ICC-ES Evaluation Report

ESR-1538-NZ

Issued December 2023

Subject to renewal December 2024

DIVISION: 05 00 00 - METALS Section: 05 40 00—Cold-Formed Metal Framing Section: 05 41 00—Structural Metal Stud Framing Section: 05 42 00—Cold-Formed Metal Joist Framing DIVISION: 09 00 00 - FINISHES Section: 09 22 16.13—Non-Structural Metal Stud Framing	REPORT HOLDER: SCOTTSDALE CONSTRUCTION SYSTEMS, PTY LTD DVELE OMEGA CORPORATION	EVALUATION SUBJECT: COLD-FORMED STEEL FRAMING MEMBERS	

1.0 EVALUATION SCOPE

Compliance with the following codes:

■ *New Zealand Building Code*: Building Regulations 1992 Version as at 15 November 2021. (2021 NZBC)

Compliance with the following performance requirements:

Clause B1 Structure: NZBC Clauses B1.3.1, B1.3.2, B1.3.3 and B1.3.4.

Design of the Cold-Formed Steel Framing Members described in this report must take into account physical conditions likely to affect the stability of the structure, including but not limited to imposed gravity loads arising from self-weight, use, earthquake, snow, wind and influence of equipment and other non-structural elements (See NZBC Clause B1.3.3 (a), (b), (f), (g), (h) and (p)). See Section 4.1 of this report.

Clause B2 Durability: NZBC Clause B2.3.1(a).

The Cold-Formed Steel Framing Members, when maintained in accordance with this report, satisfies the performance of this code for the life of the building, being not less than 50 years. See Section 4.2 of this report.

Clause F2 Hazardous Building Materials: NZBC Clause F2.3.1.

The Cold-Formed Steel Framing Members meet the performance requirements under Clause F2.3.1.

The Cold-Formed Steel Framing Members are not subject to a warning or ban under the New Zealand Building Act 2004, Version as at 7 September 2022.

2.0 USES

The Cold-Formed Steel Framing Members are used for framing of nonload-bearing interior walls and curtain walls, and load-bearing walls, floors, and roofs.

3.0 DESCRIPTION

3.1 General:

Member designations are provided in Table 2. Gross, torsional and effective properties are provided in Tables 3 and 4. Also, see Figure 1. Punch-outs are circular holes with a diameter of 34 mm (1.34 in) spaced at 600 mm (23.6 in) on center. The punch-outs are a minimum of 250 mm (9.84 inches) clear from the ends of the studs.

3.2 Material:

The framing members are cold-rolled from steel coils complying with the specification listed in Table 1.

4.0 DESIGN AND INSTALLATION

4.1 Structure (Clause B1) - Design:

The values in Tables 5 and 6 have been determined in accordance with the Australian/New Zealand Standard for Cold-Formed Steel Structures (AS/NZS 4600:2018) based on limit state design (LSD) values.

4.2 Durability (Clause B2):

4.2.1 General: The cold-formed steel framing members have an expected life exceeding 50 years when designed, installed and maintained in accordance with this report, and the manufacturer's installation instructions.

4.2.2 Maintenance: Maintenance of the cold-formed steel framing members installed in interior, dry and protected environments will not normally be required during the expected life of the anchor channels.

4.3 Installation:

The framing members must be installed in accordance with the applicable code, the approved plans and this report. If there is a conflict between the plans submitted for approval and this report, this report governs. The approved plans must be available at the jobsite at all times during the installation.

5.0 CONDITIONS OF USE:

The Cold-Formed Steel Framing members described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The Cold-Formed Steel Framing Members must be installed in accordance with the applicable code, the approved plans and this report.

5.2 Minimum uncoated base-metal thickness of the framing members as delivered to the jobsite must be at least 95 percent of the design base-metal thickness.

5.3 Complete plans and calculations verifying compliance with this report must be submitted to the code official for each project at the time of permit application. The calculations and drawings must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 The framing members are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated October 2019 (editorially revised December 2020).

