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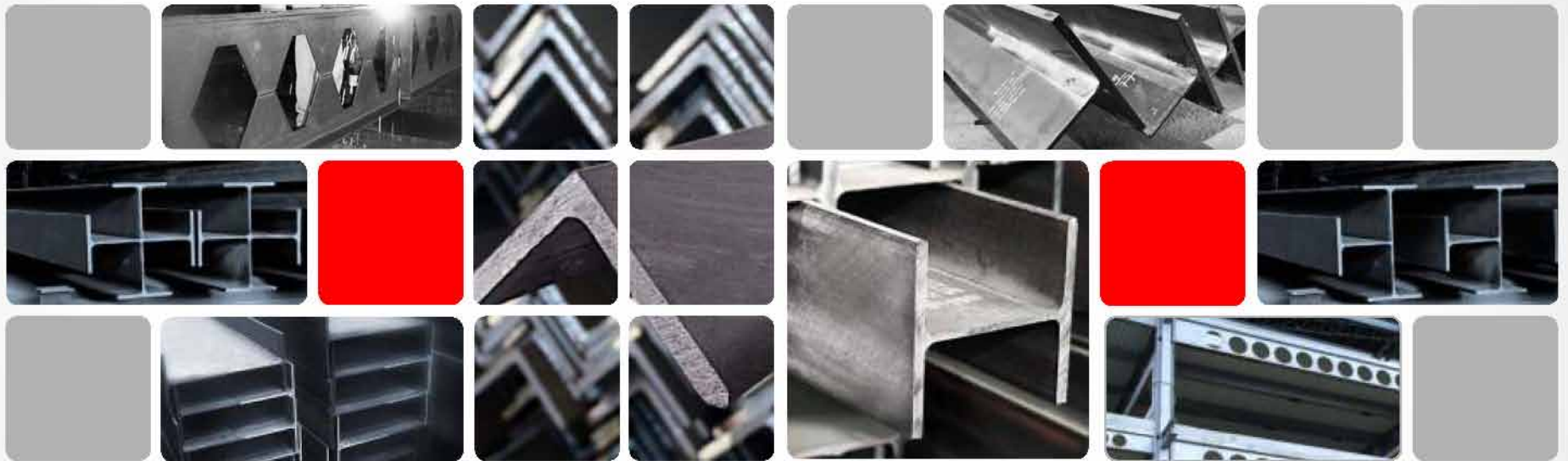
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www.gunungsteel.com

