10 WIRING ACCESSORIES AND GENERAL POWER

10.1 GENERAL

10.1.1 General Reference

1 The work of this Section is integral with the whole of the Project Documentation and is not intended to be interpreted outside that context.

2 Co-ordinate the work with all other services affecting the work of this Section.

3 Related Parts and Sections are as follows:

This Section
Part 1..... General Provisions for Electrical Installation
Part 6..... Cables and Small wiring
Part 7..... Conduits and Conduits Boxes
Part 8..... Trunking

10.1.2 References

1 The following standards are referred to in this Part:

BS 88.....HRC Fuses

BS 546.....Specification Two pole and earthing-pin plugs, socket-outlets and socket-outlet adapters

BS 800.....Specification for radio interference limits and measurements for household (IEC55014-1) appliances, portable tools and other electrical equipment causing similar types of interference

BS 1363 .....13 A plugs, socket-outlets, adaptors and connection units

BS 3456 .....Specifications for safety of household and similar electrical appliances

BS 3676 .....Part 1 Switches for household and similar fixed electrical installations(EN 60669-1)

BS 4177 .....Specification for cooker control units

BS 4343 .....Industrial Plugs, Socket Outlets and Couplers (IEC 60309-2)

BS 4662 .....Boxes for flush mounting of electrical accessories. Requirements, test methods and dimensions

BS 5419 .....Fuse Switches and Switch Fuses (EN 60947-3)

BS 5733 .....General requirements for electrical accessories

BS 6972 .....Specification for general requirements for luminaire supporting couplers for domestic, light industrial and commercial use

10.1.3 Description of Work

1 This Section shall include all labour, materials, equipment, appliances and accessories necessary for the complete performance of all switches, socket outlets etc. In accordance with the Specifications and Drawings.

10.1.4 Submittals

1 Submit shop drawings, equipment list, relevant samples etc. as mentioned under Section Part 1.

10.2 PRODUCTS

10.2.1 General

1 All individual items of materials shall be of the same make throughout the Project unless specifically approved by the Engineer.

2 Unless otherwise indicated in the sections to follow, the faceplate of all devices shall be polycarbonate.

10.2.2 Outlet Boxes

1 Outlet Boxes:

(a) galvanized one piece pressed steel, sizes and designs shall suit devices to be fitted with a minimum wall thickness of 1.0 mm.

(B) In all hazardous areas specified and/or shown on drawings: explosion proof.

2 Outlet boxes mounted externally or in damp locations shall be totally sealed to ensure water tightness.

10.2.3 Switches

1 Lighting Switches

(a) to BS 3676

(b) to be rated 10, 15 or 20 amps depending on connected load, as stipulated in the QGEWC regulations

(c) recessed with concealed conduit, surface pattern elsewhere

(d) quick make and break type

(e) single pole, double pole, one way, two way or intermediate as indicated

(f) surface mounted switches to be either poly-carbonate, or metallic and as indicated in the Project Documentation

(g) flush mounted switches to be of the grid fixing type with finish as noted in the Project document.

(h) switches shall be certified for AC-23A duty

2 Waterproof Switches:

(a) to be watertight IP 56 or as indicated in the Project Documentation

(b) to be made of poly-carbonate for indoor application in damp and wet areas.

(c) to be metallic suitable for AC-23A duty and have sunshades fitted where exposed to direct sunlight.

(d) to be provided with rear entry for outdoor use to avoid the exposure of conduit/cables to the harmful effects of the sun.

3 Switch Plates

(a) where two or more switches are grouped together and connected to the same phase, multi-gang devices and common plates shall be used.

4 Double Pole Switches:

(a) the double pole switches shall be with neon indication lamps and shall be rated 20, 30 or 45 Amps. as indicated on the drawings

(b) the face plate shall be of matt chrome, unless specified otherwise in the Project Documentation and shall be engraved 'WATER HEATER', 'WATER COOLER' etc. as required.

(c) switches shall be certified for AC-23A duty.

5 Push switches for lighting contactor control:

(a) push to make momentary contact switch

(b) suitable for inductive load

(c) surface mounted type shall be either poly-carbonate, metallic, protected to IP 56 or as indicated in the Project Documentation

(d) where two or more switches occur in one position they shall be contained in one case and each shall be appropriately labelled to indicate its function

(e) switches shall be certified for AC-23A duty and contactors shall be certified for AC-3 duty.

6 Dimming Switches:

(a) where indicated on the Project Drawings, dimming switches shall be provided, complying with BS 5518

(b) dimming switches shall be interference suppressed to conform with BS800

(c) all dimmer units shall be sized to give a 40% margin above the connected load.

