

“CPR, Standards for cable pathways in buildings”

LayerOne / BICSI conference

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Agenda

1. **Standards Overview**
2. **Background**
3. **Fire safety in design, management & use**
4. **CPR Regulation**
5. **Escape routes / premature collapse**
6. **Telecommunications cabling**
7. **Cable routing – bringing it all together**
8. **Summary**
9. **Q&A**

Standards Overview

PD 41/2018, TOTEE 2451/86

EL.I.PY.KA. Hellenic Institute of Fire Safety of Structures sets a code of practice in combination with legislation in design, management and use of buildings.

EN 50575:2014+A1:2016

Power, control and communication cables. Cables for general applications in construction works subject to reaction to fire requirements

IEC 60364

Requirements for Electrical Installations. IET Wiring Regulations

ISO11801 and EN50173

Telecommunications equipment and telecommunications cabling. Specification for installation, operation and maintenance.

EN 50355 and EN 50343

Selection and installation of fire-resistant power and control cable systems for life safety and fire-fighting applications. Code of practice

EN 50174 Part 1, 2 & 3

Installation technology. Cabling installation

Part 1 – Specification and quality, Part 2 – Installation...inside, Part 3 – Installation...outside

Loose components?



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Background

1



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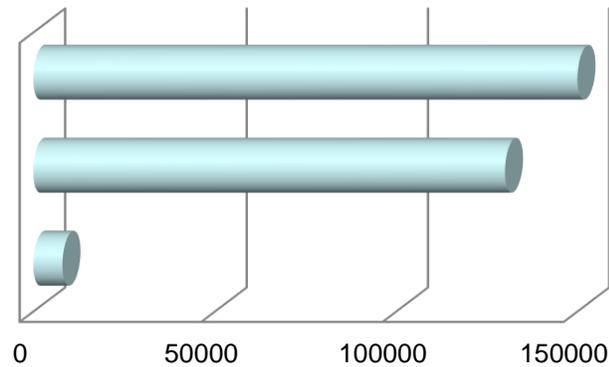
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Cable Tray (mtr)

Gasoline (litre)

Wood (kg)



3



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Fire safety in Design, Management and Use

PD 41/2018 and TOTE 2451/86 are to become / designed to be a coordinated package covering the four main areas that influence fire safety measures:

- **Fire safety** management
- The provisions of **means of escape**
- The **structural protection** of **escape facilities** and the **structural stability of the building** in the event of a fire
- The provision of **access and facilities for fire-fighting**

The primary objective of the standard is to ensure that a reasonable standard of life safety can be achieved in the event of fire in the building

The revised standards provides good practice guidelines to safeguard the lives of building occupants and fire-fighters. PD 41/2018 and TOTE 2451/86 provide recommendations and guidance on the provision of measures to control or mitigate the effects of fire

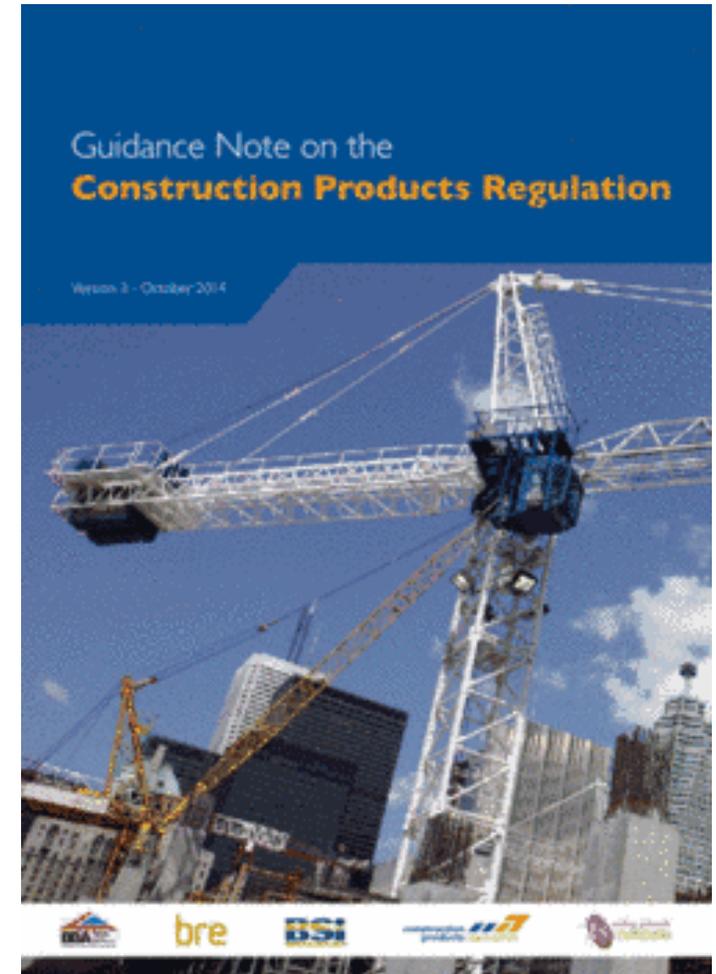
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CPR Regulation