Rev. February 2017



PT. GUNUNG GARUDA
steel is our business



Product Catalogue

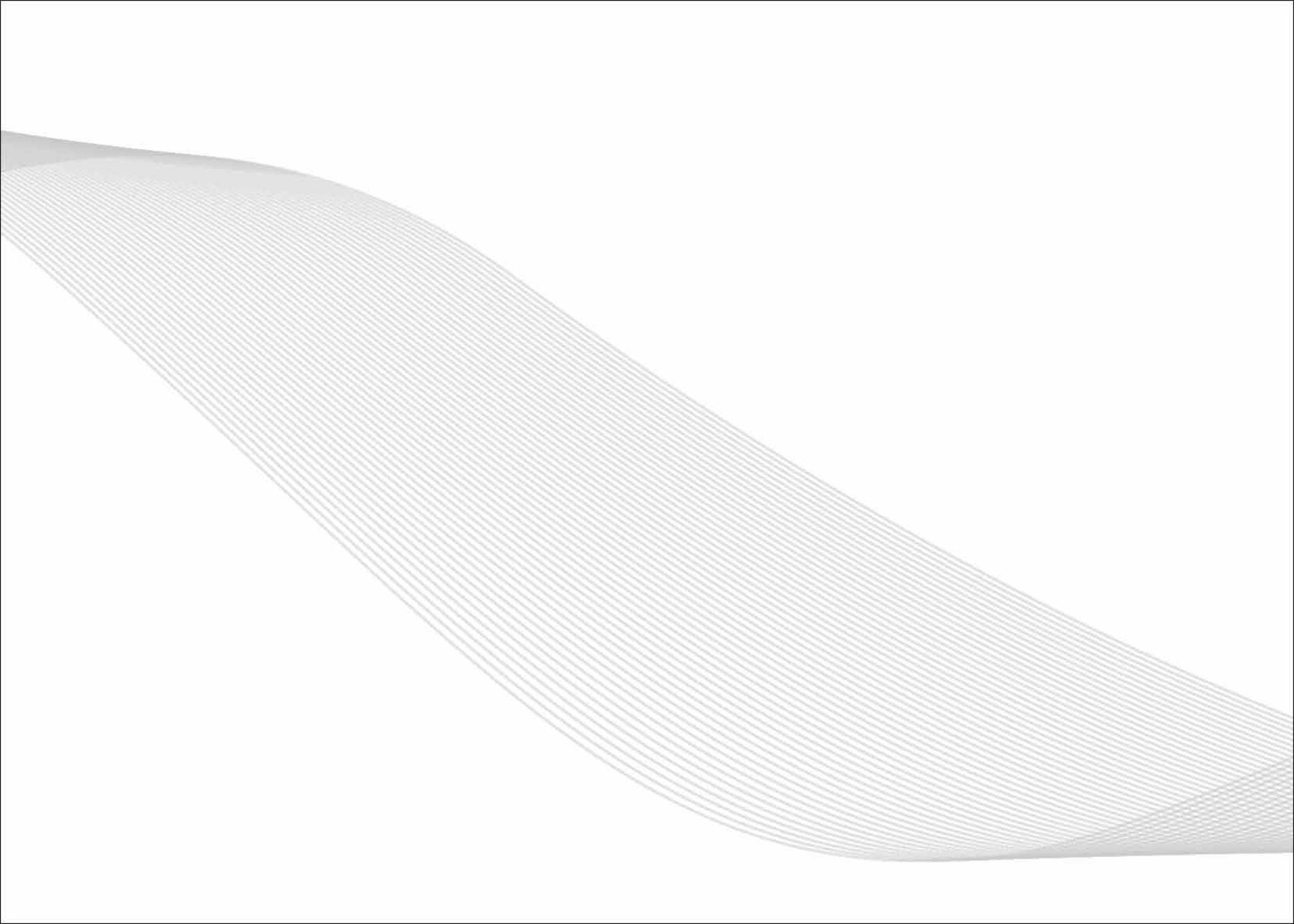




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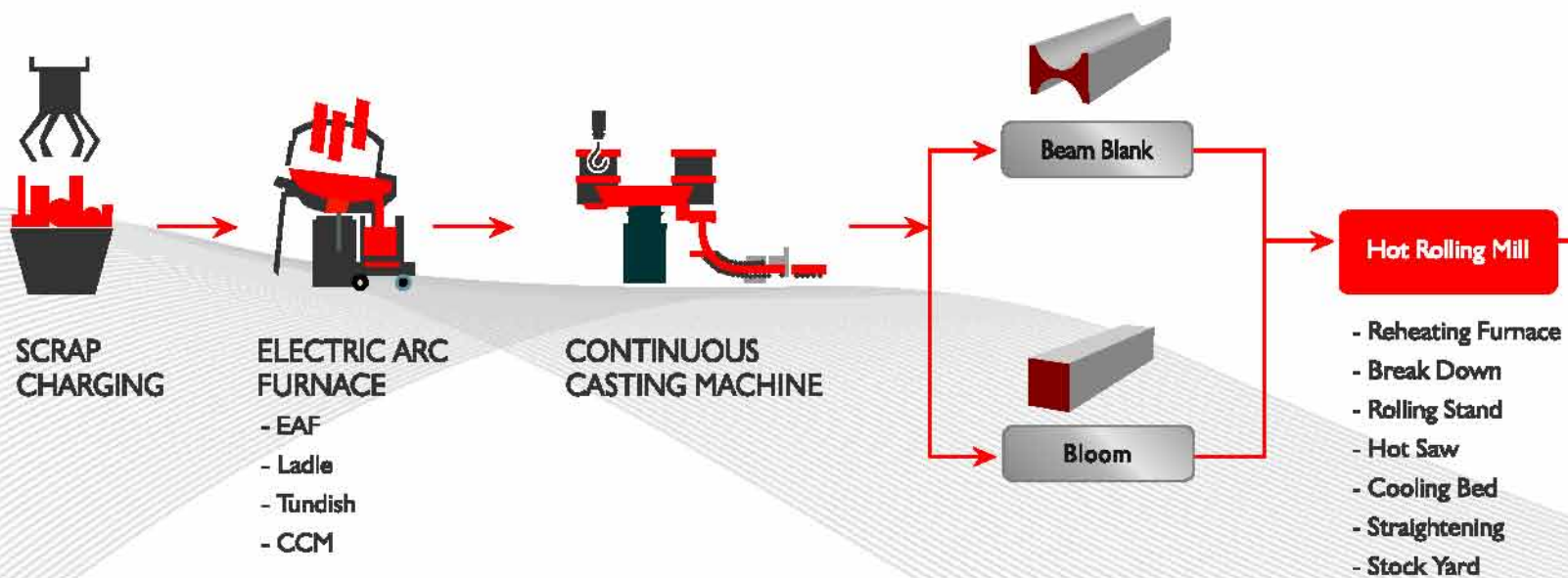
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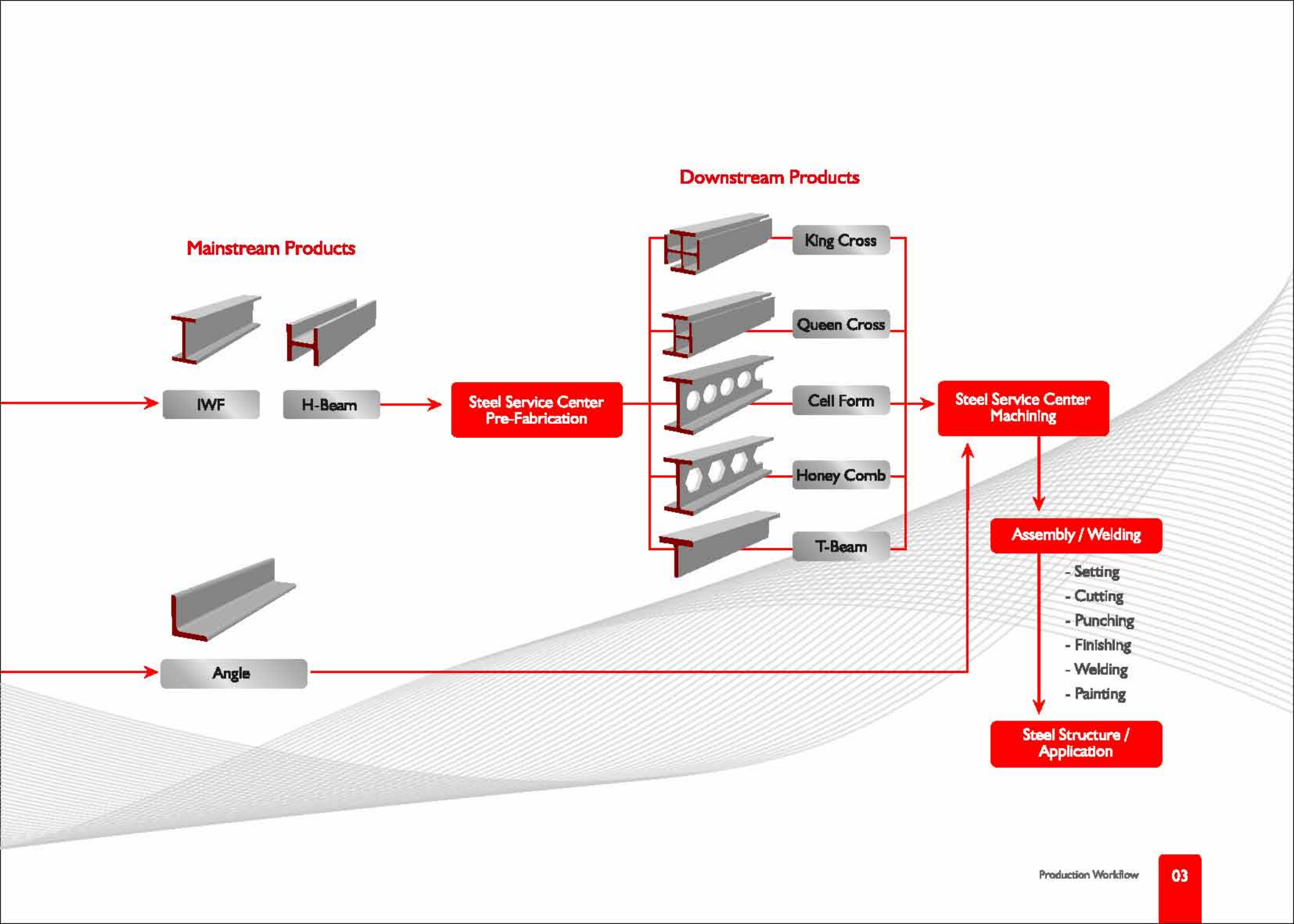
INTRODUCTION

Established in 1986, our company under the name PT. Gunung Garuda was the first company to produce structural steel products and hot rolled steel sections in Southeast Asia. We produce different type of heavy steel profile, with an annual production capacity of more than 800,000MT. Today, Gunung Garuda is one of the largest and dominant private steel manufacturers in South East Asia as a result of the investment made advanced technology and human resources.

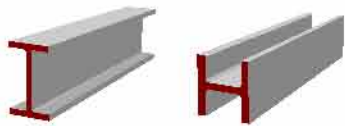
The high quality steel we produce is certified by Indonesian National Standard (SNI) and also conforms to JIS & to other equivalent International standards like ASTM, BS, DIN, etc. Here at Gunung Garuda, we proudly takes a proactive approach toward quality. Inspections are conducted throughout the manufacturing and fabrication process to ensure compliance to international standards and to our customers' requirements. And meeting our spirits towards quality steel product, it is further supported with the certification of our quality management system with ISO 9001:2008 standards. To provide our customer with the supply of high quality steel, we always keep a ready stock some of our products. Other products on stock can be produced upon request by the customer.

The information in this literature is correct at time of printing. However, specifications are subject to change without prior notice



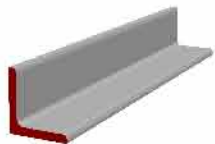


Mainstream Products



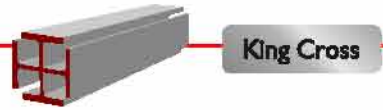
IWF

H-Beam

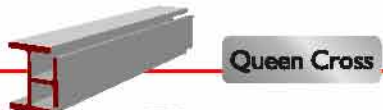


Angle

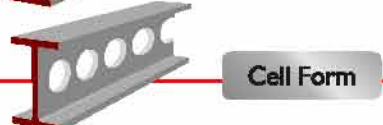
Downstream Products



King Cross



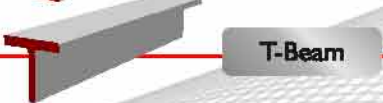
Queen Cross



Cell Form



Honey Comb



T-Beam

Steel Service Center
Pre-Fabrication

Steel Service Center
Machining

Assembly / Welding

- Setting
- Cutting
- Punching
- Finishing
- Welding
- Painting

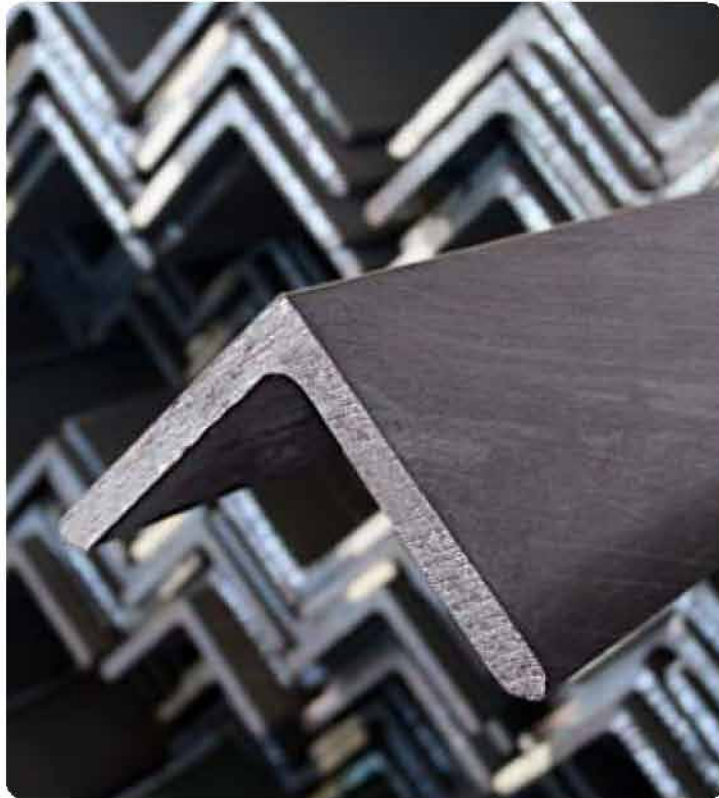
Steel Structure /
Application



STEEL STRUCTURE : MAINSTREAM



ANGLE (HOT ROLLED)



For uses that requires one leg of the angle to be longer than the other, the unequal Angle/L-Angle can be used. If the steel angle's requires the angle of degree other than 90 degrees, a V-Angle will be more suitable.

For this type of product, our company produces two variations, the Unequal Angle/L-Angle and the Equal Angle. There are certain variations in the steel angles depending on its basic construction.

One of hot rolled product under our range is the Angle Beam. Steel Angle is an important structural steel section for the manufacture of communication tower and power towers, as well as workshops and other engineering projects. It can be composed into different bearing components with different structures and it can also be used as joint piece between the components.

Gunung Garuda's Angles are hot rolled and are produced by rolling pre-heated blooms into an Angle shape. Our angle bars are manufactured under strict quality controls to ensure consistency and conformity to regional and International standards.

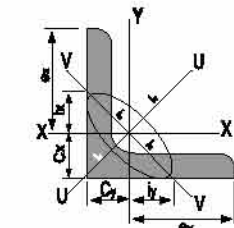
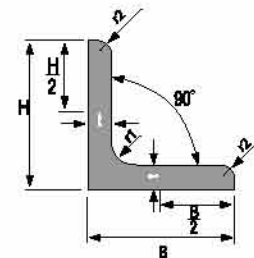
Grades and sizes other than shown on the table may also be available depending upon section and quantity requirements.

