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The Benefits of Cable Tray

Cable tray wiring systems offer significant advantages over conduit pipe and other wiring systems cable tray is less expensive, more reliable more adaptable to changing needs and easier to maintain In addition, its design does not contribute to potential safety problems associated with other wiring systems .

An evaluation of the costs and benefits of various wiring systems should be done in the design phase.unfortunately, many engineers who are unfamiliar with wiring systems avoid the system selection process or defer it until construction-often resulting in higher costs, scheduling delays and a system that will not meet future needs.

Selection of a wiring system that is not the most suitable for a particular application in terms of cost, potential corrosion and electrical considerations can lead to numerous problems, including excessive initial cost, poor design, faulty installation, extra maintenance, future power outages and unnecessary safety concerns.

Cost

Extensive experience has shown that the initial cost of a cable tray installation (including conductor, material and installation labor costs) may be as much as 60% less than a comparable conduit wiring system.

Cable tray systems, including trays, supports, fittings and other materials are generally much less expensive than conduit wiring systems. In addition, major cost, savings are generated by the relative ease of installation. Labor costs of installing a cable tray system can run up to 50 percent less. Total cost savings will vary with the complexity and size of the installation.

Direct cost savings are easy to calculate during the design phase of an installation, but the enormous advantages of cable tray may accrue only over time . the system's reliability, adaptability ease of maintenance and inherent safety features result in may other types of cost savings, including.

- Lower engineering and maintenance costs
- Less need to reconfigure system as needs change
- Less down time for electrical and data handling systems
- Fewer environmental problems resulting form loss of power to essential equipment.

Reliability

Cable tray systems offer unsurpassed reliability, resulting in less need for maintenance and less down time-important considerations for all installations but especially for such industries as data communications and financial services. In addition , since cable tray is not a closed system, moisture build up problems are eliminated and damage to cable insulation during installation is also greatly reduced.

Adaptability

A major advantage of cable tray systems derives from their adaptability to new needs and technology.

The pace of change in the economy, constantly shifting competitive pressures and rapid introduction of innovative technologies are all accelerating. More than ever before, businesses must be prepared to quickly expand facilities, change products or introduce new processes. The flexibility of the wiring system is a key consideration.

Modifying a cable tray system or adding cables to meet new needs is relatively easy because cables can enter or exit a tray at any point. And initial design considerations can build-in extra capacity as part of the planning process. Cable tray's inherent adaptability allows rewiring for future expansion, building redesign or new technologies without disruption or need to replace the entire wiring system.

Maintenance

Cable tray wiring systems require less maintenance than conduit systems. When maintenance is necessary, it is easier, less time-consuming and less labor intensive.

The physical condition and status of both the cable tray and the tray cables can be inspected visually, something that is not possible with conduit systems. In addition, it is also easy to see if there is sufficient capacity in the trays for additional cables. As was noted above, changing or adding cables can also be accomplished without difficulty.

Another comparative benefit of cable tray systems is that they do not act as channels of moisture paths, as conduit wiring systems do. Conduit systems tend to collect condensation resulting from changes in temperature and then channel the moisture to electrical equipment, where it can lead to corrosion and failure.

Cable tray and tray cable are also less susceptible to fire loss than conduit. An external fire usually results in damage to only a few feet of a cable tray system, while wire insulation inside a conduit suffers significant damage and thermoplastic insulation may actually fuse to the conduit.

Safety

Cable tray wiring systems lack the inherent safety concerns of conduit systems.

By its nature, a conduit wiring system can serve as a flow-through for corrosive, explosive and toxic gases in the same way that it channels moisture.

The conduit installation process can also present a safety issue for electricians. The process requires that a conduit system be installed from one enclosure to another before pulling in the conductors, leaving the electricians exposed to any live, energized equipment that may be in the enclosures. In contrast, installers can pull tray cables from near one termination enclosure to the next before they are inserted into the enclosures and then terminated.

Finally, in installations where cable tray can be used as the equipment grounding conductor (per NEC

Glossary of Terms

Accessories	....Devices which are used to supplement the function of straight sections and fittings, and include such items as dropouts, covers, conduit adapters,hold-down devices and dividers.
Cable tray connector	.... A device which joins cable tray straight sections or fittings, or both. The basic types of connectors are:1. Rigid, 2.Expansion, 3.Adjustable, 4.Reducer
Cable tray Fitting	.... A device which is used to change the direction,elevation or size of a cable tray system.
Cable Support	.... A device which provides adequate means for supporting cable tray sections or fittings, or both The basic types of cable tray supports are: 1.Cantilever bracket, 2.Trapeze, 3.Individual and suspension
Cable Tray Type	.... Ladder Cable Tray is prefabricated metal structure consisting of two longitudinal side rails connected by individual transverse members. Perforated Cable Tray is prefabricated metal structure consisting of a ventilated bottom within integral or separate longitudinal side rails , with no opening in longitudinal direction. Non-Perforated Cable Tray is prefabricated metal structure without opening in the bottom.
Horizontal Cross	.... A Cable tray fitting which is suitable for joining cable trays in four dnections at 90-degree intervals in the same plane.
Horizontal Bend	.... A Cable Tray fitting which changes the direction in the same plane.
Horizontal Tee	.... A Cable Tray fitting which is suitable for joining Cable Trays in three directions at 90°degree intervals in the same plane.
Cable tray System	.... An assembly of Cable tray straight section, fitting, and accessories that forms a rigid structural system to support Cables.
Reducer	.... A Cable Tray fitting which is suitable for joining cable trays of different widths in the same plane. A straight reducer has two symmetrical offset sides. A right-hand reducer, when viewed from the large end, has a straight side on the right. A left-hand reducer, when viewed from the large end, has a straight side on the left.
Straight Section	.... A length of Cable Tray which has no change in direction or size.
Ventilated Bottom	.... A Cable tray bottom having openings sufficient for the passage of air and utilizing 75 percent or less of the plan area of the surface to support cables.
Vertical Bend	.... A Cable Tray fitting which changes direction to a different plane. An inside vertical elbow changes direction upward from the horizontal plane. An outside vertical elbow changes direction downward from the horizontal plan.

Selection process

A number of basic decisions must be made before a cable tray system can be specified. vanasheed company has developed a simple four-step process to guide you in the process:

- 1.select Material and Finish
- 2.select the tray Type
- 3.select the tray Size
- 4.select the fittings

Materials

Most cable tray systems are fabricated from a corrosion-resistant metal (low-carbon steel, stainless steel or an aluminum alloy) or from a metal with a corrosion-resistant finish (zinc or epoxy), The choice of material for any particular installation depends on the installation environment and cost.

Aluminum

cable trays fabricated of extruded aluminum are often used for their high strength-to-weight ratio, superior resistance to certain corrosive environments, and ease of installation. They also offer the advantages of being light weight (approximately 50% that of a steel tray) and maintenance free, and since aluminum cable trays are non-magnetic, electrical losses are reduced to a minimum.

The unusual resistance to corrosion, including weathering, exhibited by aluminum is due to the self- healing aluminum oxide film that protects the surface. Aluminum's resistance to chemicals in the application environment should be tested before installation.

Steel

Vanasheed.Co Steel cable trays are fabricated from structural quality steels using a continuous roll-formed process. Forming and extrusions increase the mechanical strength.

The main benefits of steel cable tray are its high strength and low cost. Disadvantages include high weight, low electrical conductivity and relatively poor corrosion resistance. The rate of corrosion will vary depending on many factors such as the environment, coating or protection applied and the composition of the steel. Vanasheed.Co offers finishes and coatings to improve the corrosion resistance of steel. These include pre-galvanized, hot dip galvanized (after fabrication), epoxy and special paints.

Stainless Steel

Stainless Steel offers high yield strength and high creep strength, at high ambient temperatures.

Vanasheed.Co stainless steel cable tray is roll-formed from AISI type 304-316 stainless steel.

Stainless steel is resistant to dyestuffs, organic chemicals, and inorganic chemicals at elevated temperatures. Higher levels of chromium and nickel and a reduced level of carbon serve to increase corrosion resistance and facilitate welding. Type 316 includes molybdenum to increase high temperature strength and improve corrosion resistance, especially to chloride and sulfuric acid. Carbon content is reduced to facilitate welding.

Galvanized coatings

The most widely used coating for cable tray is galvanizing it is cost-effective, protects against a wide variety of environmental chemicals, and is self-healing if an area becomes unprotected through cuts or scratches. Steel is coated with zinc through electrolysis by dipping steel into a bath of zinc salts. A combination of carbonates, hydroxides and zinc oxides forms a protective film to protect the zinc itself. Resistance to corrosion is directly related to the thickness of the coating and the harshness of the environment.

Pre-Galvanized

Pre-galvanized, also known as mill- galvanized or hot dip mill- galvanized, is produced in a rolling mill by passing steel coils through molten zinc. These coils are then slit to size and fabricated.

Areas not normally coated during fabrication, such as cuts and welds, are protected by neighboring zinc, which works as a sacrificial anode. During welding, a small area directly affected by heat is also left bare, but the same self-healing process occurs.

G90 requires a coating of 90 ounces of zinc per square foot of steel, or .32 ounces per square foot on each side of the metal sheet. In accordance with A653/A653M-06a, pre-galvanized steel is not generally recommended for outdoor use or in industrial environments.

Hot-Dip Galvanized

After the steel cable tray has been manufactured and assembled, the entire tray is immersed in a bath of molten zinc, resulting in a coating of all surfaces, as well as all edges, holes and welds.

Coating thickness is determined by the length of time each part is immersed in the bath and speed of removal. Hot dip galvanizing after fabrication creates a much thicker coating than the pre-galvanized process, a minimum of 3.0 ounces per square foot of steel or 1.50 ounces per square foot on each side of the sheet (according to ASTM A123, grade 65).







The process is recommended for cable tray used in most outdoor environments and may harsh industrial environment applications.

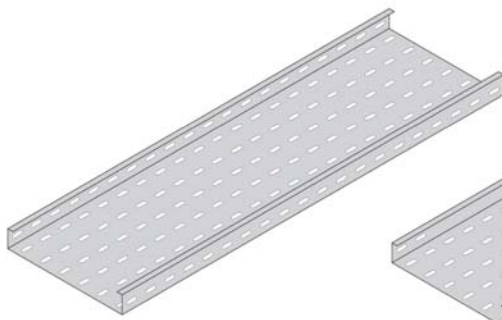
Other coatings

Epoxy and special paint coatings are available on request.

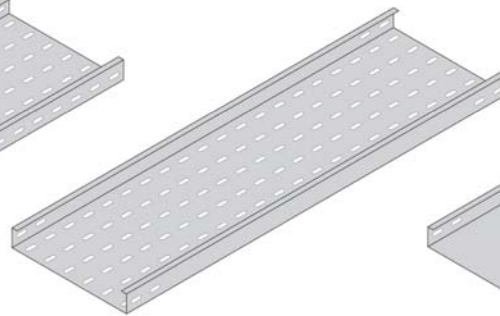
PG 1 B 20 - 4 M 20

Material	Style	Series	Width	Side height	Material thickness	Lenght
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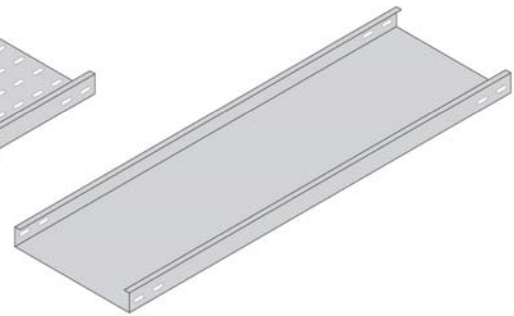
Material	PG = Pre-Galvanized , HG = Hot Dip Galvanized after fabrication SS = Stainless Stee , AL =Aluminum
Style	     
Series	A = All Perforated , B = Floor Perforated , C = Nonperforated
Width	5 = 50 mm , 10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm 40 = 400mm , 50 = 500mm , 60 = 600mm , 75 = 750mm , 100 = 1000mm
Side height	4 = 40 mm , 6 = 60mm , 8 = 80mm , 10 = 100mm , 15 = 150mm
Material thickness	K = 1mm , L = 1.25mm , M = 1.5mm , N = 2mm
lenght	20 = 2000mm , 25 = 2500mm , 30 = 3000mm



All Perforated



Floor Perforated



Nonperforated

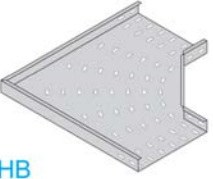
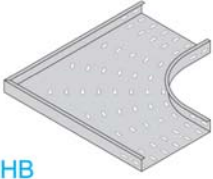
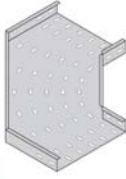

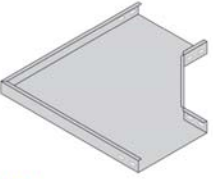
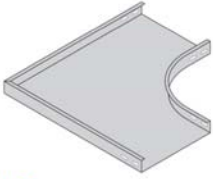
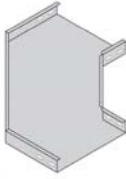

FITTING NUMBER SELECTION FOR CABLE TRAY

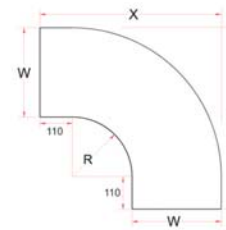
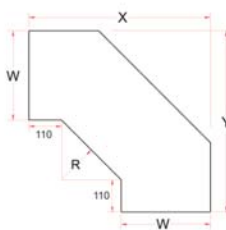
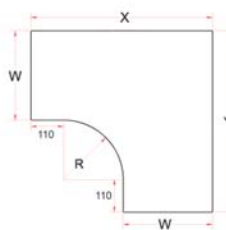
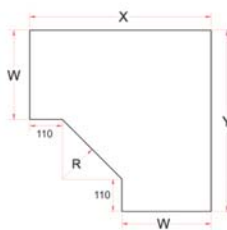


Material	PG = Pre-Galvanized , HG = Hot Dip Galvanized after fabrication SS = Stainless Steel , AL = Aluminum
Style	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> </div>
Series	B1,B3 = Perforated & Angular , C1,3 = Nonperforated & Angular B2,B4 = Perforated & Compass , C2,4 = Nonperforated & Compass
Width	5 = 50 mm , 10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm 40 = 400mm , 50 = 500mm , 60 = 600mm , 75 = 750mm , 100 = 1000mm
Side height	4 = 40 mm , 6 = 60mm , 8 = 80mm , 10 = 100mm , 15 = 150mm
Fitting type	HB = Horizontal Bend , HT = Horizontal Tee , HX = Horizontal Cross , VI = Vertical Inside Bend , VO = Vertical Outside Bend , HYR = Horizontal Wye Right , HYL = Horizontal Wye Left , RT = Horizontal Reducing Tee , ET = Horizontal Expanding Tee , EX = Horizontal Expand Cross , HLR = Horizontal Left Reducer , HSR = Horizontal Straight Reducer , HRR = Horizontal Right Reducer , VTU = Vertical Tee Up , VTD = Vertical Tee Down
Angel	30 = 30° , 45 = 45° , 60 = 60° , 90 = 90°
Radius	10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm , 40 = 400mm , 50 = 500mm , 60 = 600mm
Material thickness	K = 1mm , L = 1.25mm , M = 1.5mm , N = 2mm

