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ISIS practice
For All Openreach people

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FTTC Quality Standards & Checks

About this document ...

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Content approval

This is the Issue 11 of this document.
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Version History

Version No.	Date	Author	Comments
Issue 11	16-May-2019	Sarah Hogan-Berrow	Document review. Links to external sources/email validated/updated where appropriate. Author/Approver/Publisher details amended. Change of Author. Obsolete refrences removed, earthing guidance pointed to governing ISIS for 18th Ed changes. Document re-branded to openreach
Issue 10	17-May-2018	Ben Noakes	Author/Approver update
Issue 9	17-May-2017	Allan Lupton	C1026 amended to 10 point item (typing error). F0205 BP 4 updated. Changes made to A2110 and A2116 items.Section 8.2 typing errors updated. See section 8.3 for change summary
Issue 8	03-May-2017	Allan Lupton	Document review. See section 8.2 for change summary.
Issue 7	24-Oct-2016	Allan Lupton	Change of approver
Issue 6	21-Oct-2016	Allan Lupton	No content change – review date extended
Issue 6	03-Mar-2015	Document Manager T	Document migrated onto new platform with no content change
Issue 6	22-Oct-2013	Allan Lupton	Document review. No changes made
Issue 5	26-Oct-2012	Allan Lupton	Reviewed and updated - see section 8 for summary of changes.
Issue Draft 4b	26-Oct-2012	Allan Lupton	Updated with minor changes following review with Ct,MUS & Audit team representatives. Full details of changes can be found in the summary of changes section at the end of the document.
Issue Draft 4a	12-Oct-2012	Allan Lupton	Updated to reflect conducrete,new NTE positions, auto RCD, new earth certs and max limits by RDSLAM type,

			polylid,removal of need for DS1B in 1st JB from RDSLAM. 1 hit duct seal process & points of clarity added. New section 8 showing summary of changes
Issue 4	24-Oct-2011	Allan Lupton	Updated to reflect AEC changes since Oct 2010, MS review agreements from May 1st, cat5e cable and modem types. Audit sampling of of tie cable pairs & telemetry line provision added.Clarity added for several item codes.OQP alternative codes added
Issue Draft 3b	24-Oct-2011	Allan Lupton	updated to reflect feedback and additional audit continuity checks of tie cables
Issue Draft 3a	30-Sep-2011	Allan Lupton	updated to refelect changes since Oct 2010 and MS reviews
Issue 3	28-Oct-2010	Allan Lupton	major update to reflect change of SAC to RDSLAM, introduction of ECI, Huawei 96 RDSLAM, Managed Services Install contracts, F1031 power check item, Meter, RCD, OCR/RDSLAM fibre labelling.5m drawrope rule,duct, bolt repair changes.Scope & SS refs removed.
Issue Draft 2a	28-Oct-2010	Allan Lupton	Updated to reflect ECI 128/256 & Huawei 96 RDSLAMS and changes to working practices - ready to upload to ISIS as Issue 3.
Issue 2	30-Apr-2010	Allan Lupton	Updated to reflect Apr 10 change of FPQ SS, item codes, ratings and QC criteria after March review. Updated to include splice box2a,resin 6c,pre cast plinths, earth safety labels, new earthing policy,PCP jacking bolts & cabinet earth responsibilities
Issue Draft 1d	29-Apr-2010	Allan Lupton	updated after AL & RE review

Issue Draft 1c	28-Apr-2010	Allan Lupton	update after 28/04 changes on earthing policy and planning tie cables
Issue Draft 1b	27-Apr-2010	Allan Lupton	updated after review by RE & DA
Issue Draft 1a	26-Apr-2010	Allan Lupton	reviewed and updated on 23/04/10 by AL
Issue 1	23-Nov-2009	Allan Lupton	Initial issue

Table of Content

1 Introduction

This document references the Quality Standards and Check criteria to be applied by Openreach people and contracted Suppliers when working on Fibre to the Cabinet (FTTC) plant and equipment.

This includes the criteria for Quality checks and Independent Audits showing the relevant checklists, cat codes and items to be checked.

2 Reference documentation

The following quality standards reference documentation is applicable to the FTTC checks and audits.

- EPT/ANS/A042 (FTTC User Manual - Fibre, Copper, PCP & End User)
- EPT/ANS/A043 (FTTC User Manual - Plinth & RDSLAM installation)

3 Scope

This document is to be used to check in progress and completed work at the NGA FTTC sites.

4 Quality Checks and Independent Audits

The following standards will be checked during quality checks and independent audits completed by Openreach people and their contracted suppliers. This will be in accordance with their agreed quality checking and audit strategy. All results will be input into FPQ, or agreed Contract OQP checks input into the CANDID quality check databases e.g. CQP.

5 Audit Methodology

The Checkers and Assessors may need to liaise with the Local Planning / Programme Manager's Single Point of Contact (SPOC) and Contractor for the relevant exchange area to be fully aware of estimates, allocated resource and completion dates of the relevant Installation activities.

Audits may be completed in several visits or combined visits at critical quality check gates to reflect the phases of the In Scope installation activities– see section 5.1.

Audit strategy and sample sizes will be agreed between Audit teams and Operations/Contract Management.

Audits will be based on independent audit of completed work at critical quality check gates.

5.1 FTTC – in scope of Independent Audit

All RDSLAM related activities

- OCR fibre provision and termination – including rack, shelf and tray installation and Hydra cables.
- Plinth Installation
- Root & RDSLAM installation
- Telemetry provision, where applicable
- Copper & fibre provision & termination
- Existing PCP – including earth bonding
- Exchange and cable chamber Fibre cabling and jointing
- RDSLAM Meter provision, where applicable
- RDSLAM RCD provision
- RDSLAM Power provision
- RDSLAM Battery provision

5.2 FTTC – out of scope of Independent Audit

- RDSLAM Huawei/ ECI commissioning and testing.
- L2S & OLT rack provision
- L2S & OLT Huawei/ECI commissioning & testing
- End user installation e.g. Managed Install

6 *FPQ Checklist Information*

- Existing QPW score sheets will be used in conjunction with the FTTC specific QPW score sheets
- Additional Indicators for IA are managed by the Audit team
- Job number format – are managed by the Audit team Estimate number / Bid area short code
- Engineer CSS ID or Contract OUC – as per estimate completion
- Contractor NSZ IDs

7 Quality Check and Audit Items

7.1 OCR - FTTC check items and guidance

10	F1020	**OCR rack installed correctly and in correct position** • Floor position correct • Correct number and type of bolts and washers
10	F1021	**OCR tubing, cable breakouts and manifolds installation correctly (including order of provision)** • OCR Cable breakout units provided in correct order (right to left) • OCR sub racks & Trays provided in correct order (bottom up) • OCR fibre breakout tubing provided correctly and securely connected
10	F1022	**Hydra cables correctly routed and restrained between and within racks (side ducts ,manifolds and shelves** • No fibres out of place • Maximum of 50 mm diameter bundles • OCR / OLT Hydra 8 fibre cables correctly routed and restrained within side ducts, cable manifolds and shelf and between racks • ISIS PRO/IPP/D015 applies for Cabling on runways
10	F1023	**Hydra cables minimum bend diameter not exceeded.** • Minimum 30mm radii
10	F1024	**COF to Cable Chamber routed and restrained correctly on rack with no sharp edges on cable straps** • Metal edges of rack avoided • Cable ties correctly provided and cut flush • Strength members correctly terminated
10	F1025	**COF bending diameters correct** • At top of rack and where leaving racking • 30mm min bending radii
10	F1026	**COF Fibres (unused) left with correct length of spare in cable breakouts and storage cassettes.** • 3.8m of spare stripped fibre left from COF butt for storage

		• 2.2m of spare stripped fibre left from hydra cable butt line for storage • (in progress check)
5	F1027	**COF Fibres correctly routed from cable break out units to sub rack via tubing** • OCR fibres correctly routed from cable breakout / storage cassettes to sub rack via pre tubed route.
5	F1028	**OCR breakouts, trays, COF and Hydra cables correctly labelled** • Splicing trays cover to be labelled / marked with RDSLAM ID • Shelves front to be marked with Cable ID
5	F1029	**COF & Hydra fibres routed correctly within trays** • OCR Hydra cables provided correctly in accordance with EPT/COF/D901 installation instructions.
10	F1030	**COF & Hydra splicing correct** • Existing practices
10	F1006	**ESD protection equipment used (In Progress check)** • Used whenever cards worked on
5	G1003	**Work site left tidy, BT / Contractor rubbish removed** • Existing practices