Size Range	: 40x40 to 250x250
Standard Length	: 6m & 12m
Thickness Range	: 4mm to 35mm
Annual Capacity	: > 60.000 MT/Y
Standards	: JIS G 3101 SS400 (Mild Steel) JIS G 3101 SSS40 (High Strength)

EQUAL ANGLE

Metric Size

STANDARD SECTIONAL DIMENSIONS					SECTION AREA A	UNIT WEIGHT			INFORMATIVE REFERENCE								REMARKS
H x B	t	r ₁	r ₂	A					C _x = C _y	GEOMETRICAL MOMENT OF INERTIA			RADIUS OF GYRATION OF AREA			Z _x = Z _y	
mm x mm	mm	mm	mm	cm ²	kg/m	kg/6m	kg/12m	cm		cm ⁴	cm ⁴	cm ⁴	cm	cm	cm		
40 x 40	4	4.5	2	3.080	2.42	14.52	29	1.090	3.530	5.60	1.460	1.230	1.55	0.79	1.210		
50 x 50	5	6.5	3	4.802	3.77	22.62	45	1.410	11.100	17.50	4.580	1.520	1.91	0.98	3.080		
50 x 50	6	6.5	4.5	5.644	4.43	26.58	53	1.440	12.600	20.00	5.230	1.500	1.88	0.96	3.550		
60 x 60	5	6.5	3	5.802	4.55	27.5	55	1.660	19.600	31.20	8.090	1.840	2.32	1.18	4.520		
60 x 60	6	6.5	3	6.910	5.42	32.5	65	1.700	22.790	36.16	9.420	1.820	2.29	1.17	5.280		
85 x 85	5	8.5	3	8.367	5.00	30	80	1.770	25.300	40.10	10.500	1.990	2.51	1.28	5.350		
65 x 65	6	8.5	4	7.527	5.91	35.5	71	1.810	29.400	46.80	12.200	1.980	2.49	1.27	6.260		
70 x 70	6	8.5	4	8.127	6.38	38.5	77	1.930	37.100	58.90	15.300	2.140	2.69	1.37	7.330		
75 x 75	6	8.5	4	8.727	6.85	41	82	2.060	46.100	73.20	19.000	2.300	2.90	1.48	8.470		
80 x 80	6	8.5	4	9.230	7.32	43.9	88	2.180	56.400	89.80	23.200	2.460	3.10	1.58	9.700		
90 x 90	7	10	5	12.220	9.59	57.6	115	2.460	93.000	148.00	38.300	2.760	3.48	1.77	14.200		
90 x 90	10	10	7	17.000	13.30	80	160	2.570	125.000	199.00	51.700	2.710	3.42	1.74	19.500		
100 x 100	7	10	5	13.620	10.70	64	128	2.710	129.000	205.00	53.200	3.080	3.88	1.98	17.700		
100 x 100	10	10	7	19.000	14.90	89.5	179	2.820	175.000	278.00	72.000	3.040	3.83	1.95	24.400		
120 x 120	8	12	5	18.760	14.70	88	176	3.240	258.000	410.00	106.000	3.710	4.67	2.38	29.500		
120 x 120	11	13	6.5	25.370	19.90	119.5	239	3.300	340.000	541.00	140.000	3.660	4.62	2.35	39.360		
120 x 120	12	13	6.5	27.540	21.60	130	259	3.400	367.000	583.00	151.000	3.650	4.80	2.35	42.680		
130 x 130	9	12	6	22.740	17.90	107.4	215	3.530	366.000	583.00	150.000	4.010	5.08	2.57	38.700		
130 x 130	12	12	8.5	29.760	23.40	140.5	281	3.640	467.000	743.00	192.000	3.960	5.00	2.54	49.900		
150 x 150	12	14	7	34.770	27.30	164	328	4.140	740.000	1,180.00	304.000	4.610	5.82	2.96	68.100		
150 x 150	15	14	10	42.740	33.60	202	403	4.240	888.000	1,410.00	365.000	4.560	5.75	2.92	82.600		
150 x 150	19	14	10	53.380	41.90	251.5	503	4.400	1,090.000	1,730.00	451.000	4.520	5.89	2.91	103.000		
175 x 175	12	15	11	40.520	31.80	191	382	4.730	1,170.000	1,860.00	480.000	5.380	6.78	3.44	91.800		
175 x 175	15	15	11	50.210	39.40	236.5	473	4.850	1,440.000	2,290.00	589.000	5.350	6.75	3.48	114.000		
200 x 200	15	17	12	57.750	45.30	272	544	5.460	2,180.000	3,470.00	891.000	6.140	7.75	3.93	150.000		
200 x 200	20	17	12	78.000	59.70	358	718	5.670	2,820.000	4,490.00	1,180.000	6.090	7.68	3.90	197.000		
200 x 200	25	17	12	93.750	73.60	442	883	5.860	3,420.000	5,420.00	1,410.000	6.040	7.61	3.88	242.000		
250 x 250	25	24	12	119.400	93.70	562	1124	7.100	6,950.000	11,000.00	2,860.000	7.630	9.62	4.89	388.000		
250 x 250	35	24	18	162.600	128.00	768	1536	7.450	9,110.000	14,400.00	3,790.000	7.490	9.42	4.83	519.000		



NOTE : Non standard sizes are available upon request and subject to minimum quantity

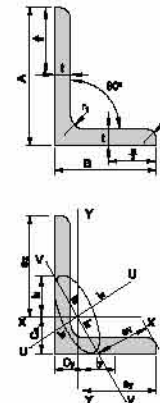
UNEQUAL ANGLE

Metric Size

STANDARD SECTIONAL DIMENSIONS					SECTION AREA	UNIT WEIGHT			INFORMATIVE REFERENCE												REMARKS	
									CENTER OF GRAVITY		GEOMETRICAL MOMENT OF INERTIA				RADIUS OF GYRATION OF AREA				tan α	MODULUS OF SECTION		
H	x	B	t	r ₁	r ₂	A	kg/m	kg/6m	kg/12m	C _x	C _y	I _x	I _y	Max I _u	Min I _v	I _x	I _y	Max I _u		Min I _v		Z _x
mm	x	mm	mm	mm	mm	cm ²	kg/m	kg/6m	kg/12m	cm	cm	cm ⁴	cm ⁴	cm ⁴	cm ⁴	cm	cm	cm	cm	cm ³		cm ³
• 90	x	75	9	8.5	6	14.01	11.0	66.0	132	2.75	2.00	109	88.1	143	34.1	2.78	2.20	3.19	1.58	0.676	17.4	12.4
• 100	x	75	7	10	5	11.87	9.32	55.9	112	3.08	1.83	118	56.9	144	30.8	3.15	2.19	3.49	1.61	0.548	17.0	10.0
• 100	x	75	10	10	7	16.50	13.0	78.0	156	3.17	1.94	159	76.1	194	41.3	3.11	2.15	3.43	1.58	0.543	23.3	13.7
125	x	75	7	10	5	13.62	10.7	64.2	128	4.10	1.64	219	60.4	243	36.4	4.01	2.11	4.23	1.64	0.362	26.1	10.3
125	x	75	10	10	7	19.00	14.9	89.4	179	4.22	1.75	299	80.8	330	49.0	3.96	2.06	4.17	1.61	0.357	36.1	14.1
125	x	75	13	10	7	24.31	19.1	114.6	229	4.35	1.87	376	101	415	61.9	3.93	2.04	4.13	1.60	0.352	46.1	17.9
125	x	90	10	10	7	20.50	16.1	96.6	193	3.95	2.22	318	138	380	76.2	3.94	2.59	4.30	1.93	0.505	37.2	20.3
125	x	90	13	10	7	26.26	20.6	123.6	247	4.07	2.34	401	173	477	96.3	3.91	2.57	4.26	1.91	0.501	47.5	25.9
150	x	90	9	12	6	20.94	16.4	98.4	197	4.95	1.99	485	133	537	80.4	4.81	2.52	5.06	1.96	0.381	48.2	19.0
150	x	90	12	12	8.5	27.36	21.5	129.0	258	5.07	2.10	619	167	685	102	4.76	2.47	5.00	1.93	0.357	62.3	24.3
• 150	x	100	9	12	6	21.84	17.1	102.6	205	4.78	2.30	502	181	579	104	4.79	2.88	5.15	2.18	0.439	49.1	23.5
• 150	x	100	12	12	8.5	28.56	22.4	134.4	269	4.88	2.41	642	228	738	132	4.74	2.83	5.09	2.15	0.435	63.4	30.1
• 150	x	100	15	12	8.5	35.25	27.7	166.2	332	5.00	2.53	782	276	897	161	4.71	2.80	5.04	2.14	0.431	78.2	37.0

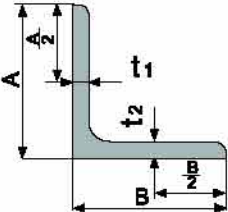
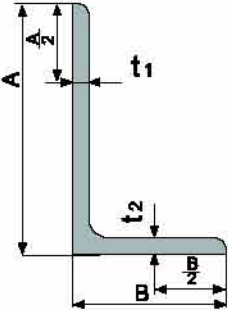

NOTE : Non standard sizes are available upon request and subject to minimum quantity

- Not Available



DIMENSIONAL TOLERANCE

Metric Size | JIS 3192 / TIS 1227-194

DIVISION AND DIMENSION		TOLERANCE	REMARKS	
Leg Length (A or B)	Under 50 in depth	± 1.5		
	50 or over to and excl. 100	± 2.0		
	100 or over to and excl. 200	± 3.0		
	200 or over	± 4.0		
Thickness (t ₁ , t ₂)	For Leg Length A or under 130 in depth	Under 6.3	± 0.6	
		6.3 or over to and excl. 10	± 0.7	
		10 or over to and excl. 16	± 0.8	
	For Leg Length A or under 130 or over in depth	Under 6.3	± 0.7	
		6.3 or over to and excl. 10	± 0.8	
		10 or over to and excl. 16	± 1.0	
Length	7m or under	+ 40 - 0	<p>Add 5mm to the plus side tolerance given in the above column for every 1m increase in length or its fraction</p>	
	Over 7m			
Out of Square (T)	Sections excluding I-section and T-section (for angles)	2.5 % or under of width B		
Bend	Sections excluding I-section and T-section (for angles)	0.30% or under of length	To be applied to bend such as sweep and camber.	

