

METROLL PURLIN DESIGN GUIDE & CAPACITY TABLES

C & Z STANDARD PURLINS



A Met-TECH™ GUIDE

SEPTEMBER 2025



Metroll®

BETTER SERVICE • BETTER BUILDING SOLUTIONS

METROLL STANDARD PURLINS & GIRTS DESIGN MANUAL & CAPACITY TABLES

CONTENTS

	Page
GENERAL INFORMATION	3
1. APPLICATION	3
2. MATERIAL	3
3. INSTALLATION	3
4. SHEET LENGTH & EXPANSION JOINTS	3
5. WELDING	3
6. SAFE WORK PRACTICE	3
7. CORROSION PROTECTION & MATERIAL COMPATIBILITY	3
8. ON-SITE STORAGE	3
PRODUCT RANGE & PROPERTIES	4
USING THIS MANUAL	8
DESIGN & SPECIFICATION	9
9. HOLE PUNCHING	9
10. STRUCTURAL LAP LENGTHS	9
11. BRIDGING - GENERAL & HOLE LOCATIONS	10
12. MEMBER WEIGHT	10
13. DEFLECTION	10
14. CLEAT CONNECTIONS	11
15. BOLTS	11
16. POINT LOADS	11
HOW TO USE THE TABLES	13
DESIGN CAPACITY TABLES	14
METROLL BRIDGING	37
SAFEBRIDGE® PURLIN SYSTEM	43

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GENERAL INFORMATION

APPLICATION

Metroll purlins and girts are primarily used in the design of sheds, industrial and commercial buildings. The sections are typically used to support roof and wall sheeting.

MATERIALS

Metroll purlins and girts are manufactured from hi-tensile G450, G500 or G550 galvanised steel, with a minimum Z350 (350 g/m²) galvanised coating conforming to AS 1397.

INSTALLATION

Purlin and girt installation should be carried out in suitable weather conditions by experienced crews.

SHEET LENGTH & EXPANSION JOINTS

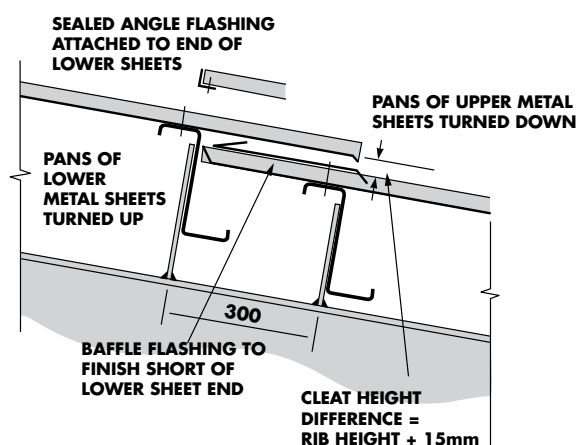
Roof sheeting lengths are limited by several issues - thermal expansion, transport limitations and practical handling are the main items governing maximum sheet lengths. The following table provides recommended maximum sheet lengths. This may vary from state to state. Contact your local Metroll branch for more information.

MAXIMUM ROOF SHEET LENGTH

ROOF COLOUR	THROUGH FIX	CONCEALED FIX
Light	25 m	33 m
Dark	17 m	25 m

Where buildings are designed with roofing runs greater than the table above, expansion joints are necessary.

TYPICAL EXPANSION JOINT



WELDING

Welding of purlins, girts and bridging is not recommended. Welding any cold rolled, high tensile material affects the material properties and removes the galvanised coating. This can cause reduced life of the member.

SAFE WORK PRACTICE

Metroll purlins and girts are not designed for walking on. Residual oil from the manufacturing process may be present and slipping can occur. Appropriate lifting equipment and work platforms must be used.

As a minimum:

- Never walk on purlins or girts during installation. Use appropriate equipment.
- Never walk on bridging.
- Ensure safety mesh is in place.
- Always use approved safety harnesses and/or other suitable safety equipment during installation.

CORROSION PROTECTION & MATERIAL COMPATIBILITY

Some building materials and environmental conditions can be detrimental to coated steel products irrespective of the product thickness. This includes contact with or exposure to runoff from:

- Industrial, agricultural, marine or other aggressive atmospheric conditions
- Incompatible metals such as lead or copper
- Building materials subject to cycles of excessive moisture content such as non-seasoned timber
- Materials which have been treated with preservatives such as CCA or tanalith treated section.

The standard Z350 (350 g/m²) galvanised coating will provide a long and trouble free life for enclosed buildings and open sided rural applications in non-aggressive environments. For more severe corrosive environments a Z450 (450 g/m²) will be required. This heavier coated product is available subject to minimum order quantities and lead times.

ON-SITE STORAGE

If not required for immediate use, the Z or C sections or bundles should be neatly stacked clear of the ground. For extended outdoor storage duration, the sections should be stored with a small incline so that no water can pool.

Sections/bundles and accessories should not be left exposed in the open for extended periods of time. If unavoidable then protect the sections/bundles from moisture and rain with waterproof covers.

PRODUCT RANGE & PROPERTIES

C & Z SECTIONS

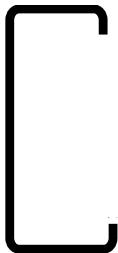
The following diagrams and tables illustrate the sizes and thicknesses readily available for purlins and girts. Shapes other than standard C and Z sections may be subject to minimum order requirements and extended lead times. Contact your local Metroll branch for more detail.

C SECTIONS

STANDARD C

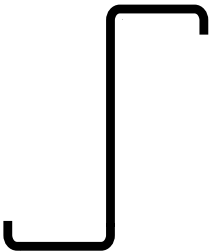


NESTABLE C
Box Configuration



Z SECTIONS

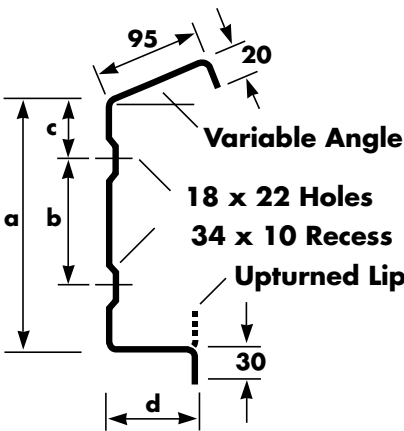
STANDARD Z



FASCIA PURLINS

Not available at all branches

Fascia Purlin design varies significantly across Australia. Different applications require different section size and configuration. Metroll manufacture a range of fascia purlins including the popular Fluted Series. These purlins feature a fluted web which adds strength and provides a flush external face when used with flat headed fascia bolts. The added advantages of this section include a down turned lip for wall fixing and a variable upturned top flange for roof pitches from 5° to 30°.

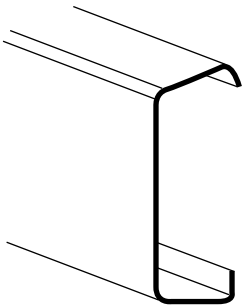


FASCIA PURLIN DIMENSIONS

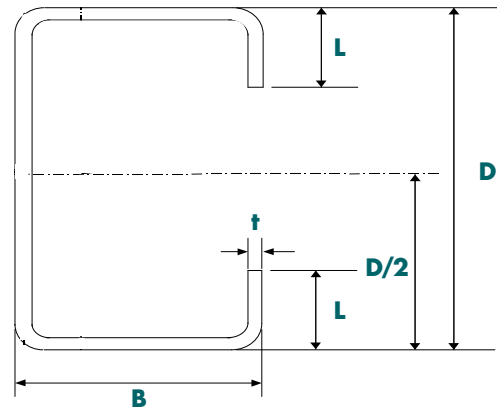
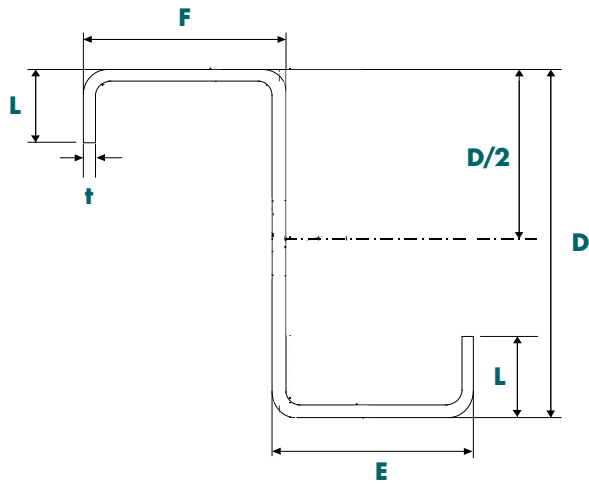
	A mm	B mm	C mm	D mm
230 Plain	230	110	65	50
230 Fluted	230	110	65	50
260 Plain	260	160	50	60
260 Fluted	260	160	50	60

FASCIA PURLIN - ALTERNATIVE OPTION

It is common practice to use a standard C section in place of a fascia purlin in fascia applications. The C section can be supplied as a standard configuration or with the top flange bent to suit the roof slope.



DIMENSIONS & PROPERTIES



C & Z PURLIN SIZE & MASS TABLE

Section	Thickness (t) mm	Height (D) mm	Z PURLINS			C PURLINS		Mass kg/m
			E	F	L	B	L	
100 10*	1.0	102	53	49	12.5	51	12.5	1.77
100 12	1.2	102	53	49	13	51	12.5	2.11
100 15	1.5	102	53	49	13.5	51	13.5	2.61
100 19	1.9	102	53	48	14.5	51	14.5	3.29
150 12	1.2	152	65	61	15.5	64	14.5	2.89
150 15	1.5	152	65	61	16.5	64	15.5	3.58
150 19	1.9	152	65	61	17.5	64	16.5	4.50
150 24	2.4	152	66	60	19.5	64	18.5	5.68
200 15	1.5	203	79	74	18	76	15.5	4.48
200 19	1.9	203	79	74	18.5	76	19	5.75
200 24	2.4	203	79	73	21.5	76	21	7.19
250 19	1.9	254	79	74	18	76	18.5	6.49
250 24	2.4	254	79	73	21	76	20.5	8.20
300 24	2.4	300	100	93	27	96	27.5	10.10
300 30	3.0	300	100	93	31	96	31.5	12.50
350 24*	2.4	350	129	121	30	125	30	12.20
350 30	3.0	350	129	121	30	125	30	15.15
400 30	3.0	400	96	96	30	96	30	15.15

* Minimum order quantity and lead time may apply

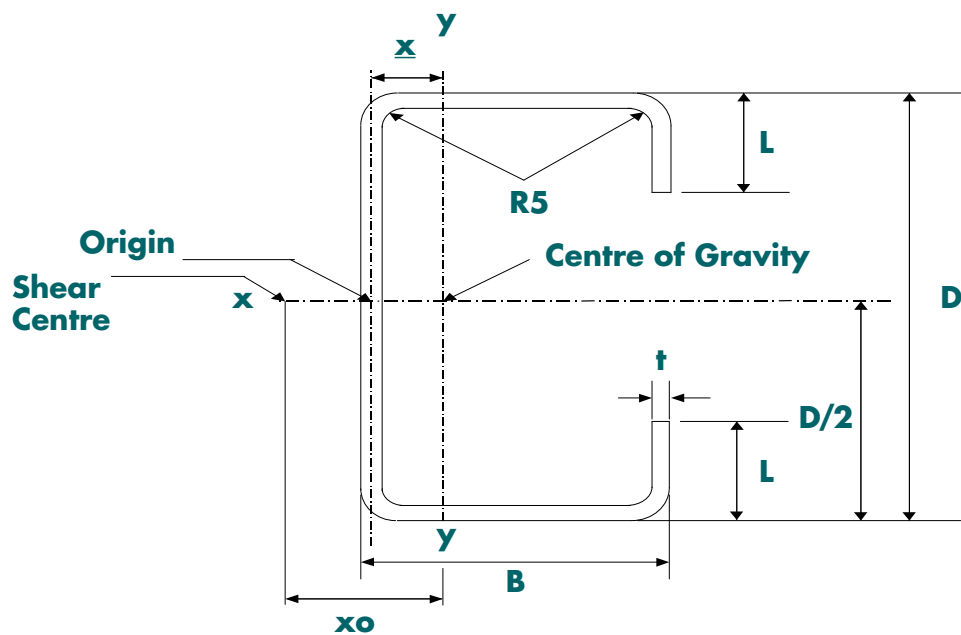
TOLERANCES

All sections will be produced with the following tolerances.
Please contact Metroll if any variation is required.

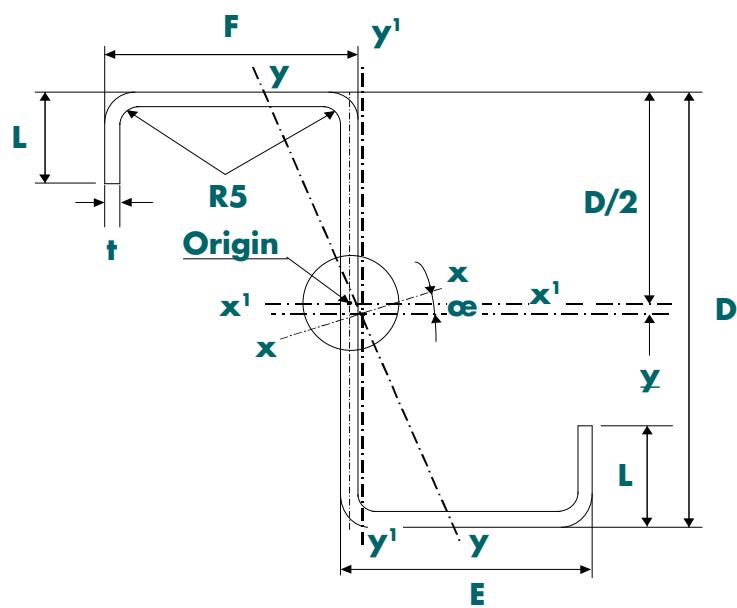
Overall Length	±5mm
Flange Width	±1mm
Depth	±1mm
Hole Centres	±1.5mm

C PURLIN DIMENSIONS & PROPERTIES

NOTE: x and y axes coincide with x^1 and y^1 axes (respectively)



Z PURLIN DIMENSIONS & PROPERTIES



C SECTION PROPERTIES

Section	Area mm ²	Second Moment of Area (x10 ⁶ mm ⁴)		Form Factor	Torsion Constant mm ⁴	Warping Constant (x10 ⁹ mm ⁶)	Monosymmetry Constant mm	Shear Centre mm	Centre of Gravity
		lx	ly	Q	J	Iw	by	xo	x
C100 10	215	0.361	0.075	0.644	71.7	0.158	123.3	-39.85	16.03
C100 12	258	0.429	0.088	0.731	123.8	0.186	122.8	-39.61	15.93
C100 15	321.7	0.531	0.111	0.824	241.3	0.238	122	-39.9	16
C100 19	408.5	0.667	0.41	0.879	491.6	0.307	121.7	-40.28	16.18
C150 12	354	1.28	0.186	0.573	169.9	0.835	170.7	-46.38	18.22
C150 15	441.4	1.593	0.234	0.671	331	1.059	170.1	-46.7	18.3
C150 19	560.5	2.009	0.297	0.76	674.5	1.358	169.8	-47.07	18.49
C150 24	708	2.527	0.382	0.813	1359.4	1.79	168.5	-47.93	18.82
C200 15	555	3.509	0.393	0.557	416.3	3.042	223.2	-51.54	19.89
C200 19	710.7	4.472	0.522	0.647	855.2	4.157	220.8	-53.4	20.7
C200 24	901.5	5.642	0.673	0.726	1722.8	5.483	218.8	-54.2	21
C250 19	807.5	7.585	0.557	0.574	971.7	6.82	276.4	-48.46	18.1
C250 24	1020	9.577	0.716	0.645	1958.4	8.859	273.9	-49.21	18.39
C300 24	1260	16.919	1.504	0.592	2419.2	26.671	319.8	-65.97	24.99
C300 30	1590	21.253	1.948	0.672	4770	35.487	315.8	-67.88	25.74
C350 24	1545	29.12	3.18	0.52	3015	77.379	386.9	-91.11	34.07
C350 30	1905	35.708	3.799	0.596	5715	89.651	378.4	-86.24	33.18
C400 24	1665	39.8	3.31	0.54	3246	103.979	439.9	-86.23	31.61
C400 30	2072	49.32	4.07	0.63	6318	127.269	440	-85.69	31.33

Z SECTION PROPERTIES

Section	Area mm ²	Second Moment of Area (x10 ⁶ mm ⁴)				Form Factor	Torsion Constant mm ⁴	Warping Constant (x10 ⁹ mm ⁶)	Monosymmetry Constant mm		Shear Centre mm		Centre of Gravity		Angle (Deg)
		lx ¹	ly ¹	lx	ly	Q	J	Iw	bx	by	xo	yo	x	y	α
Z100 10	215	0.361	0.13	1.448	0.043	0.644	71.7	0.213	9.9	11.8	-1.94	-4.73	1.11	-0.94	27.6
Z100 12	258	0.429	0.153	0.532	0.051	0.731	123.8	0.25	9.9	11.8	-1.94	-4.75	1.11	-0.94	27.5
Z100 15	322.5	0.533	0.194	0.663	0.064	0.826	241.9	0.317	9.9	11.8	-1.95	-4.75	1.11	-0.94	27.8
Z100 19	408.5	0.667	0.248	0.833	0.081	0.879	491.6	0.404	9.9	11.7	-1.96	-4.77	1.12	-0.94	28
Z150 12	352.4	1.274	0.3	1.46	0.114	0.576	169.2	1.145	12.4	12.7	-1.9	-5.9	1	-1	21.7
Z150 15	441.4	1.586	0.379	1.822	0.144	0.676	331	1.447	12.4	12.6	-1.9	-5.9	1	-1	21.9
Z150 19	559.2	1.995	0.482	2.294	0.181	0.725	672.9	1.839	12.5	12.6	-1.9	-5.9	1	-1	22
Z150 24	705.9	2.506	0.625	2.897	0.235	0.811	1363.3	2.381	18.6	18.5	-2.9	-8.8	1.5	-1.5	22.4
Z200 15	555	3.512	0.616	3.876	0.253	0.555	416.3	4.235	17.6	17.1	-2.26	-8.3	1.17	-1.36	18.5
Z200 19	712.5	4.496	0.837	4.994	0.339	0.647	857.4	5.795	17.4	16.8	-2.3	-8.24	1.19	-1.34	19.1
Z200 24	900	5.673	1.089	6.324	0.438	0.726	1728	7.58	21	19.8	-2.79	-9.94	1.45	-1.6	19.4
Z250 19	805.4	7.808	0.916	8.318	0.407	0.57	969.2	10.235	25.8	23.4	-2.7	-12.1	1.3	-1.9	14.7
Z250 24	1023.5	9.572	1.074	10.158	0.487	0.643	1952.5	12.261	26.9	23.4	-2.6	-12.8	1.3	-1.8	14.3
Z300 24	1260	17.117	2.381	18.471	1.027	0.59	2419.2	37.465	20.9	17.2	-1.99	-10.19	0.94	-1	16.2
Z300 30	1590	21.513	3.119	23.3	1.332	0.672	4770	49.318	21.3	16.9	-2.02	-10.42	0.94	-0.94	16.6
Z350 24	1545	29.1	4.98	32.02	2.07	0.52	2965	101	21.1	18.6	-2.1	-10.4	1.87	-2.16	18.2
Z350 30	1905	36.03	6.069	39.583	2.516	0.596	5715	126.23	21.6	19.1	-2.38	-10.49	1.16	-1.19	18
Z400 24	1665	39.8	4.98	42.55	2.22	0.54	3196	136	23.3	20.5	-2.4	-11.5	1.74	-2.29	15.2
Z400 30	2072	49.3	6.11	52.69	2.73	0.63	6250	166	23.7	21	-2.5	-11.8	1.73	-2.3	15.1

USING THIS MANUAL

When selecting purlins real applied loads must be considered along with the stated capacities in this manual. All spans are considered loaded concurrently and no allowance has been made for uneven or skip loading. Where this is likely, or where loading conditions vary from those designed for in this manual, a structural engineer should verify compliance independently with AS/NZS 4600:2005.

While real loading may be less than the stated capacity in this manual, this may not necessarily ensure competency of the selected system. Member adequacy is dependent on the maximum moments applied and the moment profile within the member span.

These design actions can vary widely under real, project specific, applied loads and it is the responsibility of the project design engineer to verify their purlin selection is compliant with AS/NZS 4600:2005 and AS/NZS 1170 Assessed Loading.

DESIGN ASSUMPTIONS

The tables in this brochure are for limit state capacity, which means that any load beyond the tabulated loads will prevent the member from fulfilling its intended function. This may mean reaching a limit state for collapse or loss of structural integrity. The limit state capacity tables for various purlin combinations in this publication provide economic design solutions for most projects. In special projects a more optimal design can be obtained by varying combinations, such as:

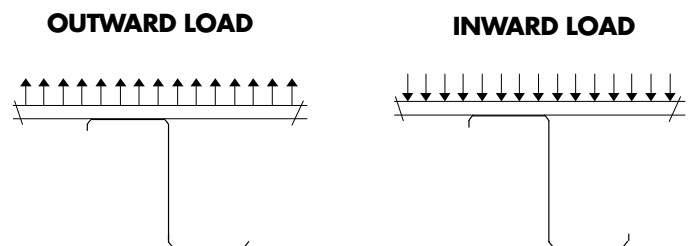
- Material specifications
- Bolt specifications & quantity
- Lap length
- Bridging quantity
- Span range
- Reduced or enlarged end spans
- Cantilevers at one or both ends of the configuration
- Loading

Design calculations are based on AS/NZS 4600:2005 Cold Formed Steel Structures, and follow criteria established by industry best practice.

Assumptions inherent in the code provisions and validated by them include:

- The Z shaped section behaves as an equivalent C shaped channel.
- Consistent with the above the section may be seen as acting with and as physically attached to the sheeting incurring the loads, in regard to its initial displacement.
- For INWARD loading full compressive bending stress is allowable on the flange attached to sheeting as shown in the following diagram. That is the centre span condition.
- For OUTWARD loading full compressive bending stress is allowable on the flange attached to the sheeting as shown in the following diagram. That is the span support condition.
- For sections/lengths under distortional buckling effects, both bending moment magnitude and gradient are taken into account.
- For all systems, loading is assumed as uniformly distributed and acting on all spans simultaneously.
- All section properties have been calculated with the holes deducted from the web.

LOADING CONDITIONS



DESIGN ASSUMPTIONS DISCLAIMER

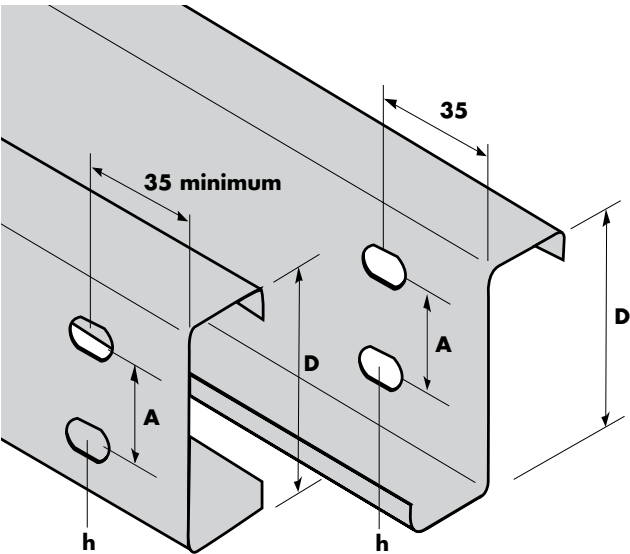
This publication is intended to provide accurate information with regard to Metroll C & Z purlins. It does not constitute a complete description of the goods, nor an explicit statement about suitability for any particular purpose. Data is provided as a guide only. Metroll Pty Ltd do not accept any liability for loss or damage suffered from the use of data in this publication.

DESIGN & SPECIFICATION

HOLE PUNCHING

Metroll C and Z purlin sections are normally supplied with holes punched to the AISC guide except in VIC where 150mm sections are punched to Structural Steel Fabricator Association Victoria recommendations (70mm centres).

Holes are required at cleat supports, laps bridging points or as specified on detail sheets supplied prior to manufacture. The preferred method of dimensioning is hole centre to hole centre rather than referenced from one end. An overall purlin length is required to provide for a data entry dimensional check.



HOLE CENTRES

PURLIN SIZE		AISC CENTRES	
D mm	A mm	h mm	
100	40	18 x 22	
150	60*	18 x 22	
200	110	18 x 22	
250	160	18 x 22	
300	210	22 round	
350	260	22 round	
400	310	25 round	

* Standard centres in VIC is 70mm
Alternative hole sizes, shapes and centres are available.
Please enquire with your local Metroll branch

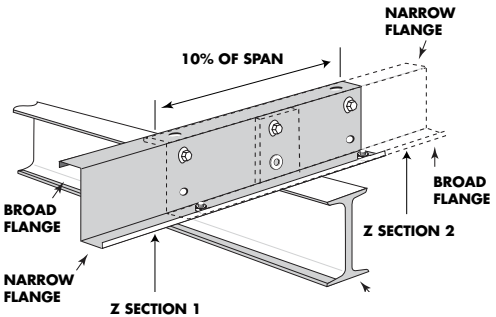
STRUCTURAL LAP LENGTHS

A feature of Metroll Z sections is one broad and one narrow flange proportioned so that two sections of the same size, when one is rotated by 180 degrees, bolt snugly together making them suitable for lapping. Structural continuity results in better economy but lapping provides two thicknesses of material over interior supports, increasing the strength of the sections where bending moments and shears are maximum, improving the load capacity and rigidity of the system. C sections cannot be lapped.

The bending moments, deflection and reaction coefficients vary with the length of the lap. These have been determined by a nominal lap of 10% span in all lapped spans. In the final analysis, where a mixed combination of lighter gauge section in an Internal Span to that in the End Span is made, the difference may be across two section thicknesses maximum. In three or four lapped span configurations with mixed thicknesses the greater thickness is in the end spans. The structural lap at the interior supports of lapped configurations must provide adequate structural continuity. Each end of the lap must be bolted with one bolt through the flanges furthest from the cladding and one bolt through the webs near the flanges connected to the cladding. The required structural lap length is shown in the table. The size of the bolts depends on the section size. Bolts are standard Metroll Purlin Bolts.

Z sections of the same and different thicknesses can be lapped in any required combination. Z sections may also be used over simple spans and for shorter spans they may be used continuously over two or more spans without laps. Z sections with one lip turned outward may be used in simple or continuous spans with the ends butted. These sections cannot be overlapped.

LAP LENGTHS		Span (mm)	Lap Length (mm)
Nominal Section Size (mm)	100	≤6000	600
		>6000	900
	150, 200, 250	≤ 9000	900
		>9000 ≤12000	1200
		>1200	1800
	300, 350	≤9000	900
		>9000 ≤12000	1200
		>1200 ≤18000	1800
		>18000	2400



BRIDGING

The limit state capacity tables provide design solutions for an equal number of rows of bridging in each span. Provision is made for 0, 1, 2 or 3 rows.

In some combinations of span configuration and loading there is no benefit in increasing the number of bridging rows.

When using the Safebridge® bridging system 3 rows of bridging should be selected.

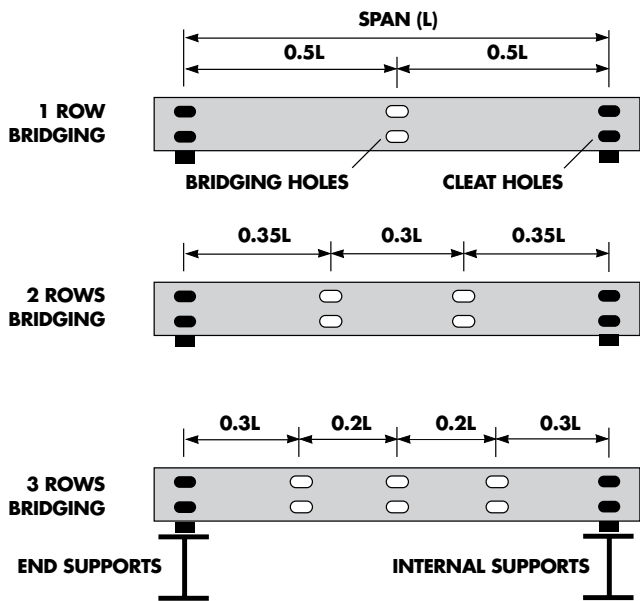
Metroll recommends that bridging is installed such that the maximum un-braced length is $20 \times D$ (D = purlin web height), or 4000mm, whichever is the least. In addition to enhancing purlin performance this requirement assists with the installation of roof sheeting. Location of the bridging must be as shown below (to the nearest 50mm), or as determined by the design engineer.