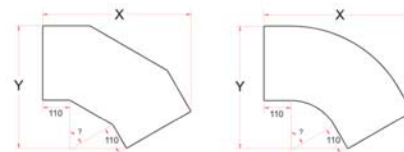
Part Numbering System								
PG	1	B	20	-4	HB	30	20	M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius	Material Thickness
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600		
						Side height (mm) : 40 , 60 , 80 , 100 , 150		
						Angel (deg) : 30° , 45° , 60° , 90°		
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600		

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Bend 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B4 30 - 6 HB 90 20 M**

(HB) :Horizontal Bend (Angular)		(HB) :Horizontal Bend (Compass)	
	HB Series:B1		HB Series:B2
	HB Series:B3		HB Series:B4
	HB Series:C1		HB Series:C2
	HB Series:C3		HB Series:C4



Horizontal Bend 90° Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
50	260	260	360	360	-	-	-	-	-	-
100	310	310	410	410	-	-	-	-	-	-
150	360	360	460	460	560	560	-	-	-	-
200	410	410	510	510	610	610	-	-	-	-
300	510	510	610	610	710	710	810	810	-	-
400	610	610	710	710	810	810	910	910	1010	1010
500	710	710	810	810	910	910	1010	1010	1110	1110
600	810	810	910	910	1010	1010	1110	1110	1210	1210



Horizontal Bend 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
50 ,..., 600	30°	302+W(0.5)	81+W
50 ,..., 600	45°	326+W(0.7)	135+W
50 ,..., 600	60°	338+W(0.86)	195+W

Cable Tray



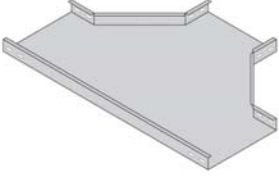
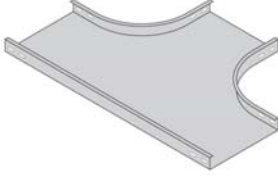
Horizontal Tee (HT)

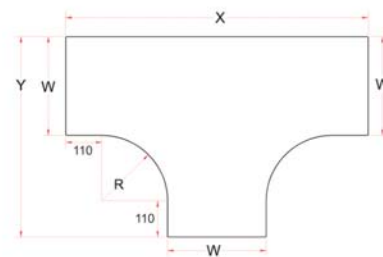
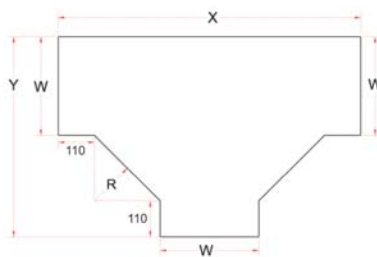
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Part Numbering System						Selection Guide	
PG	1	B	20	- 4	HT	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
							Radius
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600	
						Side height (mm) : 40 , 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B1 30 - 6 HT 90 20 M**

(HT) :Horizontal Cross (Angular)	(HT) :Horizontal Cross (Compass)
 <p>HT Series:B1</p>	 <p>HT Series:B2</p>
 <p>HT Series:C1</p>	 <p>HT Series:C2</p>

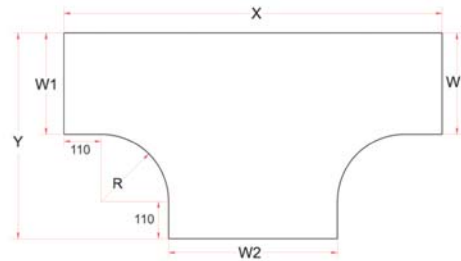
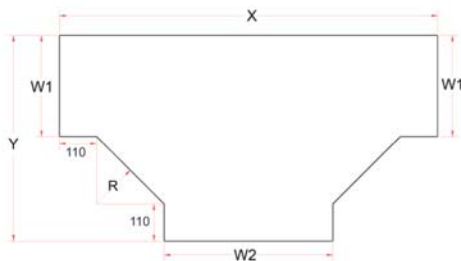


Horizontal Tee Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
50	470	260	670	360	-	-	-	-	-	-
100	520	310	720	410	-	-	-	-	-	-
150	570	360	770	460	-	-	-	-	-	-
200	620	410	820	510	1020	610	-	-	-	-
300	720	510	920	610	1120	710	1320	810	-	-
400	820	610	1020	710	1220	810	1420	910	1620	1010
500	920	710	1120	810	1320	910	1520	1010	1720	1110
600	1020	810	1220	910	1420	1010	1620	1110	1820	1210

Part Numbering System									
PG	1	B	20	-	4	ET	30	20	M
Material	Style	Series	Width		Side Height	Fitting Type	Angel	Radius	Material Thickness
Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600									
Side heigh (mm) : 40 , 60 , 80 , 100 , 150									
Angel (deg) : 30° , 45° , 60° , 90°									
Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600									

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Expanding Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B 30 - 6 ET 90 20 M**

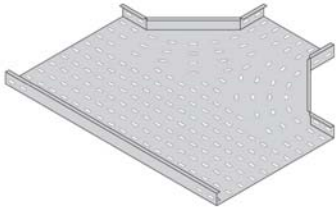
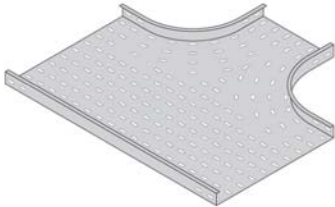
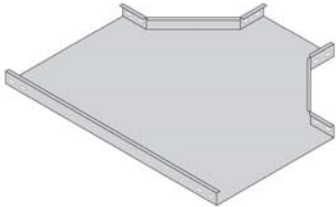
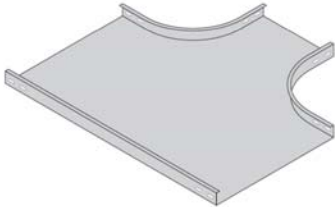
(ET) :Horizontal Expanding Tee (Angular)	(ET) :Horizontal Expanding Tee (Compass)
<p>ET Series:B1</p>	<p>ET Series:B2</p>
<p>ET Series:C1</p>	<p>ET Series:C2</p>

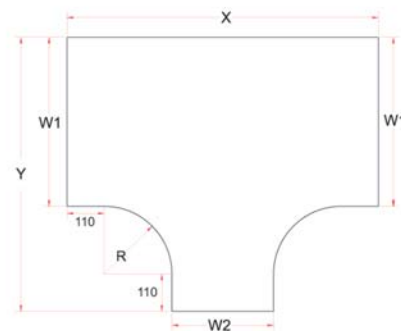
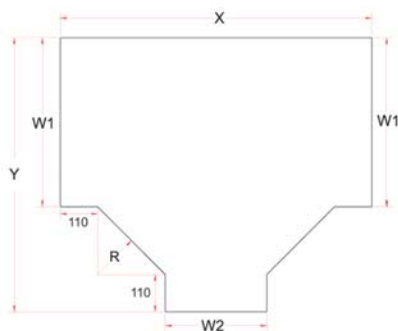


Horizontal Expanding Tee Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
50	100,600	420+W2	260	620+W2	360	-	-	-	-	-	-
100	150,...,600	420+W2	310	620+W2	410	-	-	-	-	-	-
150	200,...,600	420+W2	360	620+W2	460	-	-	-	-	-	-
200	300,...,600	420+W2	410	620+W2	510	820+W2	610	-	-	-	-
300	400,...,600	420+W2	510	620+W2	610	820+W2	710	1020+W2	810	-	-
400	500,600	420+W2	610	620+W2	710	820+W2	810	1020+W2	910	1220+W2	1010
500	600	1020	710	1220	810	1420	910	1620	1010	1820	1110

Part Numbering System						Selection Guide		
PG	1	B	20	-4	RT	30	20	M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius	Material Thickness
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600		
						Side high (mm) : 40 , 60 , 80 , 100 , 150		
						Angel (deg) : 30° , 45° , 60° , 90°		
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600		

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Reducing Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B 30 - 6 RT 90 20 M**


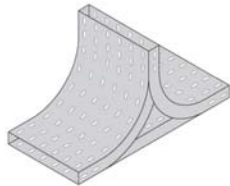
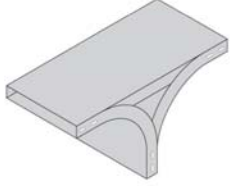
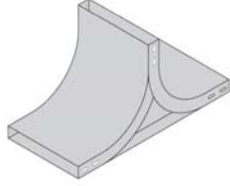
(RT) :Horizontal Reducing Tee (Angular)	(RT) :Horizontal Reducing Tee (Compass)
 <p>RT Series:B1</p>	 <p>RT Series:B2</p>
 <p>RT Series:C1</p>	 <p>RT Series:C2</p>

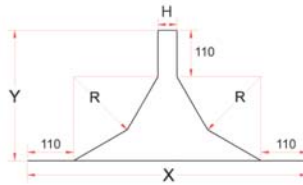


Horizontal Reducing Tee Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
-	-	-	-	-	-	-	-	-	-	-	-
100	50	470	310	670	410	-	-	-	-	-	-
150	50,100	420+W2	360	620+W2	460	-	-	-	-	-	-
200	50,...,150	420+W2	410	620+W2	510	820+W2	610	-	-	-	-
300	50,...,200	420+W2	510	620+W2	610	820+W2	710	1020+W2	810	-	-
400	50,...,300	420+W2	610	620+W2	710	820+W2	810	1020+W2	910	1220+W2	1010
500	50,...,400	420+W2	710	620+W2	810	820+W2	910	1020+W2	1010	1220+W2	1110
600	50,...,500	420+W2	810	620+W2	910	820+W2	1010	1020+W2	1110	1220+W2	1210

Part Numbering System						Selection Guide	
PG	1	B	20	- 4	VTD	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Angel (deg) : 30°, 45°, 60°, 90°	
							Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600

Example for order : Pre Galvanized All Perforated Cable Tray Vertical Tee Up (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B 30 - 6 VTU 90 20 M**

(VTD) :Vertical Tee Down	(VTU) :Vertical Tee Up
 <p>VTD Series:B</p>	 <p>VTU Series:B</p>
 <p>VTD Series:C</p>	 <p>VTU Series:C</p>



Horizontal Tee Up&Down Dimension											
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm		
W	X	Y	X	Y	X	Y	X	Y	X	Y	
50	420+H	210	620+H	310	-	-	-	-	-	-	-
100	420+H	210	620+H	310	-	-	-	-	-	-	-
150	420+H	210	620+H	310	-	-	-	-	-	-	-
200	420+H	210	620+H	310	820+H	410	-	-	-	-	-
300	420+H	210	620+H	310	820+H	410	1020+H	510	-	-	-
400	420+H	210	620+H	310	820+H	410	1020+H	510	1220+H	610	-
500	420+H	210	620+H	310	820+H	410	1020+H	510	1220+H	610	-
600	420+H	210	620+H	310	820+H	410	1020+H	510	1220+H	610	-

Cable Tray

Horizontal Wye 45° (HYL & HYR)

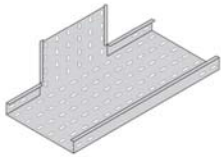

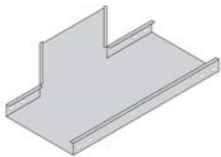
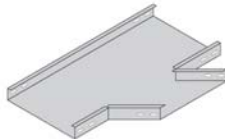
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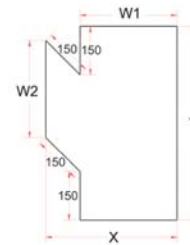
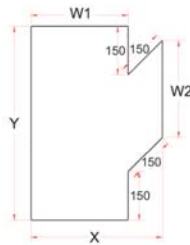


Part Numbering System						Selection Guide	
PG	1	B	20	- 4	HYR	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
							Radius

Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600
 Side height (mm) : 40 , 60 , 80 , 100 , 150
 Angel (deg) : 30° , 45° , 60° , 90°
 Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Way 45° left hand (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B 30 - 6 HYL 90 20 M**

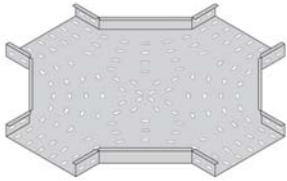

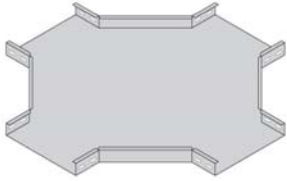
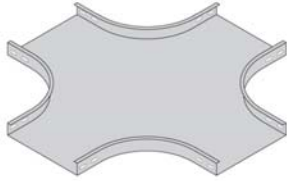
(HYL) Left Hand Wye 45°	(HYR) Right Hand Wye 45°
 <p>HYL Series:B</p>	 <p>HYR Series:B</p>
 <p>HYL Series:C</p>	 <p>HYR Series:C</p>

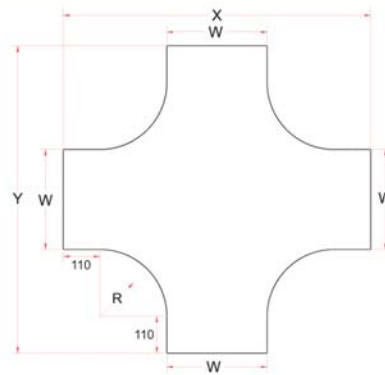
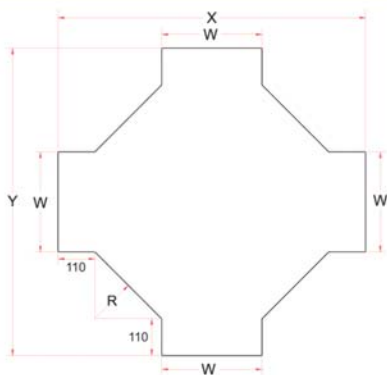


Horizontal Wye 45°			
Width mm		Dimension mm	
W 1	W 2	X	Y
50	50,...,600	156	300+W 2
100	50,...,600	206	300+W 2
150	50,...,600	256	300+W 2
200	50,...,600	306	300+W 2
300	50,...,600	406	300+W 2
400	50,...,600	506	300+W 2
500	50,...,600	606	300+W 2
600	50,...,600	706	300+W 2

Part Numbering System						Selection Guide	
PG	1	B	20	- 4	HX	30	20 M
Material	Series	Style	Width	Side Height	Fitting Type	Angel	Radius
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600	
						Side heigh (mm) : 40 , 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Cross (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B2 30 - 6 HX 90 20 M**

(HX) :Horizontal Cross (Angular)	(HX) :Horizontal Cross (Compass)
 <p>HX Series:B1</p>	 <p>HX Series:B2</p>
 <p>HX Series:C1</p>	 <p>HX Series:C2</p>