CHEMICAL COMPOSITION

According **JIS G 3101**

SYMBOL OF GRADE	CHEMICAL COMPOSITION (%)				
	C	Si	Mn	P	S
SS 400, 490	-	-	-	0.050 max	0.050 max
SS 540	0.30 max	-	1.60 max	0.040 max	0.040 max

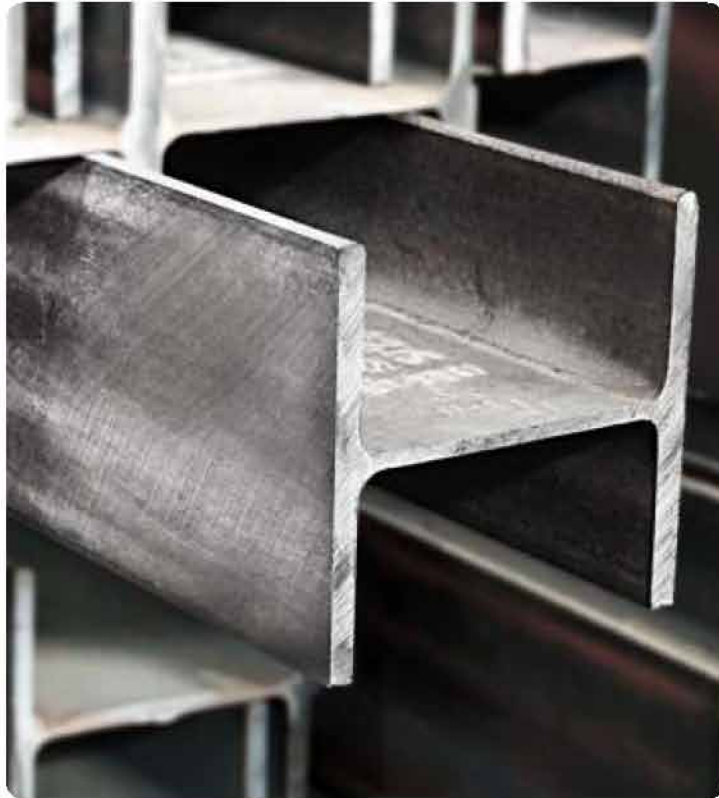
Note: (1) The value of carbon here in is the actual cast analysis value

MECHANICAL PROPERTIES

Specification	Grade	Product Thickness (mm)	Mechanical Properties				Bend Test	Impact Test (LG)	
			Thickness Range (mm)	Tensile Test (TR)				LG (Average Temp.)	TR (Average Temp.)
				YS min. (N/mm ²)	UTS (N/mm ²)	E min. (%)			
JIS G 3101 (2011)	SS 400	2 - 35	> 5 ≤ 16	245	400 - 510	17 (200mm)	Bending 180° 1.5 x t	-	-
			> 16 ≤ 35	235	400 - 510	21 (200mm)		-	-
	SS 490	6 - 35	> 5 ≤ 16	285	490 - 610	15 (200mm)	Bending 180° 2 x t	-	-
			> 16 ≤ 35	275	490 - 610	19 (200mm)		-	-
	SS 540	≤ 35	> 5 ≤ 16	400	540 min	13 (200mm)	Bending 180° 2 x t	-	-
			> 16 ≤ 35	390	540 min	17 (200mm)		-	-



H-BEAM



H-Beam is another product coming out from our hot rolled mill. It is the structural steel profile shaped like an H in section. The horizontal elements of the "I" are flanges, while the vertical element is the web. The web resists shear forces while the flanges resist most of the bending moment experienced by the beam. Beam theory shows that the H-shaped sections is a very efficient form for carrying both bending and shear loads in the plane of the web.

H-beams are widely used in the construction industry and are available in a variety of standard sizes. H-beams may be used both as beams and as columns.

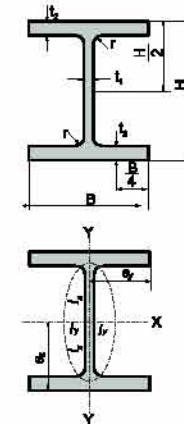
Gunung Garuda's hot rolled H-Beam comes with standard size range from 100x100 up to 350x350. Non standard H-Beam can be fabricated by welding steel plates together to form a welded beam that fits our customer's size requirements. We also provides free cut-to-length service for customers that required length below our standard length of 12m.

Size range	: 100x100 to 350x350
Standard length	: 12m
Flange thickness range	: 8mm to 19mm
Web thickness range	: 6mm to 12mm
Annual Capacity	: > 1.000.000 MT/Y
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.

H-BEAM

Metric Size | JIS 3192

STANDARD SECTIONAL DIMENSIONS				SECTION AREA A	UNIT WEIGHT		INFORMATIVE REFERENCE						REMARKS
H x B	t1	t2	r				GEOMETRICAL MOMENT OF INERTIA		RADIUS OF GYRATION OF AREA		MODULUS OF SECTION		
				Ix	Iy	Ix	Iy	Zy	Zy				
mm x mm	mm	mm	mm	cm ²	Kg/m	Kg/12m	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	
100 x 100	6	8	10	21.90	17.2	206	383	134	4.18	2.47	76.5	26.7	
• 125 x 125	6.5	9	10	30.31	23.8	286	847	293	5.29	3.11	138	47	
150 x 150	7	10	11	40.14	31.5	378	1 640	563	6.39	3.75	219	75.1	
• 175 x 175	7.5	11	12	51.21	40.2	482	2 880	984	7.50	4.38	330	112	
200 x 200	8	12	13	63.53	49.9	599	4 720	1 600	8.62	5.02	472	160	
250 x 250	9	14	16	92.18	72.4	869	10 800	3 650	10.8	6.29	867	292	
300 x 300	10	15	18	119.80	94	1128	20 400	6 750	13.1	7.51	1 360	450	
350 x 350	12	19	20	173.9	137	1644	40 300	13 600	15.2	8.84	2 300	776	



• NOTE : Non standard sizes are available upon request and subject to minimum quantity

WIDE FLANGE (IWF)



Another variation of H-Beam under our range product is the Wide Flange. Wide Flange is a structural steel profile similar with H-Beam but with its flange length longer than its web. Wide flange are also internationally known as I-Beam / W-Beam / Universal Beam / Universal Column and it's widely used in the construction industry and are available in a variety of standard sizes. Steel beams have always been a preferred alternative to concrete because it offers better tension and compression thus resulting in lighter construction structure.

Gunung Garuda's hot rolled IWF comes with standard size range from 150x75 up to 600x300. Non standard IWF can be fabricated by welding steel plates together to form a welded beam that fits our customer's size requirements. We also provides free cut-to-length service for customers that required length below our standard length of 12m.

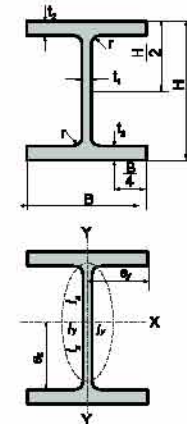
Size range	: 150x75 to 588x300
Standard length	: 12m
Flange thickness range	: 7mm to 20mm
Web thickness range	: 4.5mm to 12mm
Annual Capacity	: > 1.000.000 MT/Y
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.

WIDE FLANGE (IWF)

Metric Size | JIS 3192

STANDARD SECTIONAL DIMENSIONS					SECTION AREA A	UNIT WEIGHT		INFORMATIVE REFERENCE						REMARKS
Nominal Dimensional	H x B	t1	t2	r				GEOMETRICAL MOMENT OF INERTIA		RADIUS OF GYRATION OF AREA		MODULUS OF SECTION		
					Ix	Iy	Ix	Iy	Zy	Zy				
mm	mm x mm	mm	mm	mm	cm ²	Kg/m	Kg/12m	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	
150 x 75	150 x 75	5	7	8	17.85	14	168	666	49.5	6.11	1.66	88.8	13.2	
• 150 x 100	148 x 100	6	9	8	26.35	21.1	253	1,000	150	6.17	2.39	135	30.1	
200 x 100	198 x 99	4.5	7	11	23.18	18.2	218	1,580	114	8.26	2.21	160	23.0	
	200 x 100	5.5	8	11	27.16	21.3	256	1,840	134	8.24	2.22	184	26.8	
• 200 x 150	194 x 150	6	9	8	38.11	30.6	367	2,630	507	8.30	3.65	271	67.6	
250 x 125	248 x 124	5	8	12	32.68	25.7	308	3,540	255	10.4	2.79	265	41.1	
	250 x 125	6	9	12	37.66	29.6	355	4,050	294	10.4	2.79	324	47.0	
300 x 150	298 x 149	5.5	8	13	40.80	32	364	6,320	442	12.4	3.29	424	59.3	
	300 x 150	6.5	9	13	46.78	36.7	440	7,210	508	12.4	3.29	481	67.7	
350 x 175	346 x 174	8	9	14	52.68	41.4	497	11,100	792	14.5	3.88	641	91.0	
	350 x 175	7	11	14	63.14	49.8	595	13,600	984	14.7	3.95	775	112	
400 x 200	396 x 199	7	11	16	72.16	56.6	679	20,000	1,450	16.7	4.48	1,010	145	
	400 x 200	8	13	16	84.12	66	792	23,700	1,740	16.8	4.54	1,190	174	
450 x 200	450 x 200	9	14	18	96.8	76	912	33,500	1,870	16.6	4.40	1,490	187	
500 x 200	500 x 200	10	16	20	114.23	89.6	1075	47,800	2,140	20.5	4.43	1,910	214	
600 x 200	600 x 200	11	17	22	134.4	106	1272	77,600	2,280	24.0	4.12	2,580	228	
600 x 300	588 x 300	12	20	28	192.5	151	1812	181,000	9,020	24.80	8.85	4,020	601	

