



**Pacific Composites**

# **FIBREGLASS CABLE SUPPORT SYSTEMS**

## FIBREGLASS CABLE SUPPORT SYSTEMS

Pacific Composites Cable Support Systems offer engineers a structural product for solving many design and plant engineering problems, enabling long term reliable support of expensive and often critical cables.

Pacific Composites Cable Support Systems possess unique properties which enable them to resist many corrosive environments, particularly where conditions indicate that conventional materials will not provide an economic service life.

Constructed from glass reinforced thermoset resins, Pacific Composites Cable Support Systems are designed and manufactured with a structural integrity normally only associated with steel and aluminum, but without their corrosion, weight and electrical conductivity problems.

### CHEMICAL & CORROSION RESISTANCE

Pacific Composites Cable Support Systems resist acids, salts, alkalis and a wide range of aggressive chemicals and environments which have drastic effects on galvanised steel and aluminum. Even coated steel or aluminum products can suffer damage from minute scratches during installation or in service. These will initiate corrosion and reduce the life of the cable support system. The use of premium grade resins, non glass surfacing tissues and ultra violet inhibitors give Pacific Composites Cable Support Systems optimum protection against corrosion.

### HIGH STRENGTH TO WEIGHT RATIO

Pacific Composites Cable Support Systems have a superior strength to weight ratio compared to steel or aluminum whilst maintaining a similar structural integrity. The pultrusion process utilised in manufacture, results in high glass content and consistent reinforcement location. These are critical for consistent performance and achievement of the necessary physical properties.

### LIGHTWEIGHT AND MANAGEABLE

Pultruded fibreglass profiles used in Pacific Composites Cable Support Systems have a specific gravity of one-fourth that of steel and two-thirds that of aluminum, allowing for considerably simplified erection and handling. Unlike stainless steel, Pacific Composites Cable Support Systems can be easily cut and drilled on site using only hand tools.

### NON CONDUCTIVE AND NON MAGNETIC

As Pacific Composites cable ladder and tray is non conductive, there is no concern of transmitting electricity into the support system from damaged cables. Additionally, there is no requirement for special support conditions to prevent electrolytic corrosion. Non conductive and non magnetic features mean a safer support system.



Pacific Composites' FRP cable ladder being installed in the corrosive environment at the SCM titanium dioxide plant in Western Australia.

### TRANSPARENT TO RF TRANSMISSION

Fibreglass composites do not cause electromagnetic interference and are transparent to radio frequency transmissions. Pacific Composites Cable Support Systems provide a solution in applications where clarity of communication transmissions is paramount.

### COST PERFORMANCE

Very favourable results have been demonstrated with Pacific Composites Cable Support Systems, emphasizing low installation costs, long service life and a minimum of maintenance.

## PRODUCT FEATURES

### DESIGN

Pacific Composites Cable Support Systems are designed to comply with the requirements of NEMA specification FG1-1986 under three load/span classifications.

#### CLASS A

75kg/m on a recommended maximum span of 3.5m

#### CLASS B

110kg/m on a recommended maximum span of 6.0m

#### CLASS C

150kg/m on a recommended maximum span of 6.0m

Cable ladder produced under any of these classifications is available in lengths of either 3m or 6m and in widths from 150mm to 900mm. Rung spacings are available at either 150 or 300mm centres. All fittings are based on a standard radius of 600mm. Variations to these lengths, widths, rung spacings and radius are available to order.

Cable Tray is produced in standard lengths of 3 metres. Standard widths range from 100 to 300mm. Other tray widths can be made to order.

Tray can be provided plain or with a perforated base. Perforations are on standard 300 mm centres and provide both ventilation and sites for cable tie down.

All cable support system components are manufactured using isophthalic polyester fire retardant resin systems that enable compliance to the VO rating of UL94, a flame spread rating of less than 25 for ASTM E-84 and a self extinguishing rating under ASTM D635.

For a more aggressive corrosion environment, a vinyl ester resin system is available to order, with equivalent fire retardant properties.

### CONSTRUCTION

All cable support systems are designed using high strength to weight ratio pultruded structural composite profiles.

The ladder type system comprises two channel side rails connected by transverse rungs. All rungs to side channel connections have both a mechanical and adhesive lock.