Construction Products Regulation (CPR) and cables

- CPR covers the way products are placed on the market
- Statement issued by BCA in July 2016 concerning cables and CPR
- From 1st July 2017 it will be obligatory for cables to:
 - Be accompanied by a DoP
 - Have CE marking
- Requirement relates to the **Reaction to Fire** performance of the cables
- EN 50575:2014+A1:2016



CPR Regulation

Cable classification for
'reaction to fire'

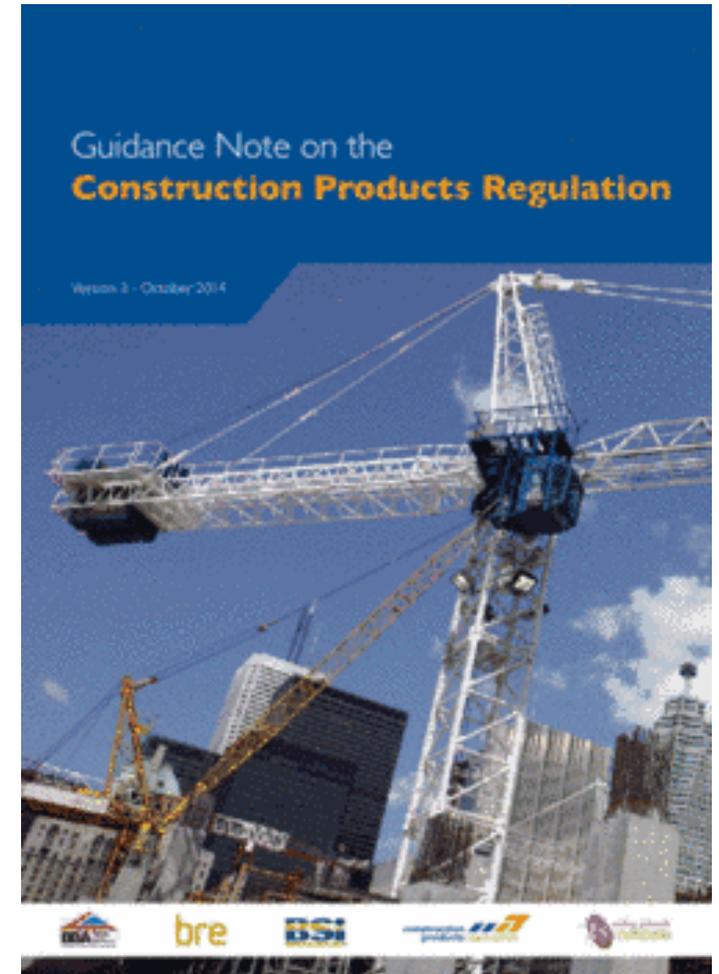
The table contains the classification of cables according to test requirements of the CPR Regulation and the correlation between the cable classification and the most representative installation rooms

