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## 29 UNDERFLOOR DUCTS

### 29.1 GENERAL

#### 29.1.1 Scope

- 1 This Part specifies the requirements for underfloor ducts.
- 2 Related Parts and Sections are as follows:

This Section

- Part 6..... Cables and small wiring
- Part 7..... Conduits
- Part 8..... Trunking
- Part 9..... Cable Trays
- Part 10..... Accessories and General Power

#### 29.1.2 Description

- 1 Underfloor ducts shall be provided as specified and shown on the drawings.

#### 29.1.3 References

- 1 The following Standards are referred to in this Part:  
BS 7671.....Requirements for Electrical Installations. IET Wiring Regulations

#### 29.1.4 Submissions

- 1 Submissions shall be in accordance with Part 1 of this Section and Part 7 of Section 1.
- 2 Shop Drawings submission shall include dimensional drawings, including sections and elevations, showing the following:
  - (a) sizes and positions of components
  - (b) positions and method of fixing cable and boxes
  - (c) other pertinent data.
- 3 Submission of project data shall be as follows:
  - (a) full specifications of the enclosure and the components of the equipment with relevant sheets of manufacturer's catalogues
  - (b) confirmation that the equipment complies with the relevant specifications.

## 29.2 PRODUCTS

### 29.2.1 General

- 1 Underfloor ducts shall confirm to requirements as specified in BS 7671, NFPA 70 - National Electrical Code, U.S.A or other equivalent standard as applicable.

- 2 Underfloor duct specification shall be in accordance with QGEWC (KAHRAMAA) regulations and IEE latest edition as applicable.
- 3 The product selected and proposed shall include manufacturer's instructions that indicate application conditions and limitations of use stipulated by the product testing agency specified under Regulatory Requirements.
- 4 The contractor shall select the product only from a manufacturer specializing in manufacturing products specified in this Part with minimum five years documented experience of the products being satisfactorily in use in a similar service and climatic conditions.
- 5 The contractor shall ensure proper co-ordination with related civil activities prior to the selection of the equipment.
- 6 The contractor shall clearly show locations of ducts, service fittings, junction boxes, and branch circuiting arrangements on the drawings

#### 29.2.2 Underfloor Ducts

- 1 Sheet metal raceway shall be designed to be embedded in concrete slab.
  - (a) concealed underfloor duct - Type of underfloor duct, which has concrete topping over cover, which shall have inserts for installation of service fittings.
  - (b) flush duct - Type of underfloor duct, which has cover, installed flush with concrete slab. Cover shall have openings for installation of service fittings
- 2 Steel duct shall be provided with a corrosion-resistant finish.
- 3 The ducting shall be Underfloor or Flush as specified
- 4 Configuration of the ducting shall be one or two level systems as specified using ducts in parallel runs as shown on Drawings.
- 5 Services shall include, 240 volt power - standard size, telephone - extra width size, computer data - extra width size, 415 volt power - standard or extra width size as specified.
- 6 Underfloor ducting shall be selected from the standard range of the manufacturer. The nominal size shall be 38 x 76 mm or as specified.
- 7 Underfloor ducting where required for larger width application shall be 38 x 152 mm or as specified.
- 8 Fabricate distribution lengths with standard height preset inserts on 610 mm centers or provide precut 32 mm diameter holes on 610 mm centers as specified. Close with flat metal screw plugs.
- 9 Rectangular or round cover and trim single level junction boxes or as specified with adjustable height shall be used. Provide internal barriers, conduit and duct entrances, and extension rings as required.

- 10 Rectangular or round cover and trim Two Level Junction Boxes or as specified with adjustable height shall be used. Provide separate enclosures for each service to allow feeder ducts to cross under distribution ducts. Provide conduit and duct entrances and extension rings as required.
- 11 Junction Box Cover Plate shall conform to one of the following as specified:
  - (a) tile trim plate flush with finished floor.
  - (b) smooth cover plate flush with concrete floor
  - (c) carpet trim holders of proper depth.
- 12 Supports shall be adjustable type and to be adjusted before concrete topping placement.
- 13 Service Fittings shall be provided in conjunction with wiring devices.
- 14 Duct Markers shall be corrosion resistant marker screws, with escutcheon.
- 15 Manufacturer's standard range of fittings and accessories shall be used as much as is practically as possible.

#### 29.2.3 Trench Ducts

- 1 Underfloor raceway where specified shall be provided with a removable cover flush with the concrete slab.
- 2 Steel trench duct shall be provided with corrosion resistant finish. The duct shall be of closed or open bottom type as specified
- 3 The duct sizes shall be as specified or indicated on the Drawings.
- 4 Provide adjustable compartment dividers.
- 5 Supports shall be adjustable type and to be adjusted before and after concrete topping placement.
- 6 Coverplates shall conform to one of the following as specified:
  - (a) 6.4 mm thick steel removable Coverplates with gasket joints
  - (b) smooth cover plate flush with concrete floor
  - (c) recessed coverplate with tile trim.
- 7 Manufacturer's standard range of fittings and accessories shall be used as much as is practically as possible.