RECOMMENDED MAX. BRIDGING SPACING

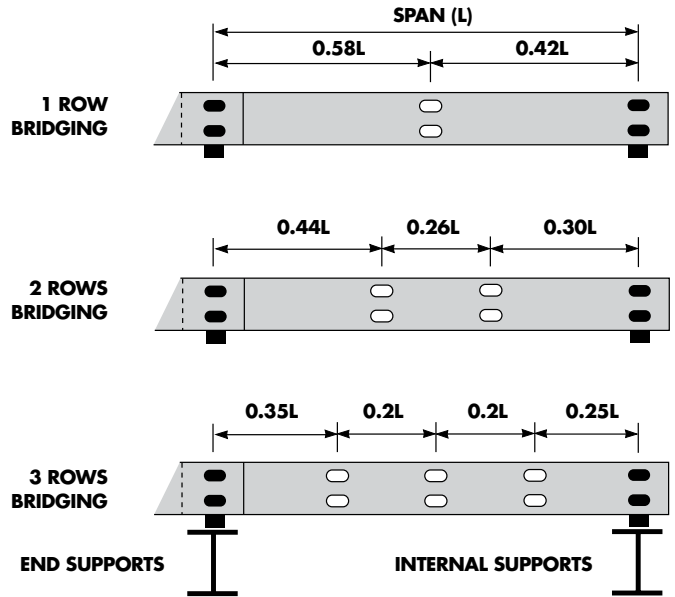
PURLIN SIZE mm	MAX. BRIDGING SPACING mm
100	2000
150	3000
200, 250 , 300, 350, 400	4000

BRIDGING HOLE LOCATIONS

SINGLE OR INTERNAL SPANS



DOUBLE OR END SPANS



MEMBER WEIGHT

All limit state loads are in kN/m. Limit state loads make no allowance for the mass of the member. In some cases, limit state loads are limited by the bolting.

DEFLECTION

There are no specific rules governing acceptable deflections, though structural codes give guidance. One needs to consider the specific requirements of any structure. It may be necessary to design under more than one load combination. Load stated is calculated to produce a deflection of $\text{Span}/150$ for the critical span. Solutions for other deflection ratios may be obtained using linear proportioning. Where a suspended ceiling is to be installed, such as in residential and commercial construction, more stringent deflection limits may be necessary to prevent damage to the ceiling components or joints. Both the end span and the internal span must be considered in the analysis of lapped and continuous spans.

CLEAT CONNECTIONS

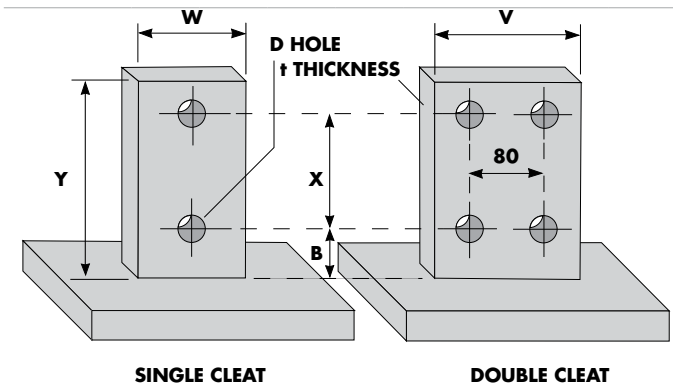
The limit state capacity tables are based on the sections being fastened through the web to the cleats so that the load is via the web of the sections.

The connections may be single section thickness such as in end connections, or the internal support connection of continuous configurations. Connections with double section thickness occur at the internal support of lapped configurations.

Each connection consists of two bolts. The bolt specifications (size and grade) will depend on the section size and design load. In some cases, eliminating cleats and bolting directly through the bottom flange for the Z and C sections could save on the number of bolts required. The number of bolts is halved compared with those in conventional cleated connections.

Single cleats are most commonly used with Z sections and double cleats with C sections. Double cleats can also be used in applications with a high reaction load to reduce bolt stress and shear. Extra care is required with hole detailing in double cleat application to a single purlin. The following table illustrates industry standard cleat sizes including purlin clearances.

CLEAT NOMINAL DIMENSIONS (mm)



SIZE	X	B+	Y+	t	GAP	hd	W	V
100	40	40	105	8	10	18	50	130
150	60*	55†	145	8	10	18	60	140
200	110	55	195	8	10	18	60	140
250	160	55	245	8	10	18	60	140
300	210	65	305	12	20	22	60	140
350	260	65	355	12	20	22	60	140
400	310	75	405	12	20	22	60	140

* 70mm in VIC

† 50mm in VIC

+ When using down turned lip purlins or girts the lip length must be added to the dimension B and Y. Cleat lengths may be increased in some design situations (e.g. above an expansion joint).

As a guide, increase the cleat thickness by 2mm for each 40mm of additional length.

BOLTS

The fastening of sections to cleats is normally by standard Metroll purlin bolts. In the limit state capacity tables, where high strength bolts govern the capacity the loads are marked accordingly. In these situations the section capacity is not fully utilised and it may be more economical to select another configuration or change the spacing of the section or increase the bolt number of specification.

Purlin laps must be bolted in the top web hole and the lower flange holes at both ends of the lap. Bolting only the web of lapped purlins does not provide full structural integrity and excessive loads can be placed on the roofing screws that penetrate both purlin thickness in the lap region. The correct size and grade of purlin bolts nominated by the design engineer should be used at all times. Bolts should be fully tightened prior to roof installation and before any loads are applied to the purlins, girts or bridging.

Bolts to be snug tightened to a nominal torque of 54Nm.

BOLT SPECIFICATION

NOMINAL SECTION SIZE mm	BOLT SPECIFICATION
100, 150, 200, 250	Standard M12 Purlin Bolt High Strength M12 Purlin Bolt
300, 350, 400	Standard M16 Purlin Bolt High Strength M16 Purlin Bolt

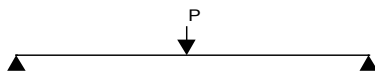
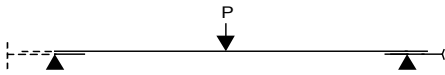
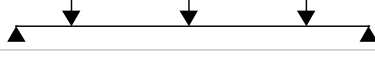
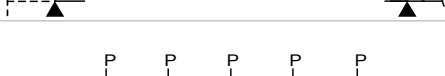
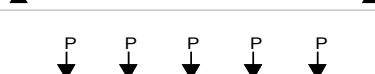
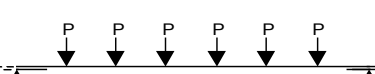
POINT LOADS
(SEE TABLE OVER PAGE)

The limit state loads specified in the tables are essentially uniformly distributed. It is inferred that all design loads will be converted into uniformly distributed values. In some applications the design loads are point loads. All design loads must be converted to uniformly distributed loads. The point-loaded configuration has been equated with uniformly loaded configuration for conversion formulae for single spans and lapped span configurations and are provided as a guide in the table on the following page. For continuous unlapped configurations a separate set of conversion formulae is applicable.

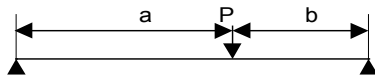
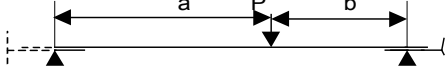
For single spans the formulae given are accurate conversions. For lapped spans, the conversion depends upon the number of spans, the position in the continuity and the lapping ratio. The lapped span formulae tabulated have been given the worst loading condition and can be safely used for interior spans, ends spans and any lapping ratio greater than 0:10. A separate set of conversion formulae would be required for deflection determination.

POINT LOADS

SYMMETRICAL EQUIDISTANT POINT LOADS

LOADING CONDITION		DIAGRAM	CONVERSION FORMULA
SINGLE LOAD	Simple		$w = \frac{2P}{L}$
	Lapped		$w = \frac{2.22P}{L}$
2 LOADS	Simple		$w = \frac{2.67P}{L}$
	Lapped		$w = \frac{3.16P}{L}$
3 LOADS	Simple		$w = \frac{4P}{L}$
	Lapped		$w = \frac{3.78P}{L}$
4 LOADS	Simple		$w = \frac{4.80P}{L}$
	Lapped		$w = \frac{5.12P}{L}$
5 LOADS	Simple		$w = \frac{6P}{L}$
	Lapped		$w = \frac{6.65P}{L}$
6 OR MORE LOADS	Simple		$w = \frac{1.14P}{L}$
	Lapped		$w = \frac{1.22P}{L}$

SINGLE ECCENTRIC & TWO SYMMETRICAL POINT LOADS

SINGLE ECCENTRIC POINT LOAD	Simple		$w = \frac{8abP}{L^3}$
	Lapped		$w = \frac{17.76ab^2P}{L^4}$
TWO SYMMETRICAL POINT LOADS	Simple		$w = \frac{8bP}{L^2}$
	Lapped		$w = \frac{9.45(2L-3b)P}{L^3}$

P = Single Point Load (kN)

L = Span (m)

a = Larger distance from support (m)

b = Smaller distance from support (m)

w = Equivalent uniform load (kN/m)

N = Number of Point Loads over one span

PURLIN DESIGN CAPACITY TABLES

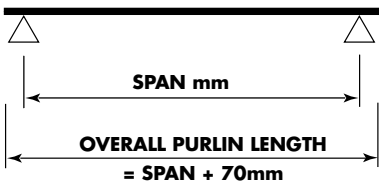
HOW TO USE THE TABLES

The tables indicate the maximum limit state capacity of the sections. Capacities are based on uniformly distributed loads and any point loads need to be converted.

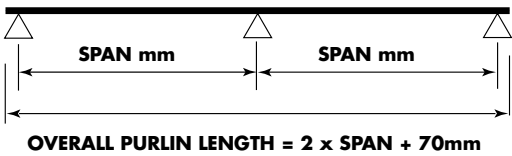
Required loads are established by a project designer using the appropriate building codes and standards. Once the purlin and girt outwards and inwards loads are determined the preferred span configuration can be checked using the tables.

When using the Safebridge® bridging system 3 rows of bridging should be selected.

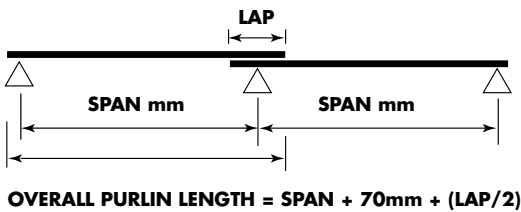
SINGLE SPAN



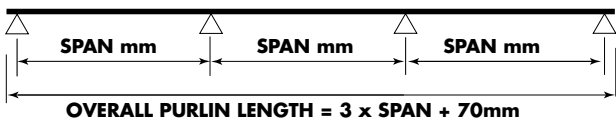
2 SPAN CONTINUOUS UNLAPPED



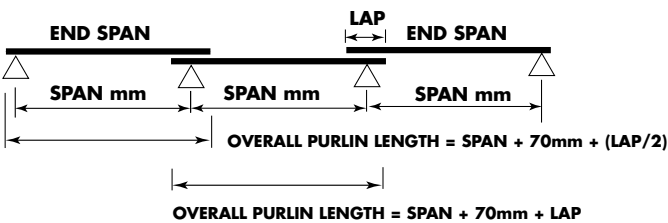
2 SPAN LAPPED



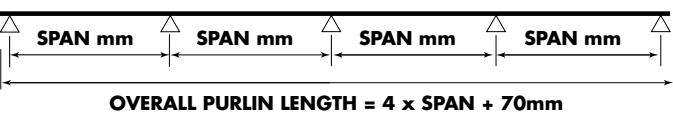
3 SPAN CONTINUOUS UNLAPPED



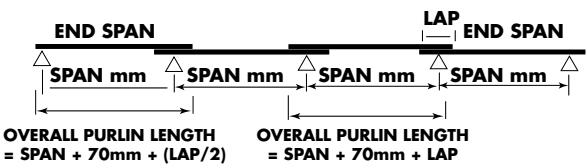
3 SPAN LAPPED



4 SPAN CONTINUOUS UNLAPPED



4 SPAN LAPPED

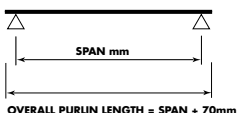


METROLL PURLIN CAPACITY TABLES

The following section contains the below Capacity Tables:

C & Z Section Continuous Inwards & Outwards Load			Page
1.	TABLE 1A:	C & Z SECTION SINGLE SPAN OUTWARDS LOAD	15
2.	TABLE 1B:	C & Z SECTION SINGLE SPAN INWARDS LOAD	16
3.	TABLE 2A:	C & Z SECTION 2 SPAN OUTWARDS LOAD	17
4.	TABLE 2B:	C & Z SECTION 2 SPAN INWARDS LOAD	18
5.	TABLE 3A:	C & Z SECTION 3 SPAN OUTWARDS LOAD	19
6.	TABLE 3B:	C & Z SECTION 3 SPAN INWARDS LOAD	20
7.	TABLE 4A:	C & Z SECTION 4 SPAN OUTWARDS LOAD	21
8.	TABLE 4B:	C & Z SECTION 4 SPAN INWARDS LOAD	22
Z Section Lapped Inwards & Outwards Load			
9.	TABLE 5A:	Z SECTION 2 SPAN LAPPED OUTWARDS LOAD	23
10.	TABLE 5B:	Z SECTION 2 SPAN LAPPED INWARDS LOAD	24
11.	TABLE 6A:	Z SECTION 3 SPAN LAPPED OUTWARDS LOAD	25
12.	TABLE 6B:	Z SECTION 3 SPAN LAPPED INWARDS LOAD	26
13.	TABLE 7A:	Z SECTION 4 SPAN LAPPED OUTWARDS LOAD	27
14.	TABLE 7B:	Z SECTION 4 SPAN LAPPED INWARDS LOAD	28
Cantilever Inwards & Outwards Load			
15.	TABLE 8A:	C SECTION CANTILEVER 1000 OUTWARDS LOAD	29
16.	TABLE 8B:	C SECTION CANTILEVER 1000 INWARDS LOAD	30
17.	TABLE 9A:	Z SECTION CANTILEVER 1000 OUTWARDS LOAD	29
18.	TABLE 9B:	Z SECTION CANTILEVER 1000 INWARDS LOAD	30
19.	TABLE 10A:	C SECTION CANTILEVER 2000 OUTWARDS LOAD	31
20.	TABLE 10B:	C SECTION CANTILEVER 2000 INWARDS LOAD	32
21.	TABLE 11A:	Z SECTION CANTILEVER 2000 OUTWARDS LOAD	31
22.	TABLE 11B:	Z SECTION CANTILEVER 2000 INWARDS LOAD	32
23.	TABLE 12A:	C SECTION CANTILEVER 3000 OUTWARDS LOAD	33
24.	TABLE 12B:	C SECTION CANTILEVER 3000 INWARDS LOAD	34
25.	TABLE 13A:	Z SECTION CANTILEVER 3000 OUTWARDS LOAD	33
26.	TABLE 13B:	Z SECTION CANTILEVER 3000 INWARDS LOAD	34
Z Section Mixed Inwards & Outwards Load			
27.	TABLE 14A:	Z SECTION MIXED 3 SPAN OUTWARDS LOAD	35
28.	TABLE 14B:	Z SECTION MIXED 3 SPAN INWARDS LOAD	35
29.	TABLE 15A:	Z SECTION MIXED 4 SPAN OUTWARDS LOAD	36
30.	TABLE 15B:	Z SECTION MIXED 4 SPAN INWARDS LOAD	36

TABLE 1A: C & Z SECTION SINGLE SPAN OUTWARD LOAD (kN/m)

					C/Z 100 10					C/Z 100 12					C/Z 100 15					C/Z 100 19					Span	
Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	4.495	4.495	4.495	4.495	4.268	5.455	5.455	5.455	5.455	5.157	6.959	7.103	7.103	7.103	6.566	9.287	9.894	9.894	9.894	9.894	8.459	2000				
	2.877	2.877	2.877	2.877	2.185	3.491	3.491	3.491	3.491	2.640	4.385	4.546	4.546	4.545	3.362	5.801	6.332	6.332	6.332	4.331	2500					
	1.998	1.998	1.998	1.998	1.265	2.424	2.424	2.424	2.424	1.528	3.011	3.157	3.157	3.157	1.946	3.957	4.397	4.397	4.397	2.506	3000					
	1.468	1.468	1.468	1.468	0.796	1.781	1.781	1.781	1.781	0.962	2.192	2.319	2.319	2.319	1.225	2.868	3.231	3.231	3.231	1.578	3500					
	1.124	1.124	1.124	1.124	0.533	1.364	1.364	1.364	1.364	0.645	1.666	1.776	1.776	1.776	0.821	2.171	2.473	2.474	2.474	1.057	4000					
	0.888	0.888	0.888	0.888		1.077	1.078	1.077	1.077	0.453	1.308	1.403	1.403	1.403	0.576	1.700	1.954	1.954	1.954	0.743	4500					
	0.719	0.719	0.719	0.719		0.873	0.873	0.873	0.873		1.054	1.136	1.136	1.136	0.420	1.366	1.582	1.583	1.583	0.541	5000					
	0.594	0.594	0.594	0.594		0.718	0.721	0.721	0.721		0.867	0.939	0.939	0.939		1.122	1.302	1.308	1.308	0.407	5500					
	0.499	0.499	0.499	0.499		0.601	0.606	0.606	0.606		0.726	0.789	0.789	0.789		0.937	1.09	1.099	1.099		6000					
	0.426	0.426	0.426	0.426		0.510	0.516	0.516	0.516		0.616	0.672	0.672	0.672		0.794	0.925	0.937	0.937		6500					
						0.439	0.445	0.445	0.445		0.529	0.580	0.580	0.580		0.681	0.795	0.808	0.808		7000					
											0.460	0.505	0.505	0.505		0.591	0.691	0.704	0.704		7500					
											0.403	0.444	0.444	0.444		0.518	0.605	0.618	0.618		8000					
															0.457	0.535	0.548	0.548		8500						
															0.406	0.476	0.488	0.489		9000						
																0.427	0.437	0.439		9500						

C/Z 150 12					C/Z 150 15					C/Z 150 19					C/Z 150 24					C/Z 200 15					Span	
Span	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	Span
2000	9.259	9.259	9.259	9.259	14.816	12.210	12.210	12.210	12.210	9.857	16.865	17.278	17.279	17.279	24.647	22.642	24.511	24.511	24.511	31.921	15.452	15.452	15.452	15.452	40.508	2000
2500	5.925	5.926	5.926	5.926	7.586	7.815	7.815	7.815	7.815	5.704	10.428	11.058	11.058	11.058	12.620	13.764	15.687	15.687	15.687	16.344	10.916	10.916	10.916	10.916	20.740	2500
3000	4.115	4.115	4.115	4.150	4.390	5.427	5.427	5.427	5.427	3.592	7.050	7.679	7.679	7.679	7.303	9.177	10.894	10.894	10.894	9.458	7.581	7.581	7.581	7.58	12.002	3000
3500	3.023	3.024	3.023	3.023	2.764	3.929	3.987	3.987	3.987	2.406	5.072	5.642	5.642	5.642	4.599	6.529	8.004	8.004	8.003	5.956	5.569	5.570	5.570	5.569	7.558	3500
4000	2.315	2.315	2.315	2.315	1.852	2.966	3.052	3.053	3.053	1.690	3.817	4.320	4.320	4.320	3.081	4.871	6.128	6.128	6.128	3.990	4.264	4.264	4.264	4.264	5.064	4000
4500	1.829	1.829	1.829	1.829	1.301	2.316	2.412	2.412	2.412	1.232	2.973	3.413	3.413	3.413	2.164	3.767	4.839	4.842	4.842	2.802	3.348	3.369	3.369	3.369	3.556	4500
5000	1.481	1.481	1.481	1.482	0.948	1.857	1.954	1.954	1.954	0.926	2.379	2.765	2.765	2.765	1.577	2.997	3.867	3.922	3.922	2.043	2.685	2.729	2.729	2.729	2.592	5000
5500	1.224	1.224	1.224	1.224	0.712	1.522	1.615	1.615	1.615	0.713	1.946	2.285	2.285	2.285	1.185	2.439	3.158	3.241	3.241	1.535	2.200	2.255	2.255	2.255	1.948	5500
6000	1.029	1.029	1.029	1.029	0.549	1.269	1.357	1.357	1.357	0.561	1.620	1.920	1.920	1.920	0.913	2.022	2.625	2.723	2.723	1.182	1.834	1.895	1.895	1.895	1.500	6000
6500	0.877	0.877	0.877	0.877	0.432	1.073	1.156	1.156	1.156	0.449	1.368	1.636	1.636	1.636	0.718	1.703	2.216	2.321	2.321	0.930	1.552	1.615	1.615	1.615	1.180	6500
7000	0.756	0.756	0.756	0.756		0.919	0.997	0.997	0.997		1.171	1.411	1.410	1.410	0.575	1.453	1.895	2.001	2.001	0.745	1.330	1.392	1.392	1.392	0.945	7000
7500	0.658	0.658	0.658	0.658		0.796	0.868	0.868	0.868		1.013	1.227	1.229	1.229	0.467	1.254	1.638	1.743	1.743	0.605	1.152	1.213	1.213	1.213	0.768	7500
8000	0.577	0.579	0.579	0.579		0.696	0.763	0.763	0.763		0.885	1.074	1.080	1.080		1.093	1.430	1.520	1.532	0.499	1.007	1.066	1.066	1.066	0.633	8000
8500	0.509	0.513	0.513	0.513		0.613	0.676	0.676	0.676		0.779	0.948	0.957	0.957		0.960	1.259	1.336	1.357	0.416	0.888	0.944	0.944	0.944	0.528	8500
9000	0.453	0.457	0.457	0.457		0.545	0.603	0.603	0.603		0.691	0.843	0.853	0.853		0.850	1.116	1.184	1.210		0.788	0.842	0.842	0.842	0.445	9000
9500	0.405	0.410	0.410	0.410		0.487	0.541	0.541	0.541		0.617	0.754	0.766	0.766		0.758	0.997	1.056	1.086		0.705	0.756	0.756	0.756		9500
10000						0.437	0.488	0.488	0.488		0.555	0.678	0.691	0.691		0.680	0.895	0.947	0.98		0.633	0.682	0.682	0.682		10000
10500							0.443	0.443	0.443		0.501	0.614	0.627	0.627		0.612	0.809	0.854	0.887		0.571	0.619	0.619	0.619		10500
11000							0.404	0.404	0.404		0.454	0.558	0.571	0.571		0.554	0.734	0.775	0.804		0.518	0.564	0.564	0.564		11000
11500											0.414	0.509	0.523	0.523		0.504	0.669	0.705	0.731		0.471	0.516	0.516	0.516		11500
12000												0.467	0.480	0.480		0.429	0.442	0.442		0.460	0.612	0.645	0.668			12000
12500												0.429	0.442	0.442		0.422	0.563	0.592	0.613			0.437	0.437	0.437		12500
13000													0.409	0.409			0.519	0.545	0.564			0.404	0.404	0.404		13000
13500																	0.480	0.503	0.521							13500
14000																	0.445	0.466	0.482							14000
14500																	0.414	0.433	0.448							14500
15000																		0.404	0.417							15000

C/Z 200 19					C/Z 200 24					C/Z 250 19					C/Z 250 24					C/Z 300 24					Span	
Span	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	Span
2000	25.938	25.938	25.938	25.939	54.357	36.254	37.089	37.089	37.090	69.833	24.840	2														

TABLE 1B: C & Z SECTION SINGLE SPAN INWARD LOAD (kN/m)

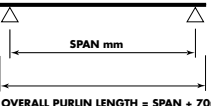
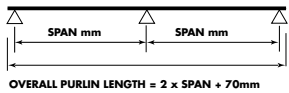
	C/Z 100 10					C/Z 100 12					C/Z 100 15					C/Z 100 19					Span					
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150						
	4.495	4.495	4.495	4.495	4.268	5.455	5.455	5.455	5.455	5.157	6.959	7.103	7.103	7.103	6.566	9.287	9.894	9.894	9.894	8.459						
	2.877	2.877	2.877	2.877	2.185	3.491	3.491	3.491	3.491	2.640	4.385	4.546	4.546	4.545	3.362	5.801	6.332	6.332	6.332	4.331						
	1.998	1.998	1.998	1.998	1.265	2.424	2.424	2.424	2.424	1.528	3.011	3.157	3.157	3.157	1.946	3.957	4.397	4.397	4.397	2.506						
	1.468	1.468	1.468	1.468	0.796	1.781	1.781	1.781	1.781	0.962	2.192	2.319	2.319	2.319	1.225	2.868	3.231	3.231	3.231	1.578						
	1.124	1.124	1.124	1.124	0.533	1.364	1.364	1.364	1.364	0.645	1.666	1.776	1.776	1.776	0.821	2.171	2.473	2.474	2.474	1.057						
	0.888	0.888	0.888	0.888		1.077	1.078	1.077	1.077	0.453	1.308	1.403	1.403	1.403	0.576	1.700	1.954	1.954	1.954	0.743						
	0.719	0.719	0.719	0.719		0.873	0.873	0.873	0.873		1.054	1.136	1.136	1.136	0.420	1.366	1.582	1.583	1.583	0.541						
	0.594	0.594	0.594	0.594		0.718	0.721	0.721	0.721		0.867	0.939	0.939	0.939		1.122	1.302	1.308	1.308	0.407						
BOLD	0.499	0.499	0.499	0.499		0.601	0.606	0.606	0.606		0.726	0.789	0.789	0.789		0.937	1.090	1.099	1.099							
	0.426	0.426	0.426	0.426		0.510	0.516	0.516	0.516		0.616	0.672	0.672	0.672		0.794	0.925	0.937	0.937							
						0.439	0.445	0.445	0.445		0.529	0.580	0.580	0.580		0.681	0.795	0.808	0.808							
											0.460	0.505	0.505	0.505		0.591	0.691	0.704	0.704							
											0.403	0.444	0.444	0.444		0.518	0.605	0.618	0.618							
																0.457	0.535	0.548	0.548							
																0.406	0.476	0.488	0.489							
																	0.427	0.437	0.439							
C/Z 150 12					C/Z 150 15					C/Z 150 19					C/Z 150 24					C/Z 200 15						
Span	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	Span
2000	9.259	9.259	9.259	9.259	14.816	12.210	12.210	12.211	12.21	19.251	16.865	17.278	17.279	17.279	24.647	22.642	24.511	24.511	24.511	31.921	15.452	15.452	15.452	15.452	40.508	2000
2500	5.925	5.926	5.926	5.926	7.586	7.815	7.815	7.815	7.815	9.857	10.428	11.058	11.058	11.058	12.620	13.764	15.687	15.687	15.687	16.344	10.916	10.916	10.916	10.916	20.740	2500
3000	4.115	4.115	4.115	4.115	4.390	5.427	5.427	5.427	5.427	5.704	7.050	7.679	7.679	7.679	7.303	9.177	10.894	10.894	10.894	9.458	7.581	7.581	7.581	7.580	12.002	3000
3500	3.023	3.024	3.023	3.023	2.764	3.929	3.987	3.987	3.987	3.592	5.072	5.642	5.642	5.642	4.599	6.529	8.004	8.004	8.003	5.956	5.569	5.570	5.570	5.569	7.558	3500
4000	2.315	2.315	2.315	2.315	1.852	2.966	3.052	3.053	3.053	2.406	3.817	4.320	4.320	4.320	3.081	4.871	6.128	6.128	6.128	3.990	4.264	4.264	4.264	4.264	5.064	4000
4500	1.829	1.829	1.829	1.829	1.301	2.316	2.412	2.412	2.412	1.690	2.973	3.413	3.413	3.413	2.164	3.767	4.839	4.842	4.842	2.802	3.348	3.369	3.369	3.369	3.556	4500
5000	1.481	1.481	1.481	1.482	0.948	1.857	1.954	1.954	1.954	1.232	2.379	2.765	2.765	2.765	1.577	2.997	3.867	3.922	3.922	2.043	2.685	2.729	2.729	2.729	2.592	5000
5500	1.224	1.224	1.224	1.224	0.712	1.522	1.615	1.615	1.615	0.926	1.946	2.285	2.285	2.285	1.185	2.439	3.158	3.241	3.241	1.535	2.200	2.255	2.255	2.255	1.948	5500
6000	1.029	1.029	1.029	1.029	0.549	1.269	1.357	1.357	1.357	0.713	1.620	1.920	1.920	1.920	0.913	2.022	2.625	2.723	2.723	1.182	1.834	1.895	1.895	1.895	1.500	6000
6500	0.877	0.877	0.877	0.877	0.432	1.073	1.156	1.156	1.156	0.561	1.368	1.636	1.636	1.636	0.718	1.703	2.216	2.321	2.321	0.930	1.552	1.615	1.615	1.615	1.180	6500
7000	0.756	0.756	0.756	0.756		0.919	0.997	0.997	0.997	0.449	1.171	1.411	1.410	1.410	0.575	1.453	1.895	2.001	2.001	0.745	1.330	1.392	1.392	1.392	0.945	7000
7500	0.658	0.658	0.658	0.658		0.796	0.868	0.868	0.868		1.013	1.227	1.229	1.229	0.467	1.254	1.638	1.743	1.743	0.605	1.152	1.213	1.213	1.213	0.768	7500
8000	0.577	0.579	0.579	0.579		0.696	0.763	0.763	0.763		0.885	1.074	1.080	1.080		1.093	1.430	1.520	1.532	0.499	1.007	1.066	1.066	1.066	0.633	8000
8500	0.509	0.513	0.513	0.513		0.613	0.676	0.676	0.676		0.779	0.948	0.957	0.957		0.960	1.259	1.336	1.357	0.416	0.888	0.944	0.944	0.944	0.528	8500
9000	0.453	0.457	0.457	0.457		0.545	0.603	0.603	0.603		0.691	0.843	0.853	0.853		0.850	1.116	1.184	1.210		0.788	0.842	0.842	0.842	0.445	9000
9500	0.405	0.410	0.410	0.410		0.487	0.541	0.541	0.541		0.617	0.754	0.766	0.766		0.758	0.997	1.056	1.086		0.705	0.756	0.756	0.756		9500
10000						0.437	0.488	0.488	0.488		0.555	0.678	0.691	0.691		0.680	0.895	0.947	0.98		0.633	0.682	0.682	0.682		10000
10500							0.443	0.443	0.443		0.501	0.614	0.627	0.627		0.612	0.809	0.854	0.887		0.571	0.619	0.619	0.619		10500
11000							0.404	0.404	0.404		0.454	0.558	0.571	0.571		0.554	0.734	0.775	0.804		0.518	0.564	0.564	0.564		11000
11500											0.414	0.509	0.523	0.523		0.504	0.669	0.705	0.731		0.471	0.516	0.516	0.516		11500
12000											0.467	0.480	0.480			0.460	0.612	0.645	0.668		0.431	0.474	0.474	0.474		12000
12500											0.429	0.442	0.442			0.422	0.563	0.592	0.613			0.519	0.545	0.564		12500
13000												0.409	0.409				0.519	0.545	0.564			0.480	0.503	0.521		13000
13500																	0.445	0.466	0.482			0.414	0.433	0.448		13500
14000																										14000
14500																										14500
15000																										15000
C/Z 200 19					C/Z 200 24					C/Z 250 19					C/Z 250 24					C/Z 300 24						
Span	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	Span
2000	25.938	25.938	25.938	25.938	54.357	36																				