6.2 Calculations in accordance with Australian/New Zealand Standard for Cold-Formed Steel Structures (AS/NZS 4600:2018).

6.3 Quality control documentation.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-1538-NZ) along with the name, registered trademark, or registered logo of the report holder or listee must be included in the product label.

7.2 In addition, each member must have a legible label, stamp or embossment, at a maximum of 96 inches (2440 mm) on center; member designation; minimum base-metal thickness (uncoated) in decimal thickness or mils; in addition to the following:

- Load-bearing members must also have the minimum yield strength, and the protective coating designation (minimum Z275).

7.3 The report holder's contact information is the following:

SCOTTSDALE CONSTRUCTION SYSTEMS
P.O. BOX 520981
SALT LAKE CITY, UT 84152, USA
1 (888) 406-2080

UNIT 4/5 HENRY ST.
LOGANHOLME, QUEENSLAND 4129
AUSTRALIA

17 CADBURY ROAD, ONEKAWA
NAPIER 4110,
NEW ZEALAND
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www.scottsdalesteelframes.com
sales@scottsdalesteelframes.com

7.1 The additional listee contact information is the following:

DVELE OMEGA CORPORATION
5580 LA JOLLA BLVD. SUITE 7
LA JOLLA, CA 92037
(909) 796-2561
www.dvele.com
info@dvele.com

DEFINITIONS OF SYMBOLS

Gross Properties

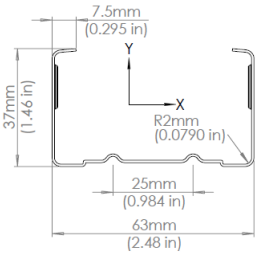
I_{xx}	-	moment of inertia of the cross section about the x-axis
S_{xx}	-	section modulus about the x-axis
R_x	-	radius of gyration of cross section about the x-axis
I_{yy}	-	moment of inertia of the cross section about the y-axis
R_y	-	radius of gyration of cross section about the y-axis

Torsional Properties

J	-	St. Venant torsion constant.
C_w	-	Warping constant
X_o	-	Distance from shear center to neutral axis in the x-direction
m	-	Distance from shear center to mid-plane of web
R_o	-	Polar radius of gyration of cross section about the shear center
β	-	Torsional flexural constant $1-(X_o/R_o)^2$

Effective Properties

A_e	-	Effective area for compression at stress = Fy
ϕN_s	-	Design section capacity of the member in compression
ϕN_{ty}	-	Design tension capacity (gross section yielding)
I_{xe}	-	Effective moment of inertia of the cross section about the x-axis
Z_{ex}	-	Effective section modulus about the x-axis
ϕM_{sx}	-	Design section moment capacity based on local buckling
ϕM_{bd}	-	Design member moment capacity based on distortional buckling
ϕV_{vx}	-	Design shear capacity about the x-axis
ϕV_{vy}	-	Design shear capacity about the y-axis
ϕR_b	-	Design web crippling capacity



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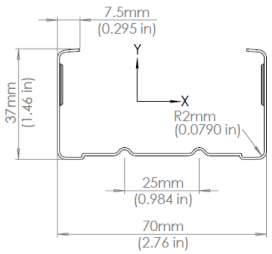

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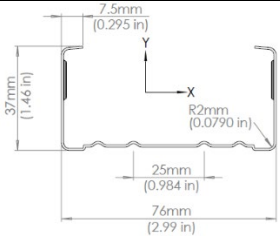

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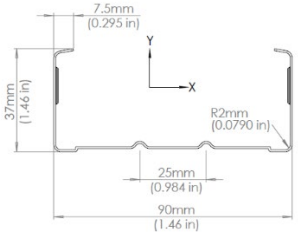

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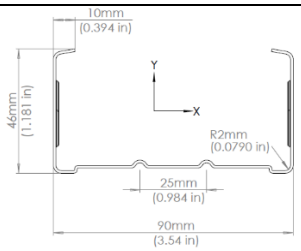

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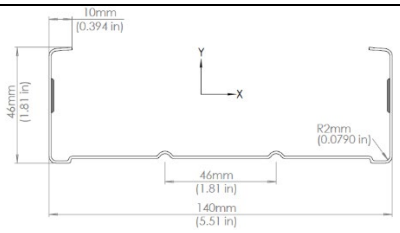