Cable trays are constructed from high strength pultruded channel profile. Tray can be provided plain or perforated to provide cable fastening and/or ventilation.

All fittings, horizontal bends, risers, reducers, tees, etc. used to enable cable routings to deviate from a straight line onto another plane, are constructed from the same profiles as the straight ladder sections.

Standard joining of cable ladder or tray sections and fittings, is accomplished via 316 stainless steel splice plates and fasteners.

Fibreglass joining accessories are also available for systems requiring total insulating properties.

Straight sections and fittings can be pre-drilled to accept joining accessories, if desired.

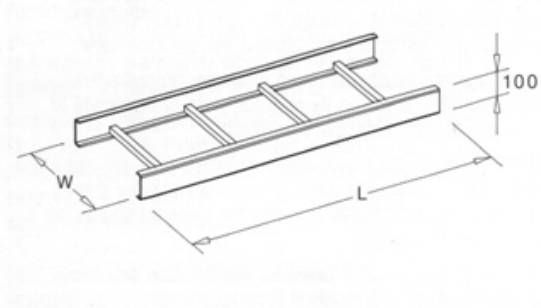
Cut edges and drilled holes are all sealed at manufacture.

**CAUTION: In the case of site fabrication, all cut edges and holes must be sealed with a resin sealer prior to installation.**

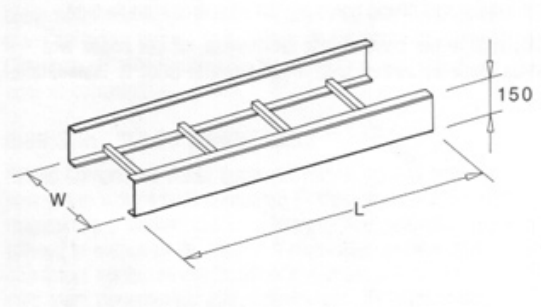
# PRODUCT SPECIFICATIONS

## CABLE LADDER

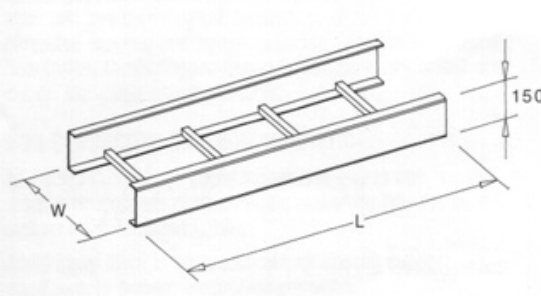
### Medium Duty Cable Ladder (NEMA Class A Type MD)



### Heavy Duty Cable Ladder (NEMA Class B Type HD)



### Extra Heavy Duty Cable Ladder (NEMA Class C Type EHD)



Order Code	Rung Pitch mm	Width W mm	Ladder Weight/ m kg
MD-150-150-L	150	150	4.1
MD-300-150-L	300	150	3.6
MD-150-300-L	150	300	4.8
MD-300-300-L	300	300	4.0
MD-150-450-L	150	450	5.6
MD-300-450-L	300	450	4.4
MD-150-600-L	150	600	6.4
MD-300-600-L	300	600	4.8
MD-150-750-L	150	750	7.2
MD-300-750-L	300	750	5.2
MD-150-900-L	150	900	8.0
MD-300-900-L	300	900	5.6

Order Code	Rung Pitch mm	Width W mm	Ladder Weight/ m kg
HD-150-150-L	150	150	5.7
HD-300-150-L	300	150	5.2
HD-150-300-L	150	300	6.5
HD-300-300-L	300	300	5.7
HD-150-450-L	150	450	7.3
HD-300-450-L	300	450	6.2
HD-150-600-L	150	600	8.1
HD-300-600-L	300	600	6.7
HD-150-750-L	150	750	8.9
HD-300-750-L	300	750	7.2
HD-150-900-L	150	900	9.7
HD-300-900-L	300	900	7.7

