

**Manufacturer of**

- Cable Tray and Accessories
- Electro Forge Gratings
- Expanded Metal Sheets
- SS Fasteners
- Solar Structure
- Lighting and Camera Pole
- Earthing Strips and Pole
- Hot Dip Galvanize



**Innovative  
solution for  
industrial  
needs...**



**PARMAR METALS PVT. LTD.**

# Cable Tray and Accessories

## PERFORATED METALS

**PERFORATIONS :** Can be diamond, round, square, elliptical, countersunk, burred, lipped, specially shaped or slots that have round or square ends. **MATERIAL :** In addition to Iron and Steel, we perforate Aluminum, Brass, Bronze, Copper, Cloth, Zinc and Tin-plate as well as Paper, Hardboard, Plastic, Rubber, Nickel, Stainless Steel, Monel and Precious Metals.

**COILED PERFORATED MATERIAL :** Coils up to 5 tonne (7 tonne in special cases) in weight having core diameters ranging from 25mm (1"), widths up to 1270mm (50") and metal thickness of 2mm (.080") can be ordered. Plain margins can be provided along the edge of the coil. Unperforated areas can be provided across the width of the coil at required spacings although in some cases it may be necessary for them to be a multiple of the pitch being perforated. We can supply in coil form, or in lengths cut to size from it.

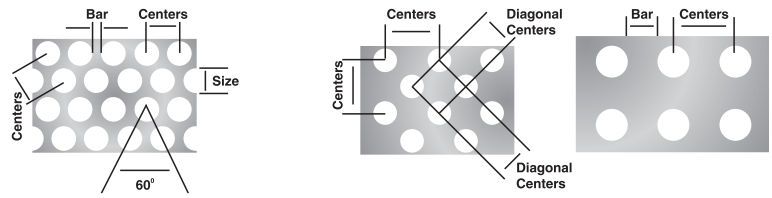
**QUOTATIONS :** To enable us to quote accurately on your specific requirements, we request that all information should be accordingly supplied as per requirement as stated in the General Ordering Information section be supplied.

**MARGINS AND BLACK SECTIONS :** Any approximate size may be left where required, the cost varying according to circumstances.

**FINISHES :** Galvanised, Painted, Anodised, Plastic Coated and various special finishes.

**PRODUCT RANGE :** Sheet Thickness from 0.15mm upto 10mm, Hole Dia from 0.5mm upto 75mm, Maximum Width Size upto 1300mm.

## HOLE PATTERNS



60 Deg Staggered Round Hole      45 Deg Staggered Round Hole      Square Round Hole

The 60 Deg staggered pattern is the most popular hole arrangement due to its wide range of open area and inherent strength

## OPEN AREA CALCULATION

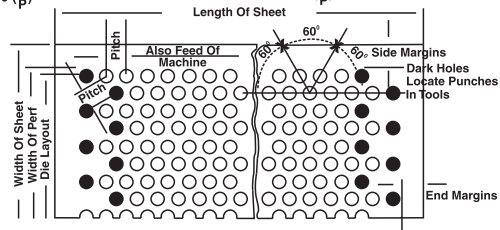
**60 Deg Staggered Pitch**

$$\% \text{ OPEN AREA} = \frac{\frac{\pi d^2}{4} \sin 60^\circ}{\frac{\pi d^2}{4} \times \frac{0.7854}{0.8660} \times \left(\frac{d}{p}\right)^2} \times 100 = 90.69 \left(\frac{d}{p}\right)^2$$

**Square Pitch**

$$\% \text{ OPEN AREA} = \frac{\frac{\pi d^2}{4}}{\frac{\pi d^2}{4} \times \frac{1}{p^2}} \times 100 = 78.54 \left(\frac{d}{p}\right)^2$$

**45 Deg Staggered Pitch**

$$\% \text{ OPEN AREA} = \frac{\frac{\pi d^2}{4}}{\frac{\pi d^2}{4} \times \frac{1}{p^2}} \times 100 = 78.54 \left(\frac{d}{p}\right)^2$$


## EXPANDED METAL SHEETS

**BUYERS GUIDE :** When ordering it would be help full if you could give us

- Material type • Sheets size or coil width • Quantity of sheets and length of coil • Raised or flattened mesh • Additional processing or special finishes (galvanised, anodised, powder coated, plastic coated)

## FLATTENED MESH DIMENSIONS

**Flattened mesh :** Mesh which has been pressure rolled, resulting in stands which are in the same plane as the sheet.

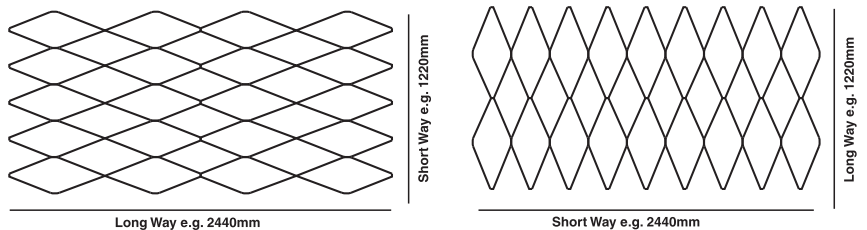
## GLOSSARY OF MESH REFERENCE SUFFIXES

- **A** - Aluminium • **Ti** - Titanium • **S** - Stainless Steel
- **M** - Monel • **C** - Copper • **Ds** - Nickle Alloy
- **B** - Brass • **Pv** - Plastic Mesh
- **Ch** - Corrosion & Heat Resistant
- **Tgc** - Tight Coat Galvanised
- **F** - Flattened i.e. **Af** = Aluminum Flattened etc.

## GLOSSARY OF TABLE SUFFIXES

- LWA** - Long Way Aperture (Length Of The Diamond For Flattened Mesh Only)
- SWA** - Short Way Aperture (Height Of The Diamond For Flattened Mesh Only)
- LWD** - Long Of The Diamond (Measured From The Point To Point Horizontally)
- SWD** - Short Of The Diamond (Measured From The Point To Point Vertically)
- Swdt** - Stand With Stk Stand Thickness (Material Thickness)
- Kgm2** - Kilograms Per Meter Squared
- % Open Area** - % Of Sheet Which Is Open

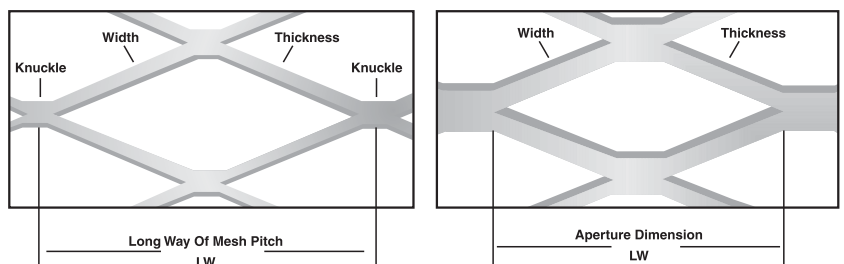
## SHEET MEASUREMENTS



All sheet size are nominal, Normally Oversize. If Exact Sheared Size are Required this must be Stated on the order.

## RAISED (CONVENTIONAL) MESH DIMENSIONS

Raised (Conventional) Mesh : Standards are Measured from Knuckle to Knuckle



## PRODUCT RANGE :

Thickness From 0.2mm Upto 5mm, Mesh Size SW Dia From 0.5mm Upto 100mm, Maximum Width Size Upto 2500mm. Apart From The Above Range, Illustrations Are Indicative Of Mesh Size End Pattern.

**LADDER TYPE TRAY**



**45° Elbow**



**Horizontal Cross**



**Horizontal Tee**



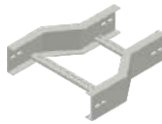
**Vertical Riser (EXT.)**



**Vertical Riser (INT.)**



**Reducer**



**LADDER TRAYS AND ACCESSORIES :**

Ladder type cable trays and accessories in various thickness of 1.5mm, 2.00mm and above in 150mm to 900mm and length of 2.4m(aluminum) / 2.5m / 3.0m are available

**PERFORATED**



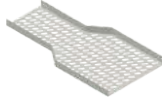
**90° Bend**



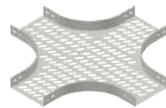
**90° External Raise**



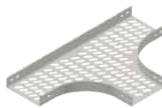
**Center Reducer**



**Cross**



**Tee**



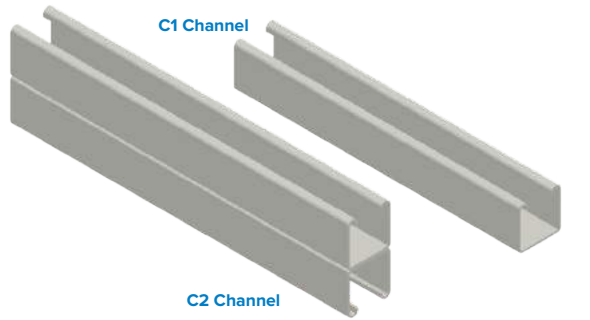
**Bottom End Cover**



**PERFORATED TRAYS AND ACCESSORIES :**

Perforated type cable trays and accessories in various thickness of 1.2mm, 1.5mm, 2.0mm and above in width 50mm to 900mm, in standard length of 2.4m (aluminum) / 2.5m/3.0m are available in various material of construction like M.S., S.S. and Aluminum.

