

Plant 1.0 MTPA ALUMINA REFINERY STREAM-5	Client NALCO	Contract Code NAL	Document ID 6695-ELT-G00-EC-0030	Contract No. 66-6695	
	TECHNICAL SPECIFICATIONS – G.I CABLE TRAY AND ACCESSORIES			 नेशनल एल्युमिनियम कम्पनी लिमिटेड National Aluminium Company Ltd.	
				Rev	01

<p>tkIS India / Vendor</p> <p>Category Codes (Submission Purpose)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 For Approval <input type="checkbox"/> 2 For Review / Comments <input type="checkbox"/> 3 For Information <input type="checkbox"/> 4 For Engineering <input type="checkbox"/> 5 For Enquiry <input type="checkbox"/> 6 For Order Placement <input type="checkbox"/> 7 Final & Approved <input type="checkbox"/> 8 Released for Construction <hr/> <p>Acceptance Codes (Approval Codes)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Approved <input type="checkbox"/> 2 Approved for Manufacturing / Fabrication with Comments as marked <input type="checkbox"/> 3 Not Approved / Resubmit <input type="checkbox"/> 4 Retained for Information / Records <input type="checkbox"/> 5 Reviewed <input type="checkbox"/> 6 Reviewed as Noted / Resubmit <p>Remarks for AC2 : This marked-up drawings is hereby approved for fabrication / manufacturing and shall be re-submitted after revision. This drawing should be revised only to the extent of tkIS India / Owner / Client comments. Any other changes made by you will not be considered unless clearly highlighted in covering letter asking for approval.</p> <p>This approval / review does not absolve the supplier from the full responsibility for design and fabrication.</p> <p>Date : ___/___/___ Name : _____</p>	<p>tkIS India / Owner / Client</p> <p>Category Codes (Submission Purpose)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 For Approval <input type="checkbox"/> 2 For Review / Comments <input type="checkbox"/> 3 For Information <input checked="" type="checkbox"/> 4 For Engineering <input type="checkbox"/> 5 For Enquiry <input type="checkbox"/> 6 For Order Placement <input type="checkbox"/> 7 Final & Approved <input type="checkbox"/> 8 Released for Construction <hr/> <p>Acceptance Codes (Approval Codes)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Approved <input type="checkbox"/> 2 Approved for Manufacturing / Fabrication with Comments as marked <input type="checkbox"/> 3 Not Approved / Resubmit <input type="checkbox"/> 4 Retained for Information / Records <input type="checkbox"/> 5 Reviewed <input type="checkbox"/> 6 Reviewed as Noted / Resubmit <p>Date : ___/___/___ Name : _____</p>
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© Copyright 2015 : All rights reserved ThyssenKrupp Industrial Solutions (India) Private Limited				<h1 style="margin: 0;">Barcode</h1>					Category Code: -04

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INDEX SHEET

The document Cover Sheet indicates revisions made in this document along with the purpose of issue of the revised document. The details of revisions made in the enclosures of this document are listed in the table of *Contents* below and the enclosures listed therein are an integral part of this document.

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	A4	Index sheet and status of revision	2	1	-
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Part-III	A4	Inspection Test Plan	1	0	-

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1.0 INTRODUCTION

This specification covers the design, manufacturing, inspection and testing of **G.I cable trays & accessories**.

Scope of supply and services covered under this specification shall be as per various parts of this specification. Specific requirement is covered in Part-II, while standard and descriptive requirement is covered in Part-I.

2.0 GENERAL REQUIREMENT

2.1 CONSTRUCTION

The cable trays shall be either ladder or perforated type as indicated in Part-II. Tray arrangement shall be as per enclosed drawings. Cable trays and accessories shall be fabricated out of hot rolled mild steel (sheet steel), which shall be hot dip galvanized. The complete assembled cable tray sections shall be corrosion resistant, high strength and with extremely smooth surface.

2.2 BENDS

Required horizontal, vertical bends and tee crosses shall be fabricated as per tray specifications. They shall have the required bending radii as required for various cable sizes with a minimum radius of 300 mm.

2.3 ACCESSORIES

Cable trays shall be supplied with GI coupler plates as indicated in Part-II and associated hardware i.e. nuts, bolts and washers for joining the standard lengths of cable tray sections.

Covers, along with all necessary hardware for fixing covers on trays (e.g. nuts, bolts etc.), shall be supplied.

2.4 SURFACE PREPARATION FOR GALVANIZING / PAINTING

For treatment and preparation of surface of fabricated trays, seven-tank process shall be employed comprising of the following

2.4.1 Cleaning

All members, plates etc. shall be free from grease, paint or any other foreign matter. A chemical solvent as trichloroethylene / carbon tetrachloride or a combination of solvent cleaning and heating shall be employed. Immediately, after degreasing, the material shall be rinsed with hot / cold water.

2.4.2 Pickling

Both hydrochloric acid and sulphuric acid solutions may be used for pickling. After pickling, the material shall be rinsed in running water. After surface treatment, cable tray shall be galvanized as given below.

