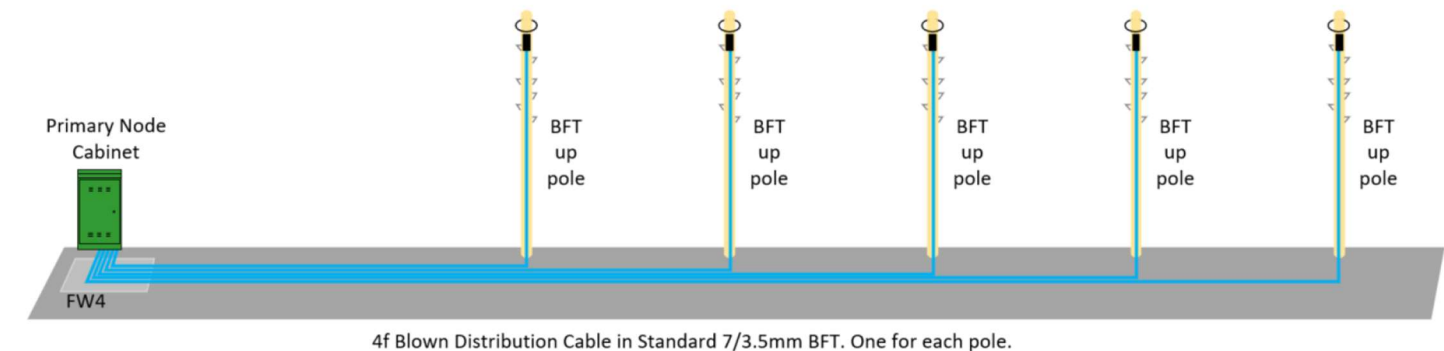
- From the PN to the first pole in a multi-span, we will run a 36F blown cable. Then run 36FULW aurally between each ASN. If the first pole has no need for a splitter, then we can feed the pole from the PN with a 36FULW as mentioned on the previous tab.



- When feeding a series of singleton poles from the PN in OR network, then we are able to run a 12 way multitube between each pole using a gel wrap to drop off a 4F blown cable at each pole. This may also house a 12F feeding the pole if the pole is feeding an MDU and requires a 36FULW between the ASN and the MDU.



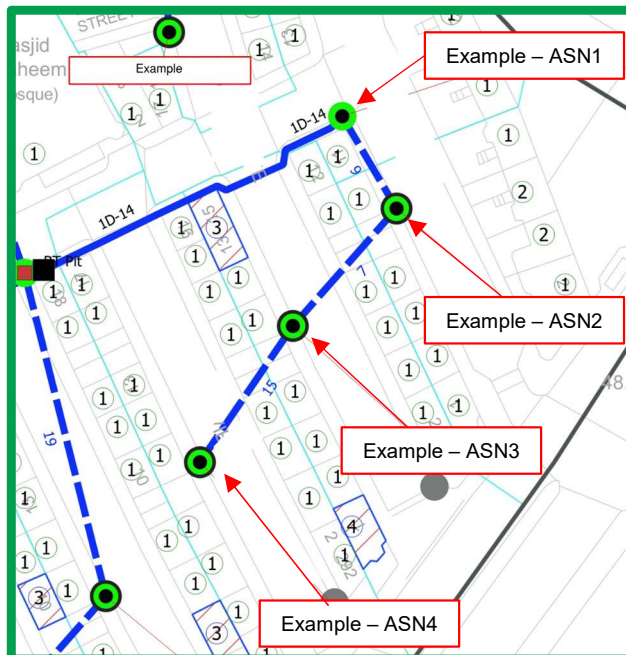
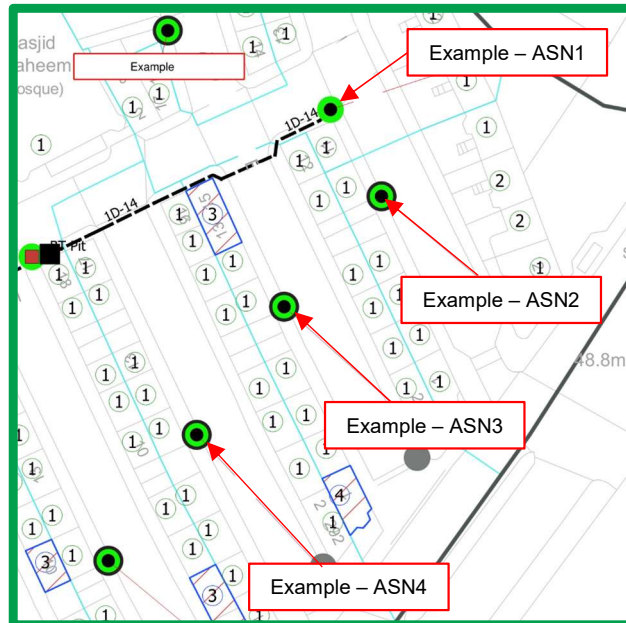
- When feeding a series of singleton poles from the PN in CF network, then we will install individual 7.3.5mm BFT to each pole as per usual. As per the previous scenario, we can also run 12F cable down the same BFT to serve MDU's from a singleton pole.



Civils Drawing

Cable Drawing

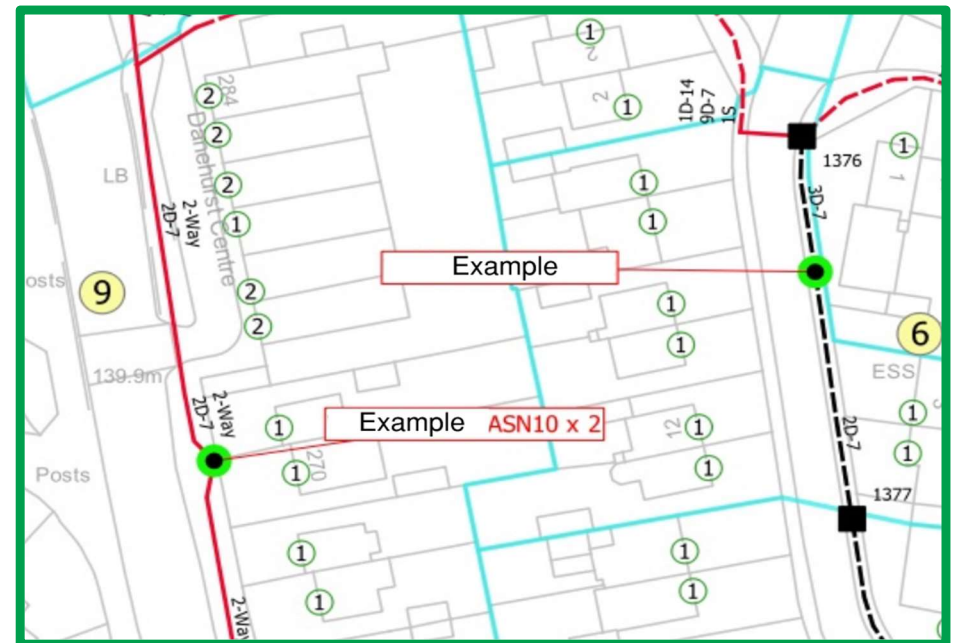
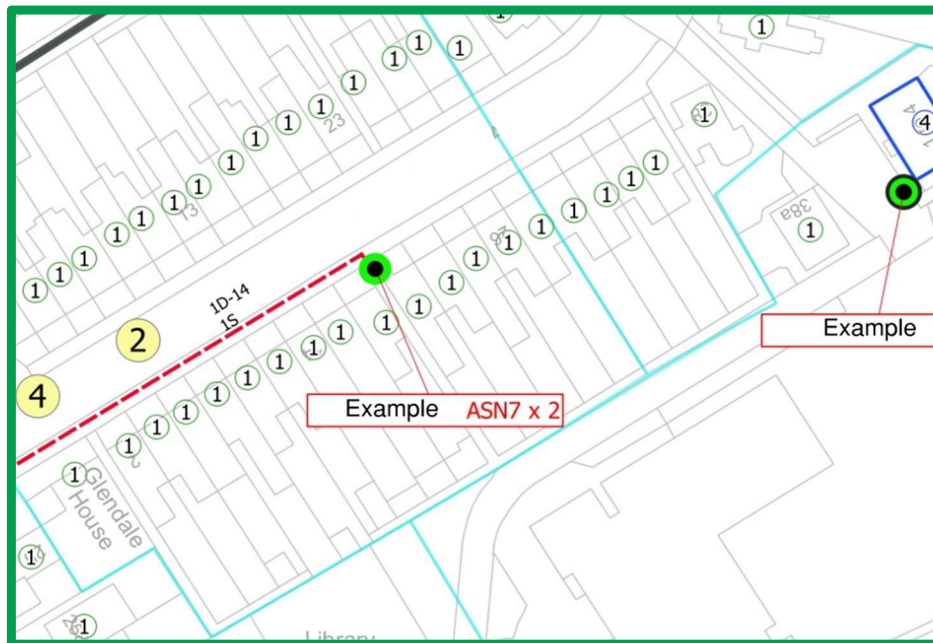
Indicate Distribution Routes (PN to ASN/SNs) (7D/14D)



- As you can see in this example, ASN1 has been fed UG using the OR duct with 1D-14 duct. However on the civils drawing it can appear that the distribution route does not continue to ASN2
- When you open the cable drawing you can see that there is an Aerial span from ASN1 to ASN2, ASN3 and ASN4.
- There will be on 36FULW that spans across to the other poles, with fibres being left at each pole to feed the splitters within the ASN.
- The designs will only show 7mm subducts will only go to singleton poles and MDU's which are fed back to the FEX with a 1:32 splitter. (These will only require the standard 7/3.5mm drop tube, however it needs to be shown as a 7D distribution for the automation to populate the MDU on the SLD. Therefore this must not be failed.
- 14mm sub ducts will be shown feeding poles with aerial spans and also SN cabinets. A 14mm subduct may also be shown on the design being left at a CF chamber, this will be due to a potential future expansion such as a housing development. This is done to leave capacity for when this is built.

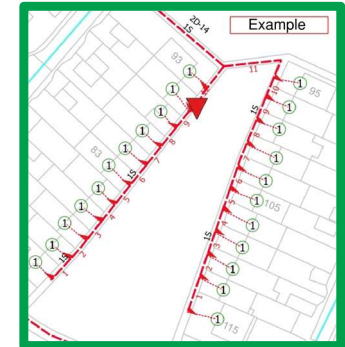
Indicate Distribution Routes (PN to ASN/SNs) (7D/14D)

- In cases where it is required, 2 ASN's can be installed on one pole. This will show on a design as an "ASN# x 2". This is able to be done as long as there is sufficient space on the pole and the maximum drops off the pole does not exceed 40.
- If it is part of a multi-span, then the 2nd ASN is spurred from the 1st, with the 1st being fed by a 36F.
- If on a singleton pole, then serve with a single 12F.



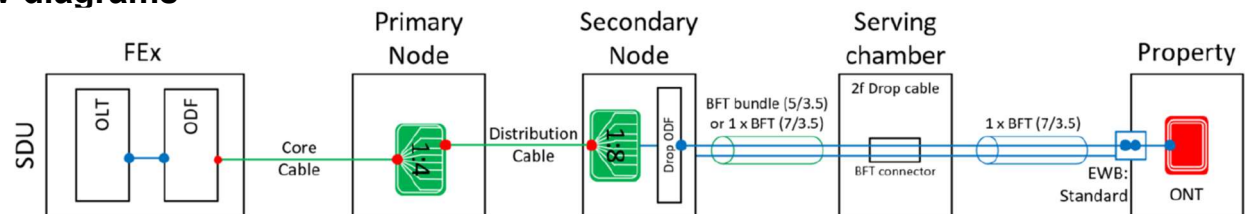
Indicated Drop Routes (SN to property)

- The numbers shown along side the trench represent the customers drops (7/3.5mm tube) going to each premises and associated Toby Box. The correct amount of drop tubes must be shown and no properties are missed from the design. Drop trenches must not leave the SN area, they must stay within the SN boundary and only feed premises within that area. If the drop tubes go in to a different SN area then this would be a fail. A customer drop from an SN is able to pass through as ASN boundary

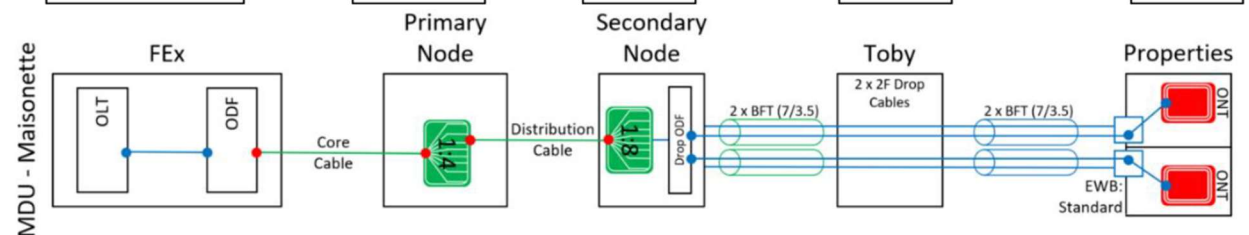


Depending on the type/size of the demand point, the drop configuration can vary. See below diagrams

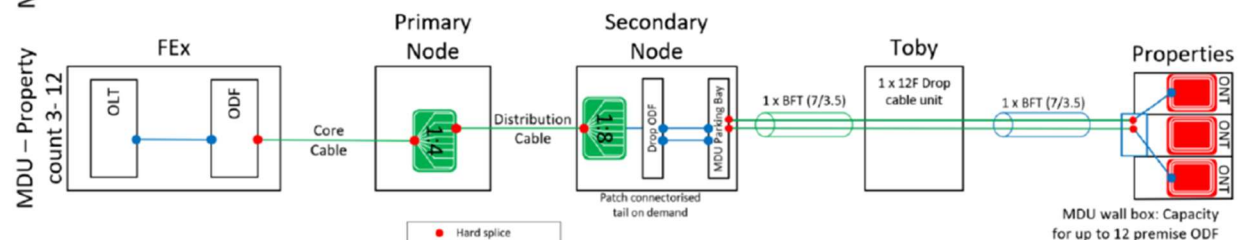
- SDU premises each have an individual customer drop 7/3.5mm BFT from the SN to the Toby box.



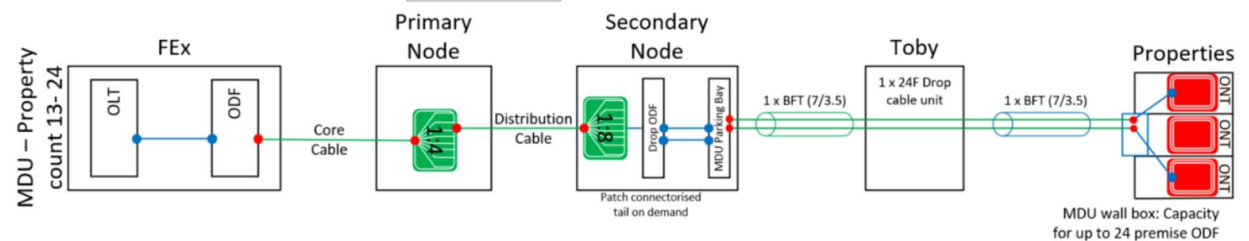
- A Maisonette style premise will be served from the SN with 2x7/3.5mm BFT to the Toby box which will have 2x2F drop cables



- MDU's with a premise count of 3-12 will be served with 1x7/3.5mm BFT which will have 1x12F drop cable.

