

CSP CULVERT CATALOG PRODUCTS

Strategies for Success in Steel Bridge Construction



PT. SIRNABAJA MANDI MAKMUR

Jl. H. Yusuf No. 53 Paninggilan
Ciledug – Kota Tangerang

VISI

Menjadi perusahaan perdagangan dan konstruksi yang mengedepankan kualitas, kepuasan pelanggan, keselamatan kerja dan kesejahteraan karyawan serta berguna bagi masyarakat dan lingkungan sekitar.

To be a trading and construction company that prioritizes on the quality, customer satisfaction, work safety and employee welfare and benefits to the community and the surrounding environment

MISI

Memberikan pelayanan yang terbaik kepada pelanggan dan supplier.
Menyediakan sumber daya manusia yang berpengalaman dan dapat diandalkan (*Accountable*).

Menjalankan bisnis dengan selalu berpegang kepada nilai-nilai inti perusahaan

To give best services to customers and suppliers

Provides experienced and competent human resources in the business

Conducting business with committed to the company's core values

C

Comply

I

Integrity
&
Honesty

F

Financial
Discipline

O

Organize
Resources

R

Respect

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Beberapa keuntungan spesifik produk corrugated steel pipe:

KEKUATAN

Kekuatan yang terdapat pada Corrugated Steel Pipe terbentuk dari kombinasi antara Properti Mekanis dan Steel Soil Interaction. Proses pembuatan baja tingkat lanjut selalu memastikan seluruh material memenuhi spesifikasi. Steel Soil Interaction secara relatif memungkinkan untuk meningkatkan kekuatan kompresi pada lapisan struktur yang tipis. Corrugated Steel Pipe menyerap dan mentransfer beban tekan vertikal dan beban hidup ke seluruh bagian lapisan dan sekeliling pipa.

DAYA TAHAN

Dengan masa pemakaian lebih dari 50 tahun, banyak yang diketazhui faktor-faktor yang mempengaruhi daya tahan Corugated Steel Pipe. Menggunakan campuran yang tepat dari High Performance Coatings, teknik pemasangan, pengisian dan material pipa, Struktur Corrugated Steel Pipe dapat direncanakan untuk pemakaian selama 50 tahun bahkan lebih.

Consider the many benefits of specifying corrugated steel Products :

STRENGTH

The inherent strength of Corrugated steel pipe is derived from the mechanical properties of steel combined with the steel-soil interaction. Advanced steel manufacturing process ensures all material meet specification every time. The steel-soil interaction allows for increasing compression strength in a relatively thin-walled structure. Corrugated steel pipe absorbs and transfers the vertical live and dead loads to the surrounding soil around the entire circumference of the pipe.

DURABILITY

With more than 50 years of service, much is known about the factors which affect the durability of Corrugated Steel Pipe. Using the right mix of high performance coatings, installation techniques, backfill and pipe materials, Corrugated Steel Pipe structures can be designed to provide a service life of 50 years or more.

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BIAYA PRODUKSI DAN HANDLING YANG MURAH

Corrugated Steel Pipe lebih efektif jika dibandingkan dengan struktur drainase yang lain jika mempertimbangkan berbagai aspek.

MENGURANGI BIAYA PERAWATAN

Meskipun seluruh struktur jalan raya memerlukan inspeksi secara berkala, Struktur Corrugated Steel Pipe biasanya membutuhkan perawatan yang lebih sedikit daripada sebuah jembatan.

MENGURANGI BIAYA PERAWATAN

Meskipun seluruh struktur jalan raya memerlukan inspeksi secara berkala, Struktur Corrugated Steel Pipe biasanya membutuhkan perawatan yang lebih sedikit daripada sebuah jembatan.

LOW COST

Corrugated steel pipe is more cost effective than other drainage structures when all aspects of the application are considered.

REDUCED MAINTENANCE

Although all roadway structures require Periodic inspections, Corrugated Steel Plate structure typically requires less maintenance than a bridge.

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MENGENDALIKAN ARUS CONTROL STREAM FLOWS ALIRAN AIR

Struktur Corrugated Steel Pipe dapat digunakan untuk mengontrol dan mengarahkan arus sungai yang berkelok-kelok yang mungkin mengancam dan dapat merobohkan dermaga jembatan dan abutmen jembatan.

IDEAL

Corrugated Steel Pipe sangat ideal untuk pembukaan dan pengembangan lokasi baru, Utilitas kota dan sistem drainase kota (gorong-gorong), serta rehabilitasi perkotaan. Corrugated Steel Pipe mempertahankan aliran secara alami dan mengurangi dampak terhadap lingkungan.

Corrugated Steel Plate structures can be used to control and redirect meandering stream flows which might otherwise threaten to undercut bridge piers and abutments.

IDEAL

Corrugated Steel is ideal for new site developments, council and municipal stream crossings, as well as urban rehabilitations. It maintains natural streambeds and reduces environmental impacts.

Dengan banyaknya keuntungan yang terdapat pada struktur Corrugated Steel Pipe, hal ini merupakan alasan yang tepat untuk mengganti jembatan dan digunakan sebagai pengganti struktur jembatan beton.

Given its many advantages, a corrugated steel pipe structure often represents the best value for concrete structure and bridge replacement.

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Tabel 1 - *Specification*

Item	Description	AASHTO	ASTM	AS	SNI
Design	Strutural design of corrugated steel pipe and structural plate pipe	Bridge Section 12	A-796	AS 2041 AS 2042	SNI 07-0950
Galvanize	Steel base steel with 2 oz. Per ft2. Zinc coating for corrugated steel pipe	M-218	A-796	AS 1650	SNI 07-7033
Cold Applied Bituminous Coating	Fibrated mastic or asphalt base coatings of various viscosities for field or shop coating of corrugated pipe or structural plate	M-190	A-849 ASTM D147	AS 2758.2 AS 1289	SNI-06-6452-2000 SK SNI-M-09-1991-03 SK SNI-M-101-1994-04
Installation	Corrugated Steel Pipe	Bridge Section 26	A-798	AS 2041 AS 2042	SNI 07-0950

Tabel 2 - *Chemical Composition*

Steel		Coating	
Element	Percentage	Element	Percentage
C	0.15 (max)	Zn	99.88
P	0.05 (max)		
S	0.05 (max)	Ai	0.02
Mn	0.6 (max)		
Si	0.35 (max)		