	Euroclass	Classification criteria	Additional criteria	AVCP system (Assessment and Verification of Consistency of Performance)
Non combustible (e.g. mineral insulated)	A_{ca}	EN ISO 1716 Gross heat of combustion		<p>"1+", including:</p> <ul style="list-style-type: none"> initial type-testing and continuous surveillance
Low-Fire-Hazard cables (various levels)	B1_{ca}	EN 50399 Heat release Flame spread	Smoke production (s1a, s1b, s2, s3) EN50399/EN61034-2 Acidity (a1, a2, a3) EN 50267-2-3 Flaming droplets (d0, d1, d2) EN 50399	<p>Audit & testing of samples by 3rd party certification body</p> <p>Factory production controls by manufacturer</p>
	B2_{ca}			
	C_{ca}			
	D_{ca}			
Standard cables	E_{ca}	EN 60332-1-2 Flame propagation		<p>"3", including:</p> <ul style="list-style-type: none"> initial type-testing by 3rd-party laboratory <p>Factory production controls by manufacturer</p>
No performance determined	F_{ca}	EN 60332-1-2 Flame propagation		<p>"4"</p> <p>initial type-testing and factory production controls by manufacturer</p>

CPR Regulation

CPR: the key facts

- EU Regulation 305/2011: harmonised conditions for the marketing of construction products
- CPR extension (A1:2017) for Power, Control and Communications Cables
- Requirement relates to the **Reaction to Fire** performance of the cable but not where they can be used
- These cables are designated with a 'class' known as a EuroClass
- These cables are supported by a DoP and are CE marked
- Cable Management Systems are not within the scope of the CPR
- Circuit integrity cables are not (yet?) within the scope of the CPR



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Protection against thermal effects

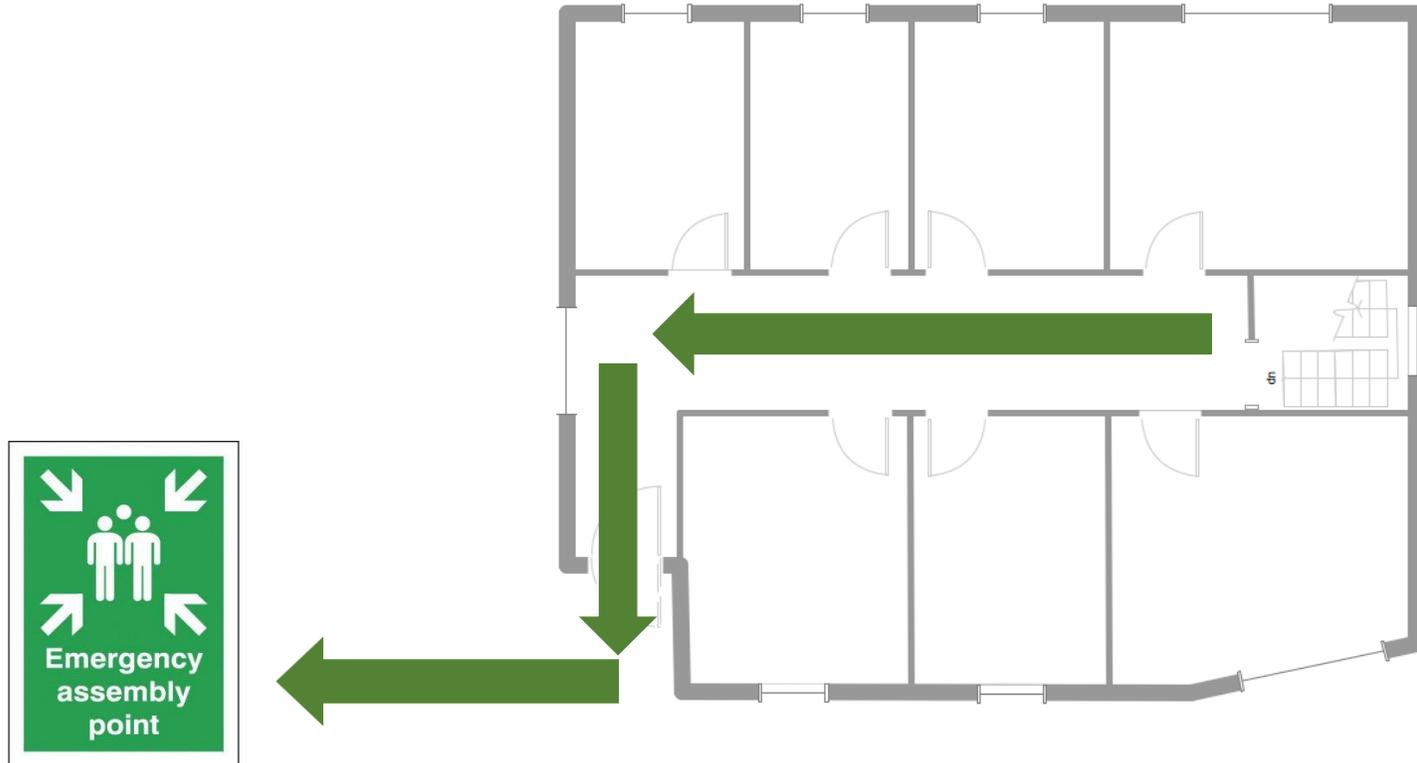
Conditions for evacuation in an emergency