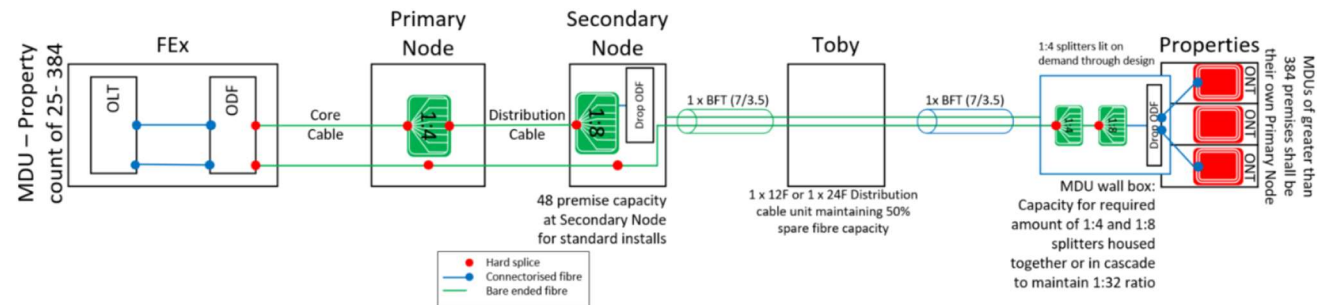


- MDU's with a premise count 13-24 will be served with 1x7/3.5mm BFT which will have 1x24F drop cable.



Indicated Drop Routes (SN to property)

- MDU's with a premise count 25-384 will be served with 1x7/3.5mm BFT which will have 1x12F or 1x24F drop cable. This will house a 1:4 and 1:8 splitter housed together to maintain a 1:32 ratio. This will bypass the SN and the PN and be served directly from the FEX. Any MDU's >384 homes will be treated as their own PN.



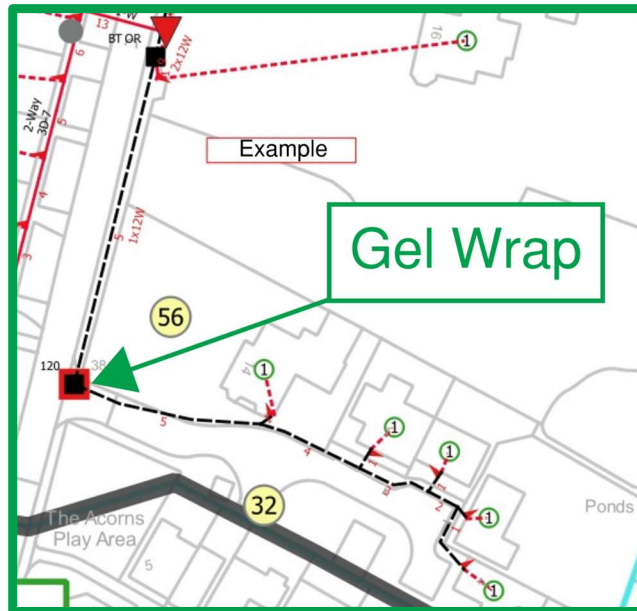
- In some scenarios we may see an MDU above a row of commercial properties. In this case we would split the building into 2 sections. We would feed the MDU as mentioned previously, and then individual tee's will be given to each commercial property below. These will be shown as separate demand points on the civils drawing. Examples shown below:



- Cell sites are to be fed with an individual 1x7/3.5mm BFT which will preferably go back to the nearest SN. The cell site can be fed directly from the PN if it makes sense to do so. i.e. the PN is closer to the cell site than the SN, or there are no SN's within the design. This exception also applied to FEX fed MDU's.

Indicated Drop Routes (SN to property)

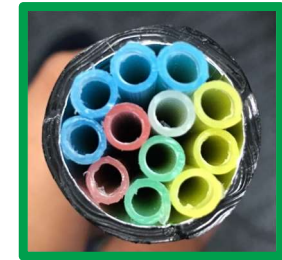
- Gel wraps are to be utilised in any BT chamber where there is a customer ingress or we need to breakdown to/from a 12 way multi-duct.



BT lead ins can only be used if we can see evidence of a ducted lead in. This is shown by the grey capping on the building wall as shown in this image.

- When utilising BT network, 12 way multi-ducts and gel wraps must be used. The maximum number of 12 ways within a BT duct is 3, however the design must attempt to keep this number to 1 where possible. If required, individual drop tubes can run along side a 12 way however this must not exceed 5 and follow the below length restrictions.

- 5 additional tubes = 6m
- 4 additional tubes = 14m
- 3 additional tubes = 28m
- 2 additional tubes = 70m



- 12 way multi-duct is not direct bury. This means that this cannot be installed in narrow trench and can only go in BT network, or new traditional duct. It is not a fail if the small section of dig from the SN to the first BT chamber contains 12 way and is shown as narrow trench.



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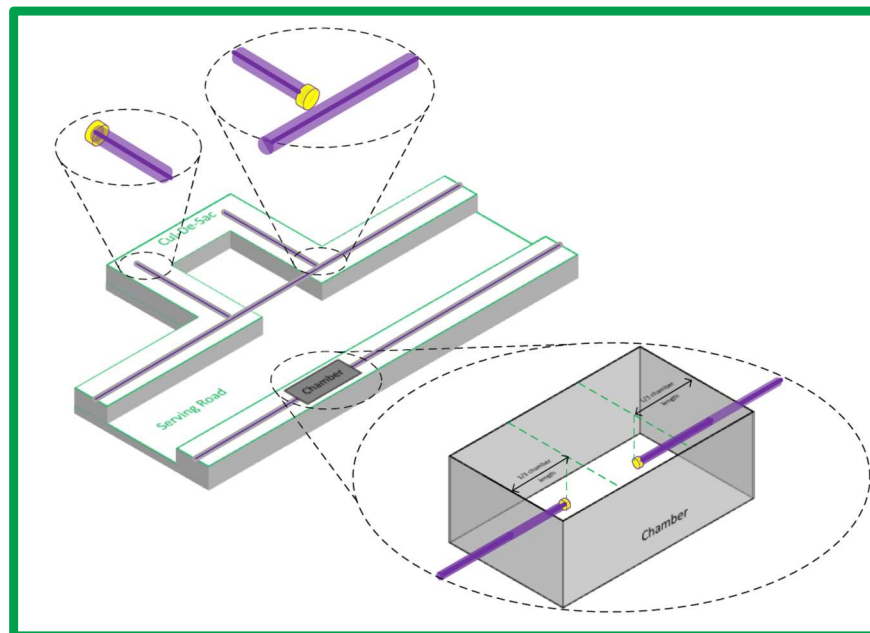
Spare Sub Duct (20/16 to EOL) installed on new CF narrow trench

- All city fibre narrow trench, must contain an element of spare 20/16 duct. This is shown on the design as a 1S. This must only be shown at new Narrow trench, and not on feeder routes or when utilising BT network.
- The standard work point for spare duct must also be present on the design.

4	Spare 20/16mm duct for future use. Any feeder route will have 2 x 110mm ducts so does not need a spare 20/16mm duct. Any route that does not have a feeder duct should have a spare 20/16mm duct. The 20/16mm will run to the extent of the last drop conduit.
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There is no need to install a spare 20/16mm BFT in the lateral cut. The spare 20/16mm BFT shall be routed through any road crossing duct in a continuous manner.



MDUs - Building outline highlighted (3+ demand points)

- Any building containing three or more premises must have a solid blue outline. LOC is no longer required as wayleave is automatically applied by salesforce. If the building has 24 or more premises, it will have its own direct fibre back to the FEX as mentioned in the previous slides. MDU's are only shown on the SLD if the premise count is 24 or greater. Drawing to be checked along side the release to make sure that all MDU's are shown on the drawing and it matches release sheet.



All MDU's no matter the size must have this blue outline.



If the MDU is being fed back to the FEX with a 1:32 splitter, then this symbol must be shown.

- MDU's must be served correctly and given the correct number of drops/toby's. Example 1, shows an MDU with 2 entrances therefore there must be 2 separate demand points and feeder for each entrance. Example 2 shows an MDU with a single entrance therefore only a single toby and feed is required.



- MDU's must not be merged on the drawing. Each property with its own drop must have its own boundary.

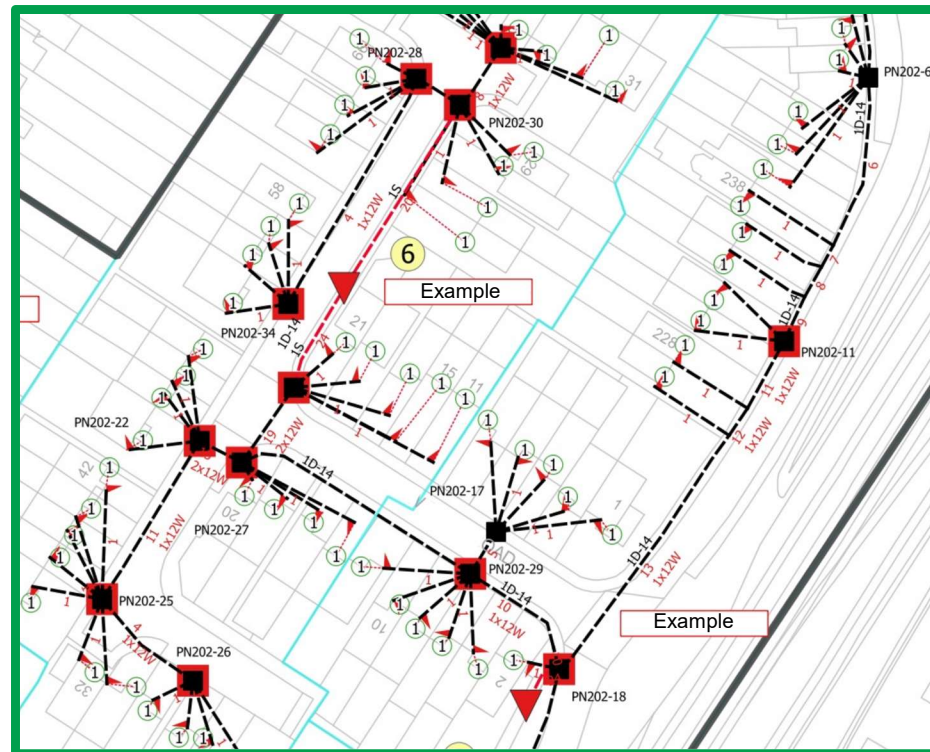
Existing CF network fully utilised/Existing BT network fully utilised (UG & OH)

- Where possible and when it is allowed, we are able to utilise existing CF/BT network. See below tables indicating when we can use existing network.
- When using BT network for feeder route, a reference point is to be added to the drawing and this is to be added to the exception log.

	Existing CityFibre infrastructure	Openreach PIA aerial infrastructure	Openreach PIA duct infrastructure
Core	Metro asset – look to utilise wherever efficient to do so. LDN asset – use to be verified by CityFibre Design team. Neither to be used if determined to be congested or for reasons of in life sensitivity.	Not to be used.	Use under concessions from CityFibre Design Team for reasons of dead dig or significant economic drivers.
Distribution	Metro asset – look to utilise wherever efficient to do so. LDN asset – use to be verified by CityFibre Design team. Neither to be used if determined to be congested or for reasons of in life sensitivity.	To be used in areas for aerial architecture deployment.	To be used in areas for u/g 3 rd party or PIA architecture deployment. To be used assuming that chambers and ducts are clean and useable. Can be used to reach poles in areas for aerial architecture deployment.
Drop	Where CityFibre has an existing lead in to a property, if feasible this should be used in the FFN design. Neither LDN nor Metro to be used if determined to be congested or for reasons of in life sensitivity.	To be used in areas for aerial architecture deployment.	To be used in areas for u/g 3 rd party or PIA architecture deployment. To be used assuming that chambers, ducts and lead ins are clean and useable.

Existing CF network fully utilised/Existing BT network fully utilised (UG & OH)

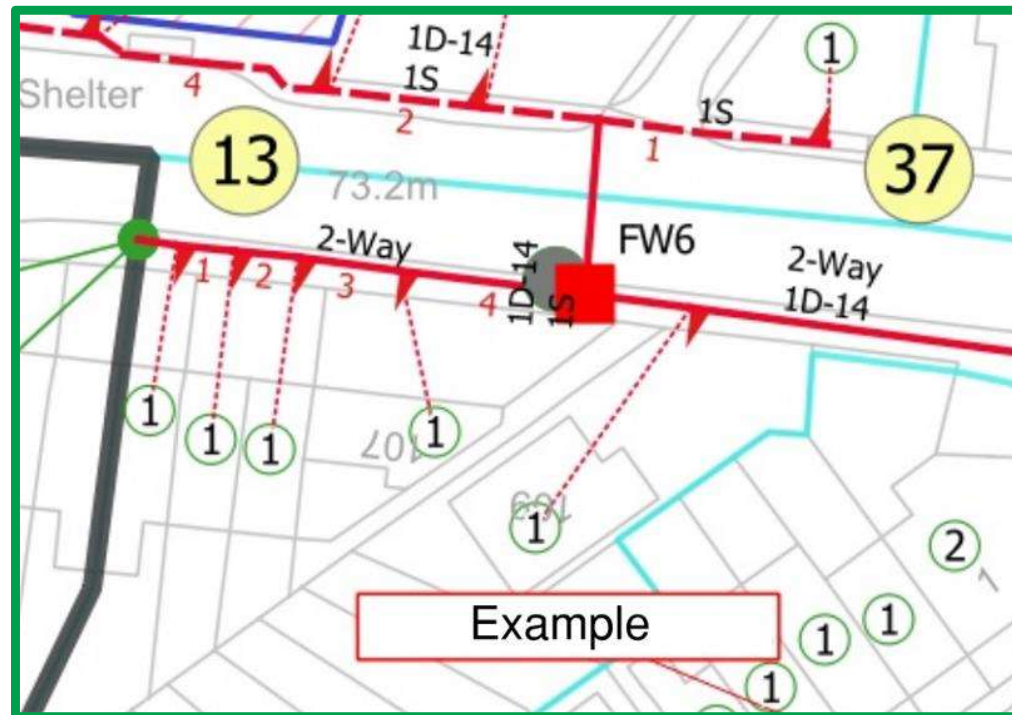
- Existing network must be used as a priority. CF network availability should be checked using Smallworld, if available and BT network must also be checked using the BT portal.
- Existing network must be shown in Black on the design. Black Dashed being BT, Black solid being CityFibre.
- Designs must avoid using small sections of existing network and focus on using larger stretching, instead of jumping in and out of existing network.
- Google maps to be used to verify when if BT lead ins are available within the PN area, and must be used.