TABLE 2A:
C & Z SECTION
2 SPAN OUTWARD LOAD
(kN/m)



	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 100 10				C/Z 100 12				C/Z 100 15				C/Z 100 19				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	4.495	4.495	4.495	4.495	4.495	5.455	5.455	5.455	5.455	7.103	7.103	7.103	9.894	9.894	9.894	9.894	2000
2500	2.877	2.877	2.877	2.877	3.491	3.491	3.491	3.491	4.546	4.546	4.546	4.546	6.332	6.332	6.332	6.332	2500
3000	1.998	1.998	1.998	1.998	2.424	2.424	2.424	2.424	3.116	3.157	3.157	3.157	4.285	4.397	4.397	4.397	3000
3500	1.468	1.468	1.468	1.468	1.749	1.781	1.781	1.781	2.195	2.319	2.319	2.319	3.000	3.231	3.231	3.231	3500
4000	1.065	1.124	1.124	1.124	1.256	1.364	1.364	1.364	1.602	1.776	1.776	1.776	2.179	2.473	2.473	2.474	4000
4500	0.769	0.888	0.888	0.888	0.920	1.077	1.077	1.077	1.200	1.383	1.403	1.403	1.627	1.908	1.954	1.954	4500
5000	0.558	0.719	0.719	0.719	0.682	0.866	0.873	0.873	0.916	1.087	1.136	1.136	1.240	1.494	1.583	1.583	5000
5500	0.405	0.582	0.594	0.594	0.510	0.684	0.721	0.721	0.708	0.869	0.939	0.939	0.962	1.191	1.308	1.308	5500
6000		0.460	0.499	0.499		0.547	0.606	0.606	0.544	0.704	0.784	0.789	0.757	0.962	1.083	1.099	6000
7000							0.516	0.516	0.419	0.576	0.654	0.672	0.600	0.786	0.901	0.937	7000
7500								0.437		0.476	0.551	0.580	0.475	0.648	0.757	0.808	7500
8000											0.468	0.501		0.538	0.641	0.693	8000
8500												0.400		0.450	0.548	0.597	8500
9000															0.470	0.518	9000
9500															0.406	0.452	9500

Span	C/Z 200 19				C/Z 200 24				C/Z 250 19				C/Z 250 24				C/Z 300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	19.630	19.631	19.630	19.633	32.393	32.394	32.394	32.396	17.750	17.751	17.751	17.754	32.871	32.870	32.873	32.867	30.961	30.958	30.958	30.962	2000
2500	14.208	14.208	14.207	14.207	22.414	22.416	22.416	22.416	13.455	13.457	13.456	13.456	24.138	24.137	24.138	24.145	23.739	23.739	23.741	23.738	2500
3000	10.710	10.711	10.710	10.710	16.334	16.334	16.334	16.334	10.573	10.574	10.574	10.573	18.421	18.421	18.421	18.422	18.867	18.866	18.863	18.870	3000
3500	8.330	8.330	8.328	8.329	12.111	12.110	12.111	12.111	8.521	8.520	8.523	8.523	14.470	14.472	14.470	14.469	15.370	15.369	15.370	15.373	3500
4000	6.485	6.485	6.484	6.485	9.272	9.272	9.272	9.273	7.002	7.002	7.003	7.002	11.633	11.632	11.633	11.632	12.757	12.756	12.757	12.754	4000
4500	5.124	5.124	5.124	5.123	7.326	7.326	7.327	7.327	5.846	5.847	5.846	5.846	9.317	9.317	9.317	9.316	10.746	10.745	10.746	10.746	4500
5000	4.150	4.150	4.150	4.150	5.805	5.934	5.934	5.934	4.946	4.946	4.946	4.945	7.546	7.547	7.547	7.546	9.162	9.162	9.162	9.162	5000
5500	3.396	3.430	3.430	3.430	4.634	4.904	4.904	4.904	4.232	4.232	4.232	4.232	6.212	6.237	6.237	6.237	7.895	7.895	7.895	7.895	5500
6000	2.728	2.882	2.882	2.882	3.748	4.121	4.121	4.121	3.635	3.635	3.634	3.635	5.000	5.241	5.241	5.241	6.865	6.865	6.865	6.864	6000
6500	2.210	2.456	2.456	2.456	3.063	3.511	3.511	3.511	2.954	3.097	3.097	3.097	4.061	4.465	4.465	4.465	6.017	6.018	6.018	6.017	6500
7000	1.802	2.117	2.117	2.117	2.523	3.028	3.028	3.028	2.391	2.670	2.670	2.670	3.311	3.850	3.850	3.850	5.313	5.313	5.313	5.313	7000
7500	1.477	1.844	1.845	1.844	2.064	2.594	2.637	2.638	1.948	2.326	2.326	2.326	2.682	3.354	3.354	3.354	4.567	4.687	4.687	4.687	7500
8000	1.217	1.621	1.621	1.621	1.693	2.228	2.318	2.318	1.588	2.044	2.044	2.044	2.175	2.948	2.948	2.948	3.854	4.120	4.120	4.120	8000
8500	1.004	1.401	1.436	1.436	1.392	1.925	2.053	2.053	1.299	1.811	1.811	1.811	1.769	2.575	2.611	2.611	3.264	3.649	3.649	3.649	8500
9000	0.835	1.209	1.281	1.281	1.152	1.671	1.832	1.832	1.075	1.613	1.615	1.615	1.458	2.228	2.329	2.329	2.772	3.255	3.255	3.255	9000
9500	0.695	1.047	1.150	1.150	0.960	1.457	1.644	1.644	0.885	1.401	1.450	1.450	1.201	1.935	2.090	2.090	2.356	2.921	2.922	2.921	9500
10000	0.582	0.909	1.038	1.038	0.801	1.275	1.476	1.484	0.738	1.211	1.308	1.308	0.997	1.685	1.887	1.887	2.018	2.637	2.637	2.636	10000
10500	0.492	0.790	0.941	0.941	0.675	1.119	1.317	1.346	0.622	1.048	1.187	1.187	0.837	1.465	1.711	1.711	1.732	2.391	2.391	2.392	10500
11000	0.420	0.689	0.857	0.857	0.574	0.975	1.179	1.226	0.530	0.910	1.081	1.081	0.709	1.268	1.559	1.559	1.494	2.169	2.179	2.179	11000
11500		0.602	0.772	0.785	0.492	0.850	1.060	1.122	0.452	0.789	0.989	0.989	0.605	1.097	1.419	1.427	1.282	1.933	1.994	1.994	11500
12000		0.526	0.692	0.720	0.425	0.741	0.955	1.030		0.684	0.909	0.909	0.520	0.949	1.275	1.310	1.109	1.726	1.881	1.831	12000
12500		0.460	0.622	0.664		0.647	0.862	0.944		0.595	0.832	0.837	0.451	0.822	1.148	1.207	0.956	1.543	1.687	1.687	12500
13000		0.404	0.560	0.614		0.566	0.780	0.862		0.521	0.749	0.774		0.716	1.036	1.116	0.827	1.381	1.560	1.560	13000
13500			0.505	0.569		0.498	0.707	0.788		0.454	0.673	0.718		0.626	0.936	1.035	0.721	1.237	1.447	1.447	13500
14000			0.455	0.527		0.437	0.642	0.723			0.605	0.668		0.546	0.847	0.963	0.631	1.108	1.345	1.345	14000
14500			0.411	0.483			0.583	0.664			0.545	0.622		0.479	0.763	0.888	0.556	0.994	1.254	1.254	14500
15000				0.443			0.527	0.611			0.491	0.582		0.422	0.686	0.816	0.491	0.895	1.172	1.172	15000

Span	C/Z 300 30				C/Z 350 24				C/Z 350 30				C/Z 400 24				C/Z 400 30				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	56.419	56.417	56.412	56.425	27.489	27.489	27.490	27.493	52.012	52.014	52.011	52.010	24.316	24.314	24.317	24.317	46.519	46.522	46.519	46.522	2000
2500	42.025	42.020	42.026	42.024	21.499	21.498	21.499	21.500	40.004	40.009	40.005	40.005	19.173	19.174	19.173	19.175	36.252	36.255	36.249	36.253	2500
3000	32.479	32.480	32.480	32.480	17.449	17.448	17.447	17.449	31.900	31.901	31.899	31.901	15.707	15.708	15.708	15.707	29.307	29.308	29.311	29.303	3000
3500	25.791	25.793	25.786	25.792	14.521	14.520	14.524	14.524	26.071	26.073	26.070	26.069	13.204	13.202	13.201	13.190	24.290	24.291	24.294	24.294	3500
4000	20.919	20.919	20.920	20.918	12.305	12.306	12.307	12.304	21.705	21.706	21.705	21.703	11.306	11.306	11.309	11.306	20.495	20.496	20.495	20.496	4000
4500	17.269	17.269	17.269	17.271	10.573	10.573	10.576	10.571	18.333	18.334	18.334	18.331	9.818	9.818	9.820	9.817	17.537	17.537	17.539	17.535	4500
5000	14.470	14.470	14.470	14.470	9.185	9.185	9.185	9.184	15.672	15.672	15.671	15.670	8.619	8.619	8.618	8.616	15.174	15.173	15.173	15.174	5000
5500	12.281	12.282	12.281	12.282	8.052	8.051	8.050	8.053	13.534	13.535	13.535	13.534	7.633	7.634	7.633	7.632	13.251	13.251	13.250	13.254	5500
6000	10.451	10.451	10.451	10.451	7.112	7.112	7.112	7.113	11.792	11.792	11.792	11.792	6.810	6.809	6.810	6.810	11.662	11.662	11.663	11.662	6000
6500	8.834	8.905	8.905	8.905	6.324	6.324	6.324	6.325	10.355	10.355	10.355	10.354	6.113	6.112	6.112	6.114	10.336	10.335	10.336	10.336	6500
7000	7.416	7.678	7.679	7.679	5.656	5.656	5.656	5.656	9.157	9.157	9.157	9.157	5.516	5.516	5.516	5.517	9.216	9.216	9.216	9.217	7000
7500	6.275	6.689	6.689	6.689	5.086	5.085	5.085	5.085	8.121	8.120	8.120	8.121	5.002	5.003	5.002	5.002	8.263	8.263	8.263	8.263	7500
8000	5.346	5.879	5.879	5.879	4.594	4.594	4.594	4.594	7.137	7.137	7.137	7.137	4.555	4.555	4.555	4.554	7.445	7.445	7.445	7.445	8000
8500	4.566	5.208	5.208	5.208	4.168	4.168	4.168	4.168	6.322	6.322	6.322	6.322	4.163	4.163	4.163	4.163	6.471	6.740	6.740	6.739	8500
9000	3.891	4.645	4.645	4.645	3.797	3.797	3.797	3.797	5.633	5.639	5.639	5.639	3.818	3.818	3.818	3.818	5.465	6.126	6.126	6.126	9000
9500	3.327	4.169	4.169	4.169	3.471	3.471	3.472	3.472	4.906	5.061	5.061	5.061	3.433	3.512	3.513	3.514	4.626	5.532	5.532	5.532	9500
10000	2.821	3.739	3.762	3.763	3.135	3.185	3.185	3.185	4.286	4.568	4.568	4.568	3.021	3.242	3.243	3.242	3.883	4.993	4.992	4.993	10000
10500	2.381	3.332	3.413	3.413	2.780	2.930	2.930	2.930	3.753	4.143	4.143	4.143	2.613	2.999	2.998	2.998	3.240	4.529	4.528	4.528	10500
11000	2.011	2.939	3.109	3.109	2.472	2.705	2.705	2.705	3.293	3.775	3.775	3.775	2.219	2.783	2.783	2.783	2.723	4.126	4.126	4.126	11000
11500	1.710	2.673	2.845	2.845	2.204	2.503	2.503	2.503	2.892	3.454	3.454	3.454	1.877	2.587	2.587	2.587	2.308	3.775	3.775	3.775	11500
12000	1.465	2.404	2.613	2.613	1.968	2.318	2.318	2.318	2.541	3.172	3.172	3.172	1.600	2.397	2.412	2.411	1.972	3.444	3.467	3.467	12000
12500	1.264	2.167	2.408	2.408	1.755	2.136	2.136	2.136	2.232	2.923	2.923	2.923	1.373	2.162	2.252	2.252	1.696	3.088	3.195	3.195	12500
13000	1.098	1.952	2.226	2.226	1.540	1.970	1.975	1.975	1.960	2.703	2.703	2.703	1.186	1.954	2.108	2.108	1.468	2.756	2.954	2.954	13000
13500	0.959	1.755	2.064	2.064	1.354	1.805	1.831	1.831	1.730	2.506	2.506	2.506	1.031	1.768	1.976	1.976	1.278	2.462	2.739	2.739	13500
14000	0.842	1.579	1.901	1.920	1.195	1.656	1.703	1.703	1.537	2.314	2.330	2.330	0.900	1.601	1.857	1.857	1.119	2.200	2.547	2.547	14000
14500	0.744	1.422	1.749	1.790	1.059	1.523	1.588	1.587	1.372	2.114	2.173	2.173	0.790	1.463	1.735	1.735	0.985	1.968	2.375	2.375	14500
15000	0.660	1.273	1.612	1.672	0.943	1.403	1.483	1.483	1.231	1.933	2.030	2.030	0.697	1.343	1.603	1.621	0.871	1.748	2.219	2.219	15000

TABLE 2B:
C & Z SECTION
2 SPAN
INWARD
LOAD (kN/m)

	C/Z 100 10					C/Z 100 12					C/Z 100 15					C/Z 100 19					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	4.495	4.495	4.495	4.495	10.261	5.455	5.455	5.455	5.455	12.399	7.035	7.103	7.103	7.102	15.788	9.484	9.894	9.894	9.894	20.338	2000
	2.877	2.877	2.877	2.877	5.254	3.491	3.491	3.491	3.491	6.349	4.416	4.546	4.546	4.546	8.084	5.903	6.332	6.332	6.332	10.413	2500
	1.998	1.998	1.998	1.998	3.040	2.424	2.424	2.424	2.424	3.674	3.016	3.157	3.157	3.157	4.678	4.007	4.397	4.397	4.397	6.026	3000
	1.468	1.468	1.468	1.468	1.915	1.781	1.781	1.781	1.781	2.314	2.182	2.319	2.319	2.319	2.946	2.886	3.231	3.231	3.231	3.391	3500
	1.124	1.124	1.124	1.124	1.283	1.346	1.364	1.364	1.364	1.550	1.646	1.776	1.776	1.776	1.974	2.169	2.473	2.474	2.473	2.542	4000
	0.888	0.888	0.888	0.888	0.901	1.044	1.077	1.077	1.077	1.089	1.281	1.403	1.403	1.403	1.386	1.683	1.954	1.954	1.954	1.786	4500
	0.719	0.719	0.719	0.719	0.657	0.829	0.873	0.873	0.873	0.794	1.021	1.136	1.136	1.136	1.011	1.339	1.583	1.583	1.583	1.302	5000
	0.584	0.594	0.594	0.594	0.493	0.671	0.721	0.721	0.721	0.596	0.830	0.939	0.939	0.939	0.759	1.087	1.308	1.308	1.308	0.978	5500
	0.478	0.499	0.499	0.499		0.551	0.606	0.606	0.606	0.459	0.686	0.789	0.789	0.789	0.585	0.897	1.097	1.099	1.099	0.753	6000
		0.426	0.426	0.426		0.458	0.516	0.516	0.516		0.574	0.672	0.672	0.672	0.460	0.750	0.924	0.937	0.937	0.592	6500
							0.445	0.445	0.445		0.485	0.575	0.580	0.580		0.634	0.786	0.808	0.808	0.474	7000
											0.414	0.494	0.505	0.505		0.541	0.675	0.704	0.704		7500
												0.428	0.444	0.444		0.466	0.584	0.614	0.618		8000
																0.404	0.509	0.537	0.548		8500
																	0.446	0.472	0.489		9000
																		0.417	0.437		9500

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

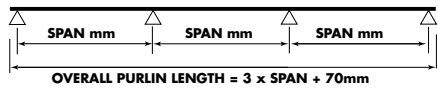
BOLD Grade 8.6 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 150 12					C/Z 150 15					C/Z 150 19					C/Z 150 24					C/Z 200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	6.820	6.820	6.820	6.820	35.624	11.041	11.041	11.04	11.041	46.290	16.927	16.926	16.927	16.927	59.263	23.549	24.375	24.374	24.374	76.751	10.598	10.598	10.597	10.598	97.393	2000
2500	4.961	4.960	4.961	4.960	18.239	7.681	7.681	7.681	7.681	23.700	10.690	11.058	11.058	11.058	30.343	14.347	15.687	15.687	15.687	39.297	7.909	7.908	7.908	7.909	49.867	2500
3000	3.755	3.755	3.755	3.755	10.555	5.427	5.427	5.427	5.427	13.715	7.212	7.679	7.679	7.679	17.560	9.561	10.894	10.894	10.894	22.741	6.123	6.123	6.123	6.123	28.859	3000
3500	2.930	2.930	2.930	2.930	6.647	3.969	3.987	3.987	3.987	8.637	5.170	5.642	5.642	5.642	11.058	6.787	8.004	8.004	8.004	14.321	4.869	4.869	4.869	4.870	18.174	3500
4000	2.315	2.315	2.315	2.315	4.453	2.979	3.053	3.053	3.053	5.786	3.873	4.320	4.320	4.320	7.408	5.045	6.128	6.128	6.128	9.594	3.955	3.955	3.955	3.955	12.175	4000
4500	1.829	1.829	1.829	1.829	3.127	2.311	2.412	2.412	2.412	4.064	3.001	3.413	3.413	3.413	5.203	3.884	4.842	4.842	4.842	6.738	3.268	3.268	3.268	3.268	8.551	4500
5000	1.481	1.481	1.481	1.481	2.280	1.838	1.954	1.954	1.954	2.962	2.386	2.765	2.765	2.765	3.793	3.074	3.922	3.922	3.922	4.912	2.696	2.729	2.729	2.729	6.233	5000
5500	1.216	1.224	1.224	1.224	1.713	1.492	1.615	1.615	1.615	2.226	1.937	2.285	2.285	2.285	2.850	2.486	3.241	3.241	3.241	3.690	2.199	2.255	2.255	2.255	4.683	5500
6000	1.008	1.029	1.029	1.029	1.319	1.231	1.357	1.357	1.357	1.714	1.599	1.920	1.920	1.920	2.195	2.047	2.723	2.724	2.723	2.843	1.824	1.895	1.895	1.895	3.607	6000
6500	0.847	0.877	0.877	0.877	1.038	1.030	1.156	1.156	1.156	1.348	1.339	1.636	1.636	1.636	1.726	1.710	2.321	2.321	2.321	2.236	1.534	1.615	1.615	1.615	2.837	6500
7000	0.719	0.756	0.756	0.756	0.831	0.871	0.997	0.997	0.997	1.080	1.134	1.411	1.411	1.411	1.382	1.446	1.994	2.001	2.001	1.790	1.306	1.392	1.392	1.392	2.272	7000
7500	0.616	0.658	0.658	0.658	0.676	0.743	0.868	0.868	0.868	0.878	0.970	1.229	1.229	1.229	1.182	1.236	1.717	1.743	1.743	1.455	1.121	1.213	1.213	1.213	1.847	7500
8000	0.529	0.579	0.579	0.579	0.557	0.639	0.763	0.763	0.763	0.723	0.836	1.080	1.080	1.080	0.926	1.066	1.492	1.532	1.532	1.199	0.965	1.066	1.066	1.066	1.522	8000
8500	0.456	0.513	0.513	0.513	0.464	0.554	0.676	0.676	0.676	0.603	0.726	0.956	0.957	0.957	0.772	0.923	1.306	1.357	1.357	1.000	0.837	0.944	0.944	0.944	1.269	8500
9000		0.457	0.457	0.457		0.482	0.603	0.603	0.603	0.508	0.634	0.843	0.853	0.853	0.650	0.803	1.151	1.210	1.210	0.842	0.730	0.842	0.842	0.842	1.069	9000
9500		0.410	0.410	0.410		0.422	0.541	0.541	0.541	0.432	0.553	0.748	0.766	0.766	0.553	0.703	1.019	1.086	1.086	0.716	0.640	0.756	0.756	0.756	0.909	9500
10000							0.488	0.488	0.488		0.485	0.667	0.691	0.691	0.474	0.618	0.908	0.980	0.98	0.614	0.564	0.682	0.682	0.682	0.779	10000
10500							0.443	0.443	0.443		0.427	0.597	0.627	0.627	0.410	0.546	0.812	0.879	0.889	0.530	0.498	0.619	0.619	0.619	0.673	10500
11000							0.402	0.404	0.404			0.537	0.571	0.571		0.484	0.729	0.791	0.8100	0.461	0.442	0.564	0.564	0.564	0.585	11000
11500												0.485	0.517	0.523		0.431	0.658	0.714	0.741	0.404		0.516	0.516	0.516	0.512	11500
12000												0.439	0.469	0.48			0.595	0.647	0.681			0.474	0.474	0.474	0.474	12000
12500													0.427	0.442			0.539	0.589	0.626			0.437	0.437	0.437		12500
13000														0.409			0.490	0.537	0.573			0.404	0.404	0.404		13000
13500																	0.447	0.490	0.525							13500
14000																	0.408	0.449	0.483							14000
14500																		0.412	0.444							14500
15000																			0.410							15000

	C/Z 200 19					C/Z 200 24					C/Z 250 19					C/Z 250 24					C/Z 300 24						
Span	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	Span	
2000	19.631	19.630	19.631	19.635	130.694	32.394	32.393	32.393	32.396	167.907	17.751	17.751	17.750	17.752	216.830	32.870	32.871	32.870	32.876	284.414	30.963	30.962	30.957	30.961	489.778	2000	
2500	14.207	14.208	14.207	14.208	66.915	22.415	22.415	22.415	22.416	85.969	13.456	13.456	13.457	13.456	111.023	24.138	24.138	24.138	24.136	145.616	23.740	23.740	23.735	23.740	250.753	2500	
3000	10.711	10.711	10.711	10.711	38.725	15.214	16.334	16.334	16.334	49.749	10.573	10.574	10.574	10.573	64.250	18.422	18.420	18.422	18.422	84.272	18.867	18.867	18.866	18.868	145.119	3000	
3500	8.100	8.330	8.329	8.328	24.386	10.743	12.111	12.110	12.111	31.329	8.521	8.521	8.523	8.523	40.458	14.134	14.471	14.470	14.468	53.070	15.370	15.370	15.370	15.375	91.385	3500	
4000	6.004	6.485	6.485	6.485	16.336	7.939	9.273	9.272	9.272	20.988	7.003	7.003	7.003	7.003	27.105	10.368	11.633	11.633	11.632	35.553	12.757	12.757	12.758	12.754	61.221	4000	
4500	4.608	5.124	5.124	5.124	11.474	6.793	7.326	7.327	7.327	14.741	5.846	5.847	5.846	5.846	19.036	7.823	9.317	9.317	9.317	24.969	10.746	10.746	10.747	10.742	42.996	4500	
5000	3.634	4.150	4.150	4.150	8.364	4.743	5.934	5.934	5.934	10.746	4.766	4.946	4.946	4.946	13.877	6.064	7.546	7.546	7.547	18.203	8.803	9.162	9.162	9.162	31.345	5000	
5500	2.929	3.430	3.430	3.430	6.284	3.791	4.904	4.905	4.905	8.074	3.826	4.232	4.232	4.232	10.426	4.813	6.237	6.237	6.237	13.676	6.935	7.895	7.894	7.895	23.551	5500	
6000	2.403	2.882	2.882	2.882	4.841	3.089	4.121	4.121	4.121	6.219	3.131	3.635	3.635	3.635	8.031	3.895	5.240	5.240	5.241	10.534	5.998	6.864	6.865	6.864	18.139	6000	
6500	2.003	2.456	2.456	2.456	3.807	2.556	3.511	3.511	3.512	4.891	2.601	3.097	3.097	3.097	6.317	3.202	4.465	4.465	4.465	8.285	4.592	6.018	6.018	6.017	14.267	6500	
7000	1.691	2.117	2.117	2.117	3.048	2.143	3.028	3.028	3.028	3.916	2.187	2.670	2.671	2.670	5.058	2.671	3.850	3.850	3.850	6.634	3.826	5.313	5.313	5.313	11.423	7000	
7500	1.443	1.844	1.844	1.845	2.478	1.818	2.637	2.637	2.637	3.184	1.858	2.326	2.326	2.326	4.112	2.256	3.354	3.354	3.354	5.394	3.232	4.687	4.687	4.687	9.287	7500	
8000	1.242	1.621	1.621	1.621	2.042	1.556	2.318	2.318	2.318	2.624	1.592	2.044	2.044	2.044	3.388	1.927	2.948	2.948	2.948	4.444	2.752	4.119	4.120	4.120	7.653	8000	
8500	1.077	1.436	1.436	1.436	1.702	1.344	2.053	2.053	2.053	2.187	1.376	1.811	1.811	1.811	2.885	1.663	2.611	2.611	2.611	3.705	2.365	3.649	3.649	3.649	6.380	8500	
9000	0.941	1.281	1.281	1.281	1.434	1.171	1.824	1.832	1.832	1.843	1.197	1.615	1.615	1.615	2.379	1.448	2.329	2.329	2.329	3.121	2.052	3.255	3.255	3.255	5.374	9000	
9500	0.826	1.150	1.150	1.150	1.219	1.027	1.622	1.644	1.644	1.567	1.048	1.450	1.450	1.450	2.023	1.265	2.091	2.090	2.091	2.654	1.797	2.921	2.922	2.921	4.570	9500	
10000	0.729	1.038	1.038	1.038	1.046	0.907	1.450	1.484	1.484	1.343	0.924	1.308	1.308	1.308	1.735	1.111	1.887	1.887	1.887	2.275	1.585	2.637	2.636	2.637	3.918	10000	
10500	0.647	0.941	0.941	0.941	0.903	0.804	1.302	1.346	1.346	1.160	0.818	1.187	1.187	1.187	1.499	0.981	1.711	1.711	1.711	1.965	1.401	2.391	2.392	2.392	3.385	10500	
11000	0.577	0.857	0.857	0.857	0.786	0.715	1.175	1.226	1.226	1.009	0.729	1.081	1.081	1.081	1.303	0.871	1.559	1.559	1.559	1.710	1.245	2.179	2.179	2.179	2.984	11000	
11500	0.516	0.785	0.785	0.785	0.687	0.638	1.064	1.122	1.122	0.883	0.651	0.989	0.989	0.989	1.141	0.777	1.417	1.427	1.427	1.496	1.113	1.994	1.994	1.994	2.576	11500	
12000	0.464	0.719	0.721	0.721	0.605	0.572	0.966	1.030	1.030	0.777	0.581	0.909	0.909	0.909	1.004	0.697	1.285	1.310	1.310	1.310	1.317	0.999	1.831	1.831	1.831	2.267	12000
12500	0.419	0.655	0.664	0.664	0.535	0.515	0.881	0.95	0.95	0.688	0.522	0.837	0.837	0.837	0.888	0.626	1.170	1.207	1.207	1.165	0.901	1.687	1.687	1.687	2.006	12500	
13000	0.597	0.614	0.614	0.614	0.476	0.466	0.805	0.877	0.878	0.611	0.470	0.774	0.774	0.774	0.790	0.566	1.067	1.116	1.116	1.036	0.816	1.560	1.560	1.560	1.783	13000	
13500	0.546	0.569	0.569	0.569	0.425	0.422	0.738	0.805	0.814	0.546	0.425	0.718	0.718	0.718	0.705	0.512	0.976	1.035	1.035	0.925	0.742	1.447	1.447	1.447	1.592	13500	
14000	0.500	0.529	0.529	0.529		0.677	0.741	0.757	0.490		0.665	0.668	0.668	0.668	0.632	0.465	0.895	0.963	0.963	0.829	0.676	1.336	1.345	1.345	1.428	14000	
14500	0.459	0.493	0.493			0.623	0.684	0.706	0.441		0.612	0.622	0.622	0.622	0.569	0.424	0.822	0.897	0.897	0.746	0.619	1.232	1.254	1.254	1.285	14500	
15000	0.422	0.461	0.461			0.575	0.632	0.659			0.562	0.582	0.582	0.514			0.756	0.839	0.838	0.674	0.567	1.138	1.172	1.172	1.161	15000	