• NOTE : Non standard sizes are available upon request and subject to minimum quantity



TECHNICAL PROPERTIES FOR H-BEAM & WIDE FLANGE

DIMENSIONAL TOLERANCE

H-Beam & Wide Flange | JIS 3192

ITEM, mm (in.)		TOLERANCE	REMARKS
FLANGE WIDTH, B		± 3.0 (0.118)	
Depth (H)	Nominal depths of under 400 (15.748)	± 3.0 (0.118)	
	400 to 600 (23.622), excl.	± 4.0 (0.157)	
	600 and over	± 5.0 (0.197)	
Thickness	Under 16	± 1.5 (0.059)	
	16 or over to and excl.25	± 2.0 (0.079)	
	25 or over to and excl.40	± 2.5 (0.098)	
	40 or over	± 3.0 (0.118)	
Length	Under 16	± 1.0 (0.039)	
	16 or over to and excl.25	± 1.5 (0.024)	
	25 or over to and excl.40	± 2.0 (0.079)	
	40 or over	± 2.5 (0.098)	
Length	7 m or under	+ 40 (1.575) - 0	
	Over 7 m	40 (1.575) plus 5 (0.197) for each additional meter or fraction thereof	
Out-of-square (T)	Nominal depths 300 (11.811) or under in nominal depth	Not more than 1.2 percent of flange width B or 2.0 (0.079) at minimum	
	Nominal depths over 300 (11.811) in nominal depth	Not more than 1.5 percent of flange width B or 2.0 (0.079) at minimum	
Camber of Sweep	Nominal depths 300 (11.811) and under	Not more than 0.20 percent of length	Horizontal or vertical curvature in the direction of length
	Nominal depths over 300 (11.811)	Not more than 0.10 percent of length	
Web Off Center (S)	Nominal depths 300 (11.811) and under	± 3.0 (0.118)	
	Nominal depths over 300 (11.811)	± 4.5 (0.117)	
Ends - out of square (e)		1.6% or under of width B or of depth H, provided that 3.0 mm is the minimum	

CHEMICAL COMPOSITION

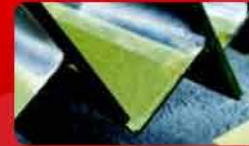
SYMBOL OF GRADE	CHEMICAL COMPOSITION (%)				
	C	Si	Mn	P	S
SS 400, 490	-	-	-	0.050 max	0.050 max
SS 540	0.30 max	-	1.60 max	0.040 max	0.040 max

MECHANICAL PROPERTIES

Specification	Grade	Product Thickness (mm)	Mechanical Properties				Bend Test	Impact Test (LG)	
			Thickness Range (mm)	Tensile Test (TR)				LG (Average Temp.)	TR (Average Temp.)
				YS min. (N/mm ²)	UTS (N/mm ²)	E min. (%)			
JIS G 3101 (2011)	SS 400	2 - 35	> 5 ≤ 16	245	400 - 510	17 (200mm)	Bending 180° 1.5 x t	-	-
			> 16 ≤ 35	235	400 - 510	21 (200mm)		-	-
	SS 540	≤ 35	> 5 ≤ 16	400	540 min	13 (200mm)	Bending 180° 2 x t	-	-
			> 16 ≤ 35	390	540 min	17 (200mm)		-	-



STEEL STRUCTURE : DOWNSTREAM



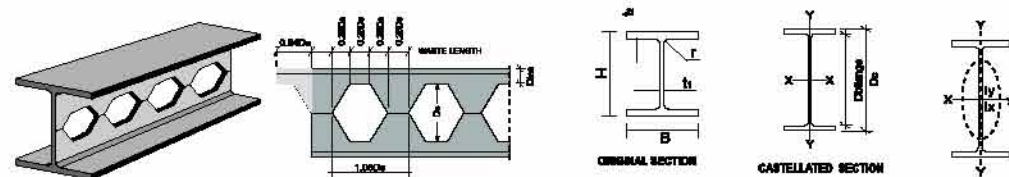
CASTELLATED BEAM : HONEY COMB



One product variation of the Castellated Beam type that is under Gunung Garuda's product range is the Honey Comb. Honey Comb is a castellated beam that is fabricated from a standard IWF. The beam is initially split along its length by a profile flame cut. The two halves of the beam are then separated, displaced by one profile and reconnected by welding, thus forming hexagonal holes along the web.

Castellated beams have a deeper section than a comparable solid beam, which has a greater resistance to deflection. They are therefore most often used in long span applications with light or moderate loadings, particularly roofs. Since the weight of steel has not changed, the structural efficiency of the section in bending has been increased. A further advantage of castellated beams is the holes in the web which provide a route for services.

Size range	: 150 x 100 to 1200 x 300
Standard length	: 12m
Depth Section	: 150 to 1200
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.



CASTELLATED BEAM : HONEY COMB

Metric Size | **JIS 3192**

Sectional Index		Weight	Depth of Section		Width of Section	Thickness		Corner Radius	Depth of Castellated Hole	Depth of Castellated Tee	Depth Between Flanges	Section Area		Moment of Inertia		Radius of Gyration		Modulus of Section	
Original	Castellated		Original	Castellated		Web	Flange					Max	Min	I _x	I _y	I _x	I _y	Z _x	Z _y
H	DC		B	t ₁	t ₂	r	D _s	D _{tee}	D _{flange}	Gross	Net	cm ⁴	cm ⁴						
mm	mm		Kg/m	mm	mm	mm	mm	mm	mm	mm	mm	mm	cm ²	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³
100 x 100	150 x 100	17.2	100	150	100	8	8	10	105	22.5	134	24.9	18.57	905.3	134	7	2.7	120.7	26.8
150 x 75	225 x 75	14	150	225	75	5	7	8	154	35.5	211	21.6	13.85	1579.7	49.5	10.7	1.9	140.4	13.2
150 x 150	225 x 150	31.5	150	225	150	7	10	11	154	35.5	205	45.39	34.54	3889.6	563	10.6	4	345.7	75.1
200 x 100	300 x 100	21.3	200	300	100	5.5	8	11	205	47.5	284	32.66	21.36	4306.8	134	14.2	2.5	287.1	26.8
200 x 100	297 x 99	18.2	198	297	99	4.5	7	11	202	47.5	283	27.64	18.5	3643.9	114	14	2.5	245.4	23
200 x 200	300 x 200	49.9	200	300	200	8	12	13	205	47.5	276	71.53	55.09	11139	1600.1	14.2	5.4	742.6	160
250 x 125	375 x 125	29.8	250	375	125	8	9	12	254	60.5	357	45.16	28.86	9491.5	294.1	17.8	3.1	506.2	47
250 x 125	372 x 124	25.7	248	372	124	5	8	12	253	59.5	356	39.88	26.21	8189.8	255	17.7	3.1	440.3	41.1
250 x 250	375 x 250	72.4	250	375	250	9	14	16	254	60.5	347	103.43	80.48	25477.5	3650.2	17.8	6.7	1358.8	292
300 x 150	450 x 150	36.7	300	450	150	6.5	9	13	305	72.5	432	56.53	36.67	16895.1	508.1	21.5	3.7	750.9	67.7
300 x 150	447 x 149	32	298	447	149	5.5	8	13	302	72.5	431	49	32.33	14664	442	21.3	3.7	656.1	59.3
300 x 300	450 x 300	94	300	450	300	10	15	18	305	72.5	420	134.8	104.25	47854.8	6750.3	21.4	8	2126.9	450
350 x 175	525 x 175	49.6	350	525	175	7	11	14	354	85.5	503	75.39	50.54	31847.5	984.1	25.1	4.4	1213.2	112.5
350 x 175	519 x 174	41.4	346	519	174	6	9	14	350	84.5	501	63.06	42	25819.2	792.1	24.8	4.3	995	91
350 x 350	525 x 350	137	350	525	350	12	19	20	354	85.5	487	194.9	152.3	95013.1	13600.6	25	9.4	3619.5	777.2
400 x 200	600 x 200	66	400	600	200	8	13	16	405	97.5	574	100.12	67.68	55683.6	1740.2	28.7	5.1	1856.1	174
400 x 200	594 x 199	56.6	396	594	199	7	11	16	401	96.5	572	86.02	57.2	46856.1	1450.1	28.4	5	1570.9	145.7
450 x 200	675 x 200	76	450	675	200	9	14	18	454	110.5	647	117.01	76.06	78747.4	1870.3	32.2	5	2333.3	187
500 x 200	750 x 200	89.6	500	750	200	10	16	20	505	122.5	718	139.2	88.65	122855.7	2140.5	35.7	4.9	3009.5	214
600 x 200	900 x 200	106	600	900	200	11	17	22	605	147.5	866	167.4	100.8	184103	2280.8	42.7	4.8	4091.2	228.1
588 x 300	882 x 300	151	588	882	300	12	20	28	593	144.5	842	227.78	156.56	274532.9	9021	41.9	7.6	6225.2	601.4
400 x 400	600 x 400	172	400	600	400	13	21	22	405	97.5	558	244.7	191.99	156913.2	22400.8	28.6	10.8	5230.4	1120
700 x 300	1050 x 300	185	700	1050	300	13	24	28	705	172.5	1002	281	189.29	473222.7	10801.5	50	7.6	9013.8	720.1
800 x 300	1200 x 300	210	800	1200	300	14	26	28	805	197.5	1148	323.4	210.63	690341.9	11702.2	57.2	7.5	11505.7	780.1