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Existing CF network fully utilised/Existing BT network fully utilised (UG & OH)

- Although it is preferable to use BT PIA where possible, there are some circumstances where we would choose to lay new network rather than using PIA.
- If we are already laying new network outside a row of houses which are being fed PIA, we would choose to lay new tee's to each house.
- In all other cases, if there are poles/UG PIA available and we are not digging past already. Then we would always try to utilise existing PIA.



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Minimise Dead Dig

- We must proactively try and avoid areas of dead dig. For example multiple road crossings that that can be merged together. Costly civils routes, which are serving minimal properties should be LOC'ed out to keep CPP to a minimum.

Five Elements Rule (Drop trenches conform)

- The 5 element rule only applies to Narrow Trench and must not be applied to Feeder / Core Trenches.** The 5 element rule is that no more than 5 elements can be installed in a narrow trench
- What constitutes an element differs slightly within the hybrid designs vs traditional build. On the UG designs 1 x 14/10mm duct counts as 1 element but on the hybrid designs up to 6 x 14/10mm ducts are 1 element. See below table:

Element	Duct
1 Element	1 x 20/16mm Duct (1S)
1 Element	12 x 7/35mm Duct
1 Element	6 x 14/10mm Duct (1D)

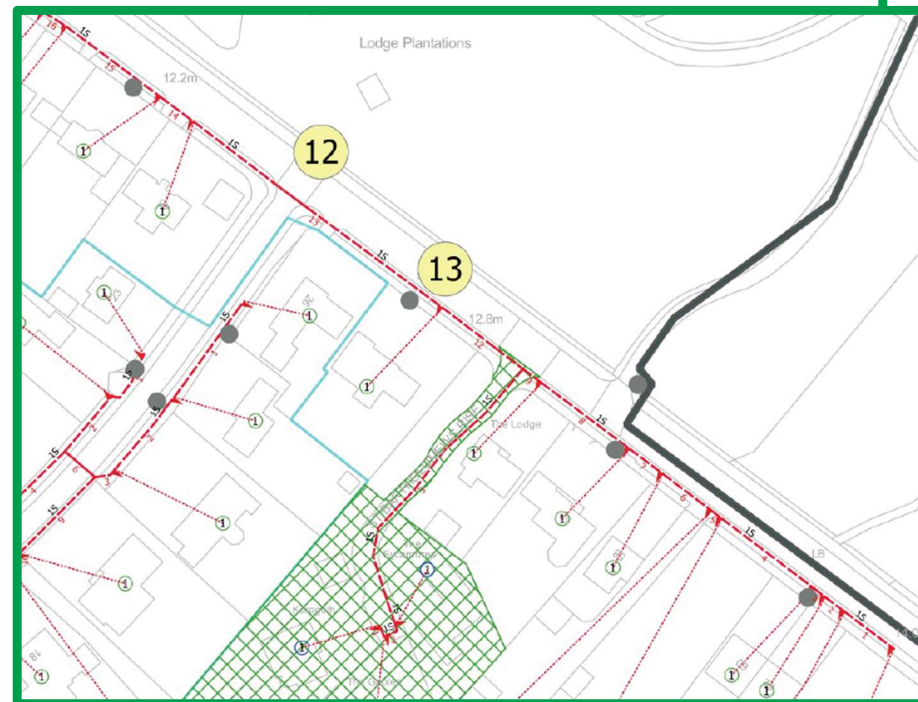
- The spare 20/16mm subduct must also be taken into account where there is narrow trench within the drawing.
- 27 x 7/3.5mm BFT's can be used in the construction (but this is limited to no more than a 30m section of narrow trench). In this instance, the 27 BFT's will count as 2 elements.
- Exceptions to the rule must be agreed on a case by case basis with the CityFibre Design team and recorded in the Exceptions Log.

SED & POI references (Highlighted on map & Detailed in table)

- Special Engineering Difficulties and POI's must be highlighted on the map by a label showing a yellow circle with a number which must correspond with the table found on the top right hand side of the design.



Reference:	DON-1-PN604
Area Name:	Doncaster
Work Point Reference Details	
1	This has been planned as per Specification: 'CityFibre Aerial Hybrid FTTH Network Architecture and Planning Guidance V0.1'
2	Install all cables to provide CityFibre FTTP services within solid line Primary boundary in black shown on plan.
3	All shaded boundaries in turquoise are LOC. Construction in areas requiring wayleave as unadopted or MDU's require wayleave agreement prior to commencement of works.
4	Spare 20/16mm duct for future use Any feeder route will have 2 x 110mm ducts so does not need a spare 20/16mm duct. Any route that does not have a feeder duct should have a spare 20/16mm duct. The 20/16mm will run to the extent of the last drop conduit.
5	Primary Joints to be installed underground in FW6 type chamber.
12	Electricity Substation
13	Bus Stop
17	Major junction - Traffic risk
21	Railway Track
35	Bridge



Street Names Shown

All road names must be shown on all drawing types.

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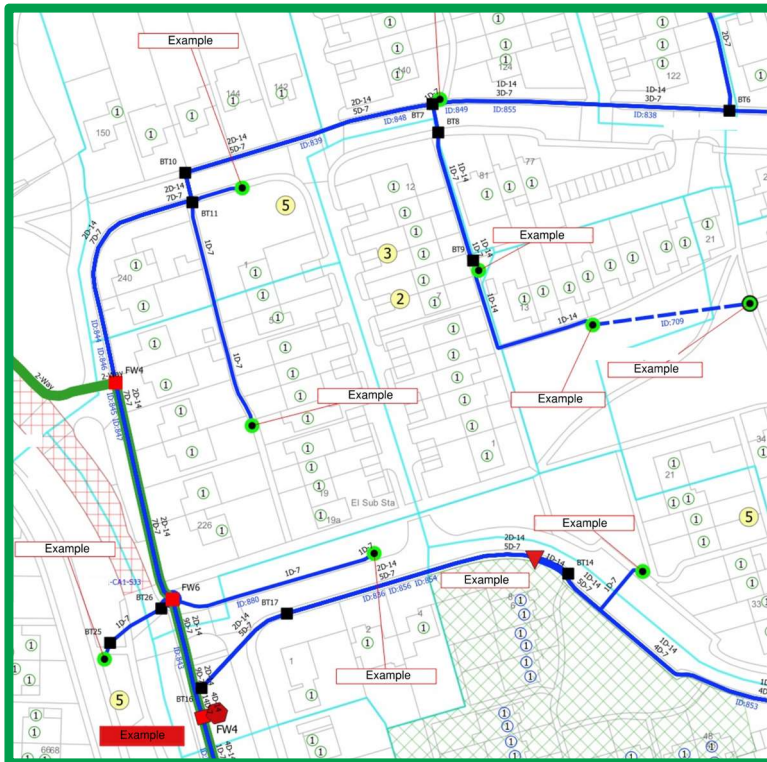
2 Cable Drawing & Cable Drawing with Drops

2	PN Cable Map with & without drops		
2.1	PN/SN/ASN Location, Boundary & Label Shown and correct		
2.2	Joints captured on drawing		
2.3	MDUs Match Civils Drawing		
2.4	LOC Area types recorded - <i>Coloured highlight</i>		
2.5	No more than 12 ASN on an aerial route (including ANSO's and spurs)		
2.6	Overhead drops over 65m highlighted in yellow (If aerial fed)		
2.7	All overhead cables meet BT rules for distance		
2.8	DILOR rules followed for overhead cables		
2.9	All properties have drop cables		

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Distribution Cable Routes (PN to ASNs/SNs) to include labels

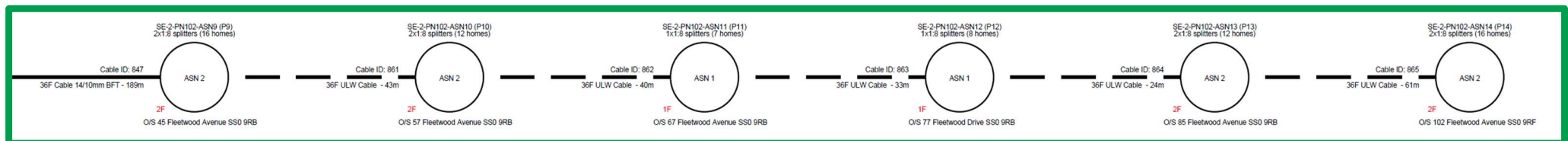
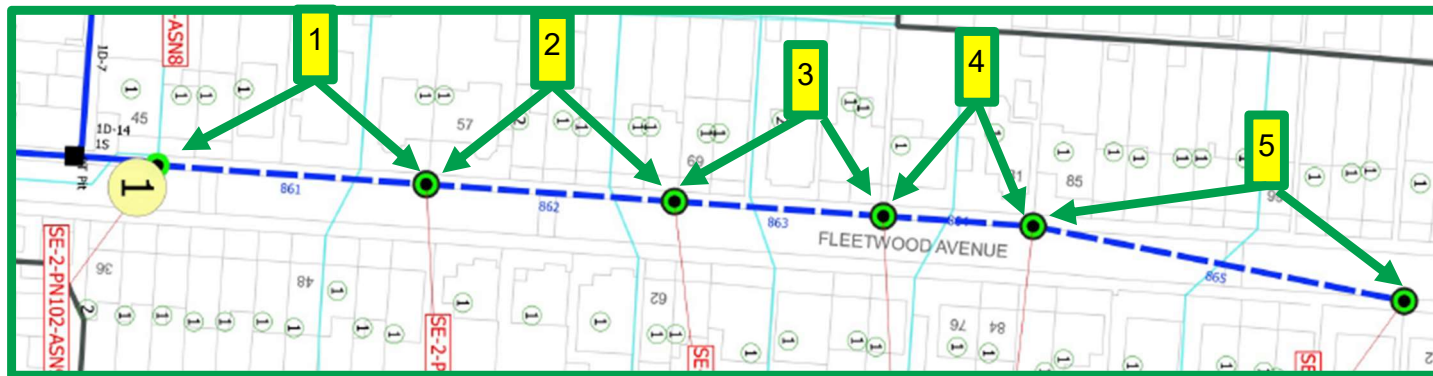
- Cable ID's must be shown across the drawing and each UG ASN/SN has a cable feeding it. A label is added roughly half way between the A and B-end of the cable.
- Due to recent relaxation by Openreach, CF pole to pole cables can now have a planned aerial span of up to 80m. Please see below table which will show aerial cable lengths for carriageway, footway and from pole to premise. Although a drop cable can go from pole to pole via an extender pole, our drop cable cannot exceed 68m, due to cable limitations.
- Any joints included within the design to be shown on the cable drawings. This is shown by a blue circle and a joint ID label. Chamber size must also be checked



Situation	Maximum Dropwire Length
Pole to Premises	68m
Pole to Pole (Carriageway)	75m
Pole to Pole (Footpath)	80m

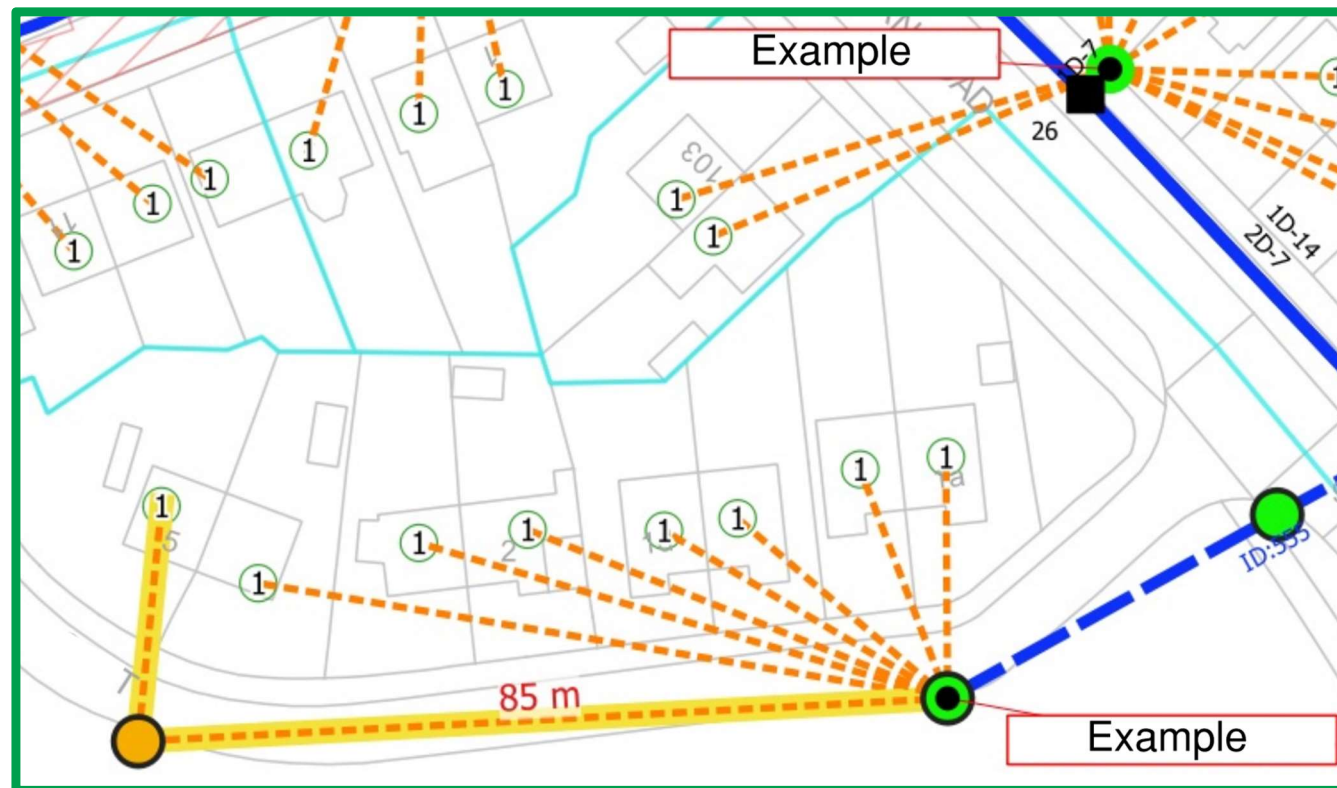
No more than 12 ASN on an aerial route (including ANS0's and spurs)

- Check both the Cable Drawing and SLD to ensure there are no more than 12 ASNs fed on an aerial route, this is including ASN0's.
- The only limitation to this is the amount of fibres used. In any multi-span we can not exceed 24F, this may mean that less than 12 ASNs are used if ASN3's are used within the design.
- This is to ensure that there is an entire 12F tube spare in the 36F ULW cable for future expansion



Overhead drops over 65m highlighted in yellow (If aerial fed), All properties have drop cables

- Whilst looking at the Cable with Drops drawing, we must check that there is a physical drop cable going to every premise, both aerially and UG fed. If there is a drop cable missing, check the SLD to ensure there is enough capacity (amount of splitters) available on the pole/SN to be able to feed the property
- The automation no longer displays the aerial drop cables length unless it is exceeding 65m. If a drop cable is near to breaking the rule, it will highlight yellow. Drop cable can highlight yellow if it is using an extender pole to reach a property. This is allowed as long as no single span is over 68m.

