

White Paper

Infrastructure Cabling for Future Buildings



2013 will see the publication of a new standard from CENELEC titled EN 50173-6 Information technology – Generic cabling systems – Part 6: Distributed building services. This standard has been written to include the requirements of the various established and developing systems that can utilise the infrastructure cabling that is installed in buildings. It is also being written to encompass Distributed building services that did not use the infrastructure cabling for historic, topographic, application or connector reasons.

First, a look back how various systems were deployed in the past. These systems included telephone, data, alarms, control and lighting to name a few. The protocols to control and monitor these systems were developed by individual manufacturers often using different cabling and connectors following different rules. These systems used ring, mesh, star and bus topology networks to connect them. Computer networks saw the introduction of Ethernet over twisted pair copper within the enterprise leading their protocols. From this evolved the development of structured cabling. It soon became common to see structured cabling used for both data and voice systems. Each using different applications, but using a common Class of cabling.

Structured cabling uses categories of components (connectors, cables and cords) to form Classes of channels. Within the standards are stated the minimum Class of cabling that will support various applications.

Now most telephone systems being installed within businesses are Voice over Internet Protocol (VoIP). VoIP systems use the same Ethernet network as the data within the building,

hence sharing the same network as well as the cable class. Furthermore, most new building networks are making provision for wireless access points, even if not being installed as part of the initial installation.

The purpose of the new standard is to allow the migration of distributed building systems onto generic cabling systems while acknowledging, and making allowance, for specific channel requirements. Distributed building systems detail the following systems as using the cabling:

- Telecommunications (Wireless access points, etc)
- Energy management (Lighting, Power distribution, Incoming utility metering, etc)
- Environmental control (Temperature, Humidity, etc)

CENELEC – European Committee for Electrotechnical Standardisation. CENELEC is the European Standards organisation responsible for the publication of infrastructure cabling standards, and others, including the EN 50173 series (Information technology – Generic cabling systems) and EN 50174 series (Information technology – Cabling installation). These “EN” standards, once published are automatically adopted by member states of CENELEC and become national standards. For example, EN 50173-1:2010 is published by the British Standards Institute as BS EN 50173-1:2010 in the United Kingdom.

- Personal management (Access control, Cameras, Passive infra-red (PIR) detectors, Time & attendance monitoring, Electronic signage, Audio visual (AV) projectors, etc)
- Personal information and alarms (Paging, Patient monitoring, Nurse call, Infant security, etc)

The standard details that balanced copper cable and optical fibre cable of classes detailed in EN 50173-2 shall be used either as an overlay (part of the structured cabling) or stand alone (installed after the initial infrastructure cabling). As you would expect, new standard brings new acronyms... We will now see SCP, SD and SO being introduced.

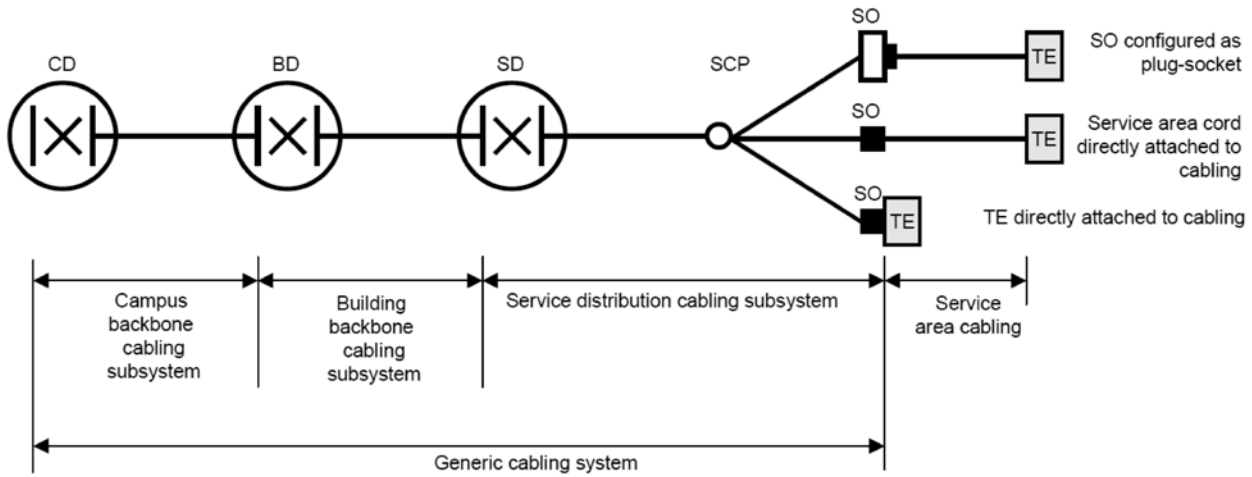
SCP – Service Concentration Point (similar to a CP – Consolidation Point)

