Chapter 10 - Cable pathway and Cable Management Systems

Introduction

1. A pathway is the term used to describe the defined route for cables between terminating points. A cable management system refers to the system utilised to support cables along a pathway and includes conduit, trunking, tray, basketwork and ladder systems.
2. Within MOD sites, all cabling is to utilise a cable management system. The specific type to be employed will be dependent upon several factors, including requirements for: mechanical protection; physical and electronic security and Electromagnetic Compatibility (EMC). The main requirements and direction are outlined below.
3. This JSP/ document is not intended to undermine statutory instruments or legislation. If there is a confliction then statutory instruments or legislation will take precedence. Where there is a confliction with an extant British or European standard or publication, then the most onerous or stringent requirement is normally to be applied. In cases of doubt please contact CIDA.
4. This chapter is to be applied in conjunction with Chapter 05 or any superseding DIN (if applicable).
5. Please note the direction around approved circuits in under review and subject to change in the future. Where there is a confliction between this document and JSP 440, leaflet 12 Annex I, JSP 440 shall take precedence.

Direction

6. Design requirements, including usable capacity and cable bend radii restrictions, for cable pathway and cable management systems, are contained in BS EN 50174-1 (see paragraph 1024) and BS EN 50174-2 (see paragraph 1025).
7. Guidance on segregation and the minimum separation distance requirement of copper telecommunication cables from power cables with respect to SAFETY can be found in BS 6701 (see paragraph 27).
8. Consideration of segregation and separation to avoid electromagnetic interference (EMI) and of equipotential bonding relating to the design and installation of cables and cable management systems is explored in BS EN 50174-2 (see paragraph 26).
9. Security measures and TEMPEST countermeasures are to be applied to all cabling systems in accordance with the security classification of the Information and Communications Technology (ICT) for which it is provided. All segments, internal, external and the transition between (building entrance facilities) are to be included. Applicable specifications are detailed in JSP 440, SDIP 29/2 and NCSC (formerly CESG) GPG No14.
10. Compliance with the requirements of the applicable elements of BS 7671 the wiring regulations shall be observed.

Requirements

11. The material selected for a cable management system is largely a matter of designers' choice. However, selected materials are to conform to the requirements stipulated in Chapter 05 'Fire Hazard Designation of Cables & Materials'. **BS EN 50174** and **BS 7671** apply.

12. In accordance with **BS7671:2018,** wiring systems shall be supported such that they will not be liable to premature collapse in the event of a fire. Guidance is available in chapter 05 and the **BS 7671 On-site guide.**

13. Where cables penetrate a fire barrier, fire-stopping and/or a penetration sealing system shall be utilised to maintain the integrity of the fire barrier.

14. Where a multi-service installation is contemplated, then, within a 'controlled area,' multicompartmented dado trunking may be utilised provided the required EMC separation of copper cables is maintained (see paragraph 26).

15. Where cable separation is called for, the separation distance required for safety may not agree with the separation distance desired with regard to EMI. In these circumstances, safety has highest priority but the more stringent requirement shall take precedence.

16. Additions and extensions to extant cable management systems should, be within the constraints and requirements of this publication, and in accordance with chapter 05.

17. Within existing Service Level 3 facilities, telephone services are required to be installed in conduit or trunking where this is already in place. However providing the requirements of Chapter 05 are delivered, where conduit or trunking is not available, installers may follow existing building conventions, provided all safety requirements are met. New and refurbished facilities must always utilise containment for telephone extensions.

18. Except where already installed, tray and ladder systems are not normally to be utilised in offices or corridors if they would be visible. Their use should be confined to above false ceilings or below false floors.

19. A cable management system is not to be installed directly on, or attached to, false ceilings or floors, each section is to be supported and secured to the fabric of the building. Further guidance is available in chapter 5 and the BS 7671 on-site guide.

20. In addition to the requirements at paragraph 10, containment that is mounted with the lid facing down is to have cable retaining devices fitted to retain the cables when lids are removed.

21. Cable trays are to be provided with a minimum clearance of 25 mm from the fixing surface to allow clearance for fixing and adjustment of cable retaining devices.

22. The usable space within a cable management system should be twice that necessary to accommodate the initial quantity of cables. Subsequent addition of cables is permissible providing that the minimum bend radii of all cables are maintained, the maximum bend radii is 4 x the diameter of the outer jacket.

23. All RED cable management systems are to be clearly identified as such and managed as an approved circuit in accordance with JSP 440.

24. On exit from a 'controlled area,' all RED approved circuits are to be tamper detectable and subject to regular inspections in accordance with JSP 440.

25. All RED approved circuits that traverse a ceiling or under-floor void or any other area where it would be difficult to complete an integrity inspection must be permanently sealed throughout the length of that traverse.

26. Although discouraged, a single cable management system may contain both RED and BLACK fibres. Where this is the case the system is to be clearly identified as such and is to be managed as an 'Approved Circuit'.

27. SDIP 29 'Facility Design Criteria and Installation of Equipment for the Processing of Classified Information'.
28. NCSC GPG No14 'Electromagnetic Security'.
29. JSP 440 'The Defence Manual of Security'.
30. Manual BS EN 50174-1 'Information technology ~ Cabling installation', 'Installation specification and quality assurance' Clause 4.3.2 'Pathways'.
31. BS EN 50174-2 'Information technology ~ Cabling installation', 'Installation planning and practices inside buildings'.
32. BS 6701 'Telecommunications equipment and telecommunications cabling - Specification for installation, operation and maintenance' Clause 5.4.3.2 'Separation between telecommunication cabling and electricity supply cabling'.
33. IEC 60793-2-10 Optical fibres – Part 2-10 "Product specifications – Sectional specification for category A1 multimode fibres".
34. BS 7671:2018 The Wiring Regulations
35. BS 7671 On-site guide