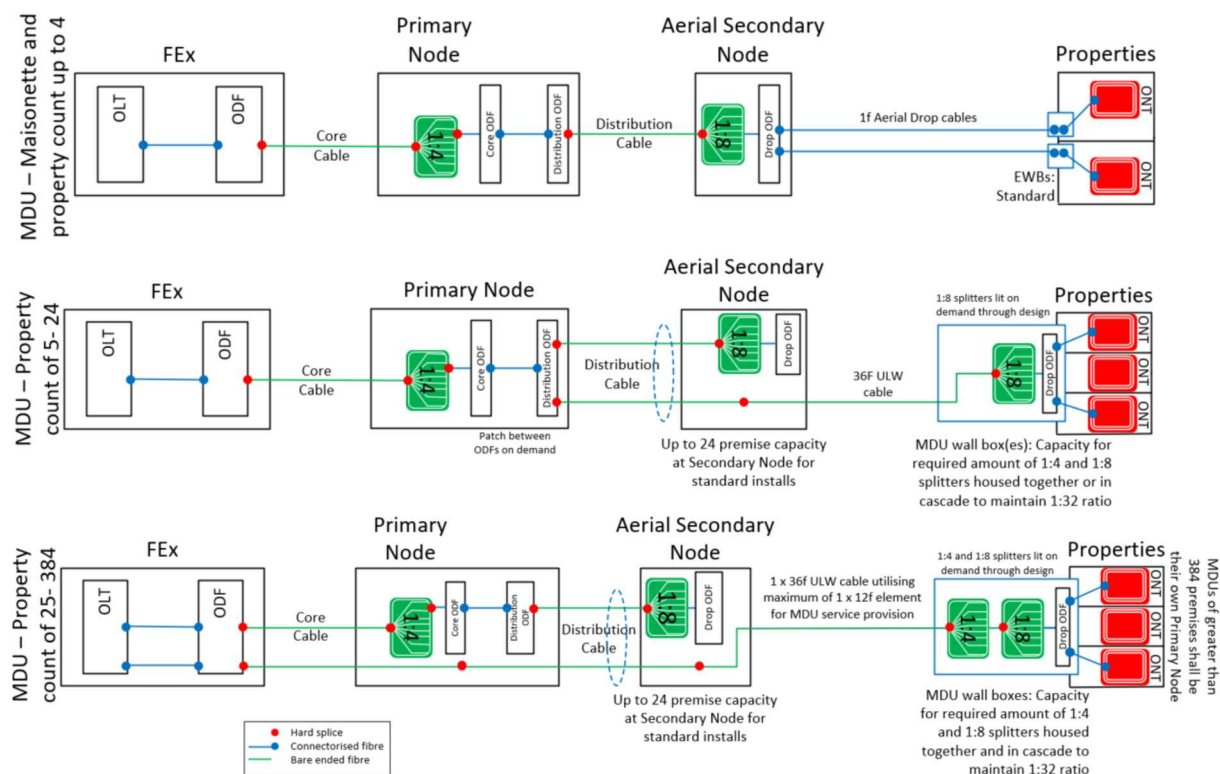


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Overhead drops configurations

Depending on the type/size of the demand point, the drop configuration can vary.
See below diagrams:

- Maisonette and properties with up to 4 premises will be served with individual 1F drop cables.
- MDU's with a property count between 5-24 will be served with a 36FULW which feeds a splitter mounted on the MDU. The feed for this bypasses the ASN and is fed from the splitter in the PN.
- MDU's with a property count between 25-384 will be served with a 36FULW which feeds a splitter mounted on the MDU. The feed for this bypasses the ASN and the PN. This is fed directly from the FEX. A 1:4 and 1:8 splitter will be installed in the MDU keeping a 1:32 ratio. Only 1x12F element is able to be used in the 36FULW

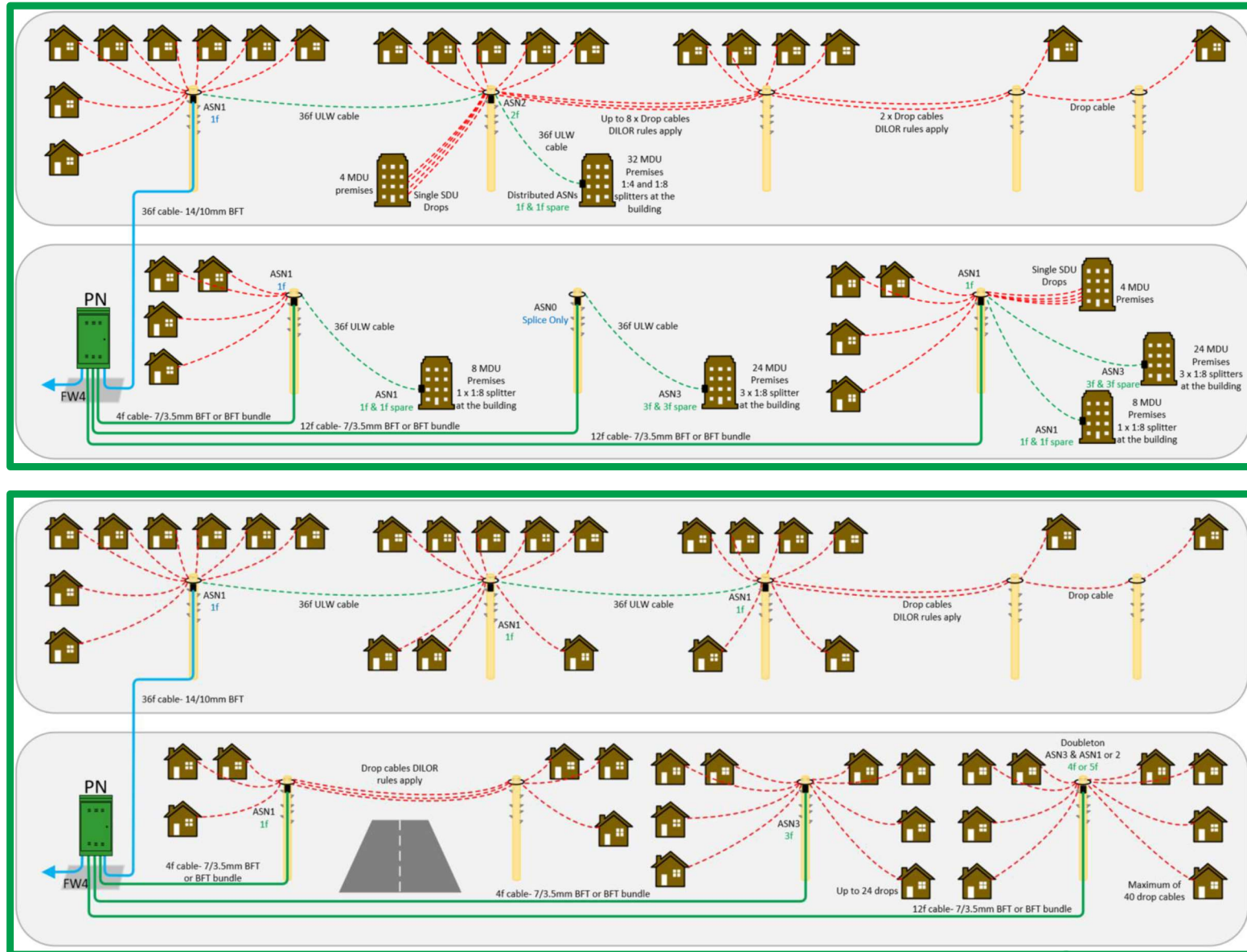


ASN0's no longer serve premises using drop cables.
These are now purely for splicing purposes.

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Overhead drops configurations

See below overview of the network showing the different methods of serving premises aerially.



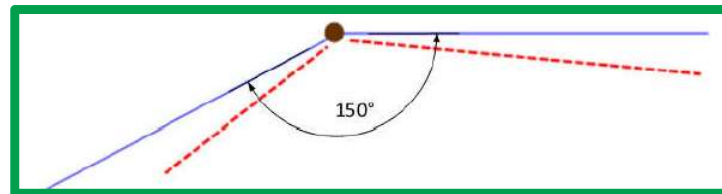
Fibre

DILOR rules followed for overhead cables

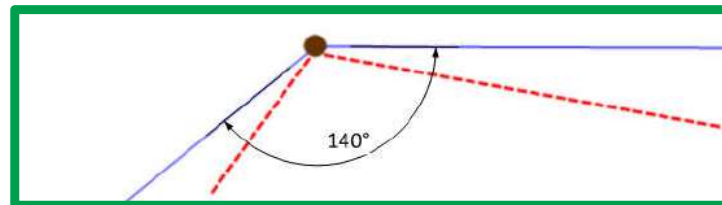
- Please note all CityFibre overhead cables are classed as drop cables according to BT specifications

- Route poles

- Route Poles are when we have cables both entering and leaving a pole in a straight line:-
- **Light class poles** – The angle shown needs to be equal or greater than 150 degrees, for it to be classed as a route pole.



- **Medium class poles** – The angle shown needs to be equal or greater than 140 degrees, for it to be classed as a route pole.



- When we have a route pole the max amount of wires are:-

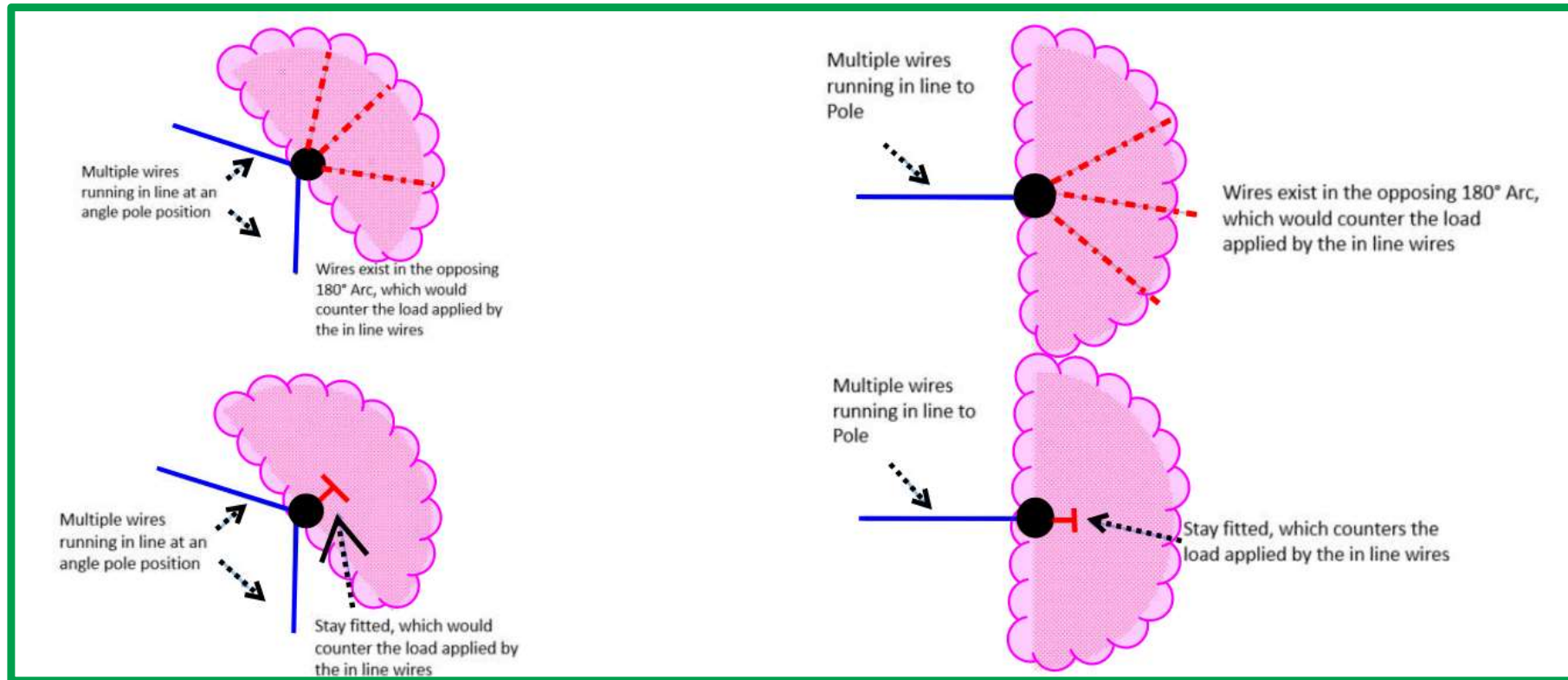
	Where one or both poles are Light Class	Where both poles are Medium or Stout Class
Max. Wires	8	12

DILOR rules followed for overhead cables

Pole to Pole Wires correctly interpreted in cable design (cont.)

Poles with an opposing load

- Poles with an opposing load, are when we have drop wires or pole stays in the opposing 180 degrees to your chosen route, Example:-



When we have opposing load poles, the max amount of wires are:-

	Where one or both poles are Light Class	Where both poles are Medium or Stout Class
Max. Wires	8	12

DILOR rules followed for overhead cables

Pole to Pole Wires correctly interpreted in cable design (cont.)

- Poles that do not have an opposing load or aren't Route poles
- For poles that do not have an opposing load or aren't route poles, the maximum drop wire loadings apply:-

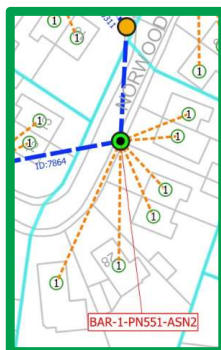
	Wires crossing Carriageway			Wires not crossing Carriageway		
	One or both poles are Light Class	Both Poles are Medium class	Both Poles are Stout class	One or both poles are Light Class	Both Poles are Medium class	Both Poles are Stout class
Max permitted wires	3	4	5	4	5	6

DILOR rules followed for overhead cables

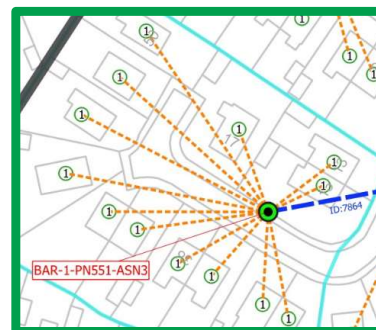
CityFibre Drops on NR Pole do not exceed Openreach rules

- NR – Non Radial. This means that the pole is only feeding premises in one direction up to 180 degrees
See below example:

NR – Non Radial Pole



R - Radial Pole



- Filter the Radial column to **NO**, this will show all of the poles that are being fed Non-Radial. We then need to check that the amount of drops that we have planned to put on the pole are < Openreach rules. If there are any over the maximum allowed for Non-Radial poles. We must check the drawing to see if we are feeding the premises radially. If we are feeding them radially then a network adjustment is to be noted I the exception to change from Non-Radial to Radial.
- Filter the Radial column to **YES**, this will show all of the poles that are being fed Radial, again we then need to check that the amount of drops that we have planned to put on the pole are < Openreach rules. If we are over the rules, but so are Openreach, the exception log will have to be noted that we require a Network Adjustment.