(d) switches shall be certified for AC-23A duty.

10.2.4 Ceiling Roses

1 Ceiling roses shall be of the all insulated type conforming to BS67 with a white finish.

2 Ceiling roses shall be provided with insulated terminals for the switched live, neutral and protective conductors; loop-in facilities shall be provided.

3 Plug-in ceiling roses shall be used in large buildings, with extensive false ceiling systems, as detailed in the particular specification.

10.2.5 Socket Outlets

1 General purpose Socket Outlets:

(a) to BS 1363

(b) 3 rectangular pin (2P+E) shuttered, with combined switch, rated 13A, 250 V

(c) to be supplied with plug complete with fuse

2 15A Socket Outlet:

(a) to BS 546

(b) 3 round pin (2 P + E) shuttered switched pattern complete with plugs.

(c) Neon indicator lamp, unless specified otherwise in the Project Documentation.

3 Weather proof Sockets:

(a) 13A Sockets: to BS 1363

(b) 3 rectangular pins, Un-switched type to be complete with weather proof plugs

(c) plugs: 13 Amps

(d) sockets: fused type with single pole cartridge fuse link of same rating as plug

(e) sockets and plugs:

(i) to have minimum IP 55 grade protection

(ii) housing parts: brass or pressure die-cast finished in grey hammered stove enamel

(iii) plugs:

- cable grips shall have rubber compression rings
- there shall be rubber gasket between plug and socket to ensure weather tightness.

(f) sockets shall have screw on caps that close tight on socket when plugs are not inserted.

4 Socket Outlet Plates:

(a) socket outlet face plates shall be finished as indicated in the Project Documentation.

5 Industrial Sockets:

(a) Combined Socket

(i) to be a combined unit comprising two sockets, rated 16A, 240V, 1 phase and 32A, 415V, 3 phase

(ii) to be equipped with 16A SP and 32A TP MCBs, or as indicted in the Project Documentation

(iii) three phase socket to be 5 pin type, single phase socket to be 3 pin type

(iv) plugs of the same manufacturer to be provided

(v) sockets and plugs to conform to BS 4343

(vi) to have minimum IP 55 ingress protection.

(b) plugs and sockets for hazardous area:

(i) to be suitable for zone 0, zone 1 or zone 2 applications, as relevant, and indicated on the Project Drawings and/or Project Documentation

(ii) to conform to IEC 309-3

(iii) to be corrosion resistant

(iv) ingress protection to IP 66.

10.2.6 Shaver Socket Outlets

1 All shaver socket outlet units shall comply with BS 3456 and IEC 335.

2 Shaver units shall be flush pattern with white moulded insert in matt chrome plate engraved ‘Shaver Only’ and be suitable for installation in bathrooms, incorporating a double wound isolating transformer to provide an earth free supply.

3 Units shall incorporate primary winding circuit protection in the form of a self-resetting thermal overload device.

4 Units shall incorporate an ‘ON/OFF’ switch with red neon indicator together with a selector switch for 20 VA load capacity at 240 Volts and 115 Volts

5 Units shall incorporate two pin shuttered outlet configuration and have terminals to accept 2.5 mm^2 conductors.

6 Unit outlet boxes shall be a minimum of 45 mm deep, rustproof by galvanising of equal finish and complete with a brass earthing stud secured to the back of the box.

10.2.7 Cooker Control Units

1 Cooker control units shall incorporate a 32 Amp. double pole switch and 13A, 3 pin switched socket outlet and neon indicator lights for both cooker and socket

2 The cooker control unit shall be flush mounted.

10.2.8 Disconnect Switches and Switch Fuses

1 Generally

(a) to be metal clad with front operated handles interlocked with switch fuse case to prevent opening switch in the “ON” position

(b) switch shall have “ON/OFF” indication and provision for locking in “OFF” position

(c) utilisation category AC 23A

2 Fuse switch and switch fuses

(a) to BS 5419

(b) fuses: to BS 88 bolted type, class Q1, certified for 415V and AC 80 Duty, rated as indicated

(c) fused switch carriages: withdrawable type

(d) fuse switches: ASTA certified to 50 KA.

3 Disconnect switches

(a) same design as switch-fuses, with solid copper links in place of fuses

(b) single pole and neutral, or triple pole and neutral

(c) ratings, as indicated.

4 Outdoor Equipment

(a) equipment intended for outdoor use shall be certified by the manufacturer as being weatherproof and suitable for use outside in the prevailing conditions and shall be in compliance with the requirements of Part 28, clause 28.2.6 of this Section.

10.2.9 Fused Connection Units

1 240 V fused connection units shall be switched, shall comply with BS5733 and shall be fitted with a fuse complying with BS1362 with a rating as specified.