- **Escape routes regulation** a note has been added stating that cables need to satisfy the requirements of the Construction Products Regulations for their reaction to fire
- Requirements have been included for cables supplying safety circuits.
- **Cables must not encroach on escape routes** unless they meet the relevant part of EN 60332-3 series and achieve at least 60% light transmittance in accordance with EN 61034-2
- **Cables in escape routes shall be as short as practicable.**
- **Cables encroaching on escape routes** shall not be installed within arms reach unless they are provided with mechanical protection against damage likely to occur during an evacuation.
- Where used **cable management systems shall be** one (or more) of the following:
 - ii. Cable trunking & ducting systems classified as non-flame propagating **according to EN 50085**
 - iii. Cable tray & ladder systems classified as non-flame propagating **according to EN 61537**
 - iv. Powertrack systems **according to EN 61534** (all powertrack must be non-flame propagating)

Protection against thermal effects

Definitions

- Escape route - Path to follow for access to a safe area in the event of an emergency.



Protection against thermal effects

Locations with risk of fire due to the nature of processed or stored materials

- A cable shall meet as a minimum EN 60332-1-2.
- A cable not completely embedded in non-combustible material such as plaster or concrete or is not otherwise protected from fire shall as a minimum meet the requirement of BS EN 60332-2-1.
- Where used **cable management systems**:
 1. Cable **tray & ladder** systems **shall satisfy the test under fire conditions** in **EN 61537**
 2. **Powertrack** systems **shall** satisfy the resistance to flame propagation specified in the appropriate part of EN 61534.
- **Wiring systems shall be selected and installed to minimize the propagation of flame (CPR).**
- **Be advised that the risk of flame propagation can be high where cables are bunched or installed in long vertical runs.**

Selection and erection of wiring systems

Wiring systems to minimize the spread of fire

- The risk of spread of fire shall be minimized by selection of appropriate materials and erection in accordance with 527.
- A wiring system shall be installed so that the general building structural performance and fire safety are not reduced.
- Products having the necessary resistance to flame propagation specified in EN 61386 series, the appropriate part of EN 50085 series, EN 61439-6, EN 61534 series, EN 61537 or EN 60570 may be installed without special precautions.

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CPR and EN 50174

- **Key changes** are related to the implementation of the **Construction Products Regulation for Reaction to Fire of cables**
- The existing general requirements of **for cables in evacuation routes is now applicable to all “permanently installed” telecommunications cables** and translates those requirements into the terminology of the **Construction Products Regulation**
- **The use of space in modern buildings tends to change** with time and it is increasingly difficult to predict which spaces will become evacuation routes. With a cabling system having a **design life exceeding 15 years** the common sense approach is to **assume everywhere is, or could become, an evacuation route and cable accordingly**

CPR and EN 50174

Requirements for installers of telecommunications equipment and telecommunications cabling