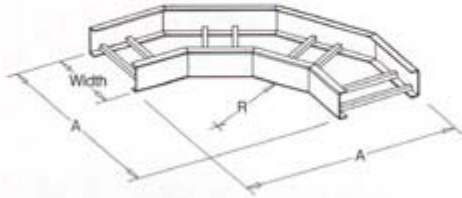
Order Code	Rung Pitch mm	Width W mm	Ladder Weight/ m kg
EHD-150-150-L	150	150	8.2
EHD-300-150-L	300	150	7.8
EHD-150-300-L	150	300	9.1
EHD-300-300-L	300	300	8.3
EHD-150-450-L	150	450	9.9
EHD-300-450-L	300	450	8.7
EHD-150-600-L	150	600	10.7
EHD-300-600-L	300	600	9.1
EHD-150-750-L	150	750	11.5
EHD-300-750-L	300	750	9.5
EHD-150-900-L	150	900	12.3
EHD-300-900-L	300	900	9.9

Note: L = 3 metre or 6 metre w = Inside width

# PRODUCT SPECIFICATIONS

## CABLE LADDER FITTINGS

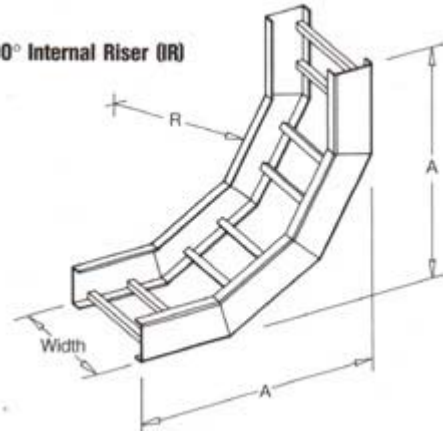
### 90° Horizontal Bend (HB)



Width	Dimension A (for R = 600mm)
150	900
300	1050
450	1200
600	1350
750	1500
900	1650

**Order Code:** Type -HB-Radius-Width-90  
e.g. MD-HB-600-300-90

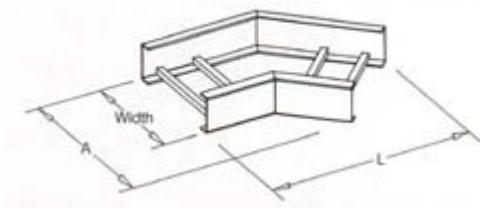
### 90° Internal Riser (IR)



Dimension A (for R = 600 mm)	
Medium Duty	Heavy Duty
840 mm	890 mm

**Order Code:** Type-IR-Radius-Width-90  
e.g. HD-IR-600-300-90

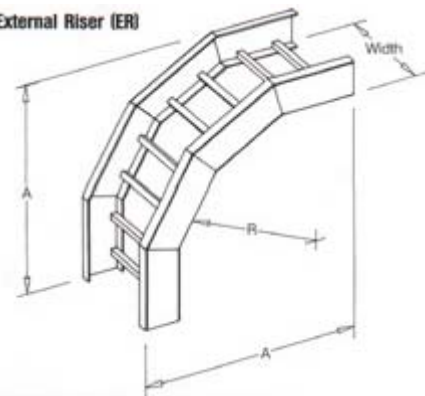
### 45° Horizontal Bend (HB)



Width mm	Dimensions (mm) (for R = 600mm)	
	A	L
150	367	609
300	517	715
450	667	821
600	817	927
750	967	1033
900	1117	1139

**Order Code:** Type-HB-Radius-Width-45  
e.g. HD-HB-600-300-45

### 90° External Riser (ER)



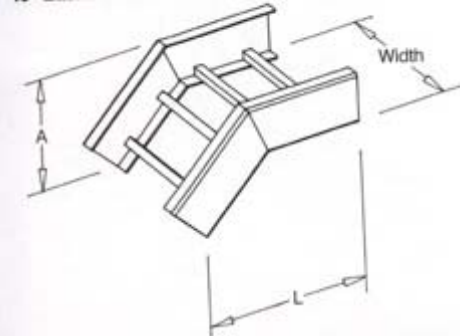
Dimension A (for R = 600 mm)	
Medium Duty	Heavy Duty
840 mm	890 mm

**Order Code:** Type-ER-Radius-Width-90  
e.g. MD-ER-600-300-90

# PRODUCT SPECIFICATIONS

## CABLE LADDER FITTINGS (continued)

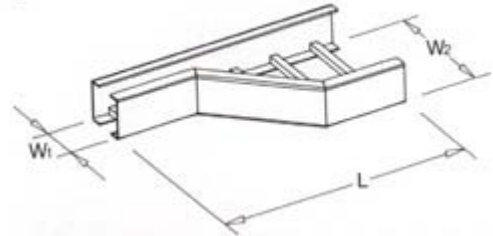
### 45° External Riser (ER)