7.2 Cable Chamber

Existing score sheets and practices

7.3 Fibre Cabling & Jointing

Existing score sheets and practices

7.4 RDSLAM Installation

FTTC QPW score sheets

7.4.1 Managed Service/BDUK Retrospective check items & Guidance

10	C1004	**Duct laid at specified / agreed depth within tolerance** • LN550 Ref 309 (i)

		• The depth of duct must be at the correct depth of cover or within tolerances quoted in LN550 • For Departures from Specification refer to ISIS - CPE/NNS/V010 • For other Civils Tolerances see CN 15456 • For FTTC Plinth and power duct depth see CN 15647 • For Earth electrode systems cover see ISIS EPT/ANS/A025 • For box entry: Given the site conditions e.g. existing duct and any supporting TDFS evidence has the duct(s) been provided to the best achievable standard? • Note: Retrospective & In Progress check Joint boxes for duct entry positions • Note: In progress check only for duct track
10	C1013	**Draw rope provided and secured at each end. Draw rope is spliced correctly & free from knots and stands** • Existing practices • Note: Draw rope to be in all un-cabled ducts (Duct 54) greater than 5 metres in length with no more than 1 x 90 degree bend. • Note: It is acceptable to secure rope to securing points (not steps) or tie rope together (even if securing points exist) • Drawrope can be continuous in RDSLAM – pending provision of temporary or permanent gas seal.
10	C1017	**Duct entries to chambers / building walls / floors by appropriate approved method** • Entries must be provided using Core Drill, where specified • Core Drill must be sufficiently oversized to enable the overbreak between the duct and the hole to be made good through the entire thickness of the wall e.g. D54 recommended drill size is 127mm (the contractor may select an alternative drill size at his discretion, provided that the overbreak can be successfully filled to provide a suitable finish to the works) • Note: The position of duct entries and the finish to them is measured in C2014, not this item • Note: For Departures from Specification refer to ISIS - CPE/NNS/V010 • EPT/UGP/B054 indicates other approved methods • Ducts not mis-shaped on entry to chamber
10	C1019	**Duct Seals fitted correctly including Draw Rope** • Existing practices • Ducts gas sealed if open or within the FTTC RDSLAM

		• FTTC Root and cabinet need temporary or permanent gas seal providing (plug pressure 1 or resin 14) • Note: Refer to EPT/ANS/A003 for type of duct seals • Note: Contractor check only • Note :Includes temporary gas seals • Note: Excludes Earth rod duct and power ducts *Note:* A light pull on cables, between finger and thumb, can be used to check that cables do not move in the duct.
5	C1021	**Duct to property wall / pole finished correctly** • CN 13388 • ISIS EPT/ANS/A010 • Duct to property wall/pole finished correctly • Pole specification is not available, ducts provided to poles should be left 25mm above ground level with a tolerance of +/- 25mm • Duct shall not be laid below the 3m mark • There must be no gap between the duct and the pole • Newly provided Power/Duct 56 sealed with Plug Duct 1A (Foam)
10	C1023	**Duct route free from severe deviations/ 90 degree bends (other than feeds into PCPs and at the foot of poles/feed to customer buildings.** • Each section must be free from severe duct deviations e.g. through the use of 90 degree bends or multiple bends duct connected together (either whole or cut) to give the same result • Note: This does not apply to 90 degree bends provided at the foot of/ into a pole, in to a cabinet or into/up against a customer's premises • Note: Where connecting to existing duct (for road crossings on Newsites) defect will not apply if slewing is not possible and TDFS has been obtained from Works originator • Note: This check item does not apply to feeds to properties using D56
5	C1025	**Correct duct type provided for non power cables** • Grey for Openreach cable
5	C2014	**Duct entries at specified location and finished flush with inside of chamber** • Duct entries at specified location and finished flush with inside of chamber • Note: For Departures from Specification refer to ISIS - CPE/NNS/V010 • Ducts not rendered / grouted or insufficient space left to render

		/ grout due to incorrect core drill used (Fosroc sealant is acceptable as an alternative to mortar grouting on modular boxes) • Note: For the installation of new duct into a JB23 or JB26, the duct may protrude a maximum 25mm into the chamber • Note: Ducts entering Modular boxes shall protrude 10mm - 25mm, with no other tolerance • Note: Safety aspects to be checked under C2026. • Note: Ducts that are not positioned in the ideal or recommended position (shown on CN Drawings) are not necessarily incorrectly positioned; occasionally site circumstances dictate where plant can be placed. In these situations, consideration must be given to BT's best interest, Safety, Network requirements and financial implications; then a practical decision must be made, based on sound experience • Given the site conditions and supporting TDFS evidence has the duct(s) been provided to the best achievable standard?
10	C2026	**Duct entry in safe location** • Duct positions must be sited in a safe position so as not to either compromise the integrity of the structure or present a safety hazard to operatives climbing in to/out of or working in the structure • Duct entries must not be sited within the manhole shaft • Duct entries must not be sited within the manhole roof • Duct entries must not be sited within the chamber floor • Duct entry position will not impede/interfere operative when using climbing steps/ladder when duct is subsequently cabled • Duct entry has required separation from anchor iron in existing chamber. Note: Where this is not possible, item will not be marked as Below Standard providing anchor Iron has been recovered/made unusable **Note: NO TDFS permitted if resultant product is/will become a safety issue**
10	C6018	**All reinstatement complies with specification. Any road markings / special surfaces replaced.** • Hard standing provided for FTTC cabinets in soft / unmade surfaces – the material chosen must include any sub base to SROH requirements • Large RDSLAM & All In One - to front and left of cabinet • Small RDSLAM - to front, left and right of cabinet Note: If there is evidence of the Local Authority refusing a hard standing consider it to be not checked – but continue with marking for other relevant items within the cat code

		Examples from LN 550 / SROH: • Grassed areas left free from stones greater than 20mm nominal size e.g. where previously mowed. • A modular structure is required for Hard standing and laid on sub base provided to SROH requirements • No trip or mowing hazard created • See EPT/ANS/A042 and LN 550 • Physical Reinstatement type matches that declared in the Closing Notice or Job Pack. • Reinstatement provided for all areas disturbed by works • Special surfaces replaced • Road Markings replaced • Vertical edges are saw cut • Trim line requirements met • Wearing course is of the correct material
5	C6020	**Reasonable growth of seeding / replanting / returfing** • Grassed areas shall be reinstated using the original turf, replacement turf or an equivalent seed depending on weather and growing season. • In all cases a reasonable growth shall be established in the following 12 months
10	C1026	**Earth rod duct / power duct sealed as per specification** • Appropriate at stand up and handover stages **Earth ducts (when rod, conducrete earth cable or earth cable strap in Huawei 288 power side is provided in earth ducts**) ■ Stand up – sealed using resin 14 **Power ducts** Huawei 288 • Stand up - earth cable in the left hand bore and the empty bore of the gland plate temporarily sealed with Compound 16A. • Stand up - Compound 16 provided in power ducts at ground level • Handover - Black pipe (40mm Internal diameter), 50 mm long with a longitudinal cut fit around each entry and filled to the top with resin pack 14 Huawei 96 • Stand up –2 x plug pressure 3 or compound 16 fitted • Handover – resin 14 provided in both ducts ECI • Stand up – 2 x plug pressure 3 or compound 16 fitted

		• Handover – resin 14 provided in both ducts Huawei All in One • Stand up (Power side) - 1 x plug pressure 3 or compound 16 fitted in empty power duct • Stand up (Passive side) - resin 14 fitted in spare earth rod duct, if fitted. • Handover - resin 14 provided in power side duct Note: Cable to duct minimum separations maintained Note: 10 point defect item for RDSLAMs applied from 1st April 2015
10	C4001	**PCP/SCP/RDSLAM Position and type of node as specified by work originator** • Cabinet type correct • The cabinet is in the correct position or BT agreed alternative • Note 1: For Departures from Specification refer to ISIS - CPE/NNS/V010 • This also applies to the FTTC RDSLAM – job pack needed to check • Sufficient space left to allow rear of cabinet panel to be 100mm from any fixed structures (for the full height of the fixed structure) • RDSLAM front and side doors open to a minimum of 90 degrees • Side access door (s) position is a minimum of 1 metre from any obstruction and other structures when opened through minimum of 90 degrees. (Huawei 96 and ECI small RDSLAMs need space on both side doors) • Rear of cabinet not on other structure foundations
5	C4002	**Cabinet upright, level and trowelled around flange as watershed.** • Cabinet upright, level and trowelled around flange as watershed • Bedded on cement mortar for all the perimeter area of flange (not required for polylid) • Mortar chamfered and neatly finished around internal (not required for polylid) and external perimeter of root flange • FTTC Plinth nuts and bolts protected with compound 16A or sealing Mud prior to applying resin (not required for polylid) • External FTTC Transit hooks removed and replaced with grommets or screw plugs
10	C4003	*Cabinet base correctly constructed including duct positioning* • Templates provided & used (522/2/ i) • Correct Concrete Grade used and levelled at correct depth (522/2/ii)