2.5 GALVANIZING

2.5.1 Zinc conforming to grade Zn 98 of IS:2629 shall normally be used for galvanizing.

2.5.2 As far as practicable, the fabricated cable tray and accessories shall not be sunk to the bottom of the bath during galvanizing.

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- 2.5.3 Tray and accessories shall be galvanized at the lowest possible temperature which will allow the free drainage of zinc from the work piece during withdrawal.
- 2.5.4 The thickness of the coating and zinc deposit shall be as per Part-II. The thickness shall be checked by magnetic method as per IS: 3203.
- 2.5.5 Small components handled in baskets shall be centrifuged to remove excess of zinc immediately after galvanizing while the coating is still in molten condition. Material of hardware such as nuts and bolts shall be as specified in Part-II.

3.0 LOADING & DEFLECTION CRITERIA

For tray system design, in addition to self-load, following criteria shall be applied to determine section and thickness of cable tray:

a) Support Span = 3000mm

b) Cable load for -

- | | |
|-----------------------|----------|
| i) 150mm wide tray: | 30 kg/m |
| ii) 300mm wide tray: | 50 kg/m |
| iii) 450mm wide tray: | 75 kg/m |
| iv) 600mm wide tray: | 100 kg/m |
| v) 750mm wide tray: | 120 kg/m |

Allowable mid span deflection < 15 mm

c) In addition to this, 70kg concentrated load at center span shall be considered for size 300 mm and above. With this load, cable tray shall not develop any crack or break.

4.0 FACTORY ACCEPTANCE TEST

All cable trays and the accessories shall be offered for inspection at the fabricator's works to LSTK Contractor/Owner/Consultant representative. Notice for readiness for inspection shall be given at least 15 days in advance.

Tests shall be carried out as per Part-III: Inspection Test Plan.

No material shall be despatched until clearance for despatch has been obtained in writing from the LSTK Contractor/Owner/Consultant.

5.0 PACKING

The cable tray shall be suitably protected by proper and adequate packing for shipment and weather conditions involved. Cable trays may be dispatched in dismantled conditions with standard length of each cable tray section as decided by LSTK Contractor. Vendor shall clearly indicate method of packing in the offer.

6.0 PERFORMANCE GUARANTEE

Vendor/LSTK Contractor shall guarantee the material supplied by him for a period as indicated elsewhere in the tender. In case of any failure in the bought out items, the same shall be replaced with new one within the period of guarantee. Moreover the Owner/LSTK Contractor reserves the right to use rejected / failed material till it is replaced.

 नालको NALCO नेशनल एल्युमिनियम कंपनी लिमिटेड National Aluminium Company Ltd.		G.I. CABLE TRAYS & ACCESSORIES PART - II DESIGN DATA SHEET		Code		NAL	
				Contract no.		66-6695	
 thyssenkrupp				Doc.		6695-ELT-G00-EC-0030	
				Rev.		01	
GENERAL	001		Make	:	As per Vendor List- Electrical		
	002		Quantity	:	*		
	003		Acceptable quantity variation after order	:	*		
			placement	:	*		
	004						
CODES	005		IS 1079 : Hot rolled carbon steel & strip				
	006		IS 816 : Code of practise for use of metal arc welding for general.				
	007		IS 2629 : Recommended practice for hot dip galvanizing of iron & steel.				
	008		IS 2633 : Method of testing, uniformity of coating on zinc coated articles.				
	009	01	Indian Electricity Act & CEA Regulations				
	010						
	011						
TRAY & ACCESSORIES	012		Type	:	Ladder		
		01	a) Material	:	hot-dip galvanised mild steel (sheet steel)		
			b) Width	:	300 / 600 / 750 / 900 mm		
			c) Standard length	:	3000 mm		
			d) Thickness	:	2.5 / 3 mm (without galvanising)		
			e) Height	:	75 / 100 mm		
			f) Rung spacing	:	300 mm		
			g) Rung dimensions (w x h x t)	:	35 mm x 15 mm x 2.5 mm		
			h) Support Span	:	3000 mm		
			i) Loading Capacity	:	As per Part-I, Cl. 3.0		
	013		Type	:	Perforated		
		01	a) Material	:	hot-dip galvanised mild steel (sheet steel)		
			b) Width	:	50 / 100 / 150 mm		
			c) Standard length	:	3000 mm		
			d) Thickness	:	2.5 mm (without galvanising)		
			e) Height	:	50 mm		
			f) Support Span	:	3000 mm		
		g) Loading Capacity	:	As per Part-I, Cl. 3.0			
COVER	014	01	Material of construction	:	hot-dip galvanised mild steel (sheet steel)		
	016		Width :	:	As required		
	017		Thickness	:	1.6 mm (without galvanising)		
	018		Standard length	:	3000 mm		
	019		Fixing of Cover	:	At every 1 meter		
	020		Covers shall be provided with necessary fixing hardware.				
HARDWARE	021		Nuts, Bolts, Washers	:	Stainless Steel (SS 3304)		
	022						