Horizontal Cross Dimension										
Width m m	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
50	470	470	670	670	-	-	-	-	-	-
100	520	520	720	720	-	-	-	-	-	-
150	570	570	770	770	-	-	-	-	-	-
200	620	620	820	820	1020	1020	-	-	-	-
300	720	720	920	920	1120	1120	1320	1320	-	-
400	820	820	1020	1020	1220	1220	1420	1420	1620	1620
500	920	920	1120	1120	1320	1320	1520	1520	1720	1720
600	1020	1020	1220	1220	1420	1420	1620	1620	1820	1820

Cable Tray

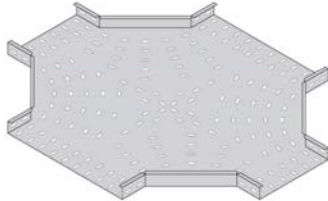

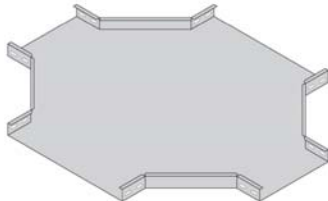
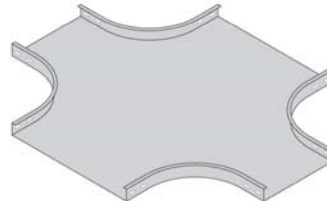
Horizontal Expanding Cross (EX)

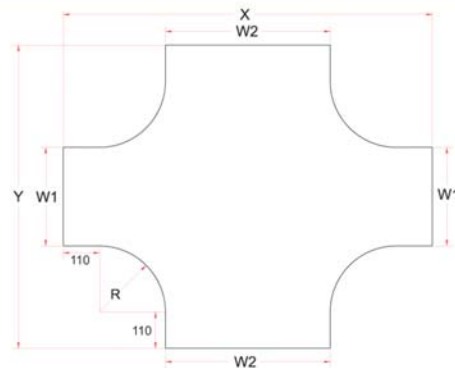
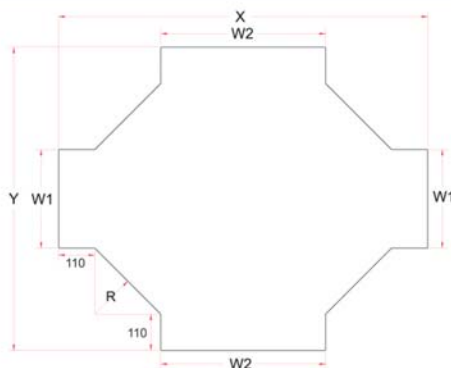
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Part Numbering System						Selection Guide	
PG	1	B	20	- 4	EX	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600	
						Side height (mm) : 40 , 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Tray Horizontal Expanding Cross (Six fold : Style 3), nominal width 300 mm
Expand To 500mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B2 30 - 6 EX 90 20 M**




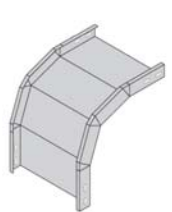
(EX) :Horizontal Expanding Cross (Angular)	(EX) :Horizontal Expanding Cross (Compass)
 <p>EX Series:B1</p>	 <p>EX Series:B2</p>
 <p>EX Series:C1</p>	 <p>EX Series:C2</p>

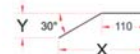
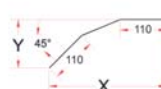
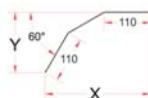
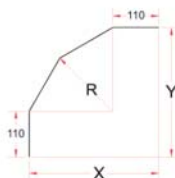


Horizontal Expanding Cross Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
50	100,...,600	420+W2	470	620+W2	670	-	-	-	-	-	-
100	150,...,600	420+W2	520	620+W2	720	-	-	-	-	-	-
150	200,...,600	420+W2	570	620+W2	770	-	-	-	-	-	-
200	300,...,600	420+W2	620	620+W2	820	820+W2	1020	-	-	-	-
300	400,...,600	420+W2	720	620+W2	920	820+W2	1120	1020+W2	1320	-	-
400	500,600	420+W2	820	620+W2	1020	820+W2	1220	1020+W2	1420	1220+W2	1620
500	600	1020	920	1220	1120	1420	1320	1620	1520	1820	1720

Part Numbering System						Selection Guide	
PG	1	B	20	- 4	VO	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600	
						Side height (mm) : 40 , 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Tray Vertical Bend Outside 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B2 30 - 6 VO 90 20 M**

(VO) :Vertical Bend Outside (flexible 0-90°)	(VO) :Vertical Bend Outside (30°- 45°- 60°- 90°)
 <p>VO Series:B1</p>	 <p>VO Series:B2</p>
 <p>VO Series:C1</p>	 <p>VO Series:C2</p>



Vertical Bend Outside Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
50	210	210	310	310	-	-	-	-	-	-
100	210	210	310	310	-	-	-	-	-	-
150	210	210	310	310	-	-	-	-	-	-
200	210	210	310	310	410	410	-	-	-	-
300	210	210	310	310	410	410	510	510	-	-
400	210	210	310	310	410	410	510	510	610	610
500	210	210	310	310	410	410	510	510	610	610
600	210	210	310	310	410	410	510	510	610	610

Vertical Bend Outside 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
50 ,... ,600	30°	212	60
50 ,... ,600	45°	280	116
50 ,... ,600	60°	252	145

Cable Tray

Vertical Bend Inside (VI)

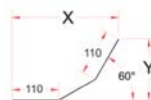
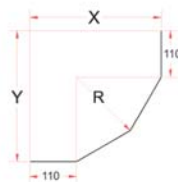
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Part Numbering System						Selection Guide	
PG	1	B	20	- 4	VI	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
						Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600	
						Side height (mm) : 40 , 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Tray Vertical Bend Inside 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B2 30 - 6 VI 90 20 M**

(VI) : Vertical Bend Inside (Adjustable 0-90°)	(VI) : Vertical Bend Inside (30°- 45°- 60°- 90°)
<p>VI Series:B1</p>	<p>VI Series:B2</p>
<p>VI Series:C1</p>	<p>VI Series:C2</p>



Vertical Bend Inside Dimension											
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm		
W	X	Y	X	Y	X	Y	X	Y	X	Y	
50	210	210	310	310	-	-	-	-	-	-	
100	210	210	310	310	-	-	-	-	-	-	
150	210	210	310	310	-	-	-	-	-	-	
200	210	210	310	310	410	410	-	-	-	-	
300	210	210	310	310	410	410	510	510	-	-	
400	210	210	310	310	410	410	510	510	610	610	
500	210	210	310	310	410	410	510	510	610	610	
600	210	210	310	310	410	410	510	510	610	610	

Vertical Bend Inside 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
50 ,..., 600	30°	212	60
50 ,..., 600	45°	280	116
50 ,..., 600	60°	252	145

Cable Tray


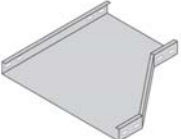
Reducer (HSR , HLR , HRR)

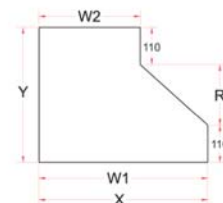
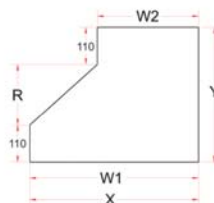
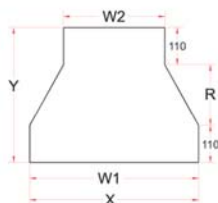
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Part Numbering System								Selection Guide	
PG	1	B	20	- 4	HSR	30	20	M	
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius	Material Thickness	
									Width (mm) : 50 , 100 , 150 , 200 , 300 , 400 , 500 , 600
									Side heigh (mm) : 40 , 60 , 80 , 100 , 150
									Angel (deg) : 30° , 45° , 60° , 90°
									Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600

Example for order : Pre Galvanized All Perforated Cable Tray Straight Reducer (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 3 B 30 - 6 HSR 90 20 M**

Straight Reducer	Offset Reducer -Right	Offset Reducer - Left
 <p>HSR Series:B1</p>	 <p>HRR Series:B1</p>	 <p>HLR Series:B1</p>
 <p>HSR Series:C1</p>	 <p>HRR Series:C1</p>	 <p>HLR Series:C1</p>

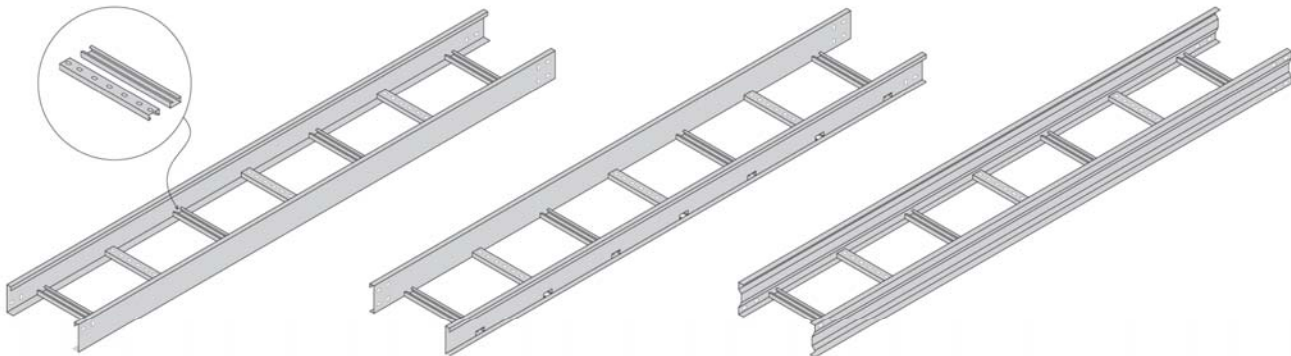
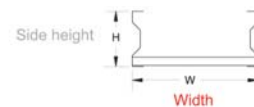


Horizontal Reducer Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
150	100	W1	320	W1	420	-	-	-	-	-	-
200	100,...,150	W1	320	W1	420	W1	520	-	-	-	-
300	100,...,200	W1	320	W1	420	W1	520	W1	620	-	-
400	100,...,300	W1	320	W1	420	W1	520	W1	620	W1	720
500	100,...,400	W1	320	W1	420	W1	520	W1	620	W1	720
600	100,...,500	W1	320	W1	420	W1	520	W1	620	W1	720

PG 1 L 20 - 4 M 20




Material Style Series Width Side height Material thickness Length

Material	PG = Pre-Galvanized , HG = Hot Dip Galvanized after fabrication SS = Stainless Steel , AL = Aluminum
Style	  
Series	L = Straight Cable Ladder
Width	10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm , 40 = 400mm 50 = 500mm , 60 = 600mm , 75 = 750mm , 90 = 900mm
Side height	4 = 40 mm , 6 = 60mm , 8 = 80mm , 10 = 100mm , 15 = 150mm
Material thickness	K = 1mm , L = 1.25mm , M = 1.5mm , N = 2mm
Length	20 = 2000mm , 25 = 2500mm , 30 = 3000mm



FITTING NUMBER SELECTION FOR CABLE LADDER



Material	PG = Pre-Galvanized , HG = Hot Dip Galvanized after fabrication SS = Stainless Steel , AL = Aluminum
Style	  
Series	L1 = Angular L2 = Compass
Width	10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm , 40 = 400mm 50 = 500mm , 60 = 600mm , 75 = 750mm , 90 = 900mm
Side height	6 = 60mm , 8 = 80mm , 10 = 100mm , 15 = 150mm
Fitting type	HB = Horizontal Bend , HT = Horizontal Tee , HX = Horizontal Cross , VI = Vertical Inside Bend , VO = Vertical Outside Bend , HYR = Horizontal Wye Right , HYL = Horizontal Wye Left , RT = Horizontal Reducing Tee , ET = Horizontal Expanding Tee , EX = Horizontal Expand Cross , HLR = Horizontal Left Reducer , HSR = Horizontal Straight Reducer , HRR = Horizontal Right Reducer , VTU = Vertical Tee Up , VTD = Vertical Tee Down
Angel	30 = 30° , 45 = 45° , 60 = 60° , 90 = 90°
Radius	10 = 100mm , 15 = 150mm , 20 = 200mm , 30 = 300mm , 40 = 400mm , 50 = 500mm , 60 = 600mm
Material thickness	K = 1mm , L = 1.25mm , M = 1.5mm , N = 2mm

Cable Ladder

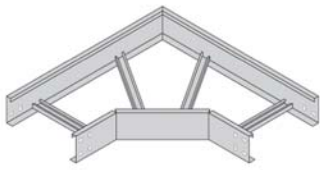

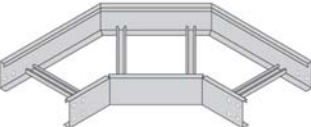
Horizontal Bend (HB)

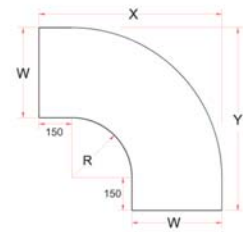
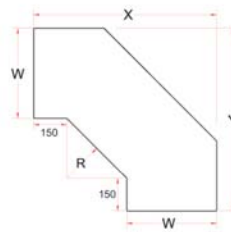
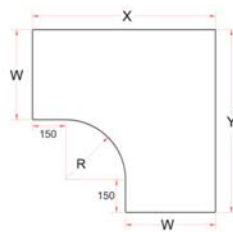
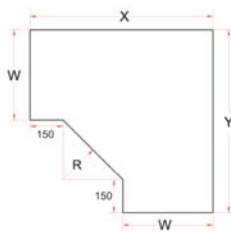
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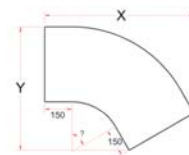
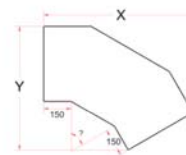
Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
						Side height (mm) : 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Bend 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 HB 90 20 M**

(HB) :Horizontal Bend (Angular)	(HB) :Horizontal Bend (Compass)
 <p>HB Series:L1</p>	 <p>HB Series:L2</p>
 <p>HB Series:L11</p>	 <p>HB Series:L21</p>



Horizontal Bend 90° Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
100	350	350	450	450	-	-	-	-	-	-
150	400	400	500	500	600	600	-	-	-	-
200	450	450	550	550	650	650	-	-	-	-
300	550	550	650	650	750	750	850	850	-	-
400	550	550	750	750	850	850	950	950	1050	1050
500	750	750	850	850	950	950	1050	1050	1150	1150
600	850	850	950	950	1050	1050	1150	1150	1250	1250



Horizontal Bend 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
100 ,..., 600	30°	376+W(0.5)	101+W
100 ,..., 600	45°	440+W(0.7)	183+W
100 ,..., 600	60°	398+W(0.86)	230+W

Cable Ladder Horizontal Tee (HT)