The maximum pole loadings by classification

Pole Classification	Radial	Non-Radial (Sideways Loaded)	D Pole (ie. 75% capacity)
Light	40	7†	30
Medium	40	15	30
Stout	50	30	38

Note: All poles will be checked by in-City planners to ensure OR rules are met for first install. The QC check is to ensure that the design is OR compliant

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† CityFibre will design to a maximum of 10 drops on non-radial Light poles, but Openreach rules state that to add the 8th dropwire to the pole a Network Adjustment will be required (unless the pole is made Radial by the addition of the 8th dropwire)

3. PN Fibre SLD

3	PN Fibre SLD		
3.1	PN/ASN/SN's shown		
3.2	Appropriate Cable Sizes (Fibre count)		
3.3	Cable ID / Name Shown		
3.4	No more than 4 Aerial Distribution cables between poles		
3.5	PN Home count less than 480 (not including properties fed from FEX)		
3.6	PN/ASN/SN Addresses		
3.7	PN/ASN/SN Home counts match drawings		
3.8	MDU's Identified & Labelled (only shown if contains splitter)		
3.9	MDU Fibre Count & Home Count		
3.10	Minimum of two distribution cables (Leaving PN)		
3.11	Check that ASN 1:8 splitters have been used efficiently		
3.12	Check that SN home count is over minimum of 16		

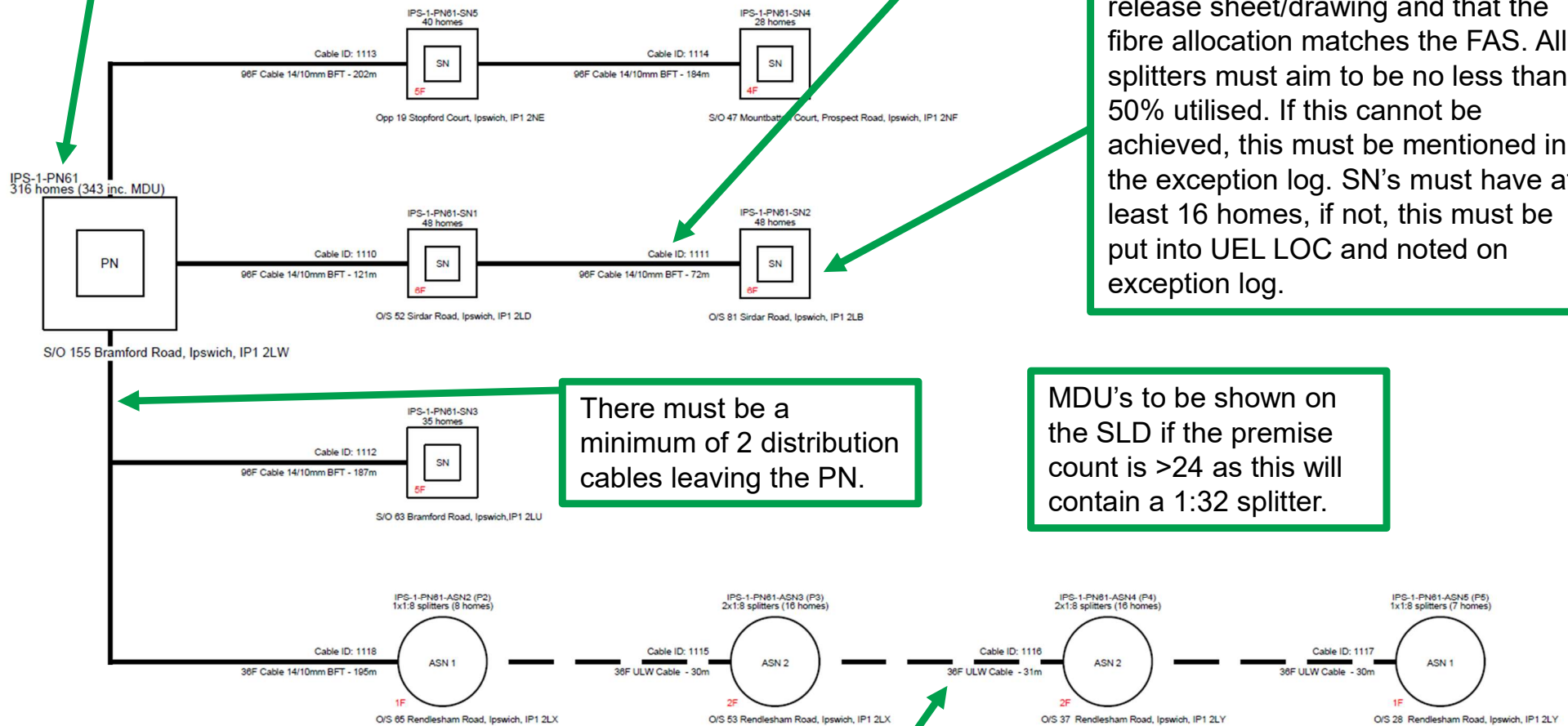
SLD

Make sure that the PN label is shown and is correct. The home count must match the release sheet and be <480 (Excluding FEX fed MDUs)

ASN/SN label is shown correctly and the address is correct.

Each cable must have an ID and the size of the cable is correct for its use i.e. SN = 96F, Singleton pole = 4F, series of pole = 36F, Cell sites = 12F

ASN/SN home count matches the release sheet/drawing and that the fibre allocation matches the FAS. All splitters must aim to be no less than 50% utilised. If this cannot be achieved, this must be mentioned in the exception log. SN's must have at least 16 homes, if not, this must be put into UEL LOC and noted on exception log.



There must be a minimum of 2 distribution cables leaving the PN.

MDU's to be shown on the SLD if the premise count is >24 as this will contain a 1:32 splitter.

No more than 4 CFH aerial distribution cables can be planned between poles.

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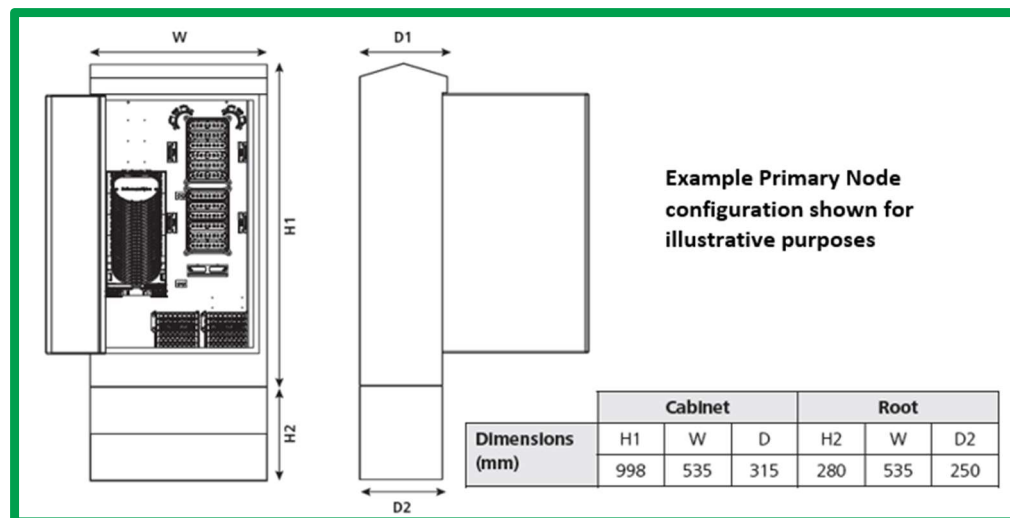
4. Cabinet / Pole Location Sheets

4	Cabinet / Pole Location Sheets		
4.1	All Cabinets & new Pole captured as per drawing		
4.2	PN/SN/Pole number		
4.3	PN/SN/Pole Address & X/Y Coordinates		
4.4	PN/SN/Pole location match drawing		
4.5	Photo indicating PN/SN/Pole location		
4.6	Cabinet Dimensions on drawing		
4.7	Pole Height and Type shown and matches Data Capture/BOQ		
4.8	The Footpath Width must be an ABSOLUTE Minimum of 1.33m for Cabinet		
4.9	Suitable Location Check on Google Maps (at QC)		
4.10	OS Map Extract (as per standard Template)		

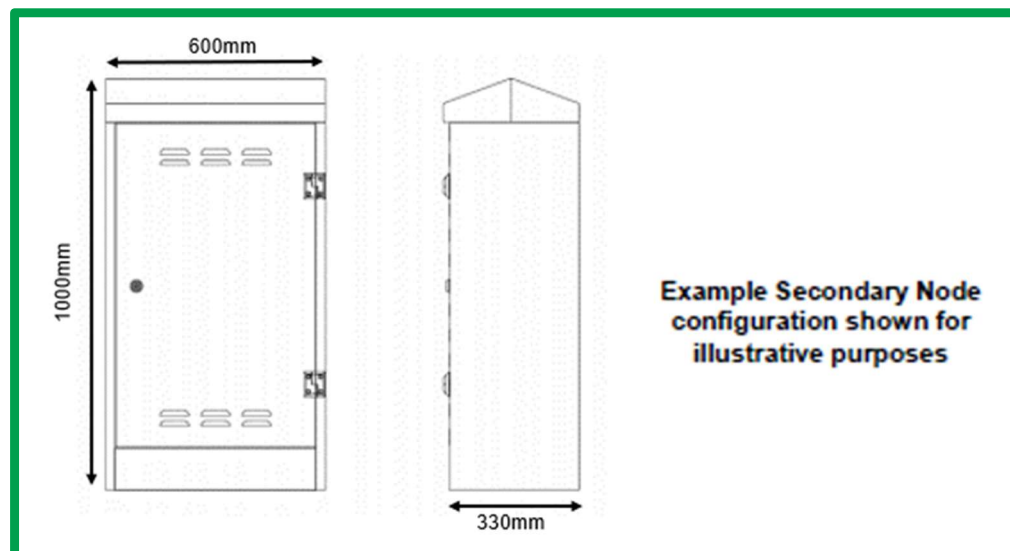
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Cabinet Location Sheets – PN/SN Dimensions for Reference

PN Dimensions



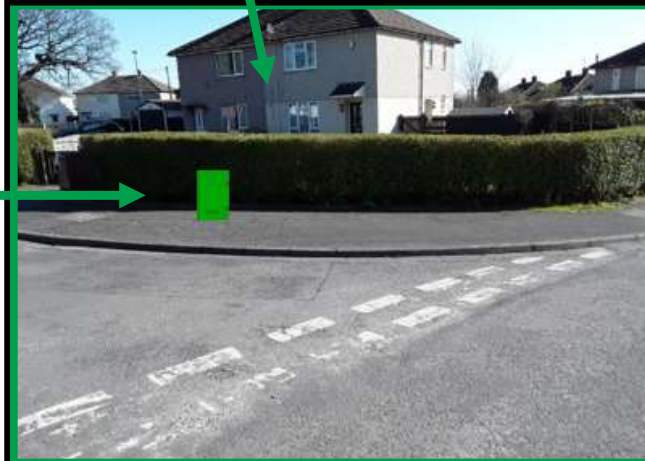
SN Dimensions



Cabinet Location Sheets – PN/SN

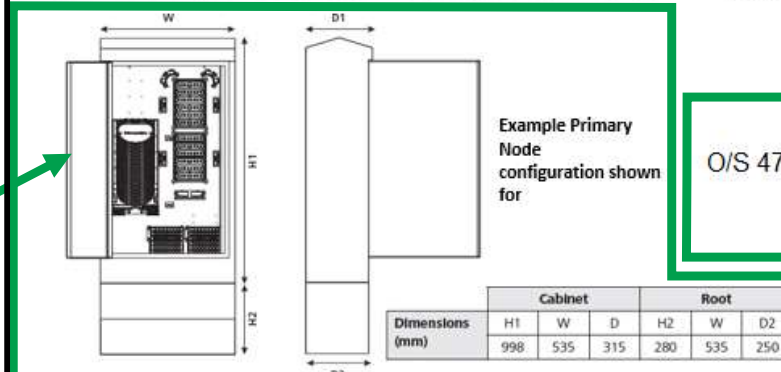
The photograph must be taken in such a way as to clearly show the proposed location and surroundings, the exact location of the cabinet must be clearly marked on the photograph, Google Maps images are **NOT** to be used under any circumstances. All pictures must be photos taken on survey.

Check Google Maps Street View to see if the cabinet location is suitable. Also ensure that the cabinet on the picture is sized as accurately as possible, Please refer to Siting Matrix



Check that the OS Map Extract is as per the standard template (in format shown on this picture). Road names must be included and an indication of where the cabinet is going to be. Ensure that the SN location matches that of the civils drawing

Check that there are dimensions of the cabinet on the drawing as shown. Please note the PN dimensions are slightly different to the SN



DER-1-PN42- PN Cabinet
O/S 47, BURLINGTON ROAD, DERBY, DE22 4JF
Coordinates:
X= 431592
Y= 336728
Footway width: 3.05m

The full address of the cabinet must be given including postcode and X & Y co-ordinates. This must also include detail of the location, e.g. cabinet in F/W or verge, back edge of F/W, left side of lamp column. Available F/W width must be included (min 1.33m).

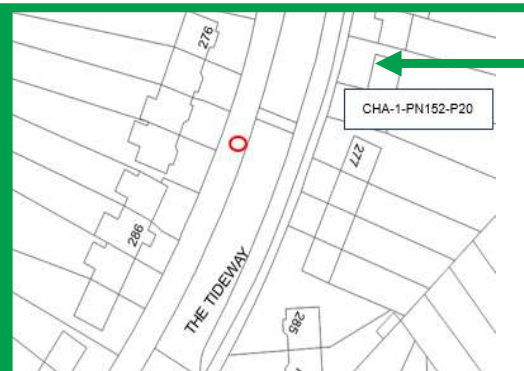
Any modifications to the drawing or use of alternative items to those specified must be agreed with CityFibre's local planning department. Reproduction from the Ordnance Survey map by CityFibre Holdings with permission of Ordnance Survey on behalf of Her Majesty's Stationary Office © Crown Copyright City Fibre (0100031673)	DER-1-PN42	Originator	
		Contact Number	
		Issue Date	
		Office	
		Line Manager	

Each page must be named using the unique PN/SN reference. (also each Sheet Tab)

Cabinet Location Sheets – Pole

The photograph must be taken in such a way as to clearly show the proposed location and surroundings, the exact location of the Pole must be clearly marked on the photograph, Google Maps images are **NOT** to be used under any circumstances. All pictures must be photos taken on survey

Check Google Maps Street View to see if the pole location is suitable. Look out for things like blocking windows/entrances etc.



Check that the OS Map Extract is as per the standard template (in format shown on this picture). Road names must be included and an indication of where the pole is going to be. Ensure that the new pole location matches that of the civils drawing.

