

SECTION : 2.11

**LIGHT FIXTURES & FANS**

1.0 **Scope**

1.1 The scope of work shall cover the supply, installation and testing of light fixtures including lamps and ceiling fans.

1.2 Where fixtures are supplied, the scope shall cover installation only with all the accessories as specified in the schedule of work.

2.0 **Standards**

2.1 The following standards and rules shall be applicable:

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|----|---|---|
| 1) | IS 3646 - 1968                                      | Code of practice for interior illumination                      |
| 2) | IS 1913 - 1969                                      | General and Safety requirements for electric lighting fittings. |
| 3) | IS 8030 - 1976                                      | Luminaries for Hospitals  |
| 3  | IS 374 - 1966                                       | Electric ceiling type fan & regulators.                         |
| 4  | Indian Electricity Act and Rules issued thereunder. |   |

2.2 All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Codes of Practice.

3.0 **General Requirements**

3.1 All fixtures shall be complete with accessories and fixings necessary for installation whether so detailed under fixture description or not.

3.2 Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box or fixture opening.

3.3 Fixtures shall be installed at mounting heights as detailed on the drawings or instructed on site by the Architects/Consultants and individually earthed with 2.5 Cu sqmm wire.

- 3.4 Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening other than shown on the drawings or herein specified shall be submitted to the Architect/Consultant for approval.
- 3.5 Pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation as per Architect's/Consultant's instructions.
- 3.6 Flush mounted and recessed fixtures shall be installed so as to completely eliminate light leakage within the fixture and between the fixture and adjacent finished surface.
- 3.7 Fixture mounted on outlet boxes shall be tightly secured to a fixture stud in the outlet box. Extension pieces shall be installed where required to facilitate proper installation.
- 3.8 Fixture shall be completely wired and constructed to comply with the regulations and standards for Electric Lighting Fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name and the factory inspection label unless otherwise approved.
- 3.9 Wiring within the fixture and for connection to the branch circuit wiring shall be not less than 1.5 sqmm copper for 250 volt application. Wire insulation shall suit the temperature conditions inside the fixture and wires bypassing the choke shall be heat protected with a heat resistant sleeve.
- 3.10 Metal used in lighting fixtures shall be not less than 22 SWG or heavier if so required to comply with the specification or standards. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burrs and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.
- 3.11 Ferrous metal shall be bonderized and given a corrosion resistant phosphate treatment or other approved rust inhibiting prime coat to provide a rust-proof base before application of finish.
- 3.12 Non-reflecting surfaces such as fixture frames and trim shall be finished in baked enamel paint.

- 3.13 Light reflecting surface shall be having a reflection factor of not less than 80%. All parts of reflector shall be completely covered by finish and free from irregularities. Finish shall be capable of withstanding 72 hours continuous exposure to an ultraviolet sun lamp placed 10 cm from the surface without discoloration, hardening or warping and retain the same reflection factor after exposure. Test results shall be furnished for each of fixtures.
- 3.14 Fixture with visible frames shall have concealed hinges and catches. Pendant fixtures and lamp holders shall be provided with ball type aligners or similar approved means. Recessed fixtures shall be constructed so as to fit into an acoustic tile ceiling or plaster ceiling plaster rings/flanges shall be provided for plaster ceiling. Fixtures with hinged diffuser doors shall be provided with spring clips or other retaining device to prevent the diffuser from moving.
- 3.15 Detailed catalogue cuts for all fixtures, or, if so required by the Architect/Consultants sample fixtures shall be submitted for approval to the Architect/Consultants before orders for the fixtures are placed. Shop drawings for non-standard fixture types shall be submitted for approval to the Architect/Consultant.
- 3.16 Recessed fixtures shall be constructed so that all components are replaceable without removing housing from the ceiling.
- 1) Lamp shall be supplied and installed in all lighting fixtures furnished under this contract. All lamps shall be rated for 250 volts.
  - 2) Lamps used for temporary lighting service shall not be used in the final lamping of fixtures units.
  - 3) Lamps shall be of wattage and type as shown on the drawings and schedule. Where not shown, the details shall be ascertained from the Architect/Consultant before procurement.
  - 4) Lamps for permanent installation shall not be placed in the fixtures until so directed by the Architect/Consultant, and this shall be accomplished directly before the building portions are ready for occupation.

#### 4.0 **Fluorescent fittings**

- 4.1 Only single and /or two lamp ballast shall be used in any one fixture. All ballasts shall be low loss electronic ballasts unless specified otherwise.

- 4.2 All fluorescent fixtures shall be provided with separate wiring channel with cover plate and an earth terminal. All screws shall be chromium brass screws. Lamp and starter holders shall be out of tough moulded plastic with spring loaded rotor type contactors rendered shock and vibration proof. Condensers shall be low loss paper impregnated hermetically sealed complying with IS 1969-196. Internal wiring shall be neatly clipped and where by passing the ballast, a suitable heat resistant barrier or sleeve shall be provided.
- 4.3 Surface mounted fixtures longer than two feet shall have one additional point of support besides the outlet box fixture stud when installed individually. Pendant individually mounted fixtures four feet long and smaller shall be provided with twin stem/conduit hangers. Stems shall have ball aligners or similar devices and provided for a minimum of 25 mm vertical adjustment. Stems shall be of appropriate length to suspend fixtures at required mounting height.
- 4.4 Lamps shall have bi-pin bases and a minimum approximate rated and guaranteed life of 6000 hrs. Colour spectrum of light shall be equivalent to 'Philips White.' Lamp starter and ballast shall match the lamp.

#### 5.0 **Incandescent fittings**

- 5.1 Incandescent fittings shall be of the type generally specified on the drawings. Contractor should have sample approved by Architects/Consultant before procurement.
- 5.2 Incandescent fixtures shall be equipped with porcelain, medium base, screw type sockets for lamps up to and including 200 watt and mogul screw type base for lamps 300 watt and over.
- 5.3 Relamping the fixture shall be possible without having to remove the fixture from its place.
- 5.4 Incandescent lamps shall be inside frosted or clear type as required by the Architect/Consultants.

#### 6.0 **Ceiling Fans**

- 6.1 Ceiling fans shall be complete with fan suspension stem canopies and regulators. 30 cm suspension stem shall be standard accessory and stems shall be heavy duty galvanised steel tubes to IS 1239-1958.

6.2 Fans shall be mounted on a pre-embedded hook with hard rubber isolator. Regulators shall be no-step type mounted in the switch box. The box in all such cases shall be large enough to accommodate the regulator and switches. One sample box with top cover shall be got approved before procurement.

7.0 **Mode of measurement**

7.1 Each fixture shall be measured as a unit complete with lamp, connectors, earthing, mounting arrangement, clamps, all accessories & supports etc. necessary for completeness of installation.

7.2 Suspension stems for light fittings shall be measured as bare conduits and paid at the rate per unit length.

7.3 Fans shall be measured as a unit complete with all accessories, suspension rods, fan hook, etc.

7.4 Where light fixtures and fans are supplied by the client, the installation shall be paid per unit and the cost shall include all suspension, installation materials, connectors, earthing, clamps, all accessories & supports etc. required for completeness of installation.