**SUPPORTING SYSTEMS**



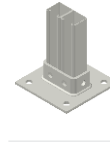
**Cantilever Arms**



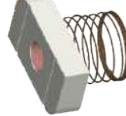
**Cantilever Channel**



**Base plate (Double Channel)**



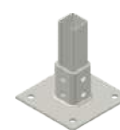
**Spring Nut**



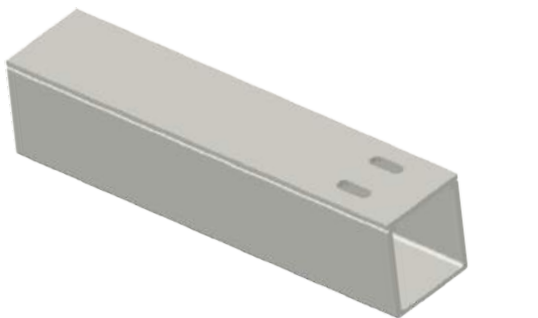
**Cover Clamp**



**Base Plate (Single Channel)**



**TRUNKINGS & ACCESSORIES**



**Tray Cover**



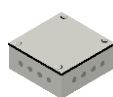
**45° Bend**



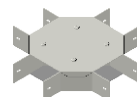
**90° Bend**



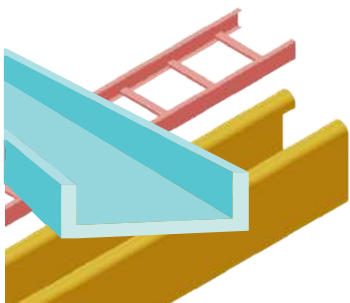
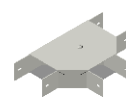
**Galvanised Box**



**Cross**



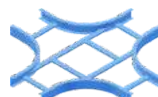
**Tee**



**45° Elbow**



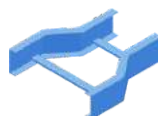
**Horizontal Cross**



**Horizontal Tee**



**Reducer**



**FRP TRAYS AND ACCESSORIES :**

FRP cable trays & accessories in perforated type as well as ladder type in different sizes are available for industry application.

Cable Trays are Manufactured in Mild Steel, Hot Dip Galvanised / Painted, Pregalvanised Stainless Steel, Aluminum and FRP.

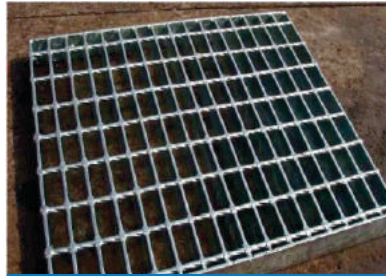
# Gratings

## TYPE OF GRATING

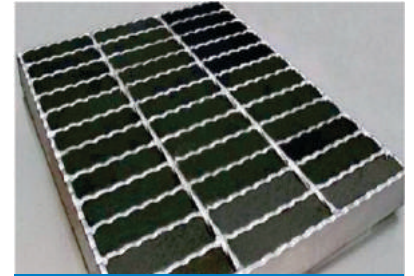
- PLANE GRATING • SERRATED GRATING

## GRATING APPLICATIONS

- Industrial floorings • Maintenance Walkways
- Drain covers - Drainage • Compound walls
- Light traffic access ramps & disable access ramps
- Vertical cladding in architectural application
- Stairways and Catwalks • Marine industries
- Tower packing support • Power plant • Stair treads



Plane Grating



Serrated Grating

## ADVANTAGES OF GRATING

- Corrosion resistant • Fire retardant
- High impact strength • Easy to install
- Light weight 6. Safe • In serration notches made on tip of the load bearing bar improve skid resistance

## REQUIRED SPECIFICATION WHILE ORDERING GRATING

- Material • Size of Bearing Bar • Type of Grating • Span • Dimension
- Type of Noising at Stairs • State whether grating is to be fixed welded or type of fastening device required • Finish (red oxide, painted, galvanized) • Dispatch instruction

## NOMENCLATURE OF GRATINGS + PRODUCT SPECIFICATIONS

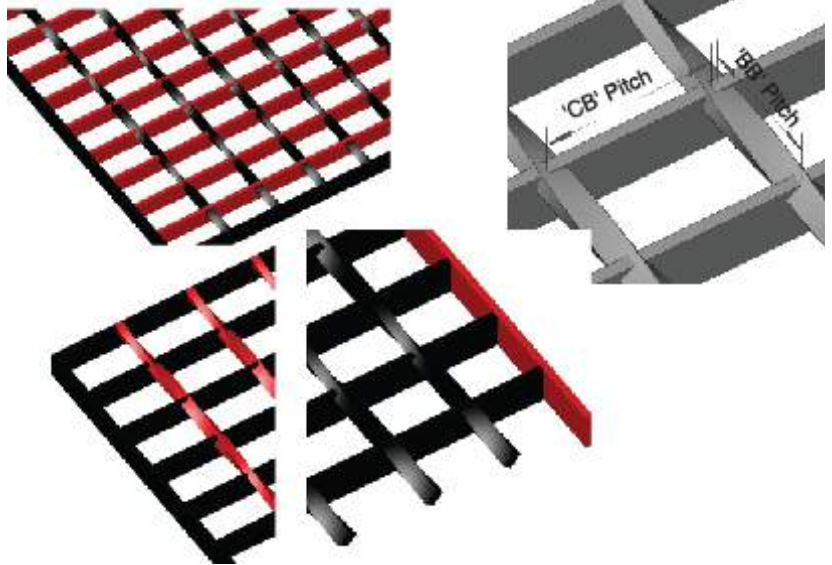
### BEARING BAR OR LOAD BEARING BAR (BB) :

These bars support the load put on the grating and they are made from low carbon steel grade IS 2062.

**MESH :** It is the center distance between two adjacent bearing bars and cross bars.

**CROSS BAR (CB) :** They are positioned transversely across bearing bars and are welded into them at their intersection point to provide lateral restraint. In steel Gratings, these are made of square twisted wire rod from low carbon grade steel of SAE 1008.

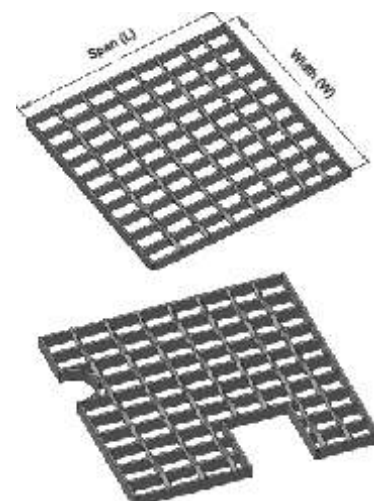
**EDGE BINDING OR FRAME BAR (FB) :** Bar fixed to the edge of the gratings and flush with the top of bearing bar.



**SPAN (S) :** Total length between the supports, i.e. the extreme ends of the bearing bars. It is measured parallel to the bearing bar. (Length of the load bearing bar)

**WIDTH (W) :** It is the overall width of the panel measuring 90° to the load bearing bar.

**CUT OUTS :** They are a of the gratings removed to allow structure, pipe, plant, obstruction or handrail to be fitted in.



## PRODUCT SPECIFICATIONS (ALL UNITS IN MM)

Bearing bar sizes (Plain or Serrated) : 25 x 3, 25 x 5, 30 x 3, 30 x 5, 32 x 5, 40 x 5, 50 x 5, 60 x 5 & 70 x 5

Cross Bar Sizes : 6 & 8 Square Twisted

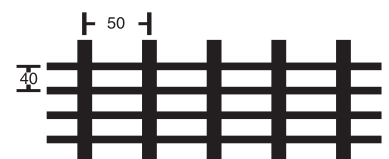
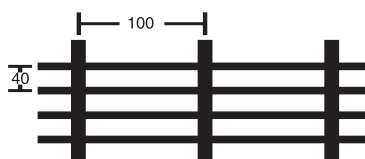
Mesh Sizes : Bearing Bar Pitches 30 / 33 / 35 / 40 / 41

Panel Sizes : 5000, 5700, 6000, 6100

## RECTANGULAR PATTERN

Most commonly used grating having bearing bar spaced at C/C 40mm and cross bar spaced at C/C 100mm .