Medium Duty		Heavy & Extra Heavy Duty	
Dimension A (mm)	Dimension L (mm)	Dimension A (mm)	Dimension L (mm)
242	338	348	474

**Order Code:** Type-ER-Radius-Width-45  
e.g. MD-ER-600-450-45

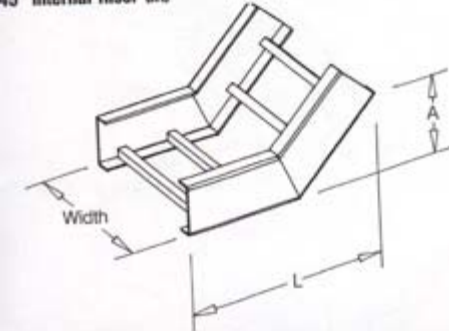
### Right or Left Hand Reducer (RR or LR)



W 2 (mm)	W1(mm)				
	900	750	600	450	300
150	1340	1190	1040	890	740
300	1190	1040	890	740	
450	1040	890	740		
600	890	740			
750	740				

**Order Code:** Type -Hand-W1-W2  
e.g. HD-RR-600-150

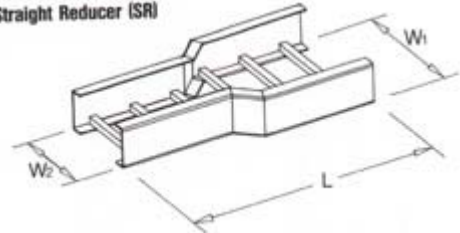
### 45° Internal Riser (IR)



Medium Duty		Heavy & Extra Heavy Duty	
Dimension A (mm)	Dimension L (mm)	Dimension A (mm)	Dimension L (mm)
170	410	240	580

**Order Code:** Type-IR-Radius-Width-45  
e.g. HD-IR-600-300-45

### Straight Reducer (SR)

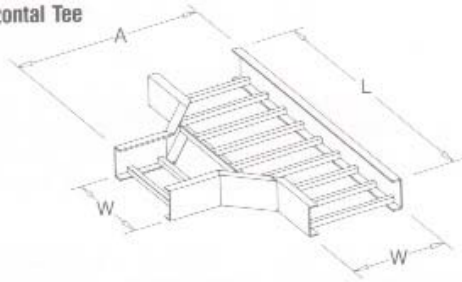


W2 (mm)	W1 (mm)				
	900	750	600	450	300
150	1040	890	890	1040	890
300	890	890	1040	890	
450	890	1040	890		
600	1040	890			
750	890				

**Order Code:** Type-SR-W1-W2  
e.g. MD-SR-600-300

# PRODUCT SPECIFICATIONS

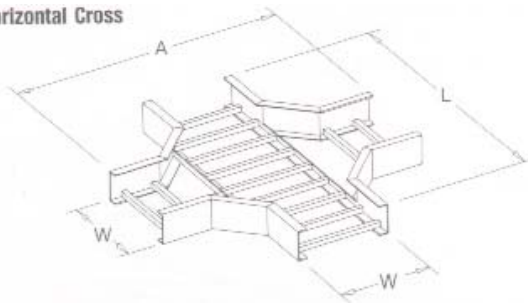
Horizontal Tee



Width (mm) W	Medium Duty		Heavy and Extra Heavy Duty	
	Dimensions A (mm) for R=600 mm	Dimension L (mm)	Dimension A (mm) for R=600 mm	Dimension L (mm)
150	765	1190	800	1490
300	915	1340	950	1640
450	1065	1490	1100	1790
600	1215	1640	1250	1940
750	1365	1790	1400	2090
900	1515	1940	1550	2240

**Order Code:** Type -HT-Radius-W  
e.g. HD-HT-600-300

Horizontal Cross



Width mm W	Medium Duty		Heavy and Extra Heavy Duty	
	Dimension A (mm) for R=600 mm	Dimension L (mm)	Dimension A (mm) for R=600 mm	Dimension L (mm)
150	1370	1190	1440	1490
300	1520	1340	1590	1640
450	1670	1490	1740	1790
600	1820	1640	1890	1940
750	1970	1790	2040	2090
900	2120	1940	2190	2240