Tabel 3 - *Mechanical Properties*

Yield Strength	:	230 MPa (Minimum)
Elongation Gauge Length	:	16% minimum on 200 mm
Anti-Corrosion Coating	:	By hot dip galvanized with a thickness pf 610 gr/cm ²

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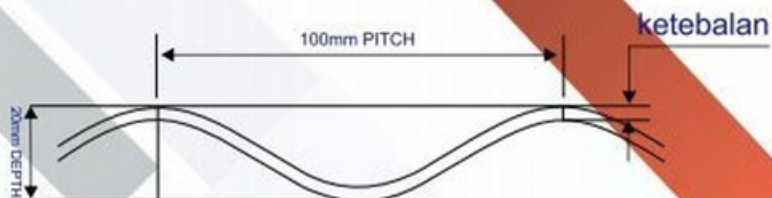


Table 4 - Section Properties of CSP 100 mm x 20 mm

Thickness (mm)	Tangent Length (mm)	Moment of Inertia (mm ⁴ / mm)	Area of Section (mm ² / mm)	Section Modulus (mm ³ / mm)	Radius of Gyration (mm)	Ultimate Seam Strength (KN/m)
2	22.96	96.85	2.188	8.805	6.65	265
2.5	22.52	118.38	2.736	10.523	6.58	380
3	22.07	145.60	3.283	12.66	6.66	475
3.5	21.61	158.46	3.829	13.486	6.43	580

Table 5 - Approximate Weight (Kg/m)

Diameter (mm)	Weight/meter (Kg/m)			
	2.0	2.5	3.0	3.5
450	30	38	45.5	4
500	35	44	53	61
600	40	48	60	68
800	49	61	74	89
900	55	69	83	96
1000	60	75	90	101
1200	75	96	113	126
1400	83	104	125	146
1500	92	115	137	159
1600	94	120	141	166
1800	-	136	164	191
2000	-	-	185	219

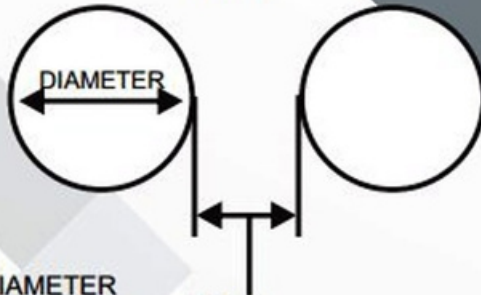
Note:

1. Minimum cover for High Way is 0.6 m until Top of Pavement.
2. Minimum cover for Rail Way is 1.0 m until Top of Rail.
3. Minimum cover is measured from top of pipe to top of subgrade or top of rigid pavement. Minimum cover for heavy construction equipment or those excessive loading is 1.2 m
4. Minimum clear spacing between structures as indicated in follow figure.

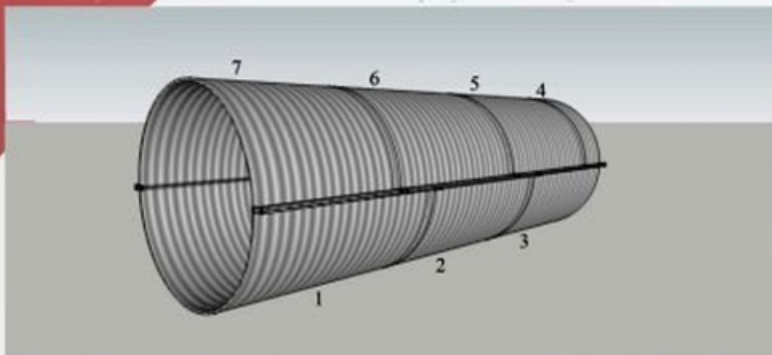
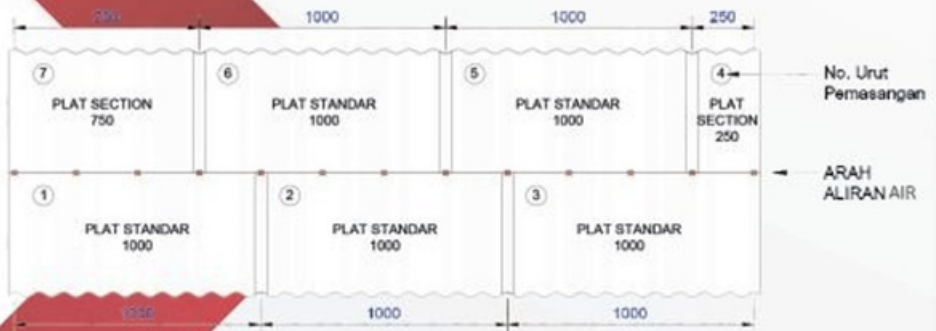
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PIPE



DIAMETER
 Up to 600 mm ... 300 mm
 600 mm to 1800 mm ... $\frac{1}{2}$ Diameter
 1800 mm and Over ... 900 mm



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PHYSICAL PROPERTIES OF 200mm X 55 ± 3mm SHEETS