		• Ducts sealed and positioned correctly (522/2).
		• Bolts positioned correctly (522/2/i)
		• When extending an existing Cabinet base the adjoining surface of the in-situ concrete to be scabbled by hand tools (522/2/iii)
		• Note 1: For Departures from Specification refer to ISIS - CPE/NNS/V010
		• Note 2: Tolerance for duct position should be + 10mm. the CN drawing are being changed to include this
		• Excavations as per CN1464
		• FTTC Plinth correct size as per works instructions and relevant CN 15647 Drawings plus CN 15764 Sht 1 (Huawei All in One
		• CN 1464 Sht 8 (Stand Off Cabinet)
		• Huawei 128 all in one - 1 x Fibre duct 56A and minimum 3 x duct 54A provided.1 x earth rod duct and 1 x power cable duct
		• Duct entry will allow subsequent cabling provision and permanent sealing as per CN Drawings
		• FTTC correct number, type and colour of ducts provided - black for power supply and earthing (this can be red in Scotland & North West DNO areas only)
		• Correct duct distance above concrete plinth or polylid (30mm above plinth) - maximum distances are 60mm above plinth or 40mm above resin
		• Bolts protrude correct distance above concrete (40mm) or polylid (30mm) and vertical.
		• FTTC Concrete plinth provided to correct depth a minimum depth of 250mm (in progress check)
		• Concrete plinth provided at correct distance below ground level (100mm - 20mm tolerance) - as measured by height of root above ground level (AGL)
		  ■ Huawei (200mm root) – maximum 120mm AGL
		  ■ ECI (280mm root) – maximum 200mm AGL
		• FTTC Concrete level within tolerances of 10mm along the length and 5mm across the width with no high or low spots
		• FTTC correct depth of class 1 compacted stone provided below concrete (in progress check)
		• Any marconite used around the earth rod is below the compacted stone (in progress check)
		• No frost damage evident (damage can be avoided by using approved additives in cold weather)
		• Any damaged ducts repaired using the approved practices
		• Loose/out of alignment plinth bolts replaced using correct core drill method and materials
		• If only 1 RDSLAM duct is requested to be connected by Openreach this must be:

		Huawei 288 – Left hand side duct ECI - Right hand side duct *Additional pre cast plinth checks* • Plinth excavated using correct template (e.g. 1530mm x 780mm for Huawei 288 cabinet) - In Progress • Binding of 10-20mm sharp sand / cement mix provided and level between HA type 1 mix and pre cast plinth – In Progress • Void around pre cast base filled and compacted using ST2 grade lean mix concrete – In Progress • Duct area voids made good and level using 200mm sharp sand and 50mm QC6 cement • Lifting eyes replaced with 4 studs • Plinth internal earth cables undamaged and sufficient spare cable left above top of plinth for termination • P1 pre cast plinths provided with spare filler duct to ensure correct cabinet alignment ***Conductive Concrete checks*** • Conductive concrete (e.g. Conducrete) provided as per ISIS EPT/ANS/A055 and manfacturers specification ***Poly lid checks*** • Concrete dispersed over polylid • Covered with polythene and cured for 72hours
10	C4004	**PCP/SCP/RDSLAM all base water sealing operations completed satisfactorily** • Cabinet base sealed correctly • This also applies to the FTTC RDSLAM • A washer and nut on each cabinet fixing bolt to a max torque of 45N/M. • Resin 6B or 6C (in cold weather) provided correctly, to correct depth and all of flange covered (FTTC) • Resin 6B / 6C set • *Water should not be present in base of RDSLAM - due to either base sealing or RDSLAM shell sealing operations* ***Polylid*** • MS60 Sealant (Fosroc) neatly applied around the ducts in accordance with the Polylid method statement. • No voids left • A washer and nut on each cabinet fixing bolt to a max torque of 45N/M.

		• No stones or debris etc. under gasket seal • Rubber gasket compressed and sealing the base of the cabinet. Note: No resin 6C required for polylid – if provided this is a defect
10	C4007	**FTTC RDSLAM Installed correctly** • All panels free from damage and scratches • All doors flush fit and free moving • Cabinet can be closed with integrated locks without deforming panels • All EMC shield tapes (rubber door seals) in place • All panel earth straps secure and in place • Base (Root) and Cabinet fixed and bolted correctly • A washer and nut on each cabinet fixing bolt to a max torque of 45N/M • Huawei 96 Frame bars removed • ECI plastic bags removed from roof fans and door filters • No corrosion present in RDSLAM • JPX modules protective cover fitted in Huawei All in One NOTE: If ECI power label is peeling off, discoloured or missing it should be reported to ECI by the RDSLAM Installer or quality checker
10	C4009	**Earth Rod/Secondary earth systems, cable and connections all terminated correctly & meets all criteria's.** **Civils Supplier:** • If required, earth rod protective earth solution provided in correct side duct with sufficient minimum length above duct (25 - 40 mm) for earth cable termination (45mm for small cabinets).The top of the earth rod must be at least 50mm below the top of the root • External 16mm2 Earth cable strap provided between passive and power side – as per specification in drawing CN15647 (Huawei 288 only) • NOTE: If no strap or less than 600mm in length = CD • Any secondary earth electrode correctly provided and connected with 16mm2 earth cables with approved connector and taped with correct material (in progress check) • Secondary earth electrode cable ,if used, correctly connected to rod earth 3 using eyelets or, if rod has had to be cut ,other approved connectors • Earth pit provided if RDSLAM rod is missing, not accessible or unusable (earth reading is unstable) • Rod in earth pit protected with tape sealing 3 • Earth pit should not be provided in any other situation • Protective Earth confirmed as meeting criteria – **in progress**

		check or using the earth electrode certificate • Rods must not be in contact with other services which would deem it an illicit earth under the agreed criteria – in progress check > Earth rod solution must be a maximum of 130 ohms at civils stage > No reading can be taken for conducrete at Civils stage **Cabinet Installer:** • Min 16mm2 protective earth cable provided and terminated on earth rod and FTTC earth bar as per specification and contractual requirement • External 16mm2 Earth cable strap terminated on passive and power side earth bars. (Huawei 288 RDSLAM only) • Conductive concrete insulated earth cable directly terminated on earth bar • Connections all terminated correctly using eyelets, washers and bolts – or, if earth rod has had to be cut, approved earth ring / clamp connectors used. • Any earth cable connection must not be within duct seals • Excessive washers not used • Washer provided above and below nut • Evidence of crimper indentations, no loose or cut conductors and maximum 5mm of bare conductor at eyelet • If required earth cable extended using approved connections. • Extra earth cables e.g. between earth rods provided with 16mm2 cable Note: See A2151 for checking of safety labels on earth cables in RDSLAM, PCP, earth pits Note: Mesh earth does not allow an effective duct seal so must not be provided in ducts requiring sealing. Note: Conductive earth electrode Resistance should not be measured until curing has occurred as detailed in EPT/PPS/B025 Criteria for earth resistance values for the relevant RDSLAMs are detailed in the goverining ISIS
5	C4012	**Earthing solution provided in accordance with policy** • Conductive concrete provided as primary earth electrode system – unless other buried services prevent this and is supported by Photographic evidence • When required, additional earth rods provided 3 metres apart (10% tolerance) – unless other buried services prevent this and is supported by Photographic evidence