**Order Code:** Type-C-Radius-W  
e.g. MD-C-600-300

## CABLE TRAY AND FITTINGS

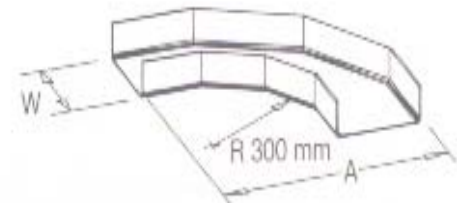
Tray (T)



Order Code	W	H
T-100	102	45
T-150	150	45
T-225	225	70
T-300	300	70

For perforated tray, prefix order code with "P", e.g. PT-100

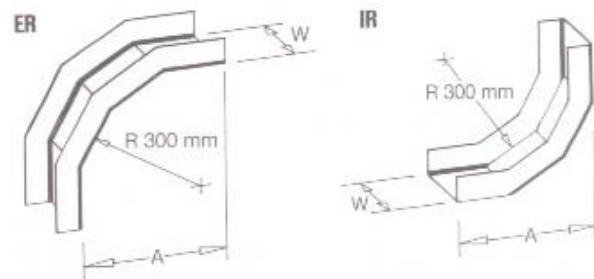
90° Horizontal Bend (HB)



Width mm	Dimension A (mm)
102	475
150	525
225	600
300	675

**Order Code:** T-HB-Radius-Width  
e.g. T-HB-300-225

90° Internal/External Riser (IR or ER)



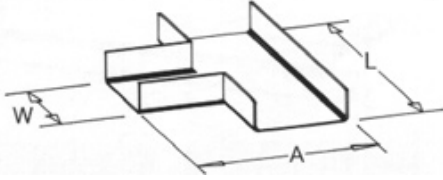
Width (mm)	Dimension A (mm)
All	380

**Order Code:** T-IR or ER-Radius-Width  
e.g. T-IR-300-225

# PRODUCT SPECIFICATIONS

## CABLE TRAY AND FITTINGS (continued)

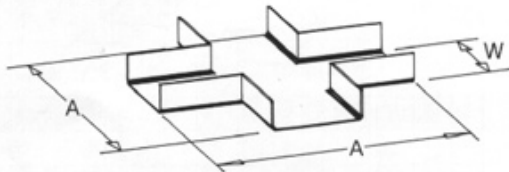
### Horizontal Tee (HT)



Width (mm)	Dimension A (mm)	Dimension L (mm)
102	300	500
150	350	550
225	425	625
300	500	700

**Order Code:** T-HT-Width  
e.g T-HT-300

### Horizontal Cross (HC)

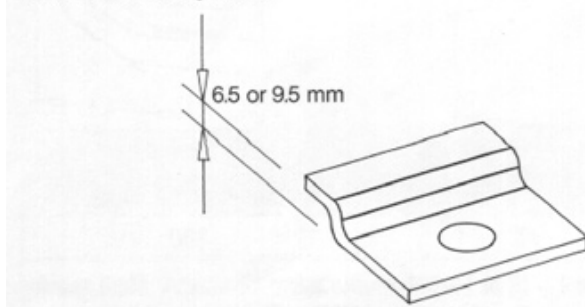


Width (mm)	Dimension A (mm)
102	500
150	550
225	625
300	700

**Order Code:** T-HC-Width  
e.g. T-HC-300

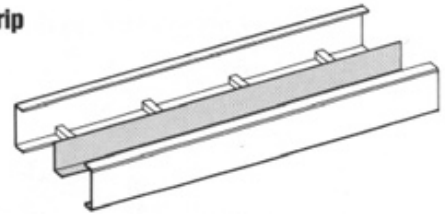
## CABLE LADDER ACCESSORIES

### Hold Down Clamp (HDC)



Standard clamps are 316 SS, FRP clamps are available on request. 316 SS fasteners are not included but can be supplied on request if length is specified.