TABLE 3A:
C & Z SECTION
3 SPAN OUTWARD LOAD
(kN/m)



	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 100 10				C/Z 100 12				C/Z 100 15				C/Z 100 19				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	5.283	5.283	5.283	5.283	6.818	6.818	6.818	6.818	8.879	8.878	8.878	8.878	12.367	12.367	12.367	12.367	2000
2500	3.596	3.596	3.596	3.596	4.364	4.364	4.364	4.364	5.558	5.682	5.682	5.682	7.631	7.915	7.915	7.915	2500
3000	2.457	2.497	2.497	2.497	2.879	3.031	3.030	3.030	3.640	3.946	3.946	3.946	4.952	5.497	5.497	5.497	3000
3500	1.616	1.835	1.835	1.835	1.924	2.226	2.227	2.226	2.493	2.894	2.899	2.899	3.363	3.995	4.038	4.038	3500
4000	1.072	1.405	1.405	1.405	1.307	1.705	1.705	1.705	1.757	2.136	2.220	2.220	2.357	2.934	3.092		4000
4500	0.714	1.086	1.110	1.110	0.897	1.276	1.347	1.347	1.247	1.619	1.754	1.754	1.689	2.211	2.443		4500
5000	0.496	0.815	0.899	0.899	0.634	0.968	1.091	1.091	0.872	1.250	1.407	1.421	1.216	1.698	1.940		5000
5500		0.615	0.743	0.743	0.462	0.741	0.902	0.902	0.630	0.978	1.132	1.174	0.878	1.324	1.555		5500
6000		0.462	0.623	0.624		0.569	0.730	0.758	0.470	0.773	0.923	0.986	0.655	1.043	1.263		6000
6500			0.504	0.532		0.438	0.595	0.646		0.611	0.761	0.824	0.503	0.829	1.037		6500
7000			0.41	0.459			0.488	0.554		0.475	0.632	0.694		0.664	0.859		7000
7500							0.402	0.467			0.529	0.590		0.525	0.716		7500
8000											0.445	0.505		0.417	0.601		8000
8500															0.507		8500
9000															0.429		9000
9500																	9500

Span	C/Z 200 19				C/Z 200 24				C/Z 250 19				C/Z 250 24				C/Z 300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	21.805	21.807	21.805	21.806	37.327	37.328	37.327	37.330	19.089	19.089	19.089	19.092	36.120	36.124	36.119	36.123	33.056	33.061	33.058	33.053	2000
2500	16.091	16.091	16.092	16.091	26.333	26.333	26.332	26.332	14.667	14.666	14.667	14.667	27.011	27.013	27.013	27.014	25.629	25.628	25.630	25.631	2500
3000	12.333	12.332	12.333	12.332	19.458	19.459	19.457	19.458	11.681	11.681	11.681	11.681	20.953	20.952	20.953	20.953	20.608	20.607	20.606	20.610	3000
3500	9.723	9.722	9.723	9.721	14.901	14.903	14.902	14.901	9.536	9.537	9.535	9.536	16.691	16.690	16.691	16.690	16.983	16.983	16.984	16.982	3500
4000	7.839	7.839	7.839	7.838	11.420	11.591	11.590	11.590	7.930	7.930	7.931	7.930	13.576	13.575	13.577	13.575	14.254	14.253	14.254	14.252	4000
4500	6.317	6.405	6.405	6.405	8.630	9.158	9.158	9.158	6.691	6.691	6.692	6.692	11.233	11.233	11.233	11.232	12.130	12.131	12.132	12.130	4500
5000	4.819	5.188	5.188	5.188	6.643	7.418	7.418	7.418	5.714	5.715	5.715	5.715	8.864	9.430	9.430	9.431	10.442	10.443	10.442	10.442	5000
5500	3.713	4.287	4.287	4.287	5.180	6.131	6.131	6.131	4.931	4.928	4.926	4.925	6.859	7.796	7.796	7.796	9.076	9.069	9.066	9.062	5500
6000	2.882	3.603	3.603	3.602	4.019	5.114	5.151	5.151	3.819	4.293	4.293	4.293	5.258	6.550	6.551	6.551	7.953	7.953	7.953	7.953	6000
6500	2.250	3.070	3.070	3.070	3.114	4.235	4.389	4.389	2.948	3.766	3.765	3.764	4.021	5.581	5.582	5.582	7.021	7.017	7.015	7.013	6500
7000	1.763	2.578	2.647	2.647	2.420	3.539	3.785	3.785	2.292	3.330	3.330	3.330	3.100	4.741	4.813	4.813	5.958	6.237	6.237	6.238	7000
7500	1.391	2.154	2.306	2.306	1.898	2.979	3.297	3.297	1.790	2.886	2.908	2.908	2.413	3.974	4.192	4.193	4.858	5.572	5.571	5.569	7500
8000	1.105	1.808	2.026	2.026	1.498	2.521	2.898	2.898	1.416	2.488	2.556	2.556	1.896	3.347	3.685	3.685	3.983	5.007	5.007	5.007	8000
8500	0.893	1.520	1.795	1.795	1.201	2.142	2.529	2.567	1.141	2.023	2.264	2.264	1.513	2.823	3.264	3.264	3.283	4.519	4.518	4.518	8500
9000	0.730	1.283	1.601	1.601	0.976	1.805	2.209	2.289	0.928	1.699	2.019	2.019	1.225	2.360	2.911	2.911	2.713	4.068	4.069	4.069	9000
9500	0.598	1.085	1.413	1.437	0.804	1.521	1.938	2.055	0.758	1.426	1.812	1.812	1.004	1.971	2.599	2.613	2.243	3.535	3.652	3.652	9500
10000	0.496	0.917	1.239	1.297	0.670	1.281	1.708	1.854	0.626	1.196	1.636	1.636	0.833	1.645	2.283	2.358	1.855	3.079	3.296	3.296	10000
10500	0.415	0.778	1.089	1.176	0.564	1.080	1.509	1.664	0.522	1.011	1.462	1.484	0.698	1.381	2.011	2.139	1.543	2.687	2.989	2.989	10500
11000		0.662	0.959	1.072	0.479	0.918	1.338	1.492	0.439	0.853	1.283	1.352	0.590	1.166	1.776	1.949	1.295	2.346	2.724	2.724	11000
11500		0.563	0.846	0.980	0.410	0.776	1.188	1.341		0.723	1.127	1.237	0.503	0.984	1.571	1.783	1.096	2.049	2.492	2.492	11500
12000		0.482	0.746	0.881		0.661	1.053	1.209		0.618	0.992	1.136	0.432	0.836	1.383	1.620	0.935	1.795	2.289	2.289	12000
12500		0.416	0.660	0.793		0.568	0.929	1.093		0.533	0.874	1.047		0.716	1.214	1.461	0.803	1.577	2.106	2.109	12500
13000			0.585	0.715		0.491	0.820	0.990		0.463	0.769	0.958		0.617	1.065	1.320	0.694	1.386	1.902	1.950	13000
13500			0.517	0.645		0.427	0.724	0.898		0.400	0.676	0.865		0.535	0.933	1.194	0.603	1.221	1.72	1.808	13500
14000			0.458	0.583			0.639	0.816			0.596	0.779		0.466	0.819	1.082	0.528	1.071	1.557	1.681	14000
14500			0.406	0.527			0.565	0.742			0.528	0.703		0.409	0.722	0.981	0.464	0.946	1.411	1.567	14500
15000			0.477				0.501	0.674			0.466	0.634			0.639	0.884	0.410	0.830	1.279	1.465	15000

Span	C/Z 300 30				C/Z 350 24				C/Z 350 30				C/Z 400 24				C/Z 400 30				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	61.382	61.377	61.376	61.380	29.005	29.003	29.002	29.003	55.420	55.425	55.418	55.425	25.532	25.534	25.530	25.536	49.188	49.191	49.189	49.190	2000
2500	46.478	46.479	46.482	46.479	22.829	22.830	22.828	22.829	43.079	43.078	43.075	43.077	20.219	20.218	20.220	20.219	38.611	38.615	38.611	38.612	2500
3000	36.481	36.479	36.485	36.476	18.662	18.661	18.662	18.663	34.729	34.729	34.730	34.728	16.644	16.643	16.639	16.645	31.469	31.468	31.469	31.472	3000
3500	29.370	29.370	29.370	29.369	15.651	15.652	15.651	15.652	28.700	28.704	28.700	28.698	14.066	14.067	14.065	14.069	26.305	26.306	26.309	26.301	3500
4000	24.113	24.113	24.114	24.112	13.370	13.370	13.371	13.369	24.152	24.151	24.149	24.147	12.116	12.115	12.116	12.112	22.395	22.394	22.396	22.394	4000
4500	20.113	20.115	20.115	20.113	11.581	11.581	11.582	11.582	20.607	20.608	20.612	20.606	10.585	10.585	10.586	10.584	19.329	19.330	19.331	19.327*	4500
5000	17.004	17.003	17.004	17.003	10.142	10.141	10.141	10.141	17.784	17.784	17.783	17.787	9.350	9.351	9.350	9.350	16.867	16.867	16.867	16.867	5000
5500	14.541	14.534	14.531	14.525	8.959	8.950	8.946	8.939	15.491	15.480	15.474	15.467	8.334	8.323	8.319	8.313	14.850	14.835	14.829	14.820	5500
6000	12.404	12.560	12.561	12.560	7.973	7.973	7.973	7.973	13.604	13.604	13.604	13.606	7.482	7.481	7.481	7.481	13.172	13.171	13.172	13.172	6000
6500	10.164	10.943	10.942	10.940	7.140	7.135	7.132	7.128	12.031	12.024	12.022	12.016	6.758	6.752	6.749	6.744	11.758	11.751	11.745	11.740	6500
7000	8.355	9.598	9.598	9.598	6.429	6.429	6.429	6.429	10.707	10.707	10.707	10.708	6.136	6.136	6.136	6.136	10.555	10.555	10.555	10.555	7000
7500	6.850	8.361	8.361	8.361	5.817	5.813	5.812	5.809	9.583	9.579	9.577	9.575	5.596	5.592	5.590	5.587	9.522	9.518	9.515	9.512	7500
8000	5.594	7.348	7.348	7.349	5.285	5.286	5.285	5.286	8.529	8.621	8.621	8.622	5.125	5.125	5.125	5.125	7.785	8.629	8.630	8.631	8000
8500	4.507	6.405	6.510	6.509	4.822	4.820	4.818	4.817	7.237	7.790	7.789	7.787	4.710	4.707	4.706	4.704	6.190	7.849	7.849	7.846	8500
9000	3.635	5.581	5.806	5.806	4.414	4.414	4.414	4.414	6.154	7.049	7.049	7.049	4.051	4.342	4.342	4.342	4.973	7.173	7.173	7.172	9000
9500	2.965	4.888	5.211	5.211	4.006	4.053	4.053	4.051	5.238	6.327	6.327	6.327	3.291	4.013	4.012	4.010	4.045	6.572	6.571	6.570	9500
10000	2.446	4.296	4.703	4.703	3.483	3.736	3.736	3.735	4.456	5.710	5.710	5.710	2.702	3.722	3.722	3.722	3.328	6.045	6.045	6.045	10000
10500	2.039	3.787	4.266	4.266	2.974	3.451	3.450	3.449	3.782	5.179	5.179	5.179	2.243	3.458	3.457	3.457	2.765	5.378	5.573	5.572	10500
11000	1.716	3.320	3.887	3.887	2.528	3.198	3.198	3.198	3.233	4.719	4.719	4.719	1.878	3.223	3.223	3.223	2.319	4.682	5.155	5.155	11000
11500	1.456	2.915	3.529	3.556	2.164	2.969	2.969	2.968	2.789	4.300	4.317	4.317	1.585	2.972	3.007	3.006	1.962	4.079	4.719	4.719	11500
12000	1.245	2.560	3.900	3.266	1.864	2.764	2.764	2.764	2.425	3.851	3.965	3.965	1.349	2.662	2.814	2.814	1.672	3.555	4.334	4.334	12000
12500	1.072	2.223	2.891	3.010	1.616	2.515	2.578	2.578	2.106	3.455	3.654	3.654	1.155	2.399	2.636	2.636	1.436	3.058	3.994	3.994	12500
13000	0.929	1.925	2.627	2.783	1.408	2.282	2.411	2.411	1.829	3.103	3.378	3.378	0.996	2.108	2.476	2.477	1.240	2.627	3.693	3.693	13000
13500	0.811	1.667	2.391	2.581	1.234	2.074	2.258	2.258	1.600	2.709	3.133	3.133	0.864	1.832	2.328	2.328	1.078	2.268	3.424	3.424	13500
14000	0.711	1.449	2.180	2.400	1.091	1.887	2.119	2.119	1.490	2.509	2.913	2.913	0.753	1.588	2.178	2.194	0.943	1.969	3.119	3.184	14000
14500	0.627	1.267	1.991	2.214	0.974	1.719	1.984	1.984	1.244	2.257	2.716	2.716	0.660	1.384	1.991	2.069	0.828	1.718	2.827	2.968	14500
15000	0.556	1.113	1.810	2.043	0.867	1.567	1.846	1.854	1.096	2.029	2.538	2.538	0.581	1.212	1.821	1.955	0.731	1.507	2.557	2.744	15000

TABLE 3B:
C & Z SECTION
3 SPAN
INWARD
LOAD (kN/m)

	C/Z 100 10					C/Z 100 12					C/Z 100 15					C/Z 100 19					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	5.283	5.283	5.283	5.283	8.075	6.818	6.818	6.819	6.819	9.757	8.508	8.878	8.879	8.878	12.424	11.327	12.367	12.367	12.367	16.005	2000
	3.596	3.596	3.596	3.596	4.134	4.361	4.364	4.364	4.364	4.996	5.309	5.682	5.682	5.682	6.362	6.992	7.915	7.915	7.915	8.195	2500
	2.497	2.497	2.497	2.497	2.393	2.956	3.030	3.030	3.030	2.891	3.607	3.946	3.946	3.946	3.681	4.714	5.497	5.497	5.497	4.742	3000
	1.835	1.835	1.835	1.835	1.507	2.118	2.227	2.226	2.226	1.821	2.596	2.899	2.899	2.899	2.318	3.375	4.038	4.038	4.038	2.986	3500
	1.378	1.405	1.405	1.405	1.009	1.577	1.705	1.705	1.705	1.220	1.946	2.220	2.220	2.220	1.553	2.521	3.092	3.092	3.092	2.001	4000
	1.050	1.110	1.110	1.110	0.709	1.208	1.347	1.347	1.347	0.857	1.503	1.754	1.754	1.754	1.091	1.943	2.443	2.443	2.443	1.405	4500
	0.815	0.899	0.899	0.899	0.517	0.943	1.091	1.091	1.091	0.624	1.186	1.421	1.421	1.420	0.795	1.534	1.979	1.979	1.979	1.024	5000
	0.641	0.743	0.743	0.743		0.748	0.902	0.902	0.902	0.469	0.953	1.174	1.174	1.174	0.597	1.233	1.634	1.635	1.635	0.770	5500
	0.508	0.624	0.624	0.624		0.599	0.758	0.758	0.758		0.776	0.986	0.986	0.986	0.460	1.006	1.362	1.374	1.374	0.593	6000
	0.405	0.532	0.532	0.532		0.484	0.646	0.646	0.646		0.638	0.840	0.841	0.841		0.830	1.147	1.171	1.171	0.466	6500
		0.459	0.459	0.459			0.557	0.557	0.557		0.528	0.715	0.725	0.725		0.692	0.977	1.010	1.010		7000
		0.400	0.400	0.400			0.485	0.485	0.485		0.435	0.615	0.631	0.631		0.582	0.839	0.879	0.879		7500
							0.426	0.426	0.426			0.533	0.555	0.555		0.489	0.727	0.769	0.773		8000
												0.465	0.488	0.492		0.412	0.633	0.673	0.685		8500
																	0.555	0.591	0.611		9000
																	0.489	0.523	0.545		9500
																	0.433	0.464	0.486		
																		0.414	0.435		

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

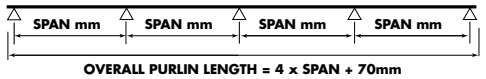
Grade 8.8 bolts required.

For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 150 12					C/Z 150 15					C/Z 150 19					C/Z 150 24					C/Z 200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	7.548	7.548	7.548	7.549	28.033	12.662	12.663	12.663	12.662	36.427	20.123	20.122	20.123	20.122	46.636	28.014	29.356	29.355	29.356	60.398	11.515	11.515	11.515	11.515	76.648	2000
2500	5.595	5.596	5.595	5.596	14.352	8.984	8.984	8.984	8.983	18.650	12.710	13.671	13.671	13.671	23.877	16.808	19.609	19.608	19.609	30.923	8.733	8.733	8.733	8.734	39.243	2500
3000	4.306	4.306	4.306	4.306	8.306	6.530	6.667	6.667	6.666	10.793	8.493	9.599	9.600	9.599	13.817	11.056	13.617	13.617	13.617	17.896	6.865	6.865	6.864	6.865	22.710	3000
3500	3.406	3.406	3.406	3.406	5.231	4.660	4.984	4.984	4.984	6.797	6.038	7.052	7.052	7.053	8.702	7.761	10.005	10.005	10.005	11.270	5.535	5.535	5.536	5.535	14.301	3500
4000	2.754	2.754	2.754	2.754	3.504	3.474	3.816	3.816	3.816	4.553	4.490	5.400	5.400	5.400	5.830	5.716	7.660	7.660	7.659	7.550	4.550	4.551	4.551	4.550	9.581	4000
4500	2.212	2.268	2.268	2.268	2.461	2.676	3.015	3.015	3.015	3.198	3.454	4.266	4.266	4.266	4.094	4.365	6.052	6.052	6.052	5.302	3.800	3.800	3.800	3.800	6.729	4500
5000	1.758	1.852	1.852	1.852	1.794	2.112	2.442	2.442	2.442	2.331	2.727	3.456	3.456	3.456	2.985	3.430	4.902	4.902	4.902	3.866	3.167	3.216	3.216	3.216	4.905	5000
5500	1.418	1.530	1.530	1.530	1.348	1.700	2.018	2.018	2.018	1.751	2.197	2.856	2.856	2.856	2.245	2.741	4.051	4.051	4.051	2.904	2.544	2.751	2.750	2.749	3.686	5500
6000	1.153	1.286	1.286	1.286	1.038	1.388	1.696	1.696	1.696	1.349	1.799	2.400	2.400	2.400	1.727	2.224	3.374	3.304	3.404	2.237	2.078	2.369	2.369	2.369	2.839	6000
6500	0.946	1.096	1.096	1.096	0.817	1.146	1.445	1.445	1.445	1.061	1.481	2.045	2.045	2.045	1.359	1.830	2.844	2.901	2.901	1.759	1.719	2.018	2.019	2.018	2.233	6500
7000	0.782	0.945	0.945	0.945	0.654	0.955	1.246	1.246	1.246	0.850	1.231	1.763	1.763	1.763	1.088	1.525	2.427	2.501	2.501	1.409	1.437	1.740	1.740	1.740	1.788	7000
7500	0.649	0.823	0.823	0.823	0.532	0.803	1.085	1.085	1.085	0.691	1.032	1.536	1.536	1.536	0.884	1.283	2.093	2.179	2.179	1.145	1.212	1.516	1.516	1.516	1.453	7500
8000	0.541	0.723	0.723	0.723	0.438	0.679	0.954	0.954	0.954	0.569	0.870	1.346	1.350	1.35	0.729	1.089	1.822	1.915	1.915	0.944	1.028	1.333	1.333	1.333	1.198	8000
8500	0.454	0.641	0.641	0.641		0.576	0.845	0.845	0.845	0.475	0.739	1.182	1.196	1.196	0.608	0.933	1.598	1.696	1.696	0.877	0.878	1.180	1.180	1.180	0.998	8500
9000		0.572	0.572	0.572		0.493	0.754	0.754	0.754	0.400	0.633	1.044	1.067	1.067	0.512	0.805	1.410	1.513	1.513	0.663	0.754	1.053	1.053	1.053	0.841	9000
9500		0.513	0.513	0.513		0.424	0.676	0.676	0.676		0.546	0.927	0.957	0.957	0.435	0.698	1.252	1.358	1.358	0.564	0.652	0.945	0.945	0.945	0.715	9500
10000		0.463	0.463	0.463			0.610	0.610	0.610		0.474	0.827	0.864	0.864		0.610	1.118	1.222	1.226	0.483	0.566	0.853	0.853	0.853	0.613	10000
10500		0.420	0.420	0.420			0.554	0.554	0.554		0.414	0.741	0.784	0.784		0.535	1.002	1.098	1.112	0.417	0.495	0.774	0.774	0.774	0.530	10500
11000							0.499	0.505	0.505			0.667	0.714	0.714		0.471	0.901	0.989	1.013		0.434	0.705	0.705	0.705	0.461	11000
11500							0.449	0.462	0.462			0.601	0.648	0.653		0.417	0.814	0.894	0.927			0.645	0.645	0.645	0.403	11500
12000							0.405	0.424	0.424			0.544	0.588	0.600			0.737	0.811	0.851			0.592	0.592	0.592		12000
12500												0.494	0.535	0.553			0.669	0.738	0.780			0.546	0.546	0.546		12500
13000												0.449	0.488	0.511			0.608	0.673	0.713			0.505	0.505	0.505		13000
13500												0.409	0.447	0.471			0.555	0.615	0.654			0.468	0.468	0.468		13500
14000													0.410	0.433			0.507	0.563	0.600			0.435	0.435	0.435		14000
14500														0.400			0.464	0.517	0.553			0.400	0.406	0.406		14500
15000														0.400			0.425	0.476	0.510							15000

Span	C/Z 200 19					C/Z 200 24					C/Z 250 19					C/Z 250 24					C/Z 300 24					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	21.806	21.805	21.804	21.806	102.847	37.327	37.328	37.327	37.328	132.130	19.090	19.090	19.089	19.090	170.635	36.122	36.120	36.121	36.129	223.815	33.056	33.055	33.057	33.052	385.402	2000
2500	16.091	16.091	16.090	16.092	52.658	26.332	26.332	26.333	26.334	67.650	14.667	14.667	14.666	14.666	87.365	27.013	27.013	27.013	27.014	114.601	25.629	25.629	25.633	25.635	197.328	2500
3000	12.333	12.332	12.332	12.333	30.474	17.806	19.456	19.458	19.457	39.150	11.681	11.680	11.681	11.681	50.558	20.953	20.954	20.953	20.953	66.317	20.607	20.607	20.603	20.607	114.196	3000
3500	9.342	9.722	9.722	9.722	19.190	12.341	14.902	14.902	14.902	24.654	9.536	9.536	9.536	9.536	31.589	15.916	16.691	16.690	16.690	41.761	16.984	16.984	16.984	16.983	71.914	3500
4000	6.839	7.839	7.839	7.838	12.856	6.879	11.590	11.591	11.591	16.516	7.930	7.930	7.931	7.929	21.329	11.315	13.575	13.577	13.574	27.977	14.253	14.255	14.253	14.252	48.175	4000
4500	5.195	6.404	6.404	6.404	9.029	6.834	9.158	9.158	9.159	11.601	6.691	6.692	6.691	6.691	19.488	8.355	11.233	11.234	11.233	19.949	12.131	12.130	12.131	12.130	33.836	4500
5000	4.065	5.188	5.188	5.188	6.582	5.108	7.418	7.418	7.418	8.456	5.250	5.715	5.714	5.715	10.921	6.379	9.431	9.430	9.431	14.325	9.633	10.442	10.442	10.442	24.667	5000
5500	3.252	4.287	4.287	4.287	4.945	4.034	6.131	6.131	6.130	6.353	4.171	4.928	4.926	4.925	8.205	5.020	7.796	7.796	7.796	10.762	7.523	9.069	9.066	9.061	18.531	5500
6000	2.648	3.602	3.603	3.603	3.809	3.256	5.151	5.151	5.151	4.894	3.378	4.293	4.293	4.293	6.320	4.050	6.551	6.551	6.551	8.290	5.975	7.953	7.953	7.953	14.275	6000
6500	2.190	3.070	3.070	3.070	2.996	2.681	4.389	4.389	4.389	3.849	2.781	3.766	3.765	3.764	4.971	3.304	5.582	5.582	5.582	6.520	4.847	7.017	7.015	7.013	11.227	6500
7000	1.832	2.647	2.647	2.647	2.399	2.232	3.785	3.785	3.785	3.082	2.324	3.330	3.330	3.330	3.980	2.739	4.813	4.813	4.813	5.220	4.001	6.237	6.238	6.237	8.989	7000
7500	1.551	2.306	2.306	2.306	1.950	1.878	3.277	3.297	3.297	2.506	1.965	2.908	2.908	2.908	3.236	2.302	4.192	4.192	4.193	4.244	3.335	5.572	5.570	5.569	7.309	7500
8000	1.326	2.026	2.026	2.026	1.607	1.598	2.854	2.898	2.898	2.065	1.673	2.556	2.556	2.556	2.666	1.956	3.685	3.685	3.685	3.497	2.817	5.007	5.007	5.008	6.022	8000
8500	1.144	1.795	1.795	1.795	1.340	1.372	2.506	2.567	2.567	1.721	1.432	2.264	2.264	2.264	2.233	1.678	3.264	3.264	3.264	2.916	2.409	4.519	4.518	4.518	5.021	8500
9000	0.989	1.601	1.601	1.601	1.129	1.188	2.216	2.289	2.289	1.450	1.235	2.019	2.019	2.019	1.873	1.541	2.911	2.911	2.911	2.456	2.080	4.069	4.069	4.069	4.230	9000
9500	0.859	1.437	1.437	1.437	0.960	1.036	1.972	2.055	2.055	1.233	1.072	1.812	1.812	1.812	1.592	1.264	2.613	2.613	2.613	2.089	1.812	3.652	3.652	3.652	3.596	9500
10000	0.750	1.297	1.297	1.297	0.823	0.909	1.764	1.854	1.854	1.057	0.936	1.636	1.636	1.636	1.365	1.108	2.350	2.358	2.358	1.791	1.591	3.296	3.296	3.296	3.083	10000
10500	0.659	1.176	1.176	1.176	0.711	0.802	1.587	1.682	1.682	0.913	0.822	1.483	1.484	1.484	1.179	0.976	2.111	2.139	2.139	1.547	1.405	2.989	2.989	2.989	2.664	10500
11000	0.581	1.072	1.072	1.072	0.618	0.710	1.433	1.533	1.533	0.794	0.725	1.352	1.352	1.352	1.026	0.864	1.904	1.949	1.949	1.345	1.249	2.724	2.724	2.724	2.361	11000
11500	0.515	0.977	0.981	0.981	0.541	0.632	1.300	1.402	1.402	0.695	0.642	1.237	1.237	1.237	0.898	0.768	1.724	1.783	1.783	1.177	1.116	2.487	2.492	2.492	2.027	11500
12000	0.458	0.887	0.901	0.901	0.476	0.564	1.183	1.288	1.288	0.612	0.571	1.136	1.136	1.136	0.790	0.685	1.567	1.638	1.638	1.036	1.002	2.260	2.289	2.289	1.784	12000
12500	0.409	0.808	0.830	0.830	0.421	0.506	1.080	1.187	1.187	0.541	0.510	1.047	1.047	1.047	0.699	0.613	1.428	1.509	1.509	0.917	0.903	2.061	2.109	2.109	1.579	12500
13000		0.737	0.767	0.767		0.455	0.989	1.092	1.097	0.481	0.456	0.968	0.968	0.968	0.621	0.550	1.305	1.395	1.395	0.815	0.817	1.886	1.950	1.950	1.403	13000
13500		0.674	0.712	0.712		0.410	0.907	1.005	1.018	0.430	0.408	0.895	0.897	0.897	0.555	0.496	1.196	1.294	1.294	0.728	0.742	1.731	1.808	1.808	1.253	13500
14000		0.618	0.662	0.662			0.834	0.926	0.946			0.823	0.834	0.834	0.497	0.448	1.098	1.203	1.203	0.653	0.675	1.594	1.681	1.681	1.121	14000
14500		0.567	0.617	0.617			0.769	0.855	0.882			0.754	0.778	0.778	0.448	0.405	1.009	1.122	1.122	0.587	0.617	1.471	1.567	1.568	1.104	14500
15000		0.521	0.576	0.576			0.709	0.791	0.824			0.692	0.727	0.727	0.404		0.930	1.048	1.048	0.531	0.564	1.360	1.465	1.465	0.914	15000

TABLE 4A:
C & Z SECTION
4 SPAN OUTWARD LOAD
(kN/m)



Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

C/Z 100 10				C/Z 100 12				C/Z 100 15				C/Z 100 19				Span
0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
5.050	5.050	5.050	5.050	6.364	6.364	6.364	6.364	8.287	8.287	8.286	8.286	11.543	11.543	11.543	11.543	
3.356	3.356	3.356	3.356	4.073	4.073	4.073	4.073	5.275	5.303	5.303	5.303	7.264	7.388	7.388	7.387	
2.331	2.331	2.331	2.331	2.775	2.828	2.828	2.828	3.482	3.683	3.683	3.683	4.757	5.130	5.130	5.130	
1.593	1.712	1.712	1.713	1.882	2.078	2.078	2.078	2.410	2.706	2.706	2.706	3.267	3.769	3.769	3.769	
1.086	1.311	1.311	1.311	1.306	1.591	1.591	1.591	1.721	2.030	2.072	2.072	2.319	2.797	2.886	2.886	
0.740	1.036	1.036	1.036	0.917	1.228	1.257	1.257	1.253	1.547	1.637	1.637	1.686	2.120	2.280	2.280	
0.513	0.797	0.839	0.839	0.650	0.941	1.018	1.018	0.908	1.202	1.326	1.326	1.249	1.640	1.838	1.847	
	0.611	0.693	0.693	0.476	0.729	0.841	0.842	0.657	0.948	1.074	1.096	0.925	1.289	1.480	1.526	
	0.469				0.568	0.700	0.707	0.491	0.756	0.879	0.921	0.691	1.025	1.207	1.283	
		0.489	0.497		0.444	0.574	0.603		0.608	0.728	0.780	0.530	0.822	0.996	1.077	
		0.401	0.428			0.474	0.520		0.488	0.608	0.660	0.416	0.665	0.829	0.908	
							0.448			0.512	0.563		0.542	0.696	0.772	
										0.433	0.483		0.436	0.587	0.661	
											0.417			0.498	0.570	
														0.425	0.494	
															0.900	
															0.950	

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD

Grade 8.8 bolts required.