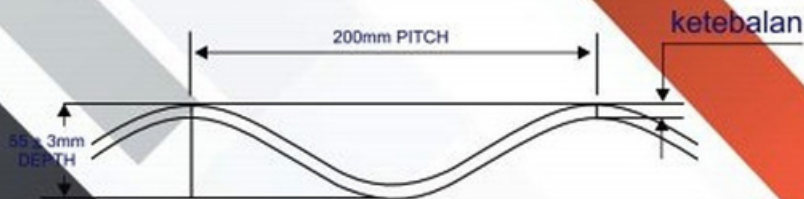


Table 6 - Section Properties of Multi Plate Pipe

Structure Number	Diameter (mm)	Periphery (m)	End Area (m ²)	Weight per Meter (Kg)					
				3 mm	3.3 mm	4 mm	5 mm	6 mm	7 mm
20M	1500	4.7	1.8	168	194	219	272	323	375
24M	1800	5.6	2.5	196	226	257	318	378	430
28M	2100	6.6	3.4	231	267	302	374	445	517
30M	2250	7.1	4.0	245	283	321	398	471	549
32M	2400	7.5	4.5	266	307	347	431	512	594
36M	2700	8.5	5.7	294	339	385	477	567	659
40M	3000	9.4	7.0	329	380	430	533	634	736
42M	3150	9.9	7.8	343	396	449	557	662	769
44M	3300	10.3	8.5	364	420	475	590	701	814
48M	3600	11.3	10.1	392	452	513	636	757	878
52M	3900	12.2	11.9	427	493	558	692	823	956
54M	4050	12.7	12.8	441	509	577	716	851	988
56M	4200	13.2	13.8	462	533	604	749	890	1034
60M	4500	14.1	15.8	490	565	641	795	946	1098
64M	4800	15.0	18.0	525	606	686	851	1008	1176
66M	4950	15.5	19.1	539	622	705	874	1040	1208
68M	5100	16.0	20.3	560	646	732	908	1079	1253
72M	5400	16.9	22.8	588	678	769	954	1135	1318
76M	5700	17.9	25.4	-	719	814	1010	1201	1395
78M	5850	18.3	26.7	-	735	833	1033	1229	1427
80M	6000	18.8	28.1	-	759	860	1066	1268	1473
84M	6300	19.7	31.0	-	-	897	1113	1324	1537
88M	6600	20.7	34.0	-	-	-	1169	1390	1615
90M	6750	21.2	35.6	-	-	-	1192	1418	1647
92M	6900	21.6	37.2	-	-	-	1225	1457	1692
96M	7200	22.6	40.5	-	-	-	1272	1513	1757
100M	7500	23.5	43.9	-	-	-	-	1579	1834
102M	7650	24.0	45.7	-	-	-	-	1607	1866
104M	7800	24.4	47.5	-	-	-	-	1646	1911
108M	8100	25.4	51.3	-	-	-	-	-	1976
112M	8400	26.3	55.1	-	-	-	-	-	2054
114M	8550	26.8	57.1	-	-	-	-	-	2086

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MULTI PLATE PIPE ARCHES

Table 13 : Section Properties of Multi Plate Pipe Arch

Structure Number	Span (mm)	Rise (mm)	Periphery (m)	End Area (m ²)	Side Radius r _s (mm)	Top Radius r _t (mm)	Bottom Radius r _b (mm)	Side Angle Ø _s (deg)	Top Angle Ø _t (deg)	Bottom Angle Ø _b (deg)	Weight Per Meter (kg)						
											3 mm	3.5 mm	4 mm	5 mm	6 mm	7 mm	
11 MA 4-4	1850	1550	5.4	2.10	633	932	1724	85	79	16	195	224	254	315	374	434	
12 MA 4-7	2280	1730	6.3	1.90	633	1181	1768	85	68	27	223	258	292	362	430	500	
18 MA 4-7	2540	1880	7.0	3.60	633	1280	2912	85	79	16	251	290	328	407	483	561	
18 MA 4-8	2890	2070	8.0	4.50	633	1448	4756	85	84	11	285	329	372	461	548	637	
18 MA 4-11	3280	2200	8.7	5.30	633	1692	3158	85	72	23	307	354	401	497	591	686	
20 MA 4-11	3430	2300	9.2	5.90	633	1740	4195	85	77	18	328	378	428	530	630	732	
22 MA 4-12	3700	2440	9.9	6.80	633	1873	5057	85	79	16	349	402	456	565	672	780	
22 MA 4-15	4100	2570	10.6	7.80	633	2157	3827	85	69	26	377	435	492	610	725	841	
26 MA 4-15	4390	2770	11.5	9.10	633	2224	6174	85	79	16	412	474	537	666	792	919	
27 MA 5-15	4590	3050	12.2	10.90	800	2323	5705	84	78	18	433	500	566	702	834	969	
30 MA 5-17	4890	3300	13.4	13.00	800	2446	12623	84	88	8	475	548	620	770	915	1062	
32 MA 5-18	5070	3280	13.4	13.00	800	2570	6650	84	79	17	470	540	612	760	905	1050	
32 MA 5-18	5340	3430	14.1	14.30	800	2697	7600	84	80	16	496	572	648	804	957	1111	
32 MA 5-20	5620	3510	14.6	15.20	800	2883	6380	84	75	21	-	596	675	838	996	1156	
37 MA 5-20	5930	3770	15.7	17.70	800	2980	11000	84	84	12	-	644	730	905	1076	1250	
39 MA 5-22	6350	3950	16.7	19.70	800	3195	10840	84	82	14	-	-	767	951	1131	1314	

PRODUCT MULTI PLATE ARCHES

Table 14 : Section Properties of Multi Plate Arch

Structure Number	Span (mm)	Rise (mm)	Periphery (m)	End Area (m ²)	Radius (mm)	Weight Per Meter (Kg)					
						3.8 mm	3.5 mm	4.0 mm	5.0 mm	6.0 mm	7.0 mm
12MA	2000	890	2.9	1.30	1008	108	123	139	169	199	229
15MA	2500	1100	3.6	2.01	1259	136	156	175	214	252	291
18MA	3000	1310	4.4	2.88	1513	157	180	203	249	294	339
22MA	3500	1640	5.3	4.31	1753	192	220	248	305	361	417
23MA	4000	1590	5.5	4.61	2051	199	228	257	316	374	433
26MB	4000	1970	6.2	6.02	2000	227	260	293	361	427	494
26MA	4500	1800	6.2	5.88	2305	227	260	293	361	427	494
29MB	4500	2180	6.9	7.48	2251	248	285	321	396	469	543
29MA	5000	2010	6.9	7.32	2559	248	285	321	396	469	543
33MB	5000	2510	7.9	9.68	2500	283	325	367	452	536	620
32MA	5500	2220	7.6	8.91	2813	276	317	357	441	522	604
36MB	5500	2720	8.6	11.50	2750	304	349	395	487	577	669
35MA	6000	2430	8.3	10.66	3067		341	385	475	563	652
39MB	6000	2930	9.3	13.48	3000		381	431	532	630	730
37MA	6500	2500	8.8	11.77	3363			412	508	603	698
42MB	6500	3140	10.0	15.63	3251			459	566	672	778
40MA	7000	2700	9.5	13.76	3616				543	644	746
46MB	7000	3470	10.9	18.74	3500				623	739	856
43MA	7500	2910	10.2	15.93	3870					697	807
49MB	7500	3670	11.6	21.25	3750					792	917
46MA	8000	3120	10.9	18.23	4123					739	856
52MB	8000	3880	12.3	23.91	4001					833	966
49MA	8500	3330	11.6	20.69	4377						917
56MB	8500	4210	13.3	27.74	4250						1043