		• Any earth rod electrode resistance is minimum of 5 ohms – if less than 5 ohms photographic evidence is provided showing no other services are nearby
10	F0308	**Gas Seals applied correctly, Where applicable**. • Gas Seals applied correctly, where applicable, in FTTC RDSLAM. • Air block cone, used for external gas seal, provided and sealed correctly with Sealant 10B • Correct distances (3mm) between BFTs and cone wall • Unused BFT tubes capped
5	F1009	**DSLAM cards & batteries installed correctly and secure. Consumables boxes and battery straps stored safely in RDSLAM to avoid damage or contamination.** Remaining consumables stored to avoid damage and contamination to contents if left in cabinet • All ECI batteries provided and straps stored in RDSLAM • Cardboard boxes stored off the ground at stand up • RDSLAM cards mounted correctly and screws / ejectors in position • Cable Connectors seated & fixed correctly and screws secured in position Note: MS suppliers do not fit battery straps Note: All batteries are fitted and connected on commissioning Note: If Huawei /ECI batteries are found missing or not connected after commissioning report to the AOC on 0800 681 6672 option 2
5	F1011	**Unused cable connectors protected & restrained** • Not left in a position liable to affect working cards
5	A2126	**All records prints and A154 legible, clean, updated, certified and forwarded** • Existing practices applied to FTTC RDSLAM
5	A2131	**Defects on site reported via A1024** • Existing practices applied to FTTC RDSLAM
5	G1003	**Work site left tidy, BT / Contractor rubbish removed** • Existing practices applied to FTTC RDSLAM
10	F1069	**The RCD has been installed correctly (ISIS EPT/PPS/B062).** • RCD installed correctly

		• RCD fitted in correct position • Correct label fitted
10	F1070	**If an RCD is installed the main PME earth has been removed and secured at the DNO cut-out** • Earth cable removed and securely strapped to one side and not connected to the DNO cut-out • Earth cable has no exposed conductors or conductors are taped over /protected Note: Excludes DNO TN-S earth to MET
10	F1071	**There are no exposed conductors on RCD to MCB link cables and all terminations are tight. (ISIS EPT/PPS/B062).** • All protective covers securely replaced • No exposed conductors ….visual check only • Includes all cable ends (including cut off ends),RCD/MCB cables to the cut off unit & incoming power cables to the cut off • Note: Audit checks are limited to a visual inspection only and no protective covers should be removed to check electrical connections in the power side.
10	F1076	**The Meter has been installed and connected correctly or UMS requirements have been met** • Meter installed correctly • Meter connections correct i.e. cable colours from left to right are brown, blue, blue, brown • UMS - Huawei 288 has a double pole 16 amp type C MCB fitted • UMS - All RDSLAMs have had 6mm double insulated cable tails with colour coding provided between MCB / RCD & Isolator or cut out assembly • UMS -Correct type of 25 amp cut off assembly and other components provided and fitted as agreed with DNO • UMS - ECI has had 25mm2 earth cable changed to 16mm2 earth cable at Earth block or cut out assembly for TN-C-S system and not fitted for TT system • UMS - Huawei 96 & 288 has had 25mm2 earth cable taped over and restrained to one side and 16mm2 earth cable provided to Earth block or cut out assembly for TN-C-S system and not fitted for TT system • UMS - PME Sticker removed from Earth box for TT system
10	F1077	**The installation technical requirements for power certification have been met.** • Earth bonding provided if required • Earth pit requirements met

		• No damage to earth cable from flange to MCB • Safety labels adequate
5	F1073	**A copy of the latest power certificate is in the cabinet.** • Copy of the earthing arrangements diagram left in RDSLAM (ISIS EPT/ANS/A036) • Earth electrode Certificate stored in RDSLAM • Latest issue of earth electrode certificate template used • Final Electrical Completion Certificate stored in RDSLAM • Latest issue of Final Electrical Completion Certificate used Note: both certificates must be retained in the RDSLAM at all times
5	F1074	**The power certificate has been completed in line with the relevant template for the RDSLAM type & either TN-C-S or TT system. (ISIS EPT/ANS/A036)** **Earth Electrode certificate** • Earthing electrode types, components and locations recorded, including rods, mats, copper tape, earth pits, and earth reading recorded on template (earth reading not needed for conductive concrete) • Additional supplementary rods recorded on diagram • For conductive concrete earthing electrode — location, length and direction of copper tails — if both tails have been used — location of black duct 36 • Installation details, Particulars of installation and Declarations fields fully completed and accurate **Final Electrical Completion Certificate** • Correct template used for RDSLAM type and earthing system • All sections completed including earth bonding and earth electrode details • Certificate signed and dated • UMS - Ensure the correct MCB type, Supply Characteristics, etc. details are adjusted for UMS in the electrical certificates.
5	A2178	**On arrival has PCP/RDSLAM been locked correctly no trapped conductors or equipment** • Existing practices applied to PCP & FTTC **RDSLAM** • High Security locks in good working condition or reported via A1024. Note: High security locks are fitted at the commissioning stage
5	A2174	**Engineer checked PCP/SCP/ RDSLAM shell. A1024 raised if defective.** • Existing PCP practices

5	A2172	**Engineer checked doors/hinges/assembles for corrosion and sheared door bolts, if defective A1024 raised** • Existing PCP practices
5	A2170	**Check and replace, if defective or missing, door seals, bolts and stays as necessary** • Existing PCP practices
10	A2630	**Ducts worked on sealed correctly to standard.** • Note: Item only checked for Cabling activities • Ducts gas sealed if open or within FTTC RDSLAM • Ducts gas sealed with resin 14 after Cabling • No inflatable air bags used within the PCP/RDSLAM • Mesh earth does not allow an effective duct seal • Draw rope in duct does not allow an effective seal • Earth & Power duct sealing is covered under C1026 • Refer to EPT/ANS/A003, EPT/UGP/B033 for types of duct seals *Note:* A light pull on cables, between finger and thumb, can be used to check that cables do not move in the duct.
5	A2165	**PCP/SCP/ RDSLAM Duct entries checked for effective seal. If not effective A1024 raised** • Applies to ducts **not** worked on • Existing practices applied to PCP & FTTC RDSLAM • Openreach check applicable after cabinet has been commissioned
5	I6018	**Desiccant packs replaced, where appropriate, clearly labelled with CSS ID or signature, dated and correctly positioned as appropriate.** • Existing PCP practices • Only applies to non-vented PCPs Note: Applies to PCP check only
5	A2153	**Jumper wire run correctly and old jumper wire recovered when jumper wire renewed.** • Existing PCP practices
10	A2155	**Renewed/re-used/provided jumper not defective or fault prone** ▪ Existing PCP practices
1	A2152	**Bunches / units worked on tidied using Straps Cable Fixing No 1 and carefully repositioned.**

		• Existing PCP practices
5	A2145	**All terminations and changed pairs effected correctly using correct connectors and correct wire.** • Existing PCP practices
10	B6014	**On job completion other jointed pairs (in joint/BT/PCP or SCP bunch checked ensuring correct connectors fitted (For 41 series not reported via A1024 use item A2131 instead).** • Existing PCP practices
10	A2110	**Modular cross connection system installed correctly at PCP/RDSLAM** • Existing PCP practices applied in PCP and FTTC RDSLAM for Telemetry cable and any tie cable modular terminations worked on • Manufacturers specific module correctly mounted and secured • Manufacturers specific Modules correctly fitted • Manufacturers specific termination tool used and in correct mode – in progress • Tie cables are terminated in the correct order for the module type • **Huawei JPX modules only** -The incoming tie cables are fed from the left of the modules and terminated on the underneath (POTS) • **Huawei JPX modules only** -The outgoing tie cables are fed from the right of the JPX module and terminated on the top (LINE) • **ECI STG Modules** – The incoming tie cables are fed from the left of the modules and terminated above or below dependent on the 10 pair range • **ECI STG Modules** – The outgoing tie cables are fed from the right of the modules and terminated above or below dependent on the 10 pair range • No forming of wires directly over jumper field guides or through SCF1A • No tails extending into splitter area **If telemetry line is provided in the tie cable** ▪ Correct tie cable pair disconnected in RDSLAM on PCP D side tie cable (BBOUT/LINE/OUTGOING module) and dressed away from modules • 1st pair of telemetry cable correctly terminated on the same module pair position - Huawei 288 – pair 100 - Huawei 96/128 – pair 70 - ECI 128/256 – pair 70