- **Fire performance of telecommunications cables**

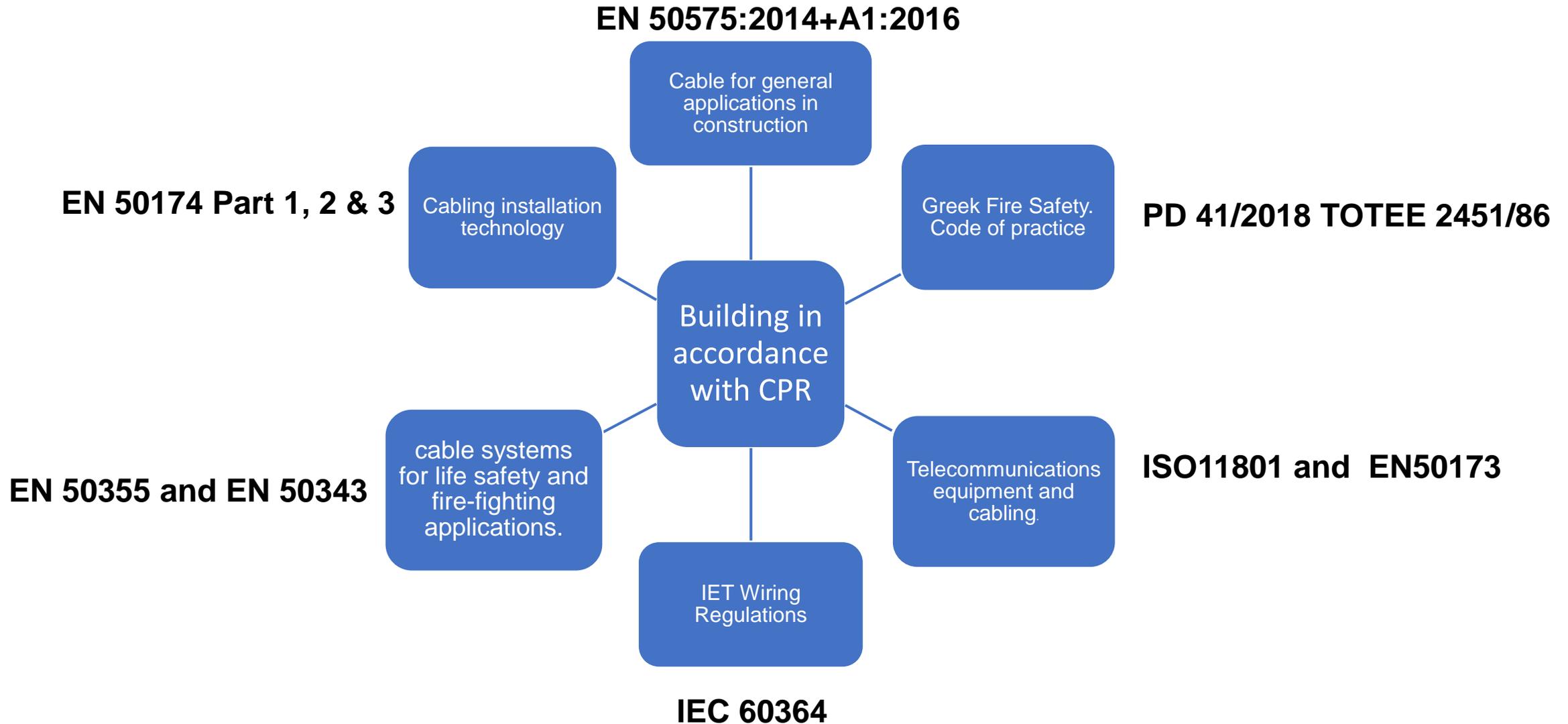
For new installations and the refurbishment or extension of existing installations, cables installed in the spaces bounded by the external fire barriers of buildings and other structures shall meet the following requirements:

- a) installation cables (as defined in Clause 3) shall, as a minimum, meet the requirements of EuroClass Cca-s1b,d2,a2, in accordance with EN 13501-6; and
- b) all other telecommunications cables shall, as a minimum, either:
 - 1) meet the requirements of EuroClass Eca, in accordance with EN 13501-6; or
 - 2) meet the recommended requirements of EN 60332-1-2.