Table 7 - Section Properties of Multi Plate Underpass

Structure Number	Span (mm)	Rise (mm)	Periphery (m)	End Area (m ²)	Side Radius (mm)	Top Radius (mm)	Bottom Radius (mm)	Side Angle θ_s (deg)	Top Angle θ_t (deg)	Bottom Angle θ_b (deg)	Weight per Meter (Kg)					
											3 mm	3.5 mm	4 mm	5 mm	6 mm	7 mm
25 M 4-8	3220	2780	9.6	7.00	897	1609	3481	60	105	15	350	403	456	562	671	780
27 M 4-11	3690	3060	10.8	8.70	897	1843	3458	60	99	21	384	443	502	623	740	860
29 M 4-11	3830	3180	11.3	9.50	897	1913	4116	60	102	18	400	460	520	646	776	891
31 M 4-12	4080	3350	12.0	10.70	897	2039	4571	60	102	18	427	493	560	691	821	953
33 M 4-12	4220	3480	12.4	11.60	897	2108	5520	60	105	15	441	508	575	714	848	985
34 M 4-15	4630	3690	13.4	13.30	897	2314	4786	60	99	21	476	548	621	770	915	1062
37 M 4-15	4830	3880	14.1	14.80	897	2414	5997	60	103	17	504	581	659	815	968	1124
39 M 4-15	4960	4000	14.6	15.80	897	2481	7105	60	106	14	518	597	676	834	996	1156
39 M 4-18	5320	4150	15.3	17.30	897	2659	5699	60	99	21	539	621	703	868	1032	1204
41 M 4-19	5570	4320	16.0	18.90	897	2784	6123	60	99	21	565	653	740	917	1089	1266
43 M 4-20	5820	4500	16.7	20.60	897	2910	6558	60	99	21	-	686	776	963	1144	1328
46 M 4-20	6010	4680	17.4	22.40	897	3005	7935	60	103	17	-	710	804	997	1185	1375

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Table 8 - Section Properties of Multi Plate Super Span High Profile Arch

Structure Number	Max Span (mm)	Bottom Span (mm)	Rise (mm)	Periphery (m)	End of Area (m ²)	Top & Bottom Radius r_t & r_b (mm)	Side Radius r_s (mm)	Angle Below (deg)	Top Step (mm)
24 A 6 - 5	6290	5920	3360	10810	18.10	4009	1586	17.518	940
25 A 6 - 6	6500	6000	3620	11515	20.30	4178	1586	20.017	980
26 A 6 - 6	6720	6230	3660	11750	21.10	4346	1586	19.247	1020
27 A 6 - 6	6940	6470	3710	11985	22.00	4514	1586	18.534	1060
28 A 6 - 6	7150	6700	3750	12220	23.00	4683	1586	17.872	1100
30 A 6 - 6	7590	7160	3830	12690	24.80	5019	1586	16.681	1170
31 A 6 - 6	7800	7390	3870	12925	25.80	5187	1586	16.143	1210
32 A 6 - 6	8020	7620	3910	13160	26.70	5356	1586	15.638	1250
33 A 6 - 6	8230	7850	3950	13395	27.70	5524	1586	15.164	1290
34 A 9 - 8	9030	8380	5060	15980	39.10	5692	2394	19.424	1330
35 A 9 - 8	9240	8610	5100	16215	40.30	5861	2394	18.869	1370
36 A 9 - 9	9460	8690	5360	16920	43.50	6029	2394	20.567	1410
37 A 9 - 8	9680	9080	5180	16685	42.80	6197	2394	17.849	1450
37 A 9 - 10	9680	8760	5620	17625	46.80	6197	2394	22.174	1450
38 A 9 - 11	9890	8820	5880	18330	50.10	6366	2394	23.695	1490
39 A 9 - 12	10110	8870	6140	19035	53.50	6534	2394	25.139	1530
40 A 9 - 12	10330	8120	6180	19270	55.00	6702	2394	24.511	1570
41 A 9 - 12	10740	9560	6430	19975	59.40	6871	2663	23.913	1610
42 A 10 - 12	10950	9800	6480	20210	61.00	7039	2663	23.343	1650
43 A 10 - 10	11170	10380	6050	19050	58.10	7207	2663	19.08	1690
44 A 10 - 15	11380	9690	7200	22090	70.60	7375	2663	27.737	1730
45 A 10 - 15	11600	9640	7240	22325	72.40	7544	2663	27.121	1760

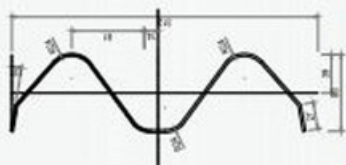
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Table 9 - Section Properties of Multi Plate Super Span Low Profile Arch

Structure Number	Max Span (mm)	Bottom Span (mm)	Rise (mm)	Periphery (m)	End of Area (m ²)	Top & Bottom Radius r_t & r_b (mm)	Side Radius r_s (mm)	Angle Below (deg)	Top Step (mm)
27 A 8	7080	7020	2770	10.105	15.90	4514	1792	11	1060
28 A 8	7300	7230	2810	10.340	16.60	4683	1792	11	1100
29 A 8	7520	7450	2850	10.575	17.30	4851	1792	11	1130
30 A 8	7730	7670	2890	10.810	18.00	5019	1792	11	1170
31 A 8	7950	7880	2930	11.045	18.70	5187	1792	11	1210
32 A 8	8170	8100	2970	11.280	19.50	5356	1792	11	1250
33 A 8	8380	8320	3010	11.515	20.20	5524	1792	11	1290
34 A 11	9070	8980	3680	13.160	27.00	5692	2454	11	1330
35 A 11	9290	9200	3720	13.395	28.00	5861	2454	11	1370
36 A 11	9500	9410	3760	13.630	28.90	6029	2454	11	1410
37 A 11	9720	9630	3800	13.865	29.80	6197	2454	11	1450
38 A 11	9940	9850	3840	14.100	30.80	6366	2454	11	1490
39 A 11	10150	10060	3880	14.335	31.70	6534	2454	11	1530
40 A 11	10370	10280	3920	14.570	32.70	6702	2454	11	1570
41 A 12	10740	10640	4170	15.275	36.10	6871	2675	11	1610
42 A 12	10960	10860	4210	15.510	37.10	7039	2675	11	1650
43 A 12	11180	11080	4250	15.745	38.20	7207	2675	11	1690
44 A 12	11390	11290	4290	15.980	39.20	7375	2675	11	1730
45 A 12	11610	11510	4320	16.215	40.30	7544	2675	11	1760

