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## Definitions/Abbreviations

**COMPANY / OWNER**

**CONTRACTOR**

The entity which has been contracted to supply goods and/or services to the COMPANY.

**SUPPLIER**

The party which manufactures or supplies equipment and/or services to perform the duties specified by COMPANY or CONTRACTOR.

**SUB-SUPPLIER**

Any party which manufactures or supplies equipment and/or services to the SUPPLIER to perform the duties specified by COMPANY or CONTRACTOR

IEC

International Electrotechnical Commission

SDRS

Supplier Documentation Requirement Schedule

ISO

International Standards Organisation

## 1 PURPOSE

The purpose is to set the standard for good design and engineering practice to be applied on facilities to achieve maximum technical and economic benefit from standardisation.

## 2 SCOPE

This specification covers the design, manufacture, installation and testing of Cable Trays, Cable Ladders and Accessories.

The SUPPLIERS scope of supply, shall be as defined in the Contract documents.

Throughout this specification reference is made to “specified elsewhere” or “as specified”. Details for requirements of this type are to be found on cable tray layout schedule as appropriate. All materials and equipment shall be new and unused.

## 3 REFERENCES

-00-ENG-SPC-00026-E	Climatic, Enviromental and Utility Data
-AL-LGT-SPC-00001	Packing and Shipping Instructions -
AL-LGT-SPC-00002	Import Instructions

## 4 ROLES AND RESPONSIBILITIES

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## 5 CODES AND STANDARDS

Cable support materials shall be designed, manufactured, installed and tested in accordance with the latest applicable sections of international, federal, state or local codes, regulations, ordinances and rules of Kazakhstan as detailed in Appendix A.

The word ‘should’ shall be replaced by ‘shall’ wherever it appears in the reference standards.

Kazakhstan is a member country of the Eurasian Customs Union (EAC), equipment shall meet the requirements of the technical regulations of the Customs Union. Attention should be paid to:

- Electromagnetic compatibility
- Low voltage equipment
- Machinery
- Safety
- EAC marking

Where the data sheet indicates that the equipment is for use in a hazardous area, the equipment and all its associated parts shall comply with the requirements of Technical Regulation Customs Union (TR CU) 012/2011.

## 6 PRECEDENCE

The order of precedence shall be as follows (unless stated otherwise in the project documentation):

- 1) National and/or Local Regulations;
- 2) Purchase Requisition;
- 3) Data sheets and drawings;
- 4) Project specifications;

- 5) This specification;
- 6) Industry codes and standards referenced.

CONTRACTOR is responsible for satisfying all technical and certification requirements for and on behalf of the COMPANY with the local Kazakh authorities.

Any apparent conflict between documents in the same level of the hierarchy shall be brought to the attention of the COMPANY for clarification. However, as a general rule, where such conflict exists, the most onerous requirement shall govern.

CONTRACTOR shall identify and detail any deviations and/or exclusions to the documents during the Tendering phase. Unless such deviations/exclusions are specifically identified, the CONTRACTOR shall be deemed to have confirmed full compliance with all the documents listed.

## **7 SERVICE CONDITIONS**

The site conditions are stated in the Specification for Climatic, Environmental and Utility Data Doc. No. -00-ENG-SPC-00026.

Cable trays, cable ladders and accessories shall be suitable for outdoor use in ambient temperatures ranging from minus 45 to plus 40 degrees Celcius.

Cable trays, cable ladders and accessories shall be designed for a minimum of 20 years.

## **8 CABLE TRAYS AND CABLE LADDER CONSTRUCTION**

Cable trays, cable ladders and associated accessories shall be manufactured from low temperature steel (S355J2G3) material, hot dip deep galvanised in accordance with BS EN ISO1461 to a minimum thickness of 80 microns or stainless steel as specified\*. The galvanising process shall be carried out only after all machining and fabrication is completed. Silicon enriched mild steel (Corten A or equivalent) may also be considered by COMPANY.

\*If specified by COMPANY stainless steel (grade 304) shall be used e.g. if the environment is so saliferous or sulphurous as to justify the use of materials offering a higher degree of corrosion resistance.

Cable trays and ladders shall be complete with all manufacturer installation accessories and standard fittings (internal/external risers, flat bends, reducers, tees, solid covers, hold down clamps etc) such that complete cable support systems can be assembled and installed with the minimum of drilling and cutting.

Cable trays and ladders shall have safe rolled flanges with no sharp edges.

Cable trays and ladders angled fittings shall have an internal radius as stated in the requisition.

