Hot Rolled Steel

Shapes and Plates

United States Steel

MULT-O®

(PATENTED)

TO OPEN - press bottom levers together with slight clockwise motion.

TO CLOSE - press top levers.

B138

Hot Rolled Steel

Shapes and Plates

United States Steel

United States Steel Corporation
Columbia-Geneva Steel Division
Tennessee Coal and Iron Division
National Tube Division
United States Steel Supply Division
United States Steel Export Company

United States Steel

ADUCO 27027

Revised Edition
July, 1963
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July, 1963

Foreword

In compliance with the recommendation of the U. S. Department of Commerce, National Bureau of Standards, this publication provides data pertaining to Simplified Practice Recommendation R216-46 for Hot Rolled Carbon Steel Structural Shapes and includes nominal dimensions, weights, properties and dimensions for detailing.

Data pertaining to other rolled products in common use by designers and fabricators are included as a matter of ready reference.

For shapes or plate sizes other than those shown, inquire of your nearest U. S. Steel Sales Office listed in the last section of this book.

This publication supersedes all other earlier USS publications dealing with Structural Sections.

July, 1963

This edition is issued jointly by the

Columbia-Geneva Steel Division, the Tennessee Coal and Iron Division, the National Tube Division and the United States Steel Corporation

Each division sells all the products listed with the exception of National Tube Division, regardless of where produced. The following symbols indicate in which district or districts the various sections are produced.

P Produced in Pittsburgh district of United States Steel Corporation.*

C Produced in Chicago district of United States Steel Corporation.

F Produced at Fairless Works of United States Steel Corporation.*

B Produced in Birmingham district by Tennessee Coal and Iron Division.

S Produced in Pacific Coast district by Columbia-Geneva Steel Division.

G Produced in Geneva district by Columbia-Geneva Steel Division.

*Note: Hollow structural tubing is produced only by National Tube Division. This product is sold by Columbia-Geneva as well as National Tube.

Sizes obtainable in USS High-Strength Low-Alloy Steels

Most of the structural sections and plate sizes shown in this publication for carbon steel can be furnished in the USS High-Strength Steels—USS Cor-Ten, USS Tri-Ten, USS Man-Ten, USS Man-Ten (A440), and USS Ex-Ten. We suggest you consult the District Sales Office for more specific information or changes in the properties of our high strength steels.

Sections obtainable in USS Alloy Steels

The structural and car building sections shown in this publication can be furnished in most of the alloy grades. However, the specific grade and section must be inquired. Those sections which are starred (★) are the sizes now available in the quenched and tempered condition.

TYPICAL PROPERTIES OF USS CONSTRUCTIONAL STEELS

	ASTM A-7 Carbon Steel	ASTM A-373 Carbon Steel	ASTM A-36 Carbon Steel	USS COR-TEN Steel	USS TRI-TEN Steel	USS MAN-TEN (A440) Steel	USS EX-TEN Steel	USS "T-1" type A Steel	USS "T-1" Steel
Yield Point min., psi.....	33,000	32,000	36,000	50,000	50,000	50,000	45,000 to 65,000 According to grade designation	100,000 (Y.S.)	100,000 (Y.S.)
Tensile Strength, psi.....	60/75,000	58/75,000	58/80,000	70,000 min.	70,000 min.	70,000 min.	65,000 to 85,000 According to grade designation	115/135,000	115/135,000
Elongation in 2", % min.....	24	24	23	24	24	24	According to grade designation	18	18
Resistance to atmospheric corrosion compared to Carbon Steel.....	1	1	1	4 to 6	2	2	1	2	4 to 6
Products available.....	plates, bars and structurals	plates, bars and structurals	plates, bars and structurals	all	all	all	all	plate, bar, semifinish, structurals	plate, bar, semifinish, structurals

USS STRUCTURAL CARBON STEEL A7-A36-A373

USS Structural Carbon Steels are available in shapes, plates and bars for the construction of bridges and buildings and for general structural purposes. A7, A36 and A373 are furnished in all structural shape sizes, however A373 is obtainable in structurals, bars and plates to a maximum thickness of 4 inches while A36 is available to 8 inches. Both A36 and A373 are fully acceptable for welded construction.

Hollow structural square and rectangular tubing is manufactured to the mechanical and chemical properties of ASTM A-7 and A-36.

MECHANICAL PROPERTIES

	A373	A36	A7
Yield Point, min. psi	32,000	36,000	33,000
Tensile Strength, psi for shapes of all thicknesses	58,000 to 75,000	58,000 to 80,000	60,000 to 75,000
For plates and bars. Up to 1½ in., incl., in thickness			60,000 to 72,000
For plates and bars over 1½ in., in thickness			60,000 to 75,000
Elongation in 8 in., min., %	21	20	21
Elongation in 2 in., min., %	24	23	24

ADDITIONAL ENGINEERING DATA

Cold Bend (2 in. and under)	180°D=½t
Resistance to atmospheric corrosion (comparative)	1, or 2 with copper 0.20% min.
Compressive Yield Point, psi	Tensile Y.P.
Shearing Strength, psi	0.60 T.S.
Modulus of Elasticity, psi	28/30,000,000
Endurance Limit (rotating beam, avg.), psi	28,000
Coefficient of Expansion per degree F, 70 to 200 F	0.0000063

CHEMICAL COMPOSITION

(A7 available to mechanical properties only.)

A36† (Ladle Analysis)

Product	Shapes	Plates					Bars and Bar Shapes		
Thickness	All	to ¾" incl.	Over ¾" to 1½" incl.	Over 1½" to 2½" incl.	Over 2½" to 4" incl.	Over 4" to 8" incl.	to ¾" incl.	Over ¾" to 1½" incl.	Over 1½" to 4" incl.
Carbon, Max. %	.26	.25	.25	.26	.27	.29	.26	.27	.28
Manganese, %	—	—	.80/1.20	.80/1.20	.85/1.20	.85/1.20	—	.60/.90	.60/.90
Silicon, %	—	—	—	.15/.30	.15/.30	.15/.30	—	—	—

Phosphorus—.04% Max. and Sulphur—.05% Max. for all classifications and thicknesses.
†A36 revised as approved by ASTM Specification A36-62T.

A373

	Shapes	Bars		Plates	
		1" and Under	Over 1" to 4"	1" and Under	Over 1" to 4"
C max.	.28	.28	.28	.25**	.27‡
Mn.	.50/.90*	—	.50/.90	.50/.90	.50/.90
Si.	—	—	—	—	.15/.30

*Group A, Heavy WF. **.26 for ½" and under. ‡.26 over 1" to 2".

An A36 Properties Card containing more detailed information regarding properties and welding is available upon request from any United States Steel Corporation Sales Office.

USS COR-TEN STEEL

This premier high-strength low-alloy steel, with its combination of greater strength and outstanding resistance to atmospheric corrosion, is ideally applicable wherever weight reduction or longer life, or both, are prime considerations. USS COR-TEN steel meets the requirements of ASTM-A242 in all respects.

Mechanical Property Requirements	Product and Thickness Ranges		
	Sheets, Strip Plates and Bars to 2½" Thick and All Structurals (incl. WF)	Plates over 2½" to 5" incl.*	Bars over 2½" to 9½" incl.
Yield Point, min. psi	50,000	46,000	45,000
Tensile Strength, min. psi	70,000	67,000	66,000
Elong. in 2", min. percent	22	24	24
Elong. in 8", min. percent	19	.....	.....

*Confer for plate properties over 5" thick.

When sheet or strip products are specified as galvanized, cold rolled, or in coils or when annealing or normalizing is specified for any product, the minimum yield point and tensile strength requirement will be reduced by 5,000 psi. The furnishing of cold rolled sheets to strength levels other than the above is subject to negotiation. Bend Test Req. of ASTM A242 and ASTM Standard Specimens, minimum number of tests and ductility modifications apply.

ADDITIONAL ENGINEERING DATA

Resistance to atmospheric corrosion.....4 to 6 Times Carbon Steel
Compressive Yield Point, psi.....Tensile Yield Point
Shearing Strength, psi.....0.60 Tensile Strength
Modulus of Elasticity, psi.....28,000,000 to 30,000,000
Endurance Limit (rotating beam polished specimen) psi.....42,000
Charpy Impact, keyhole notch (as rolled, room temp., avg.), ft.-lb.....40
Coefficient of Expansion per degree F (70° to 200°).....0.0000063

FABRICATING PRACTICE FOR COLD FORMING

Thickness of Material	Suggested Min. Inside Radius
Up to 1/16" incl.	1t
Over 1/16 to 1/4" incl.	2t
Over 1/4 to 1/2" incl.	3t

Hot forming is recommended for angle bending material over ½" in thickness.

COR-TEN STEEL FOR ARCHITECTURAL AND UNCOATED APPLICATIONS

For all products intended for architectural and uncoated applications and for special end uses as required we will apply steel to the minimum mechanical properties shown below:

	To ½" Incl.	Over ½" to 1½" Incl.	Over 1½" to 3" Incl.
Yield Point, psi	50,000	47,000	43,000
Yield Strength, psi	70,000	67,000	63,000
Elong. in 2", percent	22	.....	24
Elong. in 8", percent	19	19	19

Fabrication and welding practices should be discussed with our Metallurgical Engineers.
USS COR-TEN Steel furnished for architectural purposes in plates, structurals & bars meets the requirements of ASTM-A242 up to 3" with the exception of thicknesses from over ½" to ¾" incl.

USS TRI-TEN STEEL

A high-strength low-alloy steel intended primarily for weight reduction by means of greater strength and toughness, in applications involving cold forming, metal-arc welding and low temperature toughness, with atmospheric corrosion resistance better than that of copper steel. USS TRI-TEN is particularly applicable for structural members of metal-arc welded bridges, earthmoving equipment and similar applications. Meets all the requirements of ASTM A242 and A441.

MECHANICAL PROPERTIES

	*Sheets, Strip and Light Plate	Plates, Structurals, CB's and Bars** Thickness Ranges		
		¾" and Under	Over ¾ to 1½" Incl.	Over 1½ to 4" Incl.
Yield Point, min., psi	45,000	50,000	46,000	42,000
Tensile Strength, min., psi	60,000	70,000	67,000	63,000
Elong. in 8 in., min., %	19	18	19	19
Elong. in 2 in., min., %	25	—	—	24

*When as rolled plates ⅜" and under are required for severe cold forming or when produced on sheet or strip mills, the mechanical properties of the sheet and strip grade will apply.

**When plates or bars are ordered normalized or annealed or when severe cold forming is involved, both the minimum yield point and tensile strength requirement will be reduced 5,000 psi.

Bend test requirements of ASTM A441 and A242 and ASTM Standard Specimens; minimum number of tests and ductility modifications apply.

ADDITIONAL ENGINEERING DATA

Resistance to atmospheric corrosion ..... 2 Times Carbon Steel
Compressive Yield Point, psi ..... Tensile Yield Point
Shearing Strength, psi ..... Equal to ¾ Tensile Strength
Modulus of Elasticity, psi ..... 28,000,000 to 30,000,000
Endurance Limit (rotating beam, avg.), psi 42,000
Charpy Impact, keyhole notch (as rolled, room temp., avg.), ft.-lb. 42
Coefficient of Expansion per degree F −50 to +150 ..... 0.0000063

FABRICATING PRACTICE FOR COLD FORMING

Thickness of Material	Suggested Min. Inside Radius for	
	45,000 Y.P. Min.	50,000 Y.P. Min.
Up to 0.180" incl.	1t	—
Up to ¼" incl.	1½t	2t
Over ¼ to ½" incl.	2½t	3t

Hot forming is recommended for angle bending material over ½" in thickness.

USS MAN-TEN (A-440) STEEL

This steel meets all the requirements of ASTM Specification A-440 for plates, structural shapes, and bars. This designation should be used on orders when A-440 is required and where 50,000 psi min. YP is necessary through ¾". This grade is intended for riveted or bolted bridges, buildings, towers and other structures.

MECHANICAL PROPERTIES

	To ¾" Incl.	Over ¾" to 1½" Incl.	Over 1½" to 4" Incl.
Yield Point, min., psi	50,000	46,000	42,000
Tensile Strength, min., psi	70,000	67,000	63,000
Elong. in 8 in., min., %	18	19	19
Elong. in 2 in., min., %	—	—	24

Bend test requirements of ASTM A440 and ASTM Standard Specimens, minimum number of tests and ductility modifications apply.

ADDITIONAL ENGINEERING DATA

Resistance to atmospheric corrosion . . . . . 2 Times Carbon Steel
Compressive Yield Point, psi . . . . . Tensile Yield Point
Shearing Strength, psi . . . . . 0.60 Tensile Strength
Modulus of Elasticity, psi . . . . . 28,000,000 to 30,000,000
Endurance Limit (rotating beam, avg.) psi 39,000
Charpy Impact, keyhole notch (as rolled, room temp., avg.), ft.-lb. 30
Coefficient of Expansion per degree F, −50 to +150 F 0.0000065

FABRICATING PRACTICE FOR COLD FORMING

Thickness of Material	Suggested Min. Inside Radius
Up to ¼" incl.	2½t
Over ¼ to ½" incl.	3½t

Hot forming is recommended for angle bending material over ½" in thickness.

USS MAN-TEN STEEL

A high-strength manganese-copper steel intended primarily for weight reduction by means of greater strength in applications involving moderate forming. It is considered a weldable grade provided mild steel electrodes are used and good welding technique and workmanship are maintained. It is not considered suitable for spot welding.

USS EX-TEN STEEL

USS EX-TEN Steel is intended to fill the need for an economical grade for applications in which greater strength, to gain weight reduction, is the primary requirement. USS EX-TEN Steel has good ductility and weldability. Its resistance to atmospheric corrosion is the same as that of carbon steel. The numerical designation following USS EX-TEN indicates the minimum yield point.

MECHANICAL PROPERTIES

	EX-TEN 45 Plates and Structurals	EX-TEN 50 Plates and Structurals	EX-TEN 55 Plates and Structurals	EX-TEN 60 Plates and Structurals	EX-TEN 65 Plates and Structurals
Yield Point, psi Min.	45,000	50,000	55,000	60,000	65,000
Tensile Strength, psi Min.	60,000	65,000	70,000	75,000	80,000
Elongation, Min.					
% in 8"	19	18	17	16	15

When hot rolled products are ordered annealed or normalized, the mechanical property requirements do not apply.

ASTM Standard Specimens; minimum number of tests and ductility modifications apply.

ADDITIONAL ENGINEERING DATA

Resistance to Atmospheric Corrosion . . . . . Same as Carbon Steel
Compressive Yield Point, psi . . . . . Equal to Tensile Yield Point
Shearing Strength, psi . . . . . 0.60 Tensile Strength
Modulus of Elasticity, psi . . . . . 28,000,000 to 30,000,000
Coefficient of Expansion per degree F (70° to 200°) 0.0000063

FABRICATING PRACTICE FOR COLD FORMING

Thickness of Material	Suggested Minimum Inside Radius for Angle Bends				
	EX-TEN 45	EX-TEN 50	EX-TEN 55	EX-TEN 60	EX-TEN 65
Plates (3/8" max.)	2t	2½t	3t	3½t	4t

USS "T-1"
CONSTRUCTIONAL ALLOY STEEL PLATES

USS "T-1" quenched and tempered constructional alloy steel combines very high yield strength, outstanding toughness, and good weldability. An all-purpose steel, well suited for applications involving unusual stresses, shock and pressures at both high and low temperatures. Can be furnished especially hardened (321 or 360 min. Brinell) for outstanding resistance to impact abrasion. When ordered to 321 or 360 min. BHN, all other mechanical properties are waived.

MECHANICAL PROPERTIES

	3/16" to 2½" Incl.	Over 2½" to 4" Incl.	Over 4" to 6" Incl.
Yield Strength, Ext. under load, min., psi	100,000	90,000	90,000
Tensile Strength, min., psi	115,000/ 135,000	105/ 135,000	105/ 135,000
Elongation in 2 in., min., %	18	17	16
Reduction of Area. min., %	50†	50	45
Impact Values, ft-lbs min.	‡	—	—

Sizes outside this range may be secured on special negotiation.

†¾" and under —40%. Elongation for plates under ¼" —15% min.

‡Impact Values (minimum average) on Firebox Quality plates ½ to 2½" thick incl.: Charpy Keyhole longitudinal or transverse—15 ft. lbs. at —50°F(to 3" thick); Charpy V-Notch longitudinal —30 ft. lbs. at +10°F or 15 ft. lbs. at —50°F, transverse—20 ft. lbs. at +10°F.

ADDITIONAL ENGINEERING DATA

ASTM Cold Bend { 1 in. and under ..... 180°D = 2t
over 1 in. to 2½ in. ..... 180°D = 3t

Resistance to atmospheric corrosion ..... 4 to 5 Times Carbon Steel
Compressive Yield Strength, psi ..... Approx. Equal to Tensile Y.S.
Shearing Strength, psi ..... Approx. 0.50 T.S.
Modulus of Elasticity, psi ..... 28,000,000 to 30,000,000
Endurance Limit (rotating beam, avg.), psi 67,000
Coefficient of Expansion per degree F, —75 to +200 F 0.0000065

FABRICATING PRACTICE FOR COLD FORMING

Thickness	Suggested Min. Inside Radius
Up to 1", incl.	2t
Over 1" to 2", incl.	3t

CHEMICAL COMPOSITION*

C	Mn	P Max.	S Max.	Si	Ni	Cr	Mo	V	Cu	B
.10/.20	.60/1.00	.040	.040	.15/.35	.70/1.00	.40/.65	.40/.60	.03/.08	.15/.50	.002/.006

*U.S. Patent 2,586,042

A booklet containing more detailed information regarding properties, fabrication and applications of USS "T-1" Steel is available upon request to any United States Steel Corporation sales office.

USS "T-1" TYPE A CONSTRUCTIONAL ALLOY STEEL PLATES

USS "T-1" type A is a recent addition to the "T-1" family of constructional alloy steels. This quenched and tempered alloy steel possesses the same strength, and has comparable weldability and as good notch toughness as "T-1" Steel, in thicknesses up to 1¼" incl. There is, however, a change in the composition that makes "T-1" type A Steel a more economical grade in gages 1¼" and under for many applications. For maximum resistance to impact abrasion, USS "T-1" type A Steel may be ordered to a minimum hardness of 321 BHN, in which case all other mechanical properties are waived.

MECHANICAL PROPERTIES

	3/16" to ¾", Incl.	Over ¾" to 1¼", Incl.
Yield Strength, Ext. under load (min)	100,000 psi	100,000 psi
Tensile Strength	115,000/135,000 psi	115,000/135,000 psi
Elongation in 2", % (min)	18†	18
Reduction of Area, % (min)	40	50
Longitudinal and Transverse Charpy Keyhole* Impact Values (ASTM Procedure) (min)	15 ft. lbs. at −50°F	15 ft. lbs. at −50°F

*Impact tests apply only to Firebox or a higher quality.
†15 for plates under ¼".

ADDITIONAL ENGINEERING DATA

ASTM Cold Bend	180°D=2t
Resistance to atmospheric corrosion	2 Times Carbon Steel
Compressive Yield Strength, psi	Approx. Equal to Tensile Y.S.
Shearing Strength, psi	Approx. 0.50 T.S.
Modulus of Elasticity, psi	30,000,000
Endurance Limit (rotating beam, avg.), psi	62,000
Coefficient of Expansion per degree F, −75 to +200	0.0000065

FABRICATING PRACTICE FOR COLD FORMING

Thickness	Suggested Min. Inside Radius
Up to 1", incl.	2t
Over 1" to 1¼" incl.	3t

CHEMICAL COMPOSITION*

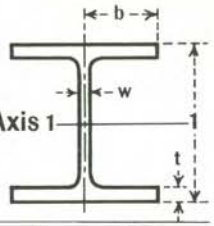
C	Mn	P	S	Si	Cr	Mo	V	B	Ti
.12/.21	.70/1.00	.040 Max.	.040 Max.	.20/.35	.40/.65	.15/.25	.03/.08	.0005/.005	.01/.03

Cu added if desired

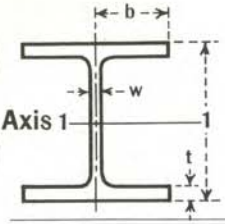
*U.S. Patent No. 2,858,206.

PLASTIC DESIGN DATA

(FOR APPLICABLE SHAPES)

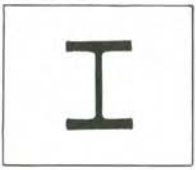


Section	Foot weight	Z in.³ Axis 1-1	d/w	b/t
36″ WF	300	1254.4	38.9	4.96
	280	1167.2	41.2	5.29
	260	1076.3	42.9	5.75
	245	1007.2	45.0	6.12
	230	941.7	46.9	6.54
	194	767.2	47.4	4.81
	182	717.0	50.1	5.12
	170	666.5	53.2	5.47
	160	623.2	55.1	5.88
	150	579.6	57.3	6.37
	135	509.0	59.4	7.52
33″ WF	240	916.3	40.4	5.67
	220	836.3	42.9	6.20
	200	756.3	46.2	6.85
	152	558.1	52.8	5.48
	141	513.0	55.1	6.01
	130	466.1	57.1	6.73
	118	414.1	59.3	7.78
30″ WF	210	734.5	39.2	5.75
	190	659.6	42.4	6.35
	172	593.0	45.6	7.04
	132	436.7	49.3	5.28
	124	407.2	52.0	5.66
	116	377.4	53.2	6.18
	108	345.4	54.4	6.90
	99	311.6	56.8	7.81
27″ WF	177	557.0	37.7	5.92
	160	504.3	41.2	6.52
	145	452.0	44.8	7.16
	114	342.9	47.9	5.40
	102	304.3	52.3	6.06
	94	277.8	54.9	6.69
	84	243.2	57.6	7.84
24″ WF	160	463.6	37.7	6.21
	145	416.0	40.3	6.89
	130	369.1	42.9	7.78
	120	336.7	43.7	6.50
	110	307.6	47.4	7.04
	100	278.2	51.3	7.74
	94	253.1	47.1	5.20
	84	224.0	51.3	5.84
	76	200.0	54.3	6.59
	68	175.6	57.0	7.70
21″ WF	142	357.1	32.6	6.00
	127	317.8	36.1	6.63
	112	278.2	39.8	7.52
21″ WF - Cont'd	96	226.2	36.8	4.84
	82	191.6	41.8	5.64
	73	172.0	46.7	5.61
	68	159.6	49.1	6.04
	62	144.0	52.5	6.70
	55	125.4	55.5	7.87
18″ WF	114	248.0	31.1	5.97
	105	226.5	33.1	6.47
	96	206.0	35.5	7.07
	85	177.6	34.8	4.85
	77	160.5	38.2	5.29
	70	144.7	41.1	5.83
	64	131.8	44.3	6.35
	60	122.6	43.9	5.44
	55	111.6	46.5	5.98
	50	100.8	50.3	6.58
	45	89,4	53.3	7.49
16″ WF	96	186.0	30.5	6.59
	88	169.0	32.1	7.24
	78	145.5	30.9	4.91
	71	131.6	33.3	5.38
	64	117.9	36.1	5.95
	58	106.2	39.0	6.56
	50	92.7	42.8	5.63
	45	82.0	46.6	6.25
	40	72.7	52.1	6.96
	36	63.9	53.0	8.17
14″ WF	136	242.7	22.3	6.94
	127	225.9	24.0	7.36
	119	210.9	25.4	7.81
	111	196.0	26.6	8.38
	84	145.4	31.4	7.73
	78	134.0	32.9	8.36
	74	125.6	31.5	6.44
	68	114.8	33.6	6.99
	61	102.4	36.8	7.78
	53	87.1	37.7	6.13
	48	78.5	40.7	6.77
	43	69.7	44.4	7.58
	38	61.5	45.1	6.61
	34	54.5	48.8	7.45
	30	47.1	51.3	8.79
12″ WF	190	311.5	13.6	3.65
	161	259.2	15.3	4.21
	133	209.7	17.7	5.00
	120	186.4	18.5	5.57
	106	163.4	20.8	6.20
	99	151.8	22.0	6.62
	92	140.2	23.2	7.10



PLASTIC DESIGN DATA

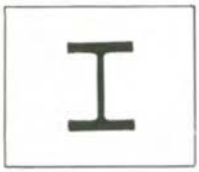
(FOR APPLICABLE SHAPES)

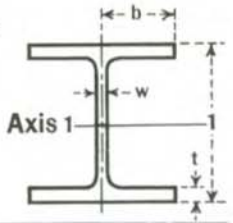


Section	Foot weight	Z in.³ Axis 1-1	d/w	b/t
12″ WF - Cont'd	85	129.1	25.3	7.61
	79	119.3	26.3	8.21
	58	86.5	34.0	7.81
	53	78.2	35.0	8.68
	50	72.6	32.9	6.30
	45	64.9	35.9	6.98
	40	57.6	40.6	7.75
	36	51.4	40.1	6.08
	31	44.0	45.6	7.02
	27	38.0	49.8	8.13
10″ WF	112	147.5	15.1	4.18
	100	130.1	16.2	4.63
	89	114.4	17.7	5.15
	77	97.7	19.9	5.88
	72	90.7	20.6	6.30
	66	82.8	22.7	6.77
	60	75.1	24.7	7.38
	54	67.0	27.5	8.12
	45	55.0	28.9	6.49
	39	47.0	31.3	7.57
	29	34.7	35.4	5.80
	25	29.5	40.0	6.70
	21	24.1	41.3	8.46
8″ WF	67	70.1	15.7	4.44
	58	59.9	17.2	5.09
	48	49.0	21.0	5.94
	40	39.9	22.6	7.24
	35	34.7	25.8	8.14
	28	27.1	28.3	7.07
	24	23.1	32.4	8.17
	20	19.1	32.8	6.97
	17	15.8	34.8	8.53
CBL 16	31	53.8	57.6	6.25
	26	43.9	62.6	7.97
CBL 14	26	36.7	54.5	6.01
	22	33.0	59.7	7.47
CBL 12	22	29.4	47.3	4.75
	19	24.8	50.7	5.75
	16.5	20.6	52.2	7.44
CBL 10	19	21.6	41.0	5.10
	17	18.6	42.2	6.10
	15	16.0	43.5	7.44
CBL 8	15	13.6	33.1	6.40
	13	11.4	34.8	7.88
CBL 6	16	11.6	24.0	4.99
	12	8.3	26.1	7.17

Section	Foot weight	Z in.³ Axis 1-1	d/w	b/t
CBS 6	25	19.0	19.9	6.67
	20	15.0	24.0	8.20
CB 51	18.5	11.4	19.3	5.98
	16	9.6	20.8	6.95
24″ I	120	298.0	30.1	3.65
	105.9	273.0	38.4	3.58
	100	238.8	32.1	4.16
	90	220.5	38.5	4.09
	79.9	203.0	48.0	4.02
20″ I	95	192.0	25.0	3.93
	85	177.3	30.6	3.85
	75	151.5	31.2	4.05
	65.4	137.3	40.0	3.96
18″ I	70	123.8	25.3	4.53
	54.7	103.5	39.1	4.34
15″ I	50	76.5	27.3	4.54
	42.9	68.6	36.6	4.42
12″ I	50	60.7	17.5	4.16
	40.8	52.5	26.1	3.99
	35	44.4	28.0	4.67
	31.8	41.6	34.3	4.60
10″ I	35	35.2	16.8	5.04
	25.4	28.0	32.6	4.75
8″ I	23	19.2	18.1	4.91
	18.4	16.3	29.6	4.71
7″ I	20	14.4	15.6	4.93
	15.3	11.9	28.0	4.67
6″ I	17.25	10.5	12.9	4.97
	12.5	8.4	26.1	4.64
5″ I	14.75	7.4	10.1	5.04
	10	5.6	23.8	4.60
4″ I	9.5	4.0	12.3	4.77
	7.7	3.5	21.1	4.54
3″ I	7.5	2.3	8.6	4.83
	5.7	1.9	17.6	4.48
6″ H3	20	14.6	24.0	7.82
5″ H2	18.9	11.1	16.0	6.00
4″ H1	13.0	6.1	16.0	5.29

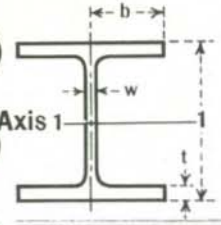
SECTION MODULUS ECONOMY TABLE
FOR SHAPES USED AS BEAMS





Section Modulus S in.³	Beam Designation USS	Beam Designation AISC	Weight lb per ft
1105.1	**CB 362**	**36 WF**	**300**
1031.2	**CB 362**	**36 WF**	**280**
951.1	**CB 362**	**36 WF**	**260**
892.5	**CB 362**	**36 WF**	**245**
835.5	**CB 362**	**36 WF**	**230**
811.1	CB 332	33 WF	240
740.6	**CB 332**	**33 WF**	**220**
669.6	**CB 332**	**33 WF**	**200**
663.6	**CB 361**	**36 WF**	**194**
649.9	CB 302	30 WF	210
621.2	**CB 361**	**36 WF**	**182**
586.1	CB 302	30 WF	190
579.1	**CB 361**	**36 WF**	**170**
541.0	**CB 361**	**36 WF**	**160**
528.2	CB 302	30 WF	172
502.9	**CB 361**	**36 WF**	**150**
492.8	CB 272	27 WF	177
486.4	CB 331	33 WF	152
446.8	**CB 331**	**33 WF**	**141**
444.5	CB 272	27 WF	160
438.6	**CB 361**	**36 WF**	**135**
413.5	CB 243	24 WF	160
404.8	**CB 331**	**33 WF**	**130**
402.9	CB 272	27 WF	145
379.7	CB 301	30 WF	132
372.5	CB 243	24 WF	145
358.3	**CB 331**	**33 WF**	**118**
354.6	CB 301	30 WF	124
330.7	CB 243	24 WF	130
327.9	**CB 301**	**30 WF**	**116**
317.2	CB 213	21 WF	142
299.2	**CB 301**	**30 WF**	**108**
299.2	CB 271	27 WF	114
299.1	CB 242	24 WF	120
284.1	CB 213	21 WF	127
274.4	CB 242	24 WF	110
269.1	**CB 301**	**30 WF**	**99**
266.3	CB 271	27 WF	102
263.2	CB 124	12 WF	190
250.9	B 18	24 I	120
249.6	CB 213	21 WF	112
248.9	CB 242	24 WF	100
242.8	**CB 271**	**27 WF**	**94**
234.3	B 18	24 I	105.9
222.2	CB 124	12 WF	161
220.9	**CB 241**	**24 WF**	**94**
220.1	CB 183	18 WF	114
216.0	CB 145	14 WF	136
211.7	**CB 271**	**27 WF**	**84**
202.2	CB 183	18 WF	105
202.0	CB 145	14 WF	127
197.6	CB 212	21 WF	96
197.6	B 1	24 I	100
196.3	**CB 241**	**24 WF**	**84**
189.4	CB 145	14 WF	119
185.8	B 1	24 I	90
184.4	CB 183	18 WF	96
182.5	CB 124	12 WF	133
176.3	CB 145	14 WF	111
175.4	**CB 241**	**24 WF**	**76**
173.9	B 1	24 I	79.9
168.0	CB 212	21 WF	82
166.1	CB 163	16 WF	96
163.6	CB 145	14 WF	103
163.4	CB 124	12 WF	120
160.0	B 2	20 I	95
156.1	CB 182	18 WF	85
153.1	**CB 241**	**24 WF**	**68**
151.3	CB 163	16 WF	88
150.7	CB 211	21 WF	73
150.6	CB 145	14 WF	95
150.2	B 2	20 I	85
144.5	CB 124	12 WF	106
141.7	CB 182	18 WF	77
139.9	**CB 211**	**21 WF**	**68**
138.1	CB 145	14 WF	87
134.7	CB 124	12 WF	99
130.9	CB 144	14 WF	84
128.2	CB 182	18 WF	70
127.8	CB 162	16 WF	78
126.4	**CB 211**	**21 WF**	**62**
126.3	B 3	20 I	75
126.3	CB 103	10 WF	112
125.0	CB 124	12 WF	92
121.1	CB 144	14 WF	78
117.0	CB 182	18 WF	64
116.9	B 3	20 I	65.4
115.9	CB 162	16 WF	71
115.7	CB 124	12 WF	85
112.4	CB 103	10 WF	100
112.3	CB 143	14 WF	74
109.7	**CB 211**	**21 WF**	**55**
107.8	CB 181	18 WF	60
107.1	CB 124	12 WF	79
104.2	CB 162	16 WF	64
103.0	CB 143	14 WF	68
101.9	B 4	18 I	70
99.7	CB 103	10 WF	89
98.2	**CB 181**	**18 WF**	**55**
97.5	CB 124	12 WF	72
94.1	CB 162	16 WF	58
92.2	CB 143	14 WF	61
89.0	**CB 181**	**18 WF**	**50**
88.4	B 4	18 I	54.7
88.0	CB 124	12 WF	65
86.1	CB 103	10 WF	77

Sections shown in bold face are **economy sections.**



SECTION MODULUS ECONOMY TABLE

FOR SHAPES USED AS BEAMS

Section Modulus S in.³	Beam Designation USS	Beam Designation AISC	Weight lb per ft
80.7	**CB 161**	**16 WF**	**50**
80.1	CB 103	10 WF	72
78.9	**CB 181**	**18 WF**	**45**
78.1	CB 123	12 WF	58
77.8	CB 142	14 WF	53
74.5	C 60	18 U	58
73.7	CB 103	10 WF	66
72.4	**CB 161**	**16 WF**	**45**
70.7	CB 123	12 WF	53
70.2	CB 142	14 WF	48
69.1	C 60	18 U	51.9
67.1	CB 103	10 WF	60
64.7	CB 122	12 WF	50
64.4	**CB 161**	**16 WF**	**40**
64.2	B 7	15 I	50
63.7	C 60	18 U	45.8
62.7	CB 142	14 WF	43
61.0	C 60	18 U	42.7
60.4	CB 103	10 WF	54
60.4	CB 83	8 WF	67
58.9	B 7	15 I	42.9
58.2	CB 122	12 WF	45
56.3	**CB 161**	**16 WF**	**36**
54.6	CB 141	14 WF	38
54.6	CB 103	10 WF	49
53.6	C 1	15 U	50
52.0	CB 83	8 WF	58
51.9	CB 122	12 WF	40
50.3	B 8	12 I	50
49.1	CB 102	10 WF	45
48.5	**CB 141**	**14 WF**	**34**
47.0	**CBL 16**	**16 B**	**31**
46.2	C 1	15 U	40
45.9	CB 121	12 WF	36
44.8	B 8	12 I	40.8
43.2	CB 83	8 WF	48
42.2	CB 102	10 WF	39
41.8	**CB 141**	**14 WF**	**30**
41.7	C 1	15 U	33.9
39.4	CB 121	12 WF	31

Section Modulus S in.³	Beam Designation USS	Beam Designation AISC	Weight lb per ft
38.1	**CBL 16**	**16 B**	**26**
37.8	B 9	12 I	35
36.0	B 9	12 I	31.8
35.5	CB 83	8 WF	40
35.0	CB 102	10 WF	33
34.9	**CBL 14**	**14 B**	**26**
34.1	CB 121	12 WF	27
31.1	CB 83	8 WF	35
30.8	CB 101	10 WF	29
29.2	B 10	10 I	35
28.9	H 4	8 M	34.3
28.8	**CBL 14**	**14 B**	**22**
27.4	CB 83	8 WF	31
26.9	C 2	12 U	30
26.4	CB 101	10 WF	25
25.3	**CBL 12**	**12 B**	**22**
24.4	B 10	10 I	25.4
24.3	CB 82	8 WF	28
23.9	C 2	12 U	25
21.5	**CB 101**	**10 WF**	**21**
21.4	**CBL 12**	**12 B**	**19**
21.4	C 2	12 U	20.7
20.8	CB 82	8 WF	24
20.6	C 3	10 U	30
18.8	CBL 10	**10 B**	**19**
18.1	C 3	10 U	25
17.5	CBL 12	**12 B**	**16.5**
17.0	CB 81	8 WF	20
16.8	CBS 6	6 WF	25
16.2	CBL 10	10 B	17
16.0	B 12	8 I	23
15.7	C 3	10 U	20
15.7	H 3a	6 M	25
14.8	**CBJ 12**	**12B**	**14**
14.2	B 12	8 I	18.4
14.1	CB 81	8 WF	17
13.8	CBL 10	10 B	15
13.5	C 4	9 U	20
13.4	C 3	10 U	15.3
13.4	CBS 6	6 WF	20
12.9	H 3	6 M	20
12.0	B 13	7 I	20
11.8	CBL 8	8 B	15
11.3	C 4	9 U	15
10.9	C 5	8 U	18.75

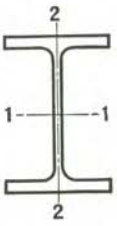
Section Modulus S in.³	Beam Designation USS	Beam Designation AISC	Weight lb per ft
10.5	**CBJ 10**	**10 B**	**11.5**
10.5	C 4	9 U	13.4
10.4	B 13	7 I	15.3
10.1	CBS 6	6 WF	15.5
10.1	CBL 6	6 B	16
9.9	CBL 8	8 B	13
9.9	CB 51	5 WF	18.5
9.5	H 2	5 M	18.9
9.0	C 5	8 U	13.75
8.7	B 14	6 I	17.25
8.5	CB 51	5 WF	16
8.1	**C 5**	**8 U**	**11.5**
7.8	**CBJ 8**	**8 B**	**10**
7.7	C 6	7 U	14.75
7.3	B 14	6 I	12.5
7.2	CBL 6	6 B	12
6.9	C 6	7 U	12.25
6.0	**C 6**	**7 U**	**9.8**
6.0	B 15	5 I	14.75
5.8	C 7	6 U	13
5.2	H 1	4 M	13
5.1	**CBJ 6**	**6 B**	**8.5**
5.0	C 7	6 U	10.5
4.8	B 15	5 I	10
4.3	**C 7**	**6 U**	**8.2**
3.5	C 8	5 U	9
3.3	B 16	4 I	9.5
3.0	**C 8**	**5 U**	**6.7**
3.0	B 16	4 I	7.7
2.3	C 9	4 U	7.25
1.9	**C 9**	**4 U**	**5.4**
1.9	B 17	3 I	7.5
1.7	B 17	3 I	5.7
1.4	C 10	3 U	6
1.2	**C 10**	**3 U**	**5**
1.1	**C 10**	**3 U**	**4.1**

Sections shown in bold face are **economy sections.**

WIDE FLANGE

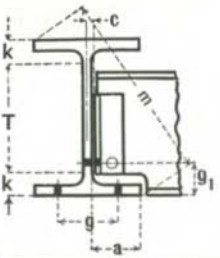
CB SECTIONS

PROPERTIES FOR DESIGNING



Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
36″ WF	P. C.	300	88.17	36.72	16.655	1.680	.945	20290.2	1105.1	15.17	1225.2	147.1	3.73
CB 362	P. C.	280	82.32	36.50	16.595	1.570	.885	18819.3	1031.2	15.12	1127.5	135.9	3.70
36 x 16½	P. C.	260	76.56	36.24	16.555	1.440	.845	17233.8	951.1	15.00	1020.6	123.3	3.65
R=1.02	P. C.	245	72.03	36.06	16.512	1.350	.802	16092.2	892.5	14.95	944.7	114.4	3.62
	P. C.	230	67.73	35.88	16.475	1.260	.765	14988.4	835.5	14.88	870.9	105.7	3.59
36″ WF	P. C.	194	57.11	36.48	12.117	1.260	.770	12103.4	663.6	14.56	355.4	58.7	2.49
CB 361	P. C.	182	53.54	36.32	12.072	1.180	.725	11281.5	621.2	14.52	327.7	54.3	2.47
36 x 12	P. C.	170	49.98	36.16	12.027	1.100	.680	10470.0	579.1	14.47	300.6	50.0	2.45
R=.80	P. C.	160	47.09	36.00	12.000	1.020	.653	9738.8	541.0	14.38	275.4	45.9	2.42
	P. C.	150	44.16	35.84	11.972	.940	.625	9012.1	502.9	14.29	250.4	41.8	2.38
	P. C.	**135**	**39.70**	**35.55**	**11.945**	**.794**	**.598**	**7796.1**	**438.6**	**14.01**	**207.1**	**34.7**	**2.28**
33″ WF	P.	240	70.52	33.50	15.865	1.400	.830	13585.1	811.1	13.88	874.3	110.2	3.52
CB 332	P.	220	64.73	33.25	15.810	1.275	.775	12312.1	740.6	13.79	782.4	99.0	3.48
33 x 15¾	P.	200	58.79	33.00	15.750	1.150	.715	11048.2	669.6	13.71	691.7	87.8	3.43
R=.96													
33″ WF	P. C.	152	44.71	33.50	11.565	1.055	.635	8147.6	486.4	13.50	256.1	44.3	2.39
CB 331	P. C.	141	41.51	33.31	11.535	.960	.605	7442.2	446.8	13.39	229.7	39.8	2.35
33 x 11½	P. C.	130	38.26	33.10	11.510	.855	.580	6699.0	404.8	13.23	201.4	35.0	2.29
R=.75	**P. C.**	**118**	**34.71**	**32.86**	**11.484**	**.738**	**.554**	**5886.9**	**358.3**	**13.02**	**170.3**	**29.7**	**2.22**
30″ WF	P. C.	210	61.78	30.38	15.105	1.315	.775	9872.4	649.9	12.64	707.9	93.7	3.38
CB 302	P. C.	190	55.90	30.12	15.040	1.185	.710	8825.9	586.1	12.57	624.6	83.1	3.34
30 x 15	P. C.	172	50.65	29.88	14.985	1.065	.655	7891.5	528.2	12.48	550.1	73.4	3.30
R=.91													
30″ WF	P. C.	132	38.83	30.30	10.551	1.000	.615	5753.1	379.7	12.17	185.0	35.1	2.18
CB 301	P. C.	124	36.45	30.16	10.521	.930	.585	5347.1	354.6	12.11	169.7	32.3	2.16
30 x 10½	P. C.	116	34.13	30.00	10.500	.850	.564	4919.1	327.9	12.00	153.2	29.2	2.12
R=.70	P. C.	108	31.77	29.82	10.484	.760	.548	4461.0	299.2	11.85	135.1	25.8	2.06
	P. C.	**99**	**29.11**	**29.64**	**10.458**	**.670**	**.522**	**3988.6**	**269.1**	**11.70**	**116.9**	**22.4**	**2.00**
27″ WF	P.	177	52.10	27.31	14.090	1.190	.725	6728.6	492.8	11.36	518.9	73.7	3.16
CB 272	P.	160	47.04	27.08	14.023	1.075	.658	6018.6	444.5	11.31	458.0	65.3	3.12
27 x 14	P.	145	42.68	26.88	13.965	.975	.600	5414.3	402.9	11.26	406.9	58.3	3.09
R=.86													
27″ WF	P. C.	114	33.53	27.28	10.070	.932	.570	4080.5	299.2	11.03	149.6	29.7	2.11
CB 271	P. C.	102	30.01	27.07	10.018	.827	.518	3604.1	266.3	10.96	129.5	25.9	2.08
27 x 10	P. C.	94	27.65	26.91	9.990	.747	.490	3266.7	242.8	10.87	115.1	23.0	2.04
R=.64	**P. C.**	**84**	**24.71**	**26.69**	**9.963**	**.636**	**.463**	**2824.8**	**211.7**	**10.69**	**95.7**	**19.2**	**1.97**

Bold face type is data for new, lighter sections.
For key to letters in second column, refer to page 3.
R=radius of fillet (inches).