ANCESTRA LAZARAS MANDIE

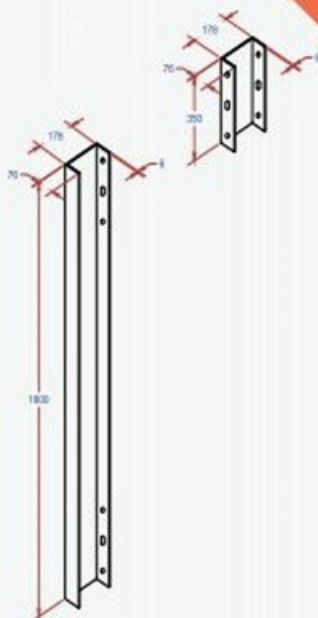


The expected deflection of the barrier should not exceed the available room to deflect. If the available space between the hazard and the barrier is not adequate, then the barrier can be stiffened in advance of, and alongside the hazard. Commonly used methods to reduce deflection of Flex-beam guardrail include reducing the post spacing

Thickness (mm)	2.7
Beam width, minimum (mm)	312
Beam Depth, minimum (mm)	83
Cross-sectional Area (mm ²)	973.980
Section Modulus (mm ³)	22.778

Thickness (mm)	4.5 : 6
Height (mm)	1800
Dimensions	178 x 76

Thickness (mm)	4.5 ; 6
Height (mm)	350
Dimensions	178 x 76



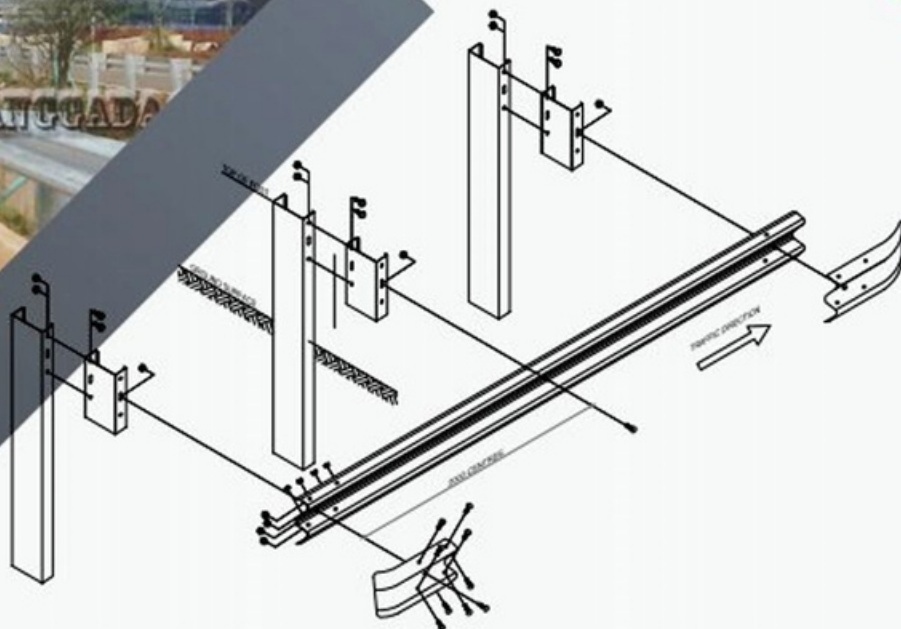
Some client may use different specification.
Our engineers are trained to work with you for your design challenges

End Terminals and Transitions

(1) FISHTAIL
(Only for low speed
departure side angle)