SD – Service Distributor (similar to Floor or Building Distributor)

SO – Service Outlet (similar to a TO – Telecommunications Outlet)

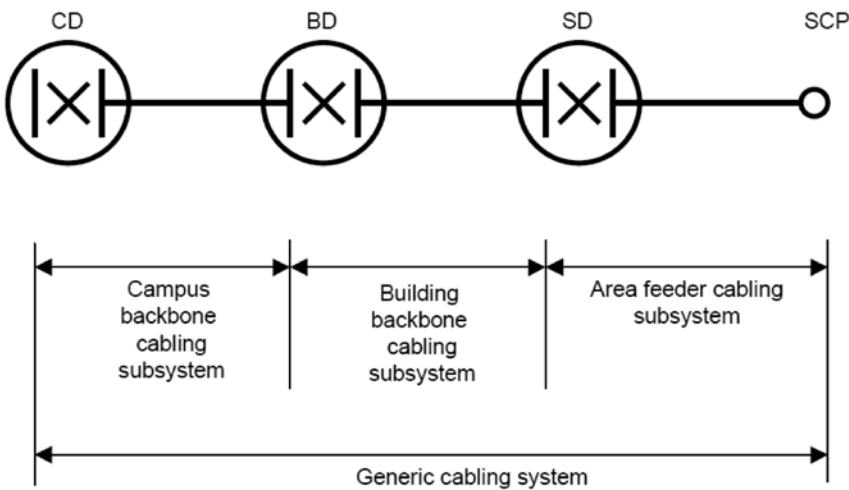
The cabling for Distributed Building Systems is split into two deployments.

Type A: Generic cabling to SO (Service Outlet)

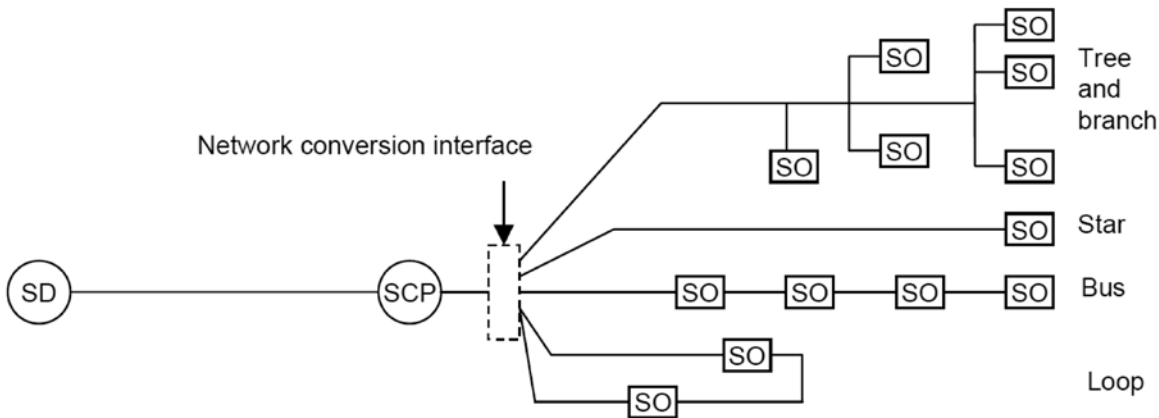


This type of deployment uses the same channel models as standard infrastructure cabling, as shown above. The schematic shows that the TE (Terminal Equipment) may be attached in different ways. For example having the SO as a plug socket and so a service area cord attaches the TE, directly attaching the service area cord to the cabling or even connecting the TE directly to the cabling.