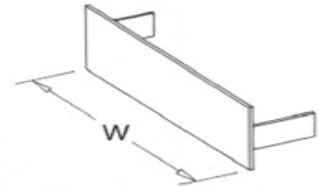
### Divider Strip



Angle divider strip is available for all MD, HD and EHD ladder types. It is fixed to rungs via nylon drive rivets.

To order, specify the following code-MD-3 for medium duty ladder, HD-4 for heavy and extra heavy duty ladders.

### Blind End (BE)

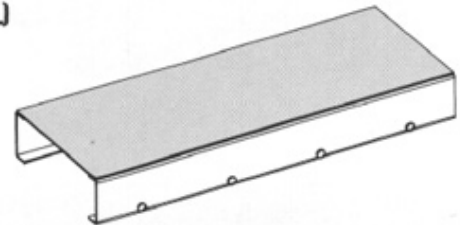


Available for MD, HD and EHD ladder types. Complete code with value for W-ladder width when ordering.

**Order Code:** Type-BE-Width  
e.g. HD-BE-300

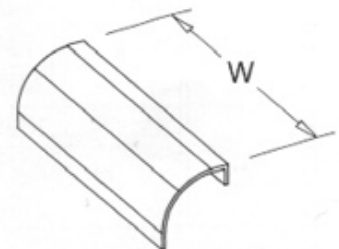
316 SS fasteners are included.

### Covers (CL)



Standard covers are flat and made from 3 mm FRP sheet. Covers are supplied with nylon drive rivets. Other cover designs and hold down clamps can be supplied on request.

### Drop Out (DO)



W = inside width of ladder section.

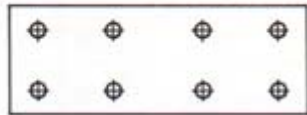
# PRODUCT SPECIFICATIONS

## CABLE LADDER AND TRAY ACCESSORIES

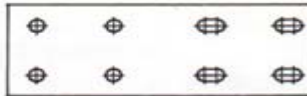
### Splice Plates

Splice Plates for Cable Tray up to 150 mm in width are 40 mm wide. For tray greater than 225 mm in width, and medium duty cable ladder, splice plates are 55 mm wide, and for heavy and extra heavy duty ladder are 100 mm wide.

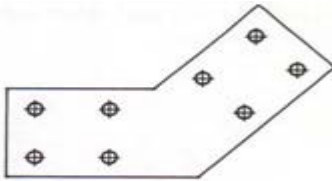
Straight



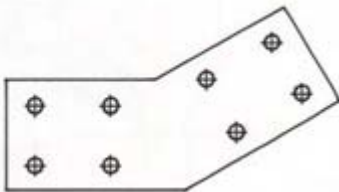
Expansion



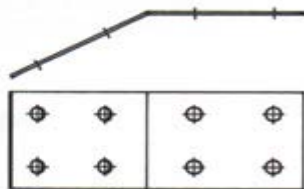
45° Vertical



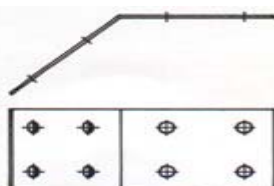
30° Vertical



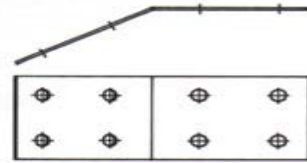
30° Horizontal



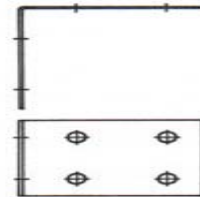
45° Horizontal



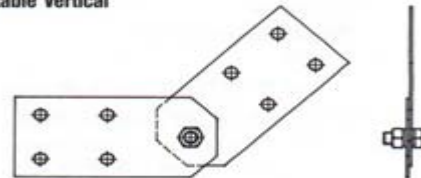
30° Horizontal



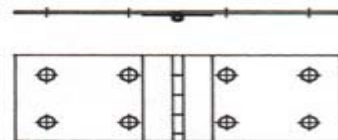
90° Horizontal



Adjustable Vertical



Adjustable Horizontal



**Note:**

The quantity of fasteners per splicer plate varies to suit cable ladder and tray size.

## INSTALLATION

The installation of Pacific Composites Cable Support Systems should be in accordance with the NEMA Standards Publication o, FG1-1986.