WIDE FLANGE
CB SECTIONS
DIMENSIONS FOR DETAILING

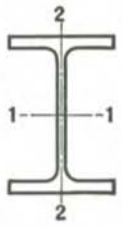
Section Index and Nominal Depth	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage
			Width	Thick-ness	Thick-ness	Half Thick-ness	a	T	k	m	Min. g_1	Clear. c	g
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
36″ WF	300	36 3/4	16 5/8	1 11/16	15/16	1/2	7 7/8	31 1/8	2 13/16	40 3/8	4	9/16	5 1/2
CB 362	280	36 1/2	16 5/8	1 9/16	7/8	7/16	7 7/8	31 1/8	2 11/16	40 1/8	4	1/2	5 1/2
36 x 16 1/2	260	36 1/4	16 1/2	1 7/16	7/8	7/16	7 7/8	31 1/8	2 9/16	39 7/8	3 3/4	1/2	5 1/2
R=1.02	245	36	16 1/2	1 3/8	13/16	3/8	7 7/8	31 1/8	2 7/16	39 3/4	3 3/4	7/16	5 1/2
	230	35 7/8	16 1/2	1 1/4	3/4	3/8	7 7/8	31 1/8	2 3/8	39 1/2	3 3/4	7/16	5 1/2
	194	36 1/2	12 1/8	1 1/4	13/16	3/8	5 5/8	32 1/4	2 1/8	38 1/2	3 1/2	7/16	5 1/2
36″ WF	182	36 3/8	12 1/8	1 3/16	3/4	3/8	5 5/8	32 1/4	2 1/16	38 3/8	3 1/4	7/16	5 1/2
CB 361	170	36 1/8	12	1 1/8	11/16	3/8	5 5/8	32 1/4	1 15/16	38 1/8	3 1/4	7/16	5 1/2
36 x 12	160	36	12	1	11/16	5/16	5 5/8	32 1/4	1 7/8	38	3 1/4	3/8	5 1/2
R=.80	150	35 7/8	12	15/16	5/8	5/16	5 5/8	32 1/4	1 13/16	37 7/8	3	3/8	5 1/2
	135	**35 1/2**	**12**	**1 3/16**	**5/8**	**5/16**	**5 5/8**	**32 1/4**	**1 5/8**	**37 1/2**	**3**	**3/8**	**5 1/2**
33″ WF	240	33 1/2	15 7/8	1 3/8	7/8	7/16	7 1/2	28 5/8	2 7/16	37 1/8	3 3/4	1/2	5 1/2
CB 332	220	33 1/4	15 3/4	1 1/4	13/16	3/8	7 1/2	28 5/8	2 5/16	36 7/8	3 1/2	7/16	5 1/2
33 x 15 3/4	200	33	15 3/4	1 1/8	3/4	3/8	7 1/2	28 5/8	2 3/16	36 5/8	3 1/2	7/16	5 1/2
R=.96													
33″ WF	152	33 1/2	11 5/8	1 1/16	5/8	5/16	5 1/2	29 3/4	1 7/8	35 1/2	3 1/4	3/8	5 1/2
CB 331	141	33 1/4	11 1/2	15/16	5/8	5/16	5 1/2	29 3/4	1 3/4	35 1/4	3	3/8	5 1/2
33 x 11 1/2	130	33 1/8	11 1/2	7/8	9/16	5/16	5 1/2	29 3/4	1 11/16	35 1/8	3	3/8	5 1/2
R=.75	**118**	**32 7/8**	**11 1/2**	**3/4**	**9/16**	**1/4**	**5 1/2**	**29 3/4**	**1 9/16**	**34 3/4**	**2 3/4**	**5/16**	**5 1/2**
30″ WF	210	30 3/8	15 1/8	1 5/16	13/16	3/8	7 1/8	25 3/4	2 5/16	34	3 1/2	7/16	5 1/2
CB 302	190	30 1/8	15	1 3/16	3/4	3/8	7 1/8	25 3/4	2 3/16	33 3/4	3 1/2	7/16	5 1/2
30 x 15	172	29 7/8	15	1 1/16	11/16	5/16	7 1/8	25 3/4	2 1/16	33 1/2	3 1/4	3/8	5 1/2
R=.91													
30″ WF	132	30 1/4	10 1/2	1	5/8	5/16	5	26 7/8	1 11/16	32 1/8	3	3/8	5 1/2
CB 301	124	30 1/8	10 1/2	15/16	5/8	5/16	5	26 7/8	1 5/8	31 7/8	3	3/8	5 1/2
30 x 10 1/2	116	30	10 1/2	7/8	9/16	5/16	5	26 7/8	1 9/16	31 3/4	3	3/8	5 1/2
R=.70	108	29 7/8	10 1/2	3/4	9/16	5/16	5	26 7/8	1 1/2	31 5/8	2 3/4	3/8	5 1/2
	99	**29 1/8**	**10 1/2**	**1 1/16**	**1/2**	**1/4**	**5**	**26 7/8**	**1 3/8**	**31 3/8**	**2 3/4**	**5/16**	**5 1/2**
27″ WF	177	27 1/4	14 1/8	1 3/16	3/4	3/8	6 3/4	23	2 1/8	30 3/4	3 1/2	7/16	5 1/2
CB 272	160	27 1/8	14	1 1/16	11/16	5/16	6 3/4	23	2 1/16	30 1/2	3 1/4	3/8	5 1/2
27 x 14	145	26 7/8	14	1	5/8	5/16	6 3/4	23	1 15/16	30 3/8	3 1/4	3/8	5 1/2
R=.86													
27″ WF	114	27 1/4	10 1/8	15/16	9/16	5/16	4 3/4	24	1 5/8	29 1/8	3	3/8	5 1/2
CB 271	102	27 1/8	10	13/16	1/2	1/4	4 3/4	24	1 9/16	28 7/8	3	5/16	5 1/2
27 x 10	94	26 7/8	10	3/4	1/2	1/4	4 3/4	24	1 7/16	28 3/4	2 3/4	5/16	5 1/2
R=.64	**84**	**26 3/4**	**10**	**5/8**	**7/16**	**1/4**	**4 3/4**	**24**	**1 3/8**	**28 1/2**	**2 3/4**	**5/16**	**5 1/2**

Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).

WIDE FLANGE

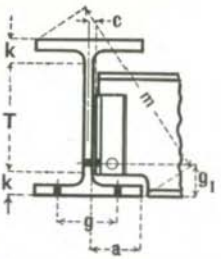
CB SECTIONS

PROPERTIES FOR DESIGNING



Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
24" WF	P. C.	160	47.04	24.72	14.091	1.135	.656	5110.3	413.5	10.42	492.6	69.9	3.23
CB 243	P. C.	145	42.62	24.49	14.043	1.020	.608	4561.0	372.5	10.34	434.3	61.8	3.19
24 x 14	P. C.	130	38.21	24.25	14.000	.900	.565	4009.5	330.7	10.24	375.2	53.6	3.13
R=.70													
24" WF	P. C.	120	35.29	24.31	12.088	.930	.556	3635.3	299.1	10.15	254.0	42.0	2.68
CB 242	P. C.	110	32.36	24.16	12.042	.855	.510	3315.0	274.4	10.12	229.1	38.0	2.66
24 x 12	P. C.	100	29.43	24.00	12.000	.775	.468	2987.3	248.9	10.08	203.5	33.9	2.63
R=.70													
24" WF	P. C.	94	27.63	24.29	9.061	.872	.516	2683.0	220.9	9.85	102.2	22.6	1.92
CB 241	P. C.	84	24.71	24.09	9.015	.772	.470	2364.3	196.3	9.78	88.3	19.6	1.89
24 x 9	P. C.	76	22.37	23.91	8.985	.682	.440	2096.4	175.4	9.68	76.5	17.0	1.85
R=.54	**P. C.**	**68**	**20.00**	**23.71**	**8.961**	**.582**	**.416**	**1814.5**	**153.1**	**9.53**	**63.8**	**14.2**	**1.79**
21" WF	P.	142	41.76	21.46	13.132	1.095	.659	3403.1	317.2	9.03	385.9	58.8	3.04
CB 213	P.	127	37.34	21.24	13.061	.985	.588	3017.2	284.1	8.99	338.6	51.8	3.01
21 x 13	P.	112	32.93	21.00	13.000	.865	.527	2620.6	249.6	8.92	289.7	44.6	2.96
R=.65													
21" WF													
CB 212	P.	96	28.21	21.14	9.038	.935	.575	2088.9	197.6	8.60	109.3	24.2	1.97
21 x 9	P.	82	24.10	20.86	8.962	.795	.499	1752.4	168.0	8.53	89.6	20.0	1.93
R=.65													
21" WF	P. C.	73	21.46	21.24	8.295	.740	.455	1600.3	150.7	8.64	66.2	16.0	1.76
CB 211	P. C.	68	20.02	21.13	8.270	.685	.430	1478.3	139.9	8.59	60.4	14.6	1.74
21 x 8¼	P. C.	62	18.23	20.99	8.240	.615	.400	1326.8	126.4	8.53	53.1	12.9	1.71
R=.54	**P. C.**	**55**	**16.18**	**20.80**	**8.215**	**.522**	**.375**	**1140.7**	**109.7**	**8.40**	**44.0**	**10.7**	**1.65**
18" WF	P. C.	114	33.51	18.48	11.833	.991	.595	2033.8	220.1	7.79	255.6	43.2	2.76
CB 183	P. C.	105	30.86	18.32	11.792	.911	.554	1852.5	202.2	7.75	231.0	39.2	2.73
18 x 11¾	P. C.	96	28.22	18.16	11.750	.831	.512	1674.7	184.4	7.70	206.8	35.2	2.71
R=.60													
18" WF	P. C.	85	24.97	18.32	8.838	.911	.526	1429.9	156.1	7.57	99.4	22.5	2.00
CB 182	P. C.	77	22.63	18.16	8.787	.831	.475	1286.8	141.7	7.54	88.6	20.2	1.98
18 x 8¾	P. C.	70	20.56	18.00	8.750	.751	.438	1153.9	128.2	7.49	78.5	17.9	1.95
R=.60	P. C.	64	18.80	17.87	8.715	.686	.403	1045.8	117.0	7.46	70.3	16.1	1.93
18" WF	P. C.	60	17.64	18.25	7.558	.695	.416	984.0	107.8	7.47	47.1	12.5	1.63
CB 181	P. C.	55	16.19	18.12	7.532	.630	.390	889.9	98.2	7.41	42.0	11.1	1.61
18 x 7½	P. C.	50	14.71	18.00	7.500	.570	.358	800.6	89.0	7.38	37.2	9.9	1.59
R=.43	**P. C.**	**45**	**13.24**	**17.86**	**7.477**	**.499**	**.335**	**704.5**	**78.9**	**7.30**	**31.9**	**8.5**	**1.55**

Bold face type is data for new, lighter sections.
For key to letters in second column, refer to page 3.
R=radius of fillet (inches).



WIDE FLANGE
CB SECTIONS
DIMENSIONS FOR DETAILING

Section Index and Nominal Depth	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage g
			Width	Thickness	Thickness	Half Thickness	a	T	k	m	Min. g_1	Clear. c	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
24″ WF	160	24¾	14⅛	1⅛	11/16	5/16	6¾	20¾	2	28½	3¼	⅜	5½
CB 243	145	24½	14	1	⅝	5/16	6¾	20¾	1⅞	28¼	3¼	⅜	5½
24 x 14	130	24¼	14	⅞	9/16	5/16	6¾	20¾	1¾	28	3	⅜	5½
R=.70													
24″ WF	120	24¼	12⅛	15/16	9/16	5/16	5¾	20⅞	1 11/16	27⅛	3	⅜	5½
CB 242	110	24⅛	12	⅞	½	¼	5¾	20⅞	1⅝	27	3	5/16	5½
24 x 12	100	24	12	¾	½	¼	5¾	20⅞	1 9/16	26⅞	3	9/16	5½
R=.70													
24″ WF	94	24¼	9	⅞	½	¼	4¼	21⅜	1 7/16	25⅞	3	5/16	5½
CB 241	84	24⅛	9	¾	½	¼	4¼	21⅜	1⅜	25¾	2¾	5/16	5½
24 x 9	76	23⅞	9	11/16	7/16	¼	4¼	21⅜	1¼	25⅝	2¾	5/16	5½
R=.54	**68**	**23¾**	**9**	9/16	7/16	3/16	**4¼**	**21⅜**	**1 1/16**	**25⅜**	**2½**	¼	**5½**
21″ WF	142	21½	13⅛	1⅛	11/16	⅜	6¼	17¾	1⅞	25¼	3¼	7/16	5½
CB 213	127	21¼	13	1	9/16	5/16	6¼	17¾	1¾	25	3	⅜	5½
21 x 13	112	21	13	⅞	9/16	¼	6¼	17¾	1⅝	24¾	3	5/16	5½
R=.65													
21″ WF													
CB 212	96	21⅛	9	15/16	9/16	5/16	4¼	18	1 9/16	23	3	⅜	5½
21 x 9	82	20⅞	9	13/16	½	¼	4¼	18	1 7/16	22¾	2¾	5/16	5½
R=.65													
21″ WF	73	21¼	8¼	¾	½	¼	4	18⅝	1 5/16	22⅞	2¾	5/16	5½
CB 211	68	21⅛	8¼	11/16	7/16	¼	4	18⅝	1¼	22¾	2¾	5/16	5½
21 x 8¼	62	21	8¼	⅝	⅜	3/16	4	18⅝	1 3/16	22⅝	2¾	¼	5½
R=.54	**55**	**20¾**	**8¼**	½	⅜	3/16	**4**	**18⅝**	**1 1/16**	**22⅜**	**2½**	¼	**5½**
18″ WF	114	18½	11⅞	1	⅝	5/16	5⅝	15⅛	1 11/16	22	3	⅜	5½
CB 183	105	18⅜	11¾	15/16	9/16	5/16	5⅝	15⅛	1⅝	21⅞	3	⅜	5½
18 x 11¾	96	18⅛	11¾	13/16	½	¼	5⅝	15⅛	1½	21¾	3	5/16	5½
R=.60													
18″ WF	85	18⅜	8⅞	15/16	9/16	¼	4⅛	15⅜	1½	20⅜	2¾	5/16	5½
CB 182	77	18⅛	8¾	13/16	½	¼	4⅛	15⅜	1⅜	20⅛	2¾	5/16	5½
18 x 8¾	70	18	8¾	¾	7/16	¼	4⅛	15⅜	1 5/16	20	2¾	5/16	5½
R=.60	64	17⅞	8¾	11/16	7/16	3/16	4⅛	15⅜	1¼	20	2¾	¼	5½
18″ WF	60	18¼	7½	11/16	7/16	3/16	3⅝	15⅞	1 3/16	19⅞	2¾	¼	3½
CB 181	55	18⅛	7½	⅝	⅜	3/16	3⅝	15⅞	1⅛	19⅝	2¾	¼	3½
18 x 7½	50	18	7½	9/16	⅜	3/16	3⅝	15⅞	1 1/16	19½	2½	¼	3½
R=.43	**45**	**17⅞**	**7½**	½	5/16	3/16	**3⅝**	**15⅞**	**1**	**19⅜**	**2½**	¼	**3½**

Gages g_1 are based on 1¼″ edge distance (1″ maximum rivet).

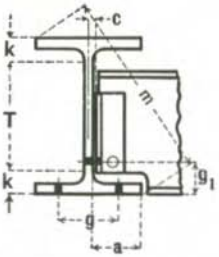
WIDE FLANGE

CB SECTIONS

PROPERTIES FOR DESIGNING

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
16″ WF													
CB 163	P. C.	96	28.22	16.32	11.533	.875	.535	1355.1	166.1	6.93	207.2	35.9	2.71
16 x 11½	P. C.	88	25.87	16.16	11.502	.795	.504	1222.6	151.3	6.87	185.2	32.2	2.67
R=.60													
16″ WF	P. C.	78	22.92	16.32	8.586	.875	.529	1042.6	127.8	6.74	87.5	20.4	1.95
★CB 162	P. C.	71	20.86	16.16	8.543	.795	.486	936.9	115.9	6.70	77.9	18.2	1.93
16 x 8½	P. C.	64	18.80	16.00	8.500	.715	.443	833.8	104.2	6.66	68.4	16.1	1.91
R=.60	P. C.	58	17.04	15.86	8.464	.645	.407	746.4	94.1	6.62	60.5	14.3	1.88
16″ WF	P. C.	50	14.70	16.25	7.073	.628	.380	655.4	80.7	6.68	34.8	9.8	1.54
★CB 161	P. C.	45	13.24	16.12	7.039	.563	.346	583.3	72.4	6.64	30.5	8.7	1.52
16 x 7	P. C.	40	11.77	16.00	7.000	.503	.307	515.5	64.4	6.62	26.5	7.6	1.50
R=.43	P. C.	36	10.59	15.85	6.992	.428	.299	446.3	56.3	6.49	22.1	6.3	1.45
	P. C.	426	125.25	18.69	16.695	3.033	1.875	6610.3	707.4	7.26	2359.5	282.7	4.34
	P. C.	398	116.98	18.31	16.590	2.843	1.770	6013.7	656.9	7.17	2169.7	261.6	4.31
	P. C.	370	108.78	17.94	16.475	2.658	1.655	5454.2	608.1	7.08	1986.0	241.1	4.27
	P. C.	342	100.59	17.56	16.365	2.468	1.545	4911.5	559.4	6.99	1806.9	220.8	4.24
	P. C.	314	92.30	17.19	16.235	2.283	1.415	4399.4	511.9	6.90	1631.4	201.0	4.20
	P. C.	287	84.37	16.81	16.130	2.093	1.310	3912.1	465.5	6.81	1466.5	181.8	4.17
	P. C.	264	77.63	16.50	16.025	1.938	1.205	3526.0	427.4	6.74	1331.2	166.1	4.14
	P. C.	246	72.33	16.25	15.945	1.813	1.125	3228.9	397.4	6.68	1226.6	153.9	4.12
	P. C.	237	69.69	16.12	15.910	1.748	1.090	3080.9	382.2	6.65	1174.8	147.7	4.11
14″ WF	P. C.	228	67.06	16.00	15.865	1.688	1.045	2942.4	367.8	6.62	1124.8	141.8	4.10
CB 146	P. C.	219	64.36	15.87	15.825	1.623	1.005	2798.2	352.6	6.59	1073.2	135.6	4.08
14 x 16	P. C.	211	62.07	15.75	15.800	1.563	.980	2671.4	339.2	6.56	1028.6	130.2	4.07
R=.60	P. C.	202	59.39	15.63	15.750	1.503	.930	2538.8	324.9	6.54	979.7	124.4	4.06
	P. C.	193	56.73	15.50	15.710	1.438	.890	2402.4	310.0	6.51	930.1	118.4	4.05
	P. C.	184	54.07	15.38	15.660	1.378	.840	2274.8	295.8	6.49	882.7	112.7	4.04
	P. C.	176	51.73	15.25	15.640	1.313	.820	2149.6	281.9	6.45	837.9	107.1	4.02
	P. C.	167	49.09	15.12	15.600	1.248	.780	2020.8	267.3	6.42	790.2	101.3	4.01
	P. C.	158	46.47	15.00	15.550	1.188	.730	1900.6	253.4	6.40	745.0	95.8	4.00
	P. C.	150	44.08	14.88	15.515	1.128	.695	1786.9	240.2	6.37	702.5	90.6	3.99
	P. C.	142	41.85	14.75	15.500	1.063	.680	1672.2	226.7	6.32	660.1	85.2	3.97
	P. C.	320‡	94.12	16.81	16.710	2.093	1.890	4141.7	492.8	6.63	1635.1	195.7	4.17
	P. C.	136	39.98	14.75	14.740	1.063	.660	1593.0	216.0	6.31	567.7	77.0	3.77
	P. C.	127	37.33	14.62	14.690	.998	.610	1476.7	202.0	6.29	527.6	71.8	3.76
14″ WF	P. C.	119	34.99	14.50	14.650	.938	.570	1373.1	189.4	6.26	491.8	67.1	3.75
CB 145	P. C.	111	32.65	14.37	14.620	.873	.540	1266.5	176.3	6.23	454.9	62.2	3.73
14 x 14½	P. C.	103	30.26	14.25	14.575	.813	.495	1165.8	163.6	6.21	419.7	57.6	3.72
R=.60	P. C.	95	27.94	14.12	14.545	.748	.465	1063.5	150.6	6.17	383.7	52.8	3.71
	P. C.	87	25.56	14.00	14.500	.688	.420	966.9	138.1	6.15	349.7	48.2	3.70

For key to letters in second column and star ★ in first column refer to page 3.
‡Column Core Section.
R=radius of fillet (inches).

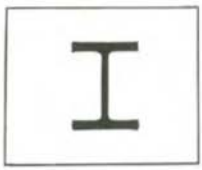


WIDE FLANGE
CB SECTIONS
DIMENSIONS FOR DETAILING

I

Section Index and Nominal Depth	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage g
			Width	Thick-ness	Thick-ness	Half Thick-ness	a	T	k	m	Min. g_1	Clear. c	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
16″ WF													
CB 163	96	16 3/8	11 1/2	7/8	9/16	5/16	5 1/2	13 1/8	1 5/8	20	3	3/8	5 1/2
16 x 11 1/2	88	16 1/8	11 1/2	13/16	1/2	1/4	5 1/2	13 1/8	1 1/2	19 7/8	2 3/4	5/16	5 1/2
R=.60													
16″ WF	78	16 3/8	8 5/8	7/8	9/16	1/4	4	13 3/8	1 1/2	18 1/2	3	5/16	5 1/2
CB 162	71	16 1/8	8 1/2	13/16	1/2	1/4	4	13 3/8	1 3/8	18 1/4	2 3/4	5/16	5 1/2
16 x 8 1/2	64	16	8 1/2	11/16	7/16	1/4	4	13 3/8	1 5/16	18 1/8	2 3/4	5/16	5 1/2
R=.60	58	15 7/8	8 1/2	5/8	7/16	1/4	4	13 3/8	1 1/4	18	2 3/4	5/16	5 1/2
16″ WF	50	16 1/4	7 1/8	5/8	3/8	3/16	3 3/8	14	1 1/8	17 3/4	2 1/2	1/4	3 1/2
CB 161	45	16 1/8	7	9/16	3/8	3/16	3 3/8	14	1 1/16	17 5/8	2 1/2	1/4	3 1/2
16 x 7	40	16	7	1/2	5/16	3/16	3 3/8	14	1	17 1/2	2 1/2	1/4	3 1/2
R=.43	36	15 7/8	7	7/16	5/16	3/16	3 3/8	14	15/16	17 3/8	2 1/2	1/4	3 1/2
	426	18 3/4	16 3/4	3 1/16	1 7/8	15/16	7 3/8	11 3/8	3 5/8	25 1/8	5	1	
	398	18 1/4	16 5/8	2 13/16	1 13/16	7/8	7 3/8	11 3/8	3 7/16	24 3/4	4 3/4	15/16	
	370	18	16 1/2	2 11/16	1 11/16	13/16	7 3/8	11 3/8	3 1/4	24 3/8	4 3/4	7/8	
	342	17 1/2	16 3/8	2 7/16	1 9/16	13/16	7 3/8	11 3/8	3 1/16	24	4 1/2	7/8	
	314	17 1/4	16 1/4	2 5/16	1 7/16	3/4	7 3/8	11 3/8	2 7/8	23 3/4	4 1/4	13/16	
	287	16 3/4	16 1/8	2 1/16	1 5/16	11/16	7 3/8	11 3/8	2 11/16	23 3/8	4	3/4	
	264	16 1/2	16	1 15/16	1 1/4	5/8	7 3/8	11 3/8	2 9/16	23	4	11/16	
	246	16 1/4	16	1 13/16	1 1/8	9/16	7 3/8	11 3/8	2 7/16	22 7/8	3 3/4	5/8	
	237	16 1/8	15 7/8	1 3/4	1 1/8	9/16	7 3/8	11 3/8	2 3/8	22 3/4	3 3/4	5/8	
14″ WF	228	16	15 7/8	1 11/16	1 1/16	9/16	7 3/8	11 3/8	2 5/16	22 5/8	3 3/4	5/8	
CB 146	219	15 7/8	15 7/8	1 5/8	1	1/2	7 3/8	11 3/8	2 1/4	22 1/2	3 3/4	9/16	3—5 1/2—3
14 x 16	211	15 3/4	15 3/4	1 9/16	1	1/2	7 3/8	11 3/8	2 3/16	22 3/8	3 1/2	9/16	
R=.60	202	15 5/8	15 3/4	1 1/2	15/16	1/2	7 3/8	11 3/8	2 1/8	22 1/4	3 1/2	9/16	
	193	15 1/2	15 3/4	1 7/16	7/8	7/16	7 3/8	11 3/8	2 1/16	22 1/8	3 1/2	1/2	
	184	15 3/8	15 5/8	1 3/8	7/8	7/16	7 3/8	11 3/8	2	22	3 1/2	1/2	
	176	15 1/4	15 5/8	1 5/16	13/16	7/16	7 3/8	11 3/8	1 15/16	21 7/8	3 1/4	1/2	
	167	15 1/8	15 5/8	1 1/4	13/16	3/8	7 3/8	11 3/8	1 7/8	21 3/4	3 1/4	7/16	
	158	15	15 1/2	1 3/16	3/4	3/8	7 3/8	11 3/8	1 13/16	21 5/8	3 1/4	7/16	
	150	14 7/8	15 1/2	1 1/8	11/16	3/8	7 3/8	11 3/8	1 3/4	21 1/2	3 1/4	7/16	
	142	14 3/4	15 1/2	1 1/16	11/16	3/8	7 3/8	11 3/8	1 11/16	21 1/2	3	7/16	
	*320	16 3/4	16 3/4	2 1/16	1 7/8	15/16	7 3/8	11 3/8	2 11/16	23 3/4	4	1	
	136	14 3/4	14 3/4	1 1/16	11/16	3/8	7	11 3/8	1 11/16	20 7/8	3	7/16	5 1/2
	127	14 5/8	14 3/4	1	5/8	5/16	7	11 3/8	1 5/8	20 3/4	3	3/8	5 1/2
14″ WF	119	14 1/2	14 5/8	15/16	9/16	5/16	7	11 3/8	1 9/16	20 5/8	3	3/8	5 1/2
CB 145	111	14 3/8	14 5/8	7/8	9/16	5/16	7	11 3/8	1 1/2	20 1/2	2 3/4	3/8	5 1/2
14 x 14 1/2	103	14 1/4	14 5/8	13/16	1/2	1/4	7	11 3/8	1 7/16	20 1/2	2 3/4	5/16	5 1/2
R=.60	95	14 1/8	14 1/2	3/4	1/2	1/4	7	11 3/8	1 3/8	20 1/4	2 3/4	5/16	5 1/2
	87	14	14 1/2	11/16	7/16	1/4	7	11 3/8	1 5/16	20 1/4	2 3/4	5/16	5 1/2

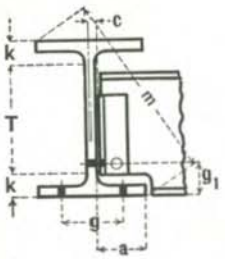
*Column Core Section.
Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).



WIDE FLANGE
CB SECTIONS
PROPERTIES FOR DESIGNING

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
14″ WF CB 144 14 x 12 R=.60	P. C.	84	24.71	14.18	12.023	.778	.451	928.4	130.9	6.13	225.5	37.5	3.02
	P. C.	78	22.94	14.06	12.000	.718	.428	851.2	121.1	6.09	206.9	34.5	3.00
14″ WF CB 143 14 x 10 R=.60	P. C.	74	21.76	14.19	10.072	.783	.450	796.8	112.3	6.05	133.5	26.5	2.48
	P. C.	68	20.00	14.06	10.040	.718	.418	724.1	103.0	6.02	121.2	24.1	2.46
	P. C.	61	17.94	13.91	10.000	643	.378	641.5	92.2	5.98	107.3	21.5	2.45
14″ WF ★CB 142 14 x 8 R=.60	P. C.	53	15.59	13.94	8.062	.658	.370	542.1	77.8	5.90	57.5	14.3	1.92
	P. C.	48	14.11	13.81	8.031	.593	.339	484.9	70.2	5.86	51.3	12.8	1.91
	P. C.	43	12.65	13.68	8.000	.528	.308	429.0	62.7	5.82	45.1	11.3	1.89
14″ WF ★CB 141 14 x 6¾ R=.43	P. C.	38	11.17	14.12	6.776	.513	.313	385.3	54.6	5.87	24.6	7.3	1.49
	P. C.	34	10.00	14.00	6.750	.453	.287	339.2	48.5	5.83	21.3	6.3	1.46
	P. C.	30	8.81	13.86	6.733	.383	.270	289.6	41.8	5.73	17.5	5.2	1.41
12″ WF CB 124 12 x 12 R=.60	P. C.	190	55.86	14.38	12.670	1.736	1.060	1892.5	263.2	5.82	589.7	93.1	3.25
	P. C.	161	47.38	13.88	12.515	1.486	.905	1541.8	222.2	5.70	486.2	77.7	3.20
	P. C.	133	39.11	13.38	12.365	1.236	.755	1221.2	182.5	5.59	389.9	63.1	3.16
	P. C.	120	35.31	13.12	12.320	1.106	.710	1071.7	163.4	5.51	345.1	56.0	3.13
	P. C.	106	31.19	12.88	12.230	.986	.620	930.7	144.5	5.46	300.9	49.2	3.11
	P. C.	99	29.09	12.75	12.190	.921	.580	858.5	134.7	5.43	278.2	45.7	3.09
	P. C.	92	27.06	12.62	12.155	.856	.545	788.9	125.0	5.40	256.4	42.2	3.08
	P. C.	85	24.98	12.50	12.105	.796	.495	723.3	115.7	5.38	235.5	38.9	3.07
	P. C.	79	23.22	12.38	12.080	.736	.470	663.0	107.1	5.34	216.4	35.8	3.05
	P. C.	72	21.16	12.25	12.040	.671	.430	597.4	97.5	5.31	195.3	32.4	3.04
	P. C.	65	19.11	12.12	12.000	.606	.390	533.4	88.0	5.28	174.6	29.1	3.02
12″ WF CB 123 12 x 10 R=.60	P. C.	58	17.06	12.19	10.014	.641	.359	476.1	78.1	5.28	107.4	21.4	2.51
	P. C.	53	15.59	12.06	10.000	.576	345	426.2	70.7	5.23	96.1	19.2	2.48
12″ WF ★CB 122 12 x 8 R=.60	P. C.	50	14.71	12.19	8.077	.641	.371	394.5	64.7	5.18	56.4	14.0	1.96
	P. C.	45	13.24	12.06	8.042	.576	.336	350.8	58.2	5.15	50.0	12.4	1.94
	P. C.	40	11.77	11.94	8.000	.516	.294	310.1	51.9	5.13	44.1	11.0	1.94
12″ WF ★CB 121 12 x 6½ R=.37	P. C.	36	10.59	12.24	6.565	.540	.305	280.8	45.9	5.15	23.7	7.2	1.50
	P. C.	31	9.12	12.09	6.525	.465	.265	238.4	39.4	5.11	19.8	6.1	1.47
	P. C.	27	7.97	11.96	6.500	.400	.240	204.1	34.1	5.06	16.6	5.1	1.44

For key to letters in second column and star ★ in first column refer to page 3.
R=radius of fillet (inches).



WIDE FLANGE
CB SECTIONS
DIMENSIONS FOR DETAILING

I

Section Index and Nominal Depth	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage
			Width	Thick-ness	Thick-ness	Half Thick-ness	a	T	k	m	Min. g_1	Clear. c	g
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
14″ WF CB 144 14 x 12 R=.60	84	14 1/8	12	3/4	7/16	1/4	5 3/4	11 3/8	1 3/8	18 5/8	2 3/4	5/16	5 1/2
	78	14	12	11/16	7/16	1/4	5 3/4	11 3/8	1 5/16	18 1/2	2 3/4	5/16	5 1/2
14″ WF CB 143 14 x 10 R=.60	74	14 1/4	10 1/8	13/16	7/16	1/4	4 3/4	11 3/8	1 3/8	17 1/2	2 3/4	5/16	5 1/2
	68	14	10	11/16	7/16	1/4	4 3/4	11 3/8	1 5/16	17 1/4	2 1/2	5/16	5 1/2
	61	13 7/8	10	5/8	3/8	3/16	4 3/4	11 3/8	1 1/4	17 1/8	2 1/2	1/4	5 1/2
14″ WF CB 142 14 x 8 R=.60	53	14	8	11/16	3/8	3/16	3 7/8	11 3/8	1 1/4	16 1/8	2 1/2	1/4	5 1/2
	48	13 3/4	8	9/16	3/8	3/16	3 7/8	11 3/8	1 3/16	16	2 1/2	1/4	5 1/2
	43	13 5/8	8	1/2	5/16	3/16	3 7/8	11 3/8	1 1/8	15 7/8	2 1/2	1/4	5 1/2
14″ WF CB 141 14 x 6 3/4 R=.43	38	14 1/8	6 3/4	1/2	5/16	3/16	3 1/4	12 1/8	1	15 3/4	2 1/2	1/4	3 1/2
	34	14	6 3/4	7/16	5/16	3/16	3 1/4	12 1/8	15/16	15 5/8	2 1/2	1/4	3 1/2
	30	13 7/8	6 3/4	3/8	5/16	1/8	3 1/4	12 1/8	7/8	15 1/2	2 1/4	3/16	3 1/2
12″ WF CB 124 12 x 12 R=.60	190	14 3/8	12 5/8	1 3/4	1 1/16	9/16	5 3/4	9 3/4	2 5/16	19 1/4	3 3/4	5/8	5 1/2
	161	13 7/8	12 1/2	1 1/2	15/16	7/16	5 3/4	9 3/4	2 1/16	18 3/4	3 1/2	1/2	5 1/2
	133	13 3/8	12 3/8	1 1/4	3/4	3/8	5 3/4	9 3/4	1 13/16	18 1/4	3 1/4	7/16	5 1/2
	120	13 1/8	12 3/8	1 1/8	3/4	3/8	5 3/4	9 3/4	1 11/16	18	3 1/4	7/16	5 1/2
	106	12 7/8	12 1/4	1	5/8	5/16	5 3/4	9 3/4	1 9/16	17 7/8	3	3/8	5 1/2
	99	12 3/4	12 1/4	15/16	5/8	5/16	5 3/4	9 3/4	1 1/2	17 3/4	3	3/8	5 1/2
	92	12 5/8	12 1/8	7/8	9/16	5/16	5 3/4	9 3/4	1 7/16	17 1/2	2 3/4	3/8	5 1/2
	85	12 1/2	12 1/8	13/16	1/2	1/4	5 3/4	9 3/4	1 3/8	17 1/2	2 3/4	5/16	5 1/2
	79	12 3/8	12 1/8	3/4	1/2	1/4	5 3/4	9 3/4	1 5/16	17 3/8	2 3/4	5/16	5 1/2
	72	12 1/4	12	11/16	7/16	1/4	5 3/4	9 3/4	1 1/4	17 1/4	2 3/4	5/16	5 1/2
	65	12 1/8	12	5/8	3/8	3/16	5 3/4	9 3/4	1 3/16	17 1/8	2 3/4	1/4	5 1/2
12″ WF CB 123 12 x 10 R=.60	58	12 1/4	10	5/8	3/8	3/16	4 7/8	9 3/4	1 1/4	15 7/8	2 1/2	1/4	5 1/2
	53	12	10	9/16	3/8	3/16	4 7/8	9 3/4	1 3/16	15 5/8	2 1/2	1/4	5 1/2
12″ WF CB 122 12 x 8 R=.60	50	12 1/4	8 1/8	5/8	3/8	3/16	3 7/8	9 3/4	1 1/4	14 5/8	2 1/2	1/4	5 1/2
	45	12	8	9/16	3/8	3/16	3 7/8	9 3/4	1 3/16	14 1/2	2 1/2	1/4	5 1/2
	40	12	8	1/2	5/16	3/16	3 7/8	9 3/4	1 1/8	14 3/8	2 1/2	1/4	5 1/2
12″ WF CB 121 12 x 6 1/2 R=.37	36	12 1/4	6 5/8	9/16	5/16	3/16	3 1/8	10 3/8	15/16	14	2 1/4	1/4	3 1/2
	31	12 1/8	6 1/2	7/16	1/4	1/8	3 1/8	10 3/8	7/8	13 3/4	2 1/4	3/16	3 1/2
	27	12	6 1/2	3/8	1/4	1/8	3 1/8	10 3/8	13/16	13 5/8	2 1/4	3/16	3 1/2

Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).

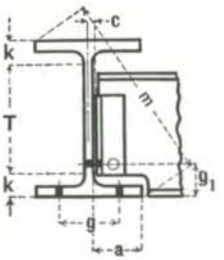
WIDE FLANGE

CB SECTIONS

PROPERTIES FOR DESIGNING

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
	P. C.	112	32.92	11.38	10.415	1.248	.755	718.7	126.3	4.67	235.4	45.2	2.67
	P. C.	100	29.43	11.12	10.345	1.118	.685	625.0	112.4	4.61	206.6	39.9	2.65
10″ WF	P. C.	89	26.19	10.88	10.275	.998	.615	542.4	99.7	4.55	180.6	35.2	2.63
CB 103	P. C.	77	22.67	10.62	10.195	.868	.535	457.2	86.1	4.49	153.4	30.1	2.60
10 x 10	P. C.	72	21.18	10.50	10.170	.808	.510	420.7	80.1	4.46	141.8	27.9	2.59
R = .50	P. C.	66	19.41	10.38	10.117	.748	.457	382.5	73.7	4.44	129.2	25.5	2.58
	P. C.	60	17.66	10.25	10.075	.683	.415	343.7	67.1	4.41	116.5	23.1	2.57
	P. C.	54	15.88	10.12	10.028	.618	.368	305.7	60.4	4.39	103.9	20.7	2.56
	P. C.	49	14.40	10.00	10.000	.558	.340	272.9	54.6	4.35	93.0	18.6	2.54
10″ WF	P. C.	45	13.24	10.12	8.022	.618	.350	248.6	49.1	4.33	53.2	13.3	2.00
★CB 102	P. C.	39	11.48	9.94	7.990	.528	.318	209.7	42.2	4.27	44.9	11.2	1.98
10 x 8	P. C.	33	9.71	9.75	7.964	.433	.292	170.9	35.0	4.20	36.5	9.2	1.94
R = .50													
10″ WF	P. C.	29	8.53	10.22	5.799	.500	.289	157.3	30.8	4.29	15.2	5.2	1.34
★CB 101	P C.	25	7.35	10.08	5.762	.430	.252	133.2	26.4	4.26	12.7	4.4	1.31
10 x 5¾	P. C.	21	6.19	9.90	5.750	.340	.240	106.3	21.5	4.14	9.7	3.4	1.25
R = .32													
	P. C.	67	19.70	9.00	8.287	.933	.575	271.8	60.4	3.71	88.6	21.4	2.12
8″ WF	P. C.	58	17.06	8.75	8.222	.808	.510	227.3	52.0	3.65	74.9	18.2	2.10
★ CB 83	P. C.	48	14.11	8.50	8.117	.683	.405	183.7	43.2	3.61	60.9	15.0	2.08
8 x 8	P. C.	40	11.76	8.25	8.077	.558	.365	146.3	35.5	3.53	49.0	12.1	2.04
R = .40	P. C.	35	10.30	8.12	8.027	.493	.315	126.5	31.1	3.50	42.5	10.6	2.03
	P. C.	31	9.12	8.00	8.000	.433	.288	109.7	27.4	3.47	37.0	9.2	2.01
8″ WF													
★ CB 82	P. C.	28	8.23	8.06	6.540	.463	.285	97.8	24.3	3.45	21.6	6.6	1.62
8 x 6½	P. C.	24	7.06	7.93	6.500	.398	.245	82.5	20.8	3.42	18.2	5.6	1.61
R = .40													
8″ WF													
★ CB 81	P. C.	20	5.88	8.14	5.268	.378	.248	69.2	17.0	3.43	8.50	3.2	1.20
8 x 5¼	P. C.	17	5.00	8.00	5.250	.308	.230	56.4	14.1	3.36	6.72	2.6	1.16
R = .32													

For key to letters in second column and star ★ in first column refer to page 3.
R = radius of fillet (inches).



WIDE FLANGE

CB SECTIONS

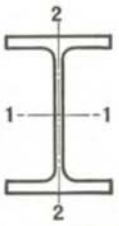
DIMENSIONS FOR DETAILING

I

Section Index and Nominal Depth	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage
			Width	Thick-ness	Thick-ness	Half Thick-ness	a	T	k	m	Min. g_1	Clear. c	g
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
10″ WF CB 103 10 x 10 R=.50	112	11 3/8	10 3/8	1 1/4	3/4	3/8	4 7/8	7 7/8	1 3/4	15 1/2	3 1/4	7/16	5 1/2
	100	11 1/8	10 3/8	1 1/8	11/16	3/8	4 7/8	7 7/8	1 5/8	15 1/4	3 1/4	7/16	5 1/2
	89	10 7/8	10 1/4	1	5/8	5/16	4 7/8	7 7/8	1 1/2	15	3	3/8	5 1/2
	77	10 5/8	10 1/4	7/8	9/16	5/16	4 7/8	7 7/8	1 3/8	14 3/4	3	3/8	5 1/2
	72	10 1/2	10 1/8	13/16	1/2	1/4	4 7/8	7 7/8	1 5/16	14 5/8	2 3/4	5/16	5 1/2
	66	10 3/8	10 1/8	3/4	7/16	1/4	4 7/8	7 7/8	1 1/4	14 1/2	2 3/4	5/16	5 1/2
	60	10 1/4	10 1/8	11/16	7/16	1/4	4 7/8	7 7/8	1 3/16	14 3/8	2 1/2	5/16	5 1/2
	54	10 1/8	10	5/8	3/8	3/16	4 7/8	7 7/8	1 1/8	14 1/4	2 1/2	1/4	5 1/2
	49	10	10	9/16	3/8	3/16	4 7/8	7 7/8	1 1/16	14 1/8	2 1/2	1/4	5 1/2
10″ WF CB 102 10 x 8 R=.50	45	10 1/8	8	5/8	3/8	3/16	3 7/8	7 7/8	1 1/8	13	2 1/2	1/4	5 1/2
	39	10	8	1/2	5/16	3/16	3 7/8	7 7/8	1 1/16	12 7/8	2 1/2	1/4	5 1/2
	33	9 3/4	8	7/16	5/16	3/16	3 7/8	7 7/8	15/16	12 5/8	2 1/2	1/4	5 1/2
10″ WF CB 101 10 x 5 3/4 R=.32	29	10 1/4	5 3/4	1/2	5/16	3/16	2 3/4	8 1/2	7/8	11 3/4	2 1/4	1/4	2 3/4
	25	10 1/8	5 3/4	7/16	1/4	1/8	2 3/4	8 1/2	13/16	11 5/8	2 1/4	3/16	2 3/4
	21	9 7/8	5 3/4	5/16	1/4	1/8	2 3/4	8 1/2	11/16	11 1/2	2 1/4	3/16	2 3/4
8″ WF CB 83 8 x 8 R=.40	67	9	8 1/4	15/16	9/16	5/16	3 7/8	6 3/8	1 5/16	12 1/4	3	3/8	5 1/2
	58	8 3/4	8 1/4	13/16	1/2	1/4	3 7/8	6 3/8	1 3/16	12	2 3/4	5/16	5 1/2
	48	8 1/2	8 1/8	11/16	7/16	3/16	3 7/8	6 3/8	1 1/16	11 7/8	2 3/4	1/4	5 1/2
	40	8 1/4	8 1/8	9/16	3/8	3/16	3 7/8	6 3/8	15/16	11 5/8	2 1/2	1/4	5 1/2
	35	8 1/8	8	1/2	5/16	3/16	3 7/8	6 3/8	7/8	11 1/2	2 1/4	1/4	5 1/2
	31	8	8	7/16	5/16	3/16	3 7/8	6 3/8	13/16	11 3/8	2 1/4	1/4	5 1/2
8″ WF CB 82 8 x 6 1/2 R=.40	28	8	6 1/2	7/16	5/16	1/8	3 1/8	6 3/8	13/16	10 1/2	2 1/4	3/16	3 1/2
	24	7 7/8	6 1/2	3/8	1/4	1/8	3 1/8	6 3/8	13/16	10 1/4	2 1/4	3/16	3 1/2
8″ WF CB 81 8 x 5 1/4 R=.32	20	8 1/8	5 1/4	3/8	1/4	1/8	2 1/2	6 3/4	11/16	9 3/4	2 1/4	3/16	2 3/4
	17	8	5 1/4	5/16	1/4	1/8	2 1/2	6 3/4	5/8	9 5/8	2	3/16	2 3/4

Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).

