



Bridge Design Details 11.2 June 2019

Standard Steel Product Designation

Standard Products	Symbol	Designation Example	Typical ASTM Specification
W-Shapes (Wide Flange Shapes)	W	W36x330	A709 Grade 50
S-Shapes (American Standard Beams)	S	S24x121	A709 Grade 36
M-Shapes (Miscellaneous Shapes)	M	M10x9	A709 Grade 36
HP-Shapes	HP	HP14x89	A709 Grade 50
C-shapes (American Standard Channels)	C	C12x25	A709 Grade 36
MC-shapes (Miscellaneous Channels)	MC	MC12x45	A709 Grade 36
L-Shapes (Angles)	L	L8x4x½	A709 Grade 36
Equal-Leg Double Angles	2L	2L6x6x 3/4	A709 Grade 36
Double Angles (Short Legs Back to Back)	SLBB	2L8x6x1 SLBB	A709 Grade 36
Double Angles (Long Legs Back to Back)	LLBB	2L4x3x½ LLBB	A709 Grade 36
WT-Shapes (Structural Tees made from W-shapes)	WT	WT12x38	A709 Grade 50
ST-Shapes (Structural Tees made from S-shapes)	ST	ST12x50	A709 Grade 36
MT-Shapes (Structural Tees made from M-Shapes)	MT	MT4x3.1	A709 Grade 36
Rectangular (and Square) Hollow Structural Sections	HSS	HSS8x6x ⁵ / ₈	A1085, A500, A501, A618, A847
Round Hollow Structural Sections	HSS	HSS5.500x0.500	A1085, A500, A501, A618, A847

Table 11.2.1 Standard Steel Product Designation



Standard Products	Symbol	Designation Example	Typical ASTM Specification
Pipe (Standard)	PIPE	PIPE 5 Std	A53 Grade B, A106 Grade B A139 Grade B
Pipe (Extra Strong)	PIPE	PIPE 5 x-Strong	A53 Grade B, A106 Grade B, A139 Grade B
Pipe (Double-Extra Strong)	PIPE	PIPE 5 xx-Strong	A53 Grade B, A106 Grade B A139 Grade B
Pipe	PIPE	PIPE 16.000x0.250	A53 Grade B, A106 Grade B A139 Grade B
Plates	PL	PL ½x18x2'-0"	A709 Grades 36, 50, 50W, HPS 50W, HPS 70W, HPS 100W
Bars	Bar	Bar ½x8x2'-0"	A709 Grades 36, 50, 50W, HPS 50W, HPS 70W, HPS 100W
Sheet	SS	SS 0.135x18x2'-0"	A1008, A1011
Strip	SS	SS 0.135x8x2'-0"	A1008, A1011
Bolts (Head one end - threads other end)	Bolt	¾"Ø Bolt	A307, F1554 Grade 36
HS Bolts (Head one end - threads other end)	HS Bolt	¾"Ø HS Bolt	A449 Type 1
Stud (Fastener threaded one or both ends with an unthreaded shank in between)	Stud	¾"Ø stud with nuts and hardened washer	A307
HS Stud (Fastener threaded at one or both ends with an unthreaded shank in between)	HS Stud	¾"Ø HS stud with nuts and hardened washer	A449 Type 1
Threaded Rod (Rod with threads full length)	Threaded Rod	¾"Ø Threaded Rod	A307, F1554 Grade 36
HS Threaded Rod (Rod with threads full length)	HS Threaded Rod	¾"Ø HS Threaded Rod	A449 Type 1
Anchor Bolts (see Fastener Note 7)	AB	¾"Ø x 12" AB	F1554
Shear Stud Connectors	Stud Connector	7/8"Ø Stud Connector	A108

Table 11.2.1 Standard Steel Product Designation (continued)