3/SB

For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 150 12				C/Z 150 15				C/Z 150 19				C/Z 150 24				C/Z 200 15				Span	
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB		
2000	7.330	7.330	7.329	7.329	12.163	12.164	12.164	12.164	19.107	19.107	19.107	19.107	27.753	27.753	27.753	27.753	11.244	11.244	11.245	11.244	2000	
2500	5.403	5.403	5.403	5.402	8.576	8.576	8.575	8.576	12.901	12.901	12.901	12.901	18.302	18.302	18.302	18.302	8.487	8.487	8.488	8.487	2500	
3000	4.136	4.136	4.136	4.136	6.331	6.331	6.331	6.331	8.959	8.959	8.959	8.959	12.709	12.709	12.710	12.709	6.641	6.641	6.641	6.641	3000	
3500	3.258	3.255	3.253	3.251	4.652	4.651	4.652	4.652	6.505	6.583	6.582	6.582	8.990	9.338	9.338	9.338	5.332	5.325	5.323	5.317	3500	
4000	2.625	2.625	2.625	2.625	3.522	3.561	3.561	3.561	4.746	5.040	5.039	5.040	6.520	7.149	7.149	7.149	4.367	4.367	4.366	4.367	4000	
4500	2.053	2.134	2.134	2.134	2.613	2.814	2.814	2.814	3.547	3.982	3.982	3.982	4.847	5.649	5.649	5.649	3.635	3.632	3.631	3.629	4500	
5000	1.536	1.728	1.728	1.728	1.965	2.279	2.279	2.279	2.696	3.225	3.225	3.225	3.669	4.510	4.575	4.575	3.067	3.067	3.067	3.066	5000	
5500	1.137	1.428	1.428	1.428	1.488	1.884	1.884	1.884	2.071	2.603	2.666	2.665	2.817	3.605	3.781	3.781	2.545	2.617	2.616	2.615	5500	
6000	0.841	1.200	1.200	1.200	1.133	1.564	1.583	1.583	1.579	2.115	2.240	2.240	2.182	2.919	3.177	3.177	2.029	2.211	2.211	2.211	6000	
6500	0.636	0.997	1.023	1.023	0.870	1.276	1.349	1.349	1.196	1.736	1.908	1.908	1.666	2.389	2.707	2.707	1.585	1.884	1.884	1.884	6500	
7000	0.491	0.824	0.882	0.882	0.682	1.048	1.163	1.163	0.926	1.436	1.646	1.646	1.284	1.971	2.291	2.334	1.234	1.624	1.624	1.624	7000	
7500		0.670	0.768	0.768	0.536	0.865	1.013	1.013	0.735	1.194	1.405	1.433	1.010	1.638	1.947	2.034	0.969	1.415	1.415	1.415	7500	
8000		0.544	0.675	0.675	0.427	0.714	0.890	0.890	0.584	0.998	1.205	1.260	0.810	1.368	1.667	1.787	0.773	1.218	1.244	1.244	8000	
8500		0.440	0.597	0.598		0.591	0.768	0.789	0.472	0.835	1.040	1.116	0.659	1.149	1.435	1.568	0.628	1.044	1.102	1.102	8500	
9000			0.518	0.533		0.490	0.663	0.703		0.687	0.902	0.989	0.544	0.965	1.242	1.372	0.518	0.892	0.983	0.983	9000	
9500			0.451	0.479		0.408	0.574	0.631		0.566	0.785	0.871	0.455	0.801	1.080	1.207	0.433	0.753	0.882	0.882	9500	
10000				0.432			0.498	0.570		0.472	0.686	0.771		0.666	0.942	1.066		0.634	0.796	0.796	10000	
10500							0.433	0.506			0.601	0.685		0.558	0.824	0.945		0.534	0.722	0.722	10500	
11000								0.449			0.527	0.610		0.472	0.723	0.841		0.452	0.644	0.658	11000	
11500								0.400			0.462	0.545		0.403	0.636	0.751			0.575	0.602	11500	
12000											0.400	0.489				0.560	0.671			0.515	0.553	12000
12500												0.438				0.491	0.602			0.457	0.509	12500
13000																0.428	0.541			0.404	0.471	13000
13500																	0.487				0.431	13500
14000																	0.438					14000
14500																						14500
15000																						15000

Span	C/Z 200 19				C/Z 200 24				C/Z 250 19				C/Z 250 24				C/Z 300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	21.154	21.155	21.154	21.154	35.803	35.803	35.804	35.806	18.696	18.697	18.696	18.698	35.153	35.156	35.154	35.157	33.056	33.061	33.058	33.053	2000
2500	15.518	15.517	15.517	15.518	25.100	25.101	25.100	25.101	14.309	14.309	14.309	14.309	26.146	26.145	26.145	26.148	25.629	25.628	25.630	25.631	2500
3000	11.832	11.831	11.831	11.831	18.462	18.462	18.463	18.462	11.350	11.350	11.350	11.350	20.179	20.180	20.178	20.179	20.608	20.607	20.606	20.610	3000
3500	9.287	9.278	9.275	9.267	14.092	14.084	14.082	14.076	9.230	9.217	9.211	9.200	16.004	15.986	15.979	15.966	16.983	16.983	16.984	16.982	3500
4000	7.461	7.461	7.461	7.461	10.818	10.818	10.818	10.818	7.647	7.647	7.646	7.647	12.968	12.967	12.968	12.967	14.254	14.253	14.254	14.252	4000
4500	5.978	5.978	5.978	5.978	8.266	8.548	8.547	8.548	6.432	6.426	6.423	6.420	10.697	10.690	10.687	10.683	12.130	12.131	12.132	12.130	4500
5000	4.678	4.842	4.842	4.842	6.409	6.923	6.923	6.923	5.476	5.476	5.476	5.476	8.583	8.804	8.804	8.804	10.442	10.443	10.442	10.442	5000
5500	3.646	4.002	4.002	4.001	5.043	5.722	5.722	5.722	4.713	4.710	4.709	4.707	6.711	7.276	7.276	7.276	9.076	9.06.			

TABLE 4B:
C & Z SECTION
4 SPAN
INWARD LOAD
(kN/m)

	C/Z 100 10					C/Z 100 12					C/Z 100 15					C/Z 100 19					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	0.500	5.049	5.050	5.050	8.602	6.364	6.364	6.364	6.364	10.394	8.040	8.286	8.287	8.286	13.235	10.760	11.543	11.543	11.543	17.049	2000
	3.356	3.356	3.356	3.356	4.404	4.073	4.073	4.073	4.073	5.322	5.028	5.303	5.303	5.303	6.776	6.661	7.387	7.387	7.388	8.730	2500
	2.331	2.331	2.331	2.331	2.549	2.808	2.828	2.828	2.828	3.080	3.423	3.683	3.683	3.683	3.921	4.503	5.130	5.130	5.130	5.051	3000
	1.712	1.713	1.712	1.712	1.605	2.020	2.078	2.078	2.078	1.939	2.469	2.706	2.706	2.706	2.470	3.231	3.769	3.769	3.769	3.181	3500
	1.311	1.311	1.311	1.311	1.075	1.512	1.591	1.591	1.591	1.299	1.856	2.072	2.072	2.072	1.654	2.420	2.886	2.886	2.886	2.131	4000
	1.019	1.036	1.036	1.036	0.755	1.166	1.257	1.257	1.257	0.913	1.440	1.637	1.637	1.637	1.162	1.872	2.280	2.280	2.280	1.497	4500
	0.801	0.839	0.839	0.839	0.551	0.920	1.018	1.018	1.018	0.665	1.143	1.326	1.326	1.326	0.847	1.484	1.847	1.847	1.847	1.091	5000
	0.640	0.693	0.693	0.693	0.414	0.739	0.841	0.841	0.841	0.500	0.925	1.096	1.096	1.096	0.636	1.200	1.526	1.526	1.526	0.820	5500
	0.518	0.583	0.583	0.583		0.602	0.707	0.707	0.707		0.760	0.921	0.921	0.921	0.490	0.986	1.279	1.283	1.283	0.631	6000
	0.424	0.497	0.496	0.497		0.495	0.602	0.602	0.602		0.632	0.785	0.784	0.785		0.820	1.080	1.093	1.093	0.497	6500
		0.428	0.428	0.428		0.411	0.519	0.520	0.519		0.531	0.673	0.676	0.676		0.690	0.920	0.942	0.942		7000
							0.453	0.453	0.453		0.450	0.579	0.589	0.589		0.586	0.791	0.821	0.821		7500
												0.503	0.518	0.518		0.501	0.686	0.720	0.721		8000
												0.439	0.457	0.459		0.432	0.598	0.630	0.639		8500
													0.403	0.409			0.525	0.554	0.570		9000
																	0.464	0.490	0.509		9500
																	0.411	0.436	0.455		1000

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

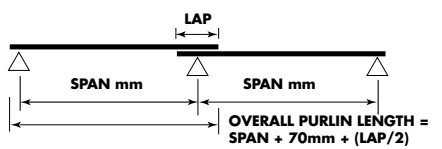
Grade 8.8 bolts required.

For Safebridge® system use data for 3 rows of bridging.

Span	C/Z 150 12					C/Z 150 15					C/Z 150 19					C/Z 150 24					C/Z 200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	7.331	7.330	7.331	7.331	29.861	12.163	12.163	12.164	12.164	38.802	19.107	19.106	19.108	19.106	49.679	26.684	27.754	27.753	27.753	64.337	11.244	11.243	11.244	11.244	81.646	2000
2500	5.402	5.403	5.403	5.404	15.289	8.576	8.576	8.576	8.577	19.867	12.096	12.902	12.901	12.901	25.435	16.101	18.702	18.302	18.301	32.941	8.487	8.488	8.486	8.488	41.803	2500
3000	4.136	4.146	4.136	4.136	8.848	6.222	6.331	6.331	6.331	11.497	8.110	8.959	8.959	8.959	14.719	10.640	12.709	12.710	12.709	19.062	6.641	6.641	6.641	6.642	24.191	3000
3500	3.258	3.255	3.253	3.251	5.572	4.452	4.652	4.652	4.652	7.240	5.783	6.582	6.582	6.583	9.269	7.498	9.338	9.338	9.338	12.005	5.332	5.325	5.323	5.317	15.234	3500
4000	2.625	2.625	2.625	2.624	3.733	3.328	3.561	3.561	3.561	4.850	4.312	5.040	5.040	5.039	6.210	5.541	7.149	7.149	7.149	8.042	4.367	4.367	4.367	4.366	10.206	4000
4500	2.106	2.134	2.134	2.134	2.622	2.571	2.814	2.814	2.814	3.406	3.326	3.982	3.982	3.982	4.361	4.244	5.649	5.649	5.649	5.648	3.634	3.632	3.631	3.629	7.168	4500
5000	1.679	1.728	1.728	1.728	1.911	2.036	2.279	2.279	2.279	2.483	2.634	3.225	3.225	3.225	3.179	3.344	4.575	4.575	4.575	4.118	3.025	3.067	3.067	3.067	5.225	5000
5500	1.364	1.428	1.428	1.428	1.436	1.646	1.884	1.884	1.884	1.866	2.129	2.666	2.666	2.666	2.389	2.694	3.781	3.781	3.781	3.094	2.459	2.617	2.616	2.615	3.926	5500
6000	1.127	1.200	1.200	1.200	1.106	1.351	1.583	1.583	1.583	1.437	1.750	2.240	2.240	2.240	1.840	2.210	3.177	3.177	3.177	2.383	2.024	2.211	2.211	2.211	3.024	6000
6500	0.935	1.023	1.023	1.023	0.870	1.124	1.349	1.349	1.349	1.130	1.459	1.908	1.908	1.909	1.447	1.829	2.694	2.707	2.707	1.874	1.682	1.884	1.884	1.884	2.378	6500
7000	0.782	0.882	0.882	0.882	0.696	0.944	1.163	1.163	1.163	0.905	1.228	1.646	1.646	1.646	1.159	1.532	2.300	2.334	2.334	1.501	1.414	1.624	1.624	1.624	1.904	7000
7500	0.660	0.768	0.768	0.768	0.566	0.800	1.013	1.013	1.013	0.736	1.038	1.433	1.433	1.433	0.942	1.295	1.984	2.033	2.034	1.220	1.200	1.415	1.415	1.415	1.548	7500
8000	0.560	0.675	0.675	0.675	0.467	0.683	0.890	0.890	0.89	0.606	0.883	1.260	1.260	1.260	0.776	1.105	1.727	1.787	1.787	1.005	1.026	1.244	1.244	1.244	1.276	8000
8500	0.477	0.598	0.598	0.598		0.587	0.789	0.789	0.789	0.505	0.757	1.115	1.116	1.116	0.647	0.950	1.514	1.583	1.583	0.838	0.883	1.102	1.102	1.102	1.064	8500
9000	0.408	0.533	0.533	0.533		0.508	0.703	0.703	0.703	0.426	0.652	0.985	0.995	0.995	0.545	0.822	1.337	1.412	1.412	0.764	0.764	0.983	0.983	0.983	0.896	9000
9500		0.479	0.479	0.479		0.441	0.631	0.631	0.631		0.565	0.875	0.893	0.893	0.464	0.717	1.187	1.267	1.267	0.600	0.664	0.882	0.882	0.882	0.762	9500
10000		0.432	0.432	0.432			0.570	0.570	0.570		0.493	0.782	0.806	0.806		0.628	1.059	1.144	1.144	0.515	0.581	0.796	0.796	0.796	0.653	10000
10500							0.517	0.517	0.517		0.433	0.701	0.731	0.731		0.554	0.949	1.030	1.038	0.445	0.510	0.722	0.722	0.722	0.564	10500
11000							0.471	0.471	0.471			0.631	0.666	0.666		0.491	0.854	0.928	0.945		0.450	0.658	0.658	0.658	0.491	11000
11500							0.427	0.431	0.431			0.570	0.607	0.61		0.437	0.772	0.839	0.865			0.602	0.602	0.602	0.429	11500
12000												0.517	0.551	0.56			0.699	0.761	0.794			0.553	0.553	0.553		12000
12500												0.469	0.502	0.516			0.635	0.692	0.730			0.509	0.509	0.509		12500
13000												0.428	0.458	0.477			0.578	0.631	0.667			0.471	0.471	0.471		13000
13500													0.420	0.441			0.528	0.577	0.612			0.437	0.437	0.437		13500
14000														0.406			0.483	0.529	0.562			0.406	0.406	0.406		14000
14500																	0.443	0.486	0.518			0.400	0.406	0.406		14500
15000																	0.407	0.447	0.478					0.406		15000

Span	C/Z 200 19					C/Z 200 24					C/Z 250 19					C/Z 250 24					C/Z 300 24					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	21.153	21.153	21.153	21.155	109.559	35.802	35.804	35.803	35.802	140.75	18.696	18.697	18.696	18.693	181.761	35.155	35.153	35.155	35.161	238.419	32.442	32.441	32.443	32.447	410.565	2000
2500	15.518	15.517	15.517	15.518	56.090	25.100	25.101	25.101	25.102	72.062	14.309	14.307	14.309	14.310	93.067	26.147	26.147	26.146	26.147	122.072	25.075	25.074	25.070	25.075	210.205	2500
3000	11.832	11.832	11.832	11.831	32.462	17.067	18.462	18.463	18.462	41.703	11.351	11.351	11.350	11.350	33.815	20.179	20.177	20.179	20.179	70.441	20.091	20.091	20.091	20.092	121.646	3000
3500	8.996	9.278	9.275	9.268	20.443	11.943	14.085	14.081	14.075	26.262	9.230	9.236	9.211	9.199	33.956	15.561	15.986	15.980	15.966	44.486	16.502	16.476	16.464	16.442	76.605	3500
4000	6.616	7.461	7.461	7.461	13.695	6.687	10.818	10.818	10.817	17.593	7.648	7.647	7.647	7.647	22.721	11.148	12.969	12.968	12.966	29.802	13.802	13.802	13.802	13.801	51.320	4000
4500	5.040	5.978	5.978	5.978	9.618	6.527	8.548	8.547	8.547	12.356	6.432	6.426	6.423	6.420	15.958	8.291	10.690	10.688	10.683	20.931	11.710	11.697	11.693	11.685	36.043	4500
5000	3.951	4.842	4.842	4.842	7.011	5.052	6.923	6.923	6.923	9.008	5.138	5.477	5.476	5.477	11.633	6.354	8.804	8.804	8.804	15.259	9.462	10.050	10.050	10.051	26.276	5000
5500	3.172	4.002	4.002	4.001	5.268	4.005	5.722	5.722	5.722	6.768	4.101	4.710	4.709	4.707	8.740	4.998	7.276	7.276	7.276	11.464	7.942	8.705	8.702	8.698	19.741	5500
6000	2.593	3.363	3.362	3.363	4.058	3.238	4.808	4.808	4.808	5.213	3.332	4.094	4.093	4.094	6.322	4.024	6.114	6.114	6.114	8.830	5.737	7.616	7.616	7.616	15.206	6000
6500	2.151	2.865	2.865	2.865	3.191	2.266	4.097	4.097	4.097	4.100	2.750	3.583	3.583	3.582	5.295	3.305	5.209	5.209	5.210	6.945	4.828	6.703	6.703	6.700	11.960	6500
7000	1.806	2.470	2.470	2.470	2.555	2.624	3.532	3.532	3.532	3.283	2.298	3.151	3.115	3.115	4.239	2.757	4.492	4.492	4.492	5.561	3.987	5.947	5.947	5.947	9.575	7000
7500	1.533	2.152	2.152	2.152	2.078	1.885	3.077	3.077	3.077	2.669	1.944	2.714	2.714	2.714	3.447	2.317	3.913	3.913	3.913	4.521	3.346	5.303	5.302	5.300	7.785	7500
8000	1.312	1.891	1.891	1.891	1.712	1.610	2.704	2.705	2.704	2.199	1.663	2.385	2.385	2.385	2.840	1.970	3.439	3.439	3.439	3.725	2.837	4.758	4.758	4.758	6.415	8000
8500	1.133	1.675	1.675	1.675	1.427	1.384	2.376	2.396	2.396	1.833	1.434	2.113	2.113	2.113	2.688	1.692	3.046	3.046	3.046	3.106	2.424	4.258	4.257	4.257	5.348	8500
9000	0.987	1.494	1.494	1.494	1.202	1.200	2.102	2.137	2.137	1.545	1.246	1.885	1.885	1.885	1.995	1.465	2.717	2.717	2.717	2.616	2.093	3.797	3.797	3.797	4.505	9000
9500	0.865	1.341	1.341	1.341	1.022	1.048	1.871	1.918	1.918	1.138	1.084	1.691	1.691	1.691	1.696	1.278	2.439	2.439	2.439	2.225	1.823	3.408	3.408	3.408	3.831	9500
10000	0.762	1.210	1.210	1.211	0.876	0.921	1.675	1.731	1.731	1.126	0.950	1.527	1.527	1.527	1.454	1.1220	2.201	2.201	2.201	1.907	1.600	3.076	3.076	3.076	3.284	10000
10500	0.671	1.098	1.098	1.098	0.757	0.814	1.506	1.570	1.570	0.973	0.836	1.385	1.385	1.385	1.256	0.991	1.996	1.996	1.996	1.648	1.414	2.790	2.790	2.790	2.837	10500
11000	0.594	1.000	1.000	1.000	0.658	0.723	1.361	1.431	1.430	0.846	0.740	1.262	1.262	1.262	1.093	0.879	1.813	1.819	1.819	1.433	1.257	2.542	2.542	2.542	2.468	11000
11500	0.529	0.915	0.915	0.915	0.576	0.646	1.234	1.309	1.309	0.740	0.659	1.154	1.154	1.154	0.956	0.784	1.642	1.664	1.664	1.254	1.124	2.326	2.326	2.326	2.160	11500
12000	0.473	0.841	0.841	0.841	0.507	0.579	1.123	1.202	1.202	0.652	0.588	1.060	1.060	1.060	0.842	0.702	1.492	1.528	1.528	1.104	1.009	2.136	2.136	2.136	1.901	12000
12500	0.424	0.767	0.775	0.775	0.449	0.521	1.026	1.108	1.108	0.577	0.527	0.977	0.977	0.977	0.744	0.631	1.361	1.409	1.409	0.977	0.910	1.969	1.969	1.969	1.682	12500
13000		0.701	0.716	0.716		0.470	0.939	1.024	1.024	0.513	0.475	0.903	0.903	0.903	0.662	0.569	1.244	1.302	1.302	0.868	0.824	1.809	1.820	1.820	1.495	13000
13500		0.642	0.664	0.664		0.426	0.862	0.943	0.950	0.458	0.429	0.838	0.838	0.838	0.591	0.515	1.140	1.208	1.208	0.775	0.749	1.682	1.688	1.688	1.335	13500
14000		0.589	0.618	0.618			0.793	0.869	0.883	0.410		0.779	0.779	0.779	0.530	0.467	1.047	1.123	1.123	0.695	0.683	1.530	1.569	1.569	1.197	14000
14500		0.541	0.576	0.576			0.731	0.803	0.823			0.720	0.726	0.726	0.477	0.425	0.964	1.047	1.047	0.626	0.624	1.413	1.463	1.463	1.077	14500
15000		0.498	0.538	0.538			0.675	0.742	0.769			0.664	0.678	0.678	0.431		0.888	0.978	0.978	0.565	0.572	1.307	1.367	1.367	0.973	15000

TABLE 5A: Z SECTION
2 SPAN LAPPED
OUTWARD LOAD (kN/m)



	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

Span	Z150 12				Z150 15				Z150 19				Z150 24				Z200 15				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	12.178	12.179	12.175	12.173	19.429	19.428	19.428	19.428	29.026	29.027	29.027	29.027	40.922	40.922	40.922	40.922	17.693	17.692	17.687	17.681	2000
2500																					2500
3000	8.255	8.254	8.255	8.255	13.430	13.430	13.431	13.430	18.928	18.927	18.928	18.928	26.684	26.684	26.684	26.684	12.273	12.271	12.273	12.272	3000
3500	5.942	5.942	5.942	5.942	9.492	9.491	9.491	9.491	13.377	13.377	13.377	13.376	18.617	18.606	18.589	18.589	9.067	9.066	9.067	9.067	3500
4000	4.448	4.449	4.448	4.448	6.950	6.951	6.950	6.951	9.595	9.577	9.577	9.577	13.108	14.066	14.067	14.066	6.957	6.957	6.955	6.958	4000
4500	3.433	3.433	3.433	3.433	4.923	5.114	5.114	5.114	6.641	7.208	7.207	7.208	9.030	10.161	10.161	10.161	5.486	5.486	5.486	5.486	4500
5000	2.716	2.716	2.716	2.716	3.467	3.778	3.778	3.778	4.707	5.325	5.325	5.325	6.381	7.507	7.507	7.507	4.419	4.419	4.419	4.419	5000
5500	1.999	2.195	2.195	2.194	2.525	2.908	2.908	2.908	3.457	4.099	4.099	4.099	4.680	5.684	5.779	5.779	3.623	3.623	3.623	3.623	5500
6000	1.466	1.760	1.759	1.759	1.880	2.310	2.310	2.310	2.604	3.202	3.255	3.255	3.527	4.405	4.589	4.589	3.016	3.016	3.016	3.016	6000
6500	1.086	1.432	1.432	1.432	1.425	1.879	1.879	1.879	1.972	2.542	2.648	2.648	2.674	3.491	3.734	3.734	2.413	2.527	2.527	2.527	6500
7000	0.814	1.188	1.188	1.188	1.095	1.518	1.559	1.559	1.506	2.054	2.198	2.198	2.053	2.815	3.098	3.098	1.913	2.097	2.097	2.097	7000
7500	0.623	0.975	1.002	1.002	0.852	1.237	1.315	1.315	1.163	1.683	1.853	1.853	1.590	2.303	2.572	2.613	1.503	1.768	1.768	1.768	7500
8000	0.487	0.807	0.856	0.856	0.675	1.018	1.124	1.124	0.917	1.394	1.565	1.584	1.246	1.906	2.158	2.233	1.186	1.511	1.511	1.511	8000
8500		0.663	0.741	0.741	0.534	0.844	0.972	0.972	0.727	1.164	1.329	1.370	0.995	1.593	1.829	1.931	0.941	1.307	1.307	1.307	8500
9000		0.547	0.647	0.647	0.431	0.704	0.841	0.849	0.584	0.980	1.138	1.196	0.807	1.342	1.564	1.680	0.758	1.141	1.141	1.141	9000
9500		0.451	0.567	0.570		0.590	0.723	0.748	0.477	0.829	1.054	1.054	0.664	1.138	1.347	1.458	0.618	0.984	1.006	1.006	9500
10000			0.519	0.541		0.516	0.658	0.710	0.403	0.720	0.898	0.980	0.566	0.996	1.231	1.351	0.530	0.898	0.955	0.955	10000
10500			0.449	0.482		0.434	0.568	0.632		0.603	0.780	0.859	0.476	0.838	1.069	1.183	0.444	0.770	0.850	0.850	10500
11000				0.432			0.493	0.560		0.506	0.680	0.757	0.405	0.707	0.933	1.041		0.657	0.762	0.762	11000
11500							0.429	0.494		0.429	0.596	0.671		0.598	0.818	0.921		0.560	0.686	0.686	11500
12000								0.438			0.524	0.596		0.509	0.720	0.819		0.478	0.617	0.622	12000
12500											0.460	0.532		0.436	0.634	0.730		0.409	0.551	0.566	12500
13000												0.421	0.516			0.584	0.707		0.534	0.574	13000
13500												0.460	0.516			0.510	0.631		0.472	0.524	13500
14000													0.412			0.446	0.566		0.417	0.480	14000
14500																	0.508				14500
15000																	0.457				15000
																	0.409				15000