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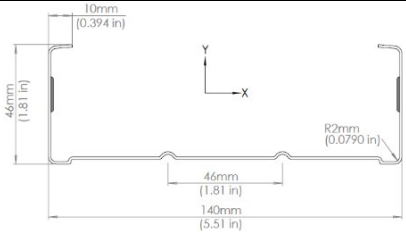

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FIGURE 1 – COLD FORMED STEEL FRAMING MEMBER SECTIONS

TABLE 1—MINIMUM STEEL YIELD STRESS[1,2]

Standard	Steel Grade:			
	G350	G550		
AS/NZS 1397	F_y =350 MPa	t < 0.6 mm	0.9 > t ≤ 0.6 mm	t ≥ 0.9
		F_y = 410 MPa	F_y = 495 MPa	F_y = 550 MPa

[1]The steel has a minimum Z275 coating per AS/NZS 4680.

[2] Minimum strength of steel conforming to AS/NZS 4600:2018 Table 1.5.2.

[3] t refers to material thickness.

TABLE 2—MEMBER DESIGNATION

Member Designation	Thickness (mm)	Web (mm)	Flange (mm)
63C37-055	0.55	63	37
63C37-075	0.75	63	37
63C37-095	0.95	63	37
70C37-055	0.55	70	37
70C37-075	0.75	70	37
70C37-095	0.95	70	37
76C37-055	0.55	76	37
76C37-075	0.75	76	37
76C37-095	0.95	76	37
90C37-055	0.55	90	37
90C37-075	0.75	90	37
90C37-095	0.95	90	37
90C37-115	1.15	90	37
90C46-055	0.55	90	46
90C46-075	0.75	90	46
90C46-095	0.95	90	46
90C46-115	1.15	90	46
140C46-075	0.75	140	46
140C46-095	0.95	140	46
140C46-115	1.15	140	46

For Imperial Units: 1 m = 39.4 in

TABLE 3—GROSS AND TORSIONAL SECTION PROPERTIES[1]

Member Designation	Design Thickness (mm)	Gross Properties							Torsional Properties					
		Area (mm^2)	Weight (kg/m)	I_{xx} (mm^4)	S_{xx} (mm^3)	R_x (mm)	I_{yy} (mm^4)	R_y (mm)	J (mm^4)	C_w (mm^6)	Xo (mm)	m (mm)	Ro (mm)	β
63C37-055	0.55	80.97	0.64	54301	1724	25.90	14821	13.54	8.16	12036075	-29.3	16.83	41.38	0.50
63C37-075	0.75	109.5	0.86	73011	2318	25.82	19806	13.45	20.53	15899632	-29.1	16.66	41.18	0.50
63C37-095	0.95	137.5	1.08	91166	2894	25.74	24577	13.36	41.39	19503984	-28.9	16.49	40.98	0.50
70C37-055	0.55	84.82	0.67	68861	1967	28.49	15368	13.47	8.55	15038731	-28.3	16.45	42.40	0.55
70C37-075	0.75	114.7	0.90	92659	2647	28.41	20539	13.38	21.52	19886304	-28.1	16.28	42.20	0.55
70C37-095	0.95	144.2	1.13	11579	3308	28.33	25490	13.29	43.39	24419878	-28.0	16.10	42.00	0.56
76C37-055	0.55	88.12	0.69	82977	2184	30.69	15799	13.40	8.88	17942467	-27.6	16.14	43.40	0.60
76C37-075	0.75	119.2	0.94	11171	2940	30.60	21116	13.31	22.36	23743927	-27.4	15.96	43.20	0.60
76C37-095	0.95	149.9	1.18	13969	3676	30.52	26208	13.22	45.10	29179459	-27.2	15.77	43.00	0.60
90C37-055	0.55	95.82	0.75	12213	2714	35.70	16689	13.20	9.66	25957321	-26.0	15.44	46.11	0.68
90C37-075	0.75	129.7	1.02	16461	3658	35.62	22306	13.11	24.33	34399588	-25.8	15.26	45.91	0.68
90C37-095	0.95	163.2	1.28	20606	4579	35.53	27687	13.02	49.10	42336256	-25.6	15.07	45.71	0.69
90C37-115	1.15	196.2	1.54	24648	5478	35.44	32834	12.93	86.49	49783193	-25.4	14.88	45.51	0.69
90C46-055	0.55	108.4	0.85	14555	3235	36.63	31265	16.98	10.94	51467051	-35.7	20.93	53.94	0.56
90C46-075	0.75	147.0	1.15	19643	4365	36.55	41956	16.89	27.56	68519851	-35.5	20.75	53.74	0.56
90C46-095	0.95	185.0	1.45	24621	5471	36.47	52289	16.81	55.67	84723797	-35.3	20.55	53.53	0.56
90C46-115	1.15	222.6	1.75	29490	6553	36.39	62265	16.72	98.15	100102104	-35.2	20.36	53.32	0.56
140C46-075	0.75	184.5	1.45	54389	7770	54.29	48210	16.16	34.59	179633203	-30.2	18.32	64.20	0.78
140C46-095	0.95	232.5	1.83	68321	9760	54.20	60094	16.07	69.96	222788700	-30.0	18.12	64.01	0.78
140C46-115	1.15	280.1	2.20	82012	1171	54.10	71576	15.98	123.50	264027906	-29.8	17.91	63.81	0.78