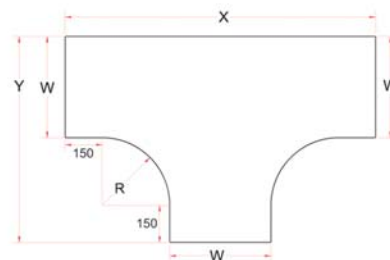
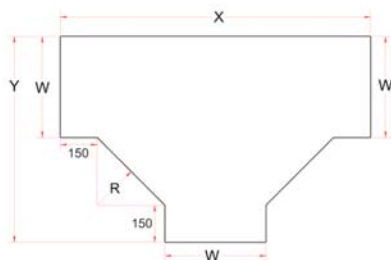
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Part Numbering System						Selection Guide			
PG	1	L1	20	-	6	HB	30	20	M
Material	Style	Series	Width	Side Height	Fitting Type	Radius	Angel	Material Thickness	
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900			
						Side heigh (mm) : 60 , 80 , 100 , 150			
						Angel (deg) : 30° , 45° , 60° , 90°			
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600			

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 HT 90 20 M**

(HT) :Horizontal Cross (Angular)	(HT) :Horizontal Cross (Compass)
<p>HT Series:L1</p>	<p>HT Series:L2</p>



Horizontal Tee Dimension											
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm		
W	X	Y	X	Y	X	Y	X	Y	X	Y	
50	470	260	670	360	-	-	-	-	-	-	-
100	520	310	720	410	-	-	-	-	-	-	-
150	570	360	770	460	-	-	-	-	-	-	-
200	620	410	820	510	1020	610	-	-	-	-	-
300	720	510	920	610	1120	710	1320	810	-	-	-
400	820	610	1020	710	1220	810	1420	910	1620	1010	-
500	920	710	1120	810	1320	910	1520	1010	1720	1110	-
600	1020	810	1220	910	1420	1010	1620	1110	1820	1210	-

Cable Ladder

Horizontal Reducing Tee (RT)

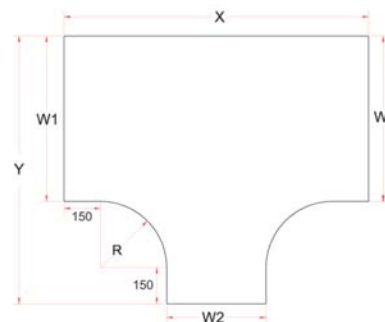
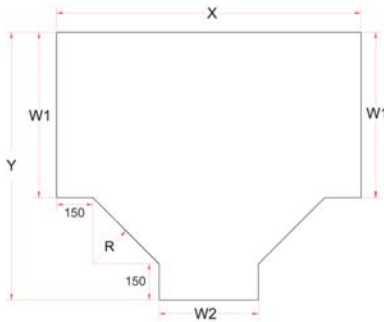
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Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
						Side height (mm) : 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Reducing Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 RT 90 20 M**

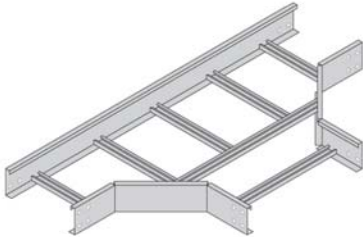
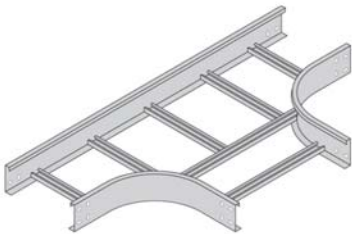
(RT) :Horizontal Reducing Tee (Angular)	(RT) :Horizontal Reducing Tee (Compass)
<p>RT Series:L1</p>	<p>RT Series:L2</p>

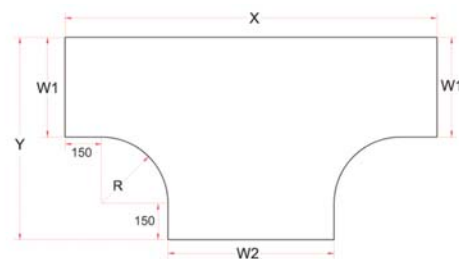
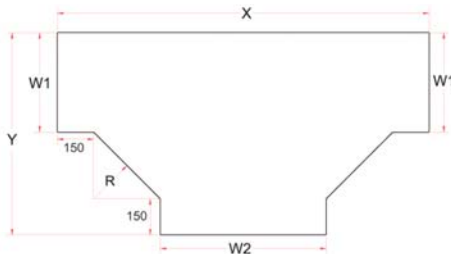


Horizontal Reducing Tee Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
150	100	500+W2	400	700+W2	500	-	-	-	-	-	-
200	100,...,150	500+W2	450	700+W2	550	900+W2	650	-	-	-	-
300	100,...,200	500+W2	550	700+W2	650	900+W2	750	1100+W2	850	-	-
400	100,...,300	500+W2	650	700+W2	750	900+W2	850	1100+W2	950	1300+W2	1050
500	100,...,400	500+W2	750	700+W2	850	900+W2	950	1100+W2	1050	1300+W2	1150
600	100,...,500	500+W2	850	700+W2	950	900+W2	1050	1100+W2	1150	1300+W2	1250

Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
						Side height (mm) : 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Expanding Tee (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 ET 90 20 M**

(ET) :Horizontal Expanding Tee (Angular)	(ET) :Horizontal Expanding Tee (Compass)
 <p>ET Series:L1</p>	 <p>ET Series:L2</p>



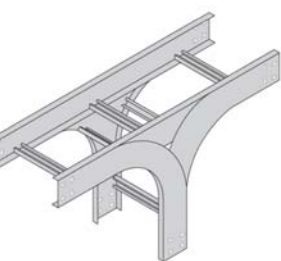
Horizontal Expanding Tee Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
100	150,...,600	500+W2	350	700+W2	450	-	-	-	-	-	-
150	200,...,600	500+W2	400	700+W2	500	-	-	-	-	-	-
200	300,...,600	500+W2	450	700+W2	550	900+W2	650	-	-	-	-
300	400,...,600	500+W2	550	700+W2	650	900+W2	750	1100+W2	850	-	-
400	500,600	500+W2	650	700+W2	750	900+W2	850	1100+W2	950	1300+W2	1050
500	600	1100	750	1300	850	900+W2	950	1700	1050	1900	1150

(VTD, VTU)

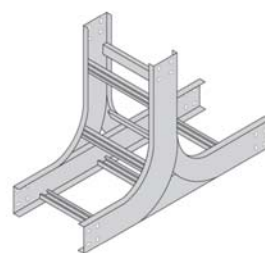
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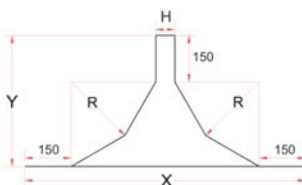
height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = PG 2 L2 30 - 6 VTU 90 20 M



VTD
Series:L2



VTU
Series:L2

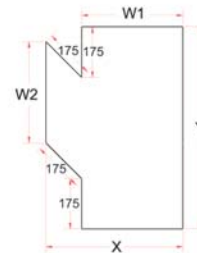
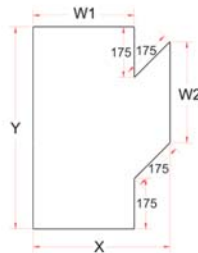


Horizontal Tee Up&Down Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
100	500+H	250	700+H	350	-	-	-	-	-	-
150	500+H	250	700+H	350	-	-	-	-	-	-
200	500+H	250	700+H	350	900+H	450	-	-	-	-
300	500+H	250	700+H	350	900+H	450	1100+H	550	-	-
400	500+H	250	700+H	350	900+H	450	1100+H	550	1300+H	650
500	500+H	250	700+H	350	900+H	450	1100+H	550	1300+H	650
600	500+H	250	700+H	350	900+H	450	1100+H	550	1300+H	650

Part Numbering System						Selection Guide		
PG	1	L1	20	- 6	HB	30	20	M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius	Material Thickness
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900		
						Side heigh (mm) : 60 , 80 , 100 , 150		
						Angel (deg) : 30° , 45° , 60° , 90°		
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600		

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Way 45° left hand (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 HYL 90 20 M**

(HYL) Left Hand Wye 45°	(HYR) Right Hand Wye 45°
 <p>HYL Series:L1</p>	 <p>HYR Series:L1</p>



Horizontal Wye 45°			
Width mm		Dimension mm	
W 1	W 2	X	Y
100	50 ,... ,600	224	300+W 2
150	50 ,... ,600	274	300+W 2
200	50 ,... ,600	324	300+W 2
300	50 ,... ,600	424	300+W 2
400	50 ,... ,600	524	300+W 2
500	50 ,... ,600	624	300+W 2
600	50 ,... ,600	724	300+W 2

Cable Ladder

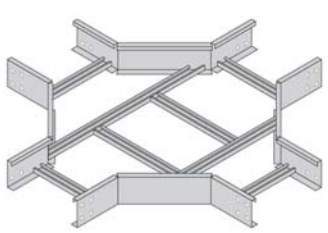
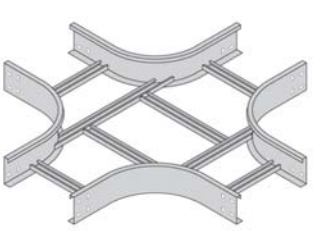
Horizontal Cross (HX)

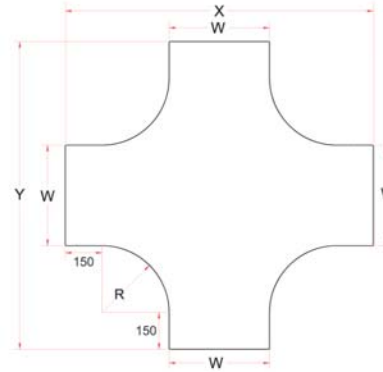
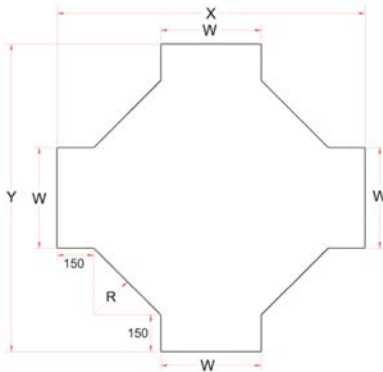
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Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Angel (deg) : 30°, 45°, 60°, 90°	Radius (mm) : 100, 150, 200, 300, 400, 500, 600

Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Cross (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 HX 90 20 M**

(HX) :Horizontal Cross (Angular)	(HX) :Horizontal Cross (Compass)
 <p>HX Series:L1</p>	 <p>HX Series:L2</p>

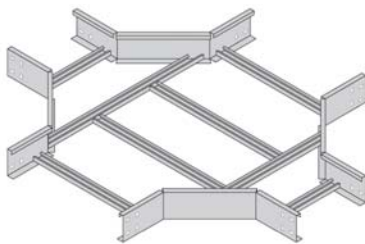


Horizontal Cross Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
100	600	600	800	800	-	-	-	-	-	-
150	650	650	850	850	-	-	-	-	-	-
200	700	700	900	900	1100	1100	-	-	-	-
300	800	800	1000	1000	1200	1200	1400	1400	-	-
400	900	900	1100	1100	1300	1300	1500	1500	1700	1700
500	1000	1000	1200	1200	1400	1400	1600	1600	1800	1800
600	1100	1100	1300	1300	1500	1500	1700	1700	1900	1900

Part Numbering System										Selection Guide	
PG	1	L1	20	-	6	HB	30	20	M		
Material		Series	Width	Side Height		Fitting Type	Angel		Material Thickness		
	Style										
										Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
										Side height (mm) : 60 , 80 , 100 , 150	
										Angel (deg) : 30° , 45° , 60° , 90°	
										Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

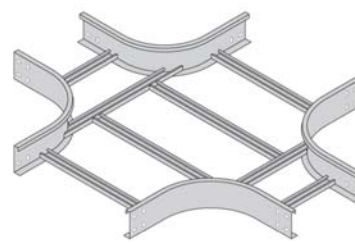
Example for order : Pre Galvanized All Perforated Cable Ladder Horizontal Expanding Cross (Six fold : Style 3), nominal width 300 mm Expand To 500mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 EX 90 20 M**

(EX) :Horizontal Expanding Cross (Angular)

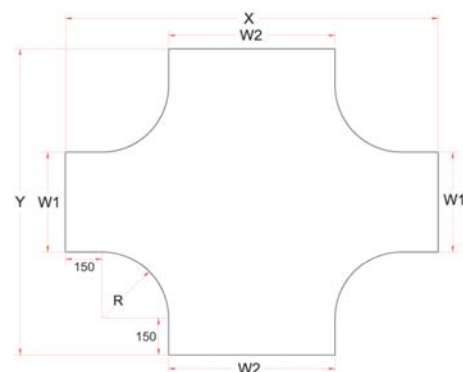
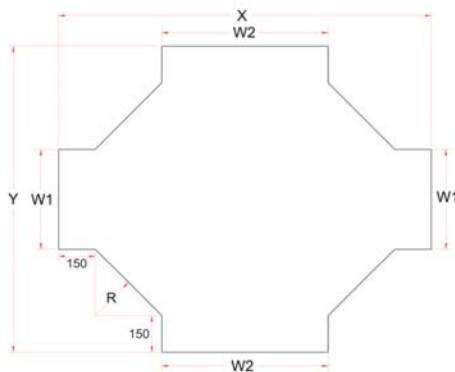


EX
Series:L1

(EX) :Horizontal Expanding Cross (Compass)



EX
Series:L2



Horizontal Expanding Cross Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
100	150,...,600	500+W2	520	700+W2	720	-	-	-	-	-	-
150	200,...,600	500+W2	570	700+W2	770	-	-	-	-	-	-
200	300,...,600	500+W2	620	700+W2	820	900+W2	1020	-	-	-	-
300	400,...,600	500+W2	720	700+W2	920	900+W2	1120	1100+W2	1320	-	-
400	500,600	500+W2	900	700+W2	1100	900+W2	1300	1100+W2	1500	1300+W2	1700
500	600	1100	1000	1300	1200	1500	1400	1700	1600	1900	1800

Cable Ladder Reducer (HSR , HLR , HRR)

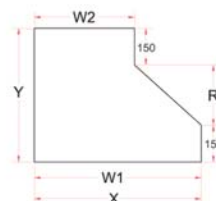
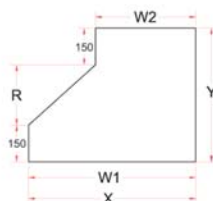
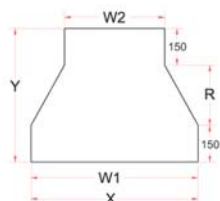
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Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Radius
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
						Side height (mm) : 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Ladder Straight Reducer (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 HSR 90 20 M**


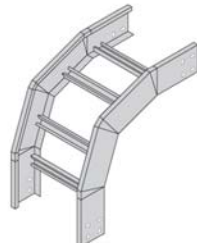
Straight Reducer	Offset Reducer -Right	Offset Reducer - Left
HSR Series:L1	HRR Series:L1	HLR Series:L1

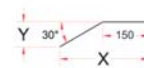
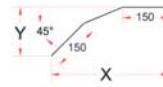
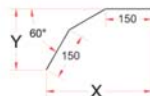
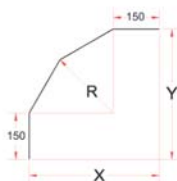