Span	Z200 19				Z200 24				Z250 19				Z250 24				Z300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	35.183	35.182	35.181	35.183	56.602	56.603	56.601	56.604	28.637	28.636	28.630	28.637	57.133	57.129	57.120	57.131	48.810	48.812	48.793	48.780	2000
2500	23.837	23.834	23.838	23.839	39.209	39.208	39.208	39.208	20.138	20.136	20.139	20.137	39.065	39.058	39.065	39.063	34.624	34.617	34.627	34.626	2500
3000	16.996	16.994	16.995	16.995	28.394	28.396	28.395	28.395	15.130	15.128	15.129	15.130	28.390	28.390	28.391	28.391	26.298	26.296	26.297	26.297	3000
3500	12.618	12.619	12.617	12.618	20.242	20.243	20.238	20.242	11.811	11.810	11.807	11.811	21.444	21.444	21.438	21.444	20.778	20.779	20.771	20.778	3500
4000	9.671	9.671	9.672	9.671	14.949	14.949	14.948	14.949	9.465	9.465	9.464	9.464	16.673	16.673	16.673	16.673	16.851	16.850	16.850	16.851	4000
4500	7.610	7.610	7.609	7.610	10.870	11.303	11.303	11.303	7.736	7.736	7.736	7.736	13.272	13.272	13.271	13.271	13.929	13.930	13.929	13.928	4500
5000	5.855	5.972	5.972	5.972	8.091	8.701	8.701	8.701	6.423	6.424	6.423	6.424	10.775	10.775	10.775	10.774	11.686	11.687	11.686	11.687	5000
5500	4.448	4.743	4.742	4.742	6.189	6.909	6.909	6.909	5.406	5.406	5.406	5.405	8.252	8.788	8.789	8.788	9.926	9.925	9.926	9.926	5500
6000	3.443	3.859	3.859	3.859	4.833	5.622	5.622	5.622	4.603	4.603	4.602	4.603	6.407	7.151	7.151	7.151	8.521	8.521	8.520	8.521	6000
6500	2.701	3.202	3.202	3.202	3.812	4.665	4.665	4.665	3.589	3.959	3.959	3.959	5.005	5.934	5.934	5.933	7.382	7.382	7.382	7.382	6500
7000	2.143	2.700	2.700	2.700	3.019	3.879	3.934	3.934	2.830	3.405	3.405	3.405	3.929	5.003	5.004	5.004	6.448	6.448	6.448	6.448	7000
7500	1.716	2.308	2.308	2.308	2.410	3.246	3.363	3.363	2.243	2.910	2.910	2.910	3.104	4.277	4.277	4.277	5.480	5.674	5.674	5.674	7500
8000	1.381	1.979	1.996	1.996	1.938	2.744	2.908	2.908	1.794	2.517	2.517	2.517	2.472	3.675	3.699	3.699	4.532	5.026	5.026	5.026	8000
8500	1.126	1.678	1.743	1.743	1.572	2.338	2.540	2.540	1.455	2.198	2.198	2.198	1.988	3.123	3.230	3.230	3.768	4.446	4.446	4.446	8500
9000	0.924	1.431	1.536	1.536	1.275	2.007	2.237	2.237	1.181	1.917	1.936	1.936	1.606	2.670	2.846	2.846	3.144	3.917	3.917	3.917	9000
9500	0.782	1.286	1.459	1.459	1.073	1.824	2.087	2.125	0.997	1.717	1.839	1.839	1.346	2.413	2.703	2.703	2.753	3.720	3.720	3.720	9500
10000	0.651	1.100	1.298	1.298	0.891	1.571	1.827	1.892	0.827	1.462	1.637	1.637	1.113	2.062	2.406	2.406	2.319	3.311	3.311	3.311	10000
10500	0.548	0.945	1.160	1.163	0.747	1.350	1.609	1.695	0.694	1.251	1.467	1.467	0.929	1.761	2.155	2.155	1.963	2.964	2.966	2.967	10500
11000	0.466	0.815	1.022	1.048	0.633	1.163	1.424	1.527	0.586	1.072	1.321	1.321	0.783	1.508	1.904	1.942	1.662	2.605	2.673	2.673	11000
11500		0.704	0.904	0.949	0.540	1.005	1.265	1.377	0.496	0.921	1.197	1.197	0.666	1.293	1.688	1.759	1.421	2.298	2.421	2.421	11500
12000		0.609	0.802	0.864	0.465	0.870	1.128	1.237	0.423	0.792	1.076	1.089	0.571	1.110	1.501	1.601	1.213	2.033	2.203	2.203	12000
12500		0.557	0.765	0.877	0.418	0.788	1.090	1.219		0.720	1.020	1.106	0.511	0.996	1.441	1.625	1.080	1.934	2.236	2.236	12500
13000		0.483	0.677	0.789		0.678	0.970	1.097		0.620	0.900	1.009	0.443	0.856	1.274	1.469	0.931	1.706	2.042	2.042	13000
13500		0.419	0.601	0.710		0.588	0.862	0.991		0.537	0.797	0.925		0.740	1.127	1.324	0.808	1.507	1.871	1.871	13500
14000			0.535	0.641		0.512	0.767	0.897		0.468	0.707	0.851		0.643	0.998	1.197	0.705	1.338	1.711	1.722	14000
14500			0.477	0.579		0.449	0.683	0.815		0.410	0.627	0.777		0.562	0.885	1.085	0.618	1.191	1.551	1.589	14500
15000			0.426	0.525			0.610	0.742			0.557	0.703		0.494	0.785	0.985	0.545	1.062	1.408	1.472	15000

TABLE 5B:
Z SECTION
2 SPAN LAPPED
INWARD LOAD
(kN/m)

	Z100 10					Z100 12					Z100 15					Z100 19					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	7.439	7.439	7.436	7.434	12.638	9.035	9.471	9.471	9.471	15.357	10.944	12.129	12.128	12.128	19.445	14.208	16.850	16.850	16.851	24.915	2000
	4.711	4.711	4.710	4.709	6.302	5.565	6.057	6.058	6.058	7.658	6.749	7.757	7.757	7.757	9.697	8.630	10.777	10.777	10.777	12.424	2500
	3.031	3.056	3.056	3.056	3.569	3.477	3.770	3.770	3.770	4.337	4.216	4.828	4.828	4.828	5.492	5.397	6.708	6.708	6.707	7.036	3000
	2.064	2.089	2.089	2.089	2.208	2.370	2.578	2.578	2.578	2.683	2.877	3.301	3.301	3.300	3.397	3.686	4.585	4.585	4.585	4.353	3500
	1.489	1.520	1.520	1.520	1.458	1.712	1.875	1.875	1.875	1.772	2.083	2.401	2.401	2.401	2.243	2.670	3.336	3.336	3.336	2.874	4000
	1.118	1.156	1.156	1.156	1.012	1.289	1.466	1.426	1.426	1.229	1.573	1.826	1.826	1.826	1.557	2.017	2.520	2.537	2.537	1.994	4500
	0.866	0.909	0.909	0.909	0.730	1.000	1.122	1.122	1.122	0.887	1.226	1.436	1.436	1.436	1.123	1.572	1.963	1.996	1.996	1.439	5000
	0.685	0.734	0.734	0.734	0.544	0.795	0.905	0.905	0.905	0.661	0.978	1.158	1.159	1.159	0.837	1.255	1.568	1.611	1.611	1.072	5500
	0.553	0.605	0.605	0.605	0.416	0.643	0.746	0.746	0.746	0.505	0.796	0.946	0.956	0.956	0.640	1.022	1.279	1.328	1.328	0.820	6000
	0.475	0.560	0.560	0.560	0.557	0.692	0.692	0.692	0.692	0.409	0.700	0.853	0.886	0.886	0.518	0.892	1.147	1.230	1.230	0.664	6500
		0.473	0.473	0.473	0.460	0.582	0.583	0.583	0.583		0.582	0.712	0.747	0.747	0.412	0.743	0.956	1.030	1.038	0.528	7000
		0.404	0.404	0.404		0.417	0.431	0.431	0.431		0.490	0.602	0.637	0.638		0.627	0.808	0.870	0.887	0.426	7500
											0.416	0.514	0.545	0.552		0.534	0.689	0.744	0.767		8000
												0.443	0.471	0.482		0.459	0.593	0.641	0.670		8500
													0.410	0.425			0.515	0.558	0.587		9000
																	0.450	0.488	0.515		9500
																		0.430	0.455		

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

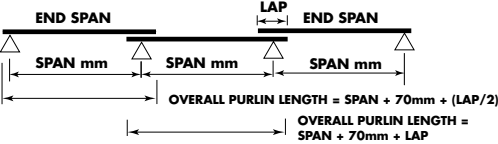
Grade 8.8 bolts required.

For Safebridge® system use data for 3 rows of bridging.

Span	Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	12.179	12.178	12.176	12.175	45.684	19.429	19.438	19.428	19.429	59.211	26.315	29.028	29.027	29.027	75.779	34.976	40.922	40.922	40.921	98.095	17.692	17.691	17.688	17.678	124.232	2000
2500	8.255	8.254	8.255	8.255	22.977	12.179	13.430	13.430	13.430	29.779	15.957	18.928	18.928	18.927	38.114	20.766	26.684	26.685	26.684	49.337	12.272	12.271	12.273	12.273	62.483	2500
3000	5.941	5.942	5.942	5.941	13.041	8.116	9.492	9.492	9.492	16.902	10.565	13.377	13.377	13.377	21.633	13.228	18.858	18.858	18.859	28.003	9.066	9.067	9.067	9.067	35.462	3000
3500	4.449	4.449	4.448	4.449	8.065	5.742	6.951	6.950	6.951	10.453	7.318	9.978	9.978	9.978	13.379	8.941	14.066	14.066	14.067	17.319	6.957	6.957	6.956	6.957	21.932	3500
4000	3.433	3.433	3.433	3.433	5.318	4.113	5.114	5.114	5.114	6.892	5.217	7.208	7.207	7.208	8.820	6.328	10.063	10.161	10.162	11.418	5.486	5.486	5.486	5.485	14.459	4000
4500	2.578	2.716	2.716	2.716	3.683	3.047	3.779	3.778	3.778	4.773	3.869	5.325	5.325	5.325	6.109	4.691	7.352	7.507	7.507	7.909	4.414	4.419	4.419	4.419	10.015	4500
5000	1.979	2.195	2.195	2.194	2.652	2.342	2.908	2.908	2.908	3.438	2.974	4.099	4.099	4.099	4.400	3.607	5.600	5.779	5.779	5.695	3.384	3.623	3.623	3.623	7.212	5000
5500	1.561	1.760	1.760	1.759	1.971	1.850	2.310	2.309	2.310	2.555	2.351	3.248	3.255	3.255	3.270	2.852	4.401	4.589	4.589	4.233	2.670	3.016	3.016	3.016	5.361	5500
6000	1.258	1.432	1.432	1.432	1.504	1.494	1.879	1.879	1.879	1.950	1.898	2.622	2.648	2.648	2.495	2.305	3.546	3.734	3.734	3.230	2.155	2.527	2.527	2.527	4.091	6000
6500	1.031	1.188	1.188	1.188	1.173	1.227	1.559	1.559	1.559	1.521	1.560	2.159	2.198	2.198	1.947	1.895	2.914	3.098	3.098	2.520	1.771	2.097	2.097	2.097	3.191	6500
7000	0.857	1.002	1.002	1.002	0.933	1.023	1.315	1.315	1.315	1.209	1.300	1.806	1.853	1.853	1.547	1.583	2.433	2.613	2.613	2.003	1.476	1.768	1.768	1.768	2.536	7000
7500	0.720	0.856	0.856	0.856	0.753	0.864	1.124	1.124	1.124	0.977	1.096	1.513	1.584	1.584	1.250	1.336	2.060	2.233	2.233	1.618	1.246	1.511	1.511	1.511	2.049	7500
8000	0.610	0.741	0.741	0.741	0.617	0.736	0.972	0.972	0.972	0.800	0.933	1.312	1.370	1.370	1.024	1.139	1.763	1.931	1.931	1.325	1.062	1.307	1.307	1.307	1.678	8000
8500	0.521	0.647	0.647	0.647	0.512	0.632	0.849	0.849	0.849	0.663	0.801	1.135	1.196	1.196	0.849	0.981	1.524	1.687	1.687	1.099	0.913	1.141	1.141	1.141	1.392	8500
9000	0.448	0.570	0.570	0.570	0.429	0.547	0.747	0.748	0.748	0.556	0.693	0.991	1.054	1.054	0.712	0.850	1.329	1.477	1.486	0.922	0.791	1.006	1.006	1.006	1.167	9000
9500		0.541	0.541	0.541		0.487	0.688	0.710	0.710	0.483	0.611	0.915	1.000	1.001	0.618	0.747	1.224	1.371	1.411	0.800	0.699	0.955	0.955	0.955	1.013	9500
10000		0.482	0.482	0.482		0.260	0.605	0.632	0.632	0.412	0.535	0.806	0.882	0.891	0.527	0.656	1.078	1.209	1.256	0.683	0.612	0.850	0.850	0.850	0.864	10000
10500		0.428	0.432	0.432			0.535	0.566	0.566		0.471	0.714	0.783	0.798	0.453	0.580	0.955	1.072	1.125	0.587	0.539	0.762	0.762	0.762	0.743	10500
11000							0.475	0.510	0.510		0.417	0.636	0.698	0.719		0.515	0.85	0.955	1.014	0.508	0.478	0.686	0.686	0.686	0.644	11000
11500							0.424	0.462	0.462			0.569	0.626	0.651		0.459	0.761	0.856	0.912	0.443	0.425	0.622	0.622	0.622	0.561	11500
12000								0.420	0.421			0.511	0.564	0.593		0.411	0.683	0.770	0.823			0.566	0.566	0.566	0.492	12000
12500									0.405	0.427		0.489	0.548	0.587			0.654	0.747	0.808			0.560	0.574	0.574	0.450	12500
13000												0.440	0.494	0.531			0.587	0.674	0.730			0.507	0.524	0.524	0.474	13000
13500													0.448	0.482			0.529	0.610	0.663			0.460	0.480	0.480	0.440	13500
14000													0.407	0.439			0.478	0.554	0.603			0.419	0.442	0.442	0.408	14000
14500														0.402			0.433	0.505	0.551						0.408	14500
15000																		0.461	0.505						0.408	15000

Span	Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	35.183	35.182	35.182	35.183	167.002	56.603	56.602	56.607	56.604	215.405	28.637	28.637	28.631	28.638	276.896	57.134	57.132	57.117	57.133	364.868	48.814	48.808	48.794	48.786	625.391	2000
2500	23.837	23.833	23.838	23.838	83.996	33.903	39.209	39.208	39.209	108.344	20.138	20.136	20.141	20.139	139.263	39.065	39.058	39.068	39.067	183.515	34.623	34.617	34.625	34.614	314.540	2500
3000	15.942	16.995	16.996	16.995	47.672	21.196	28.396	28.396	28.395	61.487	15.130	15.129	15.130	15.129	79.045	26.991	28.391	28.391	28.389	104.154	26.298	26.296	26.298	26.298	178.530	3000
3500	10.920	12.618	12.616	12.618	29.483	14.034	20.242	20.240	20.242	38.029	11.811	11.811	11.807	11.810	48.883	17.582	21.444	21.442	21.444	64.416	20.777	20.779	20.772	20.778	110.404	3500
4000	6.766	9.671	9.670	9.671	19.438	9.726	14.949	14.949	14.949	25.071	9.465	9.465	9.465	9.464	32.229	12.099	16.673	16.673	16.673	42.470	16.851	16.849	16.851	16.852	72.792	4000
4500	5.633	7.610	7.610	7.610	13.464	7.089	11.303	11.303	11.303	17.366	7.185	7.366	7.735	7.735	22.323	8.766	13.271	13.271	13.272	29.416	13.554	13.929	13.928	13.929	50.418	4500
5000	4.301	5.972	5.972	5.972	9.696	5.379	8.701	8.701	8.701	12.506	5.476	6.424	6.423	6.423	16.076	6.624	10.775	10.775	10.775	21.185	10.041	11.687	11.687	11.686	36.308	5000
5500	3.387	4.742	4.742	4.742	7.207	4.207	6.909	6.909	6.909	9.296	4.303	5.405	5.406	5.405	11.949	5.171	8.788	8.788	8.788	15.745	7.688	9.925	9.927	9.926	26.987	5500
6000	2.728	3.859	3.859	3.859	5.499	3.373	5.615	5.622	5.622	7.093	3.463	4.603	4.602	4.603	9.118	4.139	7.151	7.151	7.151	12.015	6.066	8.521	8.520	8.521	20.592	6000
6500	2.240	3.202	3.202	3.202	4.290	2.759	4.614	4.665	4.665	5.533	2.840	3.959	3.959	3.959	7.113	3.381	5.934	5.934	5.933	9.372	4.902	7.382	7.382	7.382	16.064	6500
7000	1.868	2.700	2.700	2.700	3.404	2.294	3.854	3.934	3.934	4.398	2.367	3.503	3.405	3.405	5.653	2.807	5.004	5.004	5.004	7.516	4.540	6.448	6.448	6.448	12.769	7000
7500	1.578	2.308	2.308	2.308	2.754	1.934	3.264	3.363	3.363	3.553	1.998	2.910	2.910	2.911	4.567	2.364	4.277	4.277	4.277	6.018	3.377	5.674	5.674	5.674	10.314	7500
8000	1.349	1.996	1.996	1.996	2.256	1.648	2.797	2.908	2.908	2.910	1.706	2.517	2.517	2.517	3.741	2.013	3.699	3.699	3.699	4.929	2.855	5.026	5.026	5.026	8.450	8000
8500	1.163	1.743	1.743	1.743	1.871	1.419	2.421	2.540	2.540	2.414	1.470	2.198	2.198	2.198	3.303	1.732	3.226	3.230	3.230	4.089	2.443	4.446	4.446	4.446	7.008	8500
9000	1.011	1.536	1.536	1.536	1.569	1.232	2.114	2.237	2.237	2.024	1.277	1.936	1.936	1.936	2.602	1.502	2.812	2.846	2.846	3.428	2.112	3.917	3.917	3.917	5.876	9000
9500	0.903	1.449	1.459	1.459	1.362	1.082	1.957	2.125	2.125	1.756	1.125	1.839	1.839	1.839	2.258	1.317	2.592	2.703	2.703	2.975	1.846	3.720	3.720	3.720	5.100	9500
10000	0.793	1.277	1.298	1.298	1.162	0.953	1.727	1.892	1.892	1.499	0.988	1.637	1.637	1.637	1.927	1.159	2.284	2.406	2.406	2.539	1.622	3.311	3.311	3.311	4.351	10000
10500	0.701	1.132	1.163	1.163	0.999	0.844	1.533	1.695	1.695	1.289	0.872	1.467	1.467	1.467	1.657	1.026	2.024	2.155	2.155	2.183	1.436	2.942	2.966	2.967	3.742	10500
11000	0.622	1.010	1.048	1.048	0.866	0.752	1.369	1.527	1.527	1.117	0.774	1.321	1.321	1.321	1.435	0.913	1.804	1.942	1.942	1.891	1.278	2.621	2.673	2.673	3.242	11000
11500	0.555	0.905	0.949	0.949	0.755	0.672	1.228	1.383	1.383	0.973	0.690	1.197	1.197	1.197	1.251	0.816	1.616	1.759	1.759	1.649	1.144	2.348	2.421	2.421	2.826	11500
12000	0.497	0.814	0.864	0.864	0.662	0.604	1.107	1.253	1.259	0.854	0.618	1.081	1.089	1.089	1.098	0.733	1.454	1.601	1.601	1.446	1.028	2.114	2.203	2.203	2.479	12000
12500	0.452	0.780	0.877	0.877	0.606	0.547	1.067	1.232	1.277	0.781	0.562	1.031	1.106	1.106	1.004	0.663	1.382	1.625	1.625	1.323	0.932	2.035	2.236	2.236	2.268	12500
13000	0.408	0.703	0.801	0.801	0.536	0.496	0.962	1.115	1.166	0.692	0.507	0.928	1.009	1.009	0.889	0.600	1.243	1.483	1.483	1.172	0.845	1.838	2.042	2.042	2.008	13000
13500		0.636	0.734	0.734	0.477	0.450	0.870	1.013	1.069	0.615	0.459	0.838	0.925	0.925	0.791	0.544	1.122	1.352	1.360	1.042	0.770	1.666	1.871	1.871	1.786	13500
14000		0.578	0.671	0.675	0.426	0.410	0.790	0.924	0.983	0.550	0.417	0.760	0.851	0.851	0.707	0.496	1.016	1.231	1.251	0.931	0.703	1.516	1.722	1.722	1.596	14000
14500		0.526	0.613	0.623			0.719	0.845	0.908	0.493		0.690	0.786	0.786	0.634	0.452	0.922	1.125	1.155	0.835	0.644	1.384	1.589	1.589	1.432	14500
15000		0.479	0.561	0.577			0.656	0.775	0.836	0.444		0.629	0.728	0.728	0.571	0.414	0.839	1.030	1.069	0.752	0.591	1.267	1.472	1.472	1.289	15000

TABLE 6A: Z SECTION
3 SPAN LAPPED
OUTWARD LOAD (kN/m)



Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

Span	Z150 12				Z150 15				Z150 19				Z150 24				Z200 15				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	13.760	13.760	13.755	13.759	21.445	21.255	21.227	21.229	30.221	29.955	29.915	29.918	42.606	42.232	42.175	42.177	19.748	19.748	19.742	19.747	2000
2500																					2500
3000	9.679	9.677	9.680	9.600	13.512	13.492	13.476	13.483	19.043	19.014	18.993	19.001	26.848	26.806	26.777	26.788	14.005	14.003	14.006	14.006	3000
3500	7.078	7.082	7.075	7.077	9.290	9.296	9.286	9.290	12.913	13.100	13.087	13.093	17.727	18.469	18.452	18.458	10.597	10.597	10.597	10.596	3500
4000	5.163	5.167	5.163	5.165	6.587	6.783	6.777	6.779	8.890	9.559	9.551	9.554	12.126	13.476	13.465	13.470	8.313	8.314	8.311	8.313	4000
4500	3.686	3.934	3.931	3.932	4.631	5.163	5.159	5.161	6.315	7.276	7.271	7.273	8.568	10.258	10.251	10.253	6.679	6.679	6.679	6.679	4500
5000	2.572	3.093	3.091	3.091	3.301	4.060	4.057	4.058	4.571	5.668	5.718	5.719	6.188	7.803	8.061	8.062	5.433	5.458	5.455	5.456	5000
5500	1.785	2.495	2.494	2.494	2.376	3.271	3.273	3.274	3.260	4.411	4.613	4.613	4.410	6.050	6.503	6.504	4.148	4.403	4.401	4.401	5500
6000	1.267	2.022	2.054	2.054	1.725	2.570	2.695	2.696	2.328	3.486	3.799	3.799	3.136	4.767	5.330	5.356	3.110	3.626	3.624	3.625	6000
6500	0.927	1.618	1.720	1.721	1.268	2.039	2.258	2.258	1.696	2.788	3.158	3.183	2.272	3.803	4.350	4.487	2.301	3.037	3.036	3.036	6500
7000	0.706	1.273	1.462	1.462	0.950	1.627	1.919	1.919	1.256	2.247	2.614	2.705	1.696	3.064	3.592	3.814	1.724	2.581	2.580	2.581	7000
7500	0.547	0.999	1.258	1.258	0.723	1.301	1.615	1.651	0.954	1.817	2.185	2.327	1.298	2.476	2.995	3.237	1.322	2.184	2.220	2.220	7500
8000	0.425	0.780	1.058	1.083	0.557	1.043	1.344	1.421	0.740	1.445	1.827	1.983	1.016	1.977	2.499	2.731	1.037	1.815	1.911	1.911	8000
8500		0.616	0.888	0.936	0.438	0.837	1.122	1.229	0.586	1.149	1.532	1.683	0.811	1.580	2.094	2.314	0.828	1.504	1.652	1.652	8500
9000		0.493	0.742	0.817		0.678	0.942	1.067	0.471	0.923	1.295	1.440	0.657	1.265	1.769	1.977	0.670	1.233	1.442	1.442	9000
9500		0.400	0.619	0.719		0.553	0.795	0.917		0.751	1.101	1.242	0.541	1.020	1.504	1.702	0.546	1.011	1.270	1.270	9500
10000			0.531	0.657		0.462	0.696	0.832		0.619	0.973	1.133	0.458	0.846	1.330	1.550	0.455	0.850	1.178	1.205	10000
10500			0.441	0.570			0.590	0.720		0.510	0.819	0.985		0.699	1.124	1.346		0.704	1.025	1.075	10500
11000				0.491			0.500	0.624		0.424	0.691	0.859		0.584	0.951	1.173		0.589	0.894	0.963	11000
11500				0.423				0.543			0.584	0.752		0.493	0.805	1.027		0.498	0.772	0.867	11500
12000								0.473			0.497	0.660		0.419	0.682	0.902		0.425	0.666	0.783	12000
12500								0.413			0.426	0.578			0.581	0.790			0.574	0.699	12500
13000											0.519				0.506	0.712			0.507	0.659	13000
13500											0.452				0.437	0.622			0.439	0.592	13500
14000																0.542				0.525	14000
14500																0.473				0.466	14500
15000																0.414				0.413	15000