		- Huawei All in One – not applicable • Note: splitters are fitted during Commissioning activity
10	A2137	**No nipping of insulation or signs of damage on bunches worked on.** • Existing PCP practices
10	F1004	**Bonding earth supplied where applicable** Note: Only check if RDSLAM and PCP are less than 3 metres apart (with doors open but includes the full range of door opening positions through to 180 degrees to ensure that no distance is less than 3m) Note: If applicable both FTTC RDSLAM and existing PCP and any other BT/Openreach metal cabinet are checked under this item (only the 10mm earth cable termination is checked in the RDSLAM) • PCP/DSLAM bonded correctly – see EPT/PPS/B062 & EPT/ANS/A036 • If less than 3 metres from PCP (doors open) PCP bonded to FTTC • Correct earth wires used (PCP – FTTC RDSLAM earth link and bonding) - min 10mm2 • Connections all terminated correctly using eyelets, washers and bolts – or, if earth rod has had to be cut, approved earth ring / clamp connectors used. • Excessive washers not used • Washer provided above and below nut • Evidence of crimper indentations, no loose or cut conductors and maximum 5mm of bare conductor at eyelet • If required earth cable extended using approved connections • Minimum 6mm2 earth bonds used within existing PCP for doors and shell • Earth cable routed and dressed so as not to interfere with door closure and other fixtures that would cause potential damage • Paint penetrating washers used • No drilling of cabinet panels or doors • Correct eyelet connectors, screws ,nuts and washers used • Bonding cable is continuous between RDSLAM and PCP Note: See A2151 for checking of safety labels on earth cables
5	F0201	**Observed fibre joints / cables supported and restrained** • Existing UG practices
5	A2920	**Cable / sub duct / BFT installed in correct bore** • Existing UG practices

		• Job pack needed to check if bore was specified • Telemetry cable installed in duct bore when not required i.e. UMS • Where two D54 ducts exist any duct may be used for incremental tie cabling
5	A2950	**Anti creepage devices replaced correctly after cabling** • Existing UG practices
5	I6992	**Correct replacement of high security equipment provided on UG frames and covers to protect the network - or A1024 submitted if replacement equipment is not held.** • Existing UG practices • Earth pit securing bolts fitted and not loose
5	I6019	**Joint/Cables correctly supported and restrained.** • Existing UG practices
5	A2151	**Joint/Cable/Cabinet marked or labelled correctly** • FTTC Tie cables labelled and legible showing PCP D or E side termination • FTTC tie cable labels in PCP annotated with FTTC and PCP assembly positions e.g. No of pairs: 100/0.5 – FTTC D 501 - 600 • Telemetry cable labelled • Telemetry line number and DP number recorded on NTE • Cable label provided on earth bonding cable in UG structures • BS 951 Safety label provided on earth cable from rod to cabinet earth bar at rod end , including any rod in an earth pit (Cabinet Installer) • BS 951 Safety label provided on 10mm earth bonding cables in FTTC and PCP and on 6mm door straps in PCP (Complex) • Allocated D side pair e.g. D side pair SLAM 1 annotated or labelled on BT85B in PCP • Any SCF 1A used – cut flush with no sharp ends • Conductive concrete label attached to insulated cable in RDSLAM Note: No external labels / marking needed for FTTC RDSLAM's Note: The exception is Huawei All in One cabinets where the PCP number must be provided by the first cabling jointing team on site.
5	F1016	**FTTC cabling routed and protected correctly in RDSLAM** • 125 – 150 mm of maintenance loop left between module and sleeving

		• Pairs bunched and tied using tape 11A • NOTE: copper and telemetry cables can be provided in any duct in the RDSLAMs (all types). • Sheathing removed 30 – 50 mm above centre mounting bar (Huawei 288) • Sheathing removed 30 – 50 mm above the lower bar (ECI and Huawei 96) • Copper tie cables protective sheathing (BT Sleeving No. 12),provided where cable sheathing removed up to the correct point beside the module served by the relevant 50 pair cable bunch • Wires routed through metal cable guides – sleeving must protrude 15-20mm beyond cable guide and tied using cable ties • Telemetry cable routed correctly - in passive and active side and enter in correct position in power side • NTE in power side - telemetry cable routed, restrained and cleated correctly in power side to NTE and enters NTE on the underside – on LHS of earth bar and / or to the rear of the earth cables. • Tie cable Pair (BBOUT /LINE/ OUTGOING) used for telemetry line dressed away from splitter area after being unterminated e.g. pair 70 or 100 • **ECI & Huawei 96 with conductive concrete** - telemetry cable routed and restrained correctly in active side to NTE, as per RDSLAM type, and enters NTE on the underside • Telemetry cable correctly routed to telemetry line position in tie cable - if used. • Any retrospective earth cable provided between passive and power side, via active side, routed correctly**.** • Any SCF 1A used – cut flush with no sharp ends
5	I6512	**Correct BT/ BC/ NTE fitted.** • NTE fitted in left hand side of power side on wooden board • Securely fixed with screws • ECI & Huawei 96 – NTE may be fitted in active side • ECI & Huawei 96 – If provided in active side, NTE fitted using correct method and 2 strips of the correct adhesive tape • BT85B fitted in PCP for telemetry line • BT85B fitted in correct position • BT85B secured to mounting bar or existing cables • In PCP route the telemetry cable to a position beneath the nearest existing ‘D’ side assembly position • In PCP provide the telemetry cable into a BT 85B which should be restrained to the cables or mounting bar beneath the

		selected existing 'D' side assembly position with SCF *Note: No BT 85B is required if telemetry line is provided in the tie cable*
5	I6262	**Cable terminated correctly in NTE5** • Existing NTE5 and BT wiring and terminating practices applied in FTTC RDSLAM NTE and PCP BT85B • Working pair secured to NTE using SCF
10	F1018	**Telemetry line fully functional in DSLAM– confirmed by incoming call answered at the NTE** • On a handover check if the Assessor is G39 /1 or ORNGApower1 CBT trained, the Assessor should plug a butt / handset into the Telemetry NTE in the power side, make a call to the Telemetry Line Directory number from another telephone and answer the call at the NTE. • If line is not working check PCP jumper routing is correct. • Telemetry line can be provided in the tie cable • If the Line does not ring, cannot be answered or is routed incorrectly - mark as Below Standard.
10	G9001	**Product item not covered elsewhere in product checks** • Existing audit practices
0	G1006	**Contractor check only – operative shown as accredited on CANDID for work completed only** • To be marked on separate score sheets if the work activity is different. I.e. different accreditation is required for cabling and jointing. • Also if there are no names on the job pack it may be that there were two operatives involved, one at the PCP and one at the DSLAM and again both scoresheets would be marked accordingly.

7.4.2 BDUK in Progress check items & Guidance

5	C1024	**Ducts and materials protected to prevent ingress of foreign matter and damage** • Ducts sealed after construction to prevent ingress of foreign matter e.g. before temporary reinstatement • FTTC Plinths need Plug duct 4B/4C and Plug Duct 1A providing • FTTC plinths need Driving head left on rod earth 3 as protection during reinstatement and subsequent excavation

		(unless it had to be cut)
10	C4006	**FTTC RDSLAM transported, protected and handled correctly to avoid damage** • Correct transit and handling techniques used during transportation and installation. • Correct Lifting straps used • Cabinet protected and stored correctly to avoid damage • Note : All in progress
5	A2154	**PCP/SCP/RDSLAM only opened in wet or poor weather if protected before opening. Mark Ch Ok if dry** • FTTC RDSLAM protected if opened in inclement weather
5	C4008	**FTTC Desiccant packs provided, correctly positioned and recovered as appropriate by Cabinet Installer and Commissioner** • Desiccants provided and opened in all compartments after RDSLAM installation by cabinet installer • RDSLAM desiccants removed after power up and commissioning by Huawei / ECI Note: Desiccants provided by cabinet installer Note: Desiccants do not have to be signed / dated

7.4.3 Fibre & Copper check items & guidance

5	A2151	**Joint/Cable/Cabinet marked or labelled correctly** • FTTC Tie cables labelled and legible showing PCP D or E side termination • FTTC tie cable labels in PCP annotated with FTTC and PCP assembly positions e.g. No of pairs: 100/0.5 – FTTC D 501 - 600 • Telemetry cable labelled • Telemetry line number and DP number recorded on NTE • BS 951 Safety label provided on earth cable from rod to cabinet earth bar at rod end , including any rod in an earth pit (Cabinet Installer) • BS 951 Safety label provided on 10mm earth bonding cables in FTTC and PCP and on 6mm door straps in PCP (Complex) • Allocated D side pair e.g. D side pair SLAM 1 annotated or labelled on BT85B in PCP • Any SCF 1A used – cut flush with no sharp ends Note: No external labels / marking needed for FTTC
10	A2630	**Ducts worked on sealed correctly to standard.**