Horizontal Reducer Dimension											
Width mm		Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W1	W2	X	Y	X	Y	X	Y	X	Y	X	Y
150	100	W1	400	W1	500	-	-	-	-	-	-
200	100,...,150	W1	400	W1	500	W1	600	-	-	-	-
300	100,...,200	W1	400	W1	500	W1	600	W1	700	-	-
400	100,...,300	W1	400	W1	500	W1	600	W1	700	W1	800
500	100,...,400	W1	400	W1	500	W1	600	W1	700	W1	800
600	100,...,500	W1	400	W1	500	W1	600	W1	700	W1	800

Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
						Radius	

Example for order : Pre Galvanized All Perforated Cable Ladder Vertical Bend Outside 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 VO 90 20 M**

(VO) :Vertical Bend Outside (flexible 0-90°)	(VO) :Vertical Bend Outside (30°- 45°- 60°- 90°)
 <p>VO Series:L1</p>	 <p>VO Series:L2</p>



Vertical Bend Outside 90° Dimension									
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm
W	X	Y	X	Y	X	Y	X	Y	X
100	250	250	350	350	-	-	-	-	-
150	250	250	350	350	-	-	-	-	-
200	250	250	350	350	450	450	-	-	-
300	250	250	350	350	450	450	550	550	-
400	250	250	350	350	450	450	550	550	650
500	350	250	250	350	450	450	550	550	650
600	250	250	350	350	450	450	550	550	650

Vertical Bend Outside 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
100 ,..., 600	30°	290	60
100 ,..., 600	45°	360	116
100 ,..., 600	60°	330	145

Cable Ladder

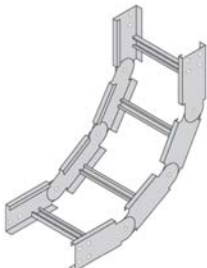
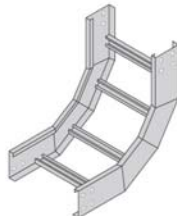
Vertical Bend Inside (VI)

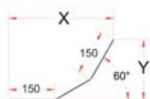
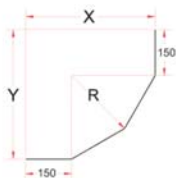
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Part Numbering System						Selection Guide	
PG	1	L1	20	- 6	HB	30	20 M
Material	Style	Series	Width	Side Height	Fitting Type	Angel	Material Thickness
						Width (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600 , 750 , 900	
						Side height (mm) : 60 , 80 , 100 , 150	
						Angel (deg) : 30° , 45° , 60° , 90°	
						Radius (mm) : 100 , 150 , 200 , 300 , 400 , 500 , 600	

Example for order : Pre Galvanized All Perforated Cable Ladder Vertical Bend Inside 90° (Six fold : Style 3), nominal width 300 mm , height for side members 60 mm , thickness of sheet 1.5 mm , Radius 200 mm = **PG 2 L1 30 - 6 VI 90 20 M**

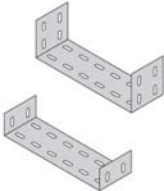
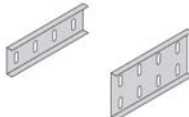
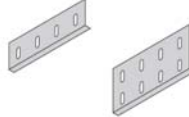
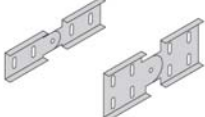
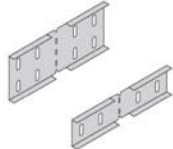
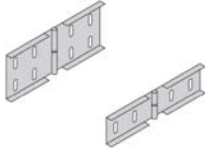

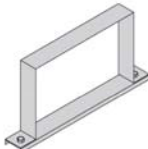

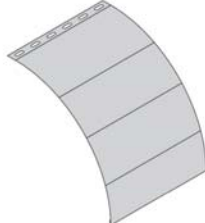
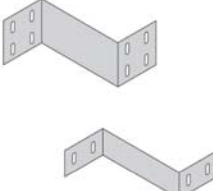
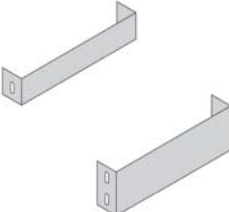
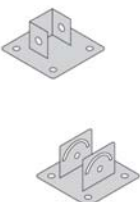
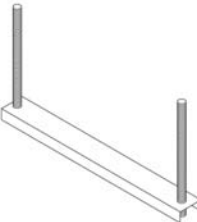
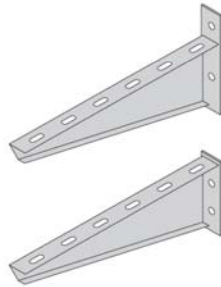
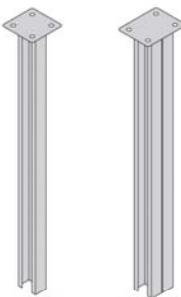
(VI) : Vertical Bend Inside (Adjustable 0-90°)	(VI) : Vertical Bend Inside (30°- 45°- 60°- 90°)
 <p>VI Series:L1</p>	 <p>VI Series:L2</p>



Vertical Bend Inside 90° Dimension										
Width mm	Radius 100mm		Radius 200mm		Radius 300mm		Radius 400mm		Radius 500mm	
W	X	Y	X	Y	X	Y	X	Y	X	Y
100	250	250	350	350	-	-	-	-	-	-
150	250	250	350	350	-	-	-	-	-	-
200	250	250	350	350	450	450	-	-	-	-
300	250	250	350	350	450	450	550	550	-	-
400	250	250	350	350	450	450	550	550	650	650
500	350	250	250	350	450	450	550	550	650	650
600	250	250	350	350	450	450	550	550	650	650

Vertical Bend Inside 30°, 45°, 60°			
Width mm	Dimension mm		
W	deg	X	Y
100 ,..., 600	30°	290	60
100 ,..., 600	45°	360	116
100 ,..., 600	60°	330	145

ACCESSORIES & SUPPORTS

			
U* SHAPE JOINTING	STRAIGHT JOINTING	STRAIGHT JOINTING	VERTICAL ADJUSTABLE JOINTING
			
HORIZONTAL ADJUSTABLE JOINTING	HORIZONTAL HINGED JOINTING	HOLD DOWN CLAMP	COVER CLAMP
			
STRAIGHT SEPARATOR	EXIT PLATE	REDUCER JOINTING	END PLATE
			
FLOOR BASE PLATE	HOLDER	BRACKET	BRACKET

A) Supporting Systems

This type of structure is used for installing brackets in different types and size of which varieties are as follows:

1- U Type Support

Order Code: UTS

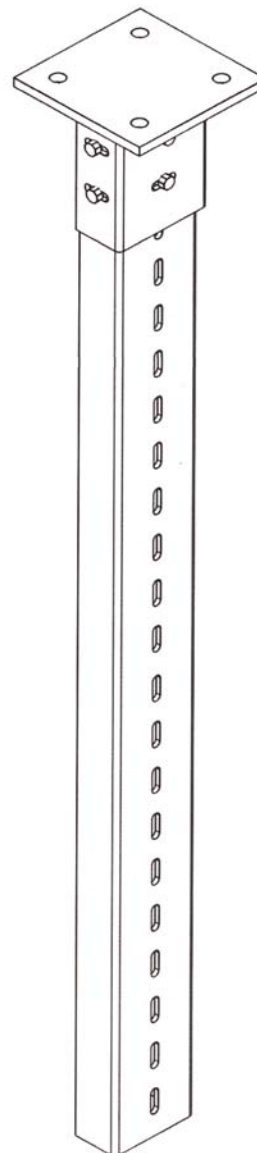
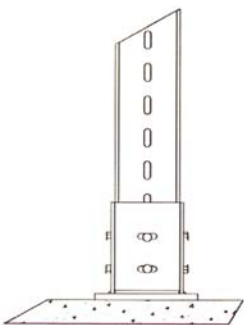
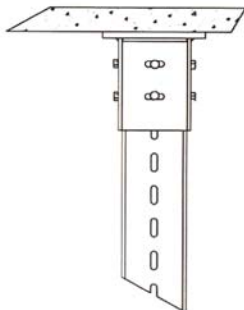
UNP Profile

Length: up to 3m

Thickness: (2.5-6)mm

Material: H.D.G (Hot Dip Galvanized)

N.G (Not galvanized)



2- H Type Support

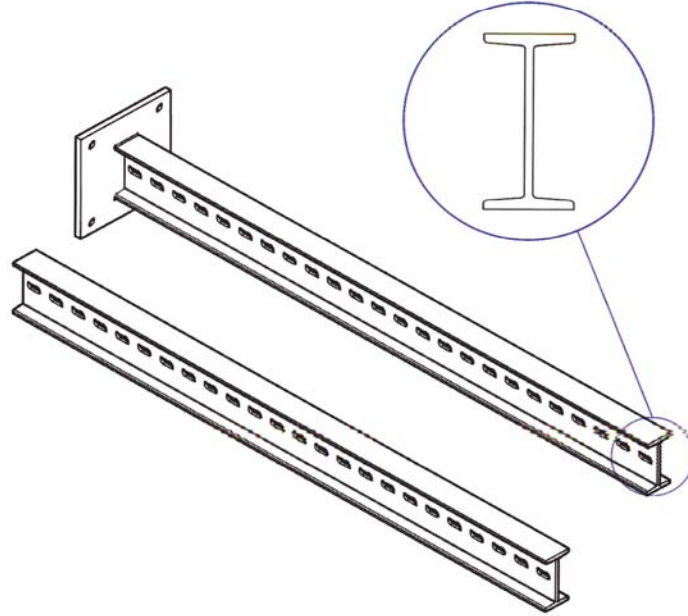
Order Code: HTS

H type profile 80-100-120...

Length: up to 3m

Material: H.D.G (Hot Dip Galvanized)

N.G (Not galvanized)



3- Clamp Type Support

Remarks: The foregoing support is only used for installing on wall.

Order code: CLTS

Length: up to 3m

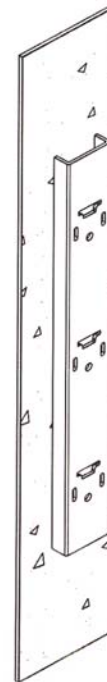
Width: only 90mm

Height: 25mm to 30mm

Thickness: 3mm to 5mm

Material: H.D.G (Hot Dip Galvanized)

N.G (Not galvanized)



4- C Type Support

Remarks: This type of structure may be made in various single and double types

Order Code: CTS

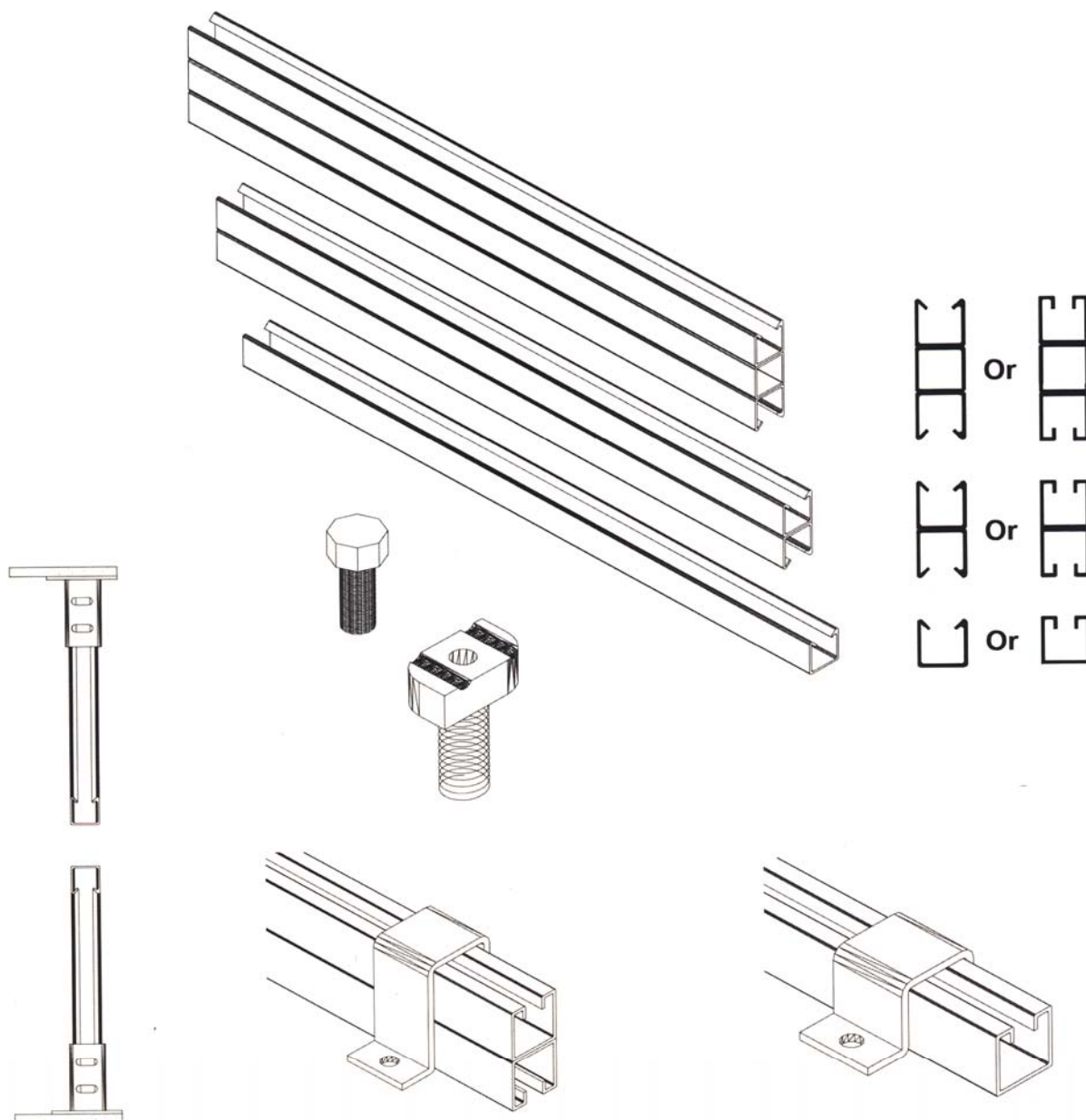
C Channel

Length: up to 3m

Thickness: 2.5mm

Material: H.D.G (Hot Dip Galvanized)

N.G (Not galvanized)



B- Bracket Systems

This type of structure, which is installed on the support and concrete walls and metal structures, is used for cable tray and cable ladder horizontally. It ought to be noted that in some cases this type of structure would have the capability of conducting and bracing cable.

