

# Imperial College London

**Information & Communications Technology  
Network Infrastructure Group**

**Network Infrastructure Standards**  
**January 2018**

**Appendix G – Copper backbone (voice)**

Version 1.5

## **Appendix G – Copper backbone (voice)**

### **Copper Backbone Cabling**

#### **1.0 Introduction**

This Section details the required standards for Copper backbone (Voice) cabling.

Currently the College runs a VoIP system and therefore the importance of the voice cabling system has been reduced. It is still critical for several services but less quantities are required these days.

As a rule of thumb there will be 10 pairs installed for each of the comms rooms in the buildings (unless there is a specific requirement to have more). All will emanate from a DP in the main comms room of the building.

#### **2.0 Cable Type**

Cables provided for voice communications purposes shall be of the CW 1308B (LSOH) or CW 1128 type with a conductor diameter of 0.5 mm.

#### **3.0 Cable Capacity**

As a general rule, 10 pair cables should be used as standard in buildings where there is an existing ICL VoIP installation for telephones. If it is a new building to be connected or the main link to the building installed (or re-instated) a cable to the source will be installed with the number of comms rooms multiplied by 10 as its size/capacity.

#### **4.0 Patch Panel Terminations**

50 Port patch panels (1U) should be used within the CWC (please see Appendix E – Ordering).

All cable pair terminations should be made by the insulation displacement connection method (IDC). Each port should be earthed to provide earth recall services.

Sufficient slack should be retained on each copper pair to allow the termination to be remade at least twice.

The cable will be left with enough slack as to allow the cabinet to be moved in an emergency or unforeseen event. Please see cabling specifications in respect to this (Appendix F – Horizontal cabling)

#### **5.0 Patch Panel Cable Management**

1 Refer to cabinet layouts shown in “Appendix C – CWC”

## **6.0 Cable Routes**

All cable routes and locations of termination points should be agreed with ICT prior to the commencement of the installation of such routes.

## **7.0 Cable Joints**

All cables shall be complete between termination points; no cable joints will be permitted. Changes of cable type to comply with BS6701 will be made on IDC through-boxes.

## **8.0 Cable Protection**

Holes drilled through walls or floors for the routing of cables shall be suitably sleeved to prevent damage to installed cables. Where cables pass through floors such protection shall be extended to at least skirting height.

## **9.0 Fire Protection**

Where cables, trunking, tray work, or conduit pass through floors or walls, suitable fire sealing shall be provided in accordance with IEE 17th Edition Wiring Regulations (BS7671:1992).

On all fire walls (to be checked with the fire strategy) EZ-Paths will be installed where physically possible.

## **10.0 Earthing**

*Signalling Earth* – Voice outlets within CWCs shall be provided with a signalling earth to allow the use of earth-loop recall telephones, in accordance with BS6701.

*Protective Earth* – A protective earth connection to the items of the installation, in compliance with the current IEE regulations, 17th Edition, should be provided.

## **11.0 Labelling**

### **11.1 Termination Points**

All termination points should be clearly labelled with a securely fixed trifoliate type engraved label with letters 10mm high, showing the termination points, reference and ownership.

### **11.2 Patch Panels**

Patch panels must be clearly labelled with a durable printed label. Individual RJ45 outlets should be labelled in accordance with circuit numbers.

The label should include the voice Cable ID. Please contact Imperial College ICT to obtain the ID number

### 11.3 Cables

All cables shall be clearly marked at 5 metre intervals and at all points of entry and exit for concealment.

All cables within buildings (vertical distribution) will have the following labels:

ICT – Voice link  
<Cable ID>  
<Building name> BDF to floor <floor> <CWC ID> <cabinet ID>  
<Installer company name> - <date>

Cable ID is provided by ICT

All cables between buildings (backbone) will have the following labels:

ICT – Voice link  
<Cable ID>  
<Installer company name> - <date>  
<Building name> BDF to <building name> MDF

Cable ID is provided by ICT. This is similar to the fibre process.

These numbers and other information about the cable should be held in an Imperial College ICT Networks database. The database will contain information such as:

- “A” end location
- “B” end location
- No. of cores
- Colour of outer jacket

### 11.4 Routes

All containment shall be clearly marked at 5 meter intervals and at all concealment points with the following label:

“ICT DATA CABLES”

The routes will be the same as per Appendix F.

### 12.0 Certification

Upon completion, the Contractor should provide a certificate of compliance to BS6701 Parts 1 and 2 upon completion of the cabling scheme.

### 13.0 Warranty

The Copper backbone distribution scheme should be included within the Structured cabling 'Applications and Performance Warranty'.

#### **14.0 Multi-core Voice Cable Testing**

The Contractor should undertake a 100% test of all cable pairs.

The results should be tabulated in a neat, legible form signed by the Contractor's representative, and submitted to ICT for acceptance.

Cable pair tests shall be made to ascertain the following:

- Crossed or split cable pairs;
- Continuity of cable pair;
- Correct Labelling;

#### **15.0 Completion Documentation**

The Contractor will, on completion of their works and prior to acceptance by ICT, submit digital copies of all records and schematics for this part of the installation.

Schematics will detail all cable runs and termination points. The installed cable capacity, cable identification reference, length and type of cable shall be identified.

Records will show clearly all cable terminations and cross connections together with cable capacity and installed length.

The following documentation is required:

- Copper cabling schematics.
- Copper cabling records.
- As fitted drawings.
- Copper cabling test results.
- Cabinet Layouts.
- All relevant operating and maintenance manuals.

All documentation and drawings will be required in machine readable format, i.e. CD-ROM disk. Full details of CAD formats should be provided. All drawings should be "as fitted" and should take account of all changes and variations.

#### **16.0 Drawings**

Please refer to Support Services Engineering Team CAD Strategy.