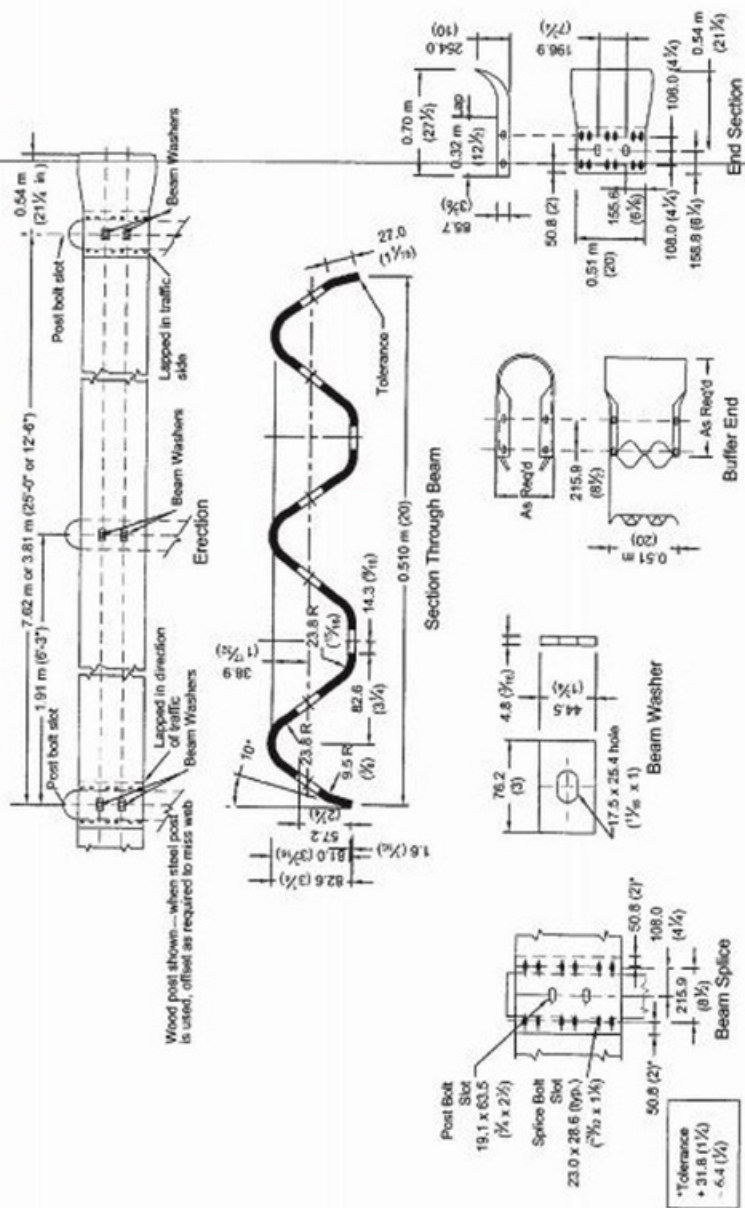
1 SPLICE BOLT
- NTS



PRODUCT

FLEX BEAM GUADRAIL

DESIGN AASHTO M180



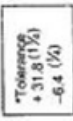
0.3 m

12 1/2

215.9 (8 1/2)

As Req'd

Buffer End



- Notes:
1. All dimensions are subject to manufacturer's tolerances except where allowable tolerances are shown.
 2. All dimensions shown in millimeters unless otherwise noted. (All parenthetical values are in inches unless otherwise noted.)
 3. Rectangular plate washers are optional only in the transition sections. They are not to be used in the main section of strong-pool granitail.

PRODUCTS

STEEL TRUSS BRIDGES

Bridge Types

Construction Structure	Class-A	Class-B	Class-C
Road Lane (m)	7.00	6.00	4.40
Wide Pedestrian (m)	2x1.00	2x0.50	2x0.50
Height Bridge (m)	5.1	5.1	5.1
Span (m)	35-40-45-50-55-60		

Design Standard

Loading Design : Bridge Management 100 or 100% as per Binamarga Standard and SK.SNI T-02-2005

Basic Earthquake Coefficient $C=0.23$ and interest factor $I = 1.2$

Structural Design : Based on SK.SNI T-03-2005

Raw Material

Primary Frame Structure

: SM490YA/YB JIS G3106 or equivalent
(F_y min = 360MPa)

Secondary Structure

: SS400 JIS G3101 or equivalent (F_y min = 245MPa)
(Top Chord Bracing, Handrail Pipe, Lateral Stop, Pedestrian Cover)

Bolt, Nut, Washer

: Main Structure : High Strength Friction Grip Gr 8.8/TF or equivalent

Corrugated Floor Deck

: Grade 4.6 or equivalent

Concrete Deck

: Minimum $f_c = 30$ Mpa (Test cylinder) or K350 kg/sm² (test cube)

Corrugated Floor Deck
Reinforced Steel

: S 400 JIS G3101 or equivalent
: $\phi \geq 13$ mm : Reinforced Steel Deform, $F_y = 390$ Mpa (min)
: $\phi \geq 12$ mm : Reinforced Steel Round, $F_y = 240$ Mpa (min)
Double Reinforced Steel Horizontal and Vertical
: OD 76.3mm, 400 and 600mm Over Curb
Quality A120 or equivalent (F_y , min = 235 Mpa)

Pipe Sandaran

Corrossion Protection

All steel and bolt components had been hot dipp galvanized process as per ASTM A123/A123M-00 standard or equvaata ekivalen

PRODUCTS

PANEL BAILEY BRIDGES

TECHNICAL SPESIFICATION

STRUCTURE : PANEL BAILEY BRIDGES

LENGTH OF PANEL : 3048mm

SPAN LENGTH : EVERY 3048mm

EFFECTIVE WIDTH :

- **STANDARD WIDE (SW)** = 3.15 M
- **EXTRA WIDE (EW)** = 4.20 M
- **DOUBLE LANE (DL)** = 7.35 M

DISTANCE AS TO AS BEARING : 3580mm

HEIGHT PANEL : 2134mm (Distance As to As Pin top and bottom at each panel)

FLOOR DECK HEIGHT : 725mm (Distance from As bearing to top Orthotropic deck Floor)

FLOOR DECK SYSTEM : Base Plate checkered Plate - Orthotropic

LOAD WEIGHT

- **AASHITO HS 25-44**
- **AASHITO HS 20-44**
- **AASHITO HS 15-44**

MATERIAL

A. MAIN PANEL

1. STEEL CHANNEL

100/UNP100 - Hot Rolled Section

2. STEEL PROFILE

IWF 80 / IWF 100 - Hot Rolled Section

B. MAIN GIRDER : IWF 400 x 200 Hot Rolled Section

MATERIAL QUALITY STANDARD

- 1. Main Frame Structure** : Yield Strength = 345 Mpa
- 2. Secondary Structure** : Yield Strength = 235 Mpa
- 3. Pin** : Tensile Strength = 1300 Mpa
- 4. Bolt/Nut/Ring** : High Tensile Bolt Grade 8.8 (galvanized) or equivalent

ANTI-CORROSION : Hot dip galvanizing - ASTM A123/ISO 1461 - 1999 or equivalent

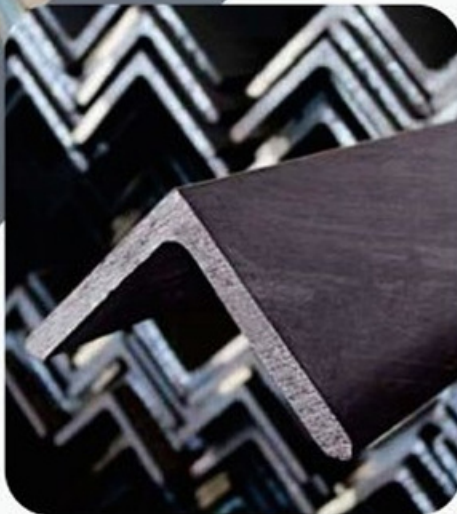
PRODUCT

STEEL STRUCTURE

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 angels depending on it's basic construction.