Having bearing bar spaced at C/C 40mm and cross bar spaced at C/C 50mm



### Metric Load table for Electroforge Grating

41mm center to center. Types EFB100 & EFB50

Bearing Bar Size (in mm)	Span															
	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	
25 x 3	U	11000	4880	2740	1760	1230	900	680								
	D	0.6	1.4	2.6	3.9	5.9	7.9	10.0								
	C	1660	1100	820	660	550	470	410								
25 x 5	U	18300	8100	4560	2920	2020	1490	1150	850							
	D	0.6	1.4	2.5	3.9	5.6	7.5	10.0	12.7							
	C	2740	1820	1370	1100	910	780	690	570							
30 x 3	U	15800	7100	3950	2520	1750	1290	990	780	680	600					
	D	0.5	1.1	2.1	3.2	4.3	5.4	6.5	7.2	8.3	12.9					
	C	2370	1580	1180	950	790	670	590	520	410	400					
30 x 5	U	22800	11700	6580	4210	2920	2150	1610	1300	1050	860					
	D	0.5	1.1	2.1	3.2	4.3	5.4	6.5	7.2	10.8	12.9					
	C	3950	2630	1970	1580	1310	1130	980	870	780	710					
35 x 3	U	21500	9570	5320	3440	2390	1760	1340	1060	860	710					
	D	0.4	1.0	1.8	2.8	3.9	5.2	7.1	9.0	11.1	13.5					
	C	3220	2150	1610	1290	1070	920	800	710	640	580					
35 x 5	U	35800	1590	8900	5700	3980	2920	2240	1770	1430	1180	990	840			
	D	0.4	1.0	1.8	2.8	3.9	5.2	7.1	9.0	11.1	13.5	16.6	19.6			
	C	5380	3580	2680	2150	1790	1530	1340	1190	1070	980	890	820			
40 x 3	U	28100	12500	7100	4490	3100	2280	1740	1380	1120	920	770	660			
	D	0.3	0.8	1.5	2.4	3.5	4.8	6.2	7.9	9.7	11.8	13.8	16.4			
	C	4200	2800	2110	1690	1400	1200	1050	930	840	760	700	640			
40 x 5	U	47200	20800	11700	7500	5200	3820	2920	2310	1860	1650	1230	1100	950	830	
	D	0.3	0.8	1.5	2.4	3.5	4.8	6.2	7.9	9.7	11.8	13.8	16.4	19.5	20.6	
	C	7000	4680	3510	2800	2330	2010	1750	1560	1400	1270	1170	1080	1000	930	
50 x 3	U	59200	26300	14800	9500	6500	4830	3700	2920	2360	1950	1640	1400	1210	1050	960
	D	0.3	0.8	1.3	2.2	3.1	4.2	5.6	7.0	8.6	10.5	12.4	14.6	16.9	19.9	22.1
	C	8900	5900	4490	3550	2960	2530	2220	1970	1760	1610	1480	1370	1270	1180	1110
50 x 5	U	73100	32500	18300	11700	8100	5900	4570	3610	2920	2410	2030	1730	1490	1300	1140
	D	0.3	0.7	1.2	2.0	2.8	3.8	5.0	6.3	7.8	9.4	11.2	13.2	15.2	17.5	19.9
	C	10900	7500	5500	4380	3660	3130	2740	2430	2190	1990	1830	1690	1560	1460	1307
	D	0.2	0.6	1.0	1.5	2.2	3.1	4.0	5.0	6.2	7.5	9.0	10.5	12.1	14.0	15.9

Unit Stress - 1650 Kg./Sq. m.  
 U : Uniformly distributed load in Kg./Sq. m.  
 C : Concentrated load in Kg./m. width at mid-span  
 D : Detection in millimeters

Span to left of heavy line produce a detection of 6mm or less under a uniform load of 500 kg./Sq. m. This detection is recommended as per BS 4592-1970

### Imperial Load table for Electroforge Grating

30mm center to center. Types EFC100 & EFC50

Bar Size	Ped Span	Sec. Mod. Per Ft. of Width	Clear Span													
			2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"	
1" x 1/8"	51"	0.211	U	632	404	281	206	158	125	101	84	70				
			D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
			C	632	505	421	361	316	281	253	230	211				
1" x 3/16"	57"	0.316	U	947	606	421	309	237	187	152	125	105				
			D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
			C	947	758	632	541	474	421	379	344	316				
1-1/4" x 1/8"	61"	0.329	U	987	632	439	322	247	195	158	130	110	93	81		
			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
			C	987	789	658	564	493	439	395	359	329	304	282		
1-1/4" x 3/16"	67"	0.493	U	1480	947	658	483	370	292	237	196	164	140	121		
			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
			C	1480	1184	987	846	740	658	592	538	493	455	423		
1-1/2" x 1/8"	70"	0.474	U	1421	909	632	464	355	281	227	188	158	135	116	89	70
			D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
			C	1421	1137	947	812	711	632	568	517	474	437	406	355	316
1-1/2" x 3/16"	77"	0.711	U	2132	1364	947	696	533	421	341	282	237	202	174	133	105
			D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
			C	2132	1705	1421	1218	1066	947	853	775	711	656	609	533	474
1-3/4" x 3/16"	87"	0.967	U	2901	1857	1289	947	725	573	464	384	322	275	237	181	143
			D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
			C	2901	2321	1934	1658	1451	1289	1161	1055	967	893	829	725	645
2" x 3/16"	96"	1.263	U	3789	2425	1684	1237	947	749	606	501	421	359	309	237	187
			D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
			C	3789	3032	2526	2165	1895	1684	1516	1378	1263	1166	1083	947	842
	D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603		

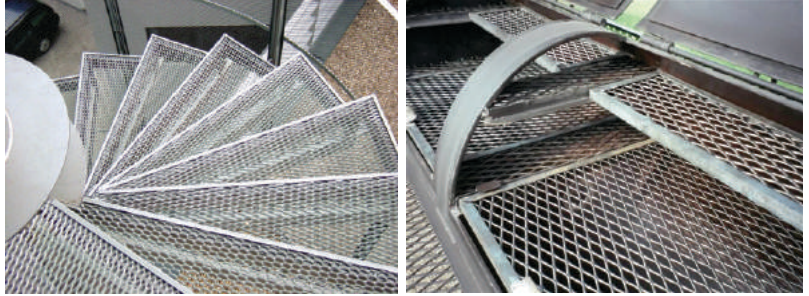
U : safe uniform load, lb/sq. ft.  
 C : Safe concentrated load, lb/sq. ft. of grating width, at mid-span  
 D : Detection in inches, Date is theory and based on 18,000psi, Install with cross rods on top

# Expanded Metal sheets

## TERMINOLOGY

### Style Designation

A combination of numbers, letters, and abbreviations permitting proper specifications of dimension, gauge, style, and weight. In expanded metal products, the first number designates nominal dimension, short way of design. The second number completes the designation and may specify the gauge of metal, weight per 100 square feet, or may have some other significance. Grating products are designated by weight of finished product per square foot.



## STANDARD EXPANDED METAL

Standard expanded metal as it comes from the press. The strands and bonds are set at a uniform angle to the plane on the sheet. This gives added strength and rigidity, as well as skid-resistant surface. Standard expanded metal is abbreviated XM.

## GRATING

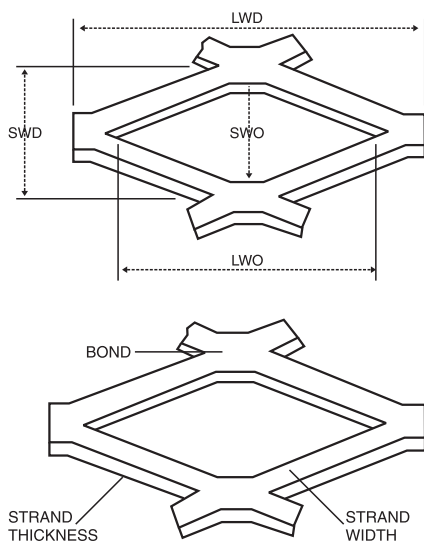
Grating is a standard expanded metal pattern produced from heavier gauge low carbon steel plates. Strands and the openings of grating are considerably larger than other meshes. It is ideal for use wherever a strong, durable, lightweight surface is needed. Although used primarily for pedestrian traffic, grating can accommodate heavier loads if properly supported.