Check that the correct pole height and type is shown on the drawing. (The letter stands for the type of pole S- Stout; M – Medium; L – Light). The number corresponds to the height of the pole in metres. 9L = 9metre light pole. Check that this matches up with the Pole data capture and SOR

Pole Type : 9M Light
Pole Height :9M

CHA-1-PN152-P20 - Extender Pole
O/S 280 THE TIDEWAY ME1 3PR
Coordinates:
X:574132.19
Y:165464.96
Footpath width: 5m
Pole type: 9M LIGHT
Pole Height: 9M
Location: In Footpath
Pole

The full address of the Pole must be given including postcode and X & Y co-ordinates. This must include detail of the location, e.g. Pole in F/W or verge, back edge of F/W, left side of lamp column. Available F/W width must be included.

Any modifications to the drawing or use of alternative items to those specified must be agreed with CityFibre's local planning department.	
Originator	Entegris
Contact Number	+353 56 77 95900
Issue Date	15 June 2020
Office	Ireland
Line Manager	Jimmy Murphy

CHA-1-PN152-P20

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Warrington Road
BIRCHWOOD
WARRINGTON
WA3 6ZH
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Each page must be named using the unique Pole reference. (also each Sheet Tab)

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Cabinet Siting Guidelines – PN/SN

This document is intended to provide general guidance to assist in the siting of cabinets safely, legally and in compliance with City Fibres requirements. Cabinets locations contravening any of the items listed in the Critical (red) section are likely to be challenged and rejected unless there are valid mitigating circumstances. In all cases consideration must be given to the nature of the area in which the cabinet is located. It is accepted that city / town centre areas are likely to be very restricted in potential cabinet locations and some of the rules may need to be less stringently applied. Quiet residential areas with low (30mph or less) speed limits present far less risk for parking at and working in cabinets than busy areas and higher speed roads. The below is general guidance only and each cabinet location must be assessed individually.

Red = Avoid, Amber = Acceptable, Green = Best Practice.

Line of Sight at Junctions	Cabinets must not block line of sight at road junctions Cabinets must be sited >10m from any road junction
Trees	Damage to root systems can cause tree to fall. Be aware of tree preservation orders Cabinets must be >5m from any tree and not within the canopy of root systems
Adopted Land	Wayleave required, potential diversionary issue at a later date, can restrict access to CF operatives Cabinets must not be sited on private land
Vehicular Access	Cabinets must not restrict vehicular access (including drop kerbs) or line of sight Safe parking area available within 15m of cabinet Safe parking area available within 5m of cabinet, and must be located >10m clear of any road junction keep in mind the effect on traffic when a van is parked outside the cabinet.
Traffic Damage	Avoid siting cabinets opposite road junctions as there is increased likelihood of vehicles hitting the cabinet. Avoid locations near loading bays where larger vehicles require space to manoeuvre. Cabinet sited at back edge of footway, clear of any road junction, and away from loading bays.
Fences	Local Authority Dependant - Some LAs do not allow cabinets sited against any fence where it may be considered a hop over security risk (e.g. 6ft fences). Cabinets must not be sited next to spiked railings, Safety of the general public must be a major consideration. Avoid siting cabinets in locations beside garden walls. Building flanks are preferable to garden walls/fences, and could be placed kerbside (where a knock down risk is minimal)

Street Furniture	Cabinets must not be sited in proximity of dangerous street furniture (electric substations, gas governor stations) and must not block road signs. Cabinet must not interfere with the designed flow of any footway drainage system or located immediately adjacent to any existing manhole or access chamber belonging to any other apparatus owner. Site cabinets near other street furniture, bollards, post boxes, telegraph poles, lamp columns, dust bins, grit bins.
Pedestrian Crossing	Cabinets must not be sited within 15m of a pedestrian crossing or within the hazard road markings as a van would need to park to work at the cabinet, (of great importance when siting a PN as this requires most splicing)
Emergency Services	Cabinets must not be sited in any location where they could affect access to any emergency services Cabinets sited >50m from an access egress to any emergency services, additional consideration given to affect on traffic flow when a van is parked at the cabinet
New Developments	Cabinets must not be sited in front of land where it could reasonably be expected to be developed at a future point.
Conservation Areas	Cabinets can be sited within conservation areas but consideration must be given to potential restrictions Cabinets not sited within conservation areas

Best Practice

Avoid



Pole Siting Guidelines

- The siting of new pole will depend on several factors, including what type of pole is to be installed, any hazards located in the area, the positioning of existing infrastructure and any impact on the local residents

Locating New Poles

Careful consideration must be given to the location of new poles to identify the optimal location for installation.

Where a pole is to be provided the following apply:

- The preferred position for installation is on the property boundary side of the footway (see Figure 3 - Pole Siting at Property Boundary (preferred))
- Wherever possible, the pole position should be a minimum of 500mm from the Kerb Stones or other edges (Figure 4).

A suitable location will ensure min. clearance in the footpath is maintained upon erection of the pole (1.0m)

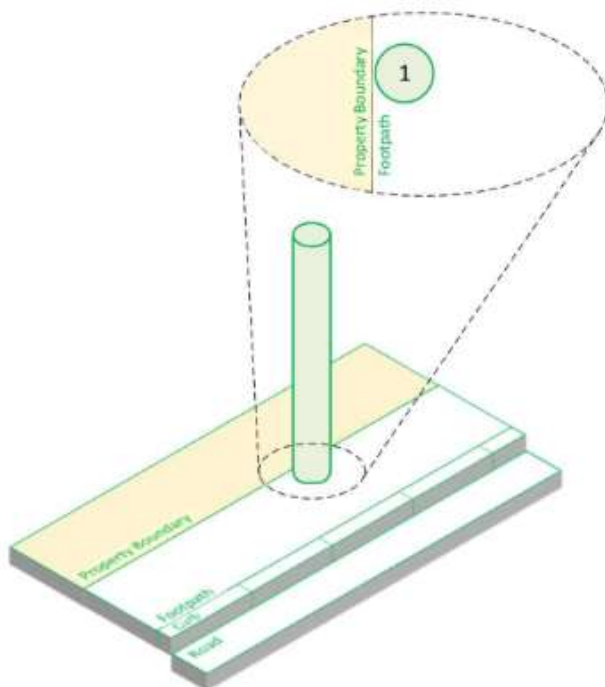


Figure 3 - Pole Siting at Property Boundary (preferred)

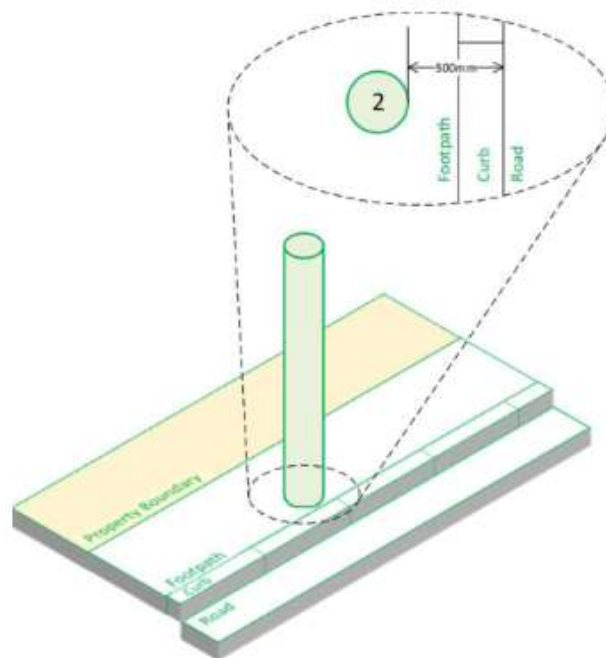


Figure 4 - Pole Siting at Curb Edge

Pole Siting Guidelines

Proximity to Schools

Creosoted wooden poles cannot be used within a school playground, play areas or other places where children will congregate. If it is decided that there is no alternative than to install a new pole, then the following apply:

- As with all new poles, explicit sign-off should be sought from Central Design Team.
- The use of wooden poles with an alternative treatment (copper oil) may be considered.
- Alternative methods of connection may be instructed.
- This will need to be clearly identified on all designs with a reference point, as well as referenced in the Pole Data Capture Sheet.

Additional Considerations

- Ladder positioning.
- Pole testing (both pre-climb and periodic).
- Access by elevating platform.
- Surface reinstatement requirements following pole testing.
- Increased likelihood of damage by tall vehicles where pole is located close to carriageway edge, particularly where significant road camber exists.
- Proximity to existing plant.

New poles must not be placed under electrical wires.

5. SED Log

5	SED Logs		
5.1	Log corresponds to reference numbers on drawing(s)		
5.2	All SEDs captured		

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All SEDs captured and Log corresponds to reference numbers on the drawing(s)

- All SEDs that are shown on the drawing must be captured within the SED log, with all the information required. Look out for things like bridges or electric sub-stations that should be easy to spot on the civils drawing.
- The SED numbers on the top right of the drawing match with the SED references in the SED log. The SED number can sometimes be within the Reference. The SED log must also show the address of the SED, the survey date and any comments

SED REF	POP	PN	SN/ASN	Structure Type:	Address:	Grid Reference:	Survey Date:
3	1	26	SN8,SN1,ASN1,SN7	High Voltage Electric Line	Along STAFFORD STREET,DERBY,DE1 1JL	434746,336292	20/02/2020
			SN7,ASN2,SN6,SN1,ASN7,SN2		Along CURZON STREET,DERBY,DE1 1JN	434850,336170	20/02/2020
			SN8		Along FRIAR GATE,DERBY,DE1 1EX	434721,336392	20/02/2020
			SN5		Along ABBEY STREET,DERBY,DE22 3SJ	434849,336101	20/02/2020
			SN5		Along MACKLIN STREET,DERBY,DE1 1SG	434888,336091	20/02/2020
			SN1		O/S 4 FRIARY STREET,DERBY,DE1 1JF	434839,336208	20/02/2020
			SN3		O/S 1-24 VICTORIA STREET, DERBY,DE1 1ES	435148,336193	20/02/2020
4	1	26	SN1	Electric Sub Station	Between CELTIC HOUSE and SAXON HOUSE,FRIARY STREET,DE1 1NL	434806,434806	20/02/2020
			ASN4		S/O KENSINGTON WORKS,FORMAN STREET,DERBY,DE1 1JQ.	434800,336027	20/02/2020
5	1	26	SN8	Bridge	S/O 32 FRIAR GATE,DERBY,DE1 1BX	434705,336401	20/02/2020
6	1	26	SN3	Culvert	OPP 17 VICTORIA STREET, DERBY,DE1 1ES	435145,336207	20/02/2020
7	1	26	SN5	Stairs	83 ABBEY STREET, DERBY,DE22 3SP	434882,335938	20/02/2020
			SN3		PADLEY HOMELESS CENTRE,BECKET STREET,DERBY,DE1 1HT	434999,336130	20/02/2020
			SN1		SAXON HOUSE,FRIARY STREET,DE1 1NL	434832,336229	20/02/2020
			SN1		1-3 FRIARY STREET,DERBY,DE1 1JF	434766,336202	20/02/2020
			SN7		75-99 CURZON STREET,DE1 1LP	434736,336134	20/02/2020
			SN8		99 FRIAR GATE,DERBY,DE1 1EZ	434702,336358	20/02/2020
8	1	26	SN5	Dig planned under building	59A ABBEY STREET,DERBY,DE22 3SP	434876,336022	20/02/2020

3	SED 3 - High Voltage Electric Line
4	SED 4 - Electric Sub Station
5	SED 5 - Bridge
6	SED 6 - Culvert
7	SED 7- Stairs
8	SED 8 - Dig planned under building. Alternative trenching methods may be needed.

6. Fibre Allocation Sheet

6	PN & ASN/SN Fibre Allocation Sheet		
6.1	Splicing sheets available (UG PN's only)		
6.2	FAS runs without errors		
6.3	All devices included		
6.4	Version control sheet filled in correctly		
6.5	Sheet optimised		

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Fibre Allocation Sheet

- All new FAS must be presented using the latest FAS templated supplied by CityFibre.
- Version Control sheet must be complete accurate, with the correct node name and the correct version information.
- The “Process Fibre Allocations” macro must run successfully with no errors. Warning are allowed, but only if they are valid for the design. A full list of error & warning is provided with the FAS documentation in the appendix.

Node name: EXA-1-PN103 Process Fibre Allocations 	Current Version		1	
	Date Exported		dd/mm/yy	
	Version	Date Exported	Planner	Ammendments Made
	1	dd/mm/yyyy	[name]	Initial Release
				[description of changes]

Distribution Network Allocation

- Check that all equipment on the distribution side has been assigned on the FAS, including the correct number of fibres for each device. The SLD must be used to validate this check.



- Verify that the device A/B end is named correct, as per SLD.

The "Tube" column shall detail the following information:

[Secondary Node ID] ASN-12
 [Tube #] Tube 1
 [A end] / [B end] PN103 / ASN12

Fibre 7	ASN11 Tube 1 ASN12 / ASN11	36f Cable LEC-1-PN608/LEC-1-PN608-ASN14
Fibre 6		
Fibre 5	ASN12 Tube 1 ASN13 / ASN12	
Fibre 4	ASN13 Tube 1 ASN14 / ASN13	
Fibre 3		
Fibre 2	ASN14 Tube 1 PN608 / ASN14	
Fibre 1		

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Core Network Allocation

- Check that all of the distribution fibres have been allocated to the correct PN splitter / core fibre. In particular the fibres 1-8 only have 1:4 splitters, and fibres 9-12 the P2P fibres

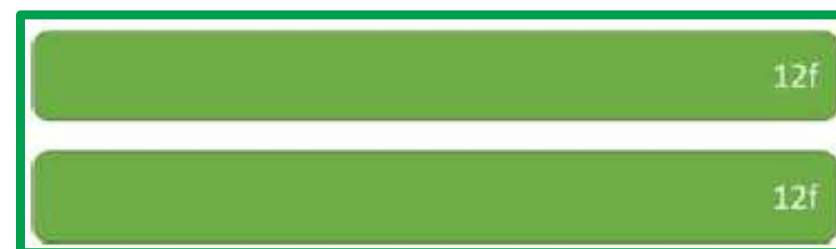
PN Allocation	PN1											
Tube Number	1											
Fibre Number	1	2	3	4	5	6	7	8	9	10	11	12
Allocation - Aerial PN Cabinet	In Use						Growth		SPARE			

- All core fibres utilisation must be balanced. With a fibre on the West then on the East being used before jumping onto the next available fibre. This is so that half the PN is served on the West route, and the other on the East route.
- Max number of 16 1:4 splitters can be used in a PN. Resulting in a maximum of 64 secondary node splitters. No exception to this rule

Tray Allocation

- All devices must be assigned to a distribution tray. The following rules must be applied.
 - A maximum of 24F must be assigned to a single tray
 - With no more than 12 of the 24F being used in the design.
- This can be broken down in to no more than 2x12F elements (tube) where each 12F element can be replaced by 3x4F element.