Cable trays shall be supplied in standard length of 3m and be perforated heavy duty, return flanged, having a minimum material thickness of 1.5mm for widths up to 300mm and 2.0mm for other widths. Side flanges shall be at least 50mm deep.

Cable ladders shall be constructed with 2.0mm thick, 150mm deep side channels having minimum 22mm wide flanges. Rungs shall be slotted channel type, 1.5mm thick for rack width up to 600mm and 2.0mm thick for other widths. Rung spacing shall be not greater than 300mm. Minimum cable ladder width shall be 300mm.

All cable trays and ladders incorporating integral joint systems shall include facilities for fitting of a purpose made flexible earth bonding strap across every joint. Copper braided earth continuity connector for cable trays shall be 16 mm<sup>2</sup> complete with copper lugs, M6 Brass Fastenings and cable ladders shall be 35 mm<sup>2</sup> complete with copper lugs, M10 Brass fastening.

All cable trays and ladders fittings shall be designed for use with proprietary joint couplings without the need for on site machining, including those cases where straight lengths have been cut to suit.

All cable trays and cable ladders joints shall be fixed by means of smooth round headed coach bolts.

All cable trays & cable ladders nuts, bolts & washers shall be spun galvanized with minimum coating thickness of 45 microns.

Cover for cable trays and cable ladders shall be ventilated type. Cover shall be raised from both side by fastener.

Hold down bracket/ clamp for fixing cable trays & cable ladders shall be from inside.

## **9 INSPECTION AND TESTING**

The SUPPLIER shall provide detailed test certificates for Type test on similar type of cable trays & ladders & accessories. Tests shall be those listed in the relevant standards. The tests shall be for the precise cubicle configuration proposed with extrapolated data where necessary.

SUPPLIER shall carry out following routine test on cable trays & cable ladders.

- 1) Verification of dimensional details: 100% Qty
- 2) Verification of galvanizing coating thickness: 10% Qty of each lot for inspection
- 3) Physical inspection for quality before and after galvanizing: 100% Qty
- 4) Certificate indicating chemical composition of steel grade: Test certificate to be furnished for each lot offered for inspection

The SUPPLIER shall give two weeks notice of tests prior to commencement.

The COMPANY reserves the right to inspect the cable trays, cable ladders and accessories at the Manufacturer's works prior to despatch to prove compliance with specification.

## **10 SHIPPING, HANDLING AND STORAGE**

Preparation for shipment shall be as stated in Docs. Nos: -AL-LGT-SPC-00001 and -AL-GT-SPC-00002. The SUPPLIER shall be solely responsible for the adequacy of the preparation for shipment provisions stated.

Preparation for shipment shall protect the component parts against corrosion, dampness, breakage or vibration injury during transportation or handling.

Each shipping container shall be clearly identified with the contents, purchase order number and item number.

Location of lifting points and the weight shall be clearly marked on all shipping containers.

Where items are required to be dismantled for shipping, instructions shall be provided for reassembly of sections in the field.

The SUPPLIER is required to provide COMPANY with a Certificate of Compliance prior to shipping of equipment.

## **11 DRAWING AND DATA REQUIREMENTS**

SUPPLIER shall provide the documentation detailed in the SUPPLIER Documentation Requirement Schedule (SDRS) and the "Supplier Document Descriptions" as listed in the Requisition.

## **12 DEVIATIONS**

Deviations from this specification are only acceptable where the SUPPLIER has listed in his quotation the requirements he cannot or does not wish to comply with and the COMPANY has accepted, in writing, the deviations before order is placed. If the SUPPLIER is also to offer alternatives resulting in technical or price advantages he should submit a supplement to the main tender.

In the absence of a list of deviations, it will be assumed by the COMPANY that the SUPPLIER complies fully with this specification.

## **APPENDIX A – CODES AND- STANDARDS**

### **CODES AND STANDARDS OF THE REPUBLIC OF KAZAKHSTAN**

Rules for the Arrangement of Electrical Installations RK	PUE RoK 2015
Metal trays for wiring. General specifications	GOST 20783-81
Machines, instruments and other industrial products. Modifications for different climatic regions. Categories, operating, storage and transportation conditions as to environment climatic aspects influence	GOST 15150-69
Unified system of corrosion and ageing protection. Metallic and non-metallic inorganic coatings. General requirements for selection	GOST 9.303-84
Unified system of corrosion and ageing protection. Metallic and non-metallic inorganic coatings. Symbols	GOST 9.306-85

### **INTERNATIONAL STANDARDS**

Cable management – Cable tray systems and cable ladder systems Edition 2.0	IEC 61537
Explosive Atmospheres.	IEC 60079