		Note: Item only checked for Cabling activities • Ducts gas sealed if open or within FTTC RDSLAM • Ducts gas sealed with resin 14 after Cabling • No draw ropes provided through duct seal • Correct spacing between cables and duct wall • No inflatable air bags used within the PCP/RDSLAM • Mesh earth does not allow an effective duct seal • Draw rope in duct does not allow an effective seal • Earth & Power duct sealing is covered under C1026 • Refer to EPT/ANS/A003, EPT/UGP/B033 for types of duct seals *Note: A light pull on cables, between finger and thumb, can be used to check that cables do not move in the duct*.
10	A2110	**Modular system installed correctly at PCP/ RDSLAM** • Existing PCP practices applied **NOTE:** Additional A2110 checks for the RDSLAM only are contained in section 7.4.1 of this document RDSLAM & PCP • D and E side cable ties in separate cables – unless TDFS agreed • RDSLAM – PCP Tie cables are in a contiguous range of terminations • PCP Mounting units provided correctly for type of module / growth system • Jacking Bolt Kit used if Quante modules provided in existing cabinets with PC 100 / SCC systems • PCP Modules correctly fitted • RDSLAM - PCP UG cables terminated correctly • RDSLAM - PCP 100% continuity test of all pairs completed by engineer – in progress. • RDSLAM - PCP Sample pair continuity test all correct – retrospective audit - Check each D & E side cable is provided in correct positions in RDSLAM & PCP (after temporarily disconnecting unused terminated pairs in the RDSLAM) - Check 2 out of every 10 pairs for continuity between individual wires e.g. D1A to E1A etc. at PCP end
10	A2190	**Non-modular cross connection systems installed correctly at PCP/SCP** • D and E side cable ties in separate cables – unless TDFS agreed

		• RDSLAM - PCP Tie cables are in a contiguous range of terminations • SCC units correctly fitted • RDSLAM -PCP UG cables terminated correctly • RDSLAM -PCP 100% continuity test of all pairs completed by engineer – in progress. • RDSLAM - PCP Sample pair continuity test all correct – retrospective audit - Check each D & E side cable is provided in correct positions in RDSLAM & PCP (after temporarily disconnecting unused terminated pairs in the RDSLAM) - Check 2 out of every 10 pairs for continuity between individual wires e.g. D1A to E1A etc. at PCP end
5	A2116	**Correct termination methods ,tools used for module system provided** • Existing PCP practices applied
5	I6019	**Joint/Cables correctly supported and restrained** • Copper tie cables supported and restrained correctly (SCF1A) on horizontal and vertical support bars. • Telemetry cable supported and restrained correctly in all sides with SCF1A) • SCF 1A – cut flush with no sharp ends
5	F0204	**Cable(s) provided correctly routed** • Spare RDSLAM pig tails stored / restrained on mandrel within Velcro straps • H96 BFT routed to rear of copper tie cables within guides up to splicing box • Any long lengths of spare BFT supported and restrained • Existing fibre practices applied in FTTC RDSLAM
10	F0205	**Cable(s) provided/worked on restrained correctly.** • Existing fibre practices applied in FTTC RDSLAM • ECI RSLAM only – duct 102, SDMB5 or joint support kit 1A used to support fibre, with SCF, where no side mounting bar has been provided in the RDSLAM by ECI. • BFT tubes to splice boxes from air block gas seal restrained correctly using Velcro – not SCF. • All In One Only - RDSLAM Fibre pig tails routed to Dual Circuit splice box correctly, restrained using Velcro (not SCF) and protected correctly using 11mm split Kopex or element support tube 3A

		• Cone Block 7 supported and restrained. • If vertical air block is used a minimum of 50mm to bottom edge of BFT protective sleeving and Top of air block cone is level with join of root and cabinet (+ / - 15mm) - BFT are restrained directly to mounting bars.
10	F0214	**Minimum bending diameter of fibre cable/BFT not compromised. Existing fibre practices applied in FTTC RDSLAM** • All spare fibre tails are stored correctly in splicing trays via the Kevlar terminating units (KTU). • For Huawei 288 only the first 4 tails need to be stored in the trays – the remaining 4 tails can be stored and restrained under the Velcro tape on the fibre management loop • RDSLAM fibre tails bend radii (30mm min) maintained outside terminating unit • Fibre cables/BFT provided in correct ducts – If Contractors have only provided 1 duct into the RDSLAM, and this is not the duct below the splicing box (Huawei 288 – should be LHS & ECI – should be RHS) then this must be reported to Ct for correction – it must not be cabled.
10	F0308	**Gas Seals applied correctly, Where applicable.** • Gas Seals applied correctly, where applicable, in FTTC RDSLAM. • Air block cone (used for external gas seal) provided and sealed correctly Sealant 10 B with correct distances (3mm) between BFTs and cone wall • Unused BFT tubes capped above cone block with tube sealing cap No. 5 • In dual circuit splice box gas seal connector (bumble bee) provided correctly by screwing both end together, with no visible gap, and restrained in holding bracket. • Gas seals in place and reprovided correctly after telemetry cable provided or if retrospective earth cable has had to be provided (gland sealing clamp is tight and cable does not move in gas seal)
10	A2504	**Customer Termination unit installed correctly and as per customer requirement** • Huawei 288 - Tyco Otian BF/COF Dual Circuit Splice Box installed and secured correctly • Huawei 96 - Tyco Otian BF/COF Dual Circuit Splice Box is fitted above the JPX modules • ECI - The 3M splice box is installed during the building of the cabinet • Plastic protective covers fixed and secure on splicing trays

10	F0402	**Fibre Cables/Jumpers provided or worked upon correctly restrained within termination unit** • Existing fibre practices in FTTC RDSLAM • Jumpers correctly restrained in termination using Kevlar (KTU) • BFT restrained correctly in splicing box behind metal restraining bar (rubber insert does not need fitting in a RDSLAM but is not a defect if fitted)
10	F0207	**Fibres provided/worked upon correctly contained/protected from cable butt to splicing tray** • Existing fibre practices in FTTC RDSLAM. • No unprotected or visible fibre bundles between cone and fibre tray NOTE: In the 3M splice box provided in ECI RDSLAMS the manifold is not required to be fitted.
10	F0404	**Fibres other than those provided/worked upon correctly contained/protected from cable butt (worked on) to splicing tray** • Existing fibre practices in FTTC RDSLAM.
10	F0211	**Fibres worked upon correctly routed within tray/shelf.** • Existing fibre practices in FTTC RDSLAM. • Correct splice protector correctly sited within the FTTC splicing tray • Fibres correctly routed in tray
5	F0213	**Circuit Identification and/or labelling correct.** • Existing fibre practices in FTTC RDSLAM. • Labelled on FTTC splicing tray • The tray should be marked as a minimum of cable number and element - example is ON 1234 Fibre 14 (or Fibre 2 / element 2) • The cable label would also have 1141 code/cable number/cable section number / fibre count/ eng Id / date Cable label example is - DL/ON 1234/ TS ABC - TNABBLC / 4F /NEABC789 / 15/10/12
5	F0301	**Cable(s)/Jumper(s)/Termination unit(s) provided marked/labelled Correctly** • Existing fibre practices applied in FTTC RDSLAM. • Starburst label provided • The splice box is a pseudo joint so Exchange (1141 code) + RDSLAM ID (node ID) + PCP number (for RDSLAM only) and eng ID & date - if not on the cable label Splice box example is - DL / TNABBLC / PCP2

		• The tray should be the same as a Generic joint 3A tray fibre e.g., element and cable number Tray example is - ON 1234 Fibre 14 (or Fibre 2 / element 2) • The cable label would also have 1141 code/cable number/cable section number / fibre count/ eng Id / date Cable label example is - DL/ON 1234/ TS ABC - TNABBLC / 4F /NEABC789 / 15/10/12 Note: Fibre Cable and termination unit only
5	F0407	**Other observed Fibres correctly routed within shelf as appropriate or reported.** • Existing fibre practices in FTTC RDSLAM.
5	F0109	**Observed Fibre defects reported to FRAC.** • Existing fibre practices in FTTC RDSLAM. • Observed Fibre defects reported to FRAC