1. Multi-Purposes Bracket

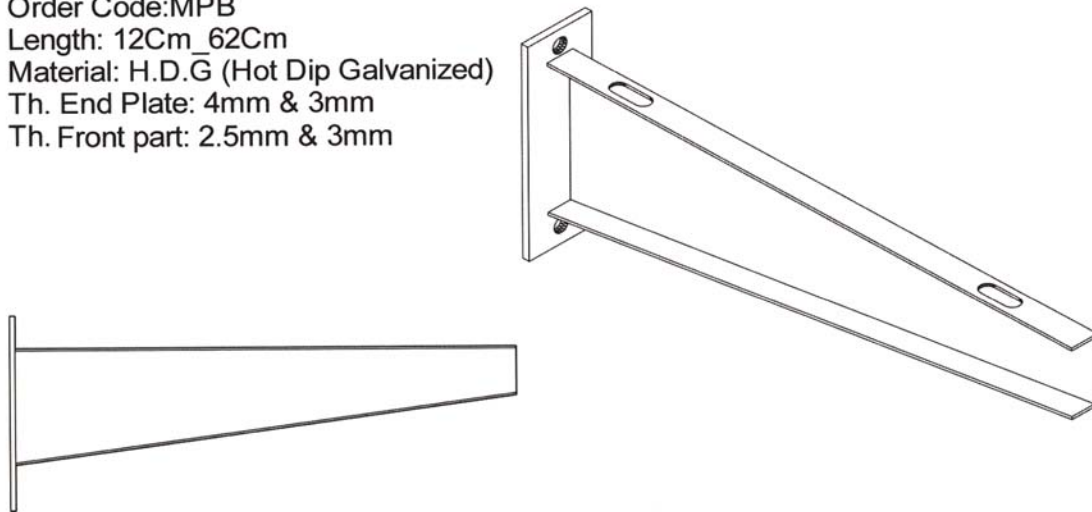
Order Code: MPB

Length: 12Cm_62Cm

Material: H.D.G (Hot Dip Galvanized)

Th. End Plate: 4mm & 3mm

Th. Front part: 2.5mm & 3mm



2. C Channel Bracket

This type of structure consists of two single and double forms, which is produced based on the type of request.

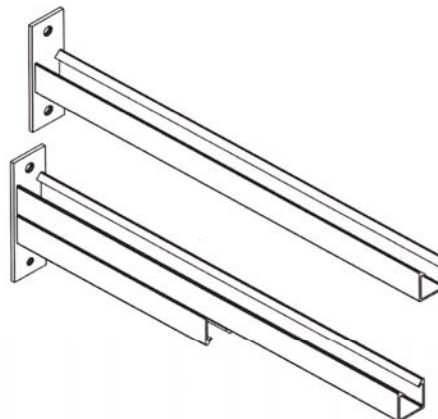
Order code: CHB

Length (Single): 10cm to 40cm

Length (Double): 40cm to 60cm

Th. End Plate: 4mm to 5mm

Th. C Channel: 2.5mm



3- Griping Bracket

This structure is only used for installation on Angle Support, H Type Support and UNP Support.

In certain Angle Support, clamshell bracket is used.

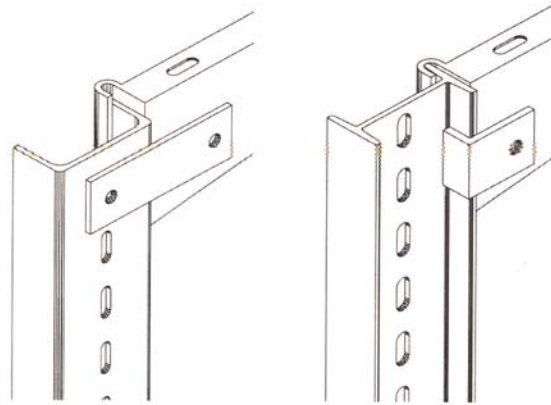
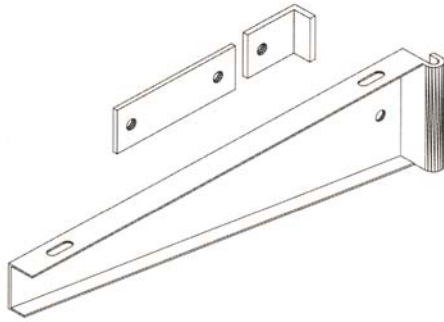
Order Code: GB

Length: 12Cm to 62 Cm

Material: H.D.G (Hot Dip Galvanized)

Th. End Plate: 4mm & 5mm

Th. Front Part: 2.5mm & 3mm



4- Clamp Bracket

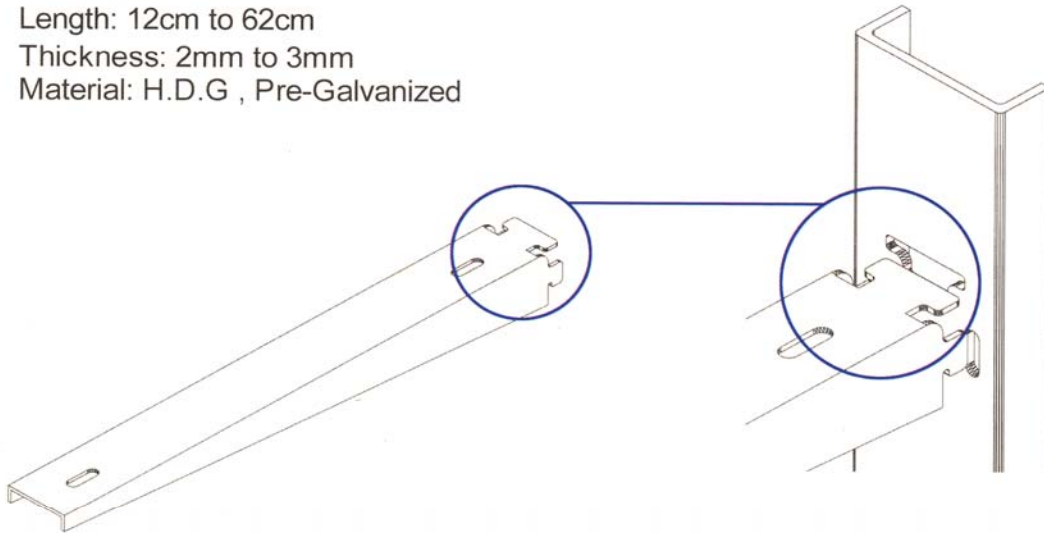
This structure is only used to be installed for clamp type support.

Order code: CB

Length: 12cm to 62cm

Thickness: 2mm to 3mm

Material: H.D.G , Pre-Galvanized



Cable Tray Type Selection

What type of cable tray should be used for the main runs of a cable tray wiring system? The cable tray types to choose from are ventilated trough, or solid bottom. What are the reasons for selecting a specific type of cable tray?

The engineer or designer should select the type of cable tray that has the features which best serve the project's requirements.

C) Ladder Cable Tray

Ladder cable tray is used for about 75 percent of the cable tray wiring system installations. It is the predominate cable tray type due to its many desirable features:

- A ladder cable tray without covers permits the maximum free flow of air across the cables. This allows the heat produced in the cable's conductors to effectively dissipate. Under such conditions, the conductor insulation in the cables of a properly designed cable tray wiring system will not exceed its maximum operating temperature. The cables will not prematurely age due to excessive operating temperatures.
- The rungs of the ladder cable trays provide convenient anchors for tying down the cables in the non-horizontal cable tray runs or where the positions of the cables must be maintained in the horizontal cable tray runs. This capability is a must for single conductor cable installations. Under fault conditions (short circuit), the magnetic forces produced by the fault current will force the single conductor cables from the cable tray if they are not securely anchored to the cable tray.
- Cables may exit or enter the ladder cable trays through the top or the bottom of the cable tray. Where the cables enter or exit conduit, the conduit to cable tray clamps may be installed upright or inverted to terminate conduits on the top or bottom of the cable tray side rail.
- Moisture can't accumulate in ladder cable trays.

If Cable trays are being installed where working space is a problem, hand access through the cable tray bottom may help to facilitate the installation of small diameter cables: control instrumentation, signal, etc.

- The most current spacing of the center to the center of staircase for ladder cable tray shall be 285mm in 2 meters branches, and 300mm for 3 meters branches. But, it does not mean that it is impossible to be more or less spaces.

1- Cable Ladder

Order code: CL

Length: up to 3m

Width: 100mm to 600mm

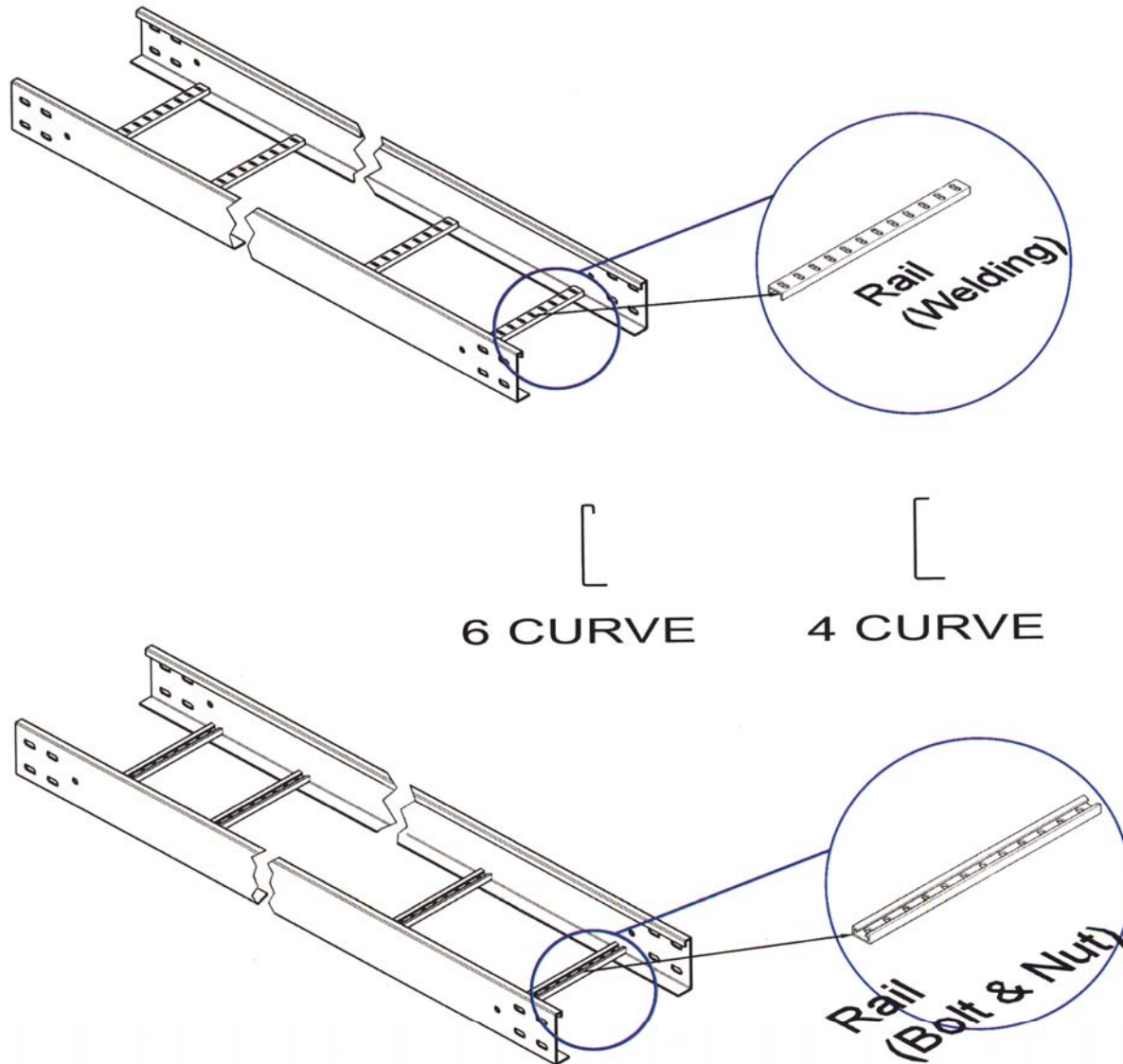
Height: 50mm to 100mm

Thickness: 1.5mm to 2.5mm

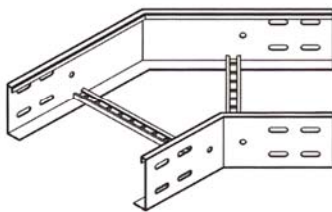
Material: pre galvanized carbon steel sheets

hot dip galvanized after fabrication

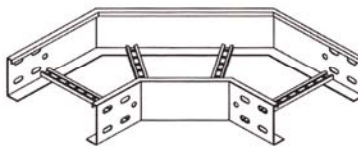
stainless steel sheets.