One of hot rolled product under our range is the Angle Beam. Steel Angel 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



PRODUCT STEEL STRUCTURE

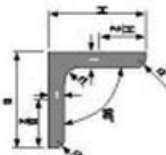
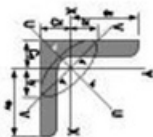
EQUAL ANGLE

Metric Size

STANDARD SECTIONAL DIMENSIONS	SECTION AREA		UNIT WEIGHT	CENTER OF GRAVITY			INFORMATIVE REFERENCE			REMARKS					
	H	B		I _x = I _y	Max I _x	Min I _y	I _x = I _y	Max I _x	Min I _y		Z _x = Z _y				
mm x mm	mm	mm	mm ²	mm ⁴	mm ⁴	mm ⁴	mm ⁴	mm ⁴	mm ⁴	mm ⁴					
40 x 40	4	4	3,060	2.42	14.82	29	1,090	3,530	5.80	1,460	1,220	1.55	0.78	1,210	
50 x 50	5	5	4,802	3.77	22.62	45	1,610	11,100	17.60	4,690	1,820	1.81	0.96	3,090	
60 x 60	6	6	5,644	4.43	26.56	53	1,640	12,500	20.00	5,230	1,900	1.86	0.96	3,550	
80 x 80	8	8	5,802	4.55	27.5	55	1,660	13,000	21.20	5,090	1,940	2.32	1.16	4,200	
100 x 100	10	10	6,810	5.42	30.5	65	1,700	22,790	36.16	8,420	1,820	2.29	1.17	5,380	
125 x 125	12.5	12.5	8,387	5.91	35.5	80	1,770	26,500	40.10	10,600	1,990	2.51	1.26	6,360	
150 x 150	15	15	9,527	6.00	38.5	71	1,810	29,400	46.80	12,200	1,960	2.49	1.27	7,300	
175 x 175	17.5	17.5	10,327	6.38	38.5	77	1,830	37,100	58.80	15,300	2,140	2.89	1.37	7,300	
200 x 200	20	20	11,727	6.65	41	82	2,000	46,100	73.20	18,000	2,300	3.10	1.46	8,470	
225 x 225	22.5	22.5	12,230	7.32	43.8	86	2,180	56,400	99.80	23,200	2,480	3.10	1.58	9,700	
250 x 250	25	25	13,000	8.09	47.8	115	2,460	63,000	144.00	28,300	2,760	3.48	1.77	14,200	
300 x 300	30	30	16,000	10.70	64	180	2,670	126,000	199.00	31,700	2,710	3.42	1.74	19,500	
350 x 350	35	35	17,800	11.70	64	128	2,710	129,000	205.00	53,200	3,060	3.66	1.96	17,700	
400 x 400	40	40	19,000	14.90	88.5	179	2,820	175,000	278.00	72,000	3,060	3.83	1.95	24,400	
450 x 450	45	45	21,000	14.70	88	178	3,240	258,000	410.00	108,000	3,710	4.87	2.38	29,500	
500 x 500	50	50	23,000	16.50	118.5	239	3,350	340,000	545.00	140,000	3,660	4.82	2.35	38,560	
550 x 550	55	55	25,000	17.80	130	259	3,400	387,000	583.00	151,000	3,660	4.80	2.35	42,800	
600 x 600	60	60	27,000	19.80	150	315	3,500	386,000	583.00	150,000	4,010	5.06	2.57	38,700	
650 x 650	65	65	29,000	21.60	164	328	3,400	487,000	743.00	192,000	3,980	5.00	2.54	49,000	
700 x 700	70	70	31,000	23.40	184	354	3,400	540,000	810.00	204,000	4,810	5.82	2.96	58,100	
750 x 750	75	75	33,000	25.20	199	379	3,400	593,000	877.00	216,000	4,810	5.82	2.96	58,100	
800 x 800	80	80	35,000	27.30	218	403	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
850 x 850	85	85	37,000	29.20	237	428	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
900 x 900	90	90	39,000	31.20	256	453	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
950 x 950	95	95	41,000	33.20	275	478	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1000 x 1000	100	100	43,000	35.20	294	503	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1050 x 1050	105	105	45,000	37.20	313	528	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1100 x 1100	110	110	47,000	39.20	332	553	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1150 x 1150	115	115	49,000	41.20	351	578	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1200 x 1200	120	120	51,000	43.20	370	603	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1250 x 1250	125	125	53,000	45.20	389	628	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1300 x 1300	130	130	55,000	47.20	408	653	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1350 x 1350	135	135	57,000	49.20	427	678	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1400 x 1400	140	140	59,000	51.20	446	703	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1450 x 1450	145	145	61,000	53.20	465	728	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1500 x 1500	150	150	63,000	55.20	484	753	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1550 x 1550	155	155	65,000	57.20	503	778	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1600 x 1600	160	160	67,000	59.20	522	803	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1650 x 1650	165	165	69,000	61.20	541	828	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1700 x 1700	170	170	71,000	63.20	560	853	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1750 x 1750	175	175	73,000	65.20	579	878	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1800 x 1800	180	180	75,000	67.20	598	903	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1850 x 1850	185	185	77,000	69.20	617	928	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1900 x 1900	190	190	79,000	71.20	636	953	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
1950 x 1950	195	195	81,000	73.20	655	978	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2000 x 2000	200	200	83,000	75.20	674	1,003	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2050 x 2050	205	205	85,000	77.20	693	1,028	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2100 x 2100	210	210	87,000	79.20	712	1,053	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2150 x 2150	215	215	89,000	81.20	731	1,078	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2200 x 2200	220	220	91,000	83.20	750	1,103	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2250 x 2250	225	225	93,000	85.20	769	1,128	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2300 x 2300	230	230	95,000	87.20	788	1,153	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2350 x 2350	235	235	97,000	89.20	807	1,178	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2400 x 2400	240	240	99,000	91.20	826	1,203	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2450 x 2450	245	245	101,000	93.20	845	1,228	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	
2500 x 2500	250	250	103,000	95.20	864	1,253	4,240	688,000	1,410.00	265,000	4,600	5.75	2.92	62,000	

The diagram shows an L-shaped section with dimensions H, B, t, r, A, I_x, I_y, C_x, C_y, Z_x, Z_y, and X, Y axes. The section is defined by its overall height H and width B, with a fillet radius r at the corner. The area A is the total cross-sectional area. The moments of inertia I_x and I_y are about the centroidal axes X and Y. The distances C_x and C_y are from the outer corners to the centroid. The distances Z_x and Z_y are from the inner corner to the centroid. The X and Y axes are shown as dashed lines passing through the centroid.