WIDE FLANGE
LIGHT BEAMS, STANCHIONS AND JOISTS
PROPERTIES FOR DESIGNING



Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
LIGHT BEAMS													
CBL 16	**P. C.**	**31.0**	**9.12**	**15.84**	**5.525**	**.442**	**.275**	**372.5**	**47.0**	**6.39**	**11.57**	**4.19**	**1.13**
16 x 5½	**P. C.**	**26.0**	**7.65**	**15.65**	**5.500**	**.345**	**.250**	**298.1**	**38.1**	**6.24**	**8.71**	**3.17**	**1.07**
R=.43													
CBL 14	**P. C.**	**26.0**	**7.65**	**13.89**	**5.025**	**.418**	**.255**	**242.6**	**34.9**	**5.63**	**8.26**	**3.29**	**1.04**
14 x 5	**P. C.**	**22.0**	**6.47**	**13.72**	**5.000**	**.335**	**.230**	**197.4**	**28.8**	**5.52**	**6.40**	**2.56**	**0.99**
R=.43													
CBL 12	P. C.	22.0	6.47	12.31	4.030	.424	.260	155.7	25.3	4.91	4.55	2.26	0.84
★12 x 4	P. C.	19.0	5.62	12.16	4.010	.349	.240	130.1	21.4	4.81	3.67	1.83	0.81
R=.30	P. C.	16.5	4.86	12.00	4.000	.269	.230	105.3	17.5	4.65	2.79	1.39	0.76
CBL 10	P. C.	19.0	5.61	10.25	4.020	.394	.250	96.2	18.8	4.14	4.19	2.08	0.86
10 x 4	P. C.	17.0	4.98	10.12	4.010	.329	.240	81.8	16.2	4.05	3.45	1.72	0.83
R=.30	P. C.	15.0	4.40	10.00	4.000	.269	.230	68.8	13.8	3.95	2.79	1.39	0.80
CBL 8													
CBL 8A*	C.	15.0	4.43	8.12	4.015	.314	.245	48.0	11.8	3.29	3.30	1.65	0.86
8 x 4	P.	13.0	3.83	8.00	4.000	.254	.230	39.5	9.88	3.21	2.62	1.31	0.83
R=.30													
CBL 6													
CBL 6A*	C.	16.0	4.72	6.25	4.030	.404	.260	31.7	10.1	2.59	4.32	2.14	0.96
6 x 4	P.	12.0	3.53	6.00	4.000	.279	.230	21.7	7.24	2.48	2.89	1.44	0.90
R=.25													

*These sections as produced in the Pittsburgh District have a flange slope of 3° and the flange thickness shown is the average thickness.

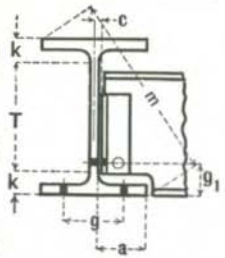
STANCHIONS

CBS 6	P. C.	25.0	7.37	6.37	6.080	.456	.320	53.5	16.8	2.69	17.1	5.6	1.52
6 x 6	P. C.	20.0	5.90	6.20	6.018	.367	.258	41.7	13.4	2.66	13.3	4.4	1.50
R=.25	P. C.	15.5	4.62	6.00	6.000	.269	.240	30.3	10.1	2.56	9.69	3.2	1.45
CB 51	P.	18.5	5.45	5.12	5.025	.420	.265	25.4	9.94	2.16	8.89	3.5	1.28
5 x 5	P.	16.0	4.70	5.00	5.000	.360	.240	21.3	8.53	2.13	7.51	3.0	1.26
R=.3													

JOISTS

CBJ 12													
12 x 4	P. C.	14.0	4.14	11.91	3.970	.224	.200	88.2	14.8	4.61	2.25	1.13	0.74
R=.30													
CBJ 10													
10 x 4	P. C.	11.5	3.39	9.87	3.950	.204	.180	51.9	10.5	3.92	2.01	1.02	0.77
R=.30													
CBJ 8													
8 x 4	P. C.	10.0	2.95	7.90	3.940	.204	.170	30.8	7.79	3.23	1.99	1.01	0.82
R=.30													
CBJ 6													
6 x 4	P. C.	8.5	2.50	5.83	3.940	.194	.170	14.8	5.07	2.43	1.89	0.96	0.87
R=.25													

Bold face type is data for new, lighter sections.
For key to letters in second column and star ★ in first column, refer to page 3.
R=radius of fillet (inches).



WIDE FLANGE
LIGHT BEAMS, STANCHIONS AND JOISTS
DIMENSIONS FOR DETAILING

Section Index and Nominal Size	Weight per Foot	Depth of Section	Flange		Web		Distance						Usual Gage g
			Width	Thickness	Thickness	Half Thickness	a	T	k	m	Min. g_1	Clear. c	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
LIGHT BEAMS													
CBL 16													
16 x 5½	**31.0**	**15⅞**	**5½**	**7/16**	**¼**	**⅛**	**2⅜**	**14**	**1 5/16**	**16¾**	**2½**	**3/16**	**2¾**
R=.43	**26.0**	**15⅝**	**5½**	**⅜**	**¼**	**⅛**	**2⅜**	**14**	**1 3/16**	**16⅝**	**2½**	**3/16**	**2¾**
CBL 14													
14 x 5	**26.0**	**13⅞**	**5**	**7/16**	**¼**	**⅛**	**2⅜**	**12⅛**	**⅞**	**14¾**	**2¼**	**3/16**	**2¾**
R=.43	**22.0**	**13¾**	**5**	**5/16**	**¼**	**⅛**	**2⅜**	**12⅛**	**1 3/16**	**14⅝**	**2¼**	**3/16**	**2¾**
CBL 12	22.0	12¼	4	7/16	¼	⅛	1⅞	10¾	¾	13	2¼	3/16	2¼
12 x 4	19.0	12⅛	4	⅜	¼	⅛	1⅞	10¾	11/16	12¾	2¼	3/16	2¼
R=.30	16.5	12	4	¼	¼	⅛	1⅞	10¾	⅝	12⅝	2	3/16	2¼
CBL 10	19.0	10¼	4	⅜	¼	⅛	1⅞	8⅞	11/16	11	2¼	3/16	2¼
10 x 4	17.0	10⅛	4	5/16	¼	⅛	1⅞	8⅞	⅝	10⅞	2	3/16	2¼
R=.30	15.0	10	4	¼	¼	⅛	1⅞	8⅞	9/16	10¾	2	3/16	2¼
CBL 8													
CBL 8A*	15.0	8⅛	4	5/16	¼	⅛	1⅞	6⅞	⅝	9	2	3/16	2¼
8 x 4	13.0	8	4	¼	¼	⅛	1⅞	6⅞	9/16	9	2	3/16	2¼
R=.30													
CBL 6													
CBL 6A*	16.0	6¼	4	⅜	¼	⅛	1⅞	4⅞	11/16	7⅜	2¼	3/16	2¼
6 x 4	12.0	6	4	¼	¼	⅛	1⅞	4⅞	9/16	7¼	2	3/16	2¼
R=.25													

*These sections as produced in the Pittsburgh District have a flange slope of 3° and the flange thickness shown is the average thickness.

STANCHIONS													
CBS 6	25.0	6⅜	6	½	5/16	3/16	2⅞	4⅞	¾	8⅞	2¼	¼	3½
6 x 6	20.0	6¼	6	⅜	¼	3/16	2⅞	4⅞	11/16	8⅝	2¼	3/16	3½
R=.25	15.5	6	6	¼	¼	⅛	2⅞	4⅞	9/16	8½	2	3/16	3½
CB 51													
5 x 5	18.5	5⅛	5	7/16	¼	⅛	2⅜	3 11/16	11/16	7⅛	2¼	3/16	2¾
R=.3	16.0	5	5	⅜	¼	⅛	2⅜	3 11/16	⅝	7	2¼	3/16	2¾
JOISTS													
CBJ 12													
12 x 4	14.0	11⅞	4	¼	3/16	⅛	1⅞	10¾	9/16	12½	2	3/16	2¼
R=.30													
CBJ 10													
10 x 4	11.5	9⅞	4	3/16	3/16	⅛	1⅞	8⅞	½	10⅝	2	3/16	2¼
R=.30													
CBJ 8													
8 x 4	10.0	7⅞	4	3/16	3/16	⅛	1⅞	6⅞	½	8⅞	2	3/16	2¼
R=.30													
CBJ 6													
6 x 4	8.5	5⅞	4	3/16	3/16	⅛	1⅞	5	7/16	7	2	3/16	2¼
R=.25													

Gages g_1 are based on 1¼" edge distance (1" maximum rivet).

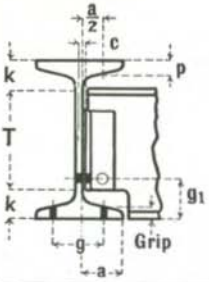
BEAMS

AMERICAN STANDARD

PROPERTIES FOR DESIGNING

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Beam	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2		
								I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
24″ I													
B 18	P.	120.0	35.13	24	8.048	1.102	.798	3010.8	250.9	9.26	84.9	21.1	1.56
24 x 7⅞	P.	105.9	30.98		7.875	1.102	.625	2811.5	234.3	9.53	78.9	20.0	1.60
R=.60													
24″ I													
B 1	P.	100.0	29.25		7.247	.871	.747	2371.8	197.6	9.05	48.4	13.4	1.29
24 x 7	P.	90.0	26.30	24	7.124	.871	.624	2230.1	185.8	9.21	45.5	12.8	1.32
R=.60	P.	79.9	23.33		7.000	.871	.500	2087.2	173.9	9.46	42.9	12.2	1.36
20″ I													
B 2	P.	95.0	27.74	20	7.200	.916	.800	1599.7	160.0	7.59	50.5	14.0	1.35
20 x 7	P.	85.0	24.80		7.053	.916	.653	1501.7	150.2	7.78	47.0	13.3	1.38
R=.70													
20″ I													
B 3	P.	75.0	21.90	20	6.391	.789	.641	1263.5	126.3	7.60	30.1	9.4	1.17
20 x 6¼	P.	65.4	19.08		6.250	.789	.500	1169.5	116.9	7.83	27.9	8.9	1.21
R=.60													
18″ I													
B 4	P. B.	70.0	20.46	18	6.251	.691	.711	917.5	101.9	6.70	24.5	7.8	1.09
18 x 6	P. B.	54.7	15.94		6.000	.691	.460	795.5	88.4	7.07	21.2	7.1	1.15
R=.56													
15″ I													
B 7	P.C.B.G.	50.0	14.59	15	5.640	.622	.550	481.1	64.2	5.74	16.0	5.7	1.05
15 x 5½	P.C.B.G.	42.9	12.49		5.500	.622	.410	441.8	58.9	5.95	14.6	5.3	1.08
R=.51													
12″ I													
B 8	P.	50.0	14.57	12	5.477	.659	.687	301.6	50.3	4.55	16.0	5.8	1.05
★ 12 x 5¼	P.	40.8	11.84		5.250	.659	.460	268.9	44.8	4.77	13.8	5.3	1.08
R=.56													
12″ I													
B 9	P.C.B.G.	35.0	10.20	12	5.078	.544	.428	227.0	37.8	4.72	10.0	3.9	0.99
★ 12 x 5	P.C.B.G.	31.8	9.26		5.000	.544	.350	215.8	36.0	4.83	9.5	3.8	1.01
R=.45													
10″ I													
B 10	P.C.B.G.	35.0	10.22	10	4.944	.491	.594	145.8	29.2	3.78	8.5	3.4	0.91
★ 10 x 4⅝	P.C.B.G.	25.4	7.38		4.660	.491	.310	122.1	24.4	4.07	6.9	3.0	0.97
R=.41													
8″ I													
B 12	P.C.B.G.S.	23.0	6.71	8	4.171	.425	.441	64.2	16.0	3.09	4.4	2.1	0.81
★ 8 x 4	P.C.B.G.S.	18.4	5.34		4.000	.425	.270	56.9	14.2	3.26	3.8	1.9	0.84
R=.37													
7″ I													
B 13	P.C.	20.0	5.83	7	3.860	.392	.450	41.9	12.0	2.68	3.1	1.6	0.74
★ 7 x 3⅝	P.C.	15.3	4.43		3.660	.392	.250	36.2	10.4	2.86	2.7	1.5	0.78
R=.35													

For key to letters in second column and star ★ in first column refer to page 3.
R=radius of fillet (inches).



BEAMS

AMERICAN STANDARD

DIMENSIONS FOR DETAILING

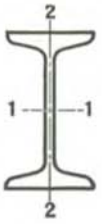
Section Index and Depth	Weight per Foot	Flange		Web		Distance							Max. Flange Rivet
		Width	Thickness, p	Thickness	Half Thickness	a	T	k	Min. g_1	Clear. c	Gage g	Grip	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
24″ I B 18 R=.60	120.0	8	1 1/8	13/16	7/16	3 5/8	20 1/8	1 15/16	3 1/4	1/2	4	1 1/8	1
	105.9	7 7/8	1 1/8	5/8	5/16	3 5/8	20 1/8	1 15/16	3 1/4	3/8	4	1 1/8	1
24″ I B 1 R=.60	100.0	7 1/4	7/8	3/4	3/8	3 1/4	20 3/4	1 5/8	3	7/16	4	7/8	1
	90.0	7 1/8	7/8	5/8	5/16	3 1/4	20 3/4	1 5/8	3	3/8	4	7/8	1
	79.9	7	7/8	1/2	1/4	3 1/4	20 3/4	1 5/8	3	5/16	4	7/8	1
20″ I B 2 R=.70	95.0	7 1/4	15/16	13/16	7/16	3 1/4	16 1/2	1 3/4	3	1/2	4	15/16	1
	85.0	7	15/16	11/16	5/16	3 1/4	16 1/2	1 3/4	3	3/8	4	7/8	1
20″ I B 3 R=.60	75.0	6 3/8	13/16	5/8	5/16	2 7/8	16 7/8	1 9/16	2 3/4	3/8	3 1/2	13/16	7/8
	65.4	6 1/4	13/16	1/2	1/4	2 7/8	16 7/8	1 9/16	2 3/4	5/16	3 1/2	3/4	7/8
18″ I B 4 R=.56	70.0	6 1/4	11/16	3/4	3/8	2 3/4	15 1/4	1 3/8	2 3/4	7/16	3 1/2	11/16	7/8
	54.7	6	11/16	1/2	1/4	2 3/4	15 1/4	1 3/8	2 3/4	5/16	3 1/2	11/16	7/8
15″ I B 7 R=.51	50.0	5 5/8	5/8	9/16	5/16	2 1/2	12 1/2	1 1/4	2 1/2	3/8	3 1/2	9/16	3/4
	42.9	5 1/2	5/8	7/16	1/4	2 1/2	12 1/2	1 1/4	2 1/2	5/16	3 1/2	9/16	3/4
12″ I B 8 R=.56	50.0	5 1/2	11/16	11/16	3/8	2 3/8	9 3/8	1 5/16	2 3/4	7/16	3	11/16	3/4
	40.8	5 1/4	11/16	1/2	1/4	2 3/8	9 3/8	1 5/16	2 3/4	5/16	3	5/8	3/4
12″ I B 9 R=.45	35.0	5 1/8	9/16	7/16	1/4	2 3/8	9 3/4	1 1/8	2 1/2	5/16	3	1/2	3/4
	31.8	5	9/16	3/8	3/16	2 3/8	9 3/4	1 1/8	2 1/2	1/4	3	1/2	3/4
10″ I B 10 R=.41	35.0	5	1/2	5/8	5/16	2 1/8	8	1	2 1/2	3/8	2 3/4	1/2	3/4
	25.4	4 5/8	1/2	5/16	3/16	2 1/8	8	1	2 1/2	1/4	2 3/4	1/2	3/4
8″ I B 12 R=.37	23.0	4 1/8	7/16	7/16	1/4	1 7/8	6 1/4	7/8	2 1/4	5/16	2 1/4	7/16	3/4
	18.4	4	7/16	5/16	1/8	1 7/8	6 1/4	7/8	2 1/4	3/16	2 1/4	7/16	3/4
7″ I B 13 R=.35	20.0	3 7/8	3/8	7/16	1/4	1 3/4	5 3/8	13/16	2 1/4	5/16	2 1/4	3/8	5/8
	15.3	3 5/8	3/8	1/4	1/8	1 3/4	5 3/8	13/16	2 1/4	3/16	2 1/4	3/8	5/8

Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).

BEAMS

AMERICAN STANDARD

PROPERTIES FOR DESIGNING

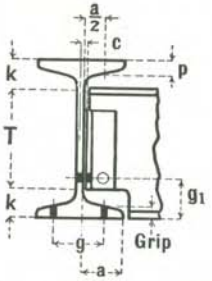


Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Beam	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2		
								I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
6″ I													
★ B 14	P.C.B.G.S.	17.25	5.02	6	3.565	.359	.465	26.0	8.7	2.28	2.3	1.3	0.68
6 x 3⅜	P.C.B.G.S.	12.5	3.61		3.330	.359	.230	21.8	7.3	2.46	1.8	1.1	0.72
R=.33													
5″ I													
B 15	P.C.	14.75	4.29	5	3.284	.326	.494	15.0	6.0	1.87	1.7	1.0	0.63
5 x 3	P.C.	10.0	2.87		3.000	.326	.210	12.1	4.8	2.05	1.2	0.82	0.65
R=.31													
4″ I													
B 16	P.C.B.G.	9.5	2.76	4	2.796	.293	.326	6.7	3.3	1.56	0.91	0.65	0.58
4 x 2⅝	P.C.B.G.	7.7	2.21		2.660	.293	.190	6.0	3.0	1.64	0.77	0.58	0.59
R=.29													
3″ I													
B 17	P. C. B.	7.5	2.17	3	2.509	.260	.349	2.9	1.9	1.15	0.59	0.47	0.52
3 x 2⅜	P.C.B.G.S.	5.7	1.64		2.330	.260	.170	2.5	1.7	1.23	0.46	0.40	0.53
R=.27													

H-BEAMS

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Beam	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2		
								I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
H 4													
8 x 8	P.G.	34.3	10.09	8	8.000	.459	.375	115.5	28.9	3.40	35.1	8.8	1.87
R=.313													
H 3a													
6 x 6	P.G.S.	25.0	7.35	6	5.938	.481	.313	47.0	15.7	2.53	14.9	5.0	1.43
R=.313													
H 3													
6 x 6	P.B.G.S.	20.0	5.88	6	5.938	.380	.250	38.8	12.9	2.57	11.4	3.8	1.39
R=.313													
H 2													
5 x 5	P.C.	18.9	5.56	5	5.000	.417	.313	23.8	9.5	2.08	7.85	3.1	1.20
R=.313													
H 1													
4 x 4	P.C.B.G.S.	13.0	3.82	4	3.937	.372	.250	10.4	5.2	1.65	3.39	1.7	.94
R=.313													

For key to letters in second column and star ★ in first column refer to page 3.
R=radius of fillet (inches).



BEAMS

AMERICAN STANDARD

DIMENSIONS FOR DETAILING

I

Section Index and Depth	Weight per Foot	Flange		Web		Distance							Max. Flange Rivet
		Width	Thickness, p	Thickness	Half Thickness	a	T	k	Min. g_1	Clear. c	Gage g	Grip	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
6″ I	17.25	3 5/8	3/8	1/2	1/4	1 1/2	4 1/2	3/4	2	5/16	2	3/8	5/8
B 14	12.5	3 3/8	3/8	1/4	1/8	1 1/2	4 1/2	3/4	2	3/16	2	5/16	5/8
R=.33													
5″ I	14.75	3 1/4	5/16	1/2	1/4	1 3/8	3 5/8	11/16	2	5/16	1 3/4	5/16	1/2
B 15	10.0	3	5/16	1/4	1/8	1 3/8	3 5/8	11/16	2	3/16	1 3/4	5/16	1/2
R=.31													
4″ I	9.5	2 3/4	5/16	5/16	3/16	1 1/4	2 3/4	5/8	2	1/4	1 1/2	5/16	1/2
B 16	7.7	2 5/8	5/16	3/16	1/8	1 1/4	2 3/4	5/8	2	3/16	1 1/2	5/16	1/2
R=.29													
3″ I	7.5	2 1/2	1/4	3/8	3/16	1 1/8	1 7/8	9/16	.....	1/4	1 1/2	1/4	3/8
B 17	5.7	2 3/8	1/4	3/16	1/8	1 1/8	1 7/8	9/16	.....	3/16	1 1/2	1/4	3/8
R=.27													

H-BEAMS

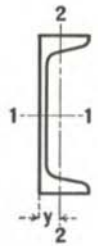
Section Index and Depth	Weight per Foot	Flange		Web		Distance						Max. Flange Rivet
		Width	Thickness, p.	Thickness	Half Thickness	a	T	k	Min. g_1	Gage g	Grip	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
H 4												
8	34.3	8	7/16	3/8	3/16	3 13/16	6 1/4	7/8	2 1/4	5 1/2	7/16	7/8
R=.313												
H 3a												
6	25.0	6	1/2	5/16	3/16	2 13/16	4 1/4	7/8	2 1/4	3 1/2	1/2	7/8
R=.313												
H 3												
6	20.0	6	3/8	1/4	1/8	2 7/8	4 3/8	3/16	2 1/4	3 1/2	3/8	7/8
R=.313												
H 2												
5	18.9	5	7/16	5/16	3/16	2 3/8	3 3/8	13/16	2	2 3/4	7/16	7/8
R=.313												
H 1												
4	13.0	4	3/8	1/4	1/8	1 7/8	2 1/2	3/4	2	2 1/4	3/8	3/4
R=.313												

Gages g_1 are based on 1 1/4″ edge distance (1″ maximum rivet).

CHANNELS

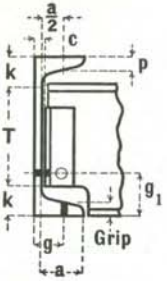
AMERICAN STANDARD

PROPERTIES FOR DESIGNING



Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Channel	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2			
								I	S	r	I	S	r	y
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.	In.
C 60†	P. C.	58.0	16.98	18	4.200	.625	.700	670.7	74.5	6.29	18.5	5.6	1.04	0.88
18 x 4	P. C.	51.9	15.18		4.100	.625	.600	622.1	69.1	6.40	17.1	5.3	1.06	0.87
R=.625	P. C.	45.8	13.38		4.000	625	.500	573.5	63.7	6.55	15.8	5.1	1.09	0.89
	P. C.	42.7	12.48		3.950	.625	.450	549.2	61.0	6.64	15.0	4.9	1.10	0.90
★ C 1	P.C.B.G.	50.0	14.64	15	3.716	.650	.716	401.4	53.6	5.24	11.2	3.8	0.87	0.80
15 x 3⅜	P.C.B.G.	40.0	11.70		3.520	.650	.520	346.3	46.2	5.44	9.3	3.4	0.89	0.78
R=.50	P.C.B.G.	33.9	9.90		3.400	.650	.400	312.6	41.7	5.62	8.2	3.2	0.91	0.79
★ C 2	P.C.B.G.S.	30.0	8.79	12	3.170	.501	.510	161.2	26.9	4.28	5.2	2.1	0.77	0.68
12 x 3	P.C.B.G.S.	25.0	7.32		3.047	.501	.387	143.5	23.9	4.43	4.5	1.9	0.79	0.68
R=.38	P.C.B.G.S.	20.7	6.03		2.940	.501	.280	128.1	21.4	4.61	3.9	1.7	0.81	0.70
★ C 3	P.C.B.G.S.	30.0	8.80	10	3.033	.436	.673	103.0	20.6	3.42	4.0	1.7	0.67	0.65
10 x 2⅝	P.C.B.G.S.	25.0	7.33		2.886	.436	.526	90.7	18.1	3.52	3.4	1.5	0.68	0.62
R=.34	P.C.B.G.S.	20.0	5.86		2.739	.436	.379	78.5	15.7	3.66	2.8	1.3	0.70	0.61
	P.C.B.G.S.	15.3	4.47		2.600	.436	.240	66.9	13.4	3.87	2.3	1.2	0.72	0.64
★ C 4	P. C. B. G.	20.0	5.86	9	2.648	.413	.448	60.6	13.5	3.22	2.4	1.2	0.65	0.59
9 x 2½	P. C. B. G.	15.0	4.39		2.485	.413	.285	50.7	11.3	3.40	1.9	1.0	0.67	0.59
R=.33	P. C. B. G.	13.4	3.89		2.430	.413	.230	47.3	10.5	3.49	1.8	0.97	0.67	0.61
★ C 5	P.C.B.G.	18.75	5.49	8	2.527	.390	.487	43.7	10.9	2.82	2.00	1.00	0.60	0.57
8 x 2¼	P.C.B.G.S.	13.75	4.02		2.343	.390	.303	35.8	9.0	2.99	1.50	0.86	0.62	0.56
R=.32	P.C.B.G.S.	11.50	3.36		2.260	.390	.220	32.3	8.1	3.10	1.30	0.79	0.63	0.58
★ C 6	P.C.B.G.S.	14.75	4.32	7	2.299	.366	.419	27.1	7.7	2.51	1.40	0.79	0.57	0.53
7 x 2⅛	P.C.B.G.S.	12.25	3.58		2.194	.366	.314	24.1	6.9	2.59	1.20	0.71	0.58	0.53
R=.31	P.C.B.G.S.	9.80	2.85		2.090	.366	.210	21.1	6.0	2.72	0.98	0.63	0.59	0.55
★ C 7	P.C.B.G.S.	13.00	3.81	6	2.157	.343	.437	17.3	5.8	2.13	1.10	0.65	0.53	0.52
6 x 2	P.C.B.G.S.	10.50	3.07		2.034	.343	.314	15.1	5.0	2.22	0.87	0.57	0.53	0.50
R=.30	P.C.B.G.S.	8.20	2.39		1.920	.343	.200	13.0	4.3	2.34	0.70	0.50	0.54	0.52
C 8	P.C.B.G.S.	9.00	2.63	5	1.885	.320	.325	8.8	3.5	1.83	0.64	0.45	0.49	0.48
5 x 1¾	P.C.B.G.S.	6.70	1.95		1.750	.320	.190	7.4	3.0	1.95	0.48	0.38	0.50	0.49
R=.29														
C 9	P.C.B.G.S.	7.25	2.12	4	1.720	.296	.320	4.5	2.3	1.47	0.44	0.35	0.46	0.46
4 x 1⅝	P.C.B.G.S.	5.40	1.56		1.580	.296	.180	3.8	1.9	1.56	0.32	0.29	0.45	0.46
R=.28														
C 10	P.C.B.	6.00	1.75	3	1.596	.273	.356	2.1	1.4	1.08	0.31	0.27	0.42	0.46
3 x 1½	P.C.B.G.S.	5.00	1.46		1.498	.273	.258	1.8	1.2	1.12	0.25	0.24	0.41	0.44
R=.27	P.C.B.G.S.	4.10	1.19		1.410	.273	.170	1.6	1.1	1.17	0.20	0.21	0.41	0.44

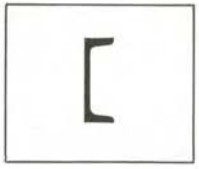
†For key to symbols in second column and star ★ in first column refer to page 3. C 60 is not an American standard channel.
R=radius of fillet (inches).



CHANNELS

AMERICAN STANDARD

DIMENSIONS FOR DETAILING



[STD

Section Index and Depth	Weight per Foot	Flange		Web		Distance							Max. Flange Rivet
		Width	Thickness, p	Thickness	Half Thickness	a	T	k	Min. g_1	Clear. c	Gage g	Grip	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
C 60†	58.0	4 1/4	5/8	11/16	3/8	3 1/2	15 3/8	1 5/16	2 1/2	3/4	2 1/2	5/8	1
18	51.9	4 1/8	5/8	5/8	5/16	3 1/2	15 3/8	1 5/16	2 1/2	11/16	2 1/2	5/8	1
R=.625	45.8	4	5/8	1/2	1/4	3 1/2	15 3/8	1 5/16	2 1/2	9/16	2 1/2	5/8	1
	42.7	4	5/8	7/16	1/4	3 1/2	15 3/8	1 5/16	2 1/2	1/2	2 1/2	5/8	1
C 1	50.0	3 3/4	5/8	3/4	3/8	3	12 3/8	1 5/16	2 1/2	13/16	2 1/4	5/8	1
15	40.0	3 1/2	5/8	9/16	1/4	3	12 3/8	1 5/16	2 1/2	5/8	2	5/8	1
R=.50	33.9	3 3/8	5/8	7/16	3/16	3	12 3/8	1 5/16	2 1/2	1/2	2	5/8	1
C 2	30.0	3 1/8	1/2	1/2	1/4	2 5/8	9 7/8	1 1/16	2 1/2	9/16	1 3/4	1/2	7/8
12	25.0	3	1/2	3/8	3/16	2 5/8	9 7/8	1 1/16	2 1/2	7/16	1 3/4	1/2	7/8
R=.38	20.7	3	1/2	5/16	1/8	2 5/8	9 7/8	1 1/16	2 1/2	3/8	1 3/4	1/2	7/8
	30.0	3	7/16	11/16	3/8	2 3/8	8 1/8	15/16	2 1/2	3/4	1 3/4	7/16	3/4
C 3	25.0	2 7/8	7/16	9/16	1/4	2 3/8	8 1/8	15/16	2 1/2	5/8	1 3/4	7/16	3/4
10	20.0	2 3/4	7/16	3/8	3/16	2 3/8	8 1/8	15/16	2 1/2	7/16	1 1/2	7/16	3/4
R=.34	15.3	2 5/8	7/16	1/4	1/8	2 3/8	8 1/8	15/16	2 1/2	5/16	1 1/2	7/16	3/4
C 4	20.0	2 5/8	7/16	7/16	1/4	2 1/4	7 1/4	7/8	2 1/4	1/2	1 1/2	7/16	3/4
9	15.0	2 1/2	7/16	5/16	3/16	2 1/4	7 1/4	7/8	2 1/4	3/8	1 3/8	7/16	3/4
R=.33	13.4	2 3/8	7/16	1/4	1/8	2 1/4	7 1/4	7/8	2 1/4	5/16	1 3/8	3/8	3/4
C 5	18.75	2 1/2	3/8	1/2	1/4	2	6 3/8	13/16	2 1/4	9/16	1 1/2	3/8	3/4
8	13.75	2 3/8	3/8	5/16	3/16	2	6 3/8	13/16	2 1/4	3/8	1 3/8	3/8	3/4
R=.32	11.5	2 1/4	3/8	1/4	1/8	2	6 3/8	13/16	2 1/4	5/16	1 3/8	3/8	3/4
C 6	14.75	2 1/4	3/8	7/16	1/4	1 7/8	5 3/8	13/16	2 1/4	1/2	1 1/4	3/8	5/8
7	12.25	2 1/4	3/8	5/16	3/16	1 7/8	5 3/8	13/16	2 1/4	3/8	1 1/4	3/8	5/8
R=.31	9.8	2 1/8	3/8	1/4	1/8	1 7/8	5 3/8	13/16	2 1/4	5/16	1 1/4	3/8	5/8
C 7	13.0	2 1/8	3/8	7/16	1/4	1 3/4	4 1/2	3/4	2 1/4	1/2	1 3/8	5/16	5/8
6	10.5	2	3/8	5/16	3/16	1 3/4	4 1/2	3/4	2 1/4	3/8	1 1/8	3/8	5/8
R=.30	8.2	1 7/8	3/8	3/16	1/8	1 3/4	4 1/2	3/4	2 1/4	1/4	1 1/8	5/16	5/8
C 8	9.0	1 7/8	5/16	5/16	3/16	1 1/2	3 5/8	11/16	2	3/8	1 1/8	5/16	5/8
5	6.7	1 3/4	5/16	3/16	1/8	1 1/2	3 5/8	11/16	2	1/4	1 1/8	5/16	1/2
R=.29													
C 9	7.25	1 3/4	5/16	5/16	3/16	1 3/8	2 3/4	5/8	2	3/8	1	5/16	5/8
4	5.4	1 5/8	5/16	3/16	1/8	1 3/8	2 3/4	5/8	2	1/4	1	1/4	1/2
R=.28													
C 10	6.0	1 5/8	1/4	3/8	3/16	1 1/4	1 3/4	5/8	.....	7/16	7/8	5/16	1/2
3	5.0	1 1/2	1/4	1/4	1/8	1 1/4	1 3/4	5/8	.....	5/16	7/8	1/4	1/2
R=.27	4.1	1 3/8	1/4	3/16	1/8	1 1/4	1 3/4	5/8	.....	1/4	7/8	1/4	1/2

Gages g_1 are based on 1 1/4" edge distance (1" maximum rivet).
†C 60 is not an American standard channel.

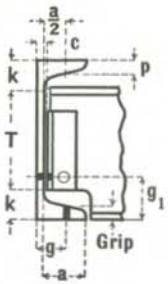
CHANNELS

CAR BUILDING AND SHIPBUILDING

PROPERTIES FOR DESIGNING

Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Channel	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2			
								I	S	r	I	S	r	y
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.	In.
C 60	P. C.	58.0	16.98	18	4.200	.625	.700	670.7	74.5	6.29	18.5	5.6	1.04	0.88
18 x 4	P. C.	51.9	15.18		4.100	.625	.600	622.1	69.1	6.40	17.1	5.3	1.06	0.87
R=.625	P. C.	45.8	13.38		4.000	.625	.500	573.5	63.7	6.55	15.8	5.1	1.09	0.89
	P. C.	42.7	12.48		3.950	.625	.450	549.2	61.0	6.64	15.0	4.9	1.10	0.90
C 20	P.C.G.	50.0	14.66	13	4.412	.610	787	312.9	48.1	4.62	16.7	4.9	1.07	0.98
13 x 4	P.C.G.	40.0	11.71		4.185	.610	.560	271.4	41.7	4.82	13.9	4.3	1.09	0.97
R=.48	P.C.G.	35.0	10.24		4.072	.610	.447	250.7	38.6	4.95	12.5	4.0	1.10	0.99
	P.C.G.	31.8	9.30		4.000	.610	.375	237.5	36.5	5.05	11.6	3.9	1.11	1.01
C 170	P.C.B.G.	50.0	14.64	12	4.135	.700	.835	268.1	44.7	4.28	17.8	5.8	1.10	1.06
12 x 4	P.C.B.G.	45.0	13.16		4.012	.700	.712	250.2	41.7	4.36	16.1	5.4	1.11	1.05
R=.50	P.C.B.G.	40.0	11.70		3.890	.700	.590	232.8	38.8	4.46	14.5	5.1	1.12	1.05
	P.C.B.G.	35.0	10.23		3.767	.700	.467	215.1	35.8	4.59	12.9	4.8	1.12	1.07
C 171	P. G.	37.0	10.80	12	3.600	.600	.600	203.4	33.9	4.34	10.3	3.8	0.98	0.89
12 x 3½	P. G.	32.9	9.60		3.500	.600	.500	189.0	31.5	4.44	9.4	3.6	0.99	0.89
R=.60	P. G.	30.9	9.00		3.450	.600	.450	181.8	30.3	4.50	8.9	3.5	0.99	0.90
C 26	P. G.	41.1	12.06	10	4.319	.575	.794	156.3	31.3	3.61	16.4	5.1	1.17	1.11
10 x 4	P. G.	33.6	9.81		4.100	.575	.575	138.0	27.6	3.75	13.7	4.6	1.18	1.11
R=.575	P. G.	28.5	8.31		3.950	.575	.425	125.5	25.1	3.89	11.8	4.2	1.19	1.15
C 27	P. G.	28.3	8.23	10	3.500	.575	.475	116.9	23.4	3.77	8.6	3.4	1.02	0.96
10 x 3½	P. G.	24.9	7.23		3.400	.575	.375	108.6	21.7	3.88	7.6	3.2	1.03	0.98
R=.575														
★ C 28	P.	25.3	7.38	10	3.550	.500	.425	106.0	21.2	3.79	7.9	3.0	1.04	0.94
10 x 3½	P.	21.9	6.38		3.450	.500	.325	97.6	19.5	3.91	7.0	2.8	1.05	0.98
R=.50														
C 32	P. G.	25.4	7.41	9	3.500	.550	.450	87.3	19.4	3.43	8.0	3.2	1.04	1.00
9 x 3½	P. G.	23.9	6.96		3.450	.550	.400	84.3	18.7	3.48	7.5	3.1	1.04	1.01
R=.55														

For key to letters in second column and star ★ in first column refer to page 3.
Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).
R=radius of fillet (inches).



CHANNELS

CAR BUILDING AND SHIP BUILDING

DIMENSIONS FOR DETAILING

Section Index and Depth	Weight per Foot	Flange		Web		Distance							Max. Flange Rivet
		Width	Thickness, p	Thickness	Half Thickness	a	T	k	Min. g_1	Clear. c	Gage g	Grip	
	Lbs.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
C 60	58.0	4 1/4	5/8	11/16	3/8	3 1/2	15 3/8	1 5/16	2 1/2	3/4	2 1/2	5/8	1
18	51.9	4 1/8	5/8	5/8	5/16	3 1/2	15 3/8	1 5/16	2 1/2	11/16	2 1/2	5/8	1
R=.625	45.8	4	5/8	1/2	1/4	3 1/2	15 3/8	1 5/16	2 1/2	9/16	2 1/2	5/8	1
	42.7	4	5/8	7/16	1/4	3 1/2	15 3/8	1 5/16	2 1/2	1/2	2 1/2	5/8	1
C 20	50.0	4 3/8	5/8	13/16	7/16	3 5/8	10 3/8	1 5/16	2 1/2	7/8	2 1/2	5/8	1
13	40.0	4 1/8	5/8	9/16	5/16	3 5/8	10 3/8	1 5/16	2 1/2	5/8	2 1/2	9/16	1
R=.48	35.0	4 1/8	5/8	7/16	1/4	3 5/8	10 3/8	1 5/16	2 1/2	1/2	2 1/2	9/16	1
	31.8	4	5/8	3/8	3/16	3 5/8	10 3/8	1 5/16	2 1/2	7/16	2 1/2	9/16	1
C 170	50.0	4 1/8	11/16	7/8	7/16	3 3/8	9 1/2	1 1/4	2 1/2	15/16	2 1/2	11/16	1
12	45.0	4	11/16	11/16	3/8	3 3/8	9 1/2	1 1/4	2 1/2	3/4	2 1/2	11/16	1
R=.50	40.0	3 7/8	11/16	5/8	5/16	3 3/8	9 1/2	1 1/4	2 1/2	11/16	2 1/2	11/16	1
	35.0	3 3/4	11/16	1/2	1/4	3 3/8	9 1/2	1 1/4	2 1/2	9/16	2 1/2	11/16	1
C 171	37.0	3 5/8	5/8	5/8	5/16	3	9 1/2	1 1/4	2 1/2	11/16	2 1/4	5/8	7/8
12	32.9	3 1/2	5/8	1/2	1/4	3	9 1/2	1 1/4	2 1/2	9/16	2 1/4	9/16	7/8
R=.60	30.9	3 1/2	5/8	7/16	1/4	3	9 1/2	1 1/4	2 1/2	1/2	2 1/4	9/16	7/8
C 26	41.1	4 5/16	9/16	13/16	7/16	3 1/2	7 5/8	1 3/16	2 1/2	7/8	2 1/2	9/16	7/8
10	33.6	4 1/8	9/16	9/16	5/16	3 1/2	7 5/8	1 3/16	2 1/2	5/8	2 1/2	9/16	7/8
R=.575	28.5	4	9/16	7/16	1/4	3 1/2	7 5/8	1 3/16	2 1/2	1/2	2 1/2	9/16	7/8
C 27	28.3	3 1/2	9/16	1/2	1/4	3	7 5/8	1 3/16	2 1/2	9/16	2	9/16	7/8
10	24.9	3 3/8	9/16	3/8	3/16	3	7 5/8	1 3/16	2 1/2	7/16	2	9/16	7/8
R=.575													
C 28	25.3	3 1/2	1/2	7/16	1/4	3 1/8	7 7/8	1 1/16	2 1/2	1/2	2	1/2	7/8
10	21.9	3 1/2	1/2	5/16	3/16	3 1/8	7 7/8	1 1/16	2 1/2	3/8	2	1/2	7/8
R=.50													
C 32	25.4	3 1/2	9/16	7/16	1/4	3	6 3/4	1 1/8	2 1/2	1/2	2	9/16	7/8
9	23.9	3 1/2	9/16	7/16	3/16	3	6 3/4	1 1/8	2 1/2	1/2	2	9/16	7/8
R=.55													

Gages g are usual standard gages, but may be varied if conditions require.
Gages g_1 are based on 1 1/4" edge distance (1" maximum rivet).

CHANNELS

CAR BUILDING AND SHIP BUILDING

PROPERTIES FOR DESIGNING

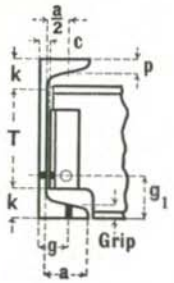
Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Depth of Channel	Width of Flange	Aver. Flange Thickness	Web Thickness	Axis 1-1			Axis 2-2			
								I	S	r	I	S	r	y
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.	In.
C 36 **8 x 3½** R=.525	P.C.G. P.C.G.	22.8 21.4	6.63 6.23	8	3.500 3.450	.525 .525	.425 .375	63.3 61.2	15.8 15.3	3.09 3.13	7.4 6.9	3.0 2.9	1.05 1.05	1.04 1.05
C 37 **8 x 3** R=.50	P.G. P.G.	20.0 18.7	5.83 5.43	8	3.025 2.975	.500 .500	.400 .350	54.0 51.9	13.5 13.0	3.05 3.09	4.7 4.4	2.2 2.1	0.90 0.90	0.86 0.88
C 41 **7 x 3½** R=.50	P. P.	22.7 19.1	6.60 5.55	7	3.600 3.450	.500 .500	.500 .350	47.1 42.8	13.5 12.2	2.67 2.78	7.5 6.3	3.0 2.7	1.07 1.07	1.07 1.11
C 42 **7 x 3** R=.475	P.	17.6	5.12	7	3.000	.475	.375	37.3	10.7	2.70	4.2	2.0	0.90	0.90
C 46 **6 x 3½** R=.475	P. G.	18.0	5.22	6	3.500	.475	.375	29.4	9.8	2.38	6.1	2.6	1.08	1.15
C 56 **6 x 3½** R=.385	P. C. G. S.	15.3	4.48	6	3.500	.385	.340	25.3	8.4	2.38	5.1	2.1	1.08	1.08
C 47 **6 x 3** R=.475	P. P.	16.3 15.1	4.75 4.37	6	3.000 2.938	.475 .475	.375 .313	25.8 24.7	8.6 8.2	2.33 2.38	4.0 3.6	1.9 1.8	0.91 0.91	0.95 0.97
C 48 **6 x 2½** R=.375	P.	12.0	3.52	6	2.500	.375	.313	18.6	6.2	2.30	2.0	1.1	0.75	0.72
C 200 **4 x 2½** R=.28	P.	13.8	4.00	4	2.500	.500	.500	8.8	4.4	1.49	2.2	1.4	0.74	0.86
*C 192 *C 193 **3 x 1 15/16** R=.19	P. P. C. P. C.	9.0 7.1	2.64 2.08	3	2.125 1.938	.351 .351	.500 .313	3.1 2.7	2.1 1.8	1.09 1.14	0.97 0.71	0.68 0.56	0.61 0.58	0.71 0.68

*C 193 and C 192 are identical except that C 193 flanges are flared out to 3⅛" at toe of flanges.

For key to letters in second column refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

R=radius of fillet (inches).



CHANNELS

CAR BUILDING AND SHIP BUILDING

DIMENSIONS FOR DETAILING

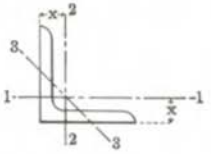
[

Section Index and Depth	Weight per Foot	Flange		Web		Distance							Max. Flange Rivet
		Width	Thick-ness, p	Thick-ness	Half Thick-ness	a	T	k	Min. g_1	Clear. c	Gage g	Grip	
	Lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
C 36													
8	22.8	3½	½	7/16	¼	3⅛	5⅞	1⅛	2¼	½	2	½	⅞
R=.525	21.4	3½	½	⅜	3/16	3⅛	5⅞	1⅛	2¼	7/16	2	½	⅞
C 37													
8	20.0	3	½	7/16	3/16	2⅝	5⅞	1⅛	2¼	½	1¾	½	⅞
R=.50	18.7	3	½	⅜	3/16	2⅝	5⅞	1⅛	2¼	7/16	1¾	½	⅞
C 41													
7	22.7	3⅝	½	½	¼	3⅛	4⅞	1⅛	2¼	9/16	2	½	⅞
R=.50	19.1	3½	½	⅜	3/16	3⅛	4⅞	1⅛	2¼	7/16	2	½	⅞
C 42													
7	17.6	3	½	⅜	3/16	2⅝	5	1	2¼	7/16	1¾	½	⅞
R=.475													
C 46													
6	18.0	3½	½	⅜	3/16	3⅛	4	1	2¼	7/16	2	½	⅞
R=.475													
C 56													
6	15.3	3½	⅜	⅜	3/16	3⅛	4⅜	13/16	2¼	7/16	2	⅜	⅞
R=.385													
C 47													
6	16.3	3	½	⅜	3/16	2⅝	4	1	2¼	7/16	1¾	½	¾
R=.475	15.1	3	½	5/16	3/16	2⅝	4	1	2¼	⅜	1¾	½	¾
C 48													
6	12.0	2½	⅜	5/16	3/16	2⅛	4½	¾	2¼	⅜	1½	⅜	⅝
R=.375													
C 200													
4	13.8	2½	½	½	¼	2	2⅜	13/16	2	9/16	1½	½	⅝
R=.28													
C 192*													
C 193*	9.0	2⅛	⅜	½	¼	1⅝	1⅞	9/16	...	9/16	...	..	..
3	7.1	2	⅜	5/16	3/16	1⅝	1⅞	9/16	...	⅜	...	..	..
R=.19													

Gages g are usual standard gages, but may be varied if conditions require.
Gages g_1 are based on 1¼" edge distance (1" maximum rivet).
*C 193 and C 192 are identical except that C 193 flanges are flared out to 3⅛" at toe of flanges.