NOTE : Non standard sizes are available upon request and subject to minimum quantity

CASTELLATED BEAM : CELL FORM

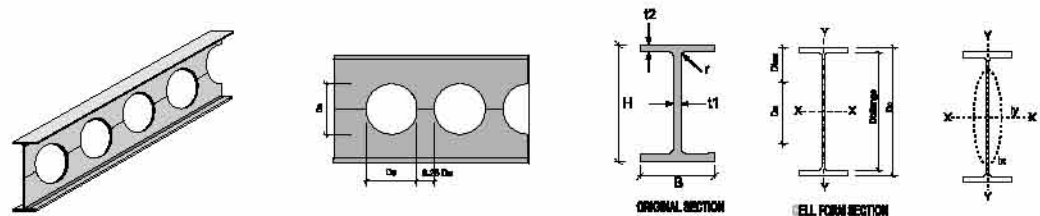


Another form of Castellated Beam type under our product range is the Cell Form. The cell form beam is fabricated in a similar way to the Honey Comb casted beam, with some additional cuts are made in the web to create circular holes when the cut sections are joined. Cell form beams offer users the benefit of flexibility, reduced weight, space and aesthetics, while lowering costs.

The use of cellular beams allows a new architectural expression. Structures are lightened and spans increased, pulling spaces together. This flexibility goes together with the functionality of allowing technical installations (pipes and ducts) to pass through the openings.

The lightweight appearance of cellular beams, combined with their high strength, never ceases to inspire architects to new structural forms.

Size range	: 150x100 to 1200x300
Standard length	: 12m
Depth Section	: 150 to 1200
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.



CASTELLATED BEAM : CELL FORM

Metric Size | **JIS 3192**

Sectional Index		Weight	Depth of Section		Width of Section	Thickness		Corner Radius	Depth of Cell Form Hole	Depth of Cell Form Tee	Depth Between Flanges	Section Area		Moment of Inertia		Radius of Gyration		Modulus of Section	
Original	Cell Form		Original	Cell Form		Web	Flange					Max	Min						
			H	DC	B	t ₁	t ₂	r	D _s	D _{tee}	D _{flange}	Gross	Net	I _x	I _y	r _x	r _y	Z _x	Z _y
mm	mm		Kg/m	mm	mm	mm	mm	mm	mm	mm	mm	mm	cm ²	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³
100 x 100	150 x 100	16.27	100	150	100	6	8	10	103	23	134	25	18.8	908.9	134	7	2.7	121.2	26.8
150 x 75	225 x 75	12.78	150	225	75	5	7	8	155	35	211	21.7	14	1586.2	49.5	10.7	1.9	141	13.2
150 x 150	225 x 150	29.75	150	225	150	7	10	11	155	35	205	45.6	34.7	3897.8	563	10.6	4	346.5	75.1
200 x 100	300 x 100	19.44	200	300	100	5.5	8	11	206	47	284	32.8	21.5	4322.8	134	14.2	2.5	288.2	26.8
200 x 100	300 x 99	16.54	198	300	99	4.5	7	11	210	45	286	27.9	18.4	3732.3	114	14.2	2.5	248.8	23
200 x 200	300 x 200	47.1	200	300	200	8	12	13	206	47	276	71.8	55.3	11159.9	1600	14.2	5.4	744	160
250 x 125	375 x 125	26.98	250	375	125	6	9	12	258	59	357	45.4	29.9	9518.5	294	17.8	3.1	507.5	47
250 x 125	375 x 124	23.33	248	375	124	5	8	12	282	57	359	39.2	26.1	8351.7	255	17.9	3.1	445.4	41.1
250 x 250	375 x 250	68.32	250	375	250	9	14	16	258	59	347	103.8	80.6	25510.2	3850	17.8	6.7	1360.5	292
300 x 150	450 x 150	33.55	300	450	150	6.5	9	13	309	70	432	56.8	36.7	16943.9	508	21.5	3.7	753.1	67.7
300 x 150	450 x 149	29.17	298	450	149	5.5	8	13	313	68	434	49.4	32.2	14905.3	442	21.5	3.7	662.5	59.3
300 x 300	450 x 300	88.76	300	450	300	10	15	18	309	70	420	135.3	104.3	47919.5	6750	21.4	8	2129.8	450
350 x 175	525 x 175	45.11	350	525	175	7	11	14	361	82	503	75.8	50.5	31912.4	984	25.1	4.4	1215.7	112.5
350 x 175	525 x 174	37.65	346	525	174	6	9	14	369	78	507	63.8	41.6	26499.6	792	25.2	4.4	1009.5	91
350 x 350	525 x 350	129.25	350	525	350	12	19	20	361	82	487	195.5	152.3	95108.4	13599.9	25	9.5	3623.2	777.1
400 x 200	600 x 200	59.94	400	600	200	8	13	16	412	94	574	100.6	67.6	55799	1740	28.7	5.1	1880	174
400 x 200	600 x 199	51.37	396	600	199	7	11	16	421	90	578	86.9	57.4	47743	1450	28.8	5	1591.4	145.7
450 x 200	675 x 200	68.66	450	675	200	9	14	18	464	106	647	117.6	75.9	78909.5	1870	32.2	5	2338.1	187
500 x 200	750 x 200	80.28	500	750	200	10	16	20	515	117	718	140	88.4	113123.5	2140	35.8	4.9	3016.6	214
600 x 200	900 x 200	94.11	600	900	200	11	17	22	618	141	866	168.4	100.4	184605.2	2279.9	42.9	4.8	4102.3	228
588 x 300	900 x 300	136.46	588	900	300	12	20	28	643	128	860	231.1	153.9	286789.2	9019.9	43.2	7.7	6373.1	601.3
400 x 400	600 x 400	162.21	400	600	400	13	21	22	412	94	558	245.5	191.9	157075.6	22399.9	28.6	10.8	5235.9	1120
700 x 300	1050 x 300	165.42	700	1050	300	13	24	28	722	164	1002	282.4	188.6	473991	10799.9	50.1	7.6	7028.4	720
800 x 300	1200 x 300	185.76	800	1200	300	14	26	28	825	188	1148	325.1	209.7	691563.8	11699.8	57.4	7.5	11526.1	780

NOTE : Non standard sizes are available upon request and subject to minimum quantity

T-BEAM



Another hot rolled under our range is the T-Beam. A T-Beam is a load-bearing structure with a t-shaped cross section. The top of the t-shaped cross section serves as a flange or compression member in resisting compressive stresses. The web of the beam below the compression flange serves to resist shear stress and to provide greater separation for the coupled forces of bending.

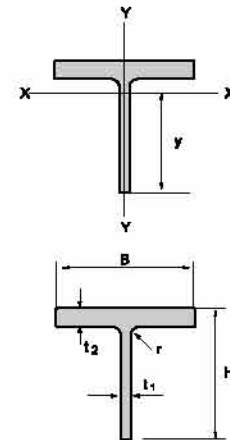
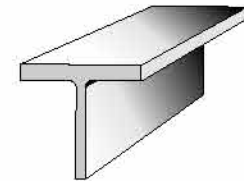
Other uses for one way to make a T-beam to be more efficient structurally is to use an inverted T-beam with a floor slab or bridge deck joining the tops of the beams. Done properly, the slab acts as the compression flange.

Size range	: 50 x 100 to 400x300
Web Thickness Range	: 6mm to 14mm
Flange Thickness Range	: 8mm to 26mm
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.