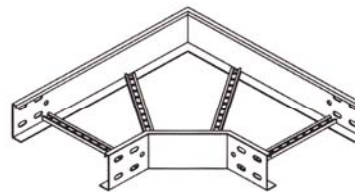
Accessories For Cable Ladder



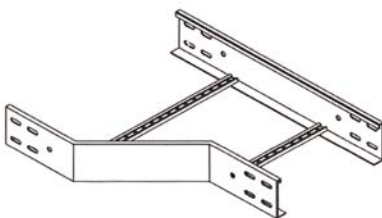
Horizontal Elbow 45°



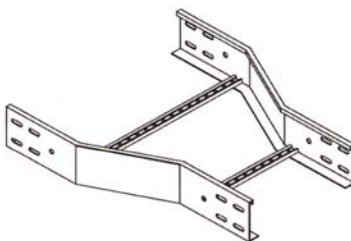
Horizontal Elbow 2x45



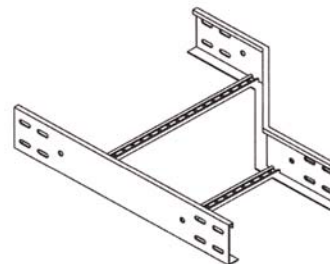
Horizontal Elbow 90°



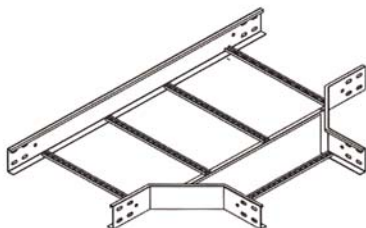
Left Hand Reducer



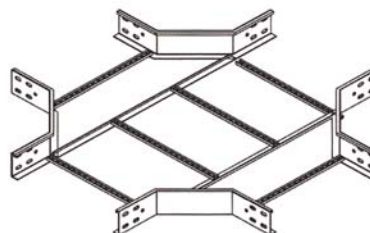
Straight Reducer



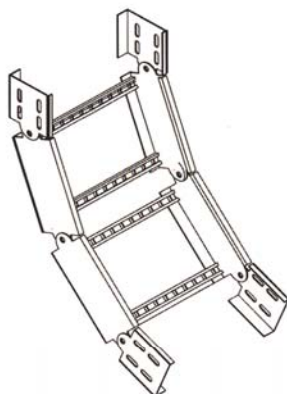
Right Hand Reducer



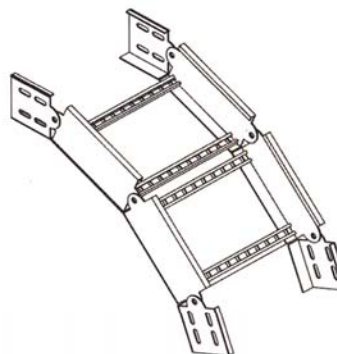
Horizontal Tee



Horizontal Cross

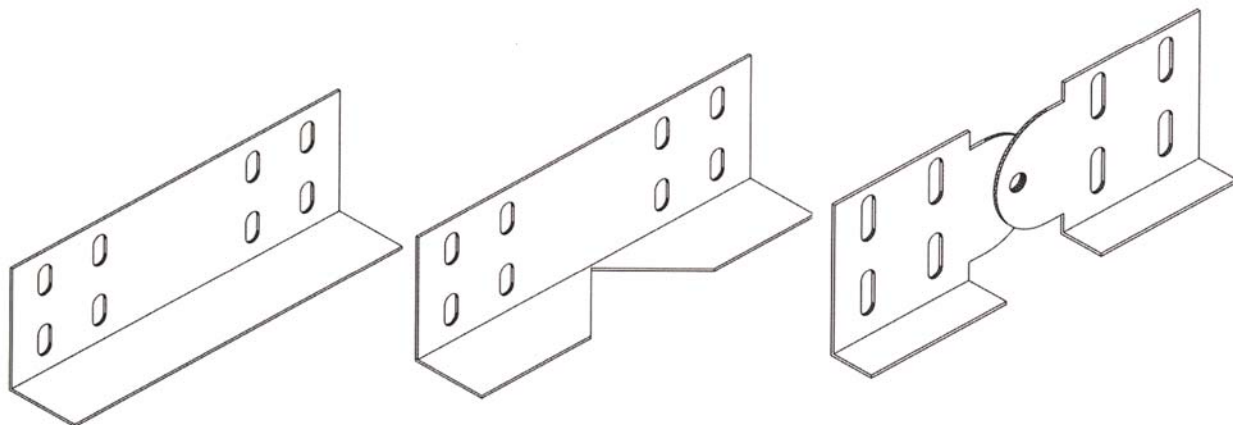


Vertical Inside Elbow

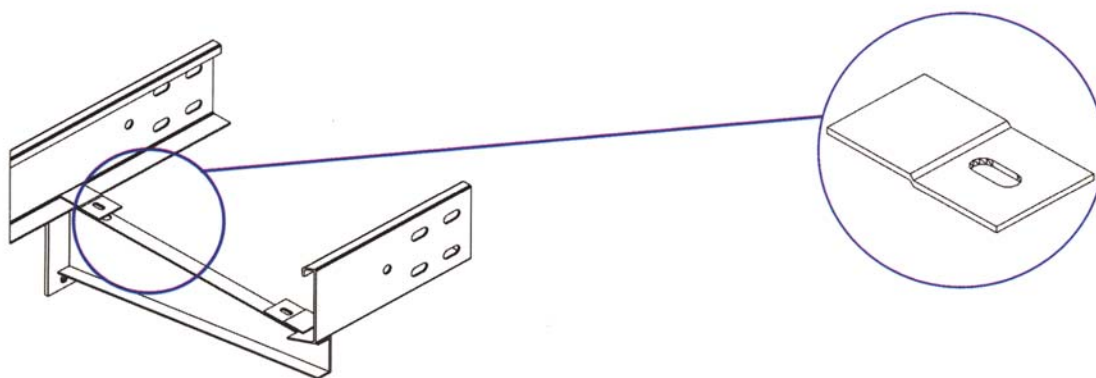


Vertical Outside Elbow

Joint



Hold Down Clamp



2- Cable Tray

Perforated Cable Tray

The only reason to select a perforated cable tray over a ladder type cable tray is aesthetics. No dropping of small cables is visible. The perforated cable tray does provide more support to the cables.

Solid Bottom Cable Tray

The main reason for selecting solid bottom cable tray (with covers) is the concern of EMI/RFI shielding protection for very sensitive circuits. A solid bottom steel cable tray with steel covers provides a good degree of shielding if there are no breaks or holes in the completed installation.

The solid bottom cable tray system has a disadvantage in that moisture can build up in the cable trays. This can be controlled by drilling oval punch (30 × 10) inch drain holes in the bottom of the cable tray at 400mm intervals (at the middle and very near the sides) if the cable tray is not being used for EMI/RFI shielding.

Some engineers and designers specify solid bottom cable trays (often with covers) in the belief that all electrical circuits have to be totally enclosed by metal. The cable trays are just supporting cables that are designed for such installations. Cable failures in cable tray runs rarely happen. Cable failures due to cable support problems in cable trays are nonexistent.

Perforated type or solid bottom Cable tray

Order code: PCT or SCT

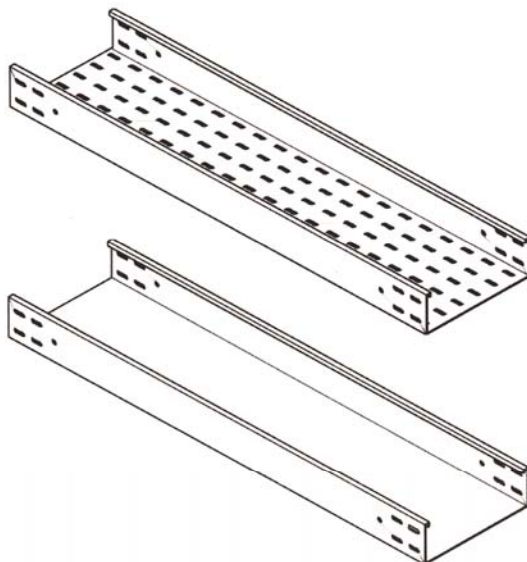
Length: up to 3m

Width: 100mm to 600mm

Height: 40mm to 100mm

Thickness: 1mm to 2.5mm

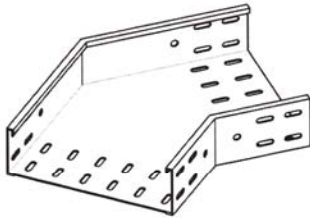
Material: pre galvanized carbon steel sheets
hot dip galvanized after fabrication
stainless steel sheets.



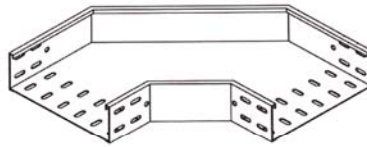
4 CURVE

6 CURVE

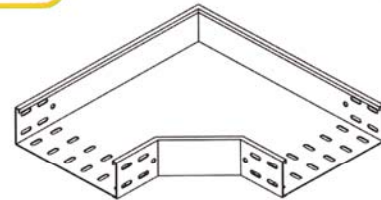
Accessories For Cable Tray



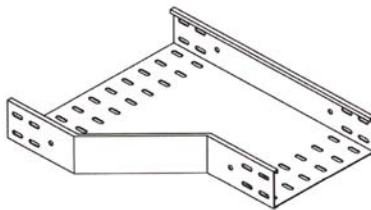
Horizontal Elbow 45°



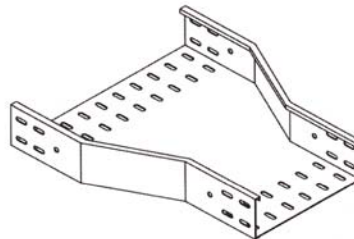
Horizontal Elbow 2 x 45°



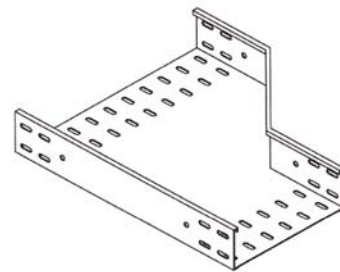
Horizontal Elbow 90°



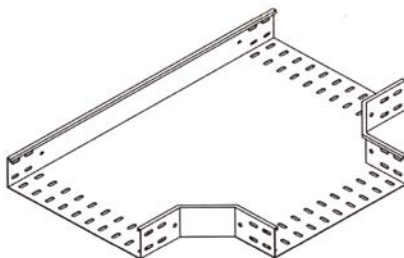
Left Hand Reducer



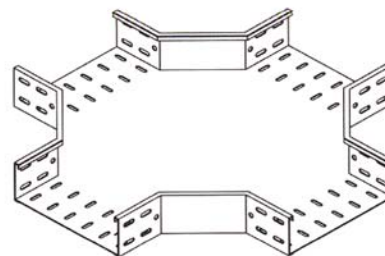
Straight Reducer



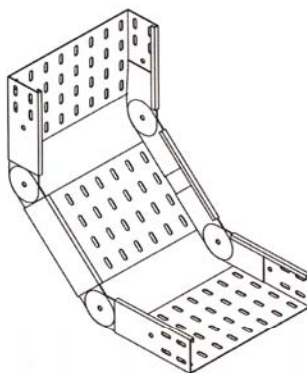
Right Hand Reducer



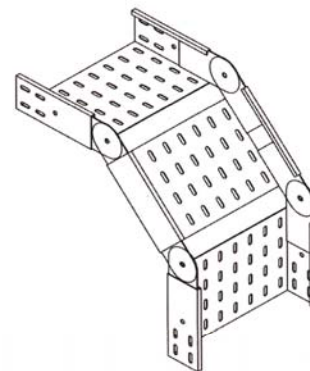
Horizontal Tee



Horizontal Cross



Vertical Elbow inside



Vertical Elbow outside

E) Cable Tray or Ladder Cover

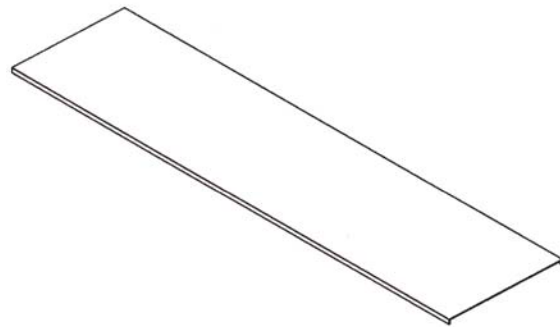
Caution in Using Cable Tray Covers Outdoors

Improperly secured covers on outdoor cable trays can cause a serious safety hazard in high winds. In the majority of cases, covers are not used on cable trays for technical or safety reasons, but due to the "raceway complex," a feeling by specifics that cables must be totally enclosed in metal. Quality tray cables have a life of 30 to 40 years without covers when exposed to the elements.

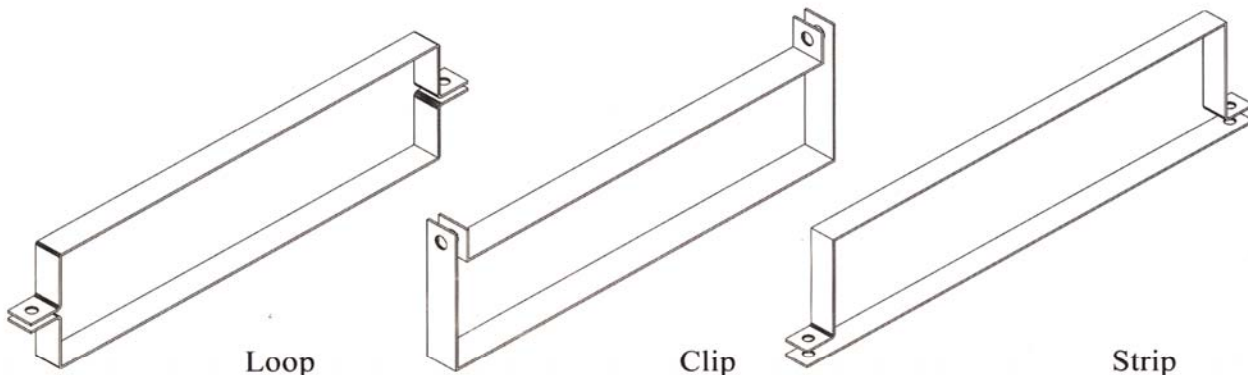
Cable tray wiring systems have a 30-year plus proven track record of safety and dependability. They are the best economic choice for commercial and industrial wiring systems.

Strong winds moving across outdoor cable trays with solid covers creates a negative pressure above the cable tray cover and a positive pressure inside the cable tray. This is the same aerodynamic phenomenon produced on aircraft wings to provide lift and maintenance of altitude. This pressure difference can lift covers off the cable tray if they are not properly clamped to the cable tray with heavy duty clamps.

Order Code: CO
Length: up to 3m
Width: 50mm to 600mm
Height: 15mm
Thickness: 1mm to 2mm
Material: pre galvanized carbon steel sheets
hot dip galvanized after fabrication
stainless steel sheets.



Cover Clamp

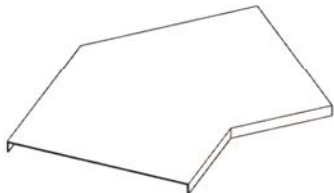


Order Code: CCL

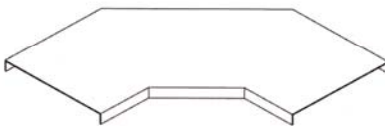
Order Code: CCC

Order Code: CCS

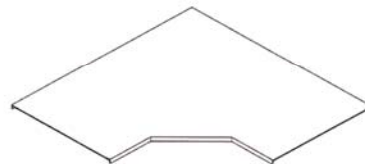
Cover For Accessories Cable Tray Or Ladder



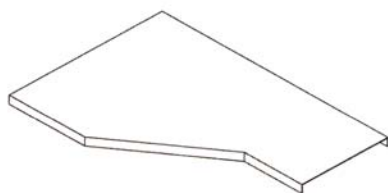
Cover Elbow 45°



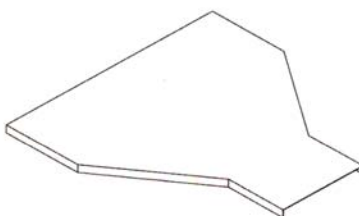
Cover Elbow 2x45°



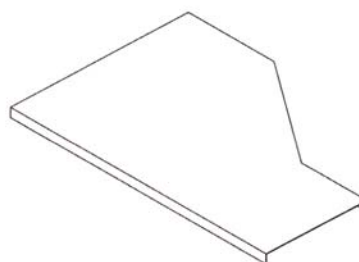
Cover Elbow 90°



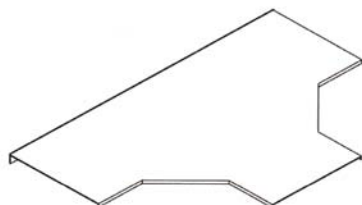
Cover Left Reducer



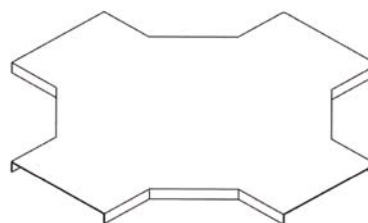
Cover Stright Reducer



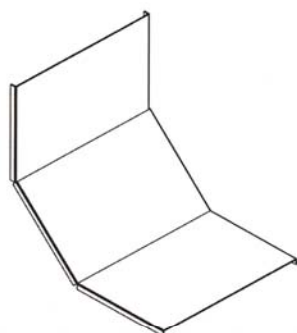
Cover Right Reducer



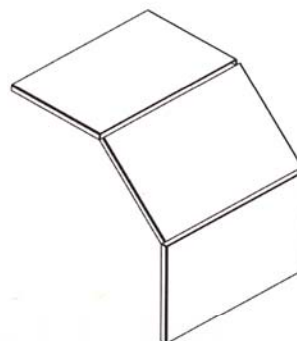
Tee Cover



Cross Cover



Vertical Elbow inside cover



Vertical Elbow outside cover

CABLE TRAY

Cable trays are designed and manufactured to ensure ease during installation. Products are in 2 meter and 3 meter lengths as standard and offered in six different type of section, i.e. , plain , outside returned flange, inside returned flange ,90 deg. inside flange, 90 deg. outside flange and safety returned flange. The sections and its matching fittings are available in standard mill galvanized finish (BS 2989) and hot dip galvanized after fabrication finish (BS 729) and stainless steel (316L,304). Materials and finishes are also available to suit customer's requirements. Below are cable tray ordering guides.