EQUAL ANGLES

PROPERTIES FOR DESIGNING



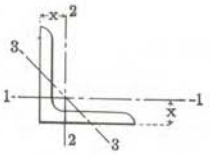
Section Index	District Rolled	Thickness	Weight per Foot	Area of Section	Axis 1-1 and Axis 2-2				Axis 3-3
					I	S	r	x	r min.
		In.	Lbs.	In.²	In.⁴	In.³	In.	In.	In.
A 1 ★ 8 x 8 R=5/8	P.C.B.	1 1/8	56.9	16.73	98.0	17.5	2.42	2.41	1.55
	P.C.B.	1	51.0	15.00	89 0	15.8	2.44	2.37	1.56
	P.C.B.	7/8	45.0	13.23	79.6	14.0	2.45	2.32	1.56
	P.C.B.	3/4	38.9	11.44	69.7	12.2	2.47	2.28	1.57
	P.C.B.	5/8	32.7	9.61	59.4	10.3	2.49	2.23	1.58
	P.C.B.	9/16	29.6	8.68	54.1	9.3	2.50	2.21	1.58
	P.C.B.	1/2	26.4	7.75	48.6	8.4	2.51	2.19	1.58
A 2 ★ 6 x 6 R=1/2	P.C.B.G.S.	1o	37.4	11.00	35.5	8.6	1.80	1.86	1.16
	P.C.B.G.S.	7/8o	33.1	9.73	31.9	7.6	1.81	1.82	1.17
	P.C.B.G.S.	3/4	28.7	8.44	28.2	6.7	1.83	1.78	1.17
	P.C.B.G.S.	5/8	24.2	7.11	24.2	5.7	1.84	1.73	1.17
	P.C.B.G.S.	9/16	21.9	6.43	22.1	5.1	1.85	1.71	1.18
	P.C.B.G.S.	1/2	19.6	5.75	19.9	4.6	1.86	1.68	1.18
	P.C.B.G.S.	7/16	17.2	5.06	17.7	4.1	1.87	1.66	1.19
	P.C.B.G.S.	3/8	14.9	4.36	15.4	3.5	1.88	1.64	1.19
	P.C.G.S.	5/16	12.6	3.66	13.0	3.0	1.89	1.61	1.19
A 3 ★ 5 x 5 R=1/2	P.	7/8	27.2	7.98	17.8	5.2	1.49	1.57	0.96
	P.B.	3/4o	23.6	6.94	15.7	4.5	1.50	1.52	0.97
	P.C.B.S.	5/8	20 0	5.86	13.6	3.9	1.52	1.48	0.97
	P.C.B.G.S.	1/2	16.2	4.75	11.3	3.2	1.54	1.43	0.98
	P.C.B.S.	7/16	14.3	4.18	10 0	2.8	1.55	1.41	0.98
	P.C.B.G.S.	3/8	12.3	3.61	8.7	2.4	1.56	1.39	0.99
	P.C.B.S.	5/16	10.3	3.03	7.4	2.0	1.56	1.36	0.99
A 4 ★ 4 x 4 R=3/8	P.C.B.G.S.	3/4	18.5	5.44	7.7	2.8	1.19	1.27	0.77
	P.C.B.G.S.	5/8	15.7	4.61	6.7	2.4	1.20	1.23	0.77
	P.C.B.G.S.	1/2	12.8	3.75	5.6	2.0	1.22	1.18	0.78
	P.C.B.G.S.	7/16	11.3	3.31	5.0	1.8	1.23	1.16	0.78
	P.C.B.G.S.	3/8	9.8	2.86	4.4	1.5	1.23	1.14	0.79
	P.C.B.G.S.	5/16	8.2	2.40	3.7	1.3	1.24	1.12	0.79
	P.C.B.G.S.	1/4	6.6	1.94	3.0	1.0	1.25	1.09	0.79
A 5 ★3 1/2 x 3 1/2 R=3/8	P.C.B.G.S.	1/2	11.1	3.25	3.6	1.5	1.06	1.06	0.68
	P.C.B.G.S.	7/16	9.8	2.87	3.3	1.3	1.07	1.04	0.68
	P.C.B.G.S.	3/8	8.5	2.48	2.9	1.2	1.07	1.01	0.69
	P.C.B.G.S.	5/16	7.2	2.09	2.5	0.98	1.08	0.99	0.69
	P.C.B.G.S.	1/4	5.8	1.69	2.0	0.79	1.09	0.97	0.69

oWhen produced in Birmingham District, leg length will exceed standard tolerance.

For key to letters in second column and star ★ in first column refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

R=radius of fillet (inches).



EQUAL ANGLES

PROPERTIES FOR DESIGNING

Section Index	District Rolled	Thick-ness	Weight per Foot	Area of Section	Axis 1-1 and Axis 2-2				Axis 3-3
					I	S	r	x	r min.
		In.	Lbs.	In.²	In.⁴	In.³	In.	In.	In.
A 7 ★3 x 3 R=5/16	P.C.B.G.S.	1/2	9.4	2.75	2.2	1.1	0.90	0.93	0.58
	P.C.B.S.	7/16	8.3	2.43	2.0	0.95	0.91	0.91	0.58
	P.C.B.G.S.	3/8	7.2	2.11	1.8	0.83	0.91	0.89	0.58
	P.C.B.G.S.	5/16	6.1	1.78	1.5	0.71	0.92	0.87	0.59
	P.C.B.G.S.	1/4	4.9	1.44	1.2	0.58	0.93	0.84	0.59
	P.C.B.G.S.	3/16	3.71	1.09	0.96	0.44	0.94	0.82	0.59
A 9† 2½ x 2½	P.C.B.S.	1/2o	7.7	2.25	1.2	0.73	0.74	0.81	0.47
	P.C.B.S.F.	3/8	5.9	1.73	0.98	0.57	0.75	0.76	0.48
	P.C.B.S.F.	5/16	5.0	1.47	0.85	0.48	0.76	0.74	0.49
	P.C.B.S.F.	1/4	4.1	1.19	0.70	0.39	0.77	0.72	0.49
	P.C.B.S.F.	3/16	3.07	0.90	0.55	0.30	0.78	0.69	0.49
A 11† 2 x 2	P.C.B.S.F.	3/8	4.7	1.36	0.48	0.35	0.59	0.64	0.39
	P.C.B.S.F.	5/16	3.92	1.15	0.42	0.30	0.60	0.61	0.39
	P.C.B.S.F.	1/4	3.19	0.94	0.35	0.25	0.61	0.59	0.39
	P.C.B.S.F.	3/16	2.44	0.71	0.28	0.19	0.62	0.57	0.40
	P.C.B.S.F.	1/8	1.65	0.48	0.19	0.13	0.63	0.55	0.40
A 12† 1¾ x 1¾	P.C.B.S.F.	1/4	2.77	0.81	0.23	0.19	0.53	0.53	0.34
	P.C.B.S.F.	3/16	2.12	0.62	0.18	0.14	0.54	0.51	0.35
	P.C.B.S.F.	1/8	1.44	0.42	0.13	0.10	0.55	0.48	0.35
A 13† 1½ x 1½	P.C.B.S.F.	1/4	2.34	0.69	0.14	0.13	0.45	0.47	0.29
	P.C.B.S.F.	3/16	1.80	0.53	0.11	0.10	0.46	0.44	0.29
	P.C.B.S.F.	1/8	1.23	0.36	0.08	0.07	0.46	0.42	0.30
A 15† 1¼ x 1¼	P.C.B.S.F.	1/4	1.92	0.56	0.08	0.09	0.37	0.40	0.24
	P.C.B.S.F.	3/16	1.48	0.43	0.06	0.07	0.38	0.38	0.24
	P.C.B.S.F.	1/8	1.01	0.30	0.04	0.05	0.38	0.35	0.25
A 16† 1 x 1	P.C.B.S.	1/4	1.49	0.44	0.04	0.06	0.29	0.34	0.19
	P.C.B.S.	3/16	1.16	0.34	0.03	0.04	0.30	0.32	0.19
	P.C.B.S.	1/8	0.80	0.23	0.02	0.03	0.31	0.30	0.19

†Bar size.

oWhen produced in Birmingham District, leg length will exceed standard tolerance.

R=radius of fillet (inches).

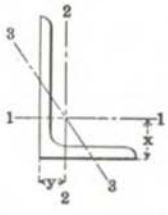
For key to letters in second column and star ★ in first column, refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

L

UNEQUAL ANGLES

PROPERTIES FOR DESIGNING



Section Index	District Rolled	Thick-ness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3
					I	S	r	x	I	S	r	y	r min.
		In.	Lbs.	In.²	In.⁴	In.³	In.	In.	In.⁴	In.³	In.	In.	In.
A 94 **9 x 4** R=½	G.	1	40.8	12.00	97.0	17.6	2.84	3.50	12.0	4.0	1.00	1.00	0.83
	G.	⅞	36.1	10.61	86.8	15.7	2.86	3.45	10.8	3.6	1.01	0.95	0.84
	G.	¾	31.3	9.19	76.1	13.6	2.88	3.41	9.6	3.1	1.02	0.91	0.84
	G.	⅝	26.3	7.73	64.9	11.5	2.90	3.36	8.3	2.6	1.04	0.86	0.85
	G.	9/16	23.8	7.00	59.1	10.4	2.91	3.33	7.6	2.4	1.04	0.83	0.85
	G.	½	21.3	6.25	53.2	9.3	2.92	3.31	6.9	2.2	1.05	0.81	0.85
A 18 ★**8 x 6** R=½	P. C. B.	1°	44.2	13.00	80.8	15.1	2.49	2.65	38.8	8.9	1.73	1.65	1.28
	P. C. B.	⅞	39.1	11.48	72.3	13.4	2.51	2.61	34.9	7.9	1.74	1.61	1.28
	P. C. B.	¾	33.8	9.94	63.4	11.7	2.53	2.56	30.7	6.9	1.76	1.56	1.29
	P. C. B.	⅝	28.5	8.36	54.1	9.9	2.54	2.52	26.3	5.9	1.77	1.52	1.29
	P. C. B.	9/16	25.7	7.56	49.3	9.0	2.55	2.50	24.0	5.3	1.78	1.50	1.30
	P. C. B.	½	23.0	6.75	44.3	8.0	2.56	2.47	21.7	4.8	1.79	1.47	1.30
	P. C. B.	7/16	20.2	5.93	39.2	7.1	2.57	2.45	19.3	4.2	1.80	1.45	1.31
A 50 ★**8 x 4** R=½	P. C. G.	1	37.4	11.00	69.6	14.1	2.52	3.05	11.6	3.9	1.03	1.05	0.85
	P. C. G.	⅞	33.1	9.73	62.5	12.5	2.53	3.00	10.5	3.5	1.04	1.00	0.85
	P. C. G.	¾	28.7	8.44	54.9	10.9	2.55	2.95	9.4	3.1	1.05	0.95	0.85
	P. C. G.	⅝	24.2	7.11	46.9	9.2	2.57	2.91	8.1	2.6	1.07	0.91	0.86
	P. C. G.	9/16	21.9	6.43	42.8	8.4	2.58	2.88	7.4	2.4	1.07	0.88	0.86
	P. C. G.	½	19.6	5.75	38.5	7.5	2.59	2.86	6.7	2.2	1.08	0.86	0.86
	P. C. G.	7/16	17.2	5.06	34.1	6.6	2.60	2.83	6.0	1.9	1.09	0.83	0.87
A 60 ★**7 x 4** R=½	P. C. G.	⅞	30.2	8.86	42.9	9.7	2.20	2.55	10.2	3.5	1.07	1.05	0.86
	P. C. G.	¾	26.2	7.69	37.8	8.4	2.22	2.51	9.1	3.0	1.09	1.01	0.86
	P. C. G.	⅝	22.1	6.48	32.4	7.1	2.24	2.46	7.8	2.6	1.10	0.96	0.86
	P. C. G.	9/16	20.0	5.87	29.6	6.5	2.24	2.44	7.2	2.4	1.11	0.94	0.87
	P. C. G.	½	17.9	5.25	26.7	5.8	2.25	2.42	6.5	2.1	1.11	0.92	0.87
	P. C. G.	7/16	15.8	4.62	23.7	5.1	2.26	2.39	5.8	1.9	1.12	0.89	0.88
	P. C. G.	⅜	13.6	3.98	20.6	4.4	2.27	2.37	5.1	1.6	1.13	0.87	0.88

°When produced in Birmingham District, leg length will exceed standard tolerance.

R=radius of fillet (inches).

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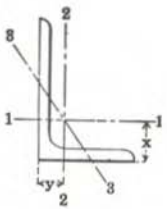
Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).



UNEQUAL ANGLES

PROPERTIES FOR DESIGNING

L

Section Index	District Rolled	Thick-ness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3
					I	S	r	x	I	S	r	y	r min.
		In.	Lbs.	In.²	In.⁴	In.³	In.	In.	In.⁴	In.³	In.	In.	In.
A 20 ★6 x 4 R=½	P.C.G.S.	⅞	27.2	7.98	27.7	7.2	1.86	2.12	9.8	3.4	1.11	1.12	0.86
	P.C.B.G.S.	¾	23.6	6.94	24.5	6.2	1.88	2.08	8.7	3.0	1.12	1.08	0.86
	P.C.B.G.S.	⅝	20.0	5.86	21.1	5.3	1.90	2.03	7.5	2.5	1.13	1.03	0.86
	P.C.B.G.S.	9/16	18.1	5.31	19.3	4.8	1.90	2.01	6.9	2.3	1.14	1.01	0.87
	P.C.B.G.S.	½	16.2	4.75	17.4	4.3	1.91	1.99	6.3	2.1	1.15	0.99	0.87
	P.C.B.G.S.	7/16	14.3	4.18	15.5	3.8	1.92	1.96	5.6	1.9	1.16	0.96	0.87
	P.C.B.G.S.	⅜	12.3	3.61	13.5	3.3	1.93	1.94	4.9	1.6	1.17	0.94	0.88
	P.C.G.S.	5/16	10.3	3.03	11.4	2.8	1.94	1.92	4.2	1.4	1.17	0.92	0.88
A 21 ★6 x 3½ R=½	P.C.B.	½	15.3	4.50	16.6	4.2	1.92	2.08	4.3	1.6	0.97	0.83	0.76
	P.C.B.	⅜	11.7	3.42	12.9	3.2	1.94	2.04	3.3	1.2	0.99	0.79	0.77
	P.C.B.	5/16	9.8	2.87	10.9	2.7	1.95	2.01	2.9	1.0	1.00	0.76	0.77
	P.C.	¼	7.9	2.31	8.9	2.2	1.96	1.99	2.3	0.85	1.01	0.74	0.78
A 23 ★5 x 3½ R=7/16	P.C.G.S.	¾	19.8	5.81	13.9	4.3	1.55	1.75	5.6	2.2	0.98	1.00	0.75
	P.C.B.G.S.	⅝	16.8	4.92	12.0	3.7	1.56	1.70	4.8	1.9	0.99	0.95	0.75
	P.C.B.G.S.	½	13.6	4.00	10.0	3.0	1.58	1.66	4.1	1.6	1.01	0.91	0.75
	P.C.G.S.	7/16	12.0	3.53	8.9	2.6	1.59	1.63	3.6	1.4	1.01	0.88	0.76
	P.C.B.G.S.	⅜	10.4	3.05	7.8	2.3	1.60	1.61	3.2	1.2	1.02	0.86	0.76
	P.C.B.G.S.	5/16	8.7	2.56	6.6	1.9	1.61	1.59	2.7	1.0	1.03	0.84	0.76
	P.C.G.S.	¼	7.0	2.06	5.4	1.6	1.61	1.56	2.2	0.83	1.04	0.81	0.76
A 24 ★5 x 3 R=⅜	P.C.B.S.	½	12.8	3.75	9.5	2.9	1.59	1.75	2.6	1.1	0.83	0.75	0.65
	P.C.G.S.	7/16	11.3	3.31	8.4	2.6	1.60	1.73	2.3	1.0	0.84	0.73	0.65
	P.C.B.G.S.	⅜	9.8	2.86	7.4	2.2	1.61	1.70	2.0	0.89	0.84	0.70	0.65
	P.C.B.S.	5/16	8.2	2.40	6.3	1.9	1.61	1.68	1.8	0.75	0.85	0.68	0.66
	P.C.S.	¼	6.6	1.94	5.1	1.5	1.62	1.66	1.4	0.61	0.86	0.66	0.66

R=radius of fillet (inches).

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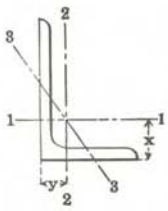
L

UNEQUAL ANGLES

PROPERTIES FOR DESIGNING



Section Index	District Rolled	Thick-ness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3
					I	S	r	x	I	S	r	y	r min.
		In.	In.	In.²	In.⁴	In.³	In.	In.	In.⁴	In.³	In.	In.	In.
A 26 ★4 x 3½ R=⅜	P.C.G.S.	⅝	14.7	4.30	6.4	2.4	1.22	1.29	4.5	1.8	1.03	1.04	0.72
	P.C.B.G.S.	½	11.9	3.50	5.3	1.9	1.23	1.25	3.8	1.5	1.04	1.00	0.72
	P.C.G.S.	7/16	10.6	3.09	4.8	1.7	1.24	1.23	3.4	1.4	1.05	0.98	0.72
	P.C.B.G.S.	⅜	9.1	2.67	4.2	1.5	1.25	1.21	3.0	1.2	1.06	0.96	0.73
	P.C.B.G.S.	5/16	7.7	2.25	3.6	1.3	1.26	1.18	2.6	1.0	1.07	0.93	0.73
	P.C.B.G.S.	¼	6.2	1.81	2.9	1.0	1.27	1.16	2.1	0.81	1.07	0.91	0.73
A 27 ★4 x 3 R=⅜	P.C.G.S.	⅝	13.6	3.98	6.0	2.3	1.23	1.37	2.9	1.4	0.85	0.87	0.64
	P.C.B.G.S.	½	11.1	3.25	5.1	1.9	1.25	1.33	2.4	1.1	0.86	0.83	0.64
	P.C.G.S.	7/16	9.8	2.87	4.5	1.7	1.25	1.30	2.2	1.0	0.87	0.80	0.64
	P.C.B.G.S.	⅜	8.5	2.48	4.0	1.5	1.26	1.28	1.9	0.87	0.88	0.78	0.64
	P.C.B.G.S.	5/16	7.2	2.09	3.4	1.2	1.27	1.26	1.7	0.73	0.89	0.76	0.65
	P.C.B.G.S.	¼	5.8	1.69	2.8	1.0	1.28	1.24	1.4	0.60	0.90	0.74	0.65
A 28 ★3½ x 3 R=⅜	P.C.B.G.S.	½	10.2	3.00	3.5	1.5	1.07	1.13	2.3	1.1	0.88	0.88	0.62
	P.C.G.S.	7/16	9.1	2.65	3.1	1.3	1.08	1.10	2.1	0.98	0.89	0.85	0.62
	P.C.B.G.S.	⅜	7.9	2.30	2.7	1.1	1.09	1.08	1.9	0.85	0.90	0.83	0.62
	P.C.B.G.S.	5/16	6.6	1.93	2.3	0.95	1.10	1.06	1.6	0.72	0.90	0.81	0.63
	P.C.B.G.S.	¼	5.4	1.56	1.9	0.78	1.11	1.04	1.3	0.59	0.91	0.79	0.63
A 29 3½ x 2½ R=5/16	P.C.B.G.S.	½	9.4	2.75	3.2	1.4	1.09	1.20	1.4	0.76	0.70	0.70	0.53
	P.C.G.S.	7/16	8.3	2.43	2.9	1.3	1.09	1.18	1.2	0.68	0.71	0.68	0.54
	P.C.B.G.S.	⅜	7.2	2.11	2.6	1.1	1.10	1.16	1.1	0.59	0.72	0.66	0.54
	P.C.B.S.	5/16	6.1	1.78	2.2	0.93	1.11	1.14	0.94	0.50	0.73	0.64	0.54
	P.C.B.G.S.	¼	4.9	1.44	1.8	0.75	1.12	1.11	0.78	0.41	0.74	0.61	0.54
A 32 3 x 2½ R=5/16	P.C.B.	½	8.5	2.50	2.1	1.0	0.91	1.00	1.3	0.74	0.72	0.75	0.52
	P.C.	7/16	7.6	2.21	1.9	0.93	0.92	0.98	1.2	0.66	0.73	0.73	0.52
	P.C.B.G.S.	⅜	6.6	1.92	1.7	0.81	0.93	0.96	1.0	0.58	0.74	0.71	0.52
	P.C.B.G.S.	5/16	5.6	1.62	1.4	0.69	0.94	0.93	0.90	0.49	0.74	0.68	0.53
	P.C.B.G.S.	¼	4.5	1.31	1.2	0.56	0.95	0.91	0.74	0.40	0.75	0.66	0.53

R=radius of fillet (inches).

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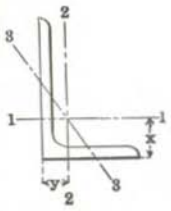

UNEQUAL ANGLES

PROPERTIES FOR DESIGNING

L

Section Index	District Rolled	Thick-ness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3
					I	S	r	x	I	S	r	y	r min.
		In.	Lbs.	In.²	In.⁴	In.³	In.	In.	In.⁴	In.³	In.	In.	In.
A 33 **3 x 2** R=5/16	P.C.B.	1/2°	7.7	2.25	1.9	1.0	0.92	1.08	0.67	0.47	0.55	0.58	0.43
	P.C.	7/16	6.8	2.00	1.7	0.89	0.93	1.06	0.61	0.42	0.55	0.56	0.43
	P.C.B.G.S.	3/8	5.9	1.73	1.5	0.78	0.94	1.04	0.54	0.37	0.56	0.54	0.43
	P.C.B.G.S.	5/16	5.0	1.47	1.3	0.66	0.95	1.02	0.47	0.32	0.57	0.52	0.43
	P.C.B.G.S.	1/4	4.1	1.19	1.1	0.54	0.95	0.99	0.39	0.26	0.57	0.49	0.43
	P.C.B.G.S.	3/16	3.07	0.90	0.84	0.41	0.97	0.97	0.31	0.20	0.58	0.47	0.44
A 35† **2½ x 2**	P.C.B.S.	3/8	5.3	1.55	0.91	0.55	0.77	0.83	0.51	0.36	0.58	0.58	0.42
	P.C.B.S.	5/16	4.5	1.31	0.79	0.47	0.78	0.81	0.45	0.31	0.58	0.56	0.42
	P.C.B.S.	1/4	3.62	1.06	0.65	0.38	0.78	0.79	0.37	0.25	0.59	0.54	0.42
	P.C.B.S.	3/16	2.75	0.81	0.51	0.29	0.79	0.76	0.29	0.20	0.60	0.51	0.43
A 48† **2½ x 1½**	P. C.	5/16	3.92	1.15	0.71	0.44	0.79	0.90	0.19	0.17	0.41	0.40	0.32
	P. C. S.	1/4	3.19	0.94	0.59	0.36	0.79	0.88	0.16	0.14	0.41	0.38	0.32
	P. C. S.	3/16	2.44	0.72	0.46	0.28	0.80	0.85	0.13	0.11	0.42	0.35	0.33
A 37† **2 x 1½**	P.C.B.S.	1/4	2.77	0.81	0.32	0.24	0.62	0.66	0.15	0.14	0.43	0.41	0.32
	P.C.B.S.	3/16	2.12	0.62	0.25	0.18	0.63	0.64	0.12	0.11	0.44	0.39	0.32
	P.C.B.S.	1/8	1.44	0.42	0.17	0.13	0.64	0.62	0.09	0.08	0.45	0.37	0.33
A 645† **2 x 1¼**	P.G.	1/4	2.55	0.75	0.30	0.23	0.63	0.71	0.09	0.10	0.34	0.33	0.27
	P.G.	3/16	1.96	0.57	0.23	0.18	0.64	0.69	0.07	0.08	0.35	0.31	0.27
	P.	1/8	1.33	0.40	0.17	0.13	0.65	0.65	0.05	0.05	0.36	0.28	0.27
A 39† **1¾ x 1¼**	P. C.	1/4	2.34	0.69	0.20	0.18	0.54	0.60	0.09	0.10	0.35	0.35	0.27
	P. C.	3/16	1.80	0.53	0.16	0.14	0.55	0.58	0.07	0.08	0.36	0.33	0.27
	P. C.	1/8	1.23	0.36	0.11	0.09	0.56	0.56	0.05	0.05	0.37	0.31	0.27

†Bar size.
R=radius of fillet (inches).
For key to letters in second column, refer to page 3.
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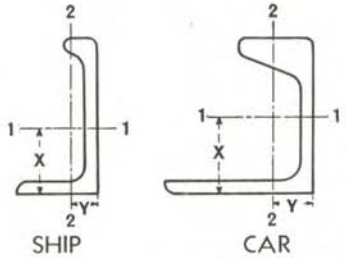
°When produced in Birmingham District, leg length will exceed standard tolerance.

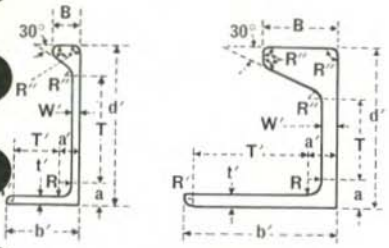
BULB ANGLES

PROPERTIES FOR DESIGNING



Section Index and Nominal Size	District Rolled	Weight per Foot	Area of Section	Width of Flange	Thickness		Axis 1-1				Axis 2-2			
					Web	Flange	I	S	r	x	I	S	r	y
		Lbs.	In.²	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.	In.
SHIP BUILDING														
BA 313 **10 x 3½**	P. G.	32.3	9.49	3.69	.64	.61	118.1	22.1	3.53	4.69	6.2	2.2	0.81	0.77
	P. G.	29.9	8.78	3.63	.58	.58	110.7	20.9	3.55	4.70	5.6	2.0	0.80	0.75
	P. G.	27.2	7.98	3.57	.52	.485	102.9	19.6	3.59	4.80	5.1	1.8	0.80	0.72
	P. G.	24.8	7.28	3.51	.46	.455	95.4	18.4	3.62	4.82	4.6	1.6	0.80	0.70
	P. G.	22.4	6.57	3.45	.40	.425	88.0	17.2	3.66	4.85	4.1	1.5	0.79	0.68
BA 312 **9 x 3½**	P.	23.8	7.00	3.57	.50	.465	73.3	15.1	3.24	4.19	4.7	1.7	0.82	0.72
	P.	21.6	6.35	3.51	.44	.435	67.7	14.1	3.27	4.21	4.2	1.5	0.82	0.70
	P.	19.4	5.70	3.45	.38	.405	62.2	13.1	3.30	4.22	3.7	1.4	0.81	0.68
BA 311 **8 x 3½**	P. G.	24.3	7.14	3.68	.58	.55	57.0	12.7	2.83	3.53	5.2	1.9	0.85	0.78
	P. G.	20.0	5.87	3.56	.46	.43	48.9	11.1	2.89	3.61	4.2	1.5	0.85	0.72
	P. G.	16.0	4.70	3.44	.34	.37	40.9	9.4	2.95	3.62	3.3	1.2	0.84	0.69
BA 309 **7 x 3½**	P.	21.1	6.19	3.68	.56	.54	37.5	9.2	2.46	2.95	4.8	1.8	0.88	0.80
	P.	17.1	5.03	3.56	.44	.41	32.0	8.0	2.52	3.03	3.9	1.4	0.88	0.74
	P.	13.6	3.98	3.44	.32	.35	26.4	6.7	2.58	3.01	3.0	1.1	0.87	0.71
BA 307 **6 x 3½**	P. G.	17.4	5.12	3.69	.52	.49	22.7	6.3	2.10	2.42	4.3	1.6	0.92	0.82
	P. G.	13.9	4.06	3.57	.40	.365	19.0	5.3	2.16	2.47	3.4	1.2	0.91	0.76
	P. G.	10.7	3.13	3.45	.28	.305	15.3	4.4	2.21	2.45	2.6	0.94	0.91	0.73
CAR BUILDING														
BA 125 **5 x 4½**	P.C.B.	19.1	5.64	4.50	.438	.438	20.8	7.9	1.91	2.39	7.9	2.4	1.18	1.23
BA 124 **5 x 3½**	P.C.B.	13.0	3.82	3.50	.375	.375	13.5	4.9	1.88	2.22	3.3	1.2	0.92	0.86
BA 122 **4 x 3½**	P.	14.3	4.21	3.50	.500	.500	8.7	3.7	1.44	1.65	3.9	1.5	0.96	0.99
BA 123 **4 x 3½**	P.C.	11.9	3.48	3.50	.375	.375	7.9	3.5	1.50	1.77	3.1	1.2	0.94	0.94

For key to letters in second column, refer to page 3.
Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).



BULB ANGLES

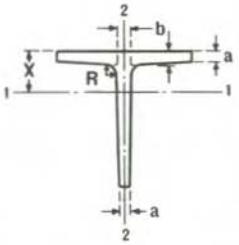
DIMENSIONS FOR DETAILING

Section Index and Nominal Size	Weight per Foot	Flange		Web		Width of Bulb (Nominal)	Tangents				Radius of Fillet (Root)	Radii of Roundings	
		Width (Nominal)	Thickness (Nominal)	Depth (Nominal)	Thickness (Nominal)		Web (Nominal)		Flange (Nominal)				
		b'	t'	d'	W'	B	a	T	a'	T'	R	R'	R''
In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
SHIPBUILDING TYPE													
BA 313 10 x 3½	32.3	3¾	5/8	10	5/8	1 15/16	1⅛	7⅜	1 3/16	2¼	.54	.27	.40
	29.9	3⅝	9/16	10	9/16	1⅞	1⅛	7⅜	1⅛	2¼	.54	.27	.40
	27.2	3⅝	½	10	½	1 13/16	1	7⅜	1 1/16	2¼	.54	.27	.40
	24.8	3½	7/16	10	7/16	1¾	1	7⅜	1	2¼	.54	.27	.40
	22.4	3½	7/16	10	3/8	1 11/16	15/16	7⅜	15/16	2¼	.54	.27	.40
BA 312 9 x 3½	23.8	3⅝	7/16	9	½	1 11/16	1	6 9/16	1 1/16	2¼	.54	.27	.36
	21.6	3½	7/16	9	7/16	1⅝	1	6 9/16	1	2¼	.54	.27	.36
	19.4	3½	3/8	9	3/8	1 9/16	15/16	6 9/16	15/16	2¼	.54	.27	.36
BA 311 8 x 3½	24.3	3⅝	9/16	8	9/16	1⅝	1 1/16	5¾	1⅛	2 5/16	.54	.27	.32
	20.0	3½	7/16	8	7/16	1½	1	5¾	1	2 5/16	.54	.27	.32
	16.0	3½	3/8	8	5/16	1⅜	15/16	5¾	7/8	2 5/16	.54	.27	.32
BA 309 7 x 3½	21.1	3⅝	9/16	7	9/16	1½	1 1/16	4 15/16	1⅛	2 5/16	.54	.27	.28
	17.1	3½	7/16	7	7/16	1⅜	15/16	4 15/16	1	2 5/16	.54	.27	.28
	13.6	3½	3/8	7	5/16	1¼	7/8	4 15/16	7/8	2 5/16	.54	.27	.28
BA 307 6 x 3½	17.4	3¾	½	6	½	1 5/16	1	4 3/16	1 1/16	2 3/8	.54	.27	.24
	13.9	3⅝	3/8	6	3/8	1 3/16	7/8	4 3/16	15/16	2 3/8	.54	.27	.24
	10.7	3½	5/16	6	¼	1 1/16	7/8	4 3/16	13/16	2 3/8	.54	.27	.24
CARBUILDING TYPE													
BA 125 5 x 4½	19.1	4½	7/16	5	7/16	2¼	13/16	2 9/16	1 3/16	3 5/16	3/8	3/8	½
BA 124 5 x 3½	13.0	3½	3/8	5	3/8	1½	¾	3	¾	2 7/16	3/8	5/16	3/8
BA 122 4 x 3½	14.3	3½	½	4	½	1½	7/8	1⅞	7/8	2 5/16	3/8	5/16	3/8
BA 123 4 x 3½	11.9	3½	3/8	4	3/8	1½	¾	1 31/32	¾	2 7/16	3/8	5/16	3/8

TEES

EQUAL AND UNEQUAL

PROPERTIES AND DIMENSIONS OF SECTIONS



Section Index	District Rolled	Weight per Foot	Area of Section	Size					Axis 1-1				Axis 2-2		
				Flange	Stem	Thickness		Radius of Fillet	I	S	r	x	I	S	r
						Toe a	Root b	R							
		Lbs.	In.²	In.	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.

EQUAL TEES

T1	P.C.	13.5	3.97	4	4	1/2	9/16	1/2	5.7	2.0	1.20	1.18	2.8	1.4	0.84
T8	P.C.	7.8	2.27	3	3	3/8	7/16	5/16	1.8	0.86	0.90	0.88	0.90	0.60	0.63
T9	P.C.	6.7	1.95	3	3	5/16	3/8	5/16	1.6	0.74	0.90	0.86	0.75	0.50	0.62
T10†	C.	6.4	1.87	2 1/2	2 1/2	3/8	7/16	1/4	1.0	0.59	0.74	0.76	0.52	0.42	0.53
T11†	C.	5.5	1.60	2 1/2	2 1/2	5/16	3/8	1/4	0.88	0.50	0.74	0.74	0.44	0.35	0.52
T13†	C.	4.1	1.19	2 1/4	2 1/4	1/4	5/16	1/4	0.52	0.32	0.66	0.65	0.25	0.22	0.46
T14†	C.	4.4	1.28	2	2	5/16	3/8	1/4	0.44	0.31	0.59	0.61	0.23	0.23	0.43
T15†	C.	3.62	1.05	2	2	1/4	5/16	1/4	0.37	0.26	0.59	0.59	0.18	0.18	0.42

UNEQUAL TEES

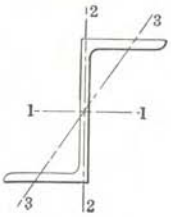
T50	P.	13.6	4.00	5	3 1/8	* 1/2, 13/32	* 9/16, 5/8	3/8	2.7	1.1	0.82	0.76	5.2	2.1	1.14
	P.	11.5	3.37	5	3	* 3/8, 13/32	* 7/16, 5/8	3/8	2.4	1.1	0.84	0.76	3.9	1.6	1.10
T61	P.C.	9.2	2.68	4	3	3/8	7/16	3/8	2.0	0.90	0.86	0.78	2.1	1.1	0.89
T62	P.	8.5	2.48	4	2 1/2	3/8	7/16	3/8	1.2	0.62	0.69	0.62	2.1	1.0	0.92
T79	P.C.	6.1	1.77	3	2 1/2	5/16	3/8	5/16	0.94	0.52	0.73	0.68	0.75	0.50	0.65

†Bar Size.

*Where two dimensions are shown, the first is for the flange, the second for the stem.

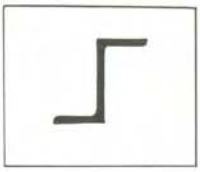
For key to letters in second column, refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).



ZEES

PROPERTIES AND DIMENSIONS OF SECTIONS



Section Index	District Rolled	Weight per Foot	Area of Section	Size			Axis 1-1			Axis 2-2			Axis 3-3
				Depth	Flange	Thickness	I	S	r	I	S	r	r min.
		Lbs.	In.²	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.	In.
Z 1 R = 5/16	P.	21.1	6.19	6 1/8	3 5/8	1/2	34.4	11.2	2.36	12.9	3.8	1.44	0.84
	P.	15.7	4.59	6	3 1/2	3/8	25.3	8.4	2.35	9.1	2.8	1.41	0.83
Z 5 R = 5/16	P.	17.9	5.25	5	3 1/4	1/2	19.2	7.7	1.91	9.1	3.0	1.31	0.74
Z 4 R = 5/16	P.	16.4	4.81	5 1/8	3 3/8	7/16	19.1	7.4	1.99	9.2	2.9	1.38	0.77
	P.	14.0	4.10	5 1/16	3 5/16	3/8	16.2	6.4	1.99	7.7	2.5	1.37	0.76
	P.	11.6	3.40	5	3 1/4	5/16	13.4	5.3	1.98	6.2	2.0	1.35	0.75
Z 8 R = 5/16	P.	15.9	4.66	4 1/16	3 1/8	1/2	11.2	5.5	1.55	8.0	2.8	1.31	0.67
Z 7 1. R = 5/16	P.C.B.	12.5	3.66	4 1/8	3 3/16	3/8	9.6	4.7	1.62	6.8	2.3	1.36	0.69
	P.C.B.	10.3	3.03	4 1/16	3 1/8	5/16	7.9	3.9	1.62	5.5	1.8	1.34	0.68
	P.C.B.	8.2	2.41	4	3 1/16	1/4	6.3	3.1	1.62	4.2	1.4	1.33	0.67
Z 12 R = 5/16	P.C.	12.6	3.69	3	2 11/16	1/2	4.6	3.1	1.12	4.9	2.0	1.15	0.53
Z 11 R = 5/16	P.C.	9.8	2.86	3	2 11/16	3/8	3.9	2.6	1.16	3.9	1.6	1.17	0.54
Z 10 2. R = 5/16	P.C.B.G.	6.7	1.97	3	2 11/16	1/4	2.9	1.9	1.21	2.8	1.1	1.19	0.55

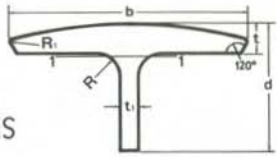
For key to letters in second column, refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

1. Also available in Cor-Ten Steel @ 6.1# per ft. Pgh. District only.
2. Also available in Cor-Ten Steel @ 5.0# per ft. Pgh. District only.

WALL ARMOR TEE

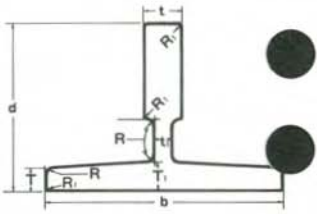
PROPERTIES AND DIMENSIONS OF SECTIONS



Section Index	District Rolled	Weight Per Ft.	Area of Section	Dimensions				Radii		Axis 1—1			
				Depth d	Flange Width b	Thickness		Fillet R	Toe (max.) R_1	I	S	r	x
						Flange t	Stem t_1						
		Lbs.	Ins.²	In.	In.	In.	In.	In.	In.	In.³	In.⁴	In.	In.
T-41	P	29.2	8.585	4 7/32	7 3/4	1	5/8	3/4	1/8	8.55	2.71	.998	1.07

ELEVATOR TEES

PROPERTIES AND DIMENSIONS OF SECTIONS



Section Index	District Rolled	Weight Per Ft.	Area of Section	Dimensions						Radii	
				Depth d	Flange Width b	Thickness				R	R_1
						Flange		Stem			
						(Toe) T	(Root) T_1	t	t_2		
		lbs.	inches²	inches	inches	inches	inches	inches	inches	inches	inches
T-160	P	16.1	4.74	3 9/16	5	1/2	5/8	3/4	3/8	3/16	.031
T-161	P	8.9	2.62	2 1/2	3 1/2	5/16	7/16	3/4	3/8	1/8	.031
T-162	P	32.7	9.62	5 1/16	5 1/2	11/16	1	1 7/16	Tapered 1 to 3/4	—	1/32
T-169	P	24.4	7.18	4 1/8	5 1/2	9/16	2/3	1 5/16	Tapered 3/4 to 5/8	—	.031

For key to letters in second column, refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

STRUCTURAL TEES

CUT FROM

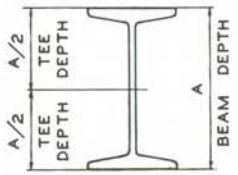
CB SECTIONS AND STANDARD BEAMS

TEES SPLIT FROM WIDE FLANGE SECTIONS AND STANDARD BEAMS

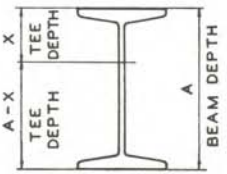
In addition to rolled tees, split tees can be produced by shearing or flame cutting either standard beams or wide flange sections.

Generally, any beam or channel section from 6 to 36 inches in depth can be split to form tees or angles.

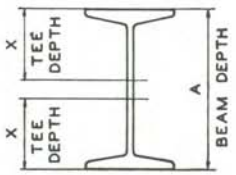
Orders should cover the full product of the beam or channel section prior to splitting.



Center Splitting



Off-Center Splitting



Two Lines of Cut

TOLERANCES FOR DEPTH OF TEE OR ANGLE

Depth	Tolerance Over or Under Inches
Beams or Channels 6 to 16 inches excl	3/16
Beams or Channels 16 to 20 inches excl	1/4
Beams 20 to 24 inches excl	5/16
Beams 24 inches and Over	3/8

The above tolerances for depth of tees or angles include the allowable tolerances in depth for the beams or channels before splitting.

Camber or Sweep

$$\text{Camber or Sweep} = 1/8 \text{ inch} \times \frac{\text{number of feet of total length}}{5}$$

Weight, Section, and Length

All Weight, Section, and Length tolerances for split tees or angles are the same as those applicable to the section from which the tees or angles are split.

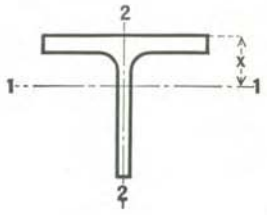
All tees or angles split from beams or channels are produced in Pgh. District only.

STRUCTURAL TEES

CUT FROM

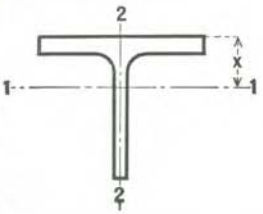
CB SECTIONS

PROPERTIES FOR DESIGNING



Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
	P.	150	44.09	18.36	16.655	1.680	.945	1222.7	85.9	5.27	4.13	612.6	73.6	3.73
T 18 WF	P.	140	41.16	18.25	16.595	1.570	.885	1133.3	79.9	5.25	4.07	563.7	67.9	3.70
TCB 18	P.	130	38.28	18.12	16.555	1.440	.845	1059.2	75.4	5.26	4.07	510.3	61.6	3.65
(CB 362)	P.	122.5	36.02	18.03	16.512	1.350	.802	994.3	71.1	5.25	4.04	472.3	57.2	3.62
	P.	115	33.87	17.94	16.475	1.260	.765	935.8	67.2	5.26	4.02	435.5	52.9	3.59
	P.	97	28.56	18.24	12.117	1.260	.770	904.0	67.3	5.63	4.81	177.7	29.3	2.49
	P.	91	26.77	18.16	12.072	1.180	.725	844.0	63.0	5.61	4.77	163.9	27.1	2.47
T 18 WF	P.	85	24.99	18.08	12.027	1.100	.680	784.7	58.8	5.60	4.74	150.3	25.0	2.45
TCB 18	P.	80	23.55	18.00	12.000	1.020	.653	741.0	56.0	5.61	4.76	137.7	22.9	2.42
(CB 361)	P.	75	22.08	17.92	11.972	.940	.625	696.7	53.0	5.62	4.79	125.2	20.9	2.38
	P.	**67.5**	**19.85**	**17.78**	**11.945**	**.794**	**.598**	**632.6**	**49.3**	**5.64**	**4.94**	**103.6**	**17.3**	**2.28**
T 16 WF	P.	120	35.26	16.75	15.865	1.400	.830	822.5	63.2	4.83	3.73	437.2	55.1	3.52
TCB16.5	P.	110	32.37	16.63	15.810	1.275	.775	754.1	58.4	4.83	3.71	391.2	49.5	3.48
(CB 332)	P.	100	29.40	16.50	15.750	1.150	.715	683.6	53.3	4.82	3.67	345.8	43.9	3.43
	P.	76	22.36	16.75	11.565	1.055	.635	591.9	47.4	5.15	4.26	128.1	22.1	2.39
T 16 WF	P.	70.5	20.76	16.66	11.535	.960	.605	551.8	44.7	5.16	4.30	114.9	19.9	2.35
TCB16.5	P.	65	19.13	16.55	11.510	.855	.580	513.0	42.1	5.18	4.37	100.7	17.5	2.29
(CB 331)	**P.**	**59.0**	**17.36**	**16.43**	**11.484**	**.738**	**.554**	**468.4**	**39.3**	**5.19**	**4.51**	**85.2**	**14.8**	**2.22**
T 15 WF	P.	105	30.89	15.19	15.105	1.315	.775	578.0	48.7	4.33	3.31	354.0	46.9	3.38
TCB 15	P.	95	27.95	15.06	15.040	1.185	.710	520.4	44.1	4.31	3.26	312.3	41.5	3.34
(CB 302)	P.	86	25.33	14.94	14.985	1.065	.655	471.0	40.2	4.31	3.23	275.1	36.7	3.30
	P.	66	19.42	15.15	10.551	1.000	.615	420.7	37.4	4.66	3.90	92.5	17.5	2.18
T 15 WF	P.	62	18.23	15.08	10.521	.930	.585	394.8	35.3	4.65	3.90	84.8	16.1	2.16
TCB 15	P.	58	17.07	15.00	10.500	.850	.564	371.8	33.6	4.67	3.94	76.6	14.6	2.12
(CB 301)	P.	54	15.89	14.91	10.484	.760	.548	349.5	32.1	4.69	4.03	67.6	12.9	2.06
	P.	**49.5**	**14.56**	**14.82**	**10.458**	**.670**	**.522**	**320.9**	**30.0**	**4.70**	**4.12**	**58.4**	**11.2**	**2.00**
T 13 WF	P.	88.5	26.05	13.66	14.090	1.190	.725	391.8	36.7	3.88	2.97	259.4	36.8	3.16
TCB13.5	P.	80	23.52	13.54	14.023	1.075	.658	351.4	33.1	3.87	2.91	229.0	32.7	3.12
(CB 272)	P.	72.5	21.34	13.44	13.965	.975	.600	316.3	29.9	3.85	2.85	203.5	29.1	3.09
	P.	57	16.77	13.64	10.070	.932	.570	288.9	28.3	4.15	3.42	74.8	14.9	2.11
T 13 WF	P.	51	15.01	13.54	10.018	.827	.518	257.7	25.4	4.14	3.39	64.8	12.9	2.08
TCB13.5	P.	47	13.83	13.46	9.990	.747	.490	238.5	23.7	4.15	3.41	57.5	11.5	2.04
(CB 271)	**P.**	**42.0**	**12.36**	**13.35**	**9.963**	**.636**	**.463**	**214.9**	**21.9**	**4.17**	**3.52**	**47.9**	**9.61**	**1.97**

Bold face type is data for new, lighter sections.
Section Index in parentheses refers to beam from which tee is cut.
For key to letters in second column, refer to page 3.