For Imperial Units: 1 m = 39.4 in; 1 kg/m = 0.672 lb/ft

[1]Gross and torsional properties are based on the full-unreduced cross section away from the punch-outs.

TABLE 4—EFFECTIVE SECTION PROPERTIES[1]

Member Designation	Design Thickness (mm)	Fy (MPa)	Effective Properties[2]						
			A_e	I_{xe}[3]	Z_{xe}	ϕM_{sx}	ϕM_{bdx}[4]	ϕVny	ϕV_{nyNet}
			(mm^2)	(mm^4)	(mm^3)	(kNm)	(kNm)	(kN)	(kN)
63C37-055	0.55	350	36.525	40515	1060	0.352	0.335	2.496	1.004
63C37-055	0.55	410	34.504	39173	1005	0.391	0.368	2.496	1.004
63C37-075	0.75	350	56.814	58660	1612.5	0.536	0.513	5.875	1.704
63C37-075	0.75	495	50.434	54890	1445.8	0.680	0.633	6.374	1.849
63C37-095	0.95	350	79.777	77280	2210.3	0.735	0.706	9.425	2.122
63C37-095	0.95	550	68.903	71527	1939.4	1.013	0.935	11.815	2.660
70C37-055	0.55	350	36.833	51196	1196.5	0.398	0.374	2.227	1.159
70C37-055	0.55	410	34.767	49457	1133.5	0.441	0.410	2.227	1.159
70C37-075	0.75	350	57.619	74455	1830.2	0.609	0.575	5.682	2.139
70C37-075	0.75	495	51.003	69538	1637.6	0.770	0.708	5.682	2.139
70C37-095	0.95	350	81.464	98479	2523.8	0.839	0.793	9.425	2.765
70C37-095	0.95	550	69.977	90916	2205.9	1.153	1.049	11.619	3.409
76C37-055	0.55	350	37.004	61382	1312.9	0.437	0.408	2.039	1.267
76C37-055	0.55	410	34.913	59255	1243.2	0.484	0.447	2.039	1.267
76C37-075	0.75	350	58.063	89566	2015.8	0.670	0.628	5.198	2.343
76C37-075	0.75	495	51.318	83522	1801.1	0.847	0.773	5.198	2.343
76C37-095	0.95	350	82.389	118791	2789.6	0.928	0.868	9.425	3.316
76C37-095	0.95	550	70.565	109465	2433	1.271	1.147	10.626	3.738
90C37-055	0.55	350	37.247	88922	1584.5	0.527	0.487	1.702	1.459
90C37-055	0.55	410	35.120	85719	1499.2	0.584	0.534	1.702	1.459
90C37-075	0.75	350	58.689	130627	2448.9	0.814	0.753	4.337	2.704
90C37-075	0.75	495	51.760	121410	2182.6	1.026	0.926	4.337	2.704
90C37-095	0.95	350	83.686	174252	3411.2	1.134	1.047	8.857	4.325
90C37-095	0.95	550	71.391	159894	2963.1	1.548	1.378	8.857	4.325
90C37-115	1.15	350	112.980	220284	4494.3	1.494	1.361	13.811	5.527
90C46-055	0.55	350	44.409	105880	1885	0.557	0.576	1.732	1.484
90C46-055	0.55	410	41.160	101054	1756.5	0.608	0.627	1.702	1.459
90C46-075	0.75	350	67.748	152948	2831.9	0.942	0.888	4.337	2.750
90C46-075	0.75	495	59.062	141183	2500.1	1.176	1.091	4.411	2.750
90C46-095	0.95	350	94.777	202629	3890.9	1.294	1.230	8.857	4.398
90C46-095	0.95	550	80.092	184326	3341.9	1.746	1.617	9.007	4.398
90C46-115	1.15	350	124.530	253002	5007.4	1.665	1.585	13.811	5.527
140C46-075	0.75	350	68.125	409524	4763.2	1.584	1.401	2.725	2.725
140C46-075	0.75	495	59.238	375978	4197.9	1.974	1.712	2.725	2.725
140C46-095	0.95	350	95.865	562323	6992	2.325	1.962	5.554	5.419
140C46-095	0.95	550	80.648	495447	5664	2.959	2.561	5.554	5.419
140C46-115	1.15	350	127.530	733315	9759	3.245	2.570	9.882	7.933