T-Beam

Metric Size | JIS 3192

Sectional Index	Standard Sectional Dimension					Sectional Area	Unit Weight	Informative Reference								Remarks
	Depth of Section	Width of Section	Thickness		Corner Radius			Center of Gravity	Geometrical Moment of Inertia		Radius of Gyration of Area		Modulus of Section			
			Web	Flange					I_x	I_y	I_x	I_y	Z_x	Z_y		
mm	H	B	t ₁	t ₂	r	A	kg/m	y	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³		
T 50 x 100	50	100	6	8	10	10.95	8.6	40	16	67	1.2	2.47	4	13.4		
T 62.5 x 125	62.5	125	6.5	9	10	15.18	11.9	50.6	35	147	1.51	3.11	6.9	23.5		
T 75 x 75	75	75	5	7	8	8.93	7	57	42	25	2.18	1.87	7.4	6.6		
T 75 x 150	75	150	7	10	11	20.07	15.75	61.3	66	282	1.81	3.75	10.8	37.6		
T 100 x 100	100	100	5.5	8	11	13.58	10.65	71.7	114	67	2.9	2.22	14.8	13.4		
T 99 x 99	99	100	4.5	7	11	11.59	9.1	78.1	94	58	2.84	2.25	12	11.7		
T 87.5 x 175	87.5	175	7.5	11	12	25.61	20.1	72	114	492	2.11	4.38	15.8	56.2		
T 100 x 200	100	200	8	12	13	31.77	24.95	82.7	184	801	2.41	5.02	22.2	80.1		
T 125 x 125	125	125	8	9	12	18.83	14.8	97.2	248	147	3.83	2.79	25.5	23.5		
T 124 x 124	124	124	5	8	12	16.34	12.85	97.7	207	127	3.56	2.79	21.2	20.5		
T 125 x 250	125	250	9	14	16	46.09	36.2	104.2	411	1825	2.98	6.29	39.4	146		
T 150 x 150	150	150	6.5	9	13	23.39	18.35	115.9	463	254	4.45	3.29	39.9	33.8		
T 149 x 149	149	149	5.5	8	13	20.4	16	116.4	393	221	4.39	3.29	33.7	29.6		
T 150 x 300	150	300	10	15	18	59.9	47	125.3	796	3378	3.64	7.51	63.5	225.2		
T 175 x 175	175	175	7	11	14	31.57	24.8	137.5	814	492	5.08	3.95	59.2	56.3		
T 173 x 174	173	174	6	9	14	26.34	20.7	136	678	396	5.07	3.88	49.9	45.5		
T 175 x 350	175	350	12	19	20	86.95	68.85	146.4	1515	6794	4.17	8.84	103.5	388.2		
T 200 x 200	200	200	8	13	16	42.06	33	157.7	1395	868	5.76	4.54	88.5	86.8		
T 198 x 199	198	199	7	11	16	36.08	28.3	156.3	1193	723	5.75	4.48	76.3	72.7		
T 200 x 400	200	400	13	21	22	109.35	86	167.9	2470	11207	4.75	10.12	147.1	560.4		
T 225 x 200	225	200	9	14	18	48.38	38	173.5	2155	936	6.67	4.4	124.2	93.6		
T 250 x 200	250	200	10	16	20	57.1	44.8	190.5	3210	1071	7.5	4.33	168.5	107.1		
T 300 x 200	300	200	11	17	22	67.2	53	221.6	5786	1139	9.29	4.12	261.9	113.9		
T 294 x 300	294	300	12	20	28	96.25	75.5	233.2	6695	4509	8.34	6.84	295.3	300.6		
T 350 x 300	350	300	13	24	28	117.75	92.5	274.5	12015	5412	10.1	6.78	447.3	360.8		
T 400 x 300	400	300	14	26	28	133.7	105	306.3	18787	5866	11.85	6.62	609.5	391.1		



NOTE :

- Material specification refer to Wide Flange (WFL)
- Tolerance H= ±2mm
- Non standard sizes are available upon request and subject to minimum quantity

KING CROSS



King Cross is a built-up / fabricated steel section. Standard sizes can be made by welding 2 T-Beams into the web of a hot rolled IWF, forming the shape of a cross. Non standard sizes are made entirely by welding steel plates.

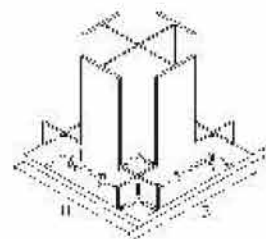
King Cross's are generally used for structure column and steel piling foundation. When used as a column, King Cross can bear higher axial load than it is of standard IWF / Queen Cross due to its mechanical properties and high cross section area.

Compared to standard IWF / H-Beam, King Cross has higher Moment Of Inertia. To increase the slenderness capacity, higher Moment Of Inertia is required to avoid any buckling on the compression member. The Moment Of Inertia of the Y and X axis is almost the same, thus resulting in no weak axis.

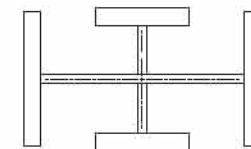
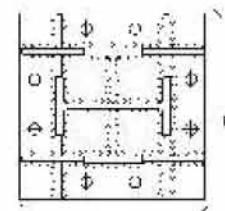
While standard Gunung Garuda's King Cross's are welded with complete/partial joint penetration welding procedure, other welding procedure can also be done as on request.

Other than our 12M length standard, non standard sizes are also available upon request and subject to minimum quantity.

Size range	: K 150x75 to K800x300
Web Thickness Range	: 5mm to 14mm
Flange Thickness Range	: 7mm to 26mm
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.



Fixed based plate for King Cross

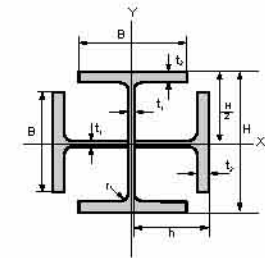
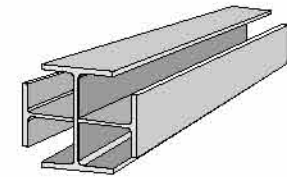


Non-standard built up King Cross

King Cross

Metric Size

Sectional Index	Standard Sectional Dimension					Sectional Area A cm ²	Unit Weight kg/m	Informative Reference						Remarks
	Depth of Section H mm	Width of Section B mm	Thickness		Corner Radius r mm			Geometrical Moment of Inertia		Radius of Gyration of Area		Modulus of Section		
			Web t ₁ mm	Flange t ₂ mm				I _x cm ⁴	I _y cm ⁴	i _x cm	i _y cm	Z _x cm ³	Z _y cm ³	
	mm	mm	mm	mm	mm			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	
K 150 x 75	150	75	5	7	8	35.7	28	716	767	4.48	4.64	95.4	99.1	
K 200 x 100	200	100	5.5	8	11	54.32	42.6	1,974	2,095	6.03	6.21	197.4	203.9	
K 198 x 99	198	99	4.5	7	11	46.36	36.4	1,694	1,778	6.04	6.23	171.1	175.6	
K 250 x 125	250	125	6	9	12	75.32	59.2	4,344	4,567	7.59	7.79	347.5	356.9	
K 248 x 124	248	124	5	8	12	65.36	51.4	3,765	3,924	7.59	7.75	303.6	310.2	
K 300 x 150	300	150	6.5	9	13	93.56	73.4	7,718	8,073	9.08	9.29	514.5	526.9	
K 298 x 149	298	149	5.5	8	13	81.6	64	6,762	7,024	9.1	9.28	453.8	462.9	
K 350 x 175	350	175	7	11	14	126.28	99.2	14,554.1	5,128	10.75	10.95	831.7	847.5	
K 346 x 174	346	174	6	9	14	105.36	82.8	11,892	12,321	10.62	10.62	687.4	700.0	
K 400 x 200	400	200	8	13	16	168.24	132	25,440	26,519	12.3	12.55	1,272	1,299.9	
K 396 x 199	396	199	7	11	16	144.32	113.2	21,450	22,267	12.19	12.19	1,083.3	1,105.1	
K 450 x 200	450	200	9	14	18	193.52	152	35,370	36,851	13.52	13.52	1,572.0	1,605.7	
K 500 x 200	500	200	10	16	20	228.4	179.2	49,940	52,189	14.79	15.7	1,997.6	2,046.6	
K 600 x 200	600	200	11	17	22	268.8	212	79,880	83,229	17.24	17.24	2,662.7	2,724.4	
K 588 x 300	588	300	12	20	28	385	302	127,020	132,585	18.16	18.16	4,320.4	4,419.5	
K 700 x 300	700	300	13	24	28	471	369.7	211,800	220,791	21.21	21.65	6,051.4	6,193.3	
K 800 x 300	800	300	14	26	28	534.8	419.8	303,700	315,027	23.83	24.27	7,592.5	7,740.2	



NOTE :

- H = H/2 = Height of T-Beam
- Material specification refer to Wide Flange (IWF)
- Tolerance H= ± 2mm
- Welded specification as per AWS E-6013
- Non standard sizes are available upon request and subject to minimum quantity

QUEEN CROSS



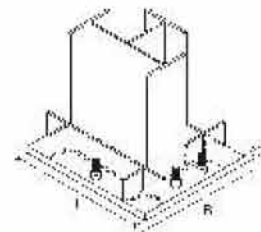
Queen Cross is almost similar to King Cross but differ in shape. Standard sizes can be made by welding a T-Beam into the web of a hot rolled IWF while for non standards sizes are made from welded steel plates.

Just like King Cross, Queen Cross are also generally used for structural column for smaller axial load properties compared to King Cross and are still have a higher load values than standard IWF.

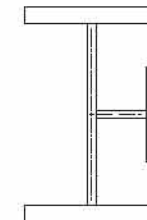
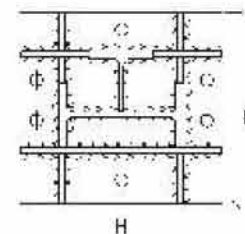
Gunung Garuda's Queen Cross's are welded with partial joint penetration welding procedure while other procedures such as complete joint penetration and fillet can also be done on request.

Other than our 12M length standard, non standard sizes are also available upon request and will subject to minimum quantity.

Size range	: Q 150x75 to Q 800x300
Web Thickness Range	: 5mm to 14mm
Flange Thickness Range	: 7mm to 26mm
Standards	: JIS G 3101 SS400 (Mild Steel)
Note	: High Strength specification are available upon request and subject to minimum quantity.