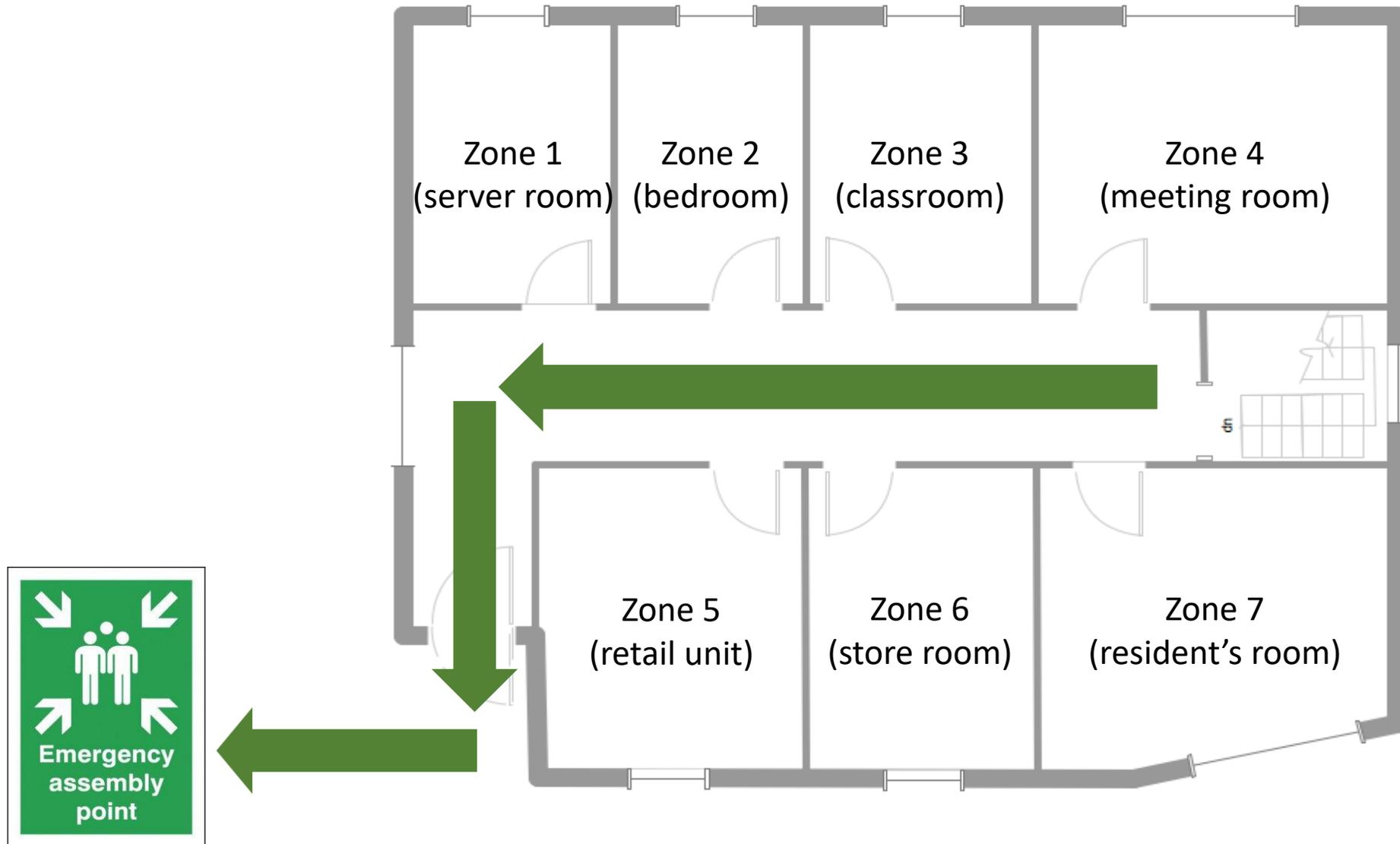
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Cable routing – bringing it all together