## FLATTENED METAL

Flattened expanded metal is manufactured by passing the standard expanded sheet through a cold roll reducing mill. Flattened expanded metal turns the strands and bonds down to provide a flattened surface, reducing the thickness (gauge) and elongating the pattern. Thickness may vary plus or minus 10% from published dimensions.

## DESIGN SIZE

Actual dimensions SWD and LWD. Measured from a point to corresponding point on the design shown.



**SWD** : Nominal dimension Short Way of Design

**SWO** : Short Way of Opening

**LWD** : Nominal dimension Long Way of Design

**LWO** : Long Way of Opening **STRANDS** The sides of the expanded metal design.

**STRAND THICKNESS** : Gauge thickness of metal expanded.

**STRAND WIDTH** : Amount of metal fed under dies to produce one strand.

**BOND** : The solid intersection of two strands.

## SIDE SHEARING

The process of cutting a piece of expanded metal parallel to the long dimension of the diamond.

**RANDOM SIDE SHEARING** Side shearing is a cut made parallel to the LWD dimension of the sheet which usually leaves open diamonds.

**BOND SIDE SHEARING** This cut is made along the length of the sheet on the center line of the bond over the specified width. In most cases it is not practical to attempt to Bond Side Shear either regular or flattened expanded metal because of the camber.

## END SHEARING

### END RANDOM SHEARING

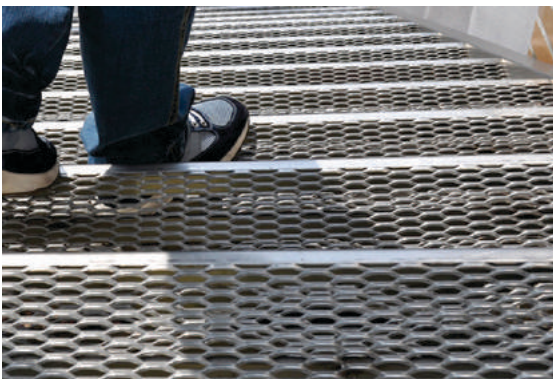
The process of shearing a piece of expanded metal to a specified length (LWD), this cut normally leaves open diamonds at both ends but accomplishes close tolerance when both ends are sheared.

### END BOND SHEARING

The process of shearing a piece of expanded metal to a specified length (LWD), one end is cut on the bond parallel to the SWD- the other end usually has open diamonds.

### ORDERING PROCEDURE.

When ordering expanded metals, give complete style specifications to avoid possible error. Include style, standard or flattened, type of metal, and sheet dimensions. SWD dimensions always given before LWD.



Drawings are exaggerated for illustrative purpose.



# Stainless Steel Fasteners

When you stop and think about fasteners, you realise that they are really pretty important little components. Without them, almost everything we use in day to day life would literally fall apart at its seams. We at PMPL Fasteners think fasteners are the most important components of an assembly. We strive to manufacture fasteners with an emphasis on betterment of overall quality aspects. We are expert in manufacturing of STAINLESS STEEL FASTENERS. The company makes wide range of fasteners and adding sophisticated machines to cover more range. Company is under vertical expansion to meet the global demand and growing with a fast pace.



## STAINLESS STEEL BOLTS & NUTS FOR WATER PROJECTS & WATER RESERVOIRS

We manufacture the complete range of stainless steel bolting in SS 202, SS 316 & SS 304 used in projects related to water treatment, sewage treatment plants, desalination plants, water equipment, flange joints & pumps. We are producing stainless steel bolts & nuts SS 202, SS 316 & SS 304 grade nuts and bolts for the ever growing demand for water storage reservoirs and projects in middle east. These bolts and nuts are used for joining pipelines using pumps and valves.

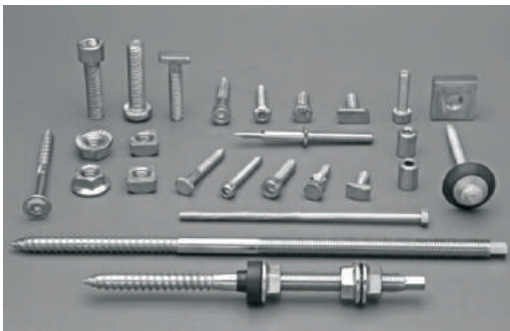
## HIGH TENSILE BOLTS & NUTS



We manufacture speciality fasteners in many grades in stainless steel and alloy steel. Our expertise over the years has resulted in us providing material in shorter delivery times as per customers drawings or prototype samples.

- Hex Bolts & Nuts in DIN 931 and 933
- Stud Bolts & Nuts ASTM-A193 and A-194
- Foundation Bolts
- Anchor Bolts
- Testing and Quality Control

We have a long standing tradition of providing uncompromised quality fasteners, We relentlessly conduct series of quality checks like UTS testing, profile checks, destructive and all other kinds of non destructive testings.



Materials	Stainless Steel, AISI 202, 304 & 316
Threads	METRIC, BSW, BSF, UNC, UNFm as Required
Size Range	M3 to M20, 1/8" to 3/4"
Length Range	8 mm to 150 mm, 3/8" to 6"
Standards	DIN, ISO, IS, BS, ANSI

We are committed to satisfy the needs and expectations of our customers by manufacturing and supplying Alloy Steel & Stainless Steel Fasteners of stated quality, timely delivery and reliable services at all times.

We strive for continuous improvement through productivity and employee participation. We make sure each and every product face rigorous inspection stages during production process before they make it to the box, ready for shipment. The Management shall promote Quality at all levels through execution of the quality management system complying to ISO 9001:2008 standard. We always aim to give zero defect products to our customers. Every products is certified after final inspection and packaging for its conformance against specified international standards or customer specific requirements. We always believe in continuous improvement in our products keeping in view of customers requirement.



### Note :

- Special Stainless Steel Grade available on request
- We can develop product as per customer's specification/drawing
- All austenitic stainless steel fasteners are normally non-magnetic; after cold working, some magnetic properties may be evident Please ref: ISO 3506-1 standard
- Material Test Certificate is provided as per the EN 10204: 3.1B/3.1 standard
- PMPL - hot forged stainless steel and high tensile bolts and sockets in grades 8.8, 10.9 and 12.9, SS 202, SS 316, SS 316 L, 316531, 316533, A2 & A4, ASTM Grades B8, B8M in Class 1 and Class 2
- We manufacture hot forged bolts and nuts, we offer bolts from M-16 diameter to M-64 diameter in any length upto 1200 mm long. We are specialized manufacturers in Stainless steel and alloy steel grades as per international steel norms.

## CHEMICAL COMPOSITION

Grade	Material Similar to...	C Max	MN Max	P Max	S Max	SI Max	CR	NI	MO
A2 / B8	AISI 304	0.08	2.00	0.05	0.030	1.00	17.00-20.00	8.0-13.0	-
A4 / B8M	AISI 316	0.08	2.00	0.05	0.030	1.00	16.00-18.50	10.0-14.4	2.00-3.00

## PHYSICAL PROPERTIES

Grade	Standard	Property Class	Tensile Strength Min. ( N/mm <sup>2</sup> )	Yield Strength 0.2% Offset Min. ( N/mm <sup>2</sup> )	Elongation After Fracture AL mm Min.
A2 & A4	ISO 3506	70	700	450	0.4d
		80	800	600	0.3d

Grade	Standard	Property Class	Diameter Inch	Tensile Strength Min. ( KSI )	Yield Strength 0.2% Offset Min. ( KSI )	Elongation in 4D Min. %	Reduction Of Area Min. %	Hardness ( Max. ) Rockwell
B8	ASTM A193 / A193M	Class 1	All	75	30	30	50	B96
		Class 2	To 3/4	125	100	12	35	C35
B8M		Class 1	Over 3/4 to 1	115	80	15	35	C35
			All	75	30	30	50	B96
		Class 2	To 3/4	110	96	15	45	C35
			Over 3/4 to 1	100	80	20	45	C35

## TORSIONAL STRENGTH AS PER ISO 3506

Thread	ST 2.2	ST 2.6	ST 2.9	ST 3.3	ST 3.5	ST 3.9	ST 4.2	ST 4.8	ST 5.5	ST 6.3	ST 8
Min. Torsional Strength NM	0.45	0.9	1.5	2	2.7	3.4	4.4	6.3	10	13.6	30.5

## FOR AUSTENITIC BOLTS & SCREWS M1.6 TO M16 (COARSE THREAD)

Grade	Standards		M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M16
Min. Breaking Torque, Mb Min. NM	Property Class	70	0.20	0.4	0.9	1.6	3.8	7.8	13	32	65	110	290
		80	0.24	0.48	0.96	1.8	4.3	8.8	15	37	74	130	330



We believe in the mantra of "Do it Fast, Do it Right, and Do it cost-effective" and that's what has given us the strength to be one of the distinguished manufacturers of Alloy Steel & Stainless Steel cold forged fasteners (Bolts, Nuts, Screws, Threaded Rods, Nails & U-Bolts).