#### 29.2.4 Service Fittings

- 1 Pedestal Convenience Receptacle shall have satin aluminum housing with stainless steel device plate in one duplex, two duplex or back to back configurations or as specified.
- 2 Flush Cover Convenience Receptacle shall be of aluminum or brass in duplex with flap or threaded opening or as specified.

- 3 Pedestal Communication Outlet shall have satin aluminum housing with stainless steel device plate having One bushed opening 25 mm inside diameter or as specified.
- 4 Flush Cover Communication Outlet shall be of aluminum or brass with stainless steel device plate having 54 x 25-mm combination threaded opening or as specified.
- 5 Pedestal Communication Fitting shall have satin aluminum housing with stainless steel device plate having one duplex convenience receptacle with one bushed opening, 25 mm inside diameter or as specified.
- 6 Flush Cover Communication Fitting shall be of aluminum or brass with stainless steel device plate having 54 x 25-mm combination threaded opening or as specified.

### 29.3 INSTALLATION

#### 29.3.1 General

- 1 Install Products in accordance with the manufacturer's instructions.
- 2 Locate duct in structural slab or concrete topping as specified.
- 3 Provide expansion fittings with suitable bonding jumper where duct crosses building expansion joints.
- 4 Terminate ducts for power service in bottom of panelboard or wireway as specified using suitable fittings. Terminate in junction box for extension of conduit to panel board where specified. .
- 5 Terminate ducts for telephone service 50 mm above floor in telephone closet or in bottom of telephone cabinet using suitable fittings as specified.
- 6 Terminate ducts for data services in bottom of data services cabinet using suitable fittings.
- 7 Level cover plates flush with finished concrete floor.
- 8 Place rectangular plates square with wall lines.
- 9 Securely hold junction boxes and ducts in place during installation to avoid floating or other movement.
- 10 Close unused duct or conduit entrances to junction boxes. Seal duct terminations at junction boxes.
- 11 Earth and bond duct under provisions of Part "Earthing and Bonding".
- 12 Install underfloor duct with tops of preset inserts as specified or indicated on the Drawings below finished floor line. Locate ducts on centers as specified or as indicated on Drawings.
- 13 Install flush duct flush with finished floor.
- 14 Place schedule on the inside of coverplate of each junction box indicating distance to first insert in each direction, measured from the center of the box. Use self-adhesive labels for schedule.

- 15 Use blank duct in permanent corridors, passages, lobbies, for connecting parallel ducts less than 1.8 m apart, for feeder duct from cabinet or panelboard to first junction box, and where indicated.
- 16 Join duct lengths using combination support couplers where practical. Provide additional supports at intervals of not over 1.5 m, within 750 mm each side of junction boxes, and as close as practical to elbows, bends, and terminations.
- 17 Install insert within 30 mm of edge of junction box. Align inserts on same centers for all services.
- 18 Do not extend inserts into special floor finishes, such as terrazzo, marble, or wood.
- 19 Install a duct marker in each insert adjacent to junction box, at end of each duct run, on both sides of permanent partitions, and on both sides of change of direction of duct. Install markers flush with finished floor material. In carpeted areas, install marker screws level with carpet backing.
- 20 Install surface service fittings after installation of floor finishes. Cut floors as necessary, following duct manufacturer's recommendations. Replace damaged floor construction and finish.
- 21 Install trench duct trims flush with coverplates. Maintain covering of factory-applied tape for protection.
- 22 Terminate ducts for X-ray circuits at wall; interface with wall duct provided under Part "Surface Raceway Trunking".
- 23 Clean ducts and fittings of debris and dust before installing wire and cable.
- 24 Pull wire and cable from outlet insert toward junction boxes.
- 25 Install branch circuit conductors continuous between junction box and farthest fitting. Do not cut conductor to make connections to receptacle devices.
- 26 Clean finished surfaces before and after the installation in accordance with manufacturer's instructions.

## 29.4 QUALITY CONTROL AND TEST PROCEDURES

### 29.4.1 General

- 1 The manufacturer shall provide proof of a stringent Quality Control (QC) Plan or Inspection Test Plan (ITP). In particular the main equipment manufacturing stages sanctioned by appropriate tests such as: incoming components inspection, discrete sub-assembly tests and complete functional checks on the final product. Final inspection and calibration operations shall be documented in a report drawn up by the supplier's Quality Inspection department.
- 2 The Assembly shall not leave the manufacturer's works until the works test sheets have been duly approved and stamped by the Engineer and written permission is obtained for their dispatch to site.

## **29.5    ENVIRONMENT**

### **29.5.1    General**

- 1        Environmental conditions shall be in accordance with Section 1 Part 1 unless specified herein.
- 2        Minimum ambient temperature shall be 0°C.
- 3        Maximum relative humidity shall be 95%.

END OF PART