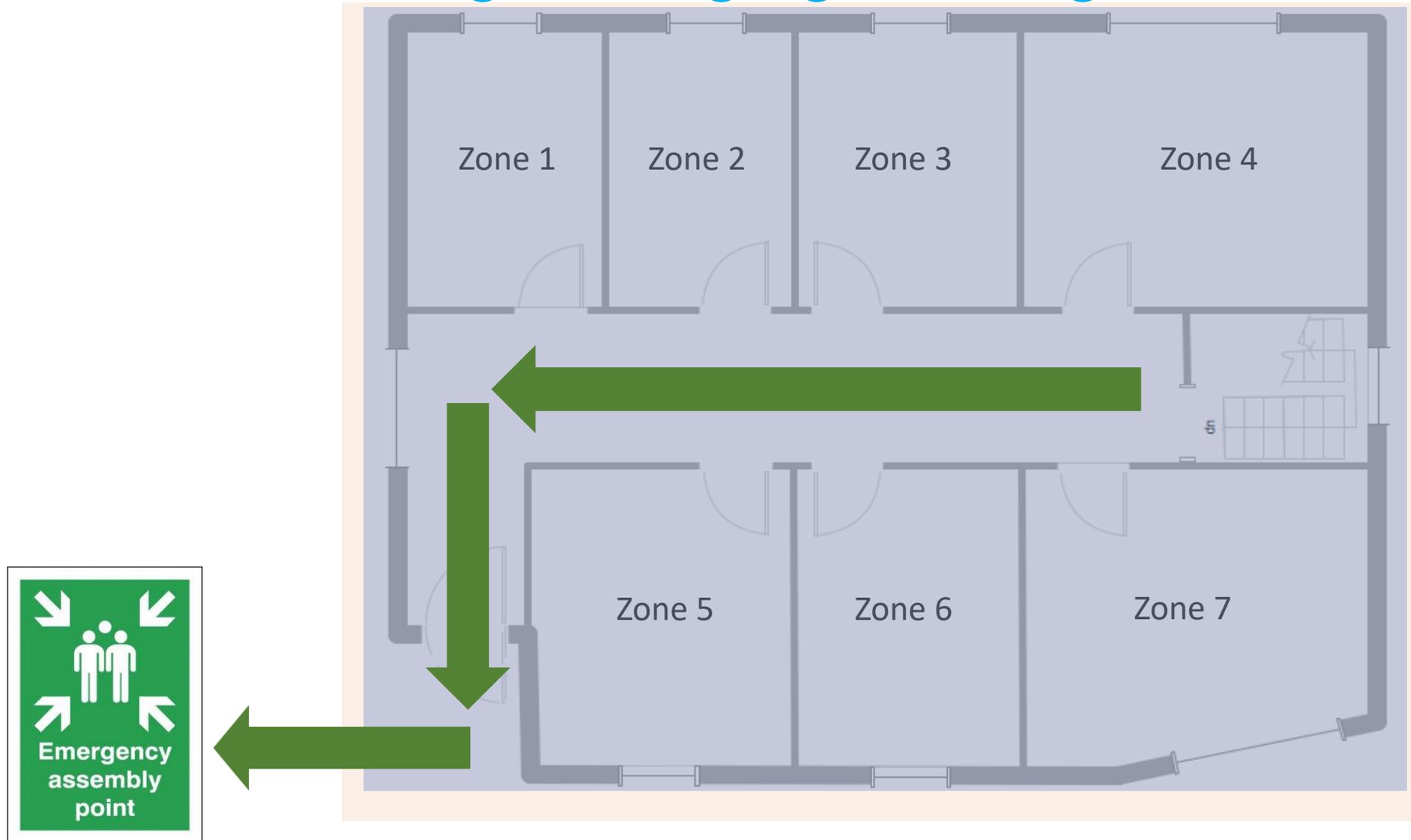


Cable routing – bringing it all together



- **Offices**
- **Apartment**
- **School**
- **Hospital**
- **Multi-dwelling**

Cable routing – bringing it all together

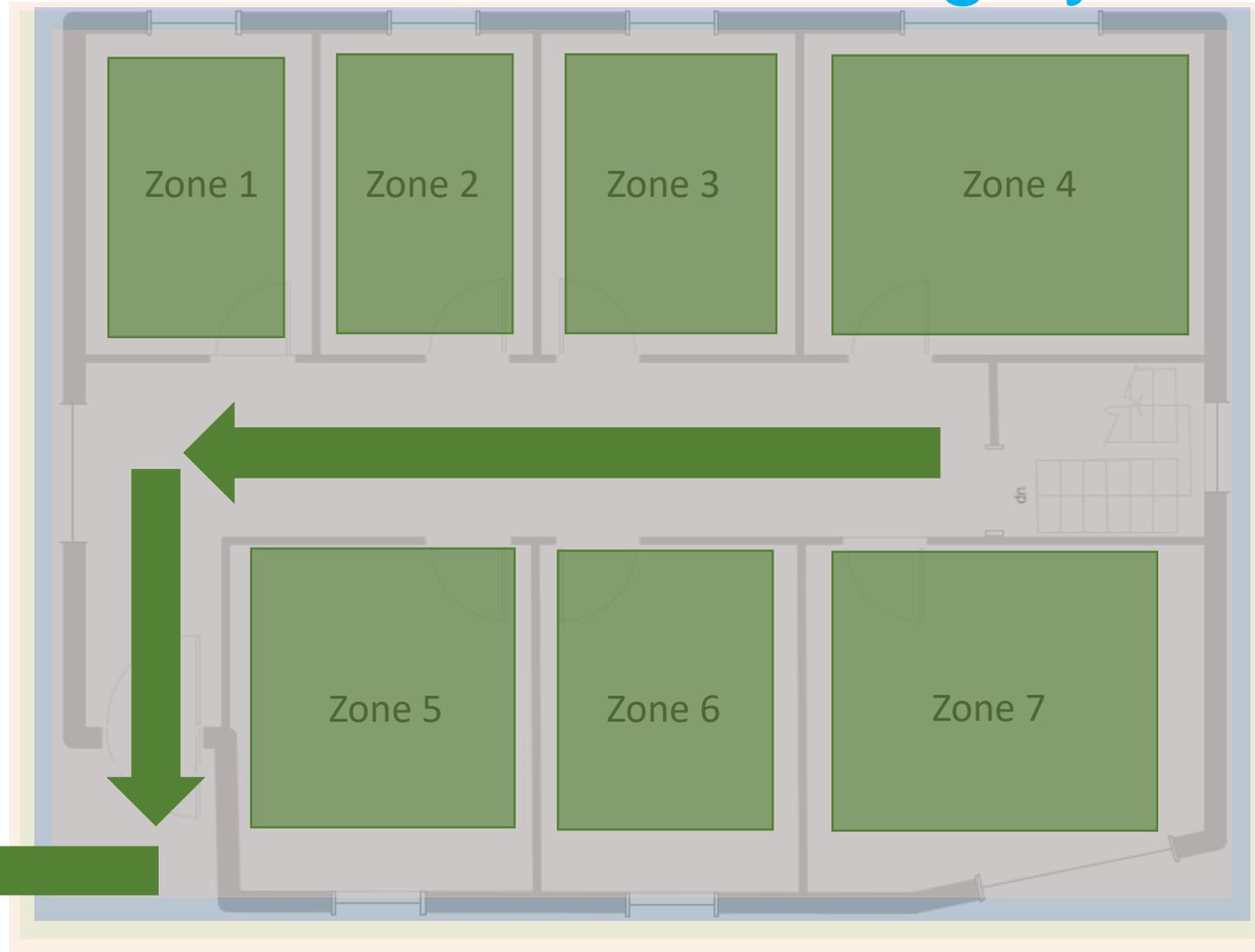


Previously...

- Cables laid in ceiling voids
- Cables crossing escape routes
- Plastic containment

Selection and erection of wiring systems

EN 50174
series



Now...

- Cables supported against premature collapse
- Metal containment or metal clips etc...
- Cables REACTION to fire

- CPR = EN 50575
- EN 50355
- EN 50173
- PD 41/2018
- +
• EN 50174

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Summary

Wiring systems must be **adequately supported against their premature collapse** in the event of a fire

Previously just a requirement of escape routes

This is a **substantial update** which will **improve the safety** of buildings

Current landscape and regulatory environment form **lessons to be learnt**

Specifying Cable Containment Systems **to maximise fire safety** is crucial

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Q&A