Our modernized well-equipped manufacturing unit, expert technicians, well-trained manpower and dedicated sales support have over the years reinforced us to move forward, and as a result we are not only able to cater to the Indian market but also export our fasteners to the international market.

Because of our substantial product range it gives our customers an opportunity to order multiple items in one shipment.

# Solar Structure

## 1. SATYR STRUCTURES

We are a Rajkot based company, with its manufacturing facility at Shapar - Veraval.

We are engaged in the manufacture and supply of Solar Structures Sections for various applications such as: Solar Structures - Purlins, Struts, Bracing Channels, Rafters, Post's, etc.

Designed as per the MNRE and IS norms, our products are of advanced quality. Designed to withstand wind load of 47 m Is as per IS standards, our products are resilient and have a minimum service life of 35 years.

Based on the project locations, our products are hot dip galvanized to a thickness of 80 to 120 microns.

## 2. SOLAR PV STRUCTURES

We offer wide range of products and services for solar structures for photo voltaic (PV)

Roll forming of solar structure sections thickness ranging from 1.25mm thick to 6.0mm thick.

Manufacture of sections with post forming operations like, punching, slotting 8 notching

Fabrication of solar mounting structures as per customer's requirement.

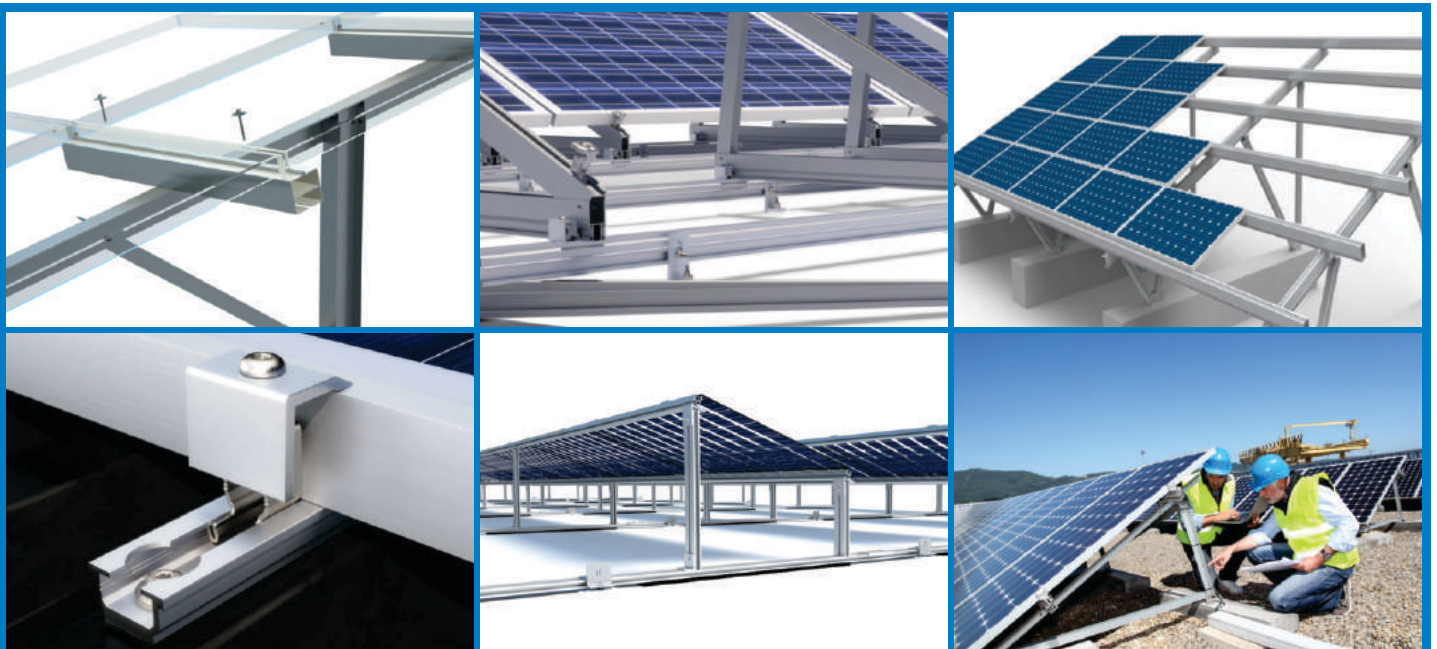
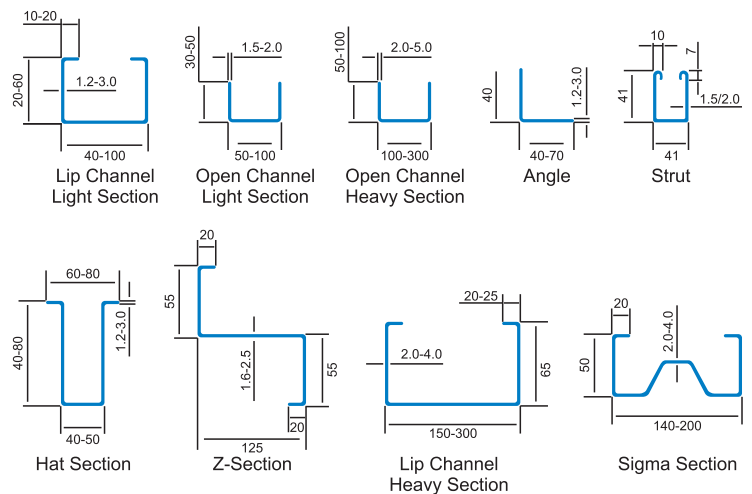
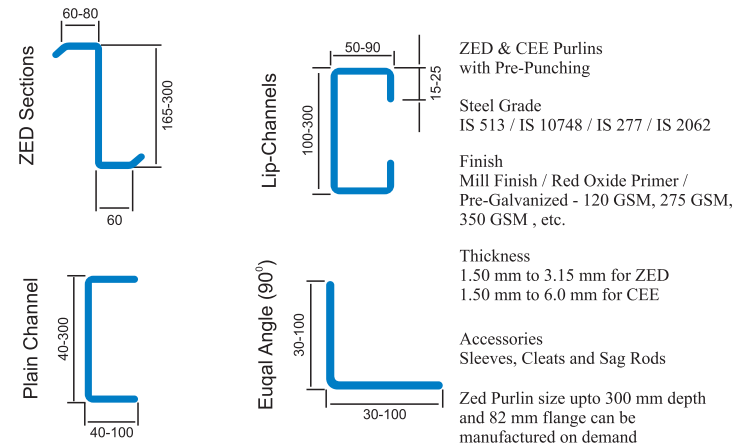
Hot dip galvanizing of solar mounting structures as per customer's requirement.

## 3. SOLAR PANEL MOUNTING SERVICE. (in-house facilities )

- Mechanical Tool Design • Roll Forming • Structure Design
- Online Punching • Coil Slitting & Punching • Hot Dip Galvanizing

## 4. COLD FORMING PROCESS

- Slitted Longitudinally to the Customized width.
- Tools are designed. • Strip of Coil Passes through Series of Rollers at Room Temperature to Get the Desired Shape & Length.
- Punching is done as per the Requirement.



## 5. RAW MATERIAL

- Hot Rolled • Width - 70 to 400 mm • Thickness - 2 to 6 mm • Grade - IS 2062, ISI 078, Fe 410, Fe 510 • Galvanizing - 550 gsm/m<sup>2</sup>

## 6. OUR PRODUCT PROFILE

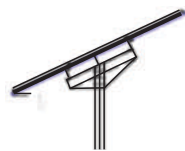
- Solar power plant structures • Profiles for solar projects • Roll forming profiles for solar projects • H beam bars for solar projects
- Steel profiles for solar projects • Solar profiles for solar projects • Module mounting structure for solar projects • Cold rolled structure for solar project
- Pre-galvanized structures for solar projects. • Solar panel support structures. • Solar parking structures • Solar support structures • Solar Structures
- Solar mounting structures • Solar panel mounts, • Solar mounting rails, • Solar Profiles.