### SUPPORT LOCATIONS

#### Straight Sections

Supports should be located whenever practical, so that all splice plate connectors between horizontal straight sections are located between the support point and the quarter point of the span. It is desirable to have the straight sections act as a continuous beam to enable the individual spans to act collectively to reduce deflection and support the loads imparted by the cables.

Unspliced straight sections should be used on all simple spans and on end spans of continuous span arrangements.

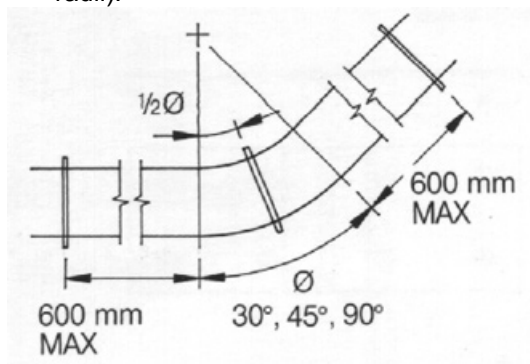
A support should be located 600 mm on each side of an expansion splice plate.

Vertical straight lengths should be supported at intervals dictated by the building structure but not exceed 6 metres on centres.

#### Horizontal Fitting Support

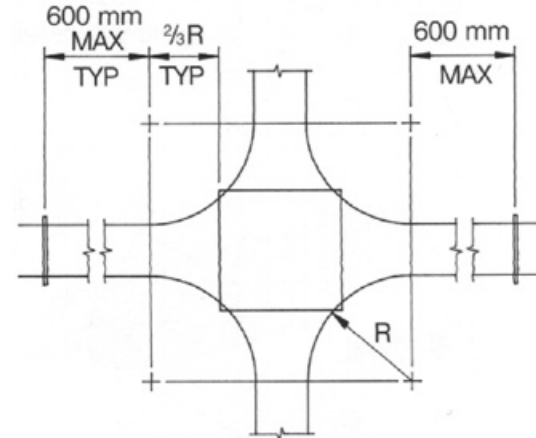
Supports should be placed within 600 mm of each fitting extremity and as follows:

- 90 degree supports at the 45 degree point of the arc.
- 45 degree supports at the 22.5 degree point of the arc (except for 300 mm radii).
- 30 degree supports at the 15 degree point of the arc (except for 300 mm radii).



#### Horizontal Tee Supports

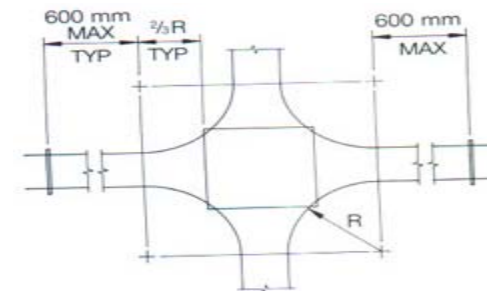
Supports shall be placed within 600 mm of each of the three openings connected to other cable ladder items for 300 mm radius. On all other radii, at least one support should also be placed under each side rail of the horizontal tee.



#### Horizontal Cross Supports

Supports shall be placed within 600 mm of the four openings connected to other cable ladder items for the 300 mm radius.

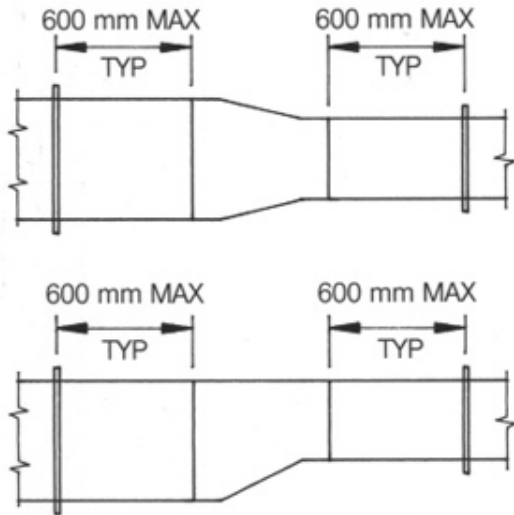
On all other radii at least one support should also be placed under each side rail of the cross.