7.4.4 Commissioning & Maintenance check items & guidance

5	C4008	**FTTC Desiccant packs provided, correctly positioned and recovered as appropriate by Cabinet Installer and Commissioner** • Desiccants provided and opened in all compartments after RDSLAM installation by cabinet installer • RDSLAM desiccants removed after power up and commissioning by Huawei / ECI. Note: Desiccants provided by cabinet installer Note: Desiccants do not have to be signed / dated
10	C5012	**Correct security locks provided and fit for purpose** • Correct High Security lock fitted correctly in accordance with fitting instructions if contractual requirement. • Specified spacing plates fitted correctly within lock • Lock closes correctly • Currently Barnet 2B type • No reinforcement plate needed on FTTC RDSLAM • Note: The locks are fitted when the RDSLAM is commissioned by Huawei / ECI
10	F1002	**If RDSLAM has been commissioned has the AOC been given prior notice before work commenced** • As per field procedures
10	F1006	**ESD protection equipment used.** • ESD protection equipment used – in progress only

5	F1009	**DSLAM cards & batteries installed correctly and secure. Consumables boxes and battery straps stored safely in RDSLAM to avoid damage or contamination.** • All Huawei batteries are provided and fitted at the commissioning stage – not checked during audit • All ECI batteries are provided, but not fitted, at the installation stage – checked at stand up stage. . • Cardboard boxes removed • RDSLAM cards mounted correctly and screws / ejectors in position • Cable Connectors seated & fixed correctly and screws secured in position Note: All batteries are fitted and connected on commissioning by Huawei / ECI - any commissioned RDSLAM found with missing batteries should be reported to the AOC In Life team on 0800 681 6672 Option 2
5	F1010	**Routine maintenance task completed correctly** • As per field procedures • Air filter changed correctly • Routine Maintenance completed correctly
10	F1012	**Splitter modules inserted & aligned and secure for all pairs provided** • Splitters fully inserted and aligned for all pairs provided (48 per card fitted – not needed for spare terminations) • Note: Splitters will be inserted during the commissioning activity
5	F1007	**All test & commissioning certification up to date and held** • 100% factory copper cable continuity test recorded as completed • Power Supply certificate provided by DNO • Telemetry Installation certificate provided by Provider • Test and commissioning certificate provided by Huawei • Handover certification provided correctly • Self Check and certification provided correctly • Acoustic Noise within limits

7.5 PCP (Including Enhancement) – FTTC check items & guidance

Existing score sheets and practices **– using additional FTTC guidance in section 7.4.3 when working in the PCP**

10	C4011	**PCP stand off provided correctly with no damage to existing PCP equipment and jumpers** Note: This check is applicable to the Civils checklist • All panels free from damage and scratches • All doors flush fit and free moving • Cabinet can be closed without deforming panels • All rubber door seals in place • Cabinet fixed and bolted correctly • Installed 90mm to 170mm from existing PCP • Not used with cast iron PCP • 2 x 70mm diameter holes metal core drilled in existing PCP • Plastic bolt covers fitted to all exposed bolts • Plastic edge protection provided to rim of tube holes • Evidence of silicon sealant being applied to connection plates and tubes • No damage to fittings, jumpers and connectors in existing PCP • All PCP fittings replaced e.g. transducers and clocks

7.6 Copper Cabling & Jointing (Due to PCP Enhancement)

Existing score sheets and practices

7.7 End User Premises- FTTC

10	F1013	**XNTE, NTE requirements and monopoly wiring segregation requirements correct.** • Incoming line not terminated directly on an XNTE (if existing) • No wiring terminated on XNTE module • XNTE (if existing) rewired from Internal NTE5 to maintain extension wiring • No extension wiring or spurs connected prior to Internal NTE5
10	F1014	**VDSL filter, modem and wiring installed correctly.SSFP fitted in NTE5** • New longer screws supplied with VDSL fitted • VDSL modem fitted and cabled in accordance with Installation instructions. • Cleats used not or 'Tacwise combi tacker' / staple gun, on correct minus setting, with CT-60 / 10mm staples • On a Huawei installation modem 2B or 3B used (item code is

		062947). • On an ECI installation modem ECLVL05 used. **Cat 5 Cable:** • Correct VDSL data extension cable kit used (CAT5) if required • No Cat 5 data extension cable kit run externally. **Cat5e cable:** • Cat 5e cable stripped correctly without damage • Sheath is over the RJ11 grip • Pair 1 terminated correctly in RJ11 plug and pair 2 cut back at sheath butt • Correct cable stripper and crimping tool used (In progress) • BT85B used to connect internal and external cat 5e cable

8 *Summary of Changes*

8.1 Issue 4 to issue 5

Cat Code	Changes
C1013	Clarity on rope securing in JB added
C1019	DS1B in RDSLAM 1st joint box requirement removed & clarity on light pull of cables added
C6018	Latest hard standing CN drawing added with reference to SROH. Additional existing reinstatement guidance added
C6020	Existing MS checklist cat code added to document
C1026	Amended to 10 point item from Jan 1st 2013.Check extended to power ducts and check additional check guidance added by RDSLAM type
C4002	Amended to reflect poly lid requirements
C4003	Amended to reflect poly lid and conducrete requirements plus new check items for the root heights above ground level
C4004	Amended to reflect poly lid requirements
C4007	Power door label check removed , check for removal of plastic bags from ECI roof fans & door filters and conducrete reference added
C4009	Earth pit requirements updated with new requirement to protect rod in earth pit with tape sealing. Earth readings required at Civils stage clarified
C5012	Additional clarity provided for existing checks on locks
N4109	Existing earth pit key requirement added and guidance on battery strap fitting added
N4111	Mandatory Auto RCD requirement, if necessary for conducrete RDSLAMs, added

N4113	Visual inspection only guidance added for audit checks
N4218	Existing Requirements aligned with N4219
N4219	Existing Requirements aligned with N4218
N1102 A2630	D/L only entry removed and light pull on cable guidance added
C4010	Metal poles and BT Kiosks references
N4413	Typing error corrected – was shown as 10 point item but is 5 point
N4212 A2151	PCP tie cable labelling requirement updated, existing labelling requirements for BT85B,earth pit and SCF use added for clarity
N1157	Use of RDSLAM ducts clarified, telemetry routing for conducrete RDSLAMs & 1hit duct seal process added, existing use of SCF added for clarity
N3109	Updated to reflect NTE requirements for ECI & Huawei 96 with conducrete, 1 hit duct seal changes and extra clarity on existing BT85B requirements added
N3107	Existing SCF requirements added for clarity
N4327	1 hit duct seal guidance added
N2101	Requirement for terminating telemetry cable on RDSLAM module added for 1 hit duct seal guidance.
F0205	ECI fibre support guidance added
F0214	Guidance on storage of last 4 yellow pig tails on Huawei 288 added
A2504	Audit guidance on Huawei 288 splice boxes added
F0207	Guidance on 3M splice box manifold usage added

8.2 Issue 7 to Issue 8

Cat Code	Changes
N/A	Old OQP Cat codes removed
5.1	Added: new heading All RDSLAM related activities
	Added: Telemetry provision, where applicable
	Removed: End user installation e.g. Managed Install Added: Exchange and cable chamber Fibre cabling and jointing RDSLAM Meter provision, where applicable
5.2	Added: End user installation e.g. Managed Install
6	Added: are managed by the Audit
	Removed: FTTC – Fibre To The Cabinet Non managed Service
	Removed: F2CMSC - Fibre To The Cabinet Managed Service Engineering Complete
	Removed: F2CPCP - Fibre To The Cabinet PCP Re Shell
	Removed: RD OUC/Exchange CSS code / PCP number Estimate number / Bid area short code Added:
7.1	

F1024	Added: Strength members correctly terminated
	Added: Managed Service / BDUK Retrospective check
	Removed: notes Alternative OQP / CANDID item codes are also shown
7.4.1	
C1004	Added: For box entry: e.g. existing duct and any supporting TDFS evidence has the duct(s) provided to the best achievable standard
	Added: notes duct entry positions
C1013	Code changed from H1013
C1017	Added: Core drill must be over sized and the hole made good, (Contractors may use alternative drill size
	EPT/UGP/B054 is not on CANDID
	Added: Ducts not mis-shaped
C1019	Changed from H1019
C1023	Added: 10 pointer
C2014	Added: notes For departures from specification
	Added: Ducts no grouted
	Added: Notes Duct not positioned in recommended position
C2026	Added: new section duct entry in safe place
C6018	Changed from R6018
	Added: All in one cabinets
	Added: notes around local authority Physical reinstatement Road marking Trim line requirements Vertical saw cuts Wearing course
C1026	Changed to 10 pointer
	Removed: (Huawei 288) Stand up cap sealing gland entry
	Removed (Huawei 288) Handover power cable entry
	Added: (Huawei 288) stand up earth entry in the left hand bore
	Added: (Huawei 288) Handover back pipe cut for each entry
	Added; (Huawei all in one) stand up (power side) plug pressure 3 or resin used
	Added: (Huawei all in one) stand up (passive side)resin 14 used in earth rod duct
	Added: (Huawei all in one) Handover resin used in power duct
	Added: notes minimum separations
	Removed: power duct requires sealing
C4001	Changed from P4001
C4003	Added: plus CN 15764 (Huawei all in one)
	Added: CN 1464 (stand of cabinet)
	Added: (Huawei 128 all in one)1 fibre duct 56/3xduct 54/1 power duct
	Added: maximum distances above plinth
	Added: RDSLAM front and side minimum 90 degrees