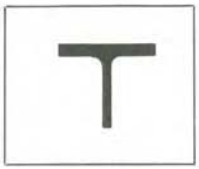


STRUCTURAL TEES

CUT FROM

CB SECTIONS

PROPERTIES FOR DESIGNING



Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
T 12 WF	P.	80	23.52	12.36	14.091	1.135	.656	271.6	27.6	3.40	2.51	246.3	35.0	3.23
TCB 12	P.	72.5	21.31	12.25	14.043	1.020	.608	246.2	25.2	3.40	2.48	217.1	30.9	3.19
(CB 243)	P.	65	19.11	12.13	14.000	.900	.565	222.6	23.1	3.41	2.47	187.6	26.8	3.13
T 12 WF	P.	60	17.65	12.16	12.088	.930	.556	213.6	22.4	3.48	2.62	127.0	21.0	2.68
TCB 12	P.	55	16.18	12.08	12.042	.855	.510	195.2	20.5	3.47	2.57	114.5	19.0	2.66
(CB 242)	P.	50	14.72	12.00	12.000	.775	.468	176.7	18.7	3.46	2.54	101.8	17.0	2.63
T 12 WF	P.	47	13.82	12.15	9.061	.872	.516	185.9	20.3	3.67	2.99	51.1	11.3	1.92
TCB 12	P.	42	12.36	12.05	9.015	.772	.470	165.9	18.3	3.66	2.97	44.2	9.8	1.89
(CB 241)	P.	38	11.19	11.96	8.985	.682	.440	151.1	16.9	3.68	3.00	38.3	8.5	1.85
	P.	**34.0**	**10.00**	**11.86**	**8.961**	**.582**	**.416**	**136.3**	**15.6**	**3.69**	**3.09**	**31.9**	**7.13**	**1.79**
T 10 WF	P.	71	20.88	10.73	13.132	1.095	.659	177.3	20.8	2.91	2.18	193.0	29.4	3.04
TCB10.5	P.	63.5	18.67	10.62	13.061	.985	.588	155.8	18.3	2.89	2.11	169.3	25.9	3.01
(CB 213)	P.	56	16.47	10.50	13.000	.865	.527	136.4	16.2	2.88	2.06	144.8	22.3	2.96
T 10 WF	P.	48	14.11	10.57	9.038	.935	.575	137.1	17.1	3.11	2.55	54.7	12.1	1.97
TCB10.5	P.	41	12.05	10.43	8.962	.795	.499	115.4	14.5	3.09	2.48	44.8	10.0	1.93
(CB 212)														
T 10 WF	P.	36.5	10.73	10.62	8.295	.740	.455	110.2	13.7	3.21	2.60	33.1	7.98	1.76
TCB10.5	P.	34	10.01	10.57	8.270	.685	.430	102.8	12.9	3.20	2.59	30.2	7.30	1.74
(CB 211)	P.	31	9.12	10.50	8.240	.615	.400	93.7	11.9	3.21	2.59	26.6	6.45	1.71
	P.	**27.5**	**8.09**	**10.40**	**8.215**	**.522**	**.375**	**83.9**	**10.8**	**3.22**	**2.66**	**22.0**	**5.36**	**1.65**
T 9 WF	P.	57	16.76	9.24	11.833	.991	.595	102.6	13.9	2.47	1.85	127.8	21.6	2.76
TCB 9	P.	52.5	15.43	9.16	11.792	.911	.554	93.9	12.8	2.47	1.82	115.5	19.6	2.73
(CB 183)	P.	48	14.11	9.08	11.750	.831	.512	85.3	11.7	2.46	1.78	103.4	17.6	2.71
T 9 WF	P.	42.5	12.49	9.16	8.838	.911	.526	84.4	11.9	2.60	2.05	49.7	11.3	2.00
TCB 9	P.	38.5	11.32	9.08	8.787	.831	.475	75.3	10.6	2.58	1.99	44.3	10.1	1.98
(CB 182)	P.	35	10.28	9.00	8.750	.751	.438	68.1	9.67	2.57	1.96	39.2	8.97	1.95
	P.	32	9.40	8.94	8.715	.686	.403	61.8	8.82	2.56	1.93	35.2	8.07	1.93
T 9 WF	P.	30	8.82	9.13	7.558	.695	.416	64.8	9.32	2.71	2.17	23.5	6.23	1.63
TCB 9	P.	27.5	8.10	9.06	7.532	.630	.390	59.6	8.63	2.71	2.16	21.0	5.57	1.61
(CB 181)	P.	25	7.36	9.00	7.500	.570	.358	53.9	7.85	2.71	2.14	18.6	4.96	1.59
	P.	**22.5**	**6.62**	**8.93**	**7.477**	**.499**	**.335**	**48.7**	**7.20**	**2.71**	**2.17**	**15.9**	**4.26**	**1.55**
T 8 WF	P.	48	14.11	8.16	11.533	.875	.535	64.7	9.82	2.14	1.57	103.6	18.0	2.71
TCB 8	P.	44	12.94	8.08	11.502	.795	.504	59.5	9.11	2.14	1.55	92.6	16.1	2.67
(CB 163)														

Bold face type is data for new, lighter sections.
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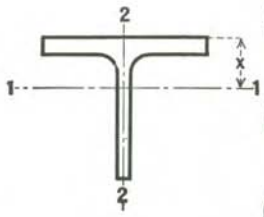
For key to letters in second column, refer to page 3.

STRUCTURAL TEES

CUT FROM

CB SECTIONS

PROPERTIES FOR DESIGNING



Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
★T 8 WF	P.	39	11.46	8.16	8.586	.875	.529	60.0	9.45	2.28	1.81	43.8	10.2	1.95
TCB 8	P.	35.5	10.43	8.08	8.543	.795	.486	54.0	8.57	2.28	1.77	38.9	9.11	1.93
(CB 162)	P.	32	9.40	8.00	8.500	.715	.443	48.3	7.71	2.27	1.73	34.2	8.05	1.91
	P.	29	8.52	7.93	8.464	.645	.407	43.6	7.00	2.26	1.70	30.2	7.14	1.88
★T 8 WF	P.	25	7.35	8.13	7.073	.628	.380	42.2	6.77	2.40	1.89	17.4	4.92	1.54
TCB 8	P.	22.5	6.62	8.06	7.039	.563	.346	37.8	6.10	2.39	1.87	15.2	4.33	1.52
(CB 161)	P.	20	5.89	8.00	7.000	.503	.307	33.2	5.37	2.37	1.82	13.3	3.79	1.50
	P.	18	5.30	7.93	6.992	.428	.299	30.7	5.10	2.41	1.90	11.1	3.17	1.45
★T 8 WF	**P.**	**15.5**	**4.56**	**7.92**	**5.525**	**.442**	**.275**	**27.1**	**4.60**	**2.44**	**2.02**	**5.79**	**2.10**	**1.13**
TCBL 8	**P.**	**13.0**	**3.83**	**7.83**	**5.500**	**.345**	**.250**	**23.2**	**4.05**	**2.46**	**2.10**	**4.36**	**1.59**	**1.07**
(CBL 16)														
	P.	105.5	31.04	7.88	15.800	1.563	.980	102.2	16.2	1.81	1.57	514.3	65.1	4.07
	P.	101	29.70	7.82	15.750	1.503	.930	95.7	15.2	1.80	1.53	489.8	62.2	4.06
	P.	96.5	28.37	7.75	15.710	1.438	.890	90.1	14.4	1.78	1.49	465.1	59.2	4.05
T 7 WF	P.	92	27.04	7.69	15.660	1.378	.840	83.9	13.4	1.76	1.45	441.4	56.4	4.04
TCB 7	P.	88	25.87	7.63	15.640	1.313	.820	80.2	12.9	1.76	1.42	418.9	53.6	4.02
(CB 146)	P.	83.5	24.55	7.56	15.600	1.248	.780	75.0	12.1	1.75	1.39	395.1	50.7	4.01
	P.	79	23.24	7.50	15.550	1.188	.730	69.3	11.3	1.73	1.34	372.5	47.9	4.00
	P.	75	22.04	7.44	15.515	1.128	.695	64.9	10.6	1.72	1.31	351.3	45.3	3.99
	P.	71	20.93	7.38	15.500	1.063	.680	62.1	10.2	1.72	1.29	330.1	42.6	3.97
	P.	68	19.99	7.38	14.740	1.063	.660	60.0	9.89	1.73	1.31	283.9	38.5	3.77
	P.	63.5	18.67	7.31	14.690	.998	.610	54.7	9.04	1.71	1.26	263.8	35.9	3.76
T 7 WF	P.	59.5	17.50	7.25	14.650	.938	.570	50.4	8.36	1.70	1.22	245.9	33.6	3.75
TCB 7	P.	55.5	16.33	7.19	14.620	.873	.540	46.7	7.80	1.69	1.19	227.4	31.1	3.73
(CB 145)	P.	51.5	15.13	7.13	14.575	.813	.495	42.4	7.10	1.67	1.15	209.9	28.8	3.72
	P.	47.5	13.97	7.06	14.545	.748	.465	39.1	6.58	1.67	1.12	191.9	26.4	3.71
	P.	43.5	12.78	7.00	14.500	.688	.420	34.9	5.88	1.65	1.08	174.8	24.1	3.70
T 7 WF	P.	42	12.36	7.09	12.023	.778	.451	37.4	6.36	1.74	1.21	112.7	18.8	3.02
TCB 7	P.	39	11.47	7.03	12.000	.718	.428	34.8	5.96	1.74	1.19	103.5	17.2	3.00
(CB 144)														
T 7 WF	P.	37	10.88	7.10	10.072	.783	.450	36.1	6.26	1.82	1.32	66.7	13.3	2.48
TCB 7	P.	34	10.00	7.03	10.040	.718	.418	33.0	5.74	1.81	1.29	60.6	12.1	2.46
(CB 143)	P.	30.5	8.97	6.96	10.000	.643	.378	29.2	5.13	1.80	1.25	53.6	10.7	2.45
★T 7 WF	P.	26.5	7.80	6.97	8.062	.658	.370	27.7	4.95	1.88	1.38	28.8	7.14	1.92
TCB 7	P.	24	7.06	6.91	8.031	.593	.339	24.9	4.49	1.88	1.35	25.6	6.38	1.91
(CB 142)	P.	21.5	6.33	6.84	8.000	.528	.308	22.2	4.02	1.87	1.33	22.6	5.64	1.89

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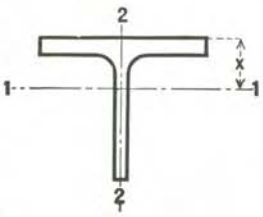

STRUCTURAL TEES

CUT FROM

CB SECTIONS

PROPERTIES FOR DESIGNING

Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
★**T 7 WF**	P.	19	5.59	7.06	6.776	.513	.313	23.5	4.27	2.05	1.56	12.3	3.64	1.49
TCB 7	P.	17	5.00	7.00	6.750	.453	.287	21.1	3.86	2.05	1.55	10.6	3.15	1.46
(CB 141)	P.	15	4.41	6.93	6.733	.383	.270	19.0	3.55	2.08	1.59	8.77	2.61	1.41
T 7 WF	**P.**	**13.0**	**3.83**	**6.95**	**5.025**	**.418**	**.255**	**17.1**	**3.29**	**2.12**	**1.73**	**4.13**	**1.65**	**1.04**
TCBL 7	**P.**	**11.0**	**3.24**	**6.86**	**5.000**	**.335**	**.230**	**14.7**	**2.88**	**2.13**	**1.77**	**3.20**	**1.28**	**.99**
(CBL 14)														
	P.	95	27.93	7.19	12.670	1.736	1.060	79.0	14.2	1.68	1.62	294.8	46.5	3.25
	P.	80.5	23.69	6.94	12.515	1.486	.905	62.6	11.5	1.63	1.47	243.1	38.9	3.20
	P.	66.5	19.56	6.69	12.365	1.236	.755	48.4	9.03	1.57	1.33	195.0	31.5	3.16
	P.	60	17.66	6.56	12.320	1.106	.710	43.4	8.22	1.57	1.28	172.5	28.0	3.13
T 6 WF	P.	53	15.60	6.44	12.230	.986	.620	36.7	7.01	1.53	1.20	150.4	24.6	3.11
TCB 6	P.	49.5	14.55	6.38	12.190	.921	.580	33.7	6.46	1.52	1.16	139.1	22.8	3.09
(CB 124)	P.	46	13.53	6.31	12.155	.856	.545	31.0	5.98	1.51	1.13	128.2	21.1	3.08
	P.	42.5	12.49	6.25	12.105	.796	.495	27.8	5.38	1.49	1.08	117.7	19.5	3.07
	P.	39.5	11.61	6.19	12.080	.736	.470	25.8	5.02	1.48	1.06	108.2	17.9	3.05
	P.	36	10.58	6.13	12.040	.671	.430	23.1	4.53	1.48	1.02	97.6	16.2	3.04
	P.	32.5	9.56	6.06	12.000	.606	.390	20.6	4.06	1.47	.98	87.3	14.6	3.02
T 6 WF	P.	29	8.53	6.10	10.014	.641	.359	19.0	3.75	1.49	1.03	53.7	10.7	2.51
TCB 6	P.	26.5	7.80	6.03	10.000	.576	.345	17.7	3.54	1.51	1.02	48.0	9.60	2.48
(CB 123)														
★**T 6 WF**	P.	25	7.36	6.10	8.077	.641	.371	18.7	3.80	1.60	1.17	28.2	6.98	1.96
TCB 6	P.	22.5	6.62	6.03	8.042	.576	.336	16.6	3.40	1.59	1.13	25.0	6.20	1.94
(CB 122)	P.	20	5.89	5.97	8.000	.516	.294	14.4	2.94	1.56	1.08	22.0	5.50	1.94
★**T 6 WF**	P.	18	5.30	6.12	6.565	.540	.305	15.3	3.14	1.70	1.26	11.9	3.62	1.50
TCB 6	P.	15.5	4.56	6.05	6.525	.465	.265	13.0	2.69	1.69	1.22	9.9	3.04	1.47
(CB 121)	P.	13.5	3.99	5.98	6.500	.400	.240	11.4	2.39	1.69	1.21	8.3	2.55	1.44
★**T 6 WF**	P.	11	3.24	6.16	4.030	.424	.260	11.7	2.58	1.90	1.63	2.27	1.13	.84
TCBL 6	P.	9.5	2.81	6.08	4.010	.349	.240	10.2	2.32	1.91	1.67	1.84	.92	.81
(CBL 12)	P.	8.25	2.43	6.00	4.000	.269	.230	9.02	2.13	1.93	1.76	1.39	.70	.76
T 6 WF														
TCBJ 6	P.	7.00	2.07	5.96	3.970	.224	.200	7.70	1.83	1.92	1.76	1.13	.57	.74
(CBJ 12)														

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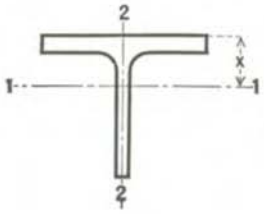
For key to letters in second column, refer to page 3.



STRUCTURAL TEES

CUT FROM

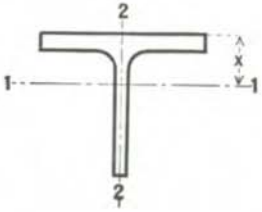
CB SECTIONS

T

PROPERTIES FOR DESIGNING

Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
	P.	56	16.46	5.69	10.415	1.248	.755	28.8	6.42	1.32	1.21	117.7	22.6	2.67
	P.	50	14.72	5.56	10.345	1.118	.685	24.8	5.62	1.30	1.14	103.3	20.0	2.65
	P.	44.5	13.10	5.44	10.275	.998	.615	21.3	4.88	1.28	1.07	90.3	17.6	2.63
T 5 WF	P.	38.5	11.34	5.31	10.195	.868	.535	17.7	4.10	1.25	1.00	76.7	15.1	2.60
TCB 5	P.	36	10.59	5.25	10.170	.808	.510	16.4	3.83	1.24	.97	70.9	13.9	2.59
(CB 103)	P.	33	9.71	5.19	10.117	.748	.457	14.5	3.39	1.22	.92	64.6	12.8	2.58
	P.	30	8.83	5.13	10.075	.683	.415	12.8	3.02	1.21	.88	58.2	11.6	2.57
	P.	27	7.94	5.06	10.028	.618	.368	11.2	2.64	1.18	.84	51.95	10.4	2.56
	P.	24.5	7.20	5.00	10.000	.558	.340	10.1	2.40	1.18	.81	46.5	9.30	2.54
★T 5 WF	P.	22.5	6.62	5.06	8.022	.618	.350	10.3	2.48	1.25	.91	26.6	6.63	2.00
TCB 5	P.	19.5	5.74	4.97	7.990	.528	.318	8.96	2.19	1.25	.88	22.5	5.62	1.98
(CB 102)	P.	16.5	4.86	4.88	7.964	.433	.292	7.80	1.95	1.27	.88	18.2	4.58	1.94
★T 5 WF	P.	14.5	4.27	5.11	5.799	.500	.289	8.38	2.07	1.40	1.05	7.61	2.62	1.34
TCB 5	P.	12.5	3.68	5.04	5.762	.430	.252	7.12	1.77	1.39	1.02	6.34	2.20	1.31
(CB 101)	P.	10.5	3.10	4.95	5.750	.340	.240	6.31	1.62	1.43	1.06	4.87	1.69	1.25
TCBL 5	P.	9.50	2.81	5.13	4.020	.394	.250	6.70	1.74	1.55	1.28	2.09	1.04	.86
(CBL 10)	P.	8.50	2.49	5.06	4.010	.329	.240	6.07	1.62	1.56	1.32	1.73	.86	.83
	P.	7.50	2.20	5.00	4.000	.269	.230	5.46	1.50	1.57	1.37	1.39	.70	.80
TCBJ 5 (CBJ 10)	P.	5.75	1.70	4.94	3.950	.204	.180	4.15	1.16	1.57	1.35	1.00	.51	.77
	P.	33.5	9.85	4.50	8.287	.933	.575	10.94	3.07	1.05	.94	44.3	10.7	2.12
	P.	29	8.53	4.38	8.222	.808	.510	9.11	2.60	1.03	.87	37.5	9.10	2.10
★T 4 WF	P.	24	7.06	4.25	8.117	.683	.405	6.92	2.00	.99	.78	30.45	7.50	2.08
TCB 4	P.	20	5.88	4.13	8.077	.558	.365	5.80	1.71	.99	.74	24.5	6.05	2.04
(CB 83)	P.	17.5	5.15	4.06	8.027	.493	.315	4.88	1.45	.97	.69	21.25	5.30	2.03
	P.	15.5	4.56	4.00	8.000	.433	.288	4.31	1.30	.97	.67	18.5	4.60	2.01
★T 4 WF	P.	14	4.12	4.03	6.540	.463	.285	4.22	1.28	1.01	.73	10.8	3.30	1.62
TCB 4	P.	12	3.53	3.97	6.500	.398	.245	3.53	1.08	1.00	.70	9.10	2.80	1.61
(CB 82)														
★T 4 WF	P.	10	2.94	4.07	5.268	.378	.248	3.66	1.13	1.12	.83	4.25	1.61	1.20
TCB 4	P.	8.5	2.50	4.00	5.250	.308	.230	3.21	1.01	1.13	.84	3.36	1.28	1.16
(CB 81)														
TCBL4A	P.	7.50	2.22	4.06	4.015	.314	.245	3.29	1.07	1.22	1.00	1.65	.82	.86
(CBL 8A)	P.	6.50	1.92	4.00	4.000	.254	.230	2.90	.98	1.23	1.03	1.31	.66	.83

Section Index in parentheses refers to beam from which tee is cut.
For key to letters in second column, refer to page 3.



STRUCTURAL TEES

CUT FROM

CB SECTIONS AND STANDARD BEAMS

PROPERTIES FOR DESIGNING

Section Index	District Produced	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	Axis 1-1				Axis 2-2		
					Width	Thickness		I	S	r	x	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.	In.⁴	In.³	In.
TCBJ 4 (CBJ 8)	P.	5.00	1.48	3.95	3.940	.204	.170	2.15	.72	1.21	.96	1.00	.51	.82
TCBL 3A (CBL 6A)	P.	8.00	2.36	3.13	4.030	.404	.260	1.66	.68	.84	.67	2.16	1.07	.96
	P.	6.00	1.77	3.00	4.000	.279	.230	1.30	.56	.86	.67	1.44	.72	.90
TCBJ 3 (CBJ 6)	P.	4.25	1.25	2.92	3.940	.194	.170	.90	.40	.85	.64	.94	.48	.87
TB 12 (B 18)	P.	60.	17.57	12.00	8.048	1.102	.798	244.5	28.9	3.73	3.53	42.5	10.6	1.56
	P.	52.95	15.49	12.00	7.875	1.102	.625	205.2	23.3	3.64	3.20	39.5	10.0	1.60
TB 12 (B 1)	P.	50.00	14.63	12.00	7.247	.871	.747	214.9	26.4	3.83	3.85	24.2	6.68	1.29
	P.	45.00	13.15	12.00	7.124	.871	.624	189.6	22.6	3.80	3.61	22.8	6.39	1.32
	P.	39.95	11.67	12.00	7.000	.871	.500	162.2	18.7	3.73	3.30	21.5	6.13	1.36
TB 10 (B 2)	P.	47.5	13.87	10.00	7.200	.916	.800	136.6	19.8	3.14	3.08	25.3	7.02	1.35
	P.	42.5	12.40	10.00	7.053	.916	.653	118.3	16.6	3.09	2.86	23.5	6.67	1.38
TB 10 (B 3)	P.	37.5	10.95	10.00	6.391	.789	.641	109.8	15.9	3.17	3.10	15.1	4.71	1.17
	P.	32.7	9.54	10.00	6.250	.789	.500	92.1	12.8	3.11	2.81	13.9	4.46	1.21
TB 9 (B 4)	P.	35.	10.23	9.00	6.251	.691	.711	84.5	14.	2.87	2.95	12.3	3.93	1.10
	P.	27.35	7.97	9.00	6.000	.691	.460	62.3	9.59	2.79	2.51	10.6	3.53	1.15
TB 7.5 (B 7)	P.	25.	7.30	7.50	5.640	.622	.550	40.5	7.73	2.36	2.26	7.99	2.83	1.05
	P.	21.45	6.25	7.50	5.500	.622	.410	32.9	5.99	2.29	2.01	7.32	2.66	1.08
★TB 6 (B 8)	P.	25.	7.29	6.00	5.477	.659	.687	25.2	6.06	1.86	1.85	8.01	2.92	1.05
	P.	20.4	5.92	6.00	5.250	.659	.460	18.8	4.26	1.78	1.58	6.91	2.63	1.08
★TB 6 (B 9)	P.	17.5	5.10	6.00	5.078	.544	.428	17.2	3.95	1.84	1.65	5.02	1.98	.99
	P.	15.9	4.63	6.00	5.000	.544	.350	14.9	3.31	1.79	1.52	4.75	1.90	1.01
★TB 5 (B 10)	P.	17.5	5.11	5.00	4.944	.491	.594	12.5	3.63	1.56	1.56	4.24	1.72	.91
	P.	12.7	3.69	5.00	4.660	.491	.310	7.81	2.05	1.45	1.20	3.45	1.48	.97
★TB 4 (B 12)	P.	11.5	3.36	4.00	4.171	.425	.441	5.02	1.77	1.22	1.16	2.19	1.05	.81
	P.	9.2	2.67	4.00	4.000	.425	.270	3.50	1.15	1.15	.94	1.89	.95	.84
★TB 3.5 (B 13)	P.	10.	2.92	3.50	3.860	.392	.450	3.36	1.36	1.07	1.04	1.61	.83	.74
	P.	7.65	2.22	3.50	3.660	.392	.250	2.18	.81	.99	.82	1.34	.73	.78
★TB 3 (B 14)	P.	8.625	2.51	3.00	3.565	.359	.465	2.13	1.02	.92	.92	1.17	.66	.68
	P.	6.25	1.81	3.00	3.330	.359	.230	1.27	.55	.84	.69	.93	.56	.72

Section Index in parentheses refers to beam from which tee is cut.
For key to letters in second column, refer to page 3.

HOT ROLLED SPECIAL SECTIONS

Though many of the component steel parts used in manufacturing and construction today are made from standard shapes (such as are shown elsewhere in this manual), there are literally thousands of other parts that are designed and produced as a Special Section.

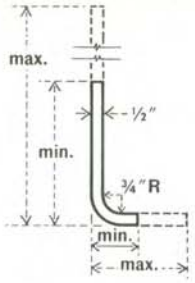
U. S. Steel, with its vast technical background as the largest producer of hot rolled Special Sections in the world, can assist you in the design and rolling of a Special Section ideally suited to your particular needs.

Variations of sizes and foot weights of standard shapes shown in this book can often be rolled to your exact requirements.

USS Special Sections offer these advantages:

- **Elimination of all or many production steps such as machining, welding, grinding and riveting.**
- **Less tonnage required due to less waste; can mean significant savings in freight and handling costs.**
- **Scrap losses reduced to almost zero and scrap handling costs all but eliminated.**

If you have any questions concerning USS Special Sections, please contact your nearest USS Sales Office. They will be happy to have a representative contact you concerning rolling feasibility, costs and specifications.



COLD ROLL-FORMED ANGLES*

(YODER MILL)

L

Yoder Mill angles are cold formed from carbon sheet, strip or plate sizes with production confined to Gary Steel Works. They can be furnished within the following limits. For grades other than carbon inquire.

	LIMITATIONS	TOLERANCES
Leg Dimensions	Vert. Leg—4" to 19½" Incl. Horiz. Leg—3" to 6" Incl.	Angles with long leg to 8" Incl.— +3/16"-1/8" Angles with long leg over 8" Incl.— +¼"-⅛"
Lengths	83'0" Max. for Thicknesses to 3/16" Incl. 60'0" Max. for Thicknesses over 3/16" 18'0" Min. for all Thicknesses	—0" under +6" over Ordered Length
Thickness	⅛" to ½" Incl.	Standard for the hot-rolled product involved

NOTE: All angles have fillet radius of ¾"

Calculation of Weights

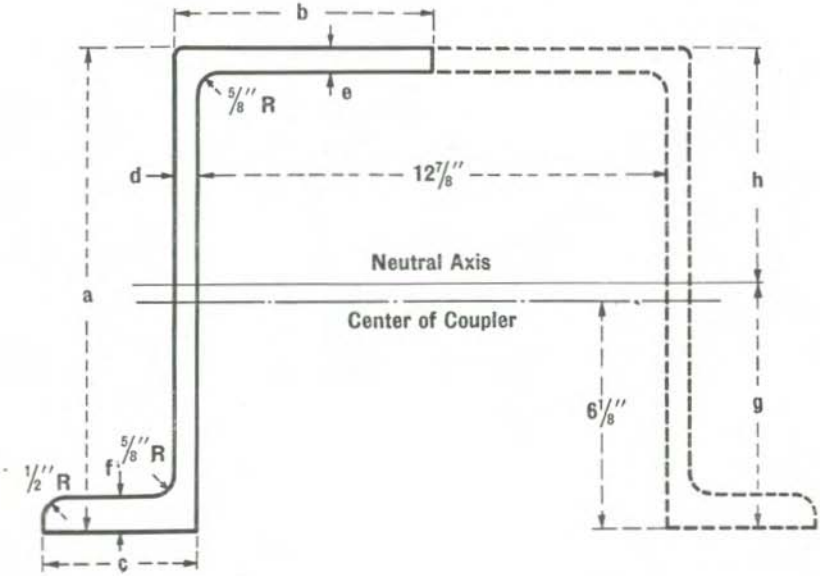
The weight of Yoder Mill Angles is calculated by adding together the length of each leg, deducting the fraction detailed below incident to the bend radius, which result determines the width of the material before forming. The theoretical piece weight is then obtained by multiplying the weight per linear foot of that size by the length of the angle ordered.

Ordered Thickness	Deduction
3/16"	1/2"
1/4"	5/8"
5/16"	5/8"
3/8"	3/4"
7/16"	7/8"
1/2"	1"

*Inquiries for shapes other than angles should be referred for production comments.

MISCELLANEOUS CAR BUILDING SECTIONS

CENTER SILL SECTION Z26



SECTION AS ROLLED

Section Index	District Rolled	Weight per Foot	Area of Section	a	b	c	d	e	f
		Lbs.	In.²	In.	In.	In.	In.	In.	In.
Z-26	P. C. G.	51.2	15.06	13 1/16	7 1/32	4 3/16	19/32	19/32	15/16
	P. C. G.	41.2	12.12	12 15/16	6 29/32	4 1/16	15/32	15/32	13/16
	P. C. G.	36.2	10.65	12 7/8	6 27/32	4	13/32	13/32	3/4
	P. C.	31.3	9.20	12 13/16	6 25/32	3 15/16	11/32	11/32	11/16

For Key to letters in second column, refer to page 3.

Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

DATA FOR COMPLETE SILL

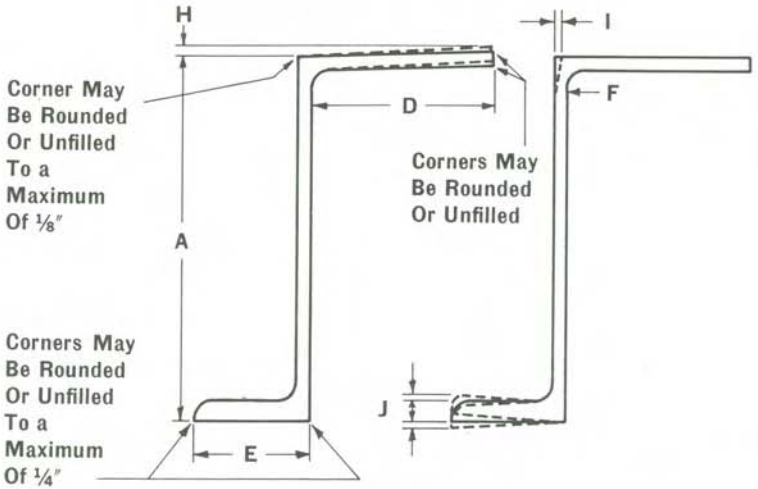
(TWO Z-26 SECTIONS)

Weight per Foot	Area	Moment of Inertia	Section Modulus		End Ratio		g	h
			Top	Bottom	Top	Bottom		
Lbs.	In.²	In.⁴	In.³	In.³			In.	In.
102.4	30.12	771.4	122.8	113.8	.0279	.0390	6.780	6.283
82.4	24.24	626.0	98.6	95.0	.0366	.0461	6.588	6.349
72.4	21.30	552.2	86.1	85.5	.0431	.0509	6.458	6.417
62.6	18.40	481.7	74.1	76.3	.0517	.0568	6.315	6.498

STANDARD MILL PRACTICE

ZEE CENTER SILL SECTIONS
STANDARD PRACTICE TABLES

Variations for Dimensions and Workmanship



Depth A		Inside Width Long Flange D		Width (Overall) Short Flange E		Weight		Off-Squareness, Flange to Web		
								Long Flange H	Short Flange J	
Over 1/16"	Under 1/16"	Over 0"	Under 1/8"	Over 5/32"	Under 1/4"	Over 2 1/2 %	Under 2 1/2 %	Up Only 1/8"	Over 1°	Under 1°

I—Depression in web—Maximum 1/16" at junction of web and flange, tapering to 0" about 1 1/4" down on web.

F—Inside depression—Maximum 1/32" Deep.

CAMBER

Lengths	Maximum	Preference
Up to 41 Ft. Incl.	1 1/4"	1/2" to 7/8"
Over 41 Ft. to 51 Ft. Incl.	1 1/2"	3/4" to 1 1/8"
Over 51 Ft. to 66 Ft. Incl.	2"	1 1/8" to 1 5/8"
Over 66 Ft. to 82 Ft. Incl.	3"	2" to 2 5/8"

Camber: Camber denotes the curvature from the plane of either flange in the length of the section. Section may vary from straight to cambered. If section is cambered, the camber of the long flange must be high at the center of length.

Sweep: Sweep denotes the curvature from the plane of the web in the length of the section. Maximum sweep in either direction:

$$1/8" \times \frac{\text{Number of feet of total length.}}{5}$$

Short kinks not acceptable.

LENGTH

Lengths	Variations from specified length* Plus	Minus
Up to 30 Ft. Incl.	3/4"	0"
Over 30 Ft. to 40 Ft. Incl.	1"	0"
Over 40 Ft.	1 1/4"	0"

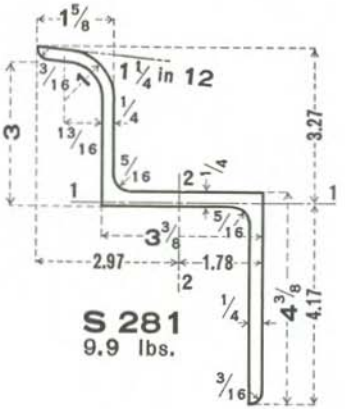
*Prefer plus 1/2", minus 0".

Surface conditioning same as applicable for structural shapes.

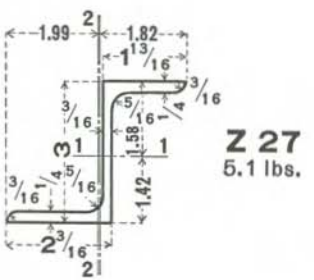
Maximum off-squareness of ends, 3/128 per inch of section depth. Excessive saw burrs to be removed.

MISCELLANEOUS CAR BUILDING SECTIONS

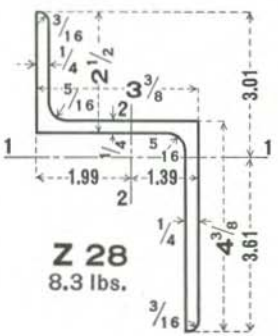
W SIDE PLATE SECTION



SIDE POST SECTION



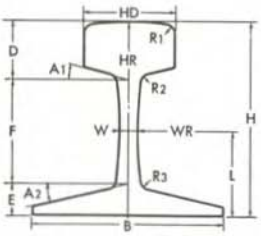
SIDE PLATE SECTION



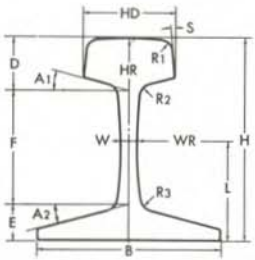
Section Index	District Rolled	Depth	Weight per Foot	Area	Axis 1-1		Axis 2-2	
					I	S	I	S
		In.	Lbs.	In.²	In.⁴	In.³	In.⁴	In.³
S 281	P.C.	7 1/16	9.9	2.89	11.26	2.70	6.94	2.34
1. Z 27	P.C.B.	3	5.10	1.50	2.13	1.34	1.16	0.58
Z 28	P.	3 3/8	8.30	2.44	6.53	1.81	4.48	2.25

For key to letters in second column, refer to page 3.
1. Also available in Cor-Ten steel @ 4.3# per ft. Pgh. district only.
Red indicates districts for certain ft.-wts. where rollings are infrequent (less than 4 times per year).

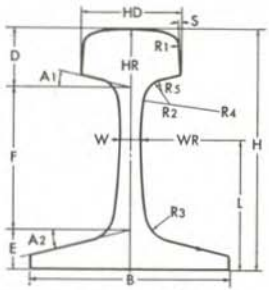
RAILROAD TEE RAILS AND LIGHT RAILS



A.S.C.E.



A.R.A. Series A & B
A.R.E.A.—100 lb.



A.R.E.A. 115, 132, 133 & 140 lb.

Weight per Yd. and Type	District Rolled	Section Index	Dimensions, Inches																	
			Depth	Base Width	Head Width	Web (min.)	Head Depth	Fishing (Web Depth)	Base Thickness	Head Angle Base Angle	Slope of Head	℄ of Web Radius	Head Radius	Web Radius	Head Fillet Radius	Web Fillet Rad. Top	Web Fillet Rad. Bottom		
			H	B	HD	W	D	F	E	A_1=A_2	S	L	HR	WR	R_1	R_2	R_3	R_4	R_5
60 lb. A.S.C.E.	B	6040	4 1/4	4 1/4	2 3/8	31/64	1 7/32	2 17/64	49/64	13°	str.	1 115/128	12	12	5/16	1/4	1/4		
75 lb. A.S.C.E.	B	7540	4 13/16	4 13/16	2 15/32	17/32	1 27/64	2 35/64	27/32	13°	str.	2 15/128	12	12	5/16	1/4	1/4		
80 lb. A.S.C.E.	B	8040	5	5	2 1/2	35/64	1 1/2	2 5/8	7/8	13°	str.	2 3/16	12	12	5/16	1/4	1/4		
85 lb. A.S.C.E.	CB	8540	5 5/16	5 5/16	2 9/16	9/16	1 35/64	2 3/4	57/64	13°	str.	2 17/64	12	12	5/16	1/4	1/4		
90 lb. A.R.A.-A	CB	9020	5 5/8	5 1/8	2 9/16	9/16	1 15/32	3 5/32	1	1:4	1:16	2 29/32	14	14	3/8	3/8	3/8		
100 lb. A.R.E.A.	B	10025	6	5 3/8	2 11/16	9/16	1 21/32	3 9/32	1 1/16	1:4	1:16	2 31/32	14	14	3/8	3/8	5/8		
100 lb. A.R.A.-A	CB	10020	6	5 1/2	2 3/4	9/16	1 9/16	3 3/8	1 1/16	1:4	1:16	2 15/16	14	14	3/8	3/8	3/8		
100 lb. A.R.A.-B	C	10030	5 41/64	5 9/64	2 21/32	9/16	1 45/64	2 55/64	1 5/64	13°	3°	2 65/128	12	12	3/8	5/16	5/16		
115 lb. A.R.E.A.	CB	11525	6 5/8	5 1/2	2 23/32	5/8	1 11/16	3 13/16	1 1/8	1:4	1:40	3 1/4	10 & 1 1/2	14	3/8	3/4	3/4	3	
119 lb.	CB	11937	6 13/16	5 1/2	2 21/32	5/8	1 7/8	3 13/16	1 1/8	1:4	1:40	3 1/4	1 1/2 & 14	3 & 14	9/16	3/4	3/4	3	
132 lb. A.R.E.A.	CB	13225	7 1/8	6	3	21/32	1 3/4	4 3/16	1 3/16	1:4	1:40	3 7/8	10 & 1 1/2	8 & 16	3/8	3/4	7/8		5/16
133 lb. P.S.	C	13331	7 1/16	6	3	11/16	1 15/16	3 15/16	1 3/16	1:3 14°	4°	3 3/4	10 & 1 1/2	8 & 16	3/8	3/4	3/4		7/16
136 lb. A.R.E.A.	CB	13637	7 5/16	6	2 15/16	11/16	1 15/16	4 3/16	1 3/16	1:4	1:40	3 7/8	1 1/2 & 14	8 & 26	9/16	3/4	3/4	8	5/16
140 lb. A.R.E.A.	C	14031	7 5/16	6	3	3/4	2 1/16	4 1/16	1 3/16	1:3 14°	4°	4	10 & 1 1/2	8 & 27	3/8	3/4	3/4		7/16

For key to letters in second column refer to page 3.
Rail sections shown in red are rolled very infrequently and therefore are not recommended.

The following rail sections (see table above), are recommended for use with LIGHT WEIGHT CRANES when our SPECIAL CRANE RAILS are heavier than required:

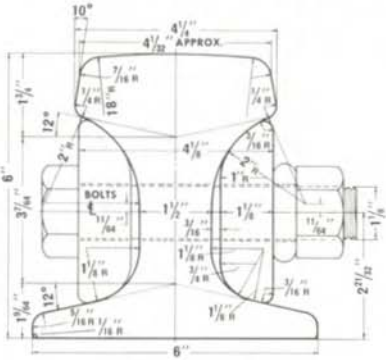
Pittsburgh and Chicago Districts.....8540.
Birmingham District .....6040 and 8540.

USS SPECIAL CRANE RAILS, shown on page 62, are recommended for Heavy Duty Cranes, or, see our booklet "USS SPECIAL CRANE RAILS AND FASTENINGS."

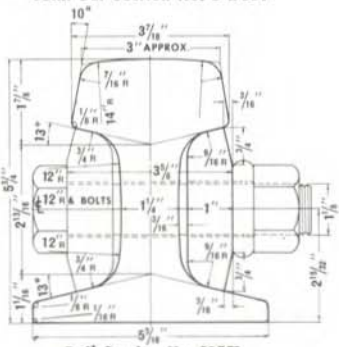
The following rail sections (see table below), are recommended for use in Industrial Railroad Tracks:

Pittsburgh and Chi. Districts.....8540, 9020, 11525, 13225 and 14031.
Birmingham District.....8540, 9020, 10025, 11525 and 13225.