Tray 7	Fibre 2	SN1 Tube 1 PN103 / SN1	96f Cable EXA-1-PN103/ EXA-1-PN103-SN1
	Fibre 1		
	Fibre 4	ASN30b Tube 1 PN103 / ASN30b	4f Cable EXA-1-PN103/ EXA-1-PN103-ASN30
	Fibre 3	ASN30a Tube 1 PN103 / ASN30a	4f Cable EXA-1-PN103/ EXA-1-PN103-ASN30
	Fibre 2		
	Fibre 1		
	Fibre 1	ASN12 Tube 1 PN103 / ASN12	4f Cable EXA-1-PN103/ EXA-1-PN103-ASN12



- 2x12F elements, possibly tubes 1&2 from a 36F/96F cable or tube 1 from two separate cables



- Example Tray Allocation, showing a 12F element and 3x4F elements being assigned to a single tray
- 12F element replaced by 3 individual 4F elements from 4F cables

7. Release Sheet

7	PN Release Sheet		
7.1	PN Home count matches SLD		
7.2	Drop distances available for all SDU's		
7.3	UG drop distances less than 250m		
7.4	UPRN's or address data available for all demand points		
7.5	Blank UPRN's have a negative CP_GIS_ID code		
7.6	No duplicated UPRN's		
7.7	LOC codes applied and matches drawing		
7.8	MDU types match drawing		

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Drop distances available for all SDU's

SN

- Filter the 'Node ID' column and take off any ASNs (leaving only SNs). Filter the Distance(m) column on the release sheet from 'Largest to Smallest'. From here, check if any drop lengths are >250m
- If any drops are >250m, Check where these are in the drawing, and see if there is anything that can be done to resolve the issue. For example: Add a road crossing or move the cabinet slightly. Drawing to be annotated and sent back to GIS/DP to make changes
- Exceptions to the rule and there will be some where this rule cannot be physically achieved must be agreed on a case by case basis with the CityFibre Design team and logged in the Exceptions Log.
- Any MDU containing a splitter will not have a drop length shown. This is due to the splitter being fed by a distribution cable. This is not a fail.

ASN

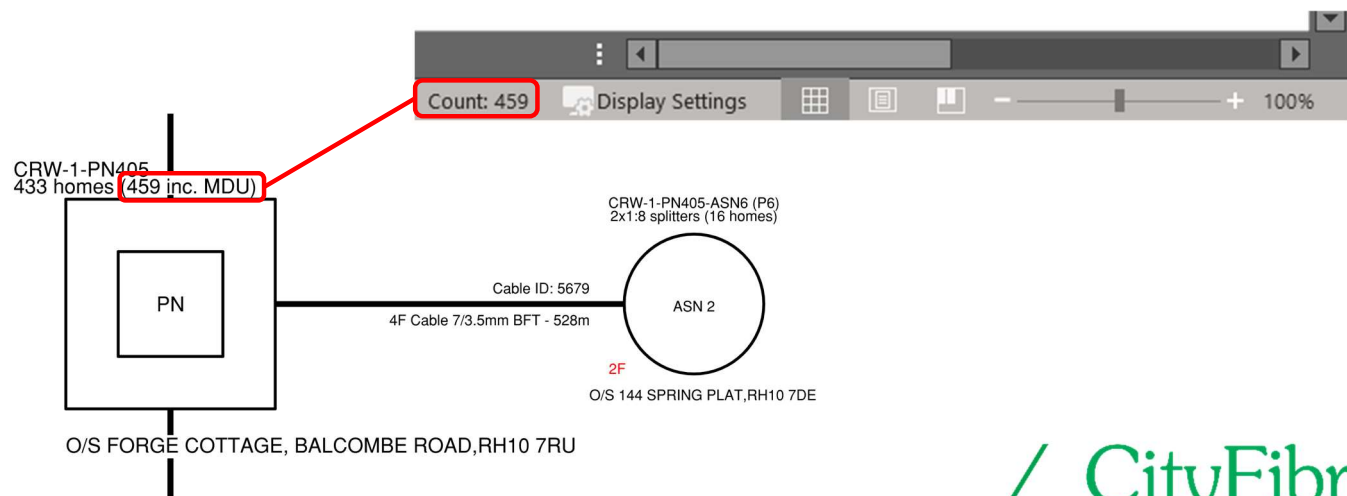
- Filter the 'Node ID' column and filter out SNs (leaving only ASNs). Then filter the Distance(m) column on the release sheet to 'Largest to Smallest'. From here you can check if any drop lengths are over 68m
- If any drops are >68m, Check where these are in the drawing and see if they are in fact over 68m. Please note, the release sheet doesn't take in to account extender poles, so there may be some instances where the drop-wire will show over 68m but this could be up to 68m between ASN and extender pole and then a further 68m between extender pole and premise.
- Any MDU containing a splitter will not have a drop length shown. This is due to the splitter being fed by a distribution cable. This is not a fail.

LOC Codes Applied and match drawing

- Check the 'LOC_DESC' column on the release sheet and ensure that there are LOC codes in there where required and the type of LOC code must match the drawing. Ensure that there is either True/T or False/F for every premises, there must not be any blanks.
- If there are any obvious areas within the design that should be in LOC and are not highlighted on the release sheet, this is to be marked up on the civils drawing and fed back to the design partner to make amendments
- Where multiple LOC codes apply to a single premises, both must be included and a space inserted between the codes in the 'Wayleave Code' (e.g. "WSD SED" or "PRRT MDU")

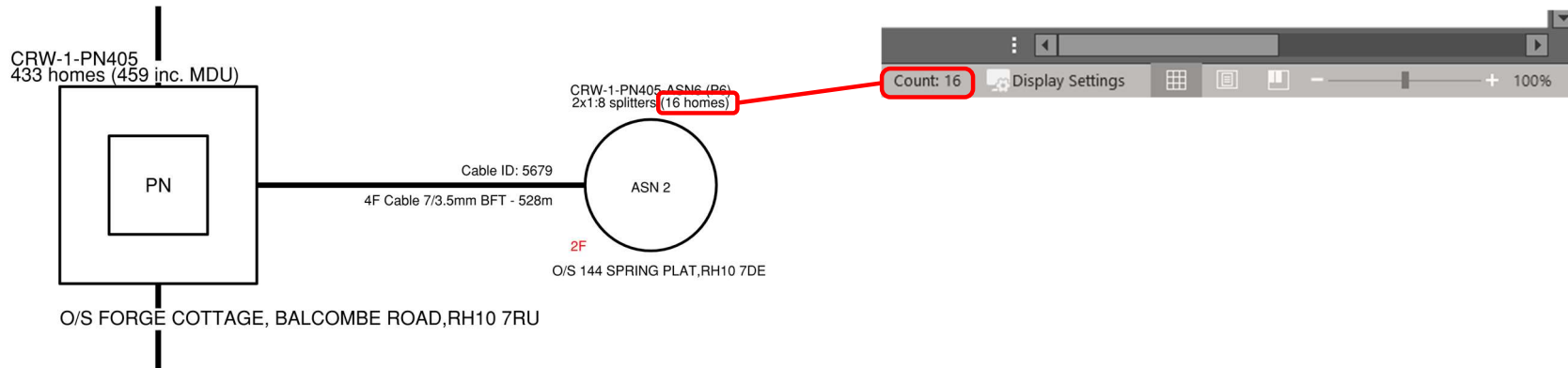
Property Count matches PN & ASN/SN totals

- Ensure that all of the filters are cleared within the release sheet and then highlight all of the premises. This will give you property count at the bottom right of the release sheet. Then compare this to the amount of properties in the PN area on the SLD and see if it matches. If it doesn't match, try and identify whether there are any properties missing. This could be due to MAST's within the drawings or properties wrong within the demand points



Property Count matches PN & ASN/SN totals

- Filter the release sheet to check each SN & ASN home count and ensure this matches with SLD. If they don't match then try to identify if any premise or MDU has been allocated to the wrong ASN or SN



MDU types match drawing

- All MDU's shown in design must be captured on the release sheet. MDU's are highlighted under 'PROP_TYPE' column and any large MDU's that's fed back to FEX must be shown as 'MDU (1:32)'
- Also check the type of MDU is shown under 'MDU_TYPE' column

	A	B	C	D
1	03-Jun-2020 15:17			
2				
3	SEC_NODE	UPRN	PROP_TYPE	MDU_TYPE
330	CRW-1-PN405-SN2	10034142836	MDU	Type 2
331	CRW-1-PN405-SN2	10034142837	MDU	Type 2
332	CRW-1-PN405-SN2	10034142838	MDU	Type 2
333	CRW-1-PN405-SN2	10034142839	MDU	Type 2
334	CRW-1-PN405-SN2	10034142840	MDU	Type 2
335	CRW-1-PN405-SN2	10034142841	MDU	Type 2
336	CRW-1-PN405-SN2	10034142842	MDU	Type 2
337	CRW-1-PN405-SN2	10034142843	MDU	Type 2
384	CRW-1-PN405-SN6	200001229156	MDU (1:32)	Type 1
385	CRW-1-PN405-SN6	200001229157	MDU (1:32)	Type 1
386	CRW-1-PN405-SN6	200001229158	MDU (1:32)	Type 1
387	CRW-1-PN405-SN6	200001229159	MDU (1:32)	Type 1
388	CRW-1-PN405-SN6	200001229160	MDU (1:32)	Type 1
389	CRW-1-PN405-SN6	200001229161	MDU (1:32)	Type 1
390	CRW-1-PN405-SN6	200001229162	MDU (1:32)	Type 1
391	CRW-1-PN405-SN6	200001229163	MDU (1:32)	Type 1
392	CRW-1-PN405-SN6	200001229164	MDU (1:32)	Type 1
393	CRW-1-PN405-SN6	200001229165	MDU (1:32)	Type 1
394	CRW-1-PN405-SN6	200001229166	MDU (1:32)	Type 1

UPRN's or address data available for all demand points, Blank UPRN's have a negative CP_GIS_ID code, No duplicated UPRN's

- (1) Address must have a positive UPRN number except when column 'CP_GIS_ID' has a negative number
- (2) Make sure that all the addresses have sufficient data such as building/house number, street name and postcode
- (3) Columns 'DP_GIS_ID' and 'CP_GIS_ID' must not be blank. Column 'CP_GIS_ID' must also not have any duplicate numbers. Any new demand points must contain a negative number within the 'DP_GIS_ID'

UPRN	PROP_TYPE	MDU_TYPE	ORG_NAME	BLD_NAME	BLD_N	BLD_NUM	STREET_NAME	POSTCODE	CATEGOR	CAT_TYPE	SN_TO_TOB	PN_TO_TOB	TOBY_TO_P	LOC_ISSU	LOC_DES	LOC_COMMENT	DP_SIZE	DP_GIS_ID	CP_GIS_ID
100061779457	SDU					34	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	15	0	15	False			1	185953542	185953546
100061779458	SDU					35	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	15	0	15	False			1	185953536	185953540
100061779459	SDU					36	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	17	0	17	False			1	185953530	185953534
100061779460	SDU					37	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	26	0	26	False			1	185953548	185953552
	SDU			ST EDWARD CONFESSOR CHURCH			HILLCREST CLOSE	RH10 7EQ	RD03	Residential	19	0	19	False			1	-1	-1
100061779437	SDU					1	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	53	0	53	False			1	185953854	185953858
100061779438	SDU					2	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	46	0	46	False			1	185953842	185953846
100061779439	SDU					3	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	38	0	38	False			1	185953836	185953840
100061779440	SDU					4	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	29	0	29	False			1	185953848	185953852
100061779441	SDU					5	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	24	0	24	False			1	185953806	185953810
100061779442	SDU					6	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	19	0	19	False			1	185953776	185953780
100061779443	SDU					7	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	19	0	19	False			1	185953812	185953816
100061779444	SDU					8	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	19	0	19	False			1	185953764	185953768
100061779445	SDU					9	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	25	0	25	False			1	185953734	185953738
100061779446	SDU					10	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	30	0	30	False			1	185953770	185953774
100061779447	SDU					11	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	36	0	36	False			1	185953758	185953762
100061779448	SDU					12	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	41	0	41	False			1	185953752	185953756
100061779449	SDU					13	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	45	0	45	False			1	185953746	185953750
100061779450	SDU					14	HILLCREST CLOSE	RH10 7EQ	RD04	Residential	21	0	21	False			1	185953740	185953744
100061779451	SDU					15	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	24	0	24	False			1	185953728	185953732
100061779452	SDU					16	HILLCREST CLOSE	RH10 7EQ	RD03	Residential	25	0	25	False			1	185953722	185953726

8. SOR / BOQ

8	SOR /BOQ		
8.1	Civils Lengths Match		
8.2	Cable Lengths Match		
8.3	Joint count match drawings		
8.4	Chamber counts match drawings		
8.5	Cabinet count matches drawings		
8.6	Correct Number of ASN's by Type		
8.7	New Pole Volumes match Pole location sheet		

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Civils/Cable/Chamber/Cabinet & Joints Match

The SoR & BoM are automatically generated by the CFDC plugin. However the values must be verified, and both documents must match.

- Both the civils & cable lengths must match, however a small difference is allowed, however if there is a difference over 100m this will be rejected.
- All new planned chambers must be captured on both documents and must match with the civils drawing, this is the same for all street cabinets & underground joints.

**BOM
CHECK**

Equipment	Count
Primary nodes	1
Secondary nodes	9
ASN1	3
ASN2	4
ASN3	2
ASN0	1
Toby boxes	160
New poles	0
Chambers	15
Joints	1
Gel Wrap	16
Chambers	

**SOR
CHECK**

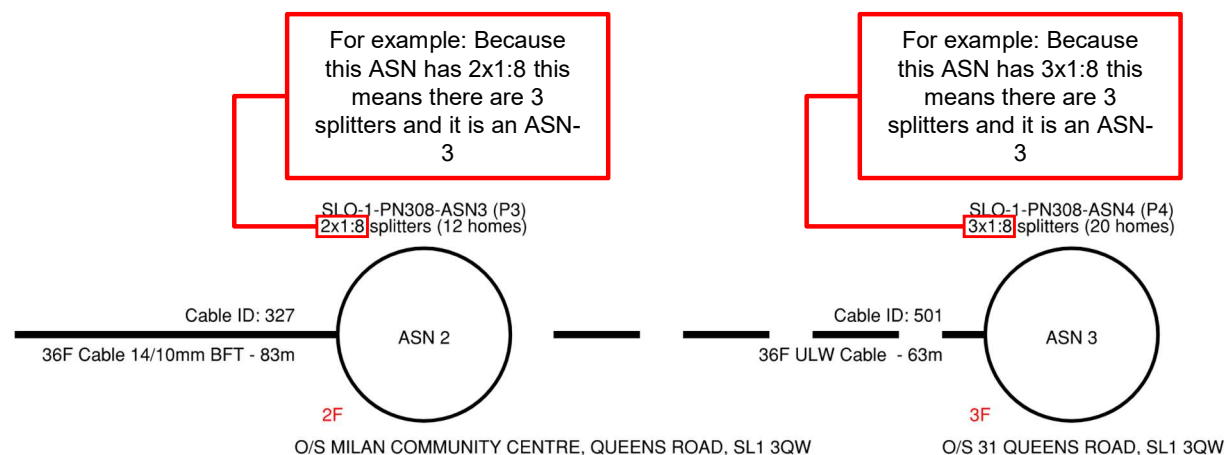
Ref	Description	Unit of Meas	Buildable	LOC	Total
Joint Enclosures (Series K100)					
K101	Supply and Install Joint Enclosures, to include all elements required - 12f	Nr	0	0	0
K102	Supply and Install Joint Enclosures, to include all elements required - 24f	Nr	0	0	0
K103	Supply and Install Joint Enclosures, to include all elements required - 48f	Nr	0	0	0
K104	Supply and Install Joint Enclosures, to include all elements required - 72f	Nr	0	0	0
K105	Supply and Install Joint Enclosures, to include all elements required - 96f	Nr	0	0	0
K106	Supply and Install Joint Enclosures, to include all elements required - 144f	Nr	0	0	0
K107	Supply and Install Joint Enclosures, to include all elements required - 288f	Nr	1	0	1
K108	Supply and Install Joint Enclosures, to include all elements required - 432f	Nr	0	0	0

Correct Number of ASN's by Type

- All ASN types must be populated on SOR and BOQ this should be cross reference with the SLD. Both the SoR & BoM must align.
- Care must be taken with 'Doubleton' ASN's. ASN 4 & 5, will appear on the SLD, however these do not exist and are created by combining ASN1/2/3 together out on the field. This means that when ever an ASN4 appears on the SLD a ASN1&3 must be shown on the BoM & SoR

BOM

Equipment	Count
Primary nodes	1
Secondary nodes	9
ASN1	3
ASN2	4
ASN3	2
ASN0	1
Toby boxes	160
New poles	0
Chambers	15
Joints	1
Gel Wrap	16
Chambers	



SOR

Ref	Description	Unit of Meas	Buildable	LOC	Total
Fibre Distribution points (Series S500)					
S501	Supply only ASN No Splitter	each	1	0	1
S502	Supply only ASN 1 Splitter	each	2	1	3
S503	Supply only ASN 2 Splitter	each	4	0	4
S504	Supply only ASN 3 Splitter	each	2	0	2

New Pole Volumes match Pole location sheet

- All new poles within the drawing must captured within SOR. The pole types in the data capture sheet and cab/pole location sheet should be cross-checked to make sure they all match.