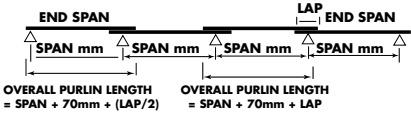
Span	Z200 19				Z200 24				Z250 19				Z250 24				Z300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	40.296	40.296	40.284	40.297	64.153	63.589	63.503	63.510	31.749	31.750	31.738	31.748	64.244	64.248	64.230	64.244	53.894	53.896	53.880	53.892	2000
2500	27.747	27.703	27.673	27.684	40.424	40.362	40.316	40.332	22.618	22.613	22.618	22.614	45.336	45.328	45.339	45.342	38.497	38.492	38.500	38.497	2500
3000	19.076	19.088	19.068	19.076	27.792	27.809	27.782	27.791	17.279	17.278	17.279	17.277	33.954	33.953	33.955	33.953	29.587	29.586	29.588	29.584	3000
3500	13.915	13.928	13.917	13.921	20.272	20.292	20.274	20.280	13.728	13.727	13.722	13.728	25.786	25.810	25.788	25.796	23.696	23.696	23.688	23.696	3500
4000	10.596	10.602	10.594	10.597	14.779	15.446	15.434	15.438	11.185	11.183	11.183	11.184	19.636	19.647	19.633	19.638	19.487	19.486	19.486	19.487	4000
4500	7.906	8.336	8.331	8.332	11.003	12.145	12.136	12.139	9.277	9.277	9.277	9.277	14.714	15.448	15.438	15.441	16.326	16.325	16.325	16.325	4500
5000	5.903	6.724	6.721	6.722	8.327	9.797	9.792	9.793	7.798	7.802	7.802	7.800	11.050	12.461	12.455	12.457	13.858	13.866	13.866	13.863	5000
5500	4.438	5.538	5.535	5.536	6.260	8.038	8.064	8.065	5.893	6.633	6.636	6.636	8.209	10.262	10.257	10.259	11.907	11.900	11.907	11.907	5500
6000	3.354	4.639	4.637	4.638	4.700	6.534	6.756	6.756	4.400	5.699	5.695	5.699	6.087	8.596	8.593	8.594	10.315	10.318	10.309	10.318	6000
6500	2.554	3.866	3.941	3.941	3.546	5.369	5.741	5.742	3.328	4.938	4.937	4.937	4.549	7.194	7.303	7.303	8.800	9.013	9.011	9.012	6500
7000	1.958	3.178	3.390	3.390	2.673	4.449	4.939	4.939	2.529	4.257	4.275	4.275	3.416	5.936	6.282	6.283	6.998	7.924	7.927	7.927	7000
7500	1.518	2.609	2.918	2.918	2.059	3.686	4.226	4.251	1.954	3.495	3.680	3.680	2.622	4.895	5.408	5.408	5.584	7.017	7.016	7.017	7500
8000	1.201	2.146	2.523	2.523	1.617	3.058	3.583	3.675	1.541	2.861	3.181	3.181	2.050	4.030	4.647	4.675	4.484	6.247	6.243	6.247	8000
8500	0.965	1.774	2.203	2.203	1.291	2.527	3.064	3.209	1.233	2.355	2.778	2.778	1.629	3.309	4.082	4.082	3.619	5.589	5.589	5.590	8500
9000	0.778	1.475	1.898	1.940	1.045	2.096	2.639	2.827	0.990	1.944	2.446	2.446	1.314	2.724	3.535	3.595	2.942	4.809	4.948	4.948	9000
9500	0.646	1.264	1.714	1.840	0.872	1.788	2.405	2.638	0.820	1.651	2.300	2.320	1.092	2.298	3.207	3.409	2.444	4.321	4.692	4.692	9500
10000	0.533	1.056	1.478	1.641	0.723	1.487	2.088	2.315	0.674	1.375	1.981	2.070	0.902	1.902	2.774	3.042	2.004	3.705	4.186	4.186	10000
10500	0.444	0.886	1.277	1.470	0.606	1.232	1.818	2.038	0.560	1.145	1.706	1.854	0.752	1.571	2.406	2.725	1.660	3.181	3.750	3.750	10500
11000		0.743	1.106	1.297	0.513	1.030	1.580	1.803	0.470	0.959	1.472	1.670	0.634	1.311	2.078	2.416	1.389	2.736	3.378	3.378	11000
11500		0.630	0.962	1.147	0.438	0.868	1.373	1.602		0.810	1.276	1.512	0.539	1.103	1.796	2.141	1.172	2.366	3.059	3.059	11500
12000		0.538	0.839	1.018		0.738	1.195	1.428		0.691	1.107	1.365	0.462	0.935	1.555	1.904	0.997	2.052	2.73	2.783	12000
12500		0.477	0.753	0.948		0.646	1.070	1.342		0.611	0.985	1.268	0.408	0.816	1.379	1.781	0.877	1.851	2.555	2.721	12500
13000		0.410	0.658	0.845		0.556	0.931	1.206		0.524	0.858	1.128		0.702	1.196	1.592	0.755	1.605	2.288	2.513	13000
13500			0.578	0.754		0.482	0.812	1.077		0.452	0.752	1.004		0.607	1.037	1.416	0.655	1.399	2.050	2.327	13500
14000			0.506	0.675		0.420	0.705	0.962			0.654	0.894		0.527	0.900	1.259	0.571	1.221	1.837	2.162	14000
14500			0.443	0.603		0.367	0.616	0.859			0.572	0.796		0.461	0.784	1.118	0.500	1.063	1.645	1.970	14500
15000				0.538		0.540	0.765				0.503	0.707		0.405	0.687	0.992	0.441	0.931	1.470	1.789	15000

Span	Z300 30	
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TABLE 6B:
Z SECTION
3 SPAN LAPPED
INWARD LOAD
(kN/m)

		Z100 10					Z100 12					Z100 15					Z100 19					Span				
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150					
TABLE 6B: Z SECTION 3 SPAN LAPPED INWARD LOAD (kN/m)		7.513	7.518	7.510	7.513	8.894	8.912	9.276	9.267	9.27	10.808	10.790	11.878	11.867	11.871	13.684	14.054	16.502	16.486	16.492	17.534	2000				
		4.760	4.764	4.760	4.762	4.502	5.464	5.878	5.874	5.875	5.470	6.621	7.528	7.522	7.524	6.927	8.507	10.458	10.45	10.452	8.875	2500				
		3.194	3.283	3.281	3.282	2.581	3.663	4.051	4.048	4.049	3.136	4.449	5.187	5.184	5.185	3.971	5.663	7.207	7.203	7.204	5.088	3000				
		2.266	2.398	2.396	2.397	1.613	2.604	2.959	2.957	2.957	1.960	3.176	3.788	3.787	3.787	2.481	4.017	5.263	5.261	5.262	3.179	3500				
		1.670	1.827	1.826	1.826	1.073	1.927	2.254	2.253	2.254	1.304	2.365	2.887	2.886	2.886	1.652	2.980	3.978	4.009	4.009	2.116	4000				
		1.262	1.438	1.437	1.438	0.750	1.467	1.774	1.774	1.774	0.911	1.816	2.272	2.271	2.271	1.154	2.284	3.091	3.156	3.156	1.478	4500				
		0.964	1.149	1.149	1.149	0.544	1.130	1.418	1.418	1.418	0.661	1.416	1.816	1.816	1.816	0.837	1.784	2.445	2.523	2.523	1.073	5000				
		0.742	0.927	0.927	0.927	0.407	0.880	1.144	1.144	1.144	0.495	1.118	1.456	1.465	1.465	0.627	1.415	1.957	2.036	2.036	0.803	5500				
		0.578	0.764	0.764	0.764		0.695	0.943	0.943	0.943		0.896	1.191	1.207	1.207	0.481	1.142	1.599	1.677	1.677	0.616	6000				
		0.465	0.690	0.690	0.690		0.573	0.851	0.851	0.851		0.742	1.053	1.090	1.090		0.955	1.411	1.514	1.514	0.491	6500				
BOLT		0.594	0.593	0.593		0.463	0.732	0.732	0.732		0.601	0.895	0.938	0.938		0.782	1.198	1.297	1.303		7000					
		0.5110	0.511	0.511			0.620	0.630	0.630		0.490	0.762	0.807	0.807		0.644	1.020	1.103	1.121		7500					
		0.442	0.442				0.527	0.545	0.545		0.403	0.651	0.691	0.698		0.536	0.872	0.943	0.969		8000					
							0.451	0.476	0.476			0.561	0.596	0.609		0.449	0.752	0.813	0.846		8500					
								0.419	0.419			0.487	0.519	0.537			0.653	0.707	0.739		9000					
												0.425	0.455	0.473			0.570	0.618	0.648		9500					
																	0.501	0.544	0.572		10000					
																	0.442	0.481	0.507		10500					
																			0.427	0.452		11000				
																				0.405		11500				
Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.																										
Grade 8.8 bolts required.																										
3/SB For Safebridge® system use data for 3 rows of bridging.																										
Span	Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	13.759	13.760	13.755	13.759	31.563	20.604	21.255	21.227	21.229	40.908	27.182	29.955	29.915	29.917	52.354	36.110	42.231	42.175	42.180	67.774	19.748	19.748	19.742	19.748	85.830	2000
2500	9.679	9.677	9.680	9.680	15.999	12.260	13.492	13.476	13.482	20.736	16.073	19.014	18.994	19.001	26.539	20.950	26.807	26.776	26.788	34.356	14.005	14.002	14.006	14.006	43.505	2500
3000	6.736	7.082	7.075	7.078	9.178	8.046	9.295	9.286	9.289	11.895	10.484	13.100	13.088	13.092	15.225	13.249	18.469	18.450	18.458	19.706	10.597	10.596	10.597	10.596	24.957	3000
3500	4.766	5.167	5.163	5.165	5.734	5.644	6.783	6.777	6.779	7.432	7.261	9.559	9.551	9.554	9.512	8.970	13.476	13.465	13.469	12.313	8.296	8.313	8.310	8.313	15.593	3500
4000	3.514	3.934	3.931	3.932	3.815	4.152	5.163	5.159	5.161	4.945	5.269	7.277	7.271	7.273	6.328	6.403	10.229	10.251	10.253	8.192	6.023	6.679	6.679	6.679	10.374	4000
4500	2.680	3.093	3.091	3.091	2.663	3.165	4.060	4.057	4.058	3.452	3.972	5.721	5.718	5.719	4.418	4.764	7.889	8.061	8.062	5.718	4.541	5.458	5.455	5.455	7.242	4500
5000	2.094	2.495	2.494	2.494	1.931	2.483	3.275	3.273	3.273	2.503	3.081	4.615	4.613	4.613	3.203	3.666	6.250	6.503	6.504	4.146	3.523	4.403	4.401	4.401	5.251	5000
5500	1.667	2.055	2.054	2.054	1.444	1.988	2.697	2.695	2.696	1.872	2.447	3.673	3.799	3.799	2.395	2.900	5.063	5.356	5.356	3.101	2.798	3.626	3.624	3.625	3.927	5500
6000	1.344	1.721	1.720	1.721	1.108	1.616	2.259	2.258	2.258	1.436	1.981	3.116	3.183	3.183	1.837	2.345	4.176	4.487	4.487	2.378	2.264	3.037	3.036	3.037	3.012	6000
6500	1.093	1.463	1.462	1.462	0.868	1.330	1.920	1.919	1.919	1.125	1.630	2.620	2.705	2.705	1.440	1.929	3.498	3.813	3.813	1.864	1.863	2.581	2.58	2.581	2.360	6500
7000	0.896	1.258	1.258	1.258	0.693	1.105	1.652	1.651	1.651	0.898	1.358	2.231	2.327	2.327	1.149	1.609	2.969	3.280	3.280	1.487	1.553	2.221	2.220	2.220	1.884	7000
7500	0.740	1.083	1.083	1.083	0.562	0.923	1.421	1.421	1.421	0.728	1.140	1.904	2.003	2.003	0.931	1.358	2.529	2.817	2.824	1.206	1.306	1.911	1.911	1.911	1.527	7500
8000	0.615	0.936	0.936	0.936	0.461	0.778	1.229	1.229	1.229	0.598	0.962	1.635	1.732	1.732	0.765	1.157	2.168	2.42	2.441	0.991	1.108	1.652	1.652	1.652	1.255	8000
8500	0.515	0.817	0.817	0.817		0.660	1.073	1.073	1.073	0.497	0.817	1.417	1.512	1.512	0.637	0.994	1.877	2.101	2.131	0.824	0.947	1.442	1.442	1.442	1.044	8500
9000	0.434	0.720	0.720	0.720		0.561	0.940	0.945	0.945	0.418	0.699	1.239	1.332	1.332	0.535	0.860	1.640	1.840	1.877	0.693	0.815	1.270	1.270	1.270	0.877	9000
9500		0.683	0.683	0.683		0.487	0.867	0.896	0.896		0.607	1.146	1.262	1.263	0.459	0.756	1.512	1.716	1.780	0.595	0.718	1.205	1.205	1.205	0.753	9500
10000		0.609	0.609	0.609		0.418	0.765	0.799	0.799		0.524	1.014	1.117	1.127		0.661	1.338	1.521	1.583	0.509	0.626	1.075	1.075	1.075	0.644	10000
10500		0.541	0.546	0.545			0.677	0.716	0.716		0.455	0.900	0.992	1.009		0.581	1.188	1.352	1.412	0.439	0.548	0.963	0.963	0.963	0.555	10500
11000		0.481	0.491	0.491			0.602	0.645	0.645			0.803	0.885	0.909		0.513	1.061	1.208	1.267			0.867	0.867	0.867		11000
11500		0.430	0.445	0.445			0.537	0.584	0.584			0.72	0.794	0.823		0.455	0.953	1.084	1.143			0.785	0.785	0.785		11500
12000			0.405	0.405			0.481	0.531	0.531			0.647	0.714	0.749		0.404	0.858	0.976	1.034			0.715	0.715	0.715		12000
12500							0.447	0.501	0.520			0.607	0.677	0.717			0.808	0.924	0.987			0.688	0.699	0.699		12500
13000							0.403	0.455	0.480			0.551	0.616	0.655			0.735	0.841	0.901			0.628	0.645	0.645		13000

TABLE 7A:
Z SECTION
4 SPAN LAPPED
OUTWARD LOAD (kN/m)



Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

Span	Z150 12				Z150 15				Z150 19				Z150 24				Z200 15				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	13.224	13.225	13.220	13.222	13.737	13.737	13.737	13.737	20.276	20.290	20.272	20.266	28.585	28.604	28.578	28.570	19.025	19.026	19.019	19.025	2000
2500					9.873	9.889	9.878	9.873	13.769	13.936	13.922	13.914	18.905	19.647	19.627	19.615	13.392	13.389	13.389	13.388	2500
3000	9.176	9.174	9.177	9.174	14.387	14.396	14.384	14.379	20.276	20.290	20.272	20.266	28.585	28.604	28.578	28.570	13.392	13.389	13.389	13.388	3000
3500	6.745	6.745	6.745	6.745	7.027	7.198	7.189	7.183	9.475	10.144	10.132	10.124	12.923	14.301	14.284	14.273	7.824	7.825	7.801	7.823	3500
4000	5.133	5.134	5.120	5.134	4.943	5.469	5.461	5.455	6.731	7.707	7.697	7.688	9.130	10.865	10.851	10.839	6.246	6.241	6.240	6.246	4000
4500	3.936	4.007	4.006	4.010	3.530	4.293	4.286	4.282	4.876	6.010	6.040	6.034	6.600	8.277	8.515	8.507	5.081	5.081	5.081	5.081	4500
5000	2.760	3.199	3.199	3.199	2.523	3.380	3.380	3.380	3.472	4.588	4.764	4.764	4.691	6.298	6.716	6.716	4.198	4.199	4.199	4.199	5000
5500	1.914	2.575	2.575	2.575	1.821	2.613	2.688	2.688	2.478	3.536	3.788	3.788	3.356	4.842	5.340	5.340	3.248	3.516	3.517	3.517	5500
6000	1.349	2.048	2.048	2.048	1.281	2.613	2.688	2.688	1.821	2.613	2.688	2.688	1.821	2.613	2.688	2.688	1.281	2.613	2.688	2.688	6000
6500	0.982	1.613	1.668	1.668	1.348	2.044	2.189	2.189	1.813	2.781	3.085	3.085	2.435	3.801	4.276	4.350	2.420	2.943	2.943	2.943	6500
7000	0.734	1.282	1.385	1.385	1.006	1.621	1.818	1.818	1.349	2.222	2.522	2.562	1.816	3.033	3.473	3.611	1.814	2.444	2.444	2.444	7000
7500	0.568	1.015	1.168	1.168	0.768	1.299	1.534	1.534	1.024	1.796	2.082	2.161	1.389	2.451	2.862	3.047	1.385	2.062	2.062	2.062	7500
8000	0.449	0.806	0.999	0.999	0.599	1.048	1.285	1.311	0.794	1.465	1.739	1.848	1.086	2.002	2.386	2.575	1.078	1.743	1.763	1.763	8000
8500		0.641	0.848	0.864	0.470	0.852	1.079	1.134	0.627	1.186	1.466	1.587	0.866	1.626	2.008	2.188	0.858	1.463	1.525	1.525	8500
9000		0.513	0.721	0.755		0.695	0.912	0.991	0.504	0.962	1.246	1.363	0.702	1.326	1.704	1.876	0.694	1.237	1.332	1.332	9000
9500		0.416	0.612	0.665		0.571	0.776	0.873	0.411	0.784	1.065	1.179	0.577	1.083	1.457	1.620	0.569	1.031	1.174	1.174	9500
10000			0.536	0.627		0.486	0.690	0.799		0.662	0.958	1.084	0.490	0.903	1.310	1.486	0.485	0.886	1.114	1.114	10000
10500			0.451	0.547		0.401	0.587	0.694		0.544	0.823	0.944	0.412	0.746	1.127	1.293	0.400	0.734	0.98	0.992	10500
11000						0.503	0.605	0.605		0.452	0.702	0.827		0.623	0.964	1.131		0.613	0.859	0.889	11000
11500				0.418			0.431	0.530			0.599	0.727		0.525	0.826	0.995		0.517	0.756	0.801	11500
12000								0.465			0.512	0.642		0.446	0.709	0.878		0.439	0.665	0.726	12000
12500							0.409				0.439	0.568			0.609	0.777			0.579	0.660	12500
13000												0.532			0.533	0.729			0.526	0.650	13000
13500												0.466			0.460	0.640			0.455	0.582	13500
14000												0.408				0.400				0.523	14000
14500																				0.468	14500
15000																				0.417	15000

Span	Z200 19				Z200 24				Z250 19				Z250 24				Z300 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	38.526	38.525	38.525	38.525	63.545	63.547	63.547	63.544	30.628	30.626	30.620	30.629	61.800	61.802	61.789	61.790	52.034	52.035	52.022	52.031	2000
2500	26.689	26.686	26.692	26.691	43.039	43.069	43.031	43.017	21.734	21.730	21.735	21.733	43.121	43.113	43.128	43.125	37.106	37.099	37.109	37.110	2500
3000	19.460	19.460	19.460	19.459	29.536	29.583	29.553	29.535	16.515	16.516	16.516	16.514	31.947	31.946	31.947	31.947	28.420	28.419	28.421	28.419	3000
3500	14.687	14.690	14.652	14.690	21.506	21.533	21.508	21.490	13.045	13.048	13.005	13.045	24.516	24.520	24.448	24.521	22.664	22.670	22.591	22.669	3500
4000	11.222	11.229	11.214	11.203	15.706	16.359	16.338	16.320	10.573	10.563	10.560	10.573	19.301	19.286	19.285	19.301	18.562	18.541	18.539	18.561	4000
4500	8.411	8.815	8.800	8.792	11.689	12.843	12.821	12.810	8.727	8.727	8.727	8.727	15.504	15.504	15.503	15.503	15.483	15.483	15.483	15.482	4500
5000	6.200	6.940	6.941	6.940	8.713	10.112	10.112	10.112	7.305	7.309	7.308	7.307	11.582	12.670	12.662	12.658	13.093	13.099	13.099	13.097	5000
5500	4.602	5.519	5.519	5.519	6.503	8.041	8.041	8.041	6.128	6.191	6.194	6.194	8.563	10.227	10.227	10.227	11.209	11.202	11.209	11.207	5500
6000	3.477	4.495	4.495	4.495	4.891	6.449	6.549	6.549	4.593	5.305	5.301	5.305	6.378	8.330	8.330	8.330	9.681	9.683	9.675	9.683	6000
6500	2.653	3.732	3.732	3.732	3.716	5.222	5.438	5.438	3.469	4.585	4.585	4.585	4.792	6.917	6.917	6.916	8.435	8.436	8.434	8.434	6500
7000	2.051	3.085	3.149	3.149	2.859	4.286	4.588	4.588	2.669	3.971	3.971	3.971	3.657	5.741	5.836	5.836	7.013	7.401	7.403	7.403	7000
7500	1.605	2.543	2.693	2.693	2.202	3.557	3.923	3.923	2.069	3.396	3.396	3.395	2.805	4.747	4.990	4.990	5.634	6.540	6.540	6.540	7500
8000	1.264	2.112	2.329	2.329	1.728	2.977	3.384	3.394	1.624	2.831	2.937	2.937	2.192	3.957	4.316	4.316	4.465	5.814	5.811	5.813	8000
8500	1.014	1.764	2.035	2.035	1.378	2.510	2.903	2.964	1.299	2.354	2.566	2.566	1.741	3.319	3.771	3.771	3.728	5.189	5.189	5.189	8500
9000	0.827	1.479	1.793	1.793	1.116	2.111	2.509	2.612	1.056	1.965	2.261	2.261	1.404	2.768	3.322	3.322	3.071	4.573	4.572	4.572	9000
9500	0.693	1.294	1.654	1.701	0.934	1.840	2.303	2.479	0.881	1.704	2.145	2.145	1.170	2.390	3.082	3.153	2.598	4.214	4.339	4.339	9500
10000	0.572	1.086	1.432	1.515	0.774	1.544	2.005	2.188	0.724	1.421	1.910	1.910	0.966	1.989	2.676	2.807	2.143	3.635	3.863	3.863	10000
10500	0.477	0.916	1.245	1.357	0.649	1.298	1.753	1.932	0.601	1.193	1.671	1.711	0.806	1.663	2.333	2.515	1.775	3.148	3.462	3.462	10500
11000	0.401	0.779	1.087	1.223	0.549	1.098	1.540	1.714	0.504	1.011	1.453	1.542	0.678	1.398	2.042	2.267	1.484	2.734	3.120	3.120	11000
11500		0.663	0.951	1.101	0.468	0.925	1.357	1.527	0.426	0.854	1.267	1.397	0.576	1.175	1.79	2.048	1.252	2.379	2.826	2.826	11500
12000		0.565	0.833	0.981	0.403	0.786	1.191	1.366		0.726	1.107	1.272	0.494	0.996	1.563	1.828	1.065	2.073	2.572	2.572	12000
12500		0.503	0.772	0.943		0.691	1.100	1.326		0.645	1.016	1.266	0.439	0.874	1.427	1.766	0.941	1.915	2.533	2.606	12500
13000		0.435	0.674	0.840		0.595	0.961	1.187		0.557	0.883	1.125		0.750	1.239	1.577	0.811	1.672	2.261	2.380	13000
13500			0.591	0.750		0.515	0.840	1.065		0.484	0.771	1.001		0.649	1.079	1.411	0.702	1.467	2.023	2.182	13500
14000			0.520	0.670		0.449	0.737	0.958		0.420	0.677	0.893		0.564	0.945	1.261	0.612	1.281	1.814	2.008	14000
14500			0.460	0.600		0.648	0.858			0.597	0.798			0.493	0.826	1.126	0.536	1.125	1.629	1.854	14500
15000			0.406	0.539		0.569	0.770			0.524	0.714			0.433	0.723	1.006	0.472	0.994	1.465	1.717	15000

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TABLE 7B:
Z SECTION
4 SPAN LAPPED
INWARD LOAD
(kN/m)

	Z100 10					Z100 12					Z100 15					Z100 19					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
	7.985	7.997	7.989	7.984	9.951	9.341	9.868	9.858	9.851	12.092	11.326	12.637	12.624	12.616	15.311	14.707	17.555	17.537	17.527	19.617	2000
	4.972	5.05	5.044	5.039	4.999	5.701	6.232	6.224	6.218	6.075	6.919	7.980	7.970	7.963	7.692	8.857	11.087	11.073	11.062	9.855	2500
	3.324	3.472	3.466	3.463	2.849	3.810	4.284	4.276	4.273	3.462	4.634	5.485	5.476	5.472	4.383	5.873	7.621	7.608	7.602	5.616	3000
	2.297	2.429	2.429	2.430	1.772	2.636	2.998	2.998	2.998	2.153	3.212	3.839	3.839	3.839	2.726	4.064	5.333	5.333	5.333	3.493	3500
	1.655	1.770	1.770	1.770	1.175	1.904	2.184	2.184	2.184	1.428	2.327	2.797	2.797	2.797	1.808	2.964	3.881	3.886	3.886	2.317	4000
	1.240	1.348	1.348	1.348	0.819	1.431	1.663	1.663	1.663	0.995	1.756	2.130	2.130	2.130	1.259	2.225	2.930	2.959	2.959	1.614	4500
	0.955	1.061	1.061	1.061	0.593	1.107	1.309	1.309	1.309	0.720	1.366	1.676	1.676	1.676	0.912	1.733	2.286	2.328	2.328	1.168	5000
	0.751	0.856	0.856	0.856	0.443	0.875	1.057	1.057	1.057	0.538	1.088	1.353	1.353	1.353	0.681	1.382	1.831	1.880	1.880	0.873	5500
	0.600	0.706	0.706	0.706		0.703	0.871	0.871	0.871	0.412	0.882	1.110	1.116	1.116	0.522	1.123	1.496	1.550	1.550	0.669	6000
	0.506	0.653	0.653	0.653		0.601	0.806	0.806	0.806		0.768	1.003	1.032	1.032	0.419	0.973	1.346	1.434	1.434	0.537	6500
	0.410	0.551	0.551	0.551		0.492	0.680	0.680	0.680		0.633	0.839	0.871	0.871		0.809	1.125	1.208	1.210	0.428	7000
		0.471	0.471	0.471		0.407	0.581	0.582	0.582		0.526	0.711	0.745	0.745		0.678	0.953	1.022	1.035		7500
		0.408	0.408	0.408			0.496	0.503	0.503		0.441	0.609	0.640	0.644		0.572	0.815	0.874	0.895		8000
							0.426	0.439	0.439			0.526	0.554	0.563		0.486	0.704	0.755	0.785		8500
												0.457	0.482	0.496		0.416	0.613	0.657	0.685		9000
												0.401	0.423	0.439			0.536	0.575	0.601		9500
																	0.472	0.507	0.531		10000
																	0.418	0.449	0.471		10500
																			0.421		11000

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

Span	Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	13.224	13.224	13.220	13.223	35.672	21.653	21.737	21.737	21.737	46.232	28.592	32.072	32.051	32.050	59.169	37.939	45.216	45.186	45.183	76.592	19.025	19.025	19.020	19.026	97.001	2000
2500						12.806	14.397	14.384	14.380	23.328	16.801	20.290	20.272	20.265	29.857	21.831	28.605	28.579	28.570	38.650	13.391	13.389	13.393	13.392	48.947	2500
3000	6.744	9.174	9.177	9.175	18.000	8.356	9.889	9.878	9.873	13.309	10.870	13.936	13.922	13.914	17.034	13.639	19.648	19.628	19.615	22.048	10.050	10.050	10.051	10.049	27.922	3000
3500	4.929	5.134	5.120	5.133	6.382	5.834	7.198	7.189	7.183	8.272	7.453	10.144	10.132	10.124	10.587	9.163	14.301	14.284	14.273	13.705	7.872	7.825	7.802	7.825	17.355	3500
4000	3.623	4.007	4.006	4.010	4.227	4.276	5.468	5.461	5.455	5.479	5.383	7.707	7.697	7.689	7.012	6.503	10.811	10.851	10.879	9.077	6.124	6.240	6.240	6.246	11.495	4000
4500	2.756	3.199	3.199	3.199	2.940	3.258	4.293	4.286	4.282	3.810	4.042	6.050	6.040	6.034	4.876	4.823	8.318	8.515	8.507	6.312	4.630	5.081	5.081	5.081	7.994	4500
5000	2.134	2.575	2.575	2.575	2.125	2.528	3.380	3.380	3.380	2.754	3.121	4.764	4.764	4.764	3.524	3.709	6.454	6.716	6.716	4.562	3.567	4.199	4.199	4.199	5.778	5000
5500	1.683	2.048	2.048	2.048	1.585	1.998	2.688	2.688	2.688	2.054	2.467	3.765	3.788	3.788	2.628	2.934	5.078	5.340	5.340	3.403	2.812	3.516	3.517	3.517	4.309	5500
6000	1.353	1.668	1.668	1.668	1.213	1.613	2.189	2.189	2.189	1.572	1.991	3.044	3.085	3.085	2.011	2.372	4.095	4.349	4.349	2.604	2.266	2.943	2.943	2.943	3.298	6000
6500	1.105	1.385	1.385	1.385	0.948	1.324	1.818	1.818	1.818	1.229	1.635	2.510	2.562	2.562	1.573	1.952	3.369	3.612	3.612	2.036	1.859	2.444	2.444	2.444	2.579	6500
7000	0.914	1.168	1.168	1.168	0.756	1.101	1.534	1.534	1.534	0.979	1.361	2.103	2.161	2.161	1.253	1.630	2.817	3.047	3.047	1.622	1.548	2.062	2.062	2.062	2.055	7000
7500	0.763	0.999	0.999	0.999	0.612	0.926	1.311	1.311	1.311	0.793	1.147	1.786	1.848	1.848	1.014	1.377	2.388	2.606	2.606	1.313	1.304	1.763	1.763	1.763	1.663	7500
8000	0.642	0.864	0.864	0.864	0.502	0.786	1.134	1.134	1.134	0.650	0.975	1.533	1.599	1.599	0.832	1.176	2.047	2.254	2.254	1.078	1.110	1.525	1.525	1.525	1.365	8000
8500	0.544	0.755	0.755	0.755	0.417	0.672	0.991	0.991	0.991	0.540	0.837	1.330	1.397	1.397	0.692	1.013	1.773	1.969	1.969	0.895	0.952	1.332	1.332	1.332	1.134	8500
9000	0.464	0.665	0.665	0.665		0.579	0.873	0.873	0.873	0.454	0.723	1.162	1.231	1.231	0.581	0.879	1.549	1.723	1.735	0.752	0.824	1.174	1.174	1.174	0.952	9000
9500	0.406	0.631	0.631	0.631		0.514	0.814	0.829	0.829		0.636	1.077	1.168	1.168	0.501	0.775	1.430	1.605	1.646	0.648	0.728	1.114	1.114	1.114	0.821	9500
10000		0.562	0.562	0.562		0.448	0.718	0.738	0.738		0.555	0.951	1.036	1.040	0.428	0.681	1.262	1.417	1.466	0.554	0.638	0.992	0.992	0.992	0.702	10000
10500		0.504	0.504	0.504			0.636	0.661	0.661		0.486	0.845	0.920	0.932		0.602	1.121	1.259	1.313	0.477	0.561	0.889	0.889	0.889	0.604	10500
11000		0.453	0.454	0.454			0.567	0.596	0.596		0.428	0.754	0.822	0.840		0.534	1.001	1.124	1.184	0.414	0.496	0.801	0.801	0.801	0.524	11000
11500		0.406	0.411	0.411			0.507	0.540	0.540			0.676	0.737	0.761		0.476	0.898	1.008	1.064		0.440	0.726	0.726	0.726	0.457	11500
12000							0.455	0.491	0.491			0.609	0.664	0.692		0.426	0.809	0.908	0.960			0.660	0.660	0.660	0.402	12000
12500							0.434	0.479	0.498			0.586	0.647	0.685			0.778	0.882	0.942			0.662	0.669	0.669		12500
13000								0.432	0.454			0.529	0.584	0.619			0.703	0.796	0.851			0.601	0.611	0.611		13000
13500									0.417			0.479	0.529	0.562			0.638	0.722	0.772			0.547	0.560	0.560		13500
14000												0.435	0.481	0.512			0.579	0.656	0.703			0.499	0.516	0.516		14000
14500													0.439	0.468			0.526	0.598	0.642			0.457	0.476	0.476		14500
15000													0.401	0.429			0.480	0.547	0.588			0.419	0.441	0.441		15000