# INSTALLATION

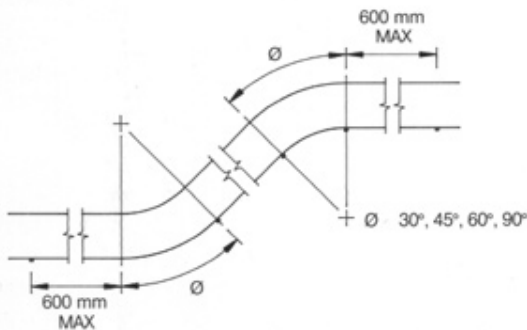
## Reducer Fitting Supports

Straight and right or left hand reducers should be supported within 600mm of each extremity.



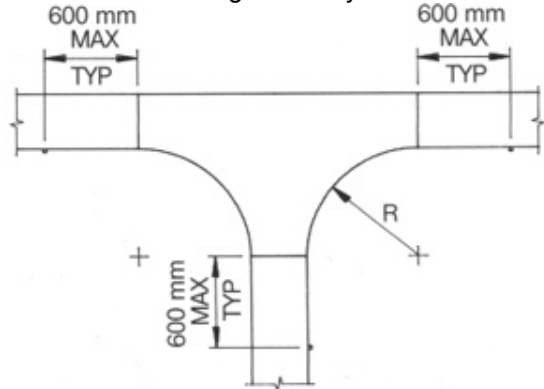
## Vertical Fitting Supports

Vertical fittings at the top of runs should be supported at each end. Fittings at the bottom of runs should be supported at the top of the fitting and within 600mm of the lower extremity of the fitting.



## Vertical Tee Supports

Vertical tee fittings should be supported within 600mm of each fitting extremity.



## Thermal Contraction and Expansion

When expansion splice plate connectors are used, fiberglass cable ladder should be permitted free longitudinal movement at all support locations between expansion splice plate connections except at one fixed location approximately halfway between the connections.

Thermal contraction and expansion data is shown in the table below.

### Warning!

In as much as Pacific Composites Cable Support Systems are designed to support power or control cables, or both, it is not intended or designed to be a walkway for personnel.

The user is urged to display appropriate warnings against the use of this support as a walkway.

The following language is suggested:  
**“Warning! Not to be used as a walkway, ladder or support for personnel. To be used only as a mechanical support for cables and tubing”**

(Refer NEMA FG1-1986 Sec 7.6)

Temperature Differential Degrees C	Cable Ladder Length for 25 mm expansion	Cable Ladder Length for each Expansion Splice Plate	
		MD	HD and EHD
15	188 m	68 m	128 m
25	113 m	41 m	77 m
40	71 m	26 m	48 m
55	51 m	18 m	35 m
70	40 m	14 m	27 m
85	33 m	12 m	22 m
100	28 m	10 m	19 m

## APPLICATION

A wide variety of industries take advantage of the benefits of Pacific Composites Cable Support Systems.

- Chemical processing
- Waste water and sewage treatment
- Petrochemical
- Offshore Oil and Gas Platforms
- Mineral processing
- Galvanising and plating
- Fertiliser processing
- Ports and harbours
- Food and beverage
- Tanneries
- Aluminium and Bauxite processing

## SUGGESTED CABLE SUPPORT SPECIFICATION

- Fibreglass tray and ladder support systems shall be by Pacific Composites Pty. Ltd.
- Cable Ladder shall be type MD, HD or EHD with NEMA Class A, B or C.
- All structural components shall be pultruded fibreglass reinforced composites with splice plate and fastener details 316 SS, unless otherwise stated.
- All structural components shall be fire retardant and comply with ASTM D-635, ASTM E-84 and UL94 V-0 fire ratings.
- All transition fittings shall be made of the same high strength materials as the straight ladder sections. Fitting width and bend radii to be specified in customer drawings.
- All accessory items shall be produced by Pacific Composites and where they are special, shall be fully compatible with the system.

## Quality Assurance

The quality management system operating throughout Pacific Composites is certified to the International Standard ISO 9001. This system is fully implemented throughout the company and covers design, development, production and management.

## Research and Development

Pacific Composites has a fully equipped R&D Laboratory and highly trained personnel. The company's Chemists and Engineers welcome the opportunity to develop innovative solutions to customer problems.



*Extensive physical testing can be carried out in Pacific Composites' well equipped R&D facilities.*

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