P112	Supply and install a dressed (ringhead,& steps) 9 Metre Light Telephone Pole	Each	1	0	1	New CFH Poles
P113	Supply and install a dressed (ringhead,& steps) 9 Metre Medium Telephone Pole	Each	0	0	0	New CFH Poles
P114	Supply and install a dressed (ringhead & steps) 10 Metre Light Telephone Pole	Each	0	0	0	New CFH Poles
P115	Supply and install a dressed (ringhead & steps) 10 Metre Medium Telephone Pole	Each	0	0	0	New CFH Poles
P116	Supply and install a dressed (ringhead & steps) 11 Metre Light Telephone Pole	Each	0	0	0	New CFH Poles
P117	Supply and install a dressed (ringhead & steps) 11 Metre Medium Telephone Pole	Each	0	0	0	New CFH Poles
P118	Supply and install a dressed (ringhead & steps) 12 Metre Light Telephone Pole	Each	0	0	0	New CFH Poles
P119	Supply and install a dressed (ringhead & steps) 12 Metre Medium Telephone Pole	Each	0	0	0	New CFH Poles

BT ID	Type	Feed	Plant Item	Existing Wires	P2P Spans	CityFibre Drops	Free Space	Ladder Access	Ring Head	Radial	Capping	Hazards	Pole A1024	Pole Age	Test Date	Status	Owner	Address
DP10	ASN	Underground	9M LIGHT	13	0	24	Top	Yes	Yes	Yes	Yes	No	No	1988	Mar-14	Existing	BT openreach	Example
DP104	ASN	Aerial	9M LIGHT	8	0	8	Top	Yes	Yes	No	No	No	Yes	1974	Nov-11	Existing	BT openreach	Example
	Extender	Aerial	9M LIGHT	0	1	0	Top	Yes	Yes	Yes	Yes	No	Yes			Planned	CityFibre	Example
DP29	ASN	Aerial	11M LIGHT	17	0	12	Top	Yes	Yes	No	Yes	Yes	No	2015	Jul-18	Existing	BT openreach	Example
DP1038	ASN	Aerial	9M LIGHT	25	0	24	Top	No	Yes	Yes	Yes	No	No		May-18	Existing	BT openreach	Example
DP1037	ASN	Aerial	9M LIGHT	21	0	20	Top	Yes	Yes	Yes	Yes	No	Yes	1973	Dec-18	Existing	BT openreach	Example
DP28	ASN	Aerial	9M LIGHT	19	0	20	Top	Yes	Yes	Yes	No	Yes	No	1981	Aug-18	Existing	BT openreach	Example
DP153	ASN	Underground	BT Generic Pole	26	0	18	Middle	Yes	Yes	No	Yes	No	Yes	1973	May-17	Existing	BT openreach	Example
DP34	ASN	Underground	8M LIGHT	14	0	12	Top	Yes	Yes	No	No	Yes	Yes	1980	Mar-14	Existing	BT openreach	Example
DP1044	ASN	Underground	8M MEDIUM	16	0	16	Top	Yes	Yes	No	Yes	No	No	2009	Mar-19	Existing	BT openreach	Example
DP1043	ASN	Aerial	8M LIGHT	21	0	21	Top	Yes	Yes	No	Yes	No	Yes	1975	Nov-11	Existing	BT openreach	Example

9. Survey Capture / Photos

9	Survey Capture / Photos		
9.1	All entries are complete within the Data Capture Form		
9.2	New Poles are identified within the Data Capture Form		
9.3	Hazards Identified within the Data Capture Form		
9.4	Pole to Pole Wires correctly interpreted in Cable Design		
9.5	City Fibre Drops on NR Pole do not exceed Openreach Rules		
9.6	Chamber / Duct Space Images available for where PIA UG used in design		
9.7	BT chamber photo ID's match drawings		

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Survey Capture/Photos

All Entries are Complete within the Pole Data Capture Form

- All entries of the sheet must be complete within the Pole Data Capture Form, anything that is missing needs to be captured in the Exception log, as to why? All information needs to be correct and accurate, anything that is not normal would need capturing in the hazards and comments. Make sure that coordinates have been provided for each pole, and they are in the correct OS National Grid format.

Openreach Pole Test Data has been captured within the Data Capture sheet.

Identifier	BT ID	Type	Feed	Plant Item	Existing Wires	P2P Span	CityFibre Drops	Free Space	Ladder Access	Ring Head	Radial	Capping	Hazards	Pole A1024	Pole Age	Test Date	Status	Owner	Address	Comments	GPS X	GPS Y	
WSM-1-PN241-P1	1750	ASN	Underground	9M LIGHT	19	1	7 Top	Yes	No	No	No	No	No	No	83	No test lab	Existing	BT openreach	15 Kewstoke Rd	Ok	330970.3	162241.5	
WSM-1-PN241-P10	3	Extender	Aerial	7M LIGHT	2	1	1 Top	Yes	Yes	No	No	No	No	No	0	UNABLE TO	Existing	BT openreach	IN THE WOOD, WESTC	Pole is in bac	331156.2	162571.5	
WSM-1-PN241-P11	0	ASN	Aerial	7M LIGHT	3	2	2 Top	Yes	Yes	No	No	No	No	No	2	11-08	Existing	BT openreach	SPRING COVE, WESTO	Tree trimmin	331116.2	162564.8	
WSM-1-PN241-P12	1	Extender	Aerial	8M LIGHT	2	1	1 Top	Yes	Yes	Yes	Yes	No	No	No	1	03-09	Existing	BT openreach	Worlebury lodge , Can	Pole is on ste	330997.3	162413.0	
WSM-1-PN241-P13	1	Extender	Aerial	9M MEDIUM	2	2	0 Top	Yes	Yes	No	No	No	No	No	3	11-17	Existing	BT openreach	WATERS EDGE, WESTC	Pole surround	331078.3	162554.5	
WSM-1-PN241-P14	2238	ASN	Underground	10M MEDIUM	3	2	2 Top	No	Yes	No	No	No	space	Yes	No	0	3/15	Existing	BT openreach	OPP WATERS EDGE, KE	Pole on cliff b	331020.0	162546.1
WSM-1-PN241-P2	428	ASN	Underground	10M LIGHT	17	2	4 Top	Yes	Yes	Yes	Yes	No	No	No	13	No test lab	Existing	BT openreach	7A Keystoke Rd	Ok	330986.7	162200.2	
WSM-1-PN241-P3	22	ASN	Underground	9M LIGHT	9	1	5 Top	Yes	Yes	Yes	Yes	No	No	No	10	No test lab	Existing	BT openreach	50 kewstoke Rd	Ok	331009.3	162161.5	
WSM-1-PN241-P4	2237	ASN	Underground	11M MEDIUM	30	0	4 Top	Yes	Yes	Yes	No	No	No	No	97	03-15	Existing	BT openreach	5 Claremont Crescent	Ok	331001.6	162136.5	
WSM-1-PN241-P5	187	ASN	Underground	11M MEDIUM	9	0	7 None	Yes	Yes	No	No	No	No	No	96	No test lab	Existing	BT openreach	11 Claremont Crescen	Pole consolida	330965.7	162159.1	
WSM-1-PN241-P6	1	ASN	Aerial	9M LIGHT	5	2	2 Top	Yes	Yes	Yes	Yes	No	No	No	8	03-09	Existing	BT openreach	1 Camp Rd North	Ok	330982.5	162322.5	
WSM-1-PN241-P7	27	ASN	Underground	11M MEDIUM	17	2	9 Top	Yes	Yes	No	No	No	No	No	71	02-13	Existing	BT openreach	Nr St Josephs Church, D	pole	331005.5	162322.8	
WSM-1-PN241-P8	298	ASN	Underground	10M LIGHT	7	1	6 Top	Yes	Yes	Yes	Yes	No	No	No	0	12-19	Existing	BT openreach	14 Camp Rd	Cannot see p	330969.7	162388.0	
WSM-1-PN241-P9		ASN	Underground	9M LIGHT	3	0	9 Top	No	No	No	No	No	No	No	0	Unable to	Existing	BT openreach	In rear garden of 12A	In rear garde	330942.8	162447.3	

New Poles are identified within the Data Capture Form

- If there are any new poles within the design; "Planned" must be present in the "Status" column, and the correct Plant Item must be entered, and this must correspond with the SoR and Pole Location sheets

Hazards Identified within the Data Capture Form

- Check the comments column in the data capture form to see if any D or C poles have been identified, or any health and safety issues.

Pole to Pole Wires correctly interpreted in cable design

- 'P2P' column of the data capture sheet details the amount of planned and existing cables will be coming from the pole to another. This must not break DILOR rules & CityFibre cable amount rules. Max 4 distribution cables in a single span, and 8 drop wires.

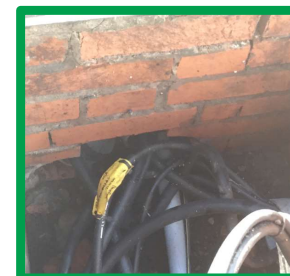
Survey Capture/Photos

Chamber / Duct Space Images available for where PIA UG used in Design

- Check we have photos for all OR apparatus used within the design. These will generally be supplied in a Survey folder along with the Pole photos.

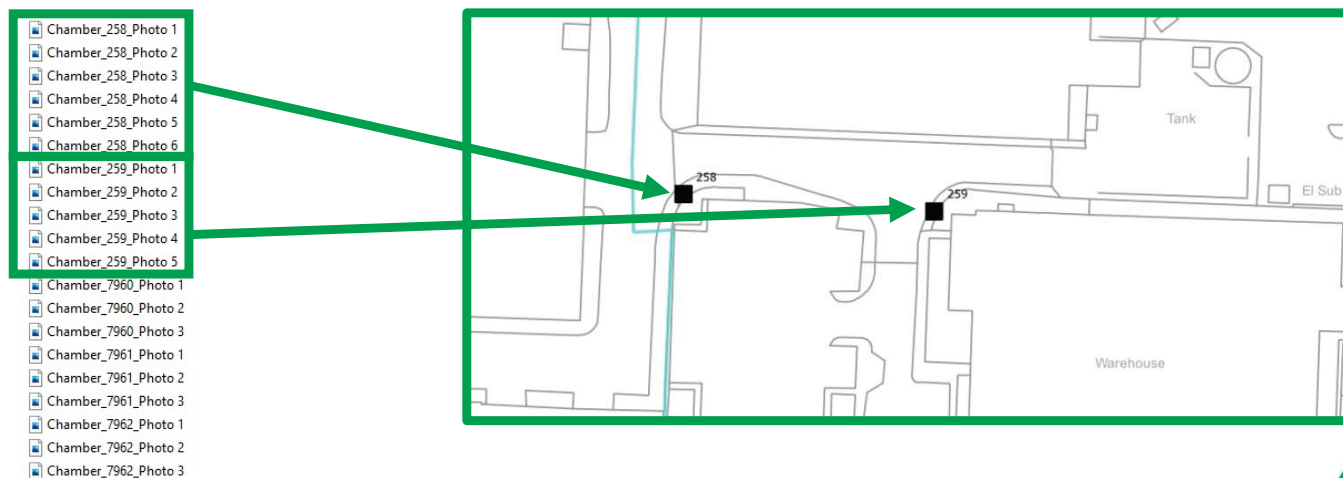
CABS	19/03/2020 12:10	File folder
CHAMBERS	23/03/2020 08:26	File folder
POLES	19/03/2020 12:09	File folder

- Chamber Images must clearly show all ingress/egress points we are proposing to utilise



BT chamber photo ID's match drawings

There may also be a map that corresponds with the images so you can tell which image relates to which chamber.



CityFibre

10. Misc.

10	Misc.		
10.1	Exception LOG included		
10.2	Correct file structure followed		
10.3	Correct Naming convention used		
10.4	CPP with acceptable margins		

CityFibre

Exception Log

All designs submitted to CF, must contain a log with all exception to the current architecture rules

- An effort must be made to avoid breaking the rules outlined in the architecture document. However this is not always possible, so this must be captured within the exception log.
- The log must also contain any time where a QC rule has also been broken, where this can not be avoided.
- Currently there is no standard format for this log. However it must have the correct area name, as well as an accurate home count, along with every exception and a reason why it is required.
- Architecture exceptions must be approved by CityFibre design before the design is submitted to CityFibre. Along with who approved it, when it was approved & where it is recorded (teams/email)

CityFibre																			
Exception log	Area																		
Homecount Exceptions																			
Home Count		Exception Explanation																	
468		No Exceptions																	

File Structure & Naming (WIP)

Place holder

CPP within acceptable margins (WIP)

Design's costs must fall into acceptable margins

- A effort must be made, to make sure that the cost for the design is as low as possible. This is achievable by utilising all existing infrastructure. This includes CF network, BT underground network and BT overhead network.
- There is expectations to this, for example PN areas that contain the FEX, or where feeder is primary in carriageway due. However these expectations must be agreed by CF design team before submission.
- A “blender” rate card has been created which is to be used for all LLD designs. This rate card is not a “real” rate card and is not used by any of our city contractors. It is intended to be an average cost, allowing design to roughly cost each PN.

CPP	Result
Less than £600	Preferred
£600-£800	Allowed, but design needs reviewed
Greater than £800	Not allowed without an exception from CF design team.