Fastener Notes

1. When a rod with partial length threads at only one or both ends is desired, specify “Stud” and note that a nut and a washer shall also be provided. Detail the required thread length on the plans.
2. If the stud or threaded rod is desired to be tensioned, specify the desired rod tension on the plans and include quality control provisions in the special provisions to ensure that the desired tension is achieved. Require hardened washers for studs or threaded rods that are to be tensioned.
3. Specify if threads are to be excluded from the shear plane for bolts and studs. For small grip lengths, thread exclusion may not be possible with bolts. See the Research Council on Structural Connections (RCSC) for non-standard thread lengths.
4. A325 bolts are generally not available with grip lengths greater than 8 inches. Specify A449 when greater than 8 inches are required.
5. Provide thread locking system or consider castellated nuts and cotter pins for bolts that are not tensioned.
6. Provide beveled washers when the outer steel member has a slope steeper than 1:20. The standard slope on the beveled hardened washer is 1:6. If a different slope is desired, the designer must call out the desired bevel angle, and should specify that the unique bevel must be ground or machined.
7. Indicate anchor bolt length, thread length and length of hook (if any) or forged head. Specify nuts and washers as required.

Thickness (inches)	To 3 ¹ / ₂ inches (Width)	3 ¹ / ₂ to 6 inches (Width)	6 to 8 inches (Width)	8 to 12 inches (Width)	12 to 48 inches (Width)	Over 48 inches (Width)
0.2300 and thicker	Bar	Bar	Bar	Plate	Plate	Plate
0.2031 to 0.2299	Bar	Bar	Strip	Strip	Sheet	Plate
0.1800 to 0.2303	Strip	Strip	Strip	Strip	Sheet	Plate
0.0449 to 0.1799	Strip	Strip	Strip	Strip	Sheet	Sheet
0.0344 to 0.0448	Strip	Strip	Hot-rolled sheet and strips not generally produced in widths greater than 6 inches for thicknesses between 0.0344 to 0.0448 inches.			
0.0255 to 0.0343	Strip	Hot-rolled sheet and strips not generally produced in widths greater than 3 ¹ / ₂ inches for thicknesses between 0.0255 to 0.0343 inches.				
0.0254 and thinner	Hot-rolled sheet and strips not generally produced for thicknesses less than 0.0254 inches.					

Table 11.2.2 Classification of Plate Product



Gauge Number	Uncoated Minimum Thickness (inches)	Uncoated Nominal Thickness (inches)	Galvanized Nominal Thickness (inches)
7	0.1703	0.1793	0.1833
8	0.1562	0.1644	0.1684
9	0.1420	0.1495	0.1532
10	0.1278	0.1345	0.1382
11	0.1136	0.1196	0.1233
12	0.0994	0.1046	0.1084
13	0.0852	0.0897	0.0934
14	0.0710	0.0747	0.0785
15	0.0639	0.0673	0.0710
16	0.0568	0.0598	0.0635
17	0.0511	0.0538	0.0575
18	0.0454	0.0478	0.0516
19	0.0397	0.0418	0.0456
20	0.0341	0.0359	0.0396
21	0.0313	0.0329	0.0366
22	0.0284	0.0299	0.0336
23	0.0256	0.0269	0.0306
24	0.0227	0.0239	0.0276
25	0.0199	0.0209	0.0247
26	0.0170	0.0179	0.0217
27	0.0156	0.0164	0.0202
28	0.0142	0.0149	0.0187
29	0.0128	0.0135	0.0172
30	0.0114	0.0120	0.0157

Table 11.2.3 Steel Sheet Gage Number and Thickness

Sheet thickness notes:

1. Uncoated minimum thickness is taken as 95% of uncoated nominal thickness and used by design engineers in calculation.
2. Uncoated nominal thickness is used by detailers in dimensioning materials galvanized after fabrication. A sheet galvanized after fabrication is designated as:

Example: Sheet thickness x width x length, Galv AFTER FABRICATION

3. Galvanized nominal thickness is used by detailers in dimensioning pre-galvanized materials. A pre-galvanized sheet is designated as:

Example: Galv Sheet thickness x width x length