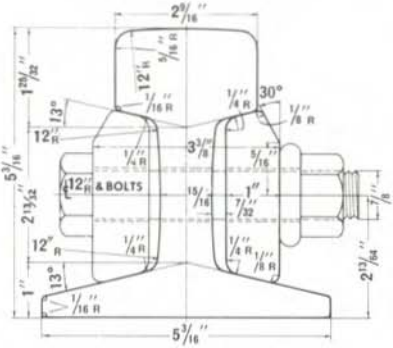
USS SPECIAL CRANE RAILS AND FASTENINGS



Rail Section No. 17551
Joint Bar Section No. S-17551



Rail Section No. 13551
Joint Bar Section No. S13551



Rail Section No. 10551
Joint Bar Section No. S-10551

RAIL PROPERTIES

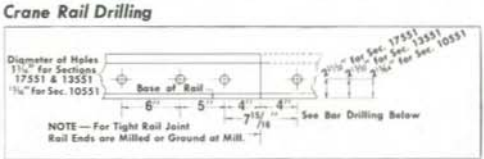
	District Rolled	Section No. 17551 C	Section No. 13551 C	Section No. 10551 PC
RAIL PROPERTIES	Area—Sq. In.	17.12	13.32	10.30
	Theo. Wt. Per Yd.—lbs.	174.62	135.86	105.10
	NominalWt. PerYd.—lbs.	175.	135.	105.
	Wt. One 39-Ft. Rail—lbs.	2270.1	1766.2	1366.3
	N. A. Above Base—Ins.	3.016	2.808	2.410
	Moment of Inertia—In^{-4}	70.22	50.59	34.41
	Sec. Mod.—Head—In^{-3}	23.53	17.20	12.39
	Sec. Mod.—Base—In^{-3}	23.28	18.02	14.28

JOINT BARS, BOLTS, NUTS AND SPRING WASHERS

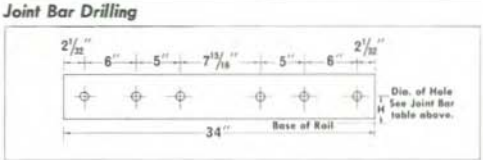
Joint Bar Sec. No.	Area Sq. Ins.	Wt. per Ft. Lbs.	Wt. of 34" Fabricated Bar Lbs.	Dimensions, Inches						
				Hole in Bar		Joint Bar Bolt			Spring Washer	
				Dia.	H	D	L	t	Size	Inside Dia.
S-17551	3.82	13.00	34.7	1 3/16	2 31/32	1 1/8	6	2	7/16 x 15/32	1 3/16
S-13551	3.19	10.85	28.9	1 3/16	2 15/32	1 1/8	5 1/2	2	7/16 x 15/32	1 3/16
S-10551	2.80	9.50	25.8	15/16	2 15/64	7/8	4 7/8	1 1/2	7/16 x 3/8	15/16

BOLTS—Machine, Quenched and Tempered Steel, hex. head and nut, A.S.T.M. specifications A325.
SPRING WASHERS—Alloy Steel, A.R.E.A. specifications.

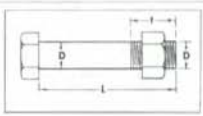
Crane Rail Drilling



Joint Bar Drilling



Joint Bar Bolt



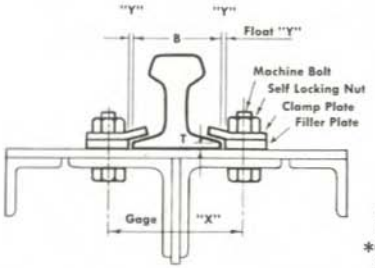
United States Steel Corporation produces the three special Crane Rails shown above. We recommend their use with heavy Duty Cranes on bridge and trolley. Standard Rail and Joint Bar Drilling is also shown. Note that spacing of holes in rail and bar makes necessary a drive fit of bolts which pull rail ends together; thus simulating welded rail construction. Clamp details for fastening rails on the runways are shown on page 61.

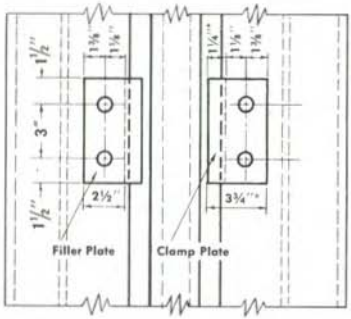
The Association of Iron and Steel Engineers recommends the use of these rails in their Specifications for Electric Overhead Traveling Cranes.

For more complete information on Crane Rails write for our booklet, "USS Special Crane Rails and Fastenings." Other rails produced by United States Steel are shown on page 62.

USS SPECIAL CRANE RAILS AND FASTENINGS

CRANE RAIL CLAMPS





CRANE RAIL CLAMPS—Clamps in pairs should be on about 3-ft. centers.

*CLAMP PLATE—Those within the limits of the joint bar are to be cut in the field to 3⅜" wide instead of 3¾", the 1¼" dimension being changed to ⅞", so that clamp will clear joint bar. Bend in all Clamp Plates is 13°.

BOLTS—Commercial carbon steel machine, with A.S.A. regular hex. head.

NUTS—A.S.A. regular hex., carbon steel, self locking type.

Components	Dimensions, Inches		
	Rail Sec. No. 17551	Rail Sec. No. 13551	Rail Sec. No. 10551
Base Width "B"	6	5 3/16	5 3/16
Toe Thickness—"T"	1/2	15/32	13/32
Gage—"X"	8 3/4	8	8
*Clamp Plate	6 x 1/2 x 3 3/4	6 x 1/2 x 3 3/4	6 x 1/2 x 3 3/4
Filler Plate	6 x 9/16 x 2 1/2	6 x 9/16 x 2 1/2	6 x 1/2 x 2 1/2
Float—"Y"	1/4	9/32	9/32
Bolt	1	1	1
Bolt Hole	1 1/16	1 1/16	1 1/16

The two bolts of this clamp keep the clamp and filler plates in alignment with the rail. Clamps are set so filler plate clears the rail base to allow for "Float Y." Filler plate is thicker than toe of rail "T" and clamp plate is bent 13° so as to clear top surface of rail base. This clearance between rail base and combined clamp and filler plates allows the rail to expand or contract without interference from clamps or runway girder.

TYPICAL CRANE RUNWAY

Runway rails should be ordered in Standard lengths (39') with one short piece on each side to complete a run such as that illustrated in the drawing of a typical 250-foot crane runway. If the short piece of rail shown as the 16-foot length in this sketch does not bring the joint reasonably close to the center of the 39-foot rail in the opposite run, user should order a piece 19½ feet (½ standard length) long.

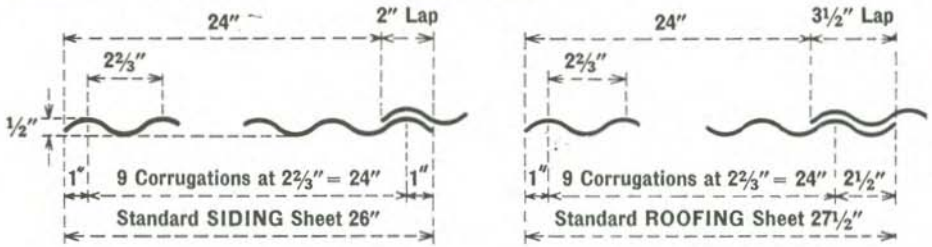
CORRUGATED SHEET CONSTRUCTION

Corrugated sheets, in addition to their extensive application as roofing and siding for buildings, are adaptable to other uses such as lining of shafts, supports and forms for floor arches, partitions, enclosures and culverts.

Corrugated sheets are available in steel of regular analysis or in rust-resisting alloys, usually copper bearing steel, either black or galvanized. Although the mills offer a wide choice in types and widths of corrugations, the curved type is generally used. General practice is to furnish in even foot lengths ranging from 60" to 144".

DOMESTIC WORK

Domestic Standard



Nominal 2½" widths of corrugation (actual 2⅔") are preferred for domestic work.

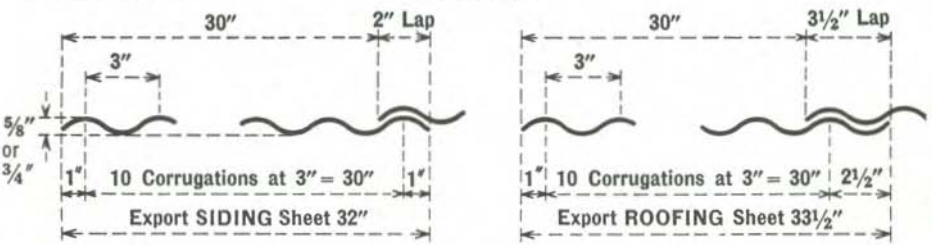
Siding sheets are 26" wide after corrugating, with both edges turned the same way. They are laid with one corrugation side lap as shown in sketch and minimum end lap of 4".

Roofing sheets are 27½" wide after corrugating with one edge turned up and the other down. They are laid with 1½ corrugations side lap as shown in sketch. A minimum end lap of 6" should be used for roof pitch of 4 in 12 or over and 8" for roof of less pitch. Corrugated steel roofing is seldom used for roof pitch under 3 in 12.

Both siding and roofing sheets cover approximately 24" net width.

EXPORT WORK

Export Style



Nominal 3" widths of corrugation are generally used for export work.

Siding sheets are 32" wide after corrugating, with both edges turned the same way.

Roofing sheets are 33½" wide after corrugating, with 1 edge turned up and the other turned down.

Both siding and roofing cover approximately 30" net width.

Sheet steel flashing must be provided at roof ridge, eaves, windows and wherever necessary to insure watertight results.

CORRUGATED SHEET CONSTRUCTION

STANDARD 2½" CORRUGATED*

Black					Galvanized					Maximum Span† Between Supports	
Manufacturers Standard Gage			Corrugated Pounds per Sq. Ft.		Galvanized Sheet Gage			Corrugated Pounds per Sq. Ft.			
Gage No.	Pounds per Sq. Ft.	Approx. Thick. Inches	26" Wide	27½" Wide	Gage No.	Pounds per Sq. Ft.	Approx. Thick. Inches	26" Wide	27½" Wide	Roofing	Siding
11	5.00	.120	5.38	5.45	11	5.15	.123	5.55	5.62	5′ 9″	5′ 10″
12	4.38	.105	4.71	4.77	12	4.53	.109	4.88	4.94	5′ 9″	5′ 10″
14	3.13	.075	3.37	3.41	14	3.28	.079	3.53	3.58	5′ 9″	5′ 10″
16	2.50	.060	2.69	2.73	16	2.66	.064	2.86	2.90	5′ 9″	5′ 10″
18	2.00	.048	2.15	2.18	18	2.16	.052	2.32	2.35	5′ 9″	5′ 10″
20	1.50	.036	1.62	1.64	20	1.66	.040	1.78	1.81	5′ 9″	5′ 10″
22	1.25	.030	1.35	1.36	22	1.41	.034	1.51	1.53	4′ 9″	5′ 10″
24	1.00	.024	1.08	1.09	24	1.16	.028	1.25	1.26	3′ 9″	4′ 10″
26	.75	.018	.81	.82	26	.91	.022	.98	.99	2′ 9″	3′ 10″
28	.63	.015	.67	.68	28	.78	.019	.84	.85	2′ 9″	3′ 10″
					29	.72	.017	.77	.78	2′ 9″	3′ 10″

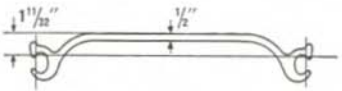
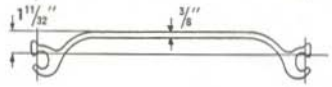
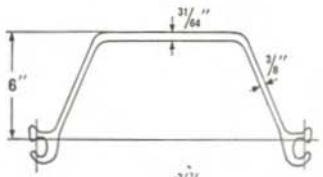
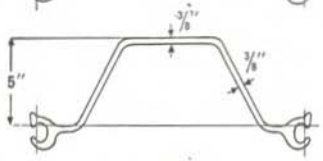
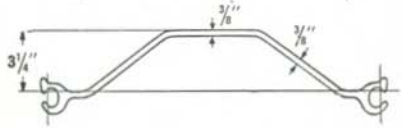
*—Standard 1¼" corrugated sheets, USS StormSeal roofing sheets, and USS 5-V crimped roofing sheets, are also available. †Calculated on the basis of 12,000 psi allowable unit stress.

EXPORT 3" CORRUGATED

Black				Galvanized				Maximum Span† Between Supports	
Manufacturers Standard Gage			Corrugated Pounds per Sq. Ft.	Galvanized Sheet Gage			Corrugated Pounds per Sq. Ft.		
Gage No.	Pounds per Sq. Ft.	Approx. Thick. Inches	32" & 33½" Wide	Gage No.	Pounds per Sq. Ft.	Approx. Thick. Inches	32" & 33½" Wide	Roofing	Siding
20	1.50	.036	1.67	20	1.66	.040	1.84	5′ 9″	5′ 10″
22	1.25	.030	1.39	22	1.41	.034	1.57	4′ 9″	5′ 10″
24	1.00	.024	1.11	24	1.16	.028	1.29	3′ 9″	4′ 10″
26	.75	.018	.83	26	.91	.022	1.01	2′ 9″	3′ 10″
28	.63	.015	.70	28	.78	.019	.87	2′ 9″	3′ 10″
				29	.72	.017	.80	2′ 9″	3′ 10″

Method of obtaining approximate gross area required:
Roofing=net area+end laps+15% for side laps of 1½ corrugations.
Siding=net area+end laps+10% for side laps of 1 corrugation.
†Calculated on the basis of 12,000 psi allowable unit stress.

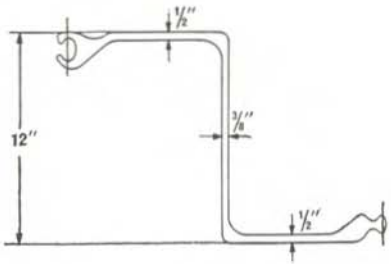
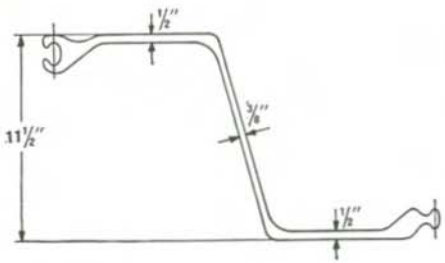
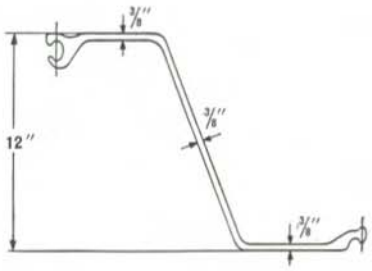
STEEL SHEET PILING SECTIONS

Profile	Section Index		District Rolled	Driving Distance per Pile	Weight		Web Thickness	Section Modulus	
					Per Foot	Per Square Foot of Wall		Per Pile	Per Foot of Wall
				In.	Lbs.	Lbs.	In.	In.³	In.³
	INTERLOCK WITH EACH OTHER	**MP 102***	P.C.	15	40.0	32.0	½	2.4	1.9
		**MP 101**	P.C.	15	35.0	28.0	⅜	2.4	1.9
	INTERLOCK WITH EACH OTHER	**MP 113***	P.	16	37.3	28.0	½	3.3	2.5
		**MP 112**	P.C.	16	30.7	23.0	⅜	3.2	2.4
		**MP 110***	P.	16	42.7	32.0	31/64	20.4	15.3
		**MP 116**	P.C.	16	36.0	27.0	⅜	14.3	10.7
		**MP 115**	P.C.	19⅝	36.0	22.0	⅜	8.8	5.4

For key to letters in second column, refer to page 3.

*Sections MP102, MP110 and MP 113 are infrequently rolled and we do not advise their use in a design unless an adequate tonnage can be ordered at one time to assure a minimum rolling.

STEEL SHEET PILING SECTIONS—Z PILES

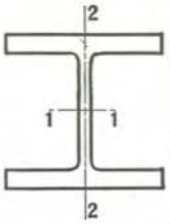
Profile		Section Index	District Rolled	Driving Distance per Pile	Weight		Web Thickness	Section Modulus	
					Per Foot	Per Square Foot of Wall		Per Pile	Per Foot of Wall
				In.	Lbs.	Lbs.	In.	In.³	In.³
	INTERLOCK WITH EACH OTHER AND WITH MP112 OR MP113	**MZ 38**	P.	18	57.0	38.0	3/8	70.2	46.8
		**MZ 32**	P.	21	56.0	32.0	3/8	67.0	38.3
	INTERLOCKS WITH ITSELF AND WITH MP112 OR MP113	**MZ 27**	P.	18	40.5	27.0	3/8	45.3	30.2

Complete data regarding these sections will be found in a separate publication entitled "USS Steel Sheet Piling." For key to letters in second column, refer to page 3.

STEEL H-PILES

WIDE FLANGE CBP SECTIONS

PROPERTIES OF SECTIONS



District Rolled	Section Index and Nominal Size	Weight per Foot	Area of Section	Depth of Section	FLANGE		Web Thickness	Axis 1-1			Axis 2-2		
					Width	Thickness		I	S	r	I	S	r
		Lbs.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
P.C.		117	34.44	14.230	14.885	.805	.805	1228.5	172.6	5.97	443.1	59.5	3.59
P.C.	CBP 145	102	30.01	14.030	14.784	.704	.704	1055.1	150.4	5.93	379.6	51.3	3.56
P.C.	**14x14½**	89	26.19	13.860	14.696	.616	.616	909.1	131.2	5.89	326.2	44.4	3.53
P.C.		73	21.46	13.640	14.586	.506	.506	733.1	107.5	5.85	261.9	35.9	3.49
P.C.	CBP 124	74	21.76	12.120	12.217	.607	.607	566.5	93.5	5.10	184.7	30.2	2.91
P.C.	**12 x 12**	53	15.58	11.780	12.046	.436	.436	394.8	67.0	5.03	127.3	21.2	2.86
P.C.	CBP 103	57	16.76	10.010	10.224	.564	.564	294.7	58.9	4.19	100.6	19.7	2.45
P.C.	**10 x 10**	42	12.35	9.720	10.078	.418	.418	210.8	43.4	4.13	71.4	14.2	2.40
P.C.	CBP 83	36	10.60	8.03	8.158	.446	.446	119.8	29.9	3.36	40.4	9.9	1.95
P.C.	**8 x 8**												

Complete data regarding these sections will be found in a separate USS publication entitled "Steel H-Piles."
For key to letters in first column, refer to page 3.

FLOOR PLATES*

ALLOWABLE UNIFORM LOAD IN LB. PER SQ. FT.

Weight of Plate Included - Simply Supported Along Two Opposite Edges - Bending Stress, 16,000 psi

Plate Thickness Inches	SPAN—Feet and Inches										
	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"
1/8	333	148	83	53	37						
3/16	750	333	188	120	83	61	47				
1/4	1333	593	333	213	148	109	83	65	53		
5/16	2083	926	521	333	231	170	130	103	83	69	58
3/8	3000	1333	750	480	333	245	188	148	120	99	83
7/16	4083	1815	1021	653	454	333	255	202	163	135	113
1/2	5333	2370	1333	853	593	435	333	263	213	176	148
5/8	8333	3704	2083	1333	926	680	521	412	333	275	231
3/4	12000	5333	3000	1920	1333	980	750	593	480	397	333
1	21333	9481	5333	3413	2370	1741	1333	1053	853	705	593
Deflection Coefficient	.0166	.0372	.0662	.1034	.1490	.2027	.2648	.3351	.4138	.5006	.5958

Deflections for loadings above stepped line will exceed 1/100th of the span.

The deflection coefficient at the bottom of each span column is a constant, which, when divided by the ***plate thickness*** under consideration, in inches, gives the deflection in inches at the center of the span for the tabular loading shown.

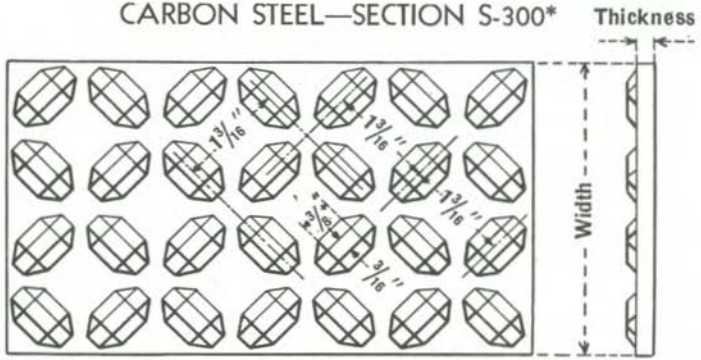
To find the deflection in inches for any uniform load less than tabulated above, find the deflection for the tabular load for a given span and plate thickness; multiply this deflection by the load per sq. ft. desired; and divide by the tabular allowable safe load above.

Plate Thickness in inches is the body or base thickness, and does not include the depth of the projections.

*Also available in High-Strength and Alloy Steels on an inquiry basis.

EXTREME SIZES OF RECTANGULAR AND CIRCULAR FLOOR PLATES

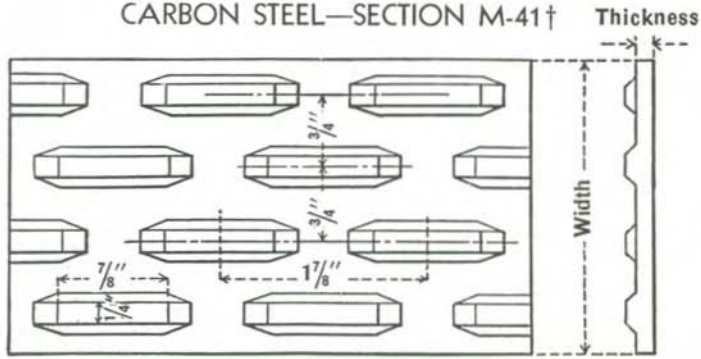
CARBON STEEL—SECTION S-300*



Thickness Inches	Weight—Lbs., per Sq. Ft.	WIDTHS IN INCHES: Over 8 to 12 Incl.	Over 12 to 18 Incl.	Over 18 to 24 Incl.	Over 24 to 30 Incl.	Over 30 to 48 Incl.	Over 48 to 60 Incl.	Over 60 to 72 Incl.	Over 72 to 84 Incl.	Circles Maximum Diameter, Inches	Thickness Inches
		LENGTHS IN INCHES									
1/8	6.15	144	180	240	240	240	240	...	...	60	1/8
3/16	8.70	144	180	300	360	600	600	600	600	84	3/16
1/4	11.25	144	180	300	360	600	600	600	600	84	1/4
5/16	3.80	144	180	300	360	600	600	600	600	84	5/16
3/8	16.35	120	180	300	360	600	600	600	600	84	3/8
7/16	18.90	120	180	300	360	600	600	600	...	72	7/16
1/2	21.45	120	180	300	360	600	600	600	...	72	1/2

*Chicago and Pittsburgh Districts.
Weights are approximate and may vary.

CARBON STEEL—SECTION M-41†



Thickness Inches	Weight—Lbs., per Sq. Ft.	WIDTHS IN INCHES: Over 8 to 12 Incl.	Over 12 to 18 Incl.	Over 18 to 24 Incl.	Over 24 to 30 Incl.	Over 30 to 60 Incl.	Over 60 to 72 Incl.	Over 72 to 84 Incl.	Over 84 to 90 Incl.	Circles Maximum Diameter, Inches	Thickness Inches
		LENGTHS IN INCHES									
1/8	6.50	144	180	240	360	480	...	...	...	60	1/8
3/16	8.70	144	180	300	360	600	600	600	480	90	3/16
1/4	11.25	144	180	300	360	600	600	600	480	90	1/4
5/16	13.80	144	180	300	360	600	600	600	480	90	5/16
3/8	16.35	120	180	300	360	600	600	600	480	90	3/8
7/16	18.90	120	180	300	360	600	600	600	480	90	7/16
1/2	21.45	120	180	300	360	600	600	600	480	90	1/2
5/8	26.55	120	180	300	360	600	600	600	...	84	5/8
3/4	31.65	120	180	300	360	480	480	480	...	84	3/4
1	41.85	...	...	300	360	480	360	...	...	72	1

†Pittsburgh District only.
Weights are approximate and may vary.

Note: The plate tables on the following pages have been grouped into producing districts in the order shown below to facilitate use of the tables.

PLATES ROLLED IN BIRMINGHAM DISTRICT

EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES

CARBON STEEL—STRUCTURAL GRADE

1¼ INCHES THICK AND UNDER

WIDTH Inches	THICKNESS - INCHES																
	¼	5/16	⅜	7/16	½	9/16	⅝	11/16	¾	13/16	⅞	15/16	1	1 1/16	1 1/8	1 3/16	1 ¼
	LENGTH - MAXIMUM INCHES																
9	600	600	600	600	600	540	540	480	480	360	360	360	360	300	300	300	300
10	600	600	600	600	600	540	540	480	480	384	384	360	360	300	300	300	300
11	600	600	600	600	600	480	480	420	420	360	360	300	300	...	...	...	...
12	600	600	600	600	600	480	480	384	384	360	360	336	336	264	264	264	264
13	600	600	600	540	540	480	480	384	384	360	360	300	300	264	264	264	264
14	600	600	600	540	540	456	456	360	360	324	324	264	264	264	264	264	264

Weights: Intermediate Thickness Available in 1/32" variations. No variations in widths.

PLATES ROLLED IN BIRMINGHAM DISTRICT

EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES

CARBON STEEL—STRUCTURAL GRADE

1½ INCHES THICK AND UNDER

Thickness Inches	Weight Lbs. / Ft.²	STANDARD PLATE WIDTH, INCHES																													Circles# Maximum Diameter, Inches
		36	Over 36 Thru 44	Over 44 Thru 48	Over 48 Thru 54	Over 54 Thru 60	Over 60 Thru 66	Over 66 Thru 72	Over 72 Thru 78	Over 78 Thru 84	Over 84 Thru 90	Over 90 Thru 96	Over 96 Thru 98	Over 98 Thru 100	Over 100 Thru 102	Over 102 Thru 104	Over 104 Thru 106	Over 106 Thru 108	Over 108 Thru 110	Over 110 Thru 112	Over 112 Thru 114	Over 114 Thru 116	Over 116 Thru 118	Over 118 Thru 120	Over 120 Thru 122	Over 122 Thru 124	Over 124 Thru 126	Over 126 Thru 128	
		MAXIMUM LENGTH, INCHES																													
.180	7.53	...	...	...	480	480	480	480	460	430	400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	90
3/16	7.65	570	570	570	570	570	570	530	500	460	430	400	400	400	370	370	320	320	320	320	320	...	...	...	...	...	...	...	...	...	114
1/4	10.20	600	600	600	600	600	600	600	580	540	500	480	400	400	400	380	380	360	340	340	340	320	320	320	..	..	..	..	..	..	120
5/16	12.75	600	600	600	600	600	600	600	600	600	600	600	550	550	550	550	550	530	530	530	500	500	500	500	500	480	420	360			123
3/8	15.30	720	720	720	720	720	720	720	720	720	660	660	660	660	600	600	600	550	550	550	520	520	520	480	480	480	400	400			123
7/16	17.85	720	720	720	720	720	720	720	720	720	660	660	660	660	600	600	600	550	550	550	520	520	520	480	480	480	400	400			96
1/2	20.40	720	720	720	720	720	720	720	720	720	680	680	680	680	640	640	640	640	600	600	600	600	560	560	540	500	440	400			96
9/16	22.95	720	720	720	720	720	720	720	720	720	680	680	680	680	640	640	640	640	600	600	600	600	560	560	540	500	440	400			128
5/8	25.50	720	720	720	720	720	720	720	720	720	680	680	680	680	640	640	640	640	600	600	600	600	560	560	540	500	440	400			128
11/16	28.05	720	720	720	720	720	720	720	720	720	680	680	680	680	640	640	640	640	600	600	600	600	560	560	540	500	440	400			128
3/4	30.60	720	720	720	720	720	720	720	720	720	680	680	680	680	640	640	640	630	600	600	590	580	560	560	540	500	440	400			128
13/16	33.15	720	720	720	720	720	720	720	720	720	680	650	640	630	610	600	590	580	570	560	550	540	530	520	510	500	440	400			128
7/8	35.70	720	720	720	720	720	720	720	720	690	650	600	590	580	570	560	550	540	530	520	510	500	490	480	480	470	440	400			128
1	40.80	720	720	720	720	720	720	700	650	600	570	530	520	510	500	490	480	470	460	450	450	440	430	420	420	410	400	380			128
1 1/8	45.90	...	...	720	720	720	650	600	550	510	480	450	430	420	410	400	390	390	380	370	370	360	350	350	340	340	330	330			128
1 1/4	51.00	...	...	720	720	650	590	540	500	460	430	400	380	380	370	360	360	350	340	340	330	320	320	310	310	300	300	290			128
1 3/8	56.10	...	...	720	660	590	530	490	450	420	390	360	350	340	340	330	320	320	310	310	300	300	290	290	280	280	270	270			128
1 1/2	61.20	...	...	680	600	540	490	450	410	380	350	330	320	310	310	300	300	290	290	280	280	270	270	260	260	250	250	240			128

Minimum Sheared Length - 60"
Widths 36" to 44": Sheared on Rotary Line
Widths 44" thru 120": Sheared on Rotary Line and/or Side Shear Line
Widths Over 120": Sheared on Side Shear Line
Note: #-All Circles are Flame Cut

PLATES ROLLED IN BIRMINGHAM DISTRICT
EXTREME SIZES OF RECTANGULAR SHEARED MILL PLATES
CARBON STEEL—STRUCTURAL GRADE
OVER 1½ INCHES THICK (Gas Cut)

Thickness Inches	Weight Lbs., per Sq. Ft.	STANDARD PLATE WIDTH, INCHES																						
		27	Over 27 Thru 28	Over 28 Thru 30	Over 30 Thru 32	Over 32 Thru 34	Over 34 Thru 36	Over 36 Thru 38	38	Over 38 Thru 40	Over 40 Thru 42	Over 42 Thru 44	Over 44 Thru 46	Over 46 Thru 48	Over 48 Thru 50	Over 50 Thru 52	Over 52 Thru 54	Over 54 Thru 56	Over 56 Thru 58	Over 58 Thru 60	Over 60 Thru 62	Over 62 Thru 64	Over 64 Thru 66
		MAXIMUM STANDARD PLATE LENGTH, INCHES																						
1⅝	66.3	270	290	310	330	350	330	310	720	720	689	658	629	603	579	556	536	517	499	482	467	452	438
1¾	71.4	270	290	310	330	320	305	290	707	672	640	611	584	560	537	517	498	480	463	448	433	420	407
1⅞	76.5	270	290	310	315	300	280	270	660	627	597	570	545	522	502	482	464	448	432	418	404	392	380
2	81.6	270	290	310	295	275	260	250	619	588	560	534	517	490	470	452	435	420	405	392	379	367	356
2¼	91.8	270	240	240	240	240	230	220	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
2½	102.0	265	240	240	230	220	205	190	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
2¾	112.2	240	235	220	205	195	185	170	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
3	122.4	215	210	195	185	175	165	155	240	240	240	240	240	240	240	240	240	240	240	240	240	240	237
3½	142.8	185	175	165	155	145	135	130	240	240	240	240	240	240	240	240	240	240	232	224	217	210	204
4	163.2	156	150	140	130	125	115	110	240	240	240	240	240	240	235	226	218	210	203	196	190	184	178
4½	183.6	...	...	...	...	...	...	...	240	240	240	237	227	218	209	201	193	187	180	174	168	163	158
5	204.0	...	...	...	...	...	...	...	240	235	224	214	204	196	188	181	174	168	162	157	152	147	142
5½	224.4	...	...	...	...	...	...	...	235	214	204	194	186	178	171	164	158	153	147	142	138	134	130
6	244.8	...	...	...	...	...	...	...	206	196	187	178	170	163	157	151	145	140	135	131	126	122	119
6½	265.2	...	...	...	...	...	...	...	192	182	173	166	158	152	146	140	135	130	126	121	118	114	110
7	285.6	...	...	...	...	...	...	...	177	168	160	153	146	140	134	139	124	120	116	112	108	105	102
7½	306.0	...	...	...	...	...	...	...	165	157	149	142	136	131	125	121	116	112	108	104	101	98	95
8	326.4	...	...	...	...	...	...	...	155	147	140	134	128	122	118	113	109	105	101	98	95	92	89

Inquire for widths under 27 inches.

(Cont. next page)

For maximum circle diameters, see table on page 74.

PLATES ROLLED IN BIRMINGHAM DISTRICT
EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES
CARBON STEEL—STRUCTURAL GRADE
OVER 1½ INCHES THICK (Gas Cut)

Thickness Inches	Weight Lbs., per Sq. Ft.	STANDARD PLATE WIDTH, INCHES																					Circles Maximum Diameter, Inches
		Over 66 Thru 68	Over 68 Thru 70	Over 70 Thru 72	Over 72 Thru 74	Over 74 Thru 76	Over 76 Thru 78	Over 78 Thru 80	Over 80 Thru 82	Over 82 Thru 84	Over 84 Thru 86	Over 86 Thru 88	Over 88 Thru 92	Over 92 Thru 96	Over 96 Thru 100	Over 100 Thru 104	Over 104 Thru 108	Over 108 Thru 112	Over 112 Thru 116	Over 116 Thru 120	Over 120 Thru 124	Over 124 Thru 128	
		MAXIMUM STANDARD PLATE LENGTH, INCHES																					
1⅛	66.3	425	413	402	391	381	371	362	353	344	336	329	314	301	289	278	268	258	249	241	233	226	128
1¼	71.4	395	384	373	363	354	344	336	328	320	312	305	292	280	269	258	249	240	232	224	217	210	128
1⅜	76.5	369	358	348	339	330	321	313	306	299	292	285	273	261	251	241	232	224	216	209	202	196	128
2	81.6	346	336	326	318	309	301	294	287	280	273	267	255	245	235	226	218	210	203	196	190	184	128
2¼	91.8	240	240	240	240	240	240	240	240	240	240	237	227	218	209	201	193	187	180	174	169	163	128
2½	102.0	240	240	240	240	240	240	235	229	224	219	214	204	196	188	181	174	168	162	157	152	147	128
2¾	112.2	240	240	237	231	225	219	214	208	204	199	194	186	178	171	164	158	153	147	142	136	131	128
3	122.4	230	224	218	212	206	201	196	191	187	182	178	170	163	157	151	145	140	135	131	128	...	124
3½	142.8	198	192	187	182	177	172	168	164	160	156	153	146	140	134	129	124	120	116	...	...	...	120
4	163.2	173	168	163	159	155	151	147	143	140	137	134	128	122	118	113	109	...	...	...	...	...	108
4½	183.6	154	149	145	141	137	134	131	127	124	121	119	114	109	104	...	...	...	...	...	...	...	104
5	204.0	138	134	131	127	124	121	118	115	112	109	107	102	98	...	...	...	...	...	...	...	...	98
5½	224.4	126	122	119	116	112	110	107	104	102	99	97	93	...	...	...	...	...	...	...	...	...	92
6	244.8	115	112	109	106	103	100	98	96	93	91	89	...	...	...	...	...	...	...	...	...	...	88
6½	265.2	107	104	101	98	96	93	91	89	87	...	...	...	...	...	...	...	...	...	...	...	...	78
7	285.6	99	96	93	91	88	86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	78
7½	306.0	92	90	87	85	82	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	78
8	326.4	86	84	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	72

PLATES ROLLED IN PITTSBURGH DISTRICT

EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES

CARBON STEEL

2½ INCHES THICK AND UNDER

THICKNESS INCHES	WEIGHT LBS. PER SQ. FT.	WIDTHS IN INCHES						
		Over 8 to 8¼	Over 8¼ to 8½	Over 8½ to 8¾	Over 8¾ to 9	Over 9 to 9¼	Over 9¼ to 9½	Over 9½ to 10
		LENGTHS IN INCHES						
¼	10.20	1080	1080	1080	1080	1080	1080	1080
5/16	12.75	1080	1080	1080	1080	1080	1080	1080
⅜	15.30	1080	1080	1080	1080	1056	1020	996
7/16	17.85	960	936	948	924	900	876	852
½	20.40	840	852	828	804	780	756	744
9/16	22.95	744	756	732	708	708	672	648
⅝	25.50	852	708	684	840	816	840	684
¾	30.60	708	684	720	696	684	696	684
⅞	35.70	600	588	612	600	576	588	576
1	40.80	528	504	540	516	504	516	504
1⅛	45.90	516	552	540	528	528	540	516
1¼	51.00	468	492	480	468	468	480	468
1⅜	56.10	420	456	444	420	420	432	420
1½	61.20	384	408	396	384	384	396	384
1⅝	66.30	348	372	372	360	360	360	348
1¾	71.40	360	348	348	336	348	336	324
1⅞	76.50	336	324	324	312	324	312	300
2	81.60	312	300	300	288	300	288	288
2⅛	.....	288	288	288	276	276	276	264
2¼	.....	276	264	264	252	264	252	252
2⅜	.....	264	252	252	240	252	240	240
2½	.....	240	240	240	228	240	228	216

PLATES ROLLED IN PITTSBURGH DISTRICT
EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES
CARBON STEEL
2 INCHES THICK AND UNDER

Thickness Inches	Weight Lbs., per Sq. Ft.	WIDTHS IN INCHES																			
		10 to 11 Incl.	Over 11 to 13 Incl.	Over 13 to 15 Incl.	Over 15 to 17 Incl.	Over 17 to 19 Incl.	Over 19 to 21 Incl.	Over 21 to 23 Incl.	Over 23 to 25 Incl.	Over 25 to 27 Incl.	Over 27 to 29 Incl.	Over 29 to 31 Incl.	Over 31 to 33 Incl.	Over 33 to 36 Incl.	Over 36 to 37 Incl.	Over 37 to 39 Incl.	Over 39 to 41 Incl.	Over 41 to 43 Incl.	Over 43 to 45 Incl.	Over 45 to 47 Incl.	Over 47 to 48 Incl.
		LENGTHS IN INCHES																			
1/4	10.20	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	720	600	....	...	...	...	...	....	....
5/16	12.75	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1080	1080	1080	960	840	720	600	....	....
3/8	15.30	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1080	1080	....	....
7/16	17.85	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1080	1080
1/2	20.40	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1080
9/16	22.95	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
5/8	25.50	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
3/4	30.60	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
7/8	35.70	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1193	1169
1	40.80	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1197	1142	1091	1044	1023
1 1/8	45.90	1200	1200	1168	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1180	1119	1064	1014	970	927	910
1 1/4	51.00	1200	1200	1052	1200	1200	1200	1200	1200	1200	1200	1200	1190	1091	1061	1006	957	913	873	835	819
1 3/8	56.10	1200	1104	956	1200	1200	1200	1200	1200	1200	1200	1151	1082	991	965	915	870	830	794	759	....
1 1/2	61.20	1195	1012	876	1152	1139	1129	1120	1114	1107	1102	1056	991	908	884	838	797	761	726	696	....
1 5/8	66.30	1103	934	803	1063	1051	1042	1034	1028	1022	1018	974	915	838	816	775	736	702	240	240	....
1 3/4	71.40	1025	867	751	987	976	968	961	954	949	945	904	850	779	758	719	684	652	240	240	....
1 7/8	76.50	956	809	701	921	912	904	896	891	886	882	844	793	726	707	671	638	608	240	240	....
2	81.60	897	759	657	863	854	847	840	835	830	826	791	744	681	663	629	596	571	240	240	....

Plate requirements in excess of dimensions shown may be submitted for special consideration.
Plates less than 10" wide—see page 75.

PLATES ROLLED IN PITTSBURGH DISTRICT
EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES
CARBON STEEL
OVER 2 INCHES THICK

Thickness Inches	WIDTHS IN INCHES																		
	10 to 11 Incl.	Over 11 to 13 Incl.	Over 13 to 15 Incl.	Over 15 to 17 Incl.	Over 17 to 19 Incl.	Over 19 to 21 Incl.	Over 21 to 23 Incl.	Over 23 to 25 Incl.	Over 25 to 27 Incl.	Over 27 to 29 Incl.	Over 29 to 31 Incl.	Over 31 to 33 Incl.	Over 33 to 35 Incl.	Over 35 to 37 Incl.	Over 37 to 39 Incl.	Over 39 to 41 Incl.	Over 41 to 43 Incl.	Over 43 to 45 Incl.	Over 45 to 46 Incl.
	LENGTHS IN INCHES																		
2¼	764	646	561	736	729	722	716	711	708	704	675	632	596	564	535	508	485	240	240
2½	688	582	505	662	656	649	644	640	637	634	606	568	536	507	481	458	437	240	240
3	573	485	420	552	546	541	537	533	531	528	506	474	447	423	401	381	364	347	333
3½	491	415	360	473	468	464	460	457	455	453	433	406	383	362	344	327	312	298	286
4	430	363	315	414	410	406	403	400	398	396	379	355	335	317	300	286	273	260	250
4½	382	323	280	368	364	361	358	355	354	352	337	316	298	282	267	254	243	231	222
5	343	291	252	331	328	325	322	320	318	317	303	284	268	253	240	229	218	208	200
5½	...	264	229	301	298	295	293	291	289	288	278	260	245	232	220	209	200	190	183
6	...	...	210	276	273	270	268	266	265	264	253	237	223	211	200	190	182	173	166
6½	...	...	194	254	252	250	248	246	245	244	234	220	207	196	186	176	169	161	154
7	...	...	...	236	234	232	230	226	227	226	216	203	191	181	172	163	156	149	143
7½	...	...	...	220	218	216	215	213	212	211	202	188	178	168	160	152	144	138	132
8	...	...	...	...	205	203	201	200	199	198	189	177	167	158	150	143	136	130	125
8½	...	...	...	...	192	191	189	188	187	186	178	167	157	149	141	134	128	122	117
9	...	...	...	...	...	180	179	178	177	176	168	158	149	141	133	127	121	115	111
9½	...	...	...	...	...	...	161	160	167	167	159	149	141	133	126	120	115	110	105
10	...	...	...	...	...	...	153	152	159	158	152	142	134	127	120	114	109	104	100
10½	...	...	...	...	...	...	...	145	151	151	144	135	127	120	114	109	104	99	95
11	...	...	...	...	...	...	...	139	144	144	138	129	122	115	109	104	100	95	91
11½	...	...	...	...	...	...	...	...	138	137	132	123	116	110	104	99	95	90	87
12	...	...	...	...	...	...	...	...	132	132	126	118	111	105	100	95	91	86	83
12½	...	...	...	...	...	...	...	...	127	126	121	114	107	101	96	91	87	83	80
13	...	...	...	...	...	...	...	...	...	122	117	110	103	98	93	88	84	80	77
13½	...	...	...	...	...	...	...	...	...	117	112	105	99	94	89	84	81	77	74
14	...	...	...	...	...	...	...	...	...	...	108	101	95	90	86	81	78	74	71
14½	...	...	...	...	...	...	...	...	...	...	104	98	92	87	83	79	75	72	69
15	...	...	...	...	...	...	...	...	...	...	...	94	89	84	80	76	72	69	66

Plate requirements in excess of dimensions shown may be submitted for special consideration.

Plates less than 10" wide—see page 75.

PLATES ROLLED IN PITTSBURGH DISTRICT
EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES
CARBON STEEL
1½ INCHES THICK AND UNDER

Thickness, Inches	Max. Wt. Lbs. Per Sq. Ft.	WIDTHS IN INCHES																										Circles, Maximum Diameter, Inches
		24 to 30 Excl	30 to 36 Excl	36 to 42 Excl	42 to 48 Incl.	48 1/16 to 54 Excl	54 to 60 Excl	60 to 66 Excl	66 to 72 Excl	72 to 78 Excl	78 to 84 Excl	84 to 87 Excl	87 to 90 Excl	90 to 92 Excl	92 Only	Over 92 to 96 Excl	96 to 102 Excl	102 to 108 Excl	108 to 114 Excl	114 to 120 Excl	120 to 126 Excl	126 to 132 Excl	132 to 138 Excl	138 to 144 Excl	144 to 150 Excl	150 Only	
		LENGTHS IN INCHES																										
.180	7.53	.....	.....	.....	.....	600	600	600	600	600	600	540	360	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	. . .
3/16	7.65	.....	.....	.....	.....	900	900	900	900	840	720	600	540	480	390	390	390	380	370	360	330	320	300	.....	.....	.....	.....	138
. . .	9.62	720	720	900	900	900	900	900	900	840	720	600	540	480	450	430	430	430	430	410	390	340	300	.....	.....	.....	.....	150
1/4	10.2	720	720	900	900	900	900	900	900	840	720	600	550	500	500	500	480	480	480	480	480	480	450	450	450	.....	.....	152
5/16	12.75	900	900	900	900	900	900	900	900	900	900	840	780	720	520	520	520	480	480	480	480	480	480	450	450	450	.....	152
3/8	15.30	900	900	900	900	900	900	900	900	900	900	840	780	720	720	720	720	720	660	600	480	480	480	480	480	480	.....	152
7/16	17.85	900	900	900	900	900	900	900	900	900	900	840	780	720	720	720	720	720	720	660	600	520	480	480	480	480	.....	152
1/2	20.40	900	900	900	900	900	900	900	900	900	900	840	780	720	720	720	720	720	720	660	600	560	520	480	480	480	.....	152
9/16	22.95	900	900	900	900	900	900	900	900	900	900	840	780	720	720	720	720	720	720	720	720	720	660	600	540	480	480	152
5/8	25.50	900	900	900	900	900	900	900	900	900	720	720	720	720	720	720	720	720	720	720	720	720	660	600	540	520	500	152
11/16	28.05	900	900	900	900	870	820	750	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
3/4	30.60	900	900	900	900	830	740	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
13/16	33.15	495	515	520	520	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
7/8	35.7	495	495	520	520	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
1	40.8	450	465	520	520	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
1 1/8	45.9	450	465	520	520	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
1 1/4	51.0	400	450	500	500	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152
1 1/2	61.2	400	420	500	500	600	660	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	660	600	560	540	.....	152

Plate requirements in excess of dimensions shown may be submitted for special consideration.