For Imperial Units: 1 m = 39.4 in; 1 kg/m = 0.672 lb/ft; 1 kN = 224.8 lb; kN-m = 651.5 k-in

[1]See Page 3 for definition of symbols.
[2]Effective properties are based on the reduced cross section at the web punch-out. Punch-outs are circular holes with a diameter of 34 mm spaced at 600 mm.
[3]Use I_{xe} deflection calculations.
[4]Distortional buckling moment (ϕM_{bdx}) is calculated without the beneficial effect of sheathing to rotational stiffness. $K_\phi = 0$.

TABLE 5 — DESIGN BEARING WEB CRIPPLING LOADS (ϕR_b) FOR SINGLE MEMBERS – One Flange Loading (N) [1,2,3]

Member Designation	Design Thickness (mm)	Fy (MPa)	Condition 1 (End 1 Flange) Fastened to Support					Condition 2 (Interior 1 Flange) Fastened to Support				
			Bearing Length (mm)					Bearing Length (mm)				
			25	45	90	125	150	25	45	90	125	150
63C37-055	0.55	350	705	874	-	-	-	1213	1414	-	-	-
63C37-055	0.55	410	825	1023	-	-	-	1421	1657	-	-	-
63C37-075	0.75	350	1287	1581	-	-	-	2373	2736	-	-	-
63C37-075	0.75	495	1820	2235	-	-	-	3356	3869	-	-	-
63C37-095	0.95	350	2021	2465	-	-	-	3903	4460	-	-	-
63C37-095	0.95	550	3177	3874	-	-	-	6133	7009	-	-	-
70C37-055	0.55	350	694	860	1131	-	-	1205	1405	1730	-	-
70C37-055	0.55	410	813	1008	1325	-	-	1412	1646	2027	-	-
70C37-075	0.75	350	1270	1561	2033	2321	-	2360	2720	3306	3663	-
70C37-075	0.75	495	1797	2207	2875	3282	-	3337	3847	4676	5181	-
70C37-095	0.95	350	1999	2438	3152	3587	-	3883	4438	5340	5890	-
70C37-095	0.95	550	3142	3831	4953	5636	-	6102	6974	8391	9255	-
76C37-055	0.55	350	685	850	1117	-	-	1198	1397	1721	-	-
76C37-055	0.55	410	803	995	1309	-	-	1404	1637	2015	-	-
76C37-075	0.75	350	1257	1545	2012	2297	-	2349	2707	3291	3646	-
76C37-075	0.75	495	1778	2185	2846	3248	-	3322	3829	4654	5157	-
76C37-095	0.95	350	1981	2416	3123	3554	-	3867	4420	5318	5866	-
76C37-095	0.95	550	3114	3797	4908	5585	-	6077	6945	8357	9217	-
90C37-055	0.55	350	666	826	1086	-	-	1184	1380	1700	-	-
