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# University College Cork

## Structured Cabling System Standard

### Version 1

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The purpose of this document is to assist building refurbishment and planning.

## Document Location

<http://www.ucc.ie/en/it-policies/standards>

## Revision History

<b>Date of this revision: 02/08/2013</b>	<b>Date of next review: 2/08/2014</b>
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<b>Version Number/Revision Number</b>	<b>Revision Date</b>	<b>Summary of Changes</b>

## Consultation History

<b>Revision Number</b>	<b>Consultation Date</b>	<b>Names of Parties in Consultation</b>	<b>Summary of Changes</b>

## Approval

This document requires the following approvals:

<b>Name</b>	<b>Title</b>	<b>Date</b>

This procedure will be reviewed on a periodic basis

## INTRODUCTION

To assist building refurbishment and planning, the IT Services Department has compiled a list of the basic requirements of a voice/data structured cabling system. This will cover the installation of all telephone and computer points within College.

Contractors and Sub-Contractors will adhere to the following standards where applicable to the Structured Cabling System:

- **ISO/IEC 11801:2000:** Generic Cabling for Customer Premises
- **EN50173:2000:** Generic Cabling Systems
- **TIA/EIA 568B:** Commercial Building Telecommunications Cabling Standard
- **BS 7671:1992:** Requirements for Electrical Installations (Amended 1997)

All cabling shall conform to the Category 5E/ Category 6 standard at minimum. All cables shall be Foil Twisted Pair.

Any deviation from these specifications must be approved by the IT Services Department

## WIRING CLOSET

The requirements for a wiring closet are as follows:

1. Located in a general access area. The floor area of the wiring closet should be at least 8 square metres. In installations that exceed 400 cables this area should be larger.
2. The number of wiring closets in any one building must be kept to one if possible, located centrally in the building. In situations where cable distances deem it necessary to have more than one closet, then the closets must be inter-linked via a 16 core 50micron single mode fibre optic cable.

In circumstances where the closets are separated by distances of no more than 80 metres, 4 FTP cables should accompany the fibre.

2. In a large installation (>240 cables) the wiring closet should be a 'walk in' design, i.e. capable of containing three six foot open bay 19' racks. Room should be allowed for front, rear and side working access to the racks. In smaller installations a floor standing lockable 19' rack cabinet located in a secure area is the usual solution.
3. At a minimum the cable, connection components and installation techniques must adhere to ISO/IEC 11801:2000 [item 1]. To ensure the maximum impedance compatibility between components all items such as Cable, Patch leads, Faceplates and Patch panels must be from the same manufacturer.

4. Cables should be terminated in RJ45 19' Patch panels. A cable management system is required for every 24 port patch panel inserted. This will ensure correct installation of patch panel cable.
5. Adequate ventilation should be provided by means of electric extractor fans and air inlets into the closet, via air vents where deemed necessary. In the larger installations (>300 cables) the minimum requirement for air conditioning is a Heat Pump Air Conditioning System rated at 5.2Kw.

In smaller installations electric A.C. fans should be placed in the cabinet to keep the active components cool.

6. **Security:** The closet must be lockable and put on the IT Services Department key system.

## TRUNKING AND CABLEWAYS

Telecommunications cables are installed largely in a fashion similar to electrical power cables. The main differences to note are:

- a) **The cable length from patch panel to faceplate outlet must not exceed 85m.**
- b) The bend radius of a cable must not be greater than 4 times the cable diameter.
- c) Trunkings and cableways must be sized to 2.5 times the requirement of the current installation, i.e. if current installation is 2 cables then cableways must be sized for 5 cables.
- d) It is preferred to use cableways completely separate from electrical power installations, however in certain situations this may not be aesthetically possible.
- e) Metal conduit or trunking is necessary only in construction/mechanical laboratories, or where it is deemed to be aesthetically necessary.
- f) Data must not be allowed to run side by side with electrical cables unless separated by a distance of 50 mm plus an earthed metal fillet.
- g) Cables must not be loomed in numbers >25.
- h) The Contractor will be responsible for the removal, and reinstatement to the original condition, of any tiles and panels required to perform the installation.
- i) Cables should be enclosed within conduit or trunking where exposed.

## TELECOMMUNICATIONS CABLES AND OUTLET DISTRIBUTION

Rooms are cabled in accordance with the following guidelines:

- a) A standard office is calculated at 9m<sup>2</sup> (for our purposes). This is called a floor unit. (FU)
- b) One standard office is cabled with four cables. This foursome is called a Telecommunications unit. (TU)
- c) If a room has area exceeding 9m<sup>2</sup>, then it is cabled accordingly with relatively even distribution of Telecommunications units i.e.
  - a. FU = 1 TU
  - b. 1.5 FU = 2 TU
  - c. FU = 2 TU etc.
- d) At a minimum terminations and faceplate outlets should adhere to ISO/IEC 11801:2000.
- e) The Channel link, (faceplate to patch panel and patch cords) should be tested in accordance with either ISO/IEC 11801:2000 or the current unratified Cat6 certification.

