SPECIFICATION

CABLE TRAY SYSTEM

General

The tray system shall generally be routed under the ceiling slabs and only above the false ceiling. The contractor shall supply all labor, material and accessories for the completion of this installation strictly in accordance with the specification laid as under, illustrated in drawings and shown in the schedule / bills of quantities.

Design

Standard perforation shall be provided in cable trays at both axis i.e. : horizontal & vertical. The cable tray system shall be designed in the standardized modular system and comprise of basic modules of trays, fittings and accessories. Each modular shall be fabricated from prime quality mild steel sheet and then hot dip galvanized of 60 microns. Modular of 90 degree elbows, t joints and double, T joints shall be used for horizontal changes in the direction of cable runs while hinged connectors shall be used for vertical branch off. The branch off joints should be such as to allow for angle connection to be easily bolted to them by means of button head screws. End plates shall be used to closed off unevenly cut faces of the cable trays and protect the cables from damage. Where required barriers shall be used to permit power cables and cables and cables of all modules shall be subject to the prior approval of the engineer be fore mass production is taken hand. The cable tray shall have standard lengths of 2440 mm.

The following standard shall be used:

Cable tray width upto 300 mm – thickness of metal sheet 1.2 mm (18 SWG)
Cable tray width upto 600 mm – thickness of metal sheet 1.6 mm (16 SWG)
Cable tray width over 600 mm – thickness of metal sheet 2.0 mm (14 SWG)

Besides these thicknesses as per consultant's specifications or customer's requirements.

Technical Specifications

Applicable codes and standards

Latest edition of codes and standards of International Electromechanical Commission (IEC), British Standard Institution (BSI), NEMA, ASTM, ISO and National Fire Protection Association (NFPA) shall be applicable. Where applicable equipment shall also conform to the requirements of Pakistan Standards Institution (PSI)

Other standard are acceptable provided they meet or exceed the quality and requirements of the stated standard and provided that two (2) complete copies in English language are submitted to the purchaser for approval.

Following abbreviation for societies and standard are either indicated in this specification or are those having a general acceptable level of quantity:

IEC	International Electromechanical Commission
BSI	British Standard Institution
VDE	Vern band Deutsche Elektrotechniker
DIN	Deutsche Institution fuer Normung
JIS	Japanese Industrial Standard
NFPA	National Fire Protection Associates
UL	Underwriter's Laboratories
ANSI	American National Standards Institution
ASTM	American Society for Testing and Materials
IEEE	Institute of Electrical and Electronic Engineers
CENELEC	European Committee for Elecrotechnical Standardization
ISO	International Standardization Organization

Service Conditions

The cable tray system supplied shall be suitable for installation and use under given combination of environmental conditions. Due and liberal consideration shall be given to the climatic conditions with respect to temperature, humidity, dust, etc.

Manufacturing of the cable trays shall be base on the following services

Extreme maximum air temperature	= 45^{O} C
High relative humidity	= 85 %
Elevation above mean sea level	= 50m
Location	= ……. (Site)

The cable trays shall be manufactured for installation where cable trays may be directly exposed to the sun, be installed or outside a building in cable trenches or in a walk-in cable tunnel, along structures etc, in a power plant or industrial environment.

Characteristic of Material

Deflection Test:

The vertical deflection of the tray shall be measured at two points along the line midway between the supports and at right angles to the longitudinal axis of the tray.

The two points of measurement shall be at the midpoint of the span of each side rail.

Resistance test procedure

Each specimen should be joined together, using the mechanical connector and following the instructions provided by the manufacturer.

A current 30 amperes shall be passed through the specimen and the resistance measured between two point s 6 inches on each side of the joint. The net resistance of the joint shall be not more then 0.00033 ohms as computed from the measured voltage drop and the current passing through the specimen.

Cable Tray Construction:

The interiors of all types of cable shall be smooth and free of any projection that might injure cable sheaths and jackets (NEC 318-4). All slice plates should be installed on the outside surface of the supports. Round head bolts, screws or other fasteners (head inside) are to be used exclusively.

The anchoring of cable trays through bottom sections with bolts or screws upon which cables may rest is prohibited. Sheaths or outer covers of cables are subject to damage where the cables are lying on bolt or screw heads. Bolting is satisfactory where the heads of bolts or screws are below the cable sporting surfaces.

Bends in cable trays shall be made with manufacturer's fittings or equivalent. Mitered vertical bends are permitted on ladder cable supports only. The effective radius must be not less than that allowable for the cables involved. Mitered cuts must be positioned midway between rungs and shall permit not over a 22 ½ degree directional change per miter or rung. Bends, ells tees and other fittings elbows are available with several radii. The radii of fittings both vertical and horizontal should be suitable to accommodate cables so that they will never be bent, either during installation or in the final arrangement, to lesser radii.

All the components of the supply, without exception, from one system and during the erection all the components will match each other without interference.

Material:

All material in the scope of supply shall be of prime quality mild steel sheet and then hot dip galvanized of 60 microns after fabrication, including all accessories.

It is manufacturer's responsibility that the materials quoted are fully resistant to the influence of the chemical product and environment

For that reason manufacturer is requested give alternatives, in case the material mentioned on this document is technically and or / economically not the best solution.

This is of course subject to approval from the client.

Testing & Inspection:

The inspection & testing shall be carried out at the manufacturer's works in accordance with the relevant sections of the specification and witnessed by the purchaser prior to the shipment. Or a sample of the required specimen should be submitted for the approvals prior to manufacturing.