# Service Partner to Humanity

We are manufacturing solar panel mounting structure as per client requirements, we have very efficient design and manufacturing team to develop structure with high strength and easy to install. We make structure of material MS and aluminum.

At PMPL, we can provide the following solutions as per project requirements.

- Fixed type module mounting structures.
- Seasonal tilt adjustable module mounting structures.
- Single axis daily tracking structures.



Single pole static structure



Double pole static structure



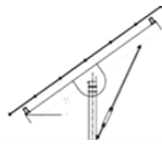
Double pole static structure with struts



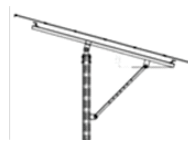
Single pole seasonal tilting structure (10 to 40 deg)

## 1. SOLAR PANEL SUPPORT STRUCTURES (for solar power projects)

With more and more awareness being generated about solar energy in our country, the demand for Solar panel support structures has also been constantly on the rise. PMPL manufactures these solar panel support structures in compliance with top quality international standards to give long lasting structures for these projects.



Seasonal structure with unique turn buckle mechanism tilting



Seasonal structure with manual tilting



Double pole static structure with struts



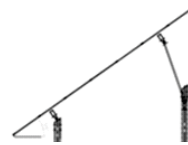
Double pole static structure without struts

## 2. SOLAR MODULE MOUNTING STRUCTURE

These are module mounting structures where Solar Panels are mounted. They support Solar Modules from the roof. Being important structural elements, they must be manufactured exactly to specification. These structures are as important as Modules. These structures are light in weight and durable as they are designed to ensure optimal Weight to Watt ratio.



Seasonal tilting structure with turn buckle with struts



Double pole seasonal tilting structure



Double pole static structure with beam

## 3. MODULE MOUNTING STRUCTURE

These easy to install structures provide an excellent solution to rural properties as they can be used on mountainous and rough terrain. Our ground based module mounting structures can be quickly delivered and are easy to install. These durable structures are an ideal solution for rural properties as they can be used to mount Photovoltaic panels on mountainous and rough terrain.



## 4. APPLICATION

- Roof Top Structures • Ground Mounted Structures

## 5. ADVANTAGES

- Very high strength-to-weight ratio; high strength, low cost.
- Significantly reduces installation time.
- No site drilling or cutting required.
- Maintenance-free owing to application of proper surface finish.
- Factory-finished, cut to exact lengths with pre-punched holes to avoid time and material wastage.
- Accessories like, connecting plates, angles splicing plates supplied along with main structure.

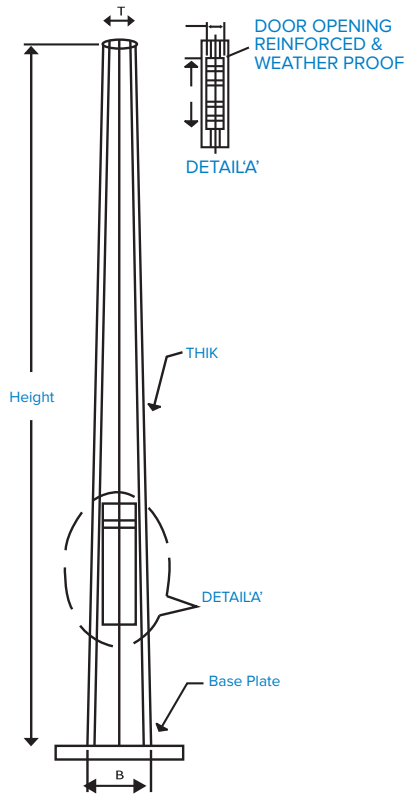
## 6. GROUND BASED MODULE MOUNTING STRUCTURE

At PMPL, we offer end-to-end solutions for ground based module mounting structures for solar installations, from design and fabrication to galvanization.

## 7. Roof Mounted Structures

In a world of escalating real estate prices, ground space is at a premium. PMPL Roof mounted structures therefore are the perfect solution for urban environments. Our products are specifically designed to be lightweight to protect the underlying roof structure. These easy to install structures are economical and are designed to withstand higher load and extreme conditions. Standardised and modular designs allow for maximum utilisation of roof space. Our design ensures minimum drilling to avoid roof leakage. With flexibility in product assembly, numerous layout options and advancements in structural engineering, we can design and install products with optimal usage of space, given module size and energy needs. We supply module mounting structures for both flat roofs and sloped roofs (tile/sheet roofs).

# Lighting and camera pole



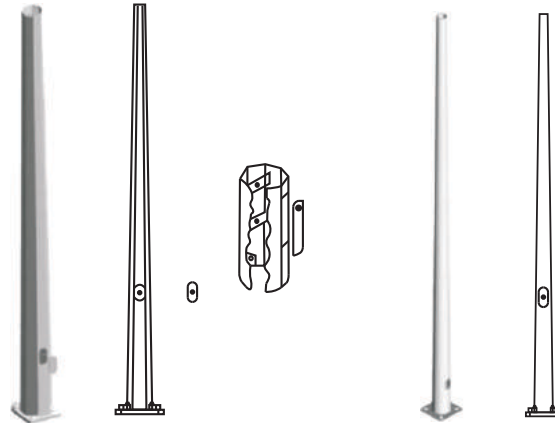
DETAILED INFORMATION AS PER TABLE

## Octagonal Poles

Parmar Metals Pvt. Ltd. Works has introduced hot dip galvanized Octagonal Poles, which can use in different sector for power transmission & distribution, Road & Building and various other applications. In general, these poles are hot dip galvanized after fabrication, internally and externally in accordance with IS-2629/BSEN ISO 1461 or equivalent.

## Material Specification

The Steel generally used to manufacture steel poles is as per BSEN 10025.  
Yield Strength Min 355N/mm<sup>2</sup>  
Tensile Strength 490-630 N/mm<sup>2</sup>



OCTAGONAL POLES

CONICAL POLES

## OCTAGONAL POLES STANDARD SPECIFICATION :

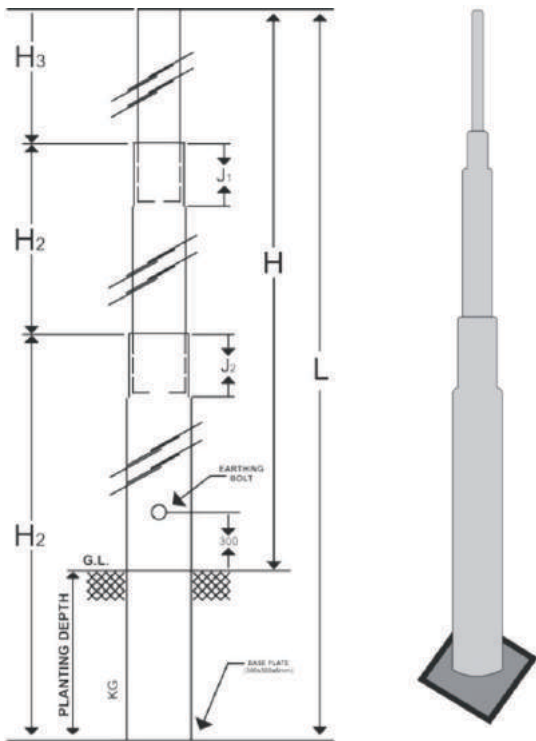
POLE TYPE	HEIGHT (mtr.)	TOP DIA (A/F) mm	BOTTOM DIA (A/F) mm	SHEET THICKNESS	BASE PLATE (L x W x T)	PITCH CIRCLE DIA. mm	Foundation Bolt (No. x Dia x mm)
PM - 3030	3	60	130	3	200 x 200 x 12	200	4 x 16 x 450
PM - 3031	3	70	130	3	200 x 200 x 12	200	4 x 16 x 450
PM - 4030	4	60	130	3	200 x 200 x 12	200	4 x 16 x 450
PM - 4031	4	70	130	3	200 x 200 x 12	200	4 x 16 x 450
PM - 5030	5	60	130	3	200 x 200 x 12	200	4 x 16 x 450
PM - 6030	6	60	130	3	200 x 220 x 12	220	4 x 20 x 600
PM - 6031	6	70	135	3	200 x 220 x 12	220	4 x 20 x 600
PM - 7030	7	60	130	3	200 x 220 x 12	220	4 x 20 x 600
PM - 7031	7	70	135	3	200 x 220 x 12	220	4 x 20 x 600
PM - 8030	8	70	135	3	225 x 225 x 16	220	4 x 20 x 600
PM - 8031	8	70	155	3	225 x 225 x 16	220	4 x 20 x 700
PM - 9030	9	70	155	3	260 x 260 x 16	220	4 x 24 x 750
PM - 9031	9	70	175	3	260 x 260 x 16	250	4 x 24 x 750
PM - 1030	10	70	155	3	260 x 260 x 16	250	4 x 24 x 750
PM - 1031	10	70	175	3	275 x 275 x 16	270	4 x 24 x 750
PM - 1130	11	90	210	3	300 x 300 x 20	300	4 x 24 x 750
PM - 1230	12	90	240	3	320 x 320 x 20	310	4 x 24 x 850