## FTP CABLE TERMINATION AND TESTING

- a) The incoming cables will have all 4-Pairs terminated at both patch panel and outlet in accordance with the TIA/EIA 568B specification.
- b) To maintain transmission performance of the cabling system the twists in the cabling must be maintained as close to the point of termination with a maximum untwist of 13mm from the point of termination. The Contractor should also ensure that if introducing twists back into the wiring then only one twist may be performed.
- c) The stripping of the cable sheath will be limited to the minimum amount required for a successful termination.
- d) Contractors shall design the system such that sufficient slack remains to enable re-termination of the outlets a minimum of twice and a limited scope for movement of the cabinets. Coils of excess cables underneath the cabinets are unacceptable.
- e) All data cables will be installed with no form of joint on the cable run between the patch panel and the outlet (or Consolidation box). If cables are damaged along the run of cable then they must be removed and replaced with new cable.
- f) Each patch panel and outlet will be labelled.

- g) All cables must be tested using a Fluke DSP400 Digital Cable Analyser or an equivalent cable analyser. All test results must be recorded and supplied to the IT Services Department.

The vendor should provide examples of acceptance documents including:

7. **Warranty:** The system must be provided with an end-to-end 'Link Performance' to comply with the ISO specification for at least five years for all of the current applications described in ISO/IEC IS 11801:2000. Details available on request.
8. **Documentation:** The contractor shall provide comprehensive descriptions, layouts, test results, connectivity diagrams for each individual link and network administration.
9. **Commissioning Report:** The contractor shall provide a commissioning report.
10. **Management:** The contractor must describe all available cabling systems management tools which can be provided to assist in the on-going maintenance of the work.

## POWER REQUIREMENTS AND EARTHING BONDING

- a) For the 'Walk in' wiring closet, 15 twin switched sockets should be installed. Precise location can be decided on site. The sockets should be 3 groups of 5 on 3 separate dedicated RCD circuits with 25 A circuit breakers.
- b) For the smaller installation (<300 cables), 3 switched twin sockets installed inside the cabinet are required. Again a separate dedicated RCD circuit, with 25A circuit breaker.
- c) *No electrical power installations are permitted without the prior consent of the Buildings and Estates Office.* **N.B. In either installation the power should not be interruptible except at distribution boards or inside the closet.**
- d) Each cabinet installed will be bonded with every other cabinet using an earth cable in accordance with I.E.E. 16th Edition regulations.
- e) Each cabinet will then be earthed using an earth cable in accordance with I.E.E. 16th Edition regulations, to a Telecoms Room Bus Bar, which will be earthed using an earth cable in accordance with I.E.E. 16th Edition regulations to the Main Building Earth (MBE)

## ACTIVE COMPONENTS

The IT Services Department reserves the right to decide which equipment can be attached to the College network. No other devices can be installed on the College network without this consent.

## FIBRE OPTIC LINKS

College currently use Fibre optic cable to interlink buildings around College. The number of fibre pairs vary from job to job. The type of cable specified, also varies from job to job but typically two types are required multimode, and singlemode fibre.

All fibre termination should end in a 19' fibre splice drawer in the comms rack in the buildings in question. The type of connectors used must be standard SC. All links should adhere to the following db loss guidelines:

- Multimode Fibre 3.75dB per Km
- Singlemode Fibre 1.5 dB per Km

The IT Services Department will advise the exact requirement of fibre optic interlinks on a job by job basis. No two locations should be linked by less than 32 cores of singlemode fibre.

## TERMS

1. **Cableways:** Trunking, cabletray, conduiting, etc
2. **ISO:** International Organisation for Standardization
3. **IEC:** International Electrotechnical Commission
4. **CENELEC:** European Committee for Electrotechnical Standardisation
5. **TIA:** Telecommunications Industry Association
6. **EIA:** Electronic Industries Association
7. **IEE:** Institute of Electrical Engineers
8. **ISO/IEC 11801:2000:** ISO standard for Category 5e cabling systems
9. **EN 50173 (2000):** CENELEC standard for Category 5e cabling systems
10. **TIA/EIA 568B:** TIA/EIA standard for Category 5e cabling systems
11. **BS 7671:1992: British Standard based on IEE Wiring regulations, 16th Edition**
12. **Floor unit: 9m<sup>2</sup> of floor area**