Fixed based plate for Queen Cross

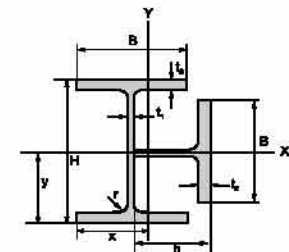
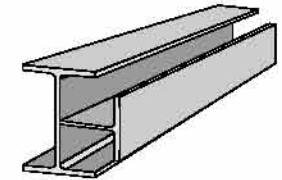


Non-standard built up Queen Cross

Queen Cross

Metric Size

Sectional Index	Standard Sectional Dimension					Sectional Area A	Unit Weight kg/m	Informative Reference								Remarks
	Depth of Section H	Width of Section B	Thickness		Corner Radius r			Center of Gravity		Geometrical Moment of Inertia		Radius of Gyration of Area		Modulus of Section		
			Web t ₁	Flange t ₂				x	y	I _x	I _y	k _x	k _y	Z _x	Z _y	
	mm	mm	mm	mm	mm			cm ²	kg/m	mm	mm	cm ⁴	cm ⁴	cm	cm	
Q 150 x 75	150	75	5	7	8	26.78	21	57.3	75	691	310	5.08	3.4	92.1	53.99	
Q 200 x 100	200	100	5.5	8	11	40.74	32	76.8	100	1,907	848	6.84	4.58	190.7	110.72	
Q 198 x 99	198	99	4.5	7	11	34.77	27.3	76.1	99	1,637	722	6.86	4.58	165.3	94.86	
Q 250 x 125	250	125	6	9	12	56.49	44.4	95.9	125	4,197	1,844	6.82	5.71	335.8	192.34	
Q 248 x 124	248	124	5	8	12	49.02	38.5	95.4	124	3,670	1,599	6.85	5.71	296.0	167.62	
Q 300 x 150	300	150	6.5	9	13	70.17	55.1	114.7	150	7,464	3,260	10.31	6.82	497.6	284.16	
Q 298 x 149	298	149	5.5	8	13	61.2	48.1	114.2	149	6,545	2,842	10.34	6.81	439.3	248.76	
Q 350 x 175	350	175	7	11	14	94.71	74.4	134.5	175	14,092	6,096	12.2	8.02	805.3	453.30	
Q 346 x 174	346	174	6	9	14	79.02	62.1	133.3	173	11,496	4,978	12.07	7.94	664.5	373.37	
Q 400 x 200	400	200	8	13	16	126.18	99.1	153.9	200	24,570	10,661	13.95	9.19	1,228.4	692.79	
Q 396 x 199	396	199	7	11	16	108.24	85	152.8	198	20,725	8,984	13.84	9.11	1,047.2	588.07	
Q 450 x 200	450	200	9	14	18	145.14	114	159.3	225	34,436	15,472	15.4	10.02	1,530.5	914.48	
Q 500 x 200	500	200	10	16	20	171.3	134.5	165.2	250	48,871	20,386	16.89	10.91	1,954.8	1,234.37	
Q 600 x 200	600	200	11	17	22	201.6	156.3	175.7	300	78,739	32,097	19.76	12.62	2,624.6	1,826.74	
Q 588 x 300	588	300	12	20	28	288.75	226.7	229.7	294	122,509	53,713	20.6	13.64	4,167.0	2,338.03	
Q 700 x 300	700	300	13	24	28	353.25	277.4	243.7	350	206,406	86,629	24.17	15.66	5,897.1	3,555.30	
Q 800 x 300	800	300	14	28	28	401.1	315	255.1	400	297,859	121,518	27.25	17.41	7,446.3	4,783.91	



NOTE :

- H = H/2 = Height of T-Beam
- Material specification refer to Wide Flange (IWF)
- Tolerance H = ±2mm
- Welded specification as per AWS E-6013
- Non standard sizes are available upon request and subject to minimum quantity







STEEL SERVICE CENTER

With facilities spanning over 40,500 sqm, the Steel Service Center (SSC) brings to you the highest quality of service in steel manufacturing and fabrication with the an advanced and precise computerized machines such as CNC sawing machines, CNC drilling, cutting, punching, bending machines, machines for galvanizing & shot blasting etc. Together with GSG's mainstream products and experienced engineers of ESC, our customers are able to buy cut-to-length/cut-to-shape or custom steel fabrication to their requirement and international quality standards.

PRODUCTS SERVICED:

Angle (HR), Cell Form, Channel (UNP), H-Beam (HR), Honey Comb, King Cross, Queen Cross, T-Beam, Welded Beam, Wide Flange Beam (IWF).

SERVICE PROVIDED:

- ◆ Angle Line: Cutting, Punching, Stamping Angle Line
- ◆ Special Operations: Bending, Chamfering, Notching
- ◆ Beam Line: Bending, Cutting (90° & 45°), Drilling Copying (Honey Comb)
- ◆ Painting
- ◆ Shot Blasting
- ◆ Welded Beam Line: Build Up Beam, Tacking, Welding, Straightening

CAPACITY (MT/Month): 150,000 MT/Year



Machinery



Drilling



Angle Punching



Cutting



Straightening



Shotblasting

STEEL STRUCTURE APPLICATIONS



High Rise Buildings

- ◆ Apartment
- ◆ Hotel
- ◆ Office Building
- ◆ Landmark
- ◆ Gas Processing & Distribution
- ◆ Terminal & Cargo Handling System

Low Rise Buildings

- ◆ Housing / Residence
- ◆ Hospital
- ◆ Office Building
- ◆ Airport / Hangar
- ◆ School

Commercial Buildings

- ◆ Show Room
- ◆ Supermarket & Hypermarket

Industrial Buildings

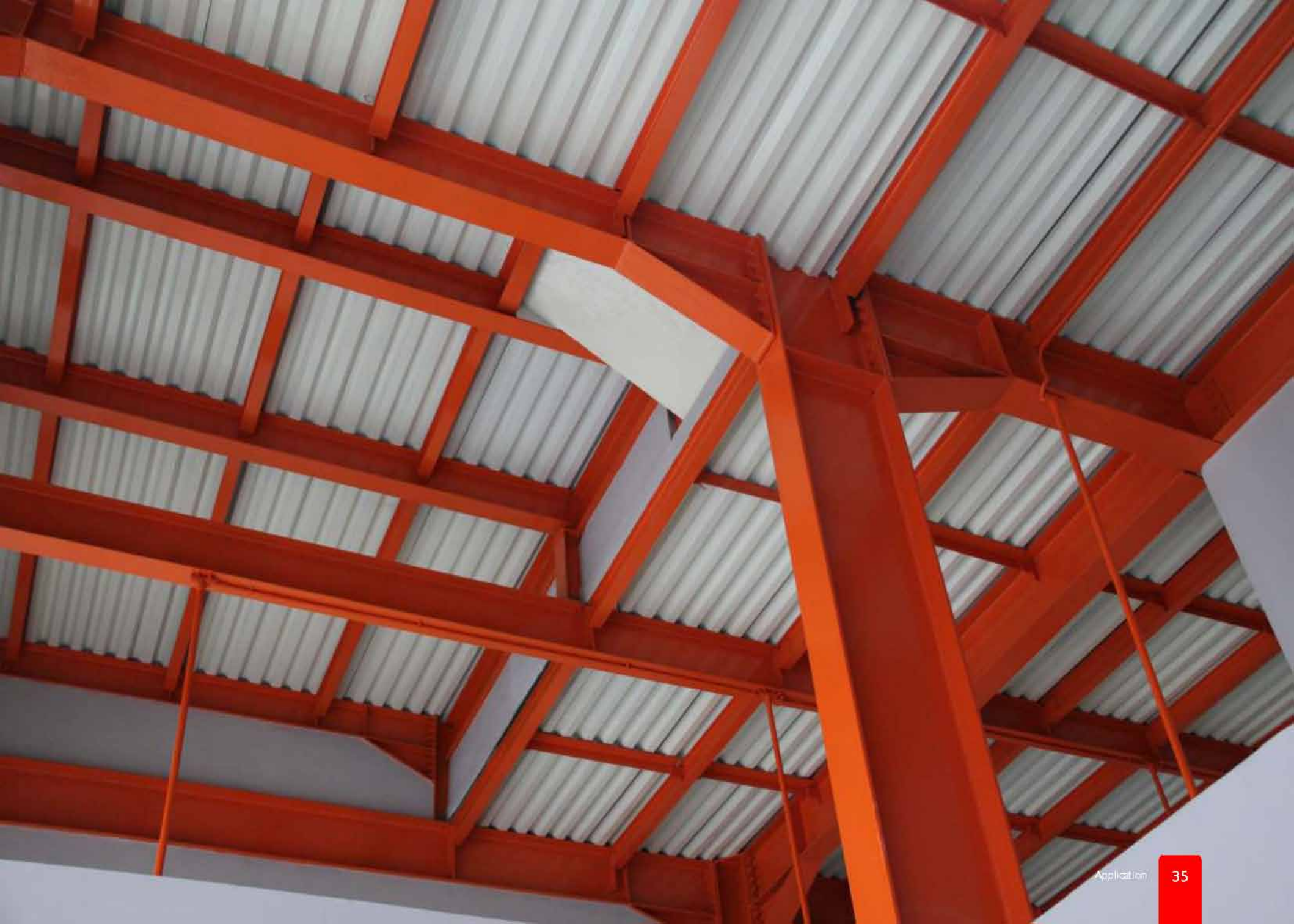
- ◆ Air Pollution Control Equipment
- ◆ Cement Plants
- ◆ Chemical & Petrochemical Plant
- ◆ Factory
- ◆ Iron & Steel Mill
- ◆ Oil Refinery
- ◆ Pulp, Paper Mills & Wood Process
- ◆ Warehouse
- ◆ Workshop

Bridges

- ◆ Girder Bridging
- ◆ Truss Bridging
- ◆ Cantilever Bridging
- ◆ Arch Bridging
- ◆ Suspension Bridging
- ◆ Cable-stayed Bridging
- ◆ Railway Bridging

Towers

- ◆ Transmission Tower
- ◆ Substation Tower
- ◆ Telecommunication Tower
- ◆ Pole Tower
- ◆ Monumental Tower
- ◆ Billboard
- ◆ Monitoring Tower
- ◆ Watertank Tower



LOCATION MAP