## CONICAL POLES STANDARD SPECIFICATION :

POLE TYPE	HEIGHT (mtr.)	TOP DIA (A/F) mm	BOTTOM DIA (A/F) mm	SHEET THICKNESS	BASE PLATE (L x W x T)	PITCH CIRCLE DIA. mm	Foundation Bolt (No. x Dia x mm)
PM - 3030	3	65	98	3	200 x 200 x 12	200	4 x 16 x 450
PM - 4030	4	65	108	3	200 x 200 x 12	200	4 x 16 x 450
PM - 5030	5	65	119	3	200 x 200 x 12	200	4 x 16 x 450
PM - 6030	6	65	130	3	220 x 220 x 12	220	4 x 20 x 600
PM - 7030	7	65	130	3	220 x 220 x 12	220	4 x 20 x 600

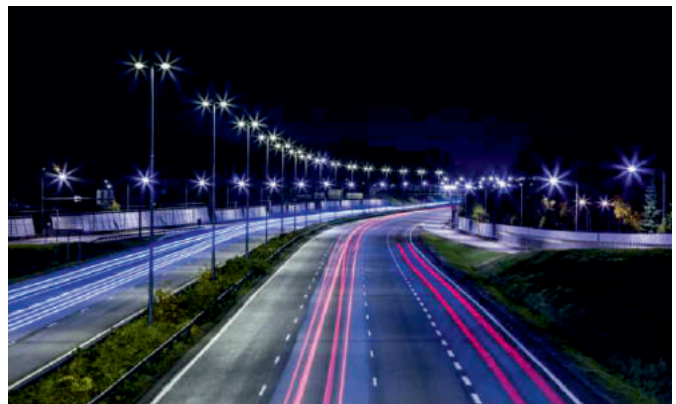
### Tubular Swaged Pole

Swaged poles are manufactured from e.R.W./welded tubes of suitable lengths swaged & joined together, no circumferential joint shall be permitted in the individual tube of poles. The longitudinal welds shall be staggered at each swaged joint. Swaging is done by hydraulic power pack unit. A circumferential weld shall be deposited at the upper end of the joint at a slope of approximately 45 degrees. Poles are manufactured by us normally conform to as per IS 2713 (p-III) - 1980 and special sizes poles can also be manufactured by as per customer drawings or requirements.



### Earthing Arrangement :

If earthing arrangement is required, a bolt of 10mm dia is welded on each pole at a height of 300 mm above the planting depth or can be provided as per customer's requirement.



### Note :-

Bracket are available for standard swage poles in various designs shown in brochure and also as per customer requirement.

## AS PER IS : 2713 (PART-II) 1980 :

DESIGNATION	OVER ALL LENGTH	PLANTING DEPTH	LOAD APPLIED FROM TOP DISTANCE	HEIGHT ABOVE GROUND H	LENGTH OF SECTIONS			OUTSIDE DIAMETER & THICKNESS OF SECTIONS			APPROX WEIGHT OF POLE
					BOTTOM H <sub>1</sub>	MIDDLE H <sub>2</sub>	TOP H <sub>1</sub>	BOTTOM	MIDDLE	TOP	
(1)	(2) (mtr.)	(3) (mtr.)	(4) (mtr.)	(5) (mtr.)	(6) (mtr.)	(7) (mtr.)	(8) (mtr.)	(9) (mm)	(10) (mm)	(11) (mm)	(12) (kg)
410PM - 1	7.00	1.25	0.30	5.75	4.00	1.50	1.50	114.3x3.65	88.9x3.25	76.1x3.25	62
410PM - 2	7.00	1.25	0.30	5.75	4.00	1.50	1.50	114.3x4.50	88.9x4.05	76.1x3.25	73
410PM - 3	7.00	1.25	0.30	5.75	4.00	1.50	1.50	114.3x5.40	88.9x4.85	76.1x3.25	85
410PM - 4	7.50	1.25	0.30	6.25	4.50	1.50	1.50	114.3x3.65	88.9x3.25	76.1x3.25	67
410PM - 5	7.50	1.25	0.30	6.25	4.50	1.50	1.50	114.3x4.50	88.9x4.05	76.1x3.25	79
410PM - 6	7.50	1.25	0.30	6.25	4.50	1.50	1.50	114.3x5.40	88.9x4.85	76.1x3.25	93
410PM - 7	7.50	1.25	0.30	6.25	4.50	1.50	1.50	139.7x4.50	114.3x3.65	88.9x3.25	97
410PM - 8	7.50	1.25	0.30	6.25	4.50	1.50	1.50	139.7x4.85	114.3x3.65	88.9x3.25	103
410PM - 9	7.50	1.25	0.30	6.25	4.50	1.50	1.50	139.7x5.40	114.3x3.65	88.9x3.25	110
410PM - 10	8.00	1.50	0.30	6.50	4.50	1.75	1.75	114.3x3.65	88.9x3.25	76.1x3.25	70
410PM - 11	8.00	1.50	0.30	6.50	4.50	1.75	1.75	114.3x4.50	88.9x4.05	76.1x3.25	83
410PM - 12	8.00	1.50	0.30	6.50	4.50	1.75	1.75	114.3x5.40	88.9x4.85	76.1x3.25	97
410PM - 13	8.00	1.50	0.30	6.50	4.50	1.75	1.75	139.7x4.50	114.3x4.65	88.9x3.25	101
410PM - 14	8.00	1.50	0.30	6.50	4.50	1.75	1.75	139.7x4.85	114.3x4.50	88.9x3.25	111
410PM - 15	8.00	1.50	0.30	6.50	4.50	1.75	1.75	139.7x5.40	114.3x4.50	88.9x3.25	119