PLATES ROLLED IN PITTSBURGH DISTRICT
EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES
CARBON STEEL
OVER 1½ INCHES THICK (GAS CUT)

Thickness, Inches	WIDTHS IN INCHES																				Circles Maximum Diameter, Inches
	42 to 46 Incl.	Over 46 to 47 Incl.	Over 47 to 48 Incl.	Over 48 to 54 Incl.	Over 54 to 60 Incl.	Over 60 to 66 Incl.	Over 66 to 72 Incl.	Over 72 to 78 Incl.	Over 78 to 84 Incl.	Over 84 to 90 Incl.	Over 90 to 96 Incl.	Over 96 to 102 Incl.	Over 102 to 108 Incl.	Over 108 to 114 Incl.	Over 114 to 120 Incl.	Over 120 to 126 Incl.	Over 126 to 132 Incl.	Over 132 to 138 Incl.	Over 138 to 144 Incl.	Over 144 to 150 Incl.	
	LENGTHS IN INCHES																				
1¾	500	500	500	600	660	720	720	720	720	720	720	720	720	720	720	660	620	600	580	540	152
2	500	500	500	600	660	720	720	720	720	720	720	720	690	660	620	590	560	540	520	480	152
2¼	500	500	500	600	600	600	600	600	600	600	600	569	537	510	483	460	439	420	402	382	150
2½	500	500	500	600	600	600	600	600	600	576	540	508	481	455	431	412	391	374	359	343	150
3	500	500	500	600	600	600	596	550	511	477	448	420	397	376	357	340	323	311	298	284	150
3½	.....	500	500	600	600	553	507	467	434	405	380	358	337	320	304	289	276	264	353	243	150
4	.....	500	500	550	528	481	441	406	377	352	329	311	293	278	263	251	239	228	220	212	150
4½	.....	494	483	473	465	423	387	358	332	311	290	273	257	246	232	222	211	202	194	185	150
5	.....	440	430	423	416	378	347	320	297	276	258	244	231	219	207	198	189	180	173	165	150
5½	.....	398	389	382	376	341	312	289	268	250	234	221	209	196	188	178	172	165	158	.....	144
6	.....	364	357	351	345	313	287	264	246	228	214	202	190	181	171	163	155	150	.....	.....	144
6½	.....	337	330	323	317	289	264	244	225	211	198	186	175	166	159	151	144	138	.....	.....	138
7	.....	311	305	299	293	267	246	225	211	196	184	173	163	153	148	139	133	.....	.....	.....	133
7½	.....	292	286	280	275	250	228	211	202	182	171	160	152	144	137	130	.....	.....	.....	.....	128
8	.....	279	273	268	263	239	220	202	186	174	163	152	142	137	128	.....	.....	.....	.....	.....	125
8½	.....	257	252	247	242	221	202	186	175	160	152	142	133	129	.....	.....	.....	.....	.....	.....	120
9	.....	244	238	233	228	209	192	175	166	153	142	135	127	.....	.....	.....	.....	.....	.....	.....	117
9½	.....	229	225	221	217	196	181	166	159	144	134	128	.....	.....	.....	.....	.....	.....	.....	.....	113
10	.....	218	214	210	206	188	171	159	151	137	128	.....	.....	.....	.....	.....	.....	.....	.....	.....	103
10½	.....	205	201	199	197	179	164	151	144	130	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	97
11	.....	198	194	191	188	170	156	144	137	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93
11½	.....	190	187	183	180	164	149	137	132	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88
12	.....	181	179	175	171	157	143	132	128	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84
12½	.....	177	173	168	164	150	138	128	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80
13	.....	168	164	161	158	144	134	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77
13½	.....	161	158	155	152	138	127	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74
14	.....	156	153	149	146	133	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71
14½	.....	150	147	144	142	128	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68
15	.....	145	142	139	137	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65

Plate requirements in excess of dimensions shown may be submitted for special consideration.

PLATES ROLLED IN PITTSBURGH DISTRICT
160" SHEARED PLATE MILL
T-1 STEEL—HEAT TREATED TO PUBLISHED PHYSICALS (FLANGE AND FIREBOX QUALITY)
T-1 TYPE "A" UP TO 1¼" INCLUSIVE

Maximum Thickness	Max. WT. Lbs. Per Sq. Ft.	WIDTH IN INCHES													CIRCLE DIAMETER	
		Over 65 to 72 Incl.	Over 72 to 78 Incl.	Over 78 to 84 Incl.	Over 84 to 90 Incl.	Over 90 to 96 Incl.	Over 96 to 102 Incl.	Over 102 to 108 Incl.	Over 108 to 114 Incl.	Over 114 to 120 Incl.	Over 120 to 126 Incl.	Over 126 to 132 Incl.	Over 132 to 136 Incl.	Over 136 to 147 Incl.		
		LENGTH IN INCHES													MIN.	MAX.
5/16	7.65	360	360	360	360	360	..	..	..	..	..	..	..	..	15	96
¼	10.20	480	480	480	480	480	480	480	..	..	..	..	..	..	15	108
5/16	12.75	480	480	480	480	480	480	480	480	480	..	..	..	..	15	120
3/8	15.30	480	480	480	480	480	480	480	480	480	480	..	..	..	15	126
½	20.40	480	480	480	480	480	480	480	480	480	480	480	480	..	15	126
5/8	25.50	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
¾	30.60	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
7/8	35.70	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
1	40.80	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
1⅛	45.90	480	480	480	480	480	480	480	480	480	480	474	440	410	15	147
1¼	51.00	480	480	480	480	480	480	480	480	480	480	474	440	410	15	147
1⅜	56.10	438	438	438	438	442	442	442	442	442	420	402	390	362	15	147
1½	61.20	434	434	434	434	440	440	440	440	440	440	440	440	414	15	147
1¾	71.40	400	400	400	400	400	400	400	400	400	400	400	400	378	15	147
2	81.60	374	374	374	374	374	374	374	374	374	374	374	374	352	15	147
2¼	91.80	320	320	320	320	320	320	320	320	320	320	320	320	300	15	147
2½	102.00	412	412	412	412	412	412	412	412	412	412	412	412	386	15	147
2¾	112.20	372	372	372	372	372	372	372	372	372	372	372	372	350	15	147
3	122.40	340	340	340	340	340	340	340	340	340	340	340	340	318	15	147
3¼	132.60	312	312	312	312	312	312	312	312	312	312	312	312	292	15	147
3½	142.80	286	286	286	286	286	286	286	286	286	286	286	286	270	15	147
3¾	153.00	266	266	266	266	266	266	266	266	266	266	266	266	250	15	147
4	163.20	248	248	248	248	248	248	248	248	248	248	248	248	232	15	147

Sizes 65" wide and narrower and/or over 4" thick will be considered on a confer basis.

Minimum circle shear diameter is 45". Maximum circle shear gauge is ⅜".

Lengths greater than published—submit inquiry.

PLATES ROLLED IN PITTSBURGH DISTRICT
160″ SHEARED PLATE MILL

T-1 STEEL—Heat Treated to Published Physicals
T-1 STEEL—Heat Treated to 321 or 360 Minimum Brinell
T-1 Type "A"—Heat Treated to 321 Minimum Brinell Thru 1¼″

Max. Thickness	Max. Wt Lbs. Per Sq. Ft.	WIDTH IN INCHES														CIRCLE DIAMETER	
		50 Incl. to 65 Incl.	Over 65 to 72 Incl.	Over 72 to 78 Incl.	Over 78 to 84 Incl.	Over 84 to 90 Incl.	Over 90 to 96 Incl.	Over 96 to 102 Incl.	Over 102 to 108 Incl.	Over 108 to 114 Incl.	Over 114 to 120 Incl.	Over 120 to 126 Incl.	Over 126 to 132 Incl.	Over 132 to 136 Incl.	Over 136 to 147 Incl.		
		LENGTH IN INCHES														MIN.	MAX.
3/16	7.65	..	360	360	360	360	360	..	..	..	..	..	..	..	..	15	96
¼	10.20	..	480	480	480	480	480	480	480	..	..	..	..	..	..	15	108
5/16	12.75	..	480	480	480	480	480	480	480	480	480	..	..	..	..	15	120
⅜	15.30	..	480	480	480	480	480	480	480	480	480	480	..	..	..	15	126
½	20.40	..	480	480	480	480	480	480	480	480	480	480	480	480	..	15	136
⅝	25.50	..	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
¾	30.60	..	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
⅞	35.70	..	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
1	40.80	..	480	480	480	480	480	480	480	480	480	480	480	480	480	15	147
1⅛	45.90	..	480	480	480	480	480	480	480	480	480	480	474	440	410	15	147
1¼	51.00	..	480	480	480	480	480	480	480	480	480	480	474	440	410	15	147
1⅜	56.10	..	438	438	438	438	442	442	442	442	442	420	402	390	362	15	147
1½	61.20	..	434	434	434	434	440	440	440	440	440	440	440	440	414	15	147
1¾	71.40	..	400	400	400	400	400	400	400	400	400	400	400	400	378	15	147
2	81.60	..	374	374	374	374	374	374	374	374	374	374	374	374	352	15	147
2¼	91.80	432	432	432	432	432	432	432	432	408	384	364	348	338	314	15	147
2½	102.00	432	432	432	432	432	432	432	432	432	432	432	432	420	392	15	147
2¾	112.20	432	432	432	432	432	432	432	432	432	432	410	392	380	354	15	147
3	122.40	432	432	432	432	432	432	432	432	418	394	376	358	348	324	15	147
3¼	132.60	432	432	432	432	432	432	430	406	384	360	344	328	318	296	15	147
3½	142.80	432	432	432	432	432	426	396	374	356	334	318	304	294	274	15	147
3¾	153.00	432	432	432	432	424	396	370	348	330	310	296	280	272	254	15	147
4	163.20	432	432	432	422	394	368	344	326	308	290	278	262	256	236	15	147

Sizes under 65″ wide up to 2″ thick incl. and sizes under 50″ wide and/or over 2″ to 4″ thick will be on a confer basis.

Circles—Minimum thickness ½″ for 321 or 360 Brinell.

Minimum circle shear diameter is 45″. Maximum circle shear gauge is ⅜″.

Maximum Thickness 1½″ for 360 minimum Brinell.

Maximum Thickness 1¼″ for T-1 Type "A".

Lengths greater than published—submit inquiry.

PLATES ROLLED IN CHICAGO DISTRICT

EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES

CARBON STEEL
2 INCHES THICK AND UNDER

Thickness Inches	Weight Lbs. per Sq. Ft.	WIDTHS IN INCHES													
		Over 8 to 8½	Over 8½ to 9	Over 9 to 9½	Over 9½ to 10	Over 10 to 12	Over 12 to 14	Over 14 to 16	Over 16 to 18	Over 18 to 20	Over 20 to 22	Over 22 to 24	Over 24 to 26	Over 26 to 28	Over 28 to 30
		LENGTHS IN INCHES													
¼	10.20	1320	1320	1320	1320	1320	1320	1320	1320	1200	1200	1140	1080	1020	960
5/16	12.75	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1200	1200	1140	1080
⅜	15.30	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1260	1200
7/16	17.85	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
½	20.40	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
9/16	22.95	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
⅝	25.50	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
¾	30.60	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
⅞	35.70	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
1	40.80	1320	1320	1320	1320	1320	1308	1296	1290	1284	1278	1272	1266	1266	1182
1⅛	45.90	1200	1200	1188	1188	1164	1152	1140	1128	1128	1128	1116	1116	1116	1032
1¼	51.00	1080	1068	1068	1068	1044	1032	1032	1020	1020	1008	1008	1008	996	936
1⅜	56.10	972	972	972	960	948	936	936	924	924	912	912	912	912	846
1½	61.20	900	888	888	888	864	864	852	840	840	840	828	828	828	792
1⅝	66.30	816	816	816	816	804	792	780	780	780	768	768	768	768	714
1¾	71.40	756	756	756	756	744	732	732	726	720	720	714	714	708	660
1⅞	76.50	708	708	702	702	696	684	684	678	672	672	666	666	660	624
2	81.60	660	660	660	648	648	648	636	630	630	624	624	624	624	576

Plate requirements in excess of dimensions shown may be submitted for special consideration.

PLATES ROLLED IN CHICAGO DISTRICT
EXTREME SIZES OF RECTANGULAR UNIVERSAL MILL PLATES
CARBON STEEL
OVER 2 INCHES THICK

Thickness Inches	WIDTHS IN INCHES													
	Over 8 to 8½	Over 8½ to 9	Over 9 to 9½	Over 9½ to 10	Over 10 to 12	Over 12 to 14	Over 14 to 16	Over 16 to 18	Over 18 to 20	Over 20 to 22	Over 22 to 24	Over 24 to 26	Over 26 to 28	Over 28 to 30
	LENGTHS IN INCHES													
2¼	588	588	582	582	576	570	564	558	558	552	552	552	546	510
2½	528	528	522	522	516	510	504	504	498	498	492	492	492	456
2¾	474	474	474	474	468	462	456	456	450	450	450	450	444	414
3	432	432	432	432	426	420	420	414	414	408	408	408	408	378
3½	372	366	366	366	366	360	354	354	348	348	348	348	348	324
4	324	324	318	318	318	312	312	306	306	306	300	300	300	282
4½	282	282	282	282	276	276	270	270	270	270	270	264	264	246
5	252	252	252	252	252	246	246	240	240	240	240	240	234	222
5½	228	228	228	228	228	222	222	216	216	216	216	216	216	198
6	204	204	204	204	204	204	198	198	198	198	198	192	192	180

Plate requirements in excess of dimensions shown may be submitted for special consideration.

PLATES ROLLED IN CHICAGO DISTRICT

EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES

CARBON STEEL

1½ INCHES THICK AND UNDER

Plate Gauge Inches	WIDTH IN INCHES																											Circles Maximum Diameter
	30–40 Excl.	40–48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	195	200	
	LENGTH IN INCHES																												
3/16	..	..	720	720	720	720	720	720	600	600	600	600	600	600	540	540	540	540	540	540	..	..	..	..	..	..	..	..	156
¼	720	720	720	720	720	720	720	720	720	720	660	660	660	660	600	600	600	600	600	540	540	540	540	..	..	..	..	..	174
5/16	720	720	720	720	720	840	840	840	780	780	720	720	720	720	660	660	660	660	660	600	600	600	600	540	540	..	..	..	186
3/8	1050	1050	1050	1020	929	1048	968	900	839	840	780	780	780	780	720	720	720	720	720	660	660	660	660	600	600	540	540	420	200
7/16	1050	1050	1050	943	859	963	940	900	890	890	840	820	810	800	740	730	730	720	720	660	660	660	660	600	600	540	540	420	200
½	1050	1050	1050	960	960	980	980	940	940	940	880	860	840	820	760	740	740	720	720	660	660	660	660	600	600	540	540	420	200
9/16	925	960	960	1020	1020	1020	1020	990	990	990	930	900	870	840	780	750	750	720	720	660	660	660	660	600	600	540	540	420	200
5/8	833	1020	1020	1020	1020	1060	1060	1040	1040	1040	980	940	900	860	800	760	760	720	720	660	660	660	660	600	600	540	540	420	200
11/16	810	1080	1080	1080	1080	1100	1100	1090	1090	1090	1030	980	930	880	820	770	770	720	720	660	660	660	660	600	600	540	540	420	200
¾	759	1140	1140	1140	1140	1140	1140	1140	1140	1140	1080	1020	960	900	840	780	780	720	720	660	660	660	660	600	600	540	540	420	200
7/8		1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1080	960	900	840	810	810	750	720	660	660	660	660	600	600	540	540	420	200
1	SEE NOTE (1) BELOW	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	960	900	840	840	840	780	720	660	660	660	660	600	600	540	540	420	200
1⅛		1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1080	960	900	840	840	840	780	720	660	660	660	660	600	600	540	540	..	195
1¼		1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1020	960	900	840	840	840	780	720	660	660	660	660	600	600	540	540	..	195
1½		960	960	960	960	960	960	960	960	960	960	960	960	900	840	840	840	780	720	660	660	660	660	600	600	540	540	..	195

(1) 30" to 40" wide plates are to be rolled in triple widths, then flame cut to width. Length limits are to be based on total width.

(2) Plate requirements in excess of dimensions shown may be submitted for special consideration.

PLATES ROLLED IN CHICAGO DISTRICT

EXTREME SIZES OF RECTANGULAR AND CIRCULAR SHEARED MILL PLATES

CARBON STEEL

OVER 1½ INCHES THICK (GAS CUT)

Plate Gauge Inches	WIDTH IN INCHES: 30–40 Excl.	40–48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	195	200	Circles Maximum Diameter
	LENGTH IN INCHES																												
1¾		960	960	960	960	960	960	960	960	960	960	960	960	900	840	840	780	780	720	660	660	660	660	600	600	540	540	..	195
2		960	960	960	960	960	960	960	960	960	960	960	928	882	840	802	767	720	706	660	653	630	608	550	530	515	506	..	195
2¼		960	960	960	960	960	960	960	960	960	922	871	826	784	747	713	682	654	627	604	581	560	541	488	471	458	450	..	195
2½		960	960	960	960	960	960	960	942	883	830	784	743	706	672	642	614	588	564	543	522	504	487	440	424	412	405	..	195
2¾		960	960	960	960	960	960	917	856	803	755	712	676	642	611	583	558	535	514	494	475	458	443	400	386	375	368	..	195
3		960	960	960	960	960	906	841	785	736	692	653	619	588	560	535	511	490	471	453	436	420	406	366	354	343	337	..	195
3½		917	917	917	917	841	776	720	673	630	593	560	531	504	480	458	438	420	403	388	373	360	348	314	303	294	289	..	195
4	S	803	803	803	803	736	680	630	589	552	519	490	464	441	420	401	384	368	353	339	327	315	304	275	265	257	253	..	195
4½	E	713	713	713	713	654	604	560	523	490	461	435	413	392	373	356	341	327	314	302	290	280	271	244	236	229	225	..	195
5	E	642	642	642	642	589	543	504	471	442	415	392	371	353	336	321	307	294	282	272	261	252	243	220	212	206	202	..	195
5½		583	583	583	583	535	494	458	428	401	378	356	338	321	306	292	279	267	257	247	238	229	221	200	193	..	..	..	186
6	N	535	535	535	535	490	453	420	392	368	346	327	310	294	280	267	256	245	235	226	218	210	203	183	..	..	..	..	180
6½	O	494	494	494	494	453	418	388	362	339	319	301	286	271	258	247	236	226	217	209	202	194	187	..	..	..	..	..	180
7	T	458	458	458	458	421	388	360	336	315	297	280	265	252	240	229	219	210	202	194	187	180	174	..	..	..	..	..	174
7½	E	428	428	428	428	392	362	336	314	294	277	261	248	235	224	214	205	196	188	181	174	168	..	..	..	..	..	..	168
8		401	401	401	401	368	340	315	294	276	260	245	232	221	210	201	192	184	177	170	163	..	..	..	..	..	..	..	162
8½	(1)	377	377	377	377	346	319	297	277	260	244	230	219	208	198	189	181	173	166	160	..	..	..	..	..	..	..	..	156
9	B	357	357	357	357	327	302	280	262	245	231	218	206	196	187	178	171	163	157	..	..	..	..	..	..	..	..	..	150
9½	E	338	338	338	338	310	286	265	248	232	219	206	196	186	177	169	162	155	..	..	..	..	..	..	..	..	..	..	144
10	L	321	321	321	321	294	272	252	235	221	208	196	186	177	168	160	154	147	..	..	..	..	..	..	..	..	..	..	144
10½	O	306	306	306	306	280	259	240	224	210	198	187	177	168	160	153	146	..	..	..	..	..	..	..	..	..	..	..	138
11	W	292	292	292	292	267	247	229	214	200	189	178	169	161	153	146	140	..	..	..	..	..	..	..	..	..	..	..	138
11½		279	279	279	279	256	236	219	204	192	180	170	162	154	146	139	..	..	..	..	..	..	..	..	..	..	..	..	132
12		267	267	267	267	245	226	210	196	184	173	163	155	147	140	134	..	..	..	..	..	..	..	..	..	..	..	..	132
12½		257	257	257	257	235	217	202	188	176	166	157	149	141	134	..	..	..	..	..	..	..	..	..	..	..	..	..	126
13		247	247	247	247	226	209	194	181	170	160	151	143	136	129	..	..	..	..	..	..	..	..	..	..	..	..	..	126
13½		238	238	238	238	218	201	187	174	163	154	145	138	131	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120
14		229	229	229	229	210	194	180	168	158	148	140	133	126	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120
14½		221	221	221	221	203	187	174	162	152	143	135	128	122	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120
15		214	214	214	214	196	181	168	157	147	138	131	124	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	114

(1) 30" to 40" wide plates are to be rolled in triple widths, then flame cut to width. Length limits are to be based on total width.

(2) Plate requirements in excess of dimensions shown may be submitted for special consideration.

COLUMBIA - GENEVA STEEL DIVISION

EXTREME SIZES OF HOT ROLLED CARBON STEEL RECTANGULAR PLATES UNDER .40% MAXIMUM CARBON OTHER THAN FULLY KILLED GRADES

Thickness in inches	WIDTHS IN INCHES																
	36	Over 36 to 42	Over 42 to 48	48 1/16	Over 48 1/16 to 54	Over 54 to 60	Over 60 to 66	Over 66 to 72	Over 72 to 78	Over 78 to 84	Over 84 to 90	Over 90 to 96	Over 96 to 102	Over 102 to 108	Over 108 to 114	Over 114 to 120	Over 120 to 121
	MAXIMUM LENGTHS IN INCHES																
.1800	..	..	..	480	480	480	480	480	480	420	..	..	..	..	..	..	..
3/16	..	..	..	480	480	480	480	480	480	420	420	420	..	..	..	..	..
1/4	720	720	720	720	720	720	720	720	720	600	520	520	520	520	520	520	..
5/16	720	720	720	720	720	720	720	720	720	600	520	520	520	520	520	520	520
3/8	720	720	720	720	720	720	720	720	720	720	600	600	600	600	600	600	600
7/16	720	720	720	720	720	720	720	720	720	720	600	600	600	600	600	600	600
1/2	720	720	720	720	720	720	720	720	720	720	600	600	600	600	600	600	600
9/16	720	720	720	720	720	720	720	720	720	720	600	600	600	600	600	480	..
5/8	720	720	720	720	720	720	720	720	720	710	600	600	600	576	546	480	..
11/16	720	720	720	720	720	720	720	720	720	636	600	600	600	600	600	480	..
3/4	720	720	720	720	720	720	720	720	710	580	580	580	580	580	546	476	..
13/16	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	468	..
7/8	480	480	480	480	480	480	480	480	480	480	480	480	480	480	468	432	..
15/16	480	480	480	480	480	480	480	480	480	480	458	458	458	458	436	414	..
1	480	480	480	480	480	480	480	480	480	430	428	428	428	428	408	388	..
1 1/16	480	480	480	480	480	480	480	480	480	404	402	402	402	402	382	364	..
1 1/8	480	480	480	480	480	480	480	480	476	380	378	378	378	378	360	343	..
1 3/16	480	480	480	480	480	480	480	480	450	358	357	357	357	357	340	322	..
1 1/4	480	480	480	480	480	480	480	480	426	339	338	338	388	338	321	305	..
1 5/16	480	480	480	480	480	480	480	480	412	322	320	320	320	320	305	290	..
1 3/8	480	480	480	480	480	480	480	462	396	306	305	305	305	305	290	275	..
1 7/16	480	480	480	480	480	480	480	452	374	291	290	290	290	290	275	262	..
1 1/2	480	480	480	480	480	480	468	426	350	420	277	277	277	277	264	250	..

COLUMBIA - GENEVA STEEL DIVISION

EXTREME SIZES OF HOT ROLLED CARBON STEEL RECTANGULAR PLATES
UNDER .40% MAXIMUM CARBON OTHER THAN FULLY KILLED GRADES

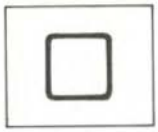
Thickness in Inches	WIDTHS IN INCHES															
	36	Over 36 to 42	Over 42 to 48	Over 48 to 54	Over 54 to 60	Over 60 to 66	Over 66 to 72	Over 72 to 78	Over 78 to 84	Over 84 to 90	Over 90 to 96	Over 96 to 102	Over 102 to 108	Over 108 to 114	Over 114 to 120	Over 120 to 121
	MAXIMUM LENGTHS IN INCHES															
19/16	532	480	512	530	496	456	413	353	270	265	265	265	265	252	239	...
1 5/8	512	464	492	508	480	436	398	335	258	254	254	254	254	241	228	...
1 11/16	492	436	480	488	464	420	383	323	248	244	244	244	244	232	220	...
1 3/4	480	430	464	470	448	404	368	309	238	234	234	234	234	223	211	...
1 13/16	456	414	446	453	430	390	354	296	229	225	225	225	225	214	203	...
1 7/8	440	400	432	438	416	376	342	288	220	217	217	217	217	206	...	...
1 15/16	425	386	416	422	402	363	331	278	213	210	210	210	210	...	...	...
2	411	373	402	408	388	350	319	268	205	202	202	202	202	...	...	...
2 1/16	398	361	390	396	376	340	309	259	...	...	...	...	...	...	...	...
2 1/8	385	350	378	384	364	329	298	251	...	...	...	...	...	...	...	...
2 3/16	375	341	367	372	353	319	290	243	...	...	...	...	...	...	...	...
2 1/4	362	330	355	360	341	308	280	235	...	...	...	...	...	...	...	...
2 5/16	352	320	344	350	331	300	272	228	...	...	...	...	...	...	...	...
2 3/8	343	311	334	341	322	291	265	222	...	...	...	...	...	...	...	...
2 7/16	333	303	324	331	315	284	258	215	...	...	...	...	...	...	...	...
2 1/2	324	294	317	322	305	275	251	210	...	...	...	...	...	...	...	...
2 9/16	316	285	308	313	297	268	244	204	...	...	...	...	...	...	...	...
2 5/8	308	278	301	306	290	261	237	...	...	...	...	...	...	...	...	...
2 11/16	300	272	293	298	283	254	231	...	...	...	...	...	...	...	...	...
2 3/4	292	265	285	290	275	248	225	...	...	...	...	...	...	...	...	...
2 13/16	285	259	280	284	269	242	219	...	...	...	...	...	...	...	...	...
2 7/8	278	252	272	276	262	237	214	...	...	...	...	...	...	...	...	...
2 15/16	272	247	266	270	256	231	208	...	...	...	...	...	...	...	...	...
3	266	241	260	264	250	225	206	...	...	...	...	...	...	...	...	...

All sizes over 1½" must be gas cut to width and length.

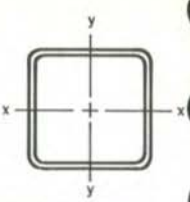
The minimum length for each thickness and width combination is 200", either in one length or multiples adding up to a minimum of 200", but not exceeding the maximum shown in the table.

Flange and Firebox Quality semi-killed grades and fully killed grades and other fully killed grades are available, but are produced to size limits different from those shown in this table.

PLATES
Geneva District

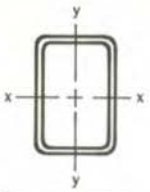


NATIONAL TUBE DIVISION*
SQUARE STRUCTURAL TUBING
PROPERTIES FOR DESIGNING



Outside Dimensions	District Rolled	Wall Thickness	Weight per Foot	Area of Metal	I	S	r	Maximum Outside Corner Radius
In.		In.	Lb.	In.²	In.⁴	In.³	In.	In.
1 x 1	F	.095	1.09	.3206	.0420	.0839	.3618	.190
		.133	1.41	.4152	.0484	.0968	.3415	.268
2 x 2	F	.110	2.69	.7914	.4574	.4574	.7603	.268
		.125	3.04	.8934	.5079	.5079	.7540	.268
		.154	3.65	1.0750	.5911	.5911	.7415	.312
		.1875	4.31	1.2688	.6667	.6667	.7249	.375
2½ x 2½	F	.141	4.32	1.2720	1.1498	.9198	.9507	.312
		.1875	5.59	1.6438	1.4211	1.1369	.9298	.375
		.250	7.10	2.0890	1.6849	1.3479	.8981	.500
3 x 3	F	.155	5.78	1.7015	2.2509	1.5006	1.1502	.312
		.1875	6.86	2.0188	2.5977	1.7318	1.1344	.375
		.250	8.80	2.5890	3.1509	2.1006	1.1032	.500
3½ x 3½	F	.156	6.88	2.0240	3.7112	2.1207	1.3541	.312
		.1875	8.14	2.3938	4.2904	2.4517	1.3388	.375
		.250	10.50	3.0890	5.2844	3.0196	1.3079	.500
		.3125	12.69	3.7329	6.0826	3.4758	1.2765	.625
4 x 4	P	.1875	9.31	2.7383	6.4677	3.2338	1.5369	.470
		.250	12.02	3.5354	7.9880	3.9940	1.5031	.625
		.3125	14.52	4.2720	9.2031	4.6016	1.4677	.785
		.375	16.84	4.9543	10.152	5.0760	1.4315	.938
		.500	20.88	6.1416	11.234	5.6169	1.3524	1.250
5 x 5	P	.1875	11.86	3.4883	13.208	5.2831	1.9458	.470
		.250	15.42	4.5354	16.595	6.6380	1.9128	.625
		.3125	18.77	5.5220	19.489	7.7955	1.8786	.785
		.375	21.94	6.4543	21.946	8.7784	1.8440	.938
		.500	27.68	8.1416	25.521	10.208	1.7705	1.250
6 x 6	P	.1875	14.41	4.2383	23.496	7.8322	2.3545	.470
		.250	18.82	5.5354	29.845	9.9482	2.3220	.625
		.3125	23.02	6.7720	35.465	11.822	2.2884	.785
		.375	27.04	7.9543	40.436	13.479	2.2547	.938
		.500	34.48	10.142	48.379	16.126	2.1841	1.250
7 x 7	P	.1875	16.85	4.9577	37.698	10.771	2.7575	.565
		.250	22.04	6.4817	48.052	13.729	2.7228	.750
		.3125	26.99	7.9389	57.306	16.373	2.6867	.940
		.375	31.73	9.3339	65.544	18.727	2.6499	1.125
		.500	40.55	11.927	78.913	22.547	2.5722	1.500
8 x 8	P	.250	25.44	7.4817	73.382	18.346	3.1318	.750
		.3125	31.24	9.1889	88.095	22.024	3.0963	.940
		.375	36.83	10.834	101.46	25.366	3.0603	1.125
		.500	47.35	13.927	124.08	31.021	2.9849	1.500
10 x 10	P	.250	32.23	9.4817	147.89	29.578	3.9494	.750
		.3125	39.74	11.689	179.12	35.824	3.9146	.940
		.375	47.03	13.834	208.21	41.642	3.8795	1.125
		.500	60.95	17.927	259.81	51.962	3.8069	1.500
		.625	73.98	21.761	302.94	60.587	3.7311	1.875

*This product is also sold by Columbia-Geneva Division.



NATIONAL TUBE DIVISION*
RECTANGULAR STRUCTURAL TUBING
PROPERTIES FOR DESIGNING

Outside Dimensions	District Rolled	Wall Thickness	Weight per Foot	Area of Metal	AXIS X-X			AXIS Y-Y			Maximum Outside Corner Radius
					I_x	S_x	r_x	I_y	S_y	r_y	
In.		In.	Lb.	In.²	In.⁴	In.³	In.	In.⁴	In.³	In.	In.
3 x 2	F	.141	4.32	1.2720	1.4972	.9981	1.0849	.7951	.7951	.7906	.312
		.1875	5.59	1.6438	1.8551	1.2367	1.0623	.9758	.9758	.7704	.375
		.250	7.10	2.0890	2.2030	1.4687	1.0269	1.1466	1.1466	.7409	.500
4 x 2	F	.155	5.78	1.7015	3.3477	1.6738	1.4027	1.1230	1.1230	.8124	.312
		.1875	6.86	2.0188	3.8654	1.9327	1.3837	1.2849	1.2849	.7978	.375
		.250	8.80	2.5890	4.6893	2.3447	1.3458	1.5321	1.5321	.7692	.500
4 x 3	F	.156	6.88	2.0240	4.5198	2.2599	1.4944	2.8949	1.9299	1.1959	.312
		.1875	8.14	2.3938	5.2291	2.6146	1.4780	3.3404	2.2269	1.1813	.375
		.250	10.50	3.0890	6.4498	3.2249	1.4450	4.0988	2.7326	1.1519	.500
		.3125	12.69	3.7329	7.4338	3.7169	1.4112	4.7000	3.1333	1.1221	.625
5 x 3	P	.1875	9.31	2.7383	8.8629	3.5452	1.7991	4.0118	2.6746	1.2104	.470
		.250	12.02	3.5354	10.949	4.3797	1.7598	4.9195	3.2797	1.1796	.625
		.3125	14.52	4.2720	12.612	5.0448	1.7182	5.6255	3.7504	1.1475	.785
		.375	16.84	4.9543	13.907	5.5628	1.6754	6.1552	4.1034	1.1146	.938
		.500	20.88	6.1416	15.355	6.1418	1.5812	6.6839	4.4559	1.0432	1.250
6 x 3	P	.1875	10.58	3.1133	13.991	4.6637	2.1199	4.7545	3.1697	1.2358	.470
		.250	13.72	4.0354	17.438	5.8128	2.0788	5.8675	3.9116	1.2058	.625
		.3125	16.65	4.8970	20.287	6.7622	2.0353	6.7592	4.5061	1.1748	.785
		.375	19.39	5.7043	22.612	7.5373	1.9910	7.4560	4.9706	1.1433	.938
		.500	24.28	7.1416	25.629	8.5431	1.8944	8.2672	5.5115	1.0759	1.250
6 x 4	P	.1875	11.86	3.4883	17.160	5.7198	2.2179	9.1952	4.5976	1.6236	.470
		.250	15.42	4.5354	21.574	7.1913	2.1810	11.509	5.7544	1.5930	.625
		.3125	18.77	5.5220	25.346	8.4487	2.1424	13.463	6.7313	1.5614	.785
		.375	21.94	6.4543	28.553	9.5178	2.1033	15.097	7.5486	1.5294	.938
		.500	27.68	8.1416	33.213	11.071	2.0198	17.400	8.7002	1.4619	1.250
7 x 5	P	.1875	14.41	4.2383	29.380	8.3943	2.6329	17.552	7.0210	2.0350	.470
		.250	18.82	5.5354	37.341	10.669	2.5973	22.241	8.8963	2.0045	.625
		.3125	23.02	6.7720	44.396	12.685	2.5604	26.365	10.546	1.9731	.785
		.375	27.04	7.9543	50.646	14.470	2.5233	29.985	11.994	1.9416	.938
		.500	34.48	10.142	60.642	17.326	2.4453	35.688	14.275	1.8759	1.250
8 x 4	P	.1875	14.41	4.2383	34.828	8.7070	2.8666	11.923	5.9614	1.6772	.470
		.250	18.82	5.5354	44.230	11.058	2.8267	15.030	7.5148	1.6478	.625
		.3125	23.02	6.7720	52.533	13.133	2.7852	17.722	8.8610	1.6177	.785
		.375	27.04	7.9543	59.864	14.966	2.7433	20.042	10.021	1.5874	.938
		.500	34.48	10.142	71.475	17.869	2.6548	23.567	11.784	1.5244	1.250
8 x 6	P	.1875	16.85	4.9577	45.772	11.443	3.0385	29.548	9.8493	2.4413	.565
		.250	22.04	6.4817	58.362	14.590	3.0007	37.608	12.536	2.4088	.750
		.3125	26.99	7.9389	69.617	17.404	2.9613	44.784	14.928	2.3751	.940
		.375	31.73	9.3339	79.643	19.911	2.9211	51.143	17.048	2.3408	1.125
		.500	40.55	11.927	95.916	23.979	2.8358	61.374	20.458	2.2684	1.500
10 x 6	P	.250	25.44	7.4817	100.35	20.070	3.6623	45.879	15.293	2.4763	.750
		.3125	31.24	9.1889	120.45	24.089	3.6205	54.903	18.301	2.4444	.940
		.375	36.83	10.834	138.69	27.739	3.5780	63.026	21.009	2.4119	1.125
		.500	47.35	13.927	169.48	33.896	3.4884	76.541	25.514	2.3443	1.500

*This product is also sold by Columbia-Geneva Division.

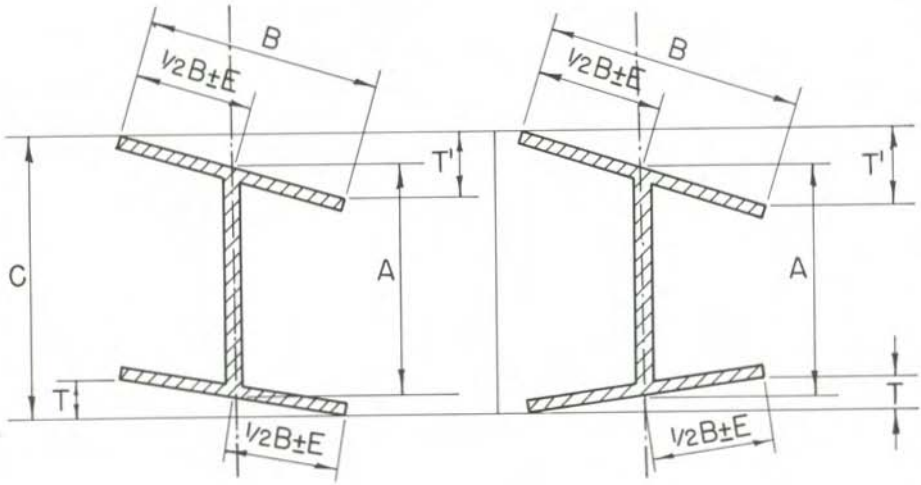
STANDARD MILL PRACTICES

PERMISSIBLE VARIATIONS FOR DIMENSIONS AND WEIGHT

Rolling structural shapes involves factors such as roll wear, subsequent roll dressing, temperature variations, etc., which cause the finished shapes to vary from published profiles. Structural shapes are furnished to standard section and length tolerances published by the American Society for Testing and Materials (Designation A6) and the United States Steel Corporation.

The permissible variation from the theoretical or specified weight is 2.5 per cent.

WIDE FLANGE BEAMS



SECTION

Section Nominal Size, In.	A Depth, In.		B Flange Width, In.		T + T', Flanges Out of Square, Max., In.	E, Web off Center, Max., In.	C, Maximum Depth at any Cross-Section over Theoretical Depth, In.
	Over Theoretical	Under Theoretical	Over Theoretical	Under Theoretical			
Up to 12, incl.	1/8	1/8	1/4	3/16	1/4	3/16	1/4
Over 12	1/8	1/8	1/4	3/16	5/16	3/16	1/4

A is measured at center line of web.
B is measured parallel to flange.
C is measured parallel to web.

STANDARD MILL PRACTICES

LENGTH

Wide Flange Shapes[a]	Variations from Specified Length for Lengths Given, In.			
	30 ft. and under		Over 30 ft.	
	Over	Under	Over	Under
Beams 24 in. and under in nominal depth	3/8	3/8	3/8 plus 1/16 for each additional 5 ft. or fraction thereof	3/8
Beams over 24 in. in nominal depth and all columns	1/2	1/2	1/2 plus 1/16 for each additional 5 ft. or fraction thereof	1/2

[a]When wide flange shapes are used as bearing piles, the length tolerance is plus 5 in. and minus 0 in.

ENDS OUT-OF-SQUARE

1/64 in. per inch of depth, or of flange width if it is greater than depth.

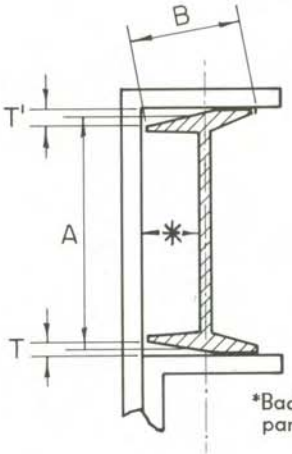
STRAIGHTNESS

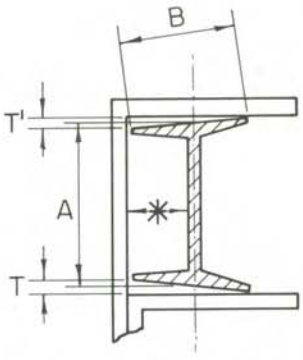
Wide Flange Shapes	Permissible Variation
Camber and sweep	$1/8 \text{ in.} \times \frac{\text{number of feet of total length}^{a}}{10}$
When certain sections[b] with a flange width approximately equal to depth are specified on order as columns:	
Lengths of 45 ft. and under	$1/8 \text{ in.} \times \frac{\text{number of feet of total length}}{10}$ but not over 3/8 in.
Lengths over 45 ft.	$3/8 \text{ in.} + 1/8 \text{ in.} \times \frac{\text{number of feet of total length} - 45}{10}$

[a]Sections with a flange width less than 6 in., tolerance for sweep $= 1/8 \text{ in.} \times \frac{\text{number of feet of total length.}}{5}$

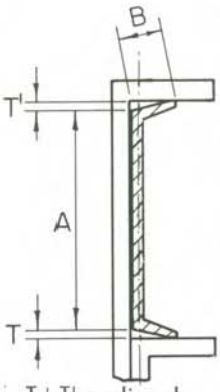
[b]Applies only to:
8-in. deep sections 31 lb per ft and heavier,
10-in. deep sections 49 lb per ft and heavier,
12-in. deep sections 65 lb per ft and heavier, and
14-in. deep sections 78 lb per ft and heavier.
If other sections are specified on the order as columns, the tolerance will be subject to negotiation with the manufacturer.

STANDARD MILL PRACTICES



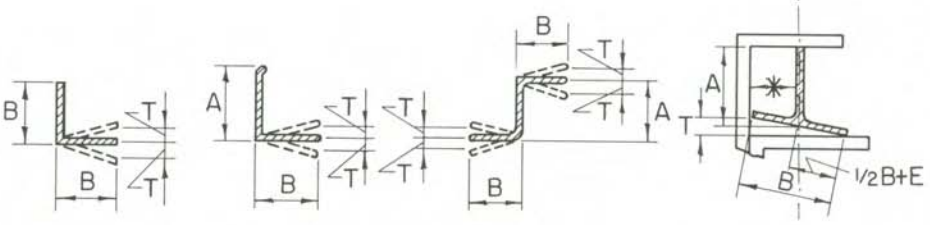


*Back of square and centerline of web to be parallel when measuring "out-of-square."



T+T' applies when flanges of channels are toed in or out.

STANDARD BEAMS **H-BEAMS** **CHANNELS**



ANGLES **BULB ANGLES** **ZEES** **TEES**

*Back of square and centerline of stem to be parallel when measuring "out-of-square."

STANDARD BEAMS, H-BEAMS, CHANNELS—SECTION

Section	Nominal Size, In.	A Depth, In.* Over Theoretical	A Depth, In.* Under Theoretical	B Flange Width, In. Over Theoretical	B Flange Width, In. Under Theoretical	T+T', Out of Square per Inch of B, In.
Standard Beams	3 to 7, incl.	3/32	1/16	1/8	1/8	1/32
	Over 7 to 14, incl.	1/8	3/32	5/32	5/32	1/32
	Over 14 to 24, incl.	3/16	1/8	3/16	3/16	1/32
Standard Mill H-Beams	4	3/32	1/16	1/8	1/8	1/32
	5	3/32	1/16	5/32	5/32	1/32
	6 and 8	1/8	3/32	3/16	3/16	1/32
Channels	3 to 7, incl.	3/32	1/16	1/8	1/8	1/32
	Over 7 to 14, incl.	1/8	3/32	1/8	5/32	1/32
	Over 14	3/16	1/8	1/8	3/16	1/32

*A is measured at center line of web for beams; and at back of web for channels.

STANDARD MILL PRACTICES

ANGLES, BULB ANGLES, ROLLED TEES, ZEES—SECTION

Section	Nominal Size, In.	A Depth, In.		B Flange Width, or Length of Leg, In.		T, Out of Square per Inch of B, In.	E, Web off Center, Max., In.
		Over Theoretical	Under Theoretical	Over Theoretical	Under Theoretical		
Angles[a]	3 to 4, incl.	...	...	1/8	3/32	3/128[b]	...
	Over 4 to 6, incl.	...	...	1/8	1/8	3/128[b]	...
	Over 6	...	...	3/16	1/8	3/128[b]	...
Bulb Angles	(Depth) 3 to 4, incl.	1/8	1/16	1/8	3/32	3/128[b]	...
	Over 4 to 6, incl.	1/8	1/16	1/8	1/8	3/128[b]	...
	Over 6	1/8	1/16	3/16	1/8	3/128[b]	...
Rolled Tees	(Stem or Flange) 5 and under	3/32	1/16	1/8	1/8	1/32	3/32
	(Stem or Flange) over 5 to 7, incl.	3/32	1/16	1/8	1/8	1/32	1/8
Zees	3 to 4, incl.	1/8	1/16	1/8	3/32	3/128[b]	...
	Over 4 to 6, incl.	1/8	1/16	1/8	1/8	3/128[b]	...