	Added: Conductive Concrete checks
	Added: Base excavated to 700mm
	Added: 2 bags conductive concrete required in trench
	Added: 2 metres of electrode extended beyond base
	Added: The electrode touch the soil
	Added: Conductive concrete not to be over other services
	Added: Spear tails coil in 200m length of duct 36 for future use
	Added: 2 bags conductive concrete used over bare electrode
	Added: 100m earth provide over conductive concrete
	Removed: additional50mm dug out
	Removed: correct number of bags used
	Removed: 2 short pieces of duct 36 used
	Removed: power duct bare wires coiled up in duct
	Removed: correct length of bare earth laid over copper duct
	Removed: additional 2m length attached to bare wire used
	Removed: bare wire folded and doubled back as necessary
	Removed: correct depth of native soil used and tamped
	Added: Concrete dispersed over polylid
C4004	Added: a washer and nut on each cabinet, max torque 45n/m
	Added: water should not be present in the base of the RDSLAM
C4007	Added: washer and nuts on each cabinet fixing bolts to max torque 45n/m
	Added: no corrosion present in RDESLAM
	Added: JPX module protective cover fitted
C4009	Removed: Words (primary if required)
	Added: rods must not be in contact with other services
	Cabinet installer
	Added: conductive concrete Removed: conducrete
	Added: any earth cable connection must not be within duct seals
	Added: excessive washers not used
	Added: washer provided above and below nut
	Added: extra earth cable e.g. between earth rods provided with 16mm 2 cable
	Added: notes about conductive earth electrode / criteria for earth resistance values
	Added: RCD table for Cabinet
C4012	Added: Earthing solution provided in accordance with policy
C5012	Removed: section regarding correct security locks
F0308	Removed: compound 16a and 9b/sealant 10b
F1009	Added: All ECI
	Removed: Earth pit key left on top of battery box
	Added: Notes: all batteries are fitted on commissioning
	Added: Notes: If Huawei/ECI batteries are found missing report to the AOC

F1069	Removed: Auto RDC installed for conducrete earth system
F1076	Added: section on UMS
F1074	Added: section on Additional supplementary rods recorded on diagram
F1077	Added: Notes: high security locks
A2630	Added: bullet points evidence of inner duct/top hat seal/Filo seal
A2165	Added: Bullet points
I6018	Added: Notes: applies to PCP checks only
A2155	Added: section on jumper not defective or fault prone
B6014	Added: section on job completion other jointed pairs
A2110	Added: section on modular cross connection system installed correctly
F1004	Added: bullet point if two or more RDSLAM are less than 3 metres apart/ should be made TT power
	Added: Connections all terminated correctly using eyelets, washers and bolts – or, if earth rod has had to be cut, approved earth ring / clamp connectors used
	Added: Excessive washers not used
	Added: Washer provided above and below nut
	Added: Evidence of crimper indentations, no loose or cut conductors and maximum 5mm of bare conductor at eyelet If required earth cable extended using approved connections
A2920	Added: Telemetry cable installed in duct bore when not required i.e. UMS
I6992	Added: Earth pit securing bolts fitted and not loose
A2151	Added: Cable label provided on earth bonding cable in UG structures
	Removed: Openreach logo on earth pit removed
	Added: Conductive concrete label attached to insulated cable in RDSLAM
	Added: Notes: The exception is Huawei All in One cabinets where the PCP number must be provided by the first cabling jointing team
F1016	Added: Tie cable Pair (BBOUT /LINE/ OUTGOING) used for telemetry line dressed away from splitter area after being unterminated e.g. pair 70 or 100
	Removed: tie cable under ‘1 hit duct seal process’
I6512	Removed: words Conducrete
	Added: In PCP route the telemetry cable to a position beneath the nearest existing ‘D’ side assembly position
	Added: In PCP provide the telemetry cable into a BT 85B which should be restrained to the cables or mounting bar beneath the selected existing ‘D’ side assembly position with SCF
	Added: Notes: *if telemetry line is provided in the tie cable*
F1018	Added: Telemetry line can be provided in the tie cable
	Removed: must not be routed via the FTTC tie cables - unless provided under the ‘1 hit duct seal process’
N6014	Removed: section removed
N2104	Removed: Section removed

N2133	Removed: Section removed
G1002	Removed: section removed
G1005	Removed: section removed
G9001	Added: Product item not covered elsewhere in product check
F1079	Removed:-BDUK RDSLAM – Observed defect on associated open estimate (non Z status
F1080	Removed: BDUK RDSLAM – Observed defect on associated closed estimate (Z status)
G1006	Added: Contractor check only – operative shown as accredited on CANDID for work completed only, To be marked on separate score sheets
7.4.2	Removed words managed service/ BDUK
C4008	Removed: Desiccants opened and positioned in all compartments prior to commissioning
7.4.3	
A2151	Removed: Openreach logo on earth pit
	Added:
	Added: Bullet points regarding Filoseal and top hat duct seal
A2110	Added: Bullet point D and E side cable ties in separate cable- unless TDFS
A2190	Added: Bullet point D and E side cable ties in separate cable- unless TDFS agreed
F0204	Added: bullet points Spare pig tails/restrainer on mandrel within Velcro straps
	Added: bullet point pig tails routed correctly
F0205	Added: spare BFT sealed above cone block
	Added: Any long lengths of spare BFT supported
	Added: fibre pig tails restrained correctly
F0214	Removed: correct cable for distance to spine joint
F0308	Added: Section: Gas Seals applied correctly, Where applicable
A2504	Remove:-Huawei 288 - Splice box 1A / 2A module installed and secured correctly
	Added: Huawei 288 - Tyco Otian BF/COF Dual Circuit Splice Box installed and secured correctly
	Removed:-Note: Tyco Otian BF/COF Dual Circuit Splice Box can be provided if there are stock shortages
	Added: Plastic protective covers fixed and secure on splicing trays
F0402	Removed: Rubber guide grommet used for splice box 1A (1 per gland and 4 fibres per gland)
	Added: Jumpers correctly restrained in termination using Kevlar (KTU) BFT restrained correctly in splicing box
F0207	Added: No unprotected or visible fibre bundles between cone and fibre tray.
F0211	Added: Fibres correctly routed in tray
F0213	Added: Labelled on FTTC splicing

	Added: The tray should be marked as a minimum of cable number and element
	Added: The cable label would also have 1141 code/cable number/cable section number / fibre count/ eng Id / date
F0301	Added: The splice box is a pseudo joint so Exchange (1141 code) + eng ID & date - if not on the cable label Added: The tray should be the same as a Generic joint 3A tray fibre e.g., element and cable number
	Added: The cable label would also have 1141 code/cable number/cable section number / fibre count/ eng Id / date
7.4.4	
C4008	Removed: words active body and power side
	Removed: Desiccants opened and positioned in all compartments prior to commissioning
C5012	Added: Section Correct security locks provided and fit for purpose
F1009	Added: Section DSLAM cards & batteries installed
7.5	
C4011	Added: section PCP stand off provided correctly Note: This check is applicable to the Civils checklist
7.7	
F1014	Added: Tacwise combi tacker' / staple gun, on correct minus setting

8.3 Issue 8 to Issue 9

Cat Code	Changes
C1026	Points value updated to 10 points (typing error on previous issue)
A2110	Section 7.4.1: relevant critical check items transferred from A2116 in section 7.4.3
A2110	Section 7.4.3 note added to refer to A2110 in section 7.4.1 for additional RDSLAM only checks
A2116	Item value changed from 10 to 5 points to reflect FPQ change from Jan 2016. Relevant 10 point check items transferred to A2110 in section 7.4.1
F0205	Clarity added to bullet point 2 to refer to AIO cabinet only
N/A	Section 8.3 added to reflect changes from Issue 8 to 9

9 *Enquiries*

All enquiries about this document should be referred to the author.

END OF DOCUMENT