DESIGNATION	OVER ALL LENGTH	PAINTING DEPTH	LOAD APPLIED FROM TOP DISTANCE	HEIGHT ABOVE GROUND H	LENGTH OF SECTIONS			OUTSIDE DIAMETER & THICKNESS OF SECTIONS			APPROX WEIGHT OF POLE
					BOTTOM H <sub>1</sub>	MIDDLE H <sub>2</sub>	TOP H <sub>3</sub>	BOTTOM	MIDDLE	TOP	
(1)	(2) (mtr.)	(3) (mtr.)	(4) (mtr.)	(5) (mtr.)	(6) (mtr.)	(7) (mtr.)	(8) (mtr.)	(9) (mm)	(10) (mm)	(11) (mm)	(12) (kg)
410PM - 16	8.50	1.50	0.30	7.00	5.00	1.75	1.75	114.3x3.65	88.9x3.25	76.1x3.25	75
410PM - 17	8.50	1.50	0.30	7.00	5.00	1.75	1.75	114.3x4.50	88.9x4.05	76.1x3.25	89
410PM - 18	8.50	1.50	0.30	7.00	5.00	1.75	1.75	114.3x5.40	88.9x4.85	76.1x3.25	104
410PM - 19	8.50	1.50	0.30	7.00	5.00	1.75	1.75	139.7x4.50	114.3x3.65	88.9x3.25	109
410PM - 20	8.50	1.50	0.30	7.00	5.00	1.75	1.75	139.7x4.85	114.3x3.65	88.9x3.25	115
410PM - 21	8.50	1.50	0.30	7.00	5.00	1.75	1.75	139.7x5.40	114.3x4.50	88.9x3.25	129
410PM - 22	8.50	1.50	0.30	7.00	5.00	1.75	1.75	165.1x4.50	139.7x4.50	114.3x3.65	141
410PM - 23	8.50	1.50	0.30	7.00	5.00	1.75	1.75	165.1x4.85	139.7x4.50	114.3x3.65	148
410PM - 24	8.50	1.50	0.30	7.00	5.00	1.75	1.75	165.1x5.40	139.7x4.50	114.3x3.65	158
410PM - 25	9.00	1.50	0.30	7.50	5.00	2.00	2.00	114.3x3.65	88.9x3.25	76.1x3.25	78
410PM - 26	9.00	1.50	0.30	7.50	5.00	2.00	2.00	114.3x4.50	88.9x4.05	76.1x3.25	92
410PM - 27	9.00	1.50	0.30	7.50	5.00	2.00	2.00	114.3x5.40	88.9x4.85	76.1x3.25	108
410PM - 28	9.00	1.50	0.30	7.50	5.00	2.00	2.00	139.7x4.50	114.3x3.65	88.9x3.25	113
410PM - 29	9.00	1.50	0.30	7.50	5.00	2.00	2.00	139.7x4.85	114.3x4.50	88.9x3.25	125
410PM - 30	9.00	1.50	0.30	7.50	5.00	2.00	2.00	139.7x5.40	114.3x4.50	88.9x3.25	133
410PM - 31	9.00	1.50	0.30	7.50	5.00	2.00	2.00	165.1x4.50	139.7x4.50	114.3x3.65	147
410PM - 32	9.00	1.50	0.30	7.50	5.00	2.00	2.00	165.1x4.85	139.7x4.50	114.3x3.65	154
410PM - 33	9.00	1.50	0.30	7.50	5.00	2.00	2.00	165.1x5.40	139.7x4.50	114.3x3.65	164
410PM - 34	9.50	1.80	0.60	7.70	5.00	2.25	2.25	139.7x4.50	114.3x4.50	88.9x3.25	122
410PM - 35	9.50	1.80	0.60	7.70	5.00	2.25	2.25	139.7x4.85	114.3x4.50	88.9x3.25	129
410PM - 36	9.50	1.80	0.60	7.70	5.00	2.25	2.25	139.7x5.40	114.3x4.50	88.9x3.25	137
410PM - 37	9.50	1.80	0.60	7.70	5.00	2.25	2.25	165.1x4.50	139.7x4.50	114.3x3.65	153
410PM - 38	9.50	1.80	0.60	7.70	5.00	2.25	2.25	165.1x4.85	139.7x4.50	114.3x3.65	160
410PM - 39	9.50	1.80	0.60	7.70	5.00	2.25	2.25	165.1x5.40	139.7x4.50	114.3x3.65	170
140PM - 40	10.00	1.80	0.60	8.20	5.20	2.40	2.40	139.7x4.50	114.3x4.50	88.9x3.25	128
140PM - 41	10.00	1.80	0.60	8.20	5.20	2.40	2.40	139.7x4.85	114.3x4.50	88.9x3.25	135
410PM - 42	10.00	1.80	0.60	8.20	5.20	2.40	2.40	139.7x5.40	114.3x4.50	88.9x3.25	144
410PM - 43	10.00	1.80	0.60	8.20	5.20	2.40	2.40	165.1x4.50	139.7x4.50	114.3x3.65	160
410PM - 44	10.00	1.80	0.60	8.20	5.20	2.40	2.40	165.1x4.85	139.7x4.50	114.3x3.65	168
410PM - 45	10.00	1.80	0.60	8.20	5.20	2.40	2.40	165.1x5.40	139.7x4.50	114.3x3.65	178
410PM - 46	10.00	1.80	0.60	8.20	5.20	2.40	2.40	193.7x4.85	165.1x4.50	139.7x4.50	208
410PM - 47	10.00	1.80	0.60	8.20	5.20	2.40	2.40	193.7x5.40	165.1x4.50	139.7x4.50	221
410PM - 48	10.00	1.80	0.60	8.20	5.20	2.40	2.40	193.7x5.90	165.1x4.50	139.7x4.50	233
410PM - 49	11.00	1.80	0.60	9.20	5.60	2.70	2.70	139.7x4.50	114.3x4.50	88.9x3.25	140
410PM - 50	11.00	1.80	0.60	9.20	5.60	2.70	2.70	139.7x4.85	114.3x4.50	88.9x3.25	140
410PM - 51	11.00	1.80	0.60	9.20	5.60	2.70	2.70	139.7x5.40	114.3x5.40	88.9x3.25	164
410PM - 52	11.00	1.80	0.60	9.20	5.60	2.70	2.70	165.1x4.50	139.7x4.50	114.3x3.65	175
410PM - 53	11.00	1.80	0.60	9.20	5.60	2.70	2.70	165.1x4.85	139.7x4.50	114.3x3.65	183
410PM - 54	11.00	1.80	0.60	9.20	5.60	2.70	2.70	165.1x5.40	139.7x4.50	114.3x3.65	194
410PM - 55	11.00	1.80	0.60	9.20	5.60	2.70	2.70	193.7x4.85	165.1x4.50	139.7x4.50	227
410PM - 56	11.00	1.80	0.60	9.20	5.60	2.70	2.70	193.7x5.40	165.1x4.50	139.7x4.50	241
410PM - 57	11.00	1.80	0.60	9.20	5.60	2.70	2.70	193.7x5.90	165.1x4.50	139.7x4.50	256
410PM - 58	12.00	2.00	0.60	10.00	5.80	3.10	3.10	165.1x4.50	139.7x4.50	114.3x3.65	186
410PM - 59	12.00	2.00	0.60	10.00	5.80	3.10	3.10	165.1x4.85	139.7x4.50	114.3x3.65	197
410PM - 60	12.00	2.00	0.60	10.00	5.80	3.10	3.10	165.1x5.40	139.7x4.50	114.3x3.65	208
410PM - 61	12.00	2.00	0.60	10.00	5.80	3.10	3.10	193.7x5.40	165.1x4.50	139.7x4.50	245
410PM - 62	12.00	2.00	0.60	10.00	5.80	3.10	3.10	193.7x4.85	165.1x4.50	139.7x4.50	259
410PM - 63	12.00	2.00	0.60	10.00	5.80	3.10	3.10	193.7x5.90	165.1x4.85	139.7x4.50	277
410PM - 64	12.00	2.00	0.60	10.00	5.80	3.10	3.10	219.1x4.85	193.7x4.85	165.1x4.50	292
410PM - 65	12.00	2.00	0.60	10.00	5.80	3.10	3.10	219.1x5.60	193.7x4.85	165.1x4.50	313
410PM - 66	12.00	2.00	0.60	10.00	5.80	3.10	3.10	219.1x5.90	193.7x4.85	165.1x4.50	322
410PM - 67	13.00	2.00	0.60	11.00	5.80	3.60	3.60	193.7x4.85	165.1x4.50	139.7x4.50	261
410PM - 68	13.00	2.00	0.60	11.00	5.80	3.60	3.60	193.7x5.40	165.1x4.85	139.7x4.50	281
410PM - 69	13.00	2.00	0.60	11.00	5.80	3.60	3.60	193.7x5.90	165.1x5.40	139.7x4.50	302
410PM - 70	13.00	2.00	0.60	11.00	5.80	3.60	3.60	219.1x4.85	193.7x4.85	165.1x4.50	312
410PM - 71	13.00	2.00	0.60	11.00	5.80	3.60	3.60	219.1x5.60	193.7x4.85	165.1x4.50	333
410PM - 72	13.00	2.00	0.60	11.00	5.80	3.60	3.60	219.1x5.90	193.1x4.85	165.1x4.50	343
410PM - 73	14.50	2.00	0.60	12.50	6.50	4.00	4.00	193.7x5.40	165.1x4.85	139.7x4.50	312
410PM - 74	14.50	2.00	0.60	12.50	6.50	4.00	4.00	193.7x5.90	165.1x5.40	139.7x4.50	336
410PM - 75	14.50	2.00	0.60	12.50	6.50	4.00	4.00	219.1x5.60	193.7x4.85	165.1x4.50	370
410PM - 76	14.50	2.00	0.60	12.50	6.50	4.00	4.00	219.1x5.90	193.7x4.85	165.1x4.50	380
410PM - 77	16.00	2.30	0.60	13.70	7.00	4.50	4.50	193.7x5.40	165.1x4.85	139.7x4.50	341
410PM - 78	16.00	2.30	0.60	13.70	7.00	4.50	4.50	193.7x5.90	165.1x5.40	139.7x4.50	367
410PM - 79	16.00	2.30	0.60	13.70	7.00	4.50	4.50	219.1x5.60	193.7x4.85	165.1x4.50	405
410PM - 80	16.00	2.30	0.60	13.70	7.00	4.50	4.50	219.1x5.90	193.7x4.85	165.1x4.50	416

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