90C37-055	0.55	410	780	968	1272	-	-	1387	1617	1991	-	-
90C37-075	0.75	350	1229	1509	1966	2245	2420	2325	2680	3257	3609	3831
90C37-075	0.75	495	1738	2135	2781	3174	3422	3288	3790	4607	5105	5418
90C37-095	0.95	350	1942	2368	3062	3484	3750	3833	4380	5270	5813	6155
90C37-095	0.95	550	3052	3722	4811	5475	5893	6023	6883	8282	9135	9672
90C37-115	1.15	350	2801	3394	4360	4948	5318	5704	6473	7725	8488	8969
90C46-055	0.55	350	666	826	1086	-	-	1184	1380	1700	-	-
90C46-055	0.55	410	780	968	1272	-	-	1387	1617	1991	-	-
90C46-075	0.75	350	1229	1509	1966	2245	2420	2325	2680	3257	3609	3831
90C46-075	0.75	495	1738	2135	2781	3174	3422	3288	3790	4607	5105	5418
90C46-095	0.95	350	1942	2368	3062	3484	3750	3833	4380	5270	5813	6155
90C46-095	0.95	550	3052	3722	4811	5475	5893	6023	6883	8282	9135	9672
90C46-115	1.15	350	2801	3394	4360	4948	5318	5704	6473	7725	8488	8969
140C46-075	0.75	350	1142	1403	1828	2086	2249	2253	2597	3156	3497	3712
140C46-075	0.75	495	1615	1984	2585	2951	3181	3186	3672	4464	4946	5250
140C46-095	0.95	350	1824	2224	2875	3272	3522	3728	4261	5127	5654	5987
140C46-095	0.95	550	2866	3495	4518	5142	5534	5859	6695	8056	8886	9408
140C46-115	1.15	350	2649	3210	4123	4679	5030	5563	6314	7535	8279	8748

For Imperial Units: 1 m = 39.4 in; 1 kN = 224.8 lb; 1 MPa = 145 psi

[1]Tabulated values are for unpunched webs and punched webs where the clear distance between the edge of bearing is such that the web crippling reduction factor, Rc, per AISI S100 Section C3.4.2 = 1.0. For webs with punchouts closer to the edge of bearing a web crippling reduction factor must be applied per AISI S100, Section C3.4.2.

[2]See notes at end of Table 6 for definitions of 1 and 2 flange loading.

[3]Design web crippling strengths for back-to-back members may be taken as twice the capacity of single members.

TABLE 6 — DESIGN BEARING LOADS (ϕR_b) FOR SINGLE MEMBERS – Two Flange Loading (N)[1,2,3]