[a] For unequal leg angles, longer leg determines classification.
[b] 3/128 in. per in. = 1 1/2 deg.

ALL STANDARD SECTIONS—LENGTH

	Variations from Specified Length for Lengths Given, In.									
	To 30 ft. incl.		Over 30 to 40 ft. incl.		Over 40 to 50 ft. incl.		Over 50 to 65 ft. incl.		Over 65 ft.	
	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under
All Standard Shapes	1/2	1/4	3/4	1/4	1	1/4	1⅛	1/4	1¼	1/4

ENDS OUT-OF-SQUARE

Beams, Channels, Standard Mill H-Beams } 1/64 in. per inch of depth.
Angles[a] ..... 3/128 in. per inch of leg length or 1½°.
Bulb Angles ..... 3/128 in. per inch of depth or 1½°.
Rolled Tees[a] ..... 1/64 in. per inch of flange or stem.
Zees ..... 3/128 in. per inch of sum of both flange lengths.

[a] Tolerances for ends out-of-square are determined on the longer members of the section.

STRAIGHTNESS

	Permissible Variations
Camber	$\frac{1}{8}$ in. $\times \frac{\text{number of feet of total length}}{5}$
Sweep	Due to the extreme variations in flexibility of standard beams and channels, sweep tolerances are subject to negotiations for the individual sections involved.

STANDARD MILL PRACTICES
SURFACE FINISH AND CONDITIONING

Conditioning of Carbon and High Strength Structural Sections including Sheet Piling and Bearing Piles

Structural sections including Sheet Piling and Bearing Piles may contain surface imperfections such as seams, slivers, tears, underfills, overfills, etc., and if considered injurious may be conditioned for removal by grinding, or chipping and grinding, provided the area is ground in a workmanlike manner and the depression does not extend below the rolled surface of the section more than the following:

1/32 inch in sections less than 3/8 inch in thickness, or 1/16 inch in sections 3/8 inch and over in thickness.

Surface imperfections which are greater in depth than the limits shown above can be removed by chipping or grinding and then depositing weld metal, subject to the following limiting conditions:

(1) The total area of the chipped or ground surface of any piece prior to welding does not exceed 2 per cent of the total surface area of that piece.

(2) The reduction of thickness of the section resulting from the removal of imperfections at any location, prior to welding does not exceed 30 per cent of the nominal thickness at the location of the imperfection, and the depth of depression prior to welding does not exceed 1–2 inch.

(3) The toes of angles, beams, channels and zees and the stems and toes of tees can be conditioned by grinding or chipping and welding. Prior to welding the depth of the depression, measured from the toe inward, is limited to the thickness of the section at the base of the depression, with a maximum depth limit of 1/2".

When welding is performed, the welds should be sound and the weld metal thoroughly fused on all surfaces and edges without undercutting or overlap. The weld metal should project at least 1/16 in. above the rolled surface, and the projecting metal should be removed by grinding or chipping and grinding to make it flush with the rolled surface.

Conditioning of Carbon and High Strength Plate Products

Imperfections that do not affect the utility of the plates are not considered injurious defects. Some plates are conditioned for the removal of surface imperfections or depressions on either surface by grinding, provided the ground area is well flared and grinding does not reduce the thickness of the as-rolled plate:

1. more than 7 per cent of the nominal thickness for plates specified to weight per square foot, but in no case more than 1/8 inch;
2. below the minimum thickness for plates specified to thickness in inches.

Plates of a quality not requiring slab identification can have surface imperfections removed by chipping and then depositing weld metal, in accordance with the conditions noted below:

1. The chipped area of each surface of a plate should not exceed 2 per cent of the area of that surface.
2. After removal of any imperfections preparatory to welding, the thickness of the plate at any location should not be reduced by more than 20 per cent of the nominal thickness of the plate.
3. When welding is performed, the welds should be sound and the weld metal thoroughly fused on all surfaces and edges without undercutting or overlap. The weld metal should project at least 1/16 inch above the rolled surface, and the projecting metal will be removed by grinding or chipping and grinding to make it flush with the rolled surface.

Requirements involving limitations restricting the use of the above customary conditioning procedures are commonly negotiated between the purchaser and producer.

STANDARD MILL PRACTICES

CAMBERING OF ROLLED BEAMS

This refers to the cold cambering of large depth beams to produce a predetermined design. The maximum lengths that can be cambered depend on the length that can be rolled of a given section, to a maximum of 100 feet. The maximum cambers that can be furnished and the minimum lengths for given cambers are shown in the following table.

Nominal Depth of Section or Beam, inches	Specified Length of Section or Beam, feet				
	Over 30 to 42, incl.	Over 42 to 52, incl.	Over 52 to 65, incl.	Over 65 to 85, incl.	Over 85
	Range of Camber Commonly Acceptable, inches				
Wide Flange Beams 24 and over.....	1 to 2, incl.	1 to 3, incl.	2 to 4, incl.	3 to 5, incl.	3 to 6, incl.
Wide Flange Beams 14 to 21, incl. and Standard Beams, 24...	¾ to 2½, incl.	1 to 3, incl.	2 to 4, incl.	2½ to 5 incl.	Refer

Notes:

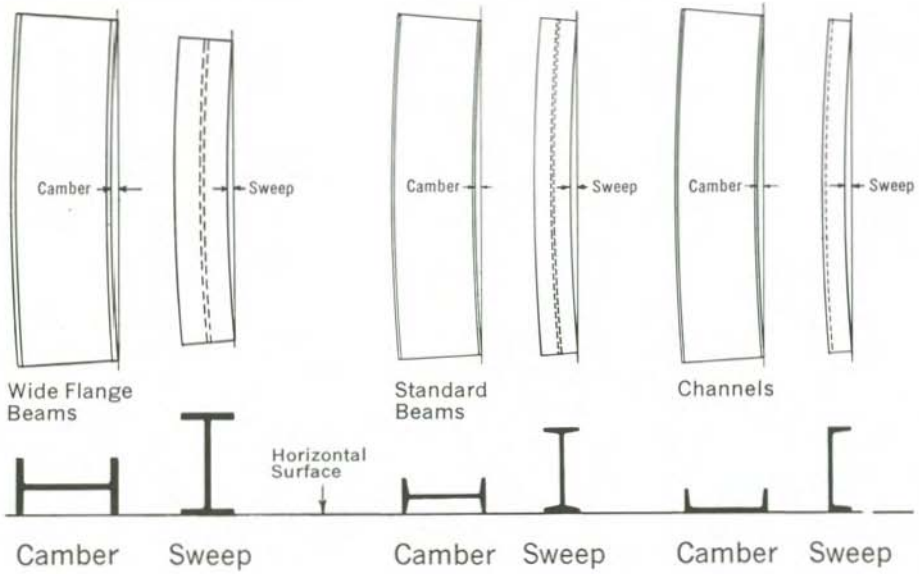
1. Consult the producer for specified camber, specified length or both which are not given in the above table.
2. A single minimum value for camber, within the ranges shown above for the length ordered, should be specified.
3. Camber is measured at the mill and will not necessarily be present in the same amount in the section of beam as received due to release of stress induced during the cambering operation. In general 75 per cent of the specified camber is likely to remain in cambered sections or beams.
4. Camber will approximate a simple regular curve nearly the full length of the section or beam, or between any two points as specified. Camber is customarily specified by the ordinate at the mid-length of the portion of the section or beam to be curved. Ordinates at other points or reverse or other compound curves are not considered practicable. The camber ordinate tolerance is 1/2 inch over, nothing under, for lengths 50 feet and less. For lengths over 50 ft. it is customary to add 1/8 in. to the over tolerance for each additional 10 feet or fraction thereof.

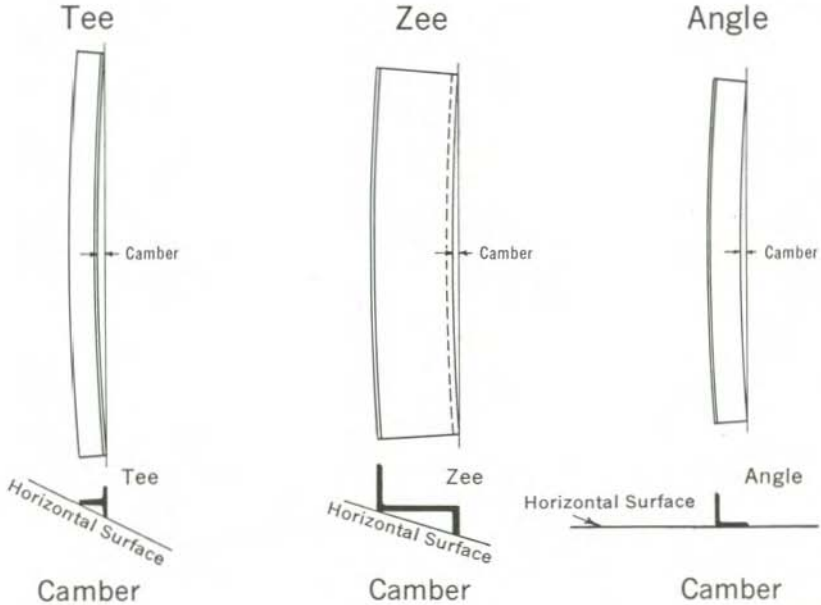
STANDARD MILL PRACTICES

POSITIONS FOR MEASURING CAMBER AND SWEEP

USS
Wide Flange Beams

American Standard
Beams and Channels





STANDARD MILL PRACTICES

SHEARED AND UNIVERSAL MILL PLATES

THICKNESS AND WEIGHT (WHEN ORDERED TO THICKNESS)

THICKNESS 2 INCHES AND UNDER

Specified Thickness, Inches	Tolerance Over Average Weight of Lots* for Widths given in Inches, Expressed in Percentages of Nominal Weights**									
	48 and under	Over 48 to 60 excl.	60 to 72 excl.	72 to 84 excl.	84 to 96 excl.	96 to 108 excl.	108 to 120 excl.	120 to 132 excl.	132 to 144 excl.	144 to 150 incl.
To ¼ excl.	7.0	8.0	9.0	10.0	12.0	14.0	16.0	18.0	21.0	....
¼ to 5/16 excl.	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	19.0	....
5/16 to ⅜ excl.	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0	17.0	18.0
⅜ to 7/16 excl.	4.5	5.0	6.0	7.0	8.0	9.0	10.0	12.0	15.0	16.0
7/16 to ½ excl.	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0	13.0	14.0
½ to ⅝ excl.	4.0	4.0	4.5	5.0	6.0	7.0	8.0	9.0	11.0	12.0
⅝ to ¾ excl.	4.0	4.0	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0
¾ to 1 excl.	3.5	4.0	4.0	4.0	4.5	5.0	6.0	7.0	8.0	9.0
1 to 2 incl.	3.5	3.5	4.0	4.0	4.0	4.5	5.0	6.0	7.0	8.0

Tolerance under specified thickness .01 inch.

*The term Lot means all the plates of each tabular width and thickness group represented in each shipment.

**Nominal Weight in pounds equals specified length in inches multiplied by specified width in inches multiplied by specified thickness in inches multiplied by 0.2833.

SINGLE PLATES

Tolerance over shall be 1⅓ times amounts indicated above.

SINGLE CIRCULAR AND SKETCH PLATES

Tolerance over shall be 1⅔ times amounts indicated above.

CIRCULAR AND SKETCH PLATES

Tolerance over shall be 1¼ times amounts indicated above.

STANDARD MILL PRACTICES

SHEARED AND UNIVERSAL MILL PLATES

WEIGHT (WHEN ORDERED TO WEIGHT)
WEIGHT 81.6 POUNDS PER SQUARE FOOT AND UNDER

Specified Weight, Pounds Per Square Foot	Tolerance Over and Under for Average Weight of Lots* for Widths given in Inches, expressed in Percentages of the Specified Weights Per Square Foot																			
	48 and Under		Over 48 to 60 excl.		60 to 72 excl.		72 to 84 excl.		84 to 96 excl.		96 to 108 excl.		108 to 120 excl.		120 to 132 excl.		132 to 144 excl.		144 to 150 incl.	
	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under
To 10 excl.	4.0	3.0	4.5	3.0	5.0	3.0	5.5	3.0	6.0	3.0	7.5	3.0	9.0	3.0	...	...	...	...	....	...
10 to 12.5 excl.	4.0	3.0	4.5	3.0	5.0	3.0	5.5	3.0	6.0	3.0	6.5	3.0	7.0	3.0	8.0	3.0	9.0	3.0	....	...
12.5 to 15.0 excl.	4.0	3.0	4.0	3.0	4.5	3.0	5.0	3.0	5.5	3.0	5.5	3.0	6.0	3.0	7.5	3.0	8.0	3.0	11.0	3.0
15 to 17.5 excl.	3.5	3.0	3.5	3.0	4.0	3.0	4.5	3.0	5.0	3.0	5.0	3.0	5.5	3.0	6.0	3.0	7.0	3.0	9.0	3.0
17.5 to 20 excl.	3.5	2.5	3.5	2.5	3.5	3.0	4.0	3.0	4.5	3.0	4.5	3.0	5.0	3.0	5.5	3.0	6.0	3.0	8.0	3.0
20 to 25 excl.	3.5	2.5	3.5	2.5	3.5	3.0	3.5	3.0	4.0	3.0	4.0	3.0	4.5	3.0	5.0	3.0	5.5	3.0	7.0	3.0
25 to 30 excl.	3.0	2.5	3.5	2.5	3.5	2.5	3.5	3.0	3.5	3.0	3.5	3.0	4.0	3.0	4.5	3.0	5.0	3.0	6.5	3.0
30 to 40 excl.	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.5	2.0	3.5	2.5	3.5	2.5	4.0	3.0	4.5	3.0	6.0	3.0
40 to 81.6 incl.	2.5	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.5	2.0	3.5	2.0	3.0	2.5	3.5	3.0	4.0	3.0	5.5	3.0

*The term Lot means all the plates of each tabular width and weight group represented in each shipment.

SINGLE PLATES
Tolerance over all shall be 1⅓ times amounts indicated above.

SINGLE CIRCULAR AND SKETCH PLATES
Tolerance over shall be 1⅔ times amounts indicated above.

CIRCULAR AND SKETCH PLATES
Tolerance over shall be 1¼ times amounts indicated above.

STANDARD MILL PRACTICES

SHEARED AND UNIVERSAL MILL PLATES
THICKNESS

THICKNESS OVER 2 INCHES

Specified Thickness, Inches	Tolerance Over Specified Thickness Widths, Inches					
	To 36 excl.	36 to 60 excl.	60 to 84 excl.	84 to 120 excl.	120 to 132 excl.	132 to 150 incl.
Over 2 to 3 excl.	1/16	3/32	7/64	1/8	1/8	9/64
3 to 4 excl.	5/64	3/32	7/64	1/8	1/8	9/64
4 to 6 excl.	3/32	1/8	9/64	9/64	5/32	11/64
6 to 8 excl.	7/64	1/8	5/32	5/32	11/64	...
8 to 10 excl.	5/32	11/64	3/16	3/16	...	...
10 to 12 excl.	11/64	3/16	15/64	15/64	...	...
12 to 15 incl.	13/64	7/32	1/4	...	...	...

Tolerance under specified thickness .01 inch.

CAMBER TOLERANCES

SHEARED PLATES AND UNIVERSAL MILL PLATES

TWO INCHES AND UNDER IN THICKNESS

$$\frac{1}{8} \text{ in.} \times \frac{\text{number of feet of length}}{5}$$

Universal Mill Plates

Over Two Inches in Thickness

Dimensions, inches		Camber Tolerance for Thicknesses and Widths Given
Thicknesses	Widths	
Over 2 to 15, incl.	To 30, incl.	$\frac{3}{16}$ in. $\times \frac{\text{number of feet of length}}{5}$
Over 2 to 15, incl.	Over 30 to 60, incl.	$\frac{1}{4}$ in. $\times \frac{\text{number of feet of length}}{5}$

STANDARD MILL PRACTICES

WIDTH AND LENGTH TOLERANCES
ALLOY STEEL

HOT ROLLED OR THERMALLY TREATED

WIDTH AND LENGTH OF SHEARED PLATES
ONE INCH AND UNDER IN THICKNESS
LENGTH OF UNIVERSAL MILL PLATES OR MILL EDGE PLATES
ONE AND THREE-QUARTER INCH AND UNDER IN THICKNESS

Specified Dimensions, inches		Tolerances over Specified Width and Length for Thickness Given, in.					
		To 3/8, excl.		3/8 to 5/8, excl.		5/8 to 1 1/4 incl.	
Widths	Lengths	Width	Length	Width	Length	Width	Length
To 60, excl.	To	3/8	1/2	7/16	5/8	1/2	3/4
60 to 84, excl.	120,	7/16	5/8	1/2	11/16	5/8	7/8
84 to 108, excl.	excl.	1/2	3/4	5/8	7/8	3/4	1
108 and over		5/8	7/8	3/4	1	7/8	1 1/8
To 60, excl.	120	3/8	3/4	1/2	7/8	5/8	1
60 to 84, excl.	to	1/2	3/4	5/8	7/8	3/4	1
84 to 108, excl.	240,	9/16	7/8	11/16	15/16	13/16	1 1/8
108 and over	excl.	5/8	1	3/4	1 3/16	7/8	1 1/4
To 60, excl.	240	3/8	1 1/16	1/2	1 3/16	5/8	1 5/16
60 to 84, excl.	to	1/2	1 1/16	5/8	1 3/16	3/4	1 5/16
84 to 108, excl.	360,	9/16	1 1/16	11/16	1 3/16	7/8	1 7/16
108 and over	excl.	11/16	1 3/16	7/8	1 5/16	1	1 7/16
To 60, excl.	360	7/16	1 3/16	1/2	1 5/16	5/8	1 7/16
60 to 84, excl.	to	1/2	1 5/16	5/8	1 7/16	3/4	1 9/16
84 to 108, excl.	480,	9/16	1 5/16	3/4	1 7/16	7/8	1 9/16
108 and over	excl.	3/4	1 7/16	7/8	1 9/16	1	1 11/16
To 60, excl.	480	7/16	1 3/8	1/2	1 5/8	5/8	1 3/4
60 to 84, excl.	to	1/2	1 1/2	5/8	1 5/8	3/4	1 3/4
84 to 108, excl.	600,	5/8	1 1/2	3/4	1 5/8	7/8	1 3/4
108 and over	excl.	3/4	1 5/8	7/8	1 3/4	1	1 7/8
To 60, excl.	600	1/2	1 7/8	5/8	2	3/4	2
60 to 84, excl.	to	5/8	1 7/8	3/4	2	7/8	2
84 to 108, excl.	720,	5/8	1 7/8	3/4	2	7/8	2
108 and over	excl.	7/8	1 7/8	1	2 1/8	1 1/8	2 3/8
To 60, excl.	720	9/16	2 1/8	3/4	2 1/4	7/8	2 3/8
60 to 84, excl.	and	3/4	2 1/8	7/8	2 1/4	1	2 3/8
84 to 108, excl.	over	3/4	2 1/8	7/8	2 1/4	1	2 3/8
108 and over		1	2 1/8	1 1/8	2 1/2	1 1/4	2 5/8

Tolerance under specified width and length, 1/4 inch.

STANDARD MILL PRACTICES
SHEARED AND UNIVERSAL MILL PLATES
CARBON AND HIGH STRENGTH STEEL

SHEARED—WIDTH AND LENGTH — THICKNESS 1½ INCHES AND UNDER

UNIVERSAL—LENGTH ONLY — THICKNESS 2½ INCHES AND UNDER

Specified Dimensions, Inches		Tolerance Over Specified Width and Length for Thickness, Inches or Equivalent Weights, Pounds Per Square Foot							
		To 3/8 excl.		3/8 to 5/8 excl.		5/8 to 1 excl.		1 to 2 incl.*	
		To 15.3 excl.		15.3 to 25.5 excl.		25.5 to 40.8 excl		40.8 to 81.6 incl.	
Length	Width	Width	Length	Width	Length	Width	Length	Width	Length
To 120 excl.	To 60 excl.	3/8	1/2	7/16	5/8	1/2	3/4	5/8	1
	60 to 84 excl.	7/16	5/8	1/2	11/16	5/8	7/8	3/4	1
	84 to 108 excl.	1/2	3/4	5/8	7/8	3/4	1	1	1 1/8
	108 to 150 incl.	5/8	7/8	3/4	1	7/8	1 1/8	1 1/8	1 1/4
120 to 240 excl.	To 60 excl.	3/8	3/4	1/2	7/8	5/8	1	3/4	1 1/8
	60 to 84 excl.	1/2	3/4	5/8	7/8	3/4	1	7/8	1 1/4
	84 to 108 excl.	9/16	7/8	11/16	15/16	13/16	1 1/8	1	1 3/8
	108 to 150 incl.	5/8	1	3/4	1 1/8	7/8	1 1/4	1 1/8	1 3/8
240 to 360 excl.	To 60 excl.	3/8	1	1/2	1 1/8	5/8	1 1/4	3/4	1 1/2
	60 to 84 excl.	1/2	1	5/8	1 1/8	3/4	1 1/4	7/8	1 1/2
	84 to 108 excl.	9/16	1	11/16	1 1/8	7/8	1 3/8	1	1 1/2
	108 to 150 incl.	11/16	1 1/8	7/8	1 1/4	1	1 3/8	1 1/4	1 3/4
350 to 480 excl.	To 60 excl.	7/16	1 1/8	1/2	1 1/4	5/8	1 3/8	3/4	1 5/8
	60 to 84 excl.	1/2	1 1/4	5/8	1 3/8	3/4	1 1/2	7/8	1 5/8
	84 to 108 excl.	9/16	1 1/4	3/4	1 3/8	7/8	1 1/2	1	1 7/8
	108 to 150 incl.	3/4	1 3/8	7/8	1 1/2	1	1 5/8	1 1/4	1 7/8
480 to 600 excl.	To 60 excl.	7/16	1 1/4	1/2	1 1/2	5/8	1 5/8	3/4	1 7/8
	60 to 84 excl.	1/2	1 3/8	5/8	1 1/2	3/4	1 5/8	7/8	1 7/8
	84 to 108 excl.	5/8	1 3/8	3/4	1 1/2	7/8	1 5/8	1	1 7/8
	108 to 150 incl.	3/4	1 1/2	7/8	1 5/8	1	1 3/4	1 1/4	1 7/8
600 to 720 excl.	To 60 excl.	1/2	1 3/4	5/8	1 7/8	3/4	1 7/8	7/8	2 1/4
	60 to 84 excl.	5/8	1 3/4	3/4	1 7/8	7/8	1 7/8	1	2 1/4
	84 to 108 excl.	5/8	1 3/4	3/4	1 7/8	7/8	1 7/8	1 1/8	2 1/4
	108 to 150 incl.	7/8	1 3/4	1	2	1 1/8	2 1/4	1 1/4	2 1/2
720 and Over	To 60 excl.	9/16	2	3/4	2 1/8	7/8	2 1/4	1	2 3/4
	60 to 84 excl.	3/4	2	7/8	2 1/8	1	2 1/4	1 1/8	2 3/4
	84 to 108 excl.	3/4	2	7/8	2 1/8	1	2 1/4	1 1/4	2 3/4
	108 to 150 incl.	1	2	1 1/8	2 3/8	1 1/4	2 1/2	1 3/8	3

*Applicable also to Universal Mill Plates up to 12 inches wide, thickness over 2 to 2½ inches, inclusive. Tolerance under specified width and length ¼ inch.

STANDARD MILL PRACTICES

WIDTH TOLERANCES
ALLOY STEEL

HOT ROLLED OR THERMALLY TREATED
UNIVERSAL MILL PLATES
FIFTEEN INCHES AND UNDER IN THICKNESS

Special Dimensions, inches WIDTH	Tolerances Over Specified Width for Thickness Given, in.					
	To 3/8, excl.	3/8 to 5/8, excl.	5/8 to 1, excl.	1 to 2, incl.	Over 2 to 10, incl.	Over 10 to 15, incl.
Over 8 to 20, exc.	1/8	1/8	3/16	1/4	1/2	3/4
20 to 36, excl.	3/16	1/4	5/16	3/8	3/4	1
36 and over	5/16	3/8	7/16	1/2	1	1 1/4

Tolerance under specified width, 1/8 inch.

WIDTH AND LENGTH TOLERANCES
ALLOY STEEL

HOT ROLLED OR THERMALLY TREATED
SPECIAL CUT OR GAS CUT RECTANGULAR PLATES

Specified Thicknesses, inches	Tolerances Over for All Specified Widths or Lengths, in.
To 2, excl.	3/4
2 to 4, excl.	1
4 to 6, excl.	1 1/8
6 to 8, excl.	1 5/16
8 to 15, incl.	1 1/2

These tolerances can be taken all under or divided over and under, if so specified.
Universal mill plates are commonly cut to length only.

STANDARD MILL PRACTICES

UNIVERSAL MILL—WIDTH
CARBON AND HIGH STRENGTH STEEL
THICKNESS 15 INCHES AND UNDER

Specified Width, Inches	Tolerance Over Specified Width for Thickness, Inches or Equivalent Weights, Pounds Per Square Foot					
	To 3/8 excl.	3/8 to 5/8 excl.	5/8 to 1 excl.	1 to 2 incl.	Over 2 to 10 incl.	Over 10 to 15 incl.
	To 15.3 excl.	15.3 to 25.5 excl.	25.5 to 40.8 excl.	40.8 to 86.1 incl.	.....	.....
Over 8 to 20 excl.....	1/8	1/8	3/16	1/4	3/8	1/2
20 to 36 excl.....	3/16	1/4	5/16	3/8	7/16	9/16
36 to 48 incl.....	5/16	3/8	7/16	1/2	9/16	5/8

Tolerance under specified width, 1/8 in.

DIAMETER
SHEARED CIRCLES THICKNESS 1 INCH AND UNDER

Specified Diameter Inches	Tolerance Over Specified Diameter, Inches No Tolerance Under		
	To 3/8 excl.	3/8 to 5/8 excl.	5/8 to 1 incl.
24 to 32 excl.....	1/4	3/8	1/2
32 to 84 excl.....	5/16	7/16	9/16
84 to 108 excl.....	3/8	1/2	5/8
108 to 152 incl.....	7/16	9/16	11/16

STANDARD MILL PRACTICES

WIDTH AND LENGTH
CARBON AND HIGH STRENGTH STEEL
GAS CUTTING

Specified Thickness, Inches	Tolerance* Over Specified Width or Length, Inches
To 2 excl.	½
2 to 4 excl.	⅝
4 to 6 excl.	¾
6 to 8 excl.	⅞
8 to 15 incl.	1

*May be specified all under or divided over and under.
Universal Mill Plates are gas cut to length only.

DIAMETER TOLERANCES
ALLOY STEEL
HOT ROLLED OR THERMALLY TREATED
SPECIAL CUT OR GAS CUT CIRCULAR PLATES

Specified Diameters, Inches	Tolerances Over Specified Diameter for Thicknesses Given, in.					
	To 1, excl.	1 to 2, excl.	2 to 4, excl.	4 to 6, excl.	6 to 8, excl.	8 to 15, incl.
To 32 excl.	½	9/16	1	1⅛	1⅛	1½
32 to 84, excl.	⅝	¾	1⅛	1 3/16	1¼	1¾
84 to 108, excl.	¾	1	1⅛	1 3/16	1¼	1¾
108 to 130, incl.	⅞	1¼	1¼	1¼	1⅜	1⅞

No tolerances under.

DIAMETER
CARBON AND HIGH STRENGTH STEEL
GAS CUTTING CIRCLES

Specified Diameter, Inches	Tolerance Over Specified Diameter, Inches No Tolerance Under					
	To 1 excl.	1 to 2 excl.	2 to 4 excl.	4 to 6 excl.	6 to 8 excl.	8 to 15 incl.
24 to 32 excl.	⅜	½	9/16	⅝	¾	⅞
32 to 84 excl.	7/16	9/16	⅝	¾	⅞	1
84 to 108 excl.	9/16	11/16	¾	⅞	1	1⅛
108 to 152 incl.	⅝	¾	⅞	1	1⅛	1¼

STANDARD MILL PRACTICES

SHEARED AND UNIVERSAL MILL PLATES
CARBON STEEL

Flatness

For all plates, the longer dimension specified is considered the length, and flatness tolerance along the length should not exceed the amounts indicated below for the specified width and thickness in plates up to 12 feet in length or in any 12 feet of longer plates. When the longer dimension is under 36 inches, flatness tolerance should not exceed ¼ inch.

Specified Thickness, Inches	Specified Weight Lb. Per Sq. Ft.	Flatness Tolerances for Specified Widths (Maximum deviation from a horizontal flat surface) Inches									
		To 36 excl.	36 to 48 excl.	48 to 60 excl.	60 to 72 excl.	72 to 84 excl.	84 to 96 excl.	96 to 108 excl.	108 to 120 excl.	120 to 144 excl.	144 to 150 incl.
To ¼ excl.	To 10.2 excl.	5/8	7/8	1 1/16	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	...
¼ to ⅜ excl.	10.2 to 15.3 excl.	9/16	3/4	7/8	1 1/16	1 1/4	1 3/8	1 7/16	1 9/16	1 7/8	...
⅜ to ½ excl.	15.3 to 20.4 excl.	1/2	5/8	1 1/16	3/4	7/8	1	1 1/8	1 1/4	1 7/16	2
½ to ¾ excl.	20.4 to 30.6 excl.	7/16	9/16	5/8	1 1/16	3/4	7/8	1 1/8	1 1/8	1 1/8	1 3/4
¾ to 1 excl.	30.6 to 40.8 excl.	7/16	9/16	5/8	1 1/16	1 1/16	3/4	1 3/16	1 5/16	1	1 1/2
1 to 2 excl.	40.8 to 81.6 excl.	3/8	1/2	9/16	5/8	5/8	1 1/16	1 1/16	1 1/16	3/4	1 1/4
2	81.6	5/16	3/8	7/16	1/2	1/2	9/16	9/16	5/8	3/4	1
Over 2 to 4 excl.	...	5/16	3/8	7/16	1/2	1/2	9/16	9/16	5/8	3/4	1
4 to 6 excl.	...	3/8	7/16	1/2	9/16	5/8	5/8	3/4	7/8	1	1
6 to 8 excl.	...	7/16	1/2	9/16	1 1/16	3/4	7/8	1 5/16	1	1	1
8 to 10 excl.	...	1/2	9/16	1 1/16	3/4	7/8	1	1	1	1	1
10 to 12 excl.	...	9/16	3/4	7/8	1	1	1	1	1	1	1
12 to 15 incl.	...	1 1/16	1 3/16	7/8	1	1	1	1	1	1	1

The above flatness tolerances apply to plates with a specified minimum tensile strength of not more than 60,000 psi (or related chemistry or hardness). For plates specified to higher minimum tensile strength (or related chemistry or hardness) the limits are increased to 1½ times the amounts indicated above.

The above flatness tolerances apply to circles and sketch plates, based on the maximum dimensions of the plates.

STANDARD MILL PRACTICES

FLATNESS TOLERANCES

ALLOY AND HIGH STRENGTH STEEL

HOT ROLLED OR THERMALLY TREATED

RECTANGULAR SHEARED PLATES, UNIVERSAL MILL PLATES, CIRCULAR PLATES, AND SKETCH PLATES

Specified Thickness, Inches	Tolerances from a Flat Surface for Specified Widths, inches										
	To 36, excl.	36 to 48, excl.	48 to 60, excl.	60 to 72, excl.	72 to 84, excl.	84 to 96, excl.	96 to 108, excl.	108 to 120, excl.	120 to 144, excl.	144 to 168, excl.	168 and Over
To 1/4, excl.	15/16	15/16	1 5/8	2 1/16	2 1/4	2 7/16	2 5/8	2 13/16	3	—	—
1/4 to 3/8, excl.	7/8	1 1/8	1 5/16	1 5/8	1 7/8	2 1/16	2 3/16	2 3/8	2 13/16	—	—
3/8 to 1/2, excl.	3/4	15/16	1 1/16	1 1/8	1 5/16	1 1/2	1 11/16	1 7/8	2 3/16	3	3 3/4
1/2 to 3/4, excl.	11/16	7/8	15/16	1 1/16	1 1/8	1 5/16	1 11/16	1 11/16	1 11/16	2 5/8	3 3/8
3/4 to 1, excl.	11/16	7/8	15/16	1 1/16	1 1/16	1 1/8	1 1/4	1 7/16	1 1/2	2 1/4	3
1 to 2, excl.	9/16	3/4	7/8	15/16	15/16	1 1/16	1 1/16	1 1/16	1 1/8	1 3/4	2 5/8
2 to 4, excl.	1/2	9/16	11/16	3/4	3/4	7/8	7/8	15/16	1 1/8	1 1/2	1 7/8
4 to 6, excl.	9/16	11/16	3/4	7/8	15/16	15/16	1 1/8	1 5/16	1 1/2	1 1/2	1 1/2
6 to 8, excl.	11/16	3/4	7/8	1 1/16	1 1/8	1 5/16	1 7/16	1 1/2	1 1/2	1 1/2	1 1/2
8 to 10, excl.	3/4	7/8	1 1/16	1 1/8	1 5/16	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
10 to 12, excl.	7/8	1 1/8	1 5/16	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
12 to 15, incl.	1 1/16	1 1/4	1 5/16	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

Flatness Tolerances for Length and Width: The longer dimension specified is considered the length and variations in flatness along the length should not exceed the tabular amount for the specified width in plates up to 12 feet in length, or in any 12 feet of longer plates.

Note 1. When the longer dimension is under 36 inches, the variation in flatness should not exceed 3/8 inch.

Note 2. The tolerances given in the above table apply to plates which have a specified minimum tensile strength not over 80,000 psi or compatible chemistry or hardness. For plates specified to a higher minimum tensile strength or compatible chemistry or hardness, the limits in the table are increased to 1 1/2 times the amounts in the above table.

Note 3. The above table and notes cover the flatness tolerances of circular and sketch plates, based on the maximum dimensions of those plates.

NATIONAL TUBE DIVISION
STANDARD MILL PRACTICES
HOLLOW STRUCTURAL SQUARE & RECTANGULAR TUBING

Structural Tubing is produced in two grades that conform to the chemical and mechanical properties of the following ASTM specifications:

Grade 1—A-7
Grade 2—A-36

Samples are analyzed in accordance with ASTM-E59 to assure conformity with the chemical composition of the above specifications.

COLD BEND PROPERTIES

The bend test specimens shall stand being bent cold through 180 degrees without cracking on the outside of the bent portion to an inside diameter which shall have a relation to the thickness of the specimen as prescribed below.

BEND TEST REQUIREMENTS

Thickness of Material	Ratio of Bend Diameter to Thickness of Specimen
¾" and under	½
Over ¾" to 1" incl.	1

METHOD OF TESTING

Bend tests are conducted in accordance with Tentative Methods and Definitions for Mechanical Testing of Steel Products, ASTM A-370.

LENGTHS

Hollow Structural Tubing is stocked in random lengths, 36–42 feet, and is also available in cut lengths or multiples.

Lengths and Permissible Variation

Std. Range Length	Specified Cut Length	Tolerances for Specified Cut Length			
		to 22′ incl.		Over 22′	
		Over	Under	Over	Under
42′ max and under	42′ max and under	½"	¼"	¾"	¼"

END FINISH

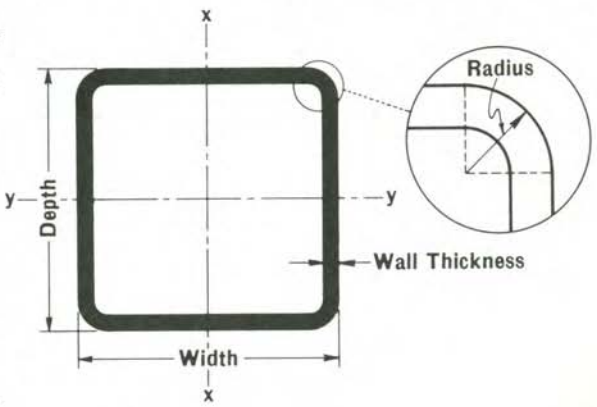
Ends are furnished cut square.

SURFACE FINISH

Ninety percent of the known requirements have been in the hot-rolled surface condition with no special protection. Other finishes can be furnished upon request.

Maximum Outside Corner Radii

Wall Thickness Inches	Max. Outside Corner Radii—Inches		
	Perimeters 14" & Under	Perimeters Over 14" to 24" Incl.	Perimeters Over 24"
Over .083 to .095 incl.	.190	....	....
Over .095 to .109 incl.	.218	....	....
Over .109 to .134 incl.	.268	....	....
Over .134 to .156 incl.	.312	....	....
Over .156 to .188 incl.	.375	.470	.565
Over .188 to .250 incl.	.500	.625	.750
Over .250 to .313 incl.	.625	.785	.940
Over .313 to .375 incl.	....	.938	1.125
Over .375 to .500 incl.	....	1.250	1.500
Over .500 to .625 incl.	....	....	1.875



TOLERANCES FOR OUTSIDE DIMENSIONS AND WALL THICKNESS

Largest Outside Dimension Across Flats, Inches	Tolerance for Outside Dimensions Including Convexity or Concavity	Wall Thickness Tolerance
1 to 2½ Incl.	Plus or Minus .020"	Minus 10%
Over 2½ to 3½ Incl.	Plus or Minus .025"	Minus 10%
Over 3½ to 5½ Incl.	Plus or Minus .030"	Minus 12½%
Over 5½	Plus or Minus 1%	Minus 12½%

Note: The allowable variation in wall thickness does not apply at corners.

MAXIMUM TWIST

Longer Outside Dimensions, Inches	Maximum Twist Per 3 Ft. of Length, Inches
1 to 1½ incl.	.050
Over 1½ to 2½ incl.	.062
Over 2½ to 4 incl.	.075
Over 4 to 5½ incl.	.087
Over 5½ to 8 incl.	.100
Over 8	.112

Twist is measured by holding down the edge of one end of a square or rectangular structural hollow on a surface plate with the bottom side of the tube parallel to the surface plate, and noting the height that either corner on the opposite end of the bottom side is above the surface plate.

SQUARENESS OF SIDES

Adjacent sides of structural hollows may deviate from 90° by plus or minus one degree.

VARIATIONS FROM EXACT STRAIGHTNESS

Permissible Variations, In. (Includes Camber and Sweep) $\frac{1}{8}'' \times \frac{\text{Number of Feet of Total Length}}{5}$

WORKABILITY AND WELDABILITY

Hollow structural tubing can be subjected to most of the usual fabricating operations. Its ductility is good, bends well, flattens, cuts, punches, flares and flanges easily and can be welded by the commonly employed techniques and practices.

PACKING

Sizes up to and including 14" perimeter are packaged in approximately 5-ton bales. All other sizes are loaded loose.

MARKING

Each length is marked to indicate manufacturer's name, heat number, size and wall thickness, length and necessary mill identification marks. For small sizes where the cross-sectional dimension is not greater than 2", this information will be marked on a tag attached to the bale. In addition, a tag indicating the total footage will be attached to each bale.

LOADING

Material will be loaded in gondola cars and flat-bed or open-top trucks in 5 to 7 ton lifts with 2 x 4 separators to enable crane slings to be inserted for unloading.

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District Sales Offices

• United States Steel

Ill., Chicago, 208 South LaSalle Street, 236-9200
Ind., Indianapolis, 428 Chamber of Commerce Bldg., MElrose 5-1391
Mass., Boston, 1420 Statler Office Building, LIberty 2-6790
Md., Baltimore, 300 St. Paul Place, 752-4300
Mich., Detroit, 3044 West Grand Blvd., 872-8350
Minn., St. Paul, 334 Minnesota Street, 222-5861
Mo., Kansas City, 2604 Power & Light Building, VIctor 2-2141
Mo., St. Louis, 1221 Locust Street, CEntral 1-1277
N.Y., Buffalo, 424 Main Street, TL 6-3350
N.Y., New York, 71 Broadway, DIgby 4-9000
Ohio, Cleveland, 55 Public Square, Room 2230, 771-0800
Ohio, Cincinnati, 1416 Fifth-Third Bank Building, 421-4460
Pa., Philadelphia, 1617 Pennsylvania Blvd., LOcust 4-4000
Pa., Pittsburgh, 525 William Penn Place, 391-2345
Wis., Milwaukee, 208 E. Wisconsin Ave., Broadway 6-2271

• Tennessee Coal and Iron Division

Ala., Fairfield, P. O. Box 599, ST 5-8011
Fla., Jacksonville, 1414 Prudential Building, EXbrook 8-9778
Ga., Atlanta, 1375 Peachtree Street, N. E., 875-9461
La., New Orleans, 222 Caribe Building, P.O. Box 19706, 529-1111
Okla., Tulsa, Room 515—Philtower Building, LUther 5-1138
Tenn., Memphis, 131 West Georgia Avenue, JAckson 7-9521
Texas, Houston, North Side Ship Channel, Clinton Road, ORchard 2-1

• Columbia-Geneva Steel Division

Denver 2, Colo., 1321 First National Bank Building, 621 17th Street, AMherst 6-3001

Los Angeles 58, Calif., 2087 East Slauson Avenue, LUdlow 5-1171

Portland 8, Ore., 2345 N. W. Nicolai, CApitol 2-9534

Salt Lake City 1, Utah, Walker Bank Building, DAvis 2-0491

San Francisco 6, Calif., 120 Montgomery Street, SUtter 1-2500

Seattle 1, Wash., Tower Building, 7th Avenue & Olive Way, MAin 2-1972

• National Tube Division

Atlanta 9, Ga., 1375 Peachtree St., N. E., 875-9462

Boston 16, Mass., 711 Statler Office Bldg., LIberty 2-6490

Chicago 90, Ill., 208 S. LaSalle St., CEntral 6-9200

Dallas 1, Texas, 1505 Elm St., RIverside 7-8691

Denver 2, Colo., 1331 First National Bank Bldg., AMherst 6-3001

Detroit 2, Mich., 9-220 General Motors Bldg., TRinty 2-8350

Houston 2, Texas, 2514 Gulf Bldg., FAirfax 3-8113

New Orleans 12, La., 1024 National Bank of Commerce Bldg., 523-6115

New York 6, N.Y., 71 Broadway, DIgby 4-9000

Philadelphia 3, Pa., 1228 Suburban Station Bldg., LOcust 4-4000

Pittsburgh 30, Pa., 525 William Penn Place, 391-2345

St. Louis 3, Mo., 1101 Shell Bldg. MAin 1-0359

Tulsa 3, Okla., 1906 Philtower Bldg., LUther 5-1155

• United States Steel Supply Division

Alabama—Birmingham; 2000 Avenue A, STate 7-9611

California—Los Angeles; 2087 E. Slauson Avenue, LUdlow 5-0101

California—San Francisco; 1940 Harrison Street, MArket 1-4988

Illinois—Chicago; 13535 S. Torrence Avenue, MItchell 6-3211

Illinois—Moline; 41st Street and Railroad Avenue, 764-5616

Maryland—Baltimore; Bush and Wicomico Streets, 837-4900

Massachusetts—Boston (Brighton 35); 176 Lincoln Street, STadium 2-9400

Minnesota—St. Paul; 2545 University Avenue, MIdway 6-7311

Missouri—St. Louis; 311 South Sarah Street, JEfferson 5-0440

New Jersey—Newark; Foot of Bessemer Street, BIgelow 2-8000

Ohio—Cleveland; 7105 Bessemer Avenue, BRoadway 1-5000

Oregon—Portland; 2345 N. W. Nicolai Street, CApitol 2-3283

Pennsylvania—Philadelphia (Bala Cynwyd); Righters Ferry Road and Schuylkill River, WAlnut 5-7882

Pennsylvania—Pittsburgh; 1281 Reedsdale Street, N.S., FAirfax, 2-4200

Tennessee—Memphis; 1701 Dock Street, President's Island, WHitehall 8-6741

Texas—Dallas, Ft. Worth (Arlington); 2920 E. Randol Mill Road, WHitehall 3-7356

Texas—Houston; P. O. Box 159, ORchard 2-8351

Washington—Seattle; Corner 3rd So. & Lander Streets, MAin 3-3014

Wisconsin—Milwaukee; 4027 W. Scott Street, EVergreen 4-5704

• United States Steel Export Company

New York—100 Church Street, COrtlandt 7-7474

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