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



PRODUCT

STEEL STRUCTURE

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.



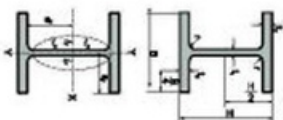
PRODUCT STEEL STRUCTURE

WIDE FLANGE (WFF)

Metric Size | IS 3192

STANDARD SECTIONAL DIMENSIONS										SECTION AREA		UNIT WEIGHT		INFORMATIVE REFERENCE					
Nominal Dimensional mm	H x B	t1	t2	r	A	Kg/m	Kg/ftm	GEOMETRICAL MOMENT OF INERTIA		RADIUS OF		MODULUS OF SECTION							
								Ix	Iy	Ix	Iy	Zx	Zy						
150 x 75	150 x 75	5	7	8	17.85	54	166	668	49.5	6.11	1.66	66.8	13.2						
• 150 x 100	148 x 100	6	9	8	26.35	21.1	253	1,000	150	8.17	2.39	135	30.1						
200 x 100	198 x 99	4.5	7	11	23.18	18.2	216	1,580	114	8.26	2.21	160	22.0						
	200 x 100	5.5	8	11	27.16	21.3	256	1,840	134	8.24	2.22	164	26.8						
• 200 x 150	194 x 150	6	9	8	38.11	30.6	367	2,830	507	8.30	3.65	271	67.8						
250 x 125	246 x 124	5	8	12	32.68	25.7	308	3,540	285	10.4	2.79	285	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	40.90	32	394	6,320	442	12.4	3.29	424	59.3						
	300 x 150	6.5	8	13	46.78	36.7	440	7,210	508	12.4	3.29	481	67.7						
350 x 175	346 x 174	6	8	14	52.08	41.4	497	11,100	782	14.5	3.88	641	91.0						
	350 x 175	7	11	14	63.14	49.6	595	13,000	984	14.7	3.95	775	112						
400 x 200	398 x 199	7	11	18	72.16	56.6	679	20,000	1,450	18.7	4.48	1,010	145						
	400 x 200	8	13	16	84.12	66	792	23,700	1,740	18.8	4.54	1,180	174						
450 x 200	450 x 200	8	14	18	96.8	78	912	33,500	1,870	18.8	4.40	1,480	187						
600 x 200	600 x 200	10	16	20	114.23	88.6	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	77,000	2,280	24.0	4.12	2,560	228						
800 x 300	808 x 300	12	20	28	182.5	151	1812	181,000	9,020	24.80	8.85	4,020	601						

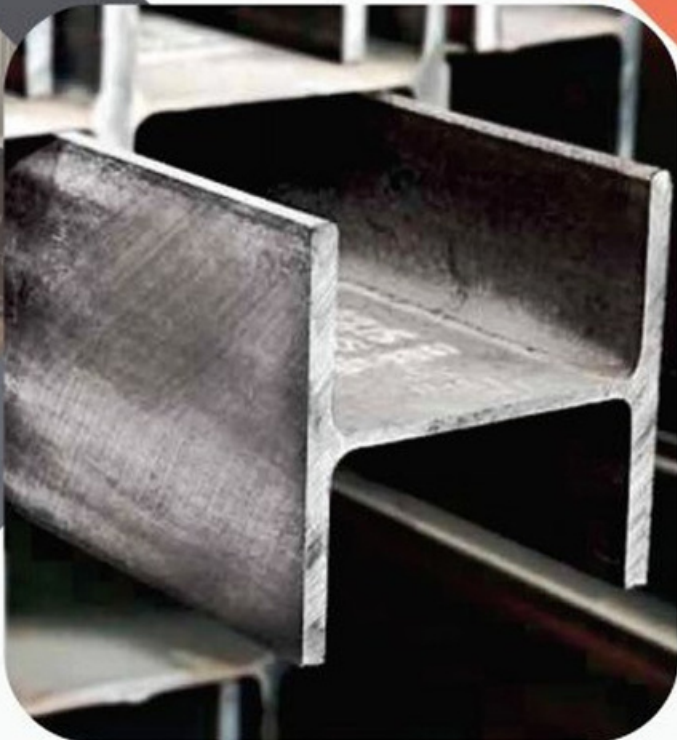
• NOTE : Non standard sizes are available upon request and subject to minimum quantity



PRODUCT STEEL STRUCTURE

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 ending and shear load in the plane of the web.

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



[illegible]

Metric Size | JIS J192

STANDARD SECTIONAL DIMENSIONS				SECTION AREA		UNIT WEIGHT		INFORMATIVE REFERENCE						REMARKS
H x B	t1	t2	r	A	kg/m	kg/ft	GEOMETRICAL MOMENT OF INERTIA		RADIUS OF GYRATION OF AREA		MODULUS OF SECTION			
mm x mm	mm	mm	mm	cm ²			I _x	I _y	I _x	I _y	Z _x	Z _y		
							cm ⁴	cm ⁴	cm	cm	cm ³	cm ³		
100 x 100	8	8	10	21.50	17.2	206	313	134	4.16	2.47	76.5	26.7		
* 120 x 120	8.5	8	10	30.31	23.8	286	647	283	5.29	3.11	138	47		
150 x 150	7	10	11	46.14	31.5	318	1540	963	6.39	3.75	219	76.1		
* 175 x 175	7.5	11	12	51.21	40.2	482	2.880	984	7.80	4.38	253	112		
200 x 200	8	12	13	63.53	49.9	599	4.720	1.603	8.62	5.02	472	180		
250 x 250	9	14	16	82.18	72.4	899	10.820	3.650	10.8	6.29	687	292		
300 x 300	10	15	16	118.80	94	1136	20.400	6.790	13.1	7.51	1.340	456		
350 x 350	12	19	20	173.8	137	1644	42.320	13.800	16.2	8.64	2.300	778		

● **NOTE:** These standard items are available upon request and subject to minimum quantity