Type B: Generic cabling to SCP (Service Concentration Point)

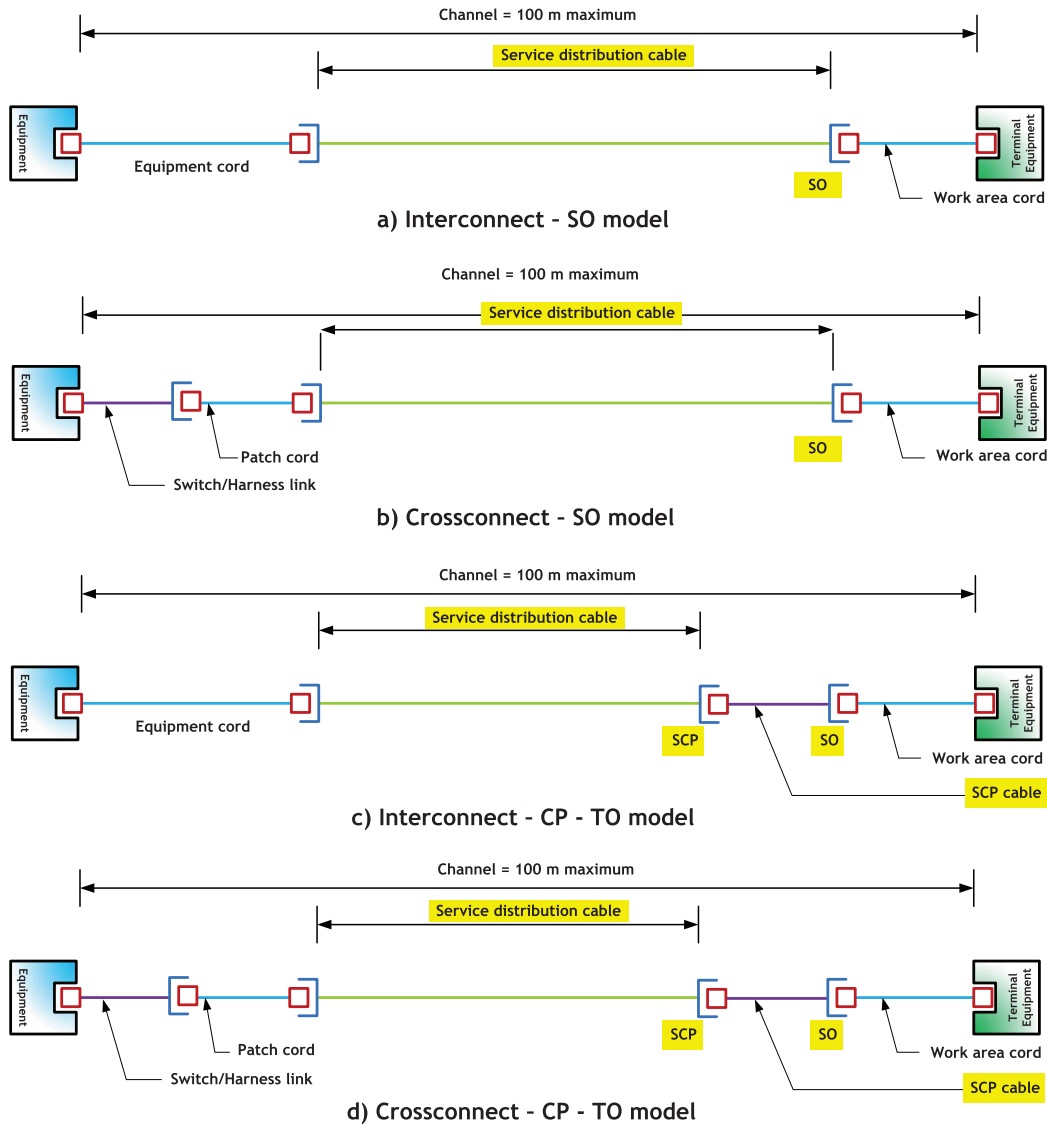


This deployment utilises generic cabling to the SCP. Thereafter the cabling is customised to suit the system being installed. At the SCP Network Concentration Equipment is installed to support the different topologies that may be employed.



This differs to other structured cabling systems by deploying active network equipment in the horizontal channel. This is not done at a Consolidation Point. The various distributed building services use the different topologies shown in the above diagram – Tree and branch, Star, Bus and Loop.

The rules for the distances between the various sections of the channel follow the rest of EN 50173, namely that the maximum horizontal channel (SD to SO) is a maximum of 100m (balanced copper cabling channel) and shows four models:



The other dimension for consideration is that if an SCP is used, the minimum length of cable between the Service Distributor and the SO is 15m. Service Concentration Points should be located in accessible permanent locations (Ceiling voids, floor voids, etc).

In summary, the introduction of this new standard will see the cabling being encompassed within the infrastructure of the building and should be considered as such:

- Electric
- Gas
- Water
- Structured Cabling

EN 50173-6 is currently in draft publication. Once ratified, this standard will be published by the British Standards Institute as BS EN 50173-6. It is anticipated that the publication will be around March 2013.

This white paper has been written using the draft of the standard; the published standard should be checked once published.

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