Member Designation	Design Thickness (mm)	Fy (MPa)	Condition 3 (End 2 Flange) Fastened to Support					Condition 2 (Interior 2 Flange) Fastened to Support				
			Bearing Length (mm)					Bearing Length (mm)				
			25	45	90	125	150	25	45	90	125	150
63C37-055	0.55	350	525	605	-	-	-	1529	1712	-	-	-
63C37-055	0.55	410	615	709	-	-	-	1791	2006	-	-	-
63C37-075	0.75	350	1071	1220	-	-	-	2983	3305	-	-	-
63C37-075	0.75	495	1514	1726	-	-	-	4218	4674	-	-	-
63C37-095	0.95	350	1806	2041	-	-	-	4919	5408	-	-	-
63C37-095	0.95	550	2837	3207	-	-	-	7729	8498	-	-	-
70C37-055	0.55	350	495	571	694	-	-	1487	1665	1955	-	-
70C37-055	0.55	410	580	669	813	-	-	1742	1951	2290	-	-
70C37-075	0.75	350	1025	1168	1401	1543	-	2917	3232	3744	4056	-
70C37-075	0.75	495	1449	1652	1982	2183	-	4125	4571	5295	5736	-
70C37-095	0.95	350	1742	1969	2337	2562	-	4826	5306	6086	6562	-
70C37-095	0.95	550	2737	3094	3673	4026	-	7584	8338	9564	10311	-
76C37-055	0.55	350	471	543	660	-	-	1453	1627	1910	-	-
76C37-055	0.55	410	552	636	773	-	-	1702	1906	2237	-	-
76C37-075	0.75	350	987	1126	1350	1487	-	2863	3172	3675	3982	-
76C37-075	0.75	495	1397	1592	1909	2103	-	4050	4487	5198	5631	-
76C37-095	0.95	350	1690	1910	2268	2486	-	4751	5223	5991	6459	-
76C37-095	0.95	550	2656	3001	3564	3906	-	7465	8207	9414	10150	-
90C37-055	0.55	350	418	481	585	-	-	1379	1544	1812	-	-
90C37-055	0.55	410	489	564	686	-	-	1615	1808	2123	-	-
90C37-075	0.75	350	906	1033	1239	1364	1443	2747	3043	3525	3819	4005
90C37-075	0.75	495	1281	1460	1752	1930	2041	3885	4304	4986	5402	5664
90C37-095	0.95	350	1577	1782	2116	2320	2448	4586	5042	5784	6236	6521
90C37-095	0.95	550	2478	2801	3325	3645	3847	7207	7923	9089	9799	10247
90C37-115	1.15	350	2431	2729	3213	3509	3695	6899	7539	8580	9215	9615
90C46-055	0.55	350	418	481	585	-	-	1379	1544	1812	-	-
90C46-055	0.55	410	489	564	686	-	-	1615	1808	2123	-	-
90C46-075	0.75	350	906	1033	1239	1364	1443	2747	3043	3525	3819	4005
90C46-075	0.75	495	1281	1460	1752	1930	2041	3885	4304	4986	5402	5664
90C46-095	0.95	350	1577	1782	2116	2320	2448	4586	5042	5784	6236	6521
90C46-095	0.95	550	2478	2801	3325	3645	3847	7207	7923	9089	9799	10247
90C46-115	1.15	350	2431	2729	3213	3509	3695	6899	7539	8580	9215	9615
140C46-075	0.75	350	660	752	902	994	1051	2394	2653	3073	3329	3491
140C46-075	0.75	495	933	1064	1276	1405	1487	3386	3752	4346	4709	4937
140C46-095	0.95	350	1236	1397	1658	1818	1918	4090	4497	5158	5561	5815
140C46-095	0.95	550	1942	2195	2606	2856	3014	6427	7066	8105	8739	9138
140C46-115	1.15	350	1986	2229	2625	2867	3019	6244	6824	7766	8341	8703

For Imperial Units: 1 m = 39.4 in; 1 kN = 224.8 lb; 1 MPa = 145 psi

[1]Tabulated values are for unpunched webs and punched webs where the clear distance between the edge of bearing is such that the web crippling reduction factor, Rc, per AISI S100 Section C3.4.2 = 1.0. For webs with punchouts closer to the edge of bearing a web crippling reduction factor must be applied per AISI S100, Section C3.4.2.

[2]See notes at end of Table 6 for definitions of 1 and 2 flange loading.

[3]Design web crippling strengths for back-to-back members may be taken as twice the capacity of single members.

As defined in AS 4600:2018

- One-flange loading or reaction occurs when the clear distance between the bearing edges of adjacent opposite concentrated loads or reactions is greater than $1.5d_1$.
- Two-flange loading or reaction occurs when the clear distance between the bearing edges of adjacent opposite concentrated loads or reaction is equal to or less than$1.5d_1$.
- End loading or reaction occurs when the distance from the edge of the bearing to the end of the member is equal to or less than $1.5d_1$.
- Interior loading or reaction occurs when the distance from the edge of the bearing to the end of the member is greater than $1.5d_1$.

Where d_1 is the depth of the flat portion of the web.