2 All fused connection unit shall be fitted with a neon indicator.

3 Live contacts shall not be exposed under normal operating conditions when replacing a fuse.

4 240 V fuse connection units in plant areas, workshops etc., shall be surface mounted, metalclad and shall comply with BS1363 .

5 The type of fused connection unit, particularly relating to the flex outlet, shall be authorised by the Engineer prior to the ordering of accessories.

10.2.10 Junction, Pull and Terminal Boxes

1 The Junction Box shall be completed with a terminal block suitable for connecting up to 10 mm^2 copper conductor (phase, neutral and earth) and an all insulated moulded white cover plate with removal covers.

2 The cover plate shall be raised for connecting outgoing cable.

10.2.11 Timer

1 Timers shall be electronic type, unless specified otherwise in the Project Documentation.

2 Timers shall be suitable for operation from supply voltage of 240V, 1-phase, 50Hz system.

3 Timer output contacts shall be suitable for both a.c. and d.c. control circuits. The contacts shall be suitable for duty of AC-2 or DC-3 utilisation category. The rating of output contacts shall be co-ordinated with the application requirements.

4 Timers shall be provided with 2 independent timing scales with sets of change-over output contacts:

(a) 10 ..... 200 seconds

(b) 0.10 ..... 20 seconds

5 ON/OFF indicator shall be provided to monitor the circuit status.

6 Timers shall be either:

(a) delay on energisation or

(b) delay on de-energisation type, as per the application requirements

Upon supply of rated voltage to the input terminals, the timer shall start, the output relay remains in rest position. After the set time, the output relay pulls in.

The relay resets after the input supply has been cut-off.

7 Timers shall be suitable for minimum 10 million operations.

8 The timer shall require a pozi-drive screw driver for changing of the settings.

9 Degree of protection shall be minimum IP 20.

10.2.12 Time clocks

1 Time clocks to control circuits depended on time and hours of the day, may be either

(a) Synchronous motor operated, or

(b) Quartz controlled motor operated, as per Project Documentation.

2 Time clocks shall be suitable for operation from supply voltage of 240V, 1-phase, 50Hz system.

3 Output contacts shall be suitable for both AC and DC control circuits. The contacts shall be suitable for duty of AC-2 or DC-3 utilisation category. The rating of output contacts shall be co-ordinated with the application requirements.

4 The no. of output contacts and the duration of contact closing shall be decided as per the application requirements.

5 Time clocks shall be provided with a time dial setting for 24 hours and 7 days program.

6 Each time clock shall be provided with a minimum running reserve energy for 1 day.

7 Accuracy of clocks shall be better than 1 second per day.

10.3 INSTALLATION

10.3.1 Mounting Heights

1 The mounting heights of wiring accessories shall be as stipulated in the QGEWC Regulations, or as otherwise approved by the Engineer.

10.3.2 Installation of Outlet Boxes

1 Location of Boxes:

(a) determine exact location of boxes on site and obtain the Engineer's approval before commencing installation.

(b) make allowance for overhead pipes, ducts, variations in arrangement, thickness of finish, window trim, panelling and other construction when locating boxes.

2 Fixing:

(a) fix outlet boxes securely.

(b) fix exposed outlet boxes to permanent inserts or lead anchors with machine screws.

10.3.3 Installation of Switches

1 Lighting Switches:

(a) located at the strike side of the door, approximately 150 mm from the edge of door frame

(b) plates shall be installed with all four edges in continuous contact with finished wall.

(c) plates shall be installed with an alignment tolerance of 1.5 mm.

(d) all switch assembly louvered plates shall have their earthing terminal connected to the earth terminal attached to the switch box by an insulated 2.5 mm^2 protective conductor.

10.3.4 Installation of Junction, Pull and Terminal Boxes

1 Generally:

(a) fix junction, pull and terminal boxes where indicated and where required to facilities pulling of wires and cables and connection of future appliances

(b) locate boxes as inconspicuously as possible, but accessible after work is completed.

2 Pull Boxes:

(a) fix at maximum 10m spacing and to limit the number of bends in conduit to not more than two 90° bends.

10.3.5 Testing

1 Test all switches, socket outlets etc. for correct polarity and continuity of conductors in the presence of and to the entire satisfaction of the Engineer.

2 Carry out live phase to earth loop impedance tests at all switches and socket outlets with an approved earth loop impedance tester to the entire satisfaction of the Engineer. Ensure that all device plates have satisfactory earth continuity to the protective conductor system.

3 Test all socket outlets for instantaneous tripping of associated distribution board current operated earth leakage circuit breaker using testing equipment, approved by the Engineer.

END OF PART