ORDERED BY CATALOG NUMBER

T S / 4I -2 2 1 06

GENERAL TYPE ——— WIDTH
 ——— SIDE HEIGHT
 ——— MATERIAL THICKNESS
 PART NUMBER ———
 FLANGE TYPE ——— LENGTH / RADIUS

SPECIFICATIONS

LENGTH/RADIUS:

STRAIGHT SECTION

2=2000mm
3=3000mm

RADIUS:

3=300mm
6=600mm

SIDE HEIGHTS:

1=100mm
4=40mm
5=50mm
6=60mm
7=70mm
8=80mm
9=90mm

MATERIAL THICKNESS

1=1mm
2=1.5mm
3=2mm
4=2.5mm

WIDTH:

01=100mm	09=900mm
02=200mm	10=1000mm
03=300mm	11=50mm
04=400mm	12=150mm
05=500mm	13=250mm
06=600mm	14=450mm
07=700mm	15=750mm
08=800mm	16=CUSTOM SIZE



PLAIN TYPE - 2I



90° INSIDE FLANGE - 4I



INSIDE RETURN FLANGE - 6I



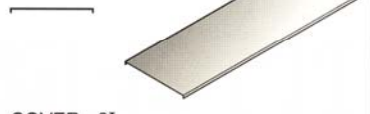
90° OUTSIDE FLANGE - 40



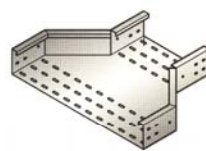
OUTSIDE RETURN FLANGE - 60



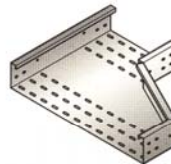
SAFETY RETURN FLANGE - SI



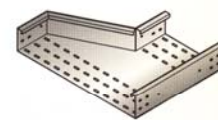
COVER - 2I



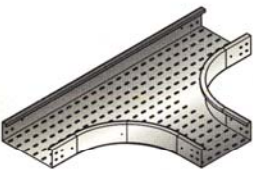
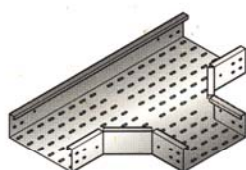
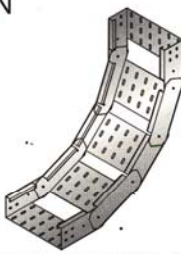
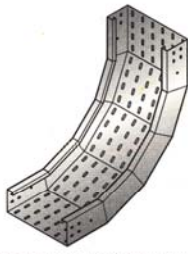
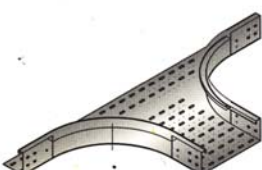
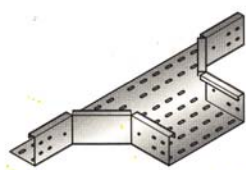
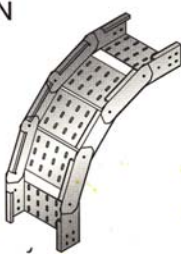
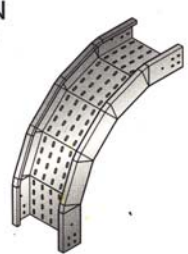
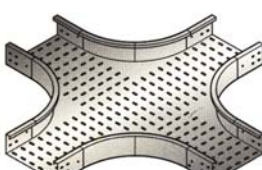
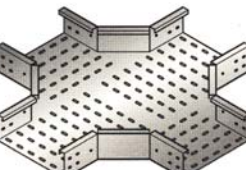
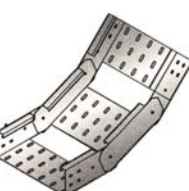
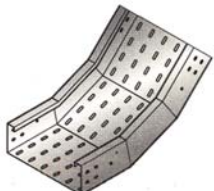






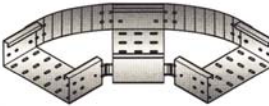


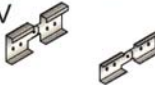


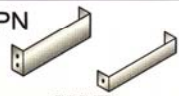
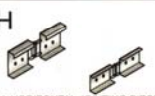





STRAIGHT REDUCER




LEFTHAND REDUCER




RIGHTHAND REDUCER

TEC  HORIZONTAL TEE (R300)	TE  HORIZONTAL TEE	EAN  90° INSIDE ADJ. VER. ELBOW	EIN  90° INSIDE VERTICAL ELBOW
TBC  BRANCH TEE (R300)	TB  BRANCH TEE	EAN  90° OUTSIDE ADJ. VER. ELBOW	EON  90° OUTSIDE VERTICAL ELBOW
CEC  HORIZONTAL CROSS (R300)	CE  HORIZONTAL CROSS	EAF  45° INSIDE ADJ. VER. ELBOW	EIF  45° INSIDE VERTICAL ELBOW
BNC  90° HOR. ELBOW (R300)	BN  90° HOR. L ELBOW	EAF  45° OUTSIDE ADJ. VER ELBOW	EOF  45° OUTSIDE VERTICAL ELBOW
BFC  30°&45° HOR. ELBOW (R300)	BF BT  30°&45° HOR. ELBOW	BA  90° ADJ. HOR. ELBOW	WS  STRAIGHT SEPARATOR
JS  STRAIGHT JOINTING PIECE	JV  ADJ. VERTICAL JOINTING PIECE	JU  "U" SHAPE JOINTING PIECE	JUR  "U" SHAPE REDUCER JOINTING PIECE
PN  END PLATE	JH  ADJ. HORIZONTAL JOINTING PIECE	JF  FISH PLATE	JR  REDUCER JOINTING PIECE
		KH  HOLD DOWN CLAMP	PE  EXIT PLATE
		KC  COVER CLAMP	


FLANGE TYPE-S




90° INSIDE FLANGE - 4I




INSIDE RETURN FLANGE - 6I




OUTSIDE RETURN FLANGE - 6O




90° OUTSIDE FLANGE - 4O




OUTSIDE RETURN FLANGE - 6O
(WELDED TYPE)




90° OUTSIDE FLANGE - 4O
(WELDED TYPE)



INSIDE RETURN FLANGE - 6I
(WELDED TYPE)



SAFETY RETURN FLANGE - SI




COVER - 2I


CABLE LADDER


Cable ladders are fabricated with the following specifications: medium duty with inside flange and heavy duty with outside flange. Also return flanges have extra rigidity. Standard lengths are 2 meters and 3 meters. Standard finishes are mill galvanized (BS 2989) and hot dip galvanized after fabrication finish (BS 729) and stainless steel (316L, 304). Rungs are either rivetted or welded to side members or bolted. Optional materials and finishes are also available to suit customer's requirements.


ORDERED BY CATALOG NUMBER


L S / 4I - 2 2 1 06 1


GENERAL TYPE 


PART NUMBER 

FLANGE TYPE 

 RUNG SPACING
WIDTH

 SIDE HEIGHT

 MATERIAL THICKNESS

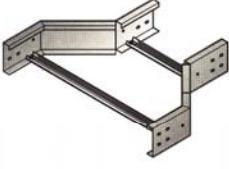
 LENGTH / RADIUS

SPECIFICATIONS

LENGTH/RADIUS:	MATERIAL THICKNESS	SIDE HEIGHTS
STRAIGHT SECTION	1=1mm	1=100mm
2=2000mm	2=1.5mm	4=40mm
3=3000mm	3=2mm	5=50mm
RADIUS:	4=2.5mm	6=60mm
3=300mm		7=70mm
6=600mm		8=80mm
		9=90mm

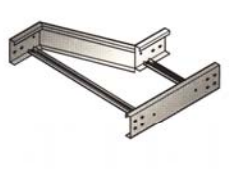
RUNG SPACING :	WIDTH:
1=200mm	01=100mm 09=900mm
2=250mm	02=200mm 10=1000mm
3=300mm	03=300mm 11=50mm
	04=400mm 12=150mm
	05=500mm 13=250mm
	06=600mm 14=450mm
	07=700mm 15=750mm
	08=800mm 16= CUSTOM SIZE

RS



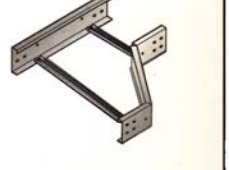
STRAIGHT REDUCER

RL



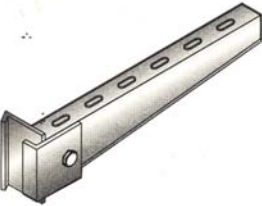
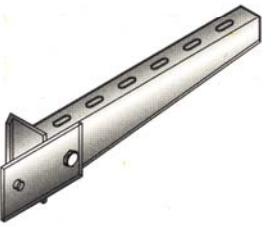
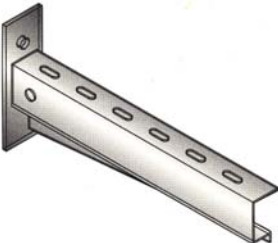
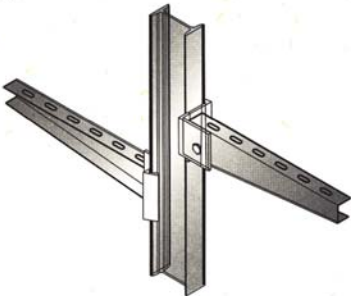
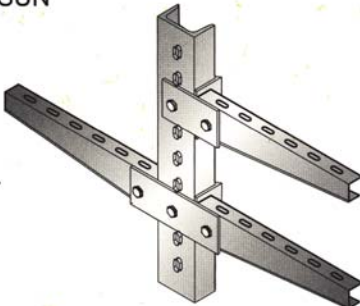
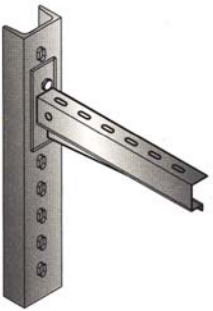
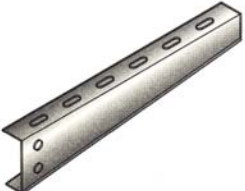

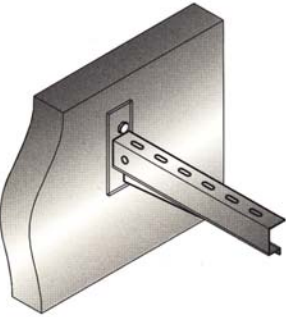
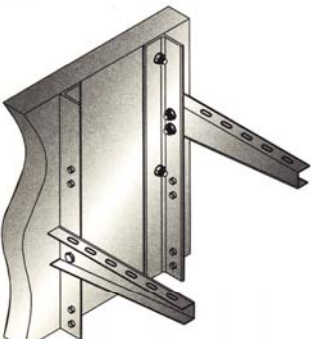
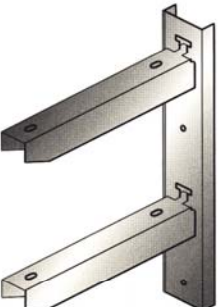
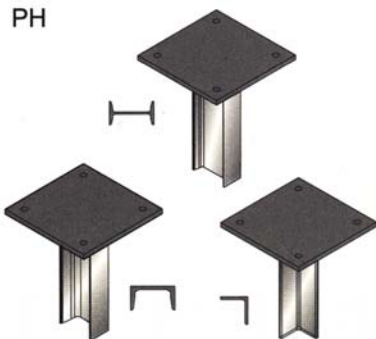
LEFTHAND REDUCER

RR



RIGHTHAND REDUCER

<p>CEC</p> <p>HORIZONTAL CROSS (R300)</p>	<p>CE</p> <p>HORIZONTAL CROSS</p>	<p>EAN</p> <p>90° INSIDE ADJ. VER. ELBOW</p>	<p>EIN</p> <p>90° INSIDE VERTICAL ELBOW</p>
<p>TEC</p> <p>HORIZONTAL TEE (R300)</p>	<p>TE</p> <p>HORIZONTAL TEE</p>	<p>EAN</p> <p>90° OUTSIDE ADJ. VER. ELBOW</p>	<p>EON</p> <p>90° OUTSIDE VERTICAL ELBOW</p>
<p>BNC</p> <p>90° HOR. ELBOW (R300)</p>	<p>BN</p> <p>90° HORIZONTAL ELBOW</p>	<p>EAF</p> <p>45° INSIDE ADJ. VER. ELBOW</p>	<p>EIF</p> <p>45° INSIDE VERTICAL ELBOW</p>
<p>BFC</p> <p>45° HOR. ELBOW (R300)</p>	<p>BF</p> <p>45° HORIZONTAL ELBOW</p>	<p>EAF</p> <p>45° OUTSIDE ADJ. VER. ELBOW</p>	<p>EOF</p> <p>45° OUTSIDE VER. ELBOW</p>
<p>BTC</p> <p>30° HORI. ELBOW (R300)</p>	<p>BT</p> <p>30° HORIZONTAL ELBOW</p>	<p>BA</p> <p>90° ADJ. HOR. ELBOW</p>	<p>WS</p> <p>STRAIGHT SEPARATOR</p>
<p>JS</p> <p>STRAIGHT JOINTING PIECE</p>	<p>JV</p> <p>ADJ. VERTICAL JOINTING PIECE</p>	<p>JR</p> <p>REDUCER JOINTING PIECE</p>	<p>KC</p> <p>COVER CLAMP</p>
<p>PN</p> <p>END PLATE</p>	<p>JH</p> <p>ADJ. HORIZONTAL JOINTING PIECE</p>	<p>KH</p> <p>HOLD DOWN CLAMP</p>	
			<p>PE</p> <p>EXIT PLATE</p>

SUPPORTS AND BRACKETS		
<p>BI</p>  <p>I BRACKET</p>	<p>BU</p>  <p>UNP BRACKET</p>	<p>BW</p>  <p>GENERAL BRACKET</p>
<p>SI</p>  <p>I SUPPORT</p>	<p>SUN</p>  <p>UNP SUPPORT</p>	<p>SUN</p>  <p>UNP SUPPORT</p>
<p>BL</p>  <p>L BRACKET</p>	<p>BH</p>  <p>HOOKED BRACKET</p>	 <p>WALL BRACKET</p>
<p>SL</p>  <p>L SUPPORT</p>	<p>SU</p>  <p>U SUPPORT</p>	<p>PH</p>  <p>HEAD PLATE</p>