Span	Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					Span
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	38.525	38.525	38.527	38.527	130.394	62.413	63.545	63.545	63.545	168.189	30.628	30.627	30.620	30.621	216.202	61.803	61.801	61.789	61.800	284.886	52.032	52.037	52.020	52.031	488.302	2000
2500	26.096	26.686	26.661	26.691	65.800	35.673	43.071	43.032	43.019	84.873	21.734	21.730	21.735	21.736	109.095	43.121	43.124	43.125	43.121	143.756	37.106	37.099	37.109	37.109	246.400	2500
3000	16.407	19.461	19.460	19.460	37.537	21.834	29.583	29.552	29.535	48.415	16.516	16.516	16.516	16.516	62.235	27.712	31.948	31.947	31.947	82.011	28.420	28.420	28.420	28.420	140.561	3000
3500	11.099	14.690	14.652	14.689	23.331	14.332	21.533	21.507	21.490	30.094	13.046	13.048	13.004	13.049	38.684	17.919	24.522	24.448	24.519	50.975	22.664	22.670	22.592	22.670	87.372	3500
4000	7.909	11.229	11.214	11.202	15.453	9.796	16.359	16.338	16.321	19.931	10.070	10.563	10.559	10.573	25.620	12.317	19.286	19.281	19.302	33.761	18.562	18.541	18.538	18.563	57.867	4000
4500	5.890	8.815	8.800	8.792	10.746	7.241	12.843	12.820	12.810	13.861	7.476	8.727	8.727	8.725	17.818	8.915	15.504	15.504	15.505	23.480	14.083	15.482	15.482	15.482	40.241	4500
5000	4.523	6.941	6.941	6.940	7.767	5.482	10.112	10.112	10.111	10.019	5.728	7.309	7.308	7.308	12.878	6.734	12.671	12.664	12.656	16.969	10.427	13.099	13.099	13.098	29.086	5000
5500	3.561	5.520	5.519	5.519	5.793	4.287	8.041	8.041	8.041	7.471	4.497	6.191	6.195	6.194	9.604	5.254	10.228	10.227	10.228	12.655	7.953	11.202	11.209	11.208	21.693	5500
6000	2.871	4.495	4.495	4.495	4.433	3.437	6.484	6.549	6.549	5.718	3.612	5.305	5.302	5.304	7.350	4.207	8.330	8.330	8.330	9.685	6.294	9.683	9.676	9.684	16.601	6000
6500	2.359	3.732	3.733	3.732	3.467	2.813	5.329	5.438	5.438	4.472	2.957	4.585	4.584	4.585	5.748	3.437	6.917	6.917	6.917	7.574	5.009	8.435	8.434	8.435	12.983	6500
7000	1.969	3.149	3.149	3.149	2.762	2.34	4.452	4.588	4.588	3.562	2.460	3.971	3.971	3.971	4.579	2.856	5.836	5.836	5.836	6.034	4.107	7.401	7.403	7.403	10.343	7000
7500	1.664	2.693	2.693	2.693	2.236	1.974	3.772	3.923	3.923	2.883	2.072	3.396	3.396	3.396	3.706	2.406	4.990	4.990	4.990	4.884	3.424	6.540	6.540	6.540	8.371	7500
8000	1.418	2.329	2.329	2.329	1.835	1.684	3.233	3.394	3.393	2.366	1.765	2.937	2.937	2.937	3.042	2.050	4.309	4.316	4.317	4.008	2.895	5.814	5.811	5.814	6.870	8000
8500	1.220	2.035	2.035	2.035	1.524	1.450	2.800	2.964	2.965	1.966	1.518	2.566	2.566	2.566	2.527	1.765	3.726	3.731	3.731	3.330	2.477	5.189	5.189	5.189	5.707	8500
9000	1.057	1.793	1.793	1.793	1.280	1.260	2.446	2.612	2.612	1.651	1.315	2.261	2.261	2.261	2.122	1.532	3.251	3.322	3.322	2.796	2.142	4.573	4.572	4.572	4.792	9000
9500	0.933	1.688	1.701	1.701	1.104	1.100	2.266	2.479	2.479	1.423	1.160	2.145	2.145	2.145	1.830	1.347	2.999	3.332	3.353	2.411	1.875	4.336	4.339	4.339	4.133	9500
10000	0.820	1.490	1.515	1.515	0.943	0.978	2.002	2.207	2.207	1.216	1.019	1.910	1.910	1.910	1.564	1.186	2.646	2.807	2.807	2.060	1.648	3.815	3.863	3.863	3.532	10000
10500	0.725	1.324	1.357	1.357	0.812	0.867	1.780	1.977	1.977	1.048	0.900	1.711	1.711	1.711	1.347	1.050	2.349	2.515	2.515	1.774	1.459	3.379	3.462	3.462	3.041	10500
11000	0.643	1.183	1.223	1.223	0.704	0.772	1.591	1.782	1.782	0.909	0.799	1.542	1.542	1.542	1.168	0.935	2.097	2.267	2.267	1.539	1.299	3.011	3.120	3.120	2.638	11000
11500	0.574	1.063	1.108	1.108	0.615	0.691	1.430	1.614	1.614	0.793	0.712	1.397	1.397	1.397	1.019	0.836	1.882	2.053	2.053	1.343	1.163	2.698	2.826	2.826	2.303	11500
12000	0.514	0.958	1.008	1.009	0.540	0.621	1.291	1.463	1.469	0.696	0.638	1.269	1.272	1.272	0.895	0.750	1.696	1.869	1.869	1.180	1.047	2.429	2.572	2.572	2.022	12000
12500	0.472	0.923	1.022	1.022	0.489	0.566	1.251	1.443	1.489	0.630	0.585	1.222	1.288	1.288	0.810	0.682	1.622	1.893	1.893	1.068	0.951	2.340	2.606	2.606	1.830	12500
13000	0.426	0.835	0.933	0.933	0.433	0.513	1.132	1.309	1.359	0.559	0.527	1.104	1.177	1.177	0.718	0.617	1.464	1.729	1.729	0.947	0.863	2.115	2.380	2.380	1.623	13000
13500		0.758	0.856	0.856		0.465	1.027	1.191	1.246	0.498	0.475	1.000	1.079	1.079	0.640	0.560	1.326	1.585	1.585	0.843	0.786	1.920	2.182	2.182	1.445	13500
14000		0.690	0.787	0.787		0.424	0.935	1.087	1.147	0.445	0.430	0.909	0.993	0.993	0.572	0.510	1.205	1.450	1.459	0.754	0.718	1.748	2.008	2.008	1.293	14000
14500		0.630	0.724	0.727			0.853	0.995	1.059	0.400		0.829	0.917	0.917	0.514	0.465	1.098	1.326	1.347	0.677	0.658	1.598	1.854	1.854	1.161	14500
15000		0.576	0.664	0.673			0.781	0.914	0.975			0.757	0.849	0.849	0.463	0.425	1.003	1.216	1.248	0.611	0.605	1.465	1.717	1.717	1.046	15000

C & Z SECTION CANTILEVER 1000 OUTWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

TABLE 8A:
C SECTION
OUTWARDS

C100 10					C100 12					C100 15					C100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	2.205	2.529	2.529	2.529		2.631	3.069	3.068	3.069		3.425	3.995	3.995	3.996		4.608	5.514	5.566	5.567	3000
	0.471	0.846	0.983	0.983		0.598	1.011	1.192	1.193		0.811	1.321	1.520	1.553		1.110	1.784	2.092	2.163	4500
	0.163	0.300	0.474	0.529		0.298	0.381	0.563	0.640		0.275	0.524	0.729	0.802		0.389	0.725	0.987	1.099	6000

C150 12					C150 15					C150 19					C150 24					C200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	5.261	5.209	5.208	5.209		6.938	6.869	6.868	6.870		9.464	9.721	9.720	9.722		13.042	13.790	13.788	13.791		8.453	8.453	8.453	8.455	3000
4500	1.476	2.030	2.024	2.024		2.973	2.677	2.669	2.669		2.750	3.666	3.777	3.777		3.768	5.066	5.358	5.358		3.526	3.739	3.729	3.729	4500
6000	0.509	0.945	1.089	1.089		0.689	1.218	1.436	1.436		0.930	1.680	2.002	2.031		1.269	2.294	2.772	2.882		1.289	2.008	2.006	2.005	6000
																					0.455	0.869	1.100	1.101	8000

C200 19					C200 24					C250 19					C250 24					C300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	14.738	14.593	14.591	14.593		21.074	20.866	20.864	20.867		13.944	13.944	13.945	13.943		26.666	26.535	26.531	26.536		24.065	24.066	24.065	24.065	3000
4500	5.018	5.686	5.671	5.670		6.988	8.130	8.108	8.108		6.719	7.171	7.151	7.151		9.288	10.339	10.311	10.311		13.525	14.694	14.681	14.674	4500
6000	1.931	2.957	3.051	3.049		2.643	4.062	4.363	4.361		2.502	3.851	3.848	3.846		3.393	5.442	5.548	5.545		6.772	7.760	7.753	7.750	6000
8000	0.650	1.268	1.664	1.674		0.873	1.771	2.276	2.394		0.830	1.671	2.110	2.111		1.101	2.306	3.043	3.044		2.568	4.145	4.252	4.254	8000
10000																					1.073	2.152	2.690	2.691	10000
12000																					0.531	1.159	1.725	1.857	12000
15000																					0.230	0.487	0.872	1.100	15000

TABLE 9A:
Z SECTION
OUTWARDS

Z100 10					Z100 12					Z100 15					Z100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	2.205	2.529	2.529	2.529		2.673	3.120	3.120	3.121		3.425	3.995	3.995	3.996		4.561	5.468	5.551	5.552	3000
	0.471	0.846	0.983	0.983		0.611	1.028	1.213	1.212		0.811	1.321	1.520	1.553		1.088	1.765	2.074	2.157	4500
	0.163	0.300	0.474	0.529		0.205	0.390	0.572	0.648		0.275	0.524	0.729	0.802		0.382	0.710	0.977	1.090	6000

Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	5.414	5.360	5.360	5.360		7.106	7.036	7.035	7.036		9.568	9.916	9.914	9.916		13.100	13.979	13.977	13.979		8.438	8.438	8.438	8.438	3000
4500	1.495	2.089	2.083	2.083		1.997	2.742	2.734	2.734		2.755	3.708	3.853	3.853		3.750	5.090	5.432	5.432		3.491	3.686	3.676	3.676	4500
6000	0.519	0.958	1.121	1.120		0.698	1.230	1.471	1.470		0.923	1.704	2.024	2.072		1.259	2.325	2.784	2.921		1.281	1.980	1.978	1.977	6000
																					0.455	0.863	1.085	1.085	8000

Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	14.591	14.447	14.446	14.448		21.257	21.048	21.045	21.050		13.933	13.933	13.933	13.933		26.694	26.694	26.696	26.694		24.050	24.050	24.050	24.052	3000
4500	5.001	5.629	5.614	5.614		7.059	8.201	8.179	8.179		6.702	7.098	7.079	7.079		9.381	10.432	10.404	10.403		14.354	14.357	14.318	14.317	4500
6000	1.919	2.945	3.021	3.019		2.675	4.097	4.401	4.399		2.500	3.812	3.809	3.807		3.430	5.488	5.598	5.595		6.752	7.710	7.703	7.700	6000
8000	0.652	1.262	1.657	1.657		0.882	1.794	2.295	2.415		0.833	1.664	2.089	2.090		1.112	2.335	3.070	3.071		2.557	4.130	4.225	4.227	8000
10000																					1.077	2.144	2.673	2.674	10000
12000																					0.534	1.154	1.719	1.845	12000
15000																					0.230	0.489	0.867	1.096	15000

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	45.052	45.053	45.053	45.055		21.000	21.000	21.000	21.002		40.310	40.308	40.309	40.317		18.448	18.448	18.447	18.449		35.650	35.648	35.648	35.653	3000
4500	20.486	20.527	20.471	20.470		15.006	15.006	15.006	15.006		25.029	25.032	24.965	24.964		13.121	13.121	13.122	13.121		25.527	25.527	25.528	25.528	4500
6000	9.403	11.024	11.014	11.009		9.778	9.824	9.815	9.810		13.434	13.443	13.432	13.426		9.653	10.079	10.080	10.080		13.525	14.694	14.681	14.674	6000
8000	3.418	5.689	6.041	6.043		4.676	5.386	5.383	5.385		6.135	7.371	7.367	7.370		3.783	5.712	5.882	5.885		4.665	8.056	8.051	8.055	8000
10000	1.440	3.054	3.776	3.823		2.210	3.298	3.405	3.407		2.877	4.591	4.660	4.662		1.565	3.163	3.721	3.723		1.944	4.284	5.094	5.096	10000
12000	0.722	1.563	2.396	2.638		1.160	2.075	2.350	2.351		1.487	2.751	3.217	3.217		0.768	1.721	2.412	2.569		0.962	2.128	3.454	3.517	12000
15000	0.318	0.658	1.227	1.527		0.501	1.007	1.406	1.497		0.632	1.307	1.928	2.049		0.326	0.712	1.332	1.538		0.414	0.887	1.685	2.203	15000

C & Z SECTION CANTILEVER 1000 INWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

TABLE 8B:
C SECTION
INWARDS

TABLE 8B: C SECTION INWARDS		C100 10					C100 12					C100 15					C100 19					Span	
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150		
		2.554	2.529	2.529	2.529	0.889	3.099	3.069	3.068	3.069	1.074	3.806	3.996	3.995	3.996	1.368	4.999	5.556	5.565	5.567	1.762		3000
		0.985	0.985	0.983	0.983	0.889	1.196	1.196	1.193	1.192	0.184	1.458	1.557	1.553	1.553	0.234	1.900	2.169	2.163	2.163	0.302		4500
	0.529	0.529	0.529	0.528	0.056	0.642	0.642	0.642	0.641	0.068	0.776	0.836	0.835	0.835	0.087	1.006	1.155	1.164	1.163	0.112	6000		

C150 12					C150 15					C150 19					C150 24					C200 15				
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150
3000	5.261	5.209	5.208	3.087	6.938	6.869	6.868	6.870	4.011	9.069	9.721	9.719	9.721	5.135	11.944	13.790	13.788	13.790	6.650	8.453	8.453	8.453	8.454	8.439
4500	2.029	2.030	2.024	0.528	2.611	2.677	2.669	2.669	0.686	3.370	3.788	3.777	3.777	0.879	4.330	5.373	5.358	5.358	1.138	3.739	3.739	3.729	3.729	1.444
6000	1.089	1.090	1.089	0.196	1.373	1.437	1.436	1.436	0.255	1.761	2.034	2.032	2.031	0.422	2.226	2.805	2.883	2.882	0.422	1.989	2.008	2.006	2.005	0.536
																				1.068	1.101	1.100	1.101	0.212
																								8000

C200 19					C200 24					C250 19					C250 24					C300 24					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	14.493	14.593	14.591	14.594	11.324	19.323	20.866	20.863	20.867	14.549	13.944	13.944	13.944	13.943	18.789	25.664	26.536	26.531	26.536	24.643	24.065	24.066	24.063	24.064	42.435
4500	5.212	5.686	5.671	5.670	3.482	6.859	8.130	8.108	8.108	2.490	6.906	7.171	7.151	7.151	3.215	8.956	10.339	10.311	10.311	4.217	13.303	14.449	14.410	14.409	7.261
6000	2.657	3.054	3.051	3.050	0.719	3.412	4.366	4.363	4.360	0.924	3.488	3.851	3.847	3.846	1.193	4.370	5.553	5.548	5.545	1.565	6.333	7.760	7.753	7.749	2.694
8000	1.388	1.674	1.673	1.674	0.285	1.735	2.314	2.393	2.394	0.366	1.810	2.111	2.110	2.111	0.473	2.187	3.044	3.043	3.044	0.620	3.085	4.254	4.252	4.254	1.068
10000																					1.792	2.691	2.690	2.691	0.532
12000																					1.159	1.785	1.857	1.857	0.304
15000																					0.688	1.076	1.182	1.183	0.154
																								15000	

C300 30					C350 24					C350 30					C400 24					C400 30					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	45.090	45.092	45.089	45.091	54.837	21.000	21.000	21.001	20.996	68.916	40.310	40.310	40.310	40.309	88.594	18.448	18.449	18.447	18.448	83.012	35.648	35.649	35.648	35.644	106.374
4500	17.982	20.619	20.564	20.563	9.384	15.006	15.006	15.006	15.006	11.793	24.537	25.033	24.965	24.963	15.160	13.121	13.121	13.121	13.121	14.205	25.210	25.528	25.528	25.528	18.203
6000	8.258	11.074	11.064	11.059	3.482	8.840	9.824	9.815	9.810	4.376	11.419	13.444	13.431	13.426	5.625	9.054	10.080	10.079	10.079	5.270	11.163	14.694	14.681	14.674	6.754
8000	3.676	5.989	6.068	6.071	1.380	4.313	5.386	5.383	5.385	1.734	5.113	7.371	7.366	7.370	2.229	4.454	5.885	5.882	5.885	2.088	4.878	8.056	8.051	8.055	2.676
10000	2.036	3.592	3.839	3.841	0.688	2.371	3.407	3.405	3.407	0.864	2.820	4.663	4.661	4.662	1.111	2.486	3.648	3.721	3.723	1.041	2.687	5.096	5.094	5.096	1.334
12000	1.287	2.365	2.637	2.650	0.392	1.487	2.281	2.350	2.351	0.493	1.743	3.092	3.217	3.218	0.634	1.577	2.428	2.568	2.569	0.594	1.692	3.328	3.516	3.517	0.761
15000	0.751	1.399	1.598	1.688	0.199	0.860	1.385	1.497	1.497	0.250	0.995	1.797	2.048	2.049	0.321	0.923	1.478	1.621	1.636	0.301	0.984	1.933	2.239	2.239	0.385
																								15000	

TABLE 9B: Z SECTION INWARDS		Z100 10					Z100 12					Z100 15					Z100 19					Span	
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150		
		2.554	2.529	2.529	2.529	0.889	3.151	3.120	3.120	3.121	1.080	3.806	3.996	3.995	3.996	1.368	4.972	5.552	5.551	5.552	1.753		3000
		0.985	0.985	0.983	0.983	0.152	1.216	1.216	1.213	1.213	0.185	1.458	1.557	1.553	1.553	0.234	1.891	2.163	2.157	2.157	0.300		4500
	0.529	0.529	0.529	0.528	0.056	0.649	0.653	0.652	0.652	0.069	0.776	0.836	0.835	0.835	0.087	1.002	1.149	1.161	1.160	0.111	6000		

Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	5.413	5.360	5.360	3.561	3.097	7.036	7.036	7.035	7.036	4.013	9.195	9.916	9.914	9.916	5.136	12.079	13.979	13.978	13.980	6.649	8.438	8.438	8.438	8.439	8.420
4500	2.088	2.089	2.083	2.083	0.530	2.642	2.742	2.734	2.734	0.687	3.420	3.864	3.853	3.853	0.879	4.396	5.441	5.432	5.432	1.138	3.685	3.686	3.676	3.676	1.441
6000	1.121	1.122	1.121	1.120	0.197	1.390	1.472	1.471	1.470	0.255	1.789	2.075	2.073	2.072	0.326	2.267	2.817	2.923	2.921	0.422	1.967	1.980	1.978	1.977	0.535
																					1.056	1.085	1.085	1.085	0.212
																								8000	

Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	14.426	14.447	14.446	14.448	11.319	19.479	21.049	21.046	21.049	14.600	13.934	13.934	13.932	13.935	18.767	25.864	26.694	26.693	26.692	24.732	24.051	24.050	24.049	24.050	42.388
4500	5.188	5.629	5.614	5.614	1.937	6.918	8.202	8.179	8.179	2.498	6.878	7.098	7.079	7.079	3.212	9.011	10.432	10.404	10.403	4.232	13.247	14.357	14.318	14.318	7.254
6000	2.644	3.023	3.021	3.019	0.719	3.434	4.405	4.401	4.399	0.927	3.473	3.812	3.809	3.807	1.192	4.399	5.603	5.597	5.595	1.570	6.305	7.710	7.703	7.700	2.691
8000	1.381	1.658	1.657	1.657	0.285	1.747	2.329	2.413	2.415	0.367	1.800	2.090	2.089	2.090	0.472	2.203	3.071	3.070	3.071	0.622	3.063	4.227	4.225	4.227	1.066
10000																					1.783	2.674	2.673	2.674	0.532
12000																					1.151	1.777	1.845	1.845	0.303
15000																					0.687	1.072	1.175	1.175	0.154
																								15000	

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	45.054	45.056	45.054	45.055	54.801	21.000	21.000	21.001	20.996	68.916	40.310	40.310	40.310	40.309	88.594	18.448	18.449	18.447	18.448	83.012	35.648	35.649	35.648	35.644	106.374
4500	17.903	20.527	20.471	20.470	9.377	15.006	15.006	15.006	15.006	11.793	24.537	25.033	24.965	24.963	15.160	13.121	13.121	13.121	13.121	14.205	25.210	25.528	25.528	25.528	18.203
6000	8.267	11.024	11.014	11.009	3.479	8.840	9.824	9.815	9.810	4.376	11.419	13.444	13.431	13.426	5.625	9.054	10.080	10.079	10.079	5.270	11.163	14.694	14.681	14.674	6.754
8000	3.678	5.955	6.041	6.043	1.379	4.313	5.386	5.383	5.385	1.734	5.113	7.371	7.366	7.370	2.229	4.454	5.885	5.882	5.885	2.088	4.878	8.056	8.051	8.055	2.676
10000	2.037	3.569	3.821	3.823	0.687	2.371	3.407	3.405	3.407	0.864	2.820	4.663	4.661	4.662	1.111	2.486	3.648	3.721	3.723	1.041	2.687	5.096	5.094	5.096	1.334
12000	1.287	2.348	2.623	2.638	0.392	1.487	2.281	2.350	2.351	0.493	1.743	3.092	3.217	3.218	0.634	1.577	2.428	2.568	2.569	0.594	1.692	3.328	3.516	3.517	0.761
15000	0.751	1.392	1.588	1.680	0.199	0.860	1.																		

TABLE 9B:
Z SECTION
INWARDS

TABLE 9B: Z SECTION INWARDS																										
Z100 10					Z100 12					Z100 15					Z100 19					Span						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150						
	2.554	2.529	2.529	2.529	0.889	3.151	3.120	3.120	3.121	1.080	3.806	3.996	3.995	3.996	1.368	4.972	5.552	5.551	5.552	1.753	3000					
	0.985	0.985	0.983	0.983	0.152	1.216	1.216	1.213	1.213	0.185	1.458	1.557	1.553	1.553	0.234	1.891	2.163	2.157	2.157	0.300	4500					
	0.529	0.529	0.529	0.528	0.056	0.649	0.653	0.652	0.652	0.069	0.776	0.836	0.835	0.835	0.087	1.002	1.149	1.161	1.160	0.111	6000					
Z150 12					Z150 15					Z150 19					Z150 24					Z200 15						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150						
3000	5.413	5.360	5.360	5.361	3.097	7.036	7.036	7.035	7.036	4.013	9.195	9.916	9.914	9.916	5.136	12.079	13.979	13.978	13.980	6.649	8.438	8.438	8.438	8.439	8.420	3000
4500	2.088	2.089	2.083	2.083	0.530	2.642	2.742	2.734	2.734	0.687	3.420	3.864	3.853	3.853	0.879	4.396	5.441	5.432	5.432	1.138	3.685	3.686	3.676	3.676	1.441	4500
6000	1.121	1.122	1.121	1.120	0.197	1.390	1.472	1.471	1.470	0.255	1.789	2.075	2.073	2.072	0.326	2.267	2.817	2.923	2.921	0.422	1.967	1.980	1.978	1.977	0.535	6000
																					1.056	1.085	1.085	1.085	0.212	8000
Z200 19					Z200 24					Z250 19					Z250 24					Z300 24						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	14.426	14.447	14.446	14.448	11.319	19.479	21.049	21.046	21.049	14.600	13.934	13.934	13.932	13.935	18.767	25.864	26.694	26.693	26.692	24.732	24.051	24.050	24.049	24.050	42.388	3000
4500	5.188	5.629	5.614	5.614	1.937	6.918	8.202	8.179	8.179	2.498	6.878	7.098	7.079	7.079	3.212	9.011	10.432	10.404	10.403	4.232	13.247	14.357	14.318	14.318	7.254	4500
6000	2.644	3.023	3.021	3.019	0.719	3.434	4.405	4.401	4.399	0.927	3.473	3.812	3.809	3.807	1.192	4.399	5.603	5.597	5.595	1.570	6.305	7.710	7.703	7.708	2.691	6000
8000	1.381	1.658	1.657	1.657	0.285	1.747	2.329	2.413	2.415	0.367	1.800	2.090	2.089	2.090	0.472	2.203	3.071	3.070	3.071	0.622	3.063	4.227	4.225	4.227	1.066	8000
10000																					1.783	2.674	2.673	2.674	0.532	10000
12000																					1.151	1.777	1.845	1.845	0.303	12000
15000																					0.687	1.072	1.175	1.175	0.154	15000
Z300 30					Z350 24					Z350 30					Z400 24					Z400 30						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	45.054	45.056	45.054	45.055	54.801	21.000	21.000	21.002	20.996	68.916	40.310	40.310	40.310	40.309	88.594	18.448	18.449	18.447	18.448	83.012	35.648	35.649	35.648	35.644	106.374	3000
4500	17.903	20.527	20.471	20.470	9.377	15.006	15.006	15.006	15.006	11.793	24.537	25.033	24.965	24.963	15.160	13.121	13.121	13.121	13.121	14.205	25.210	25.528	25.528	25.528	18.203	4500
6000	8.267	11.024	11.014	11.009	3.479	8.840	9.824	9.815	9.810	4.376	11.419	13.444	13.431	13.426	5.625	9.054	10.080	10.079	10.079	5.270	11.163	14.694	14.681	14.674	6.754	6000
8000	3.678	5.955	6.041	6.043	1.379	4.313	5.386	5.383	5.385	1.734	5.113	7.371	7.366	7.370	2.229	4.454	5.885	5.882	5.885	2.088	4.878	8.056	8.051	8.055	2.676	8000
10000	2.037	3.569	3.821	3.823	0.687	2.371	3.407	3.405	3.407	0.864	2.820	4.663	4.661	4.662	1.111	2.486	3.648	3.721	3.723	1.041	2.687	5.096	5.094	5.096	1.334	10000
12000	1.287	2.348	2.623	2.638	0.392	1.487	2.281	2.350	2.351	0.493	1.743	3.092	3.217	3.218	0.634	1.577	2.428	2.568	2.569	0.594	1.692	3.328	3.516	3.517	0.761	12000
15000	0.751	1.392	1.588	1.680	0.199	0.860	1.385	1.497	1.497	0.250	0.995	1.797	2.048	2.049	0.321	0.923	1.478	1.621	1.636	0.301	0.984	1.933	2.239	2.239	0.385	15000

C & Z SECTION CANTILEVER 2000 OUTWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

TABLE 10A:
C SECTION
OUTWARDS

C100 10					C100 12					C100 15					C100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	1.124	1.124	1.124	1.124		1.364	3.364	1.364	1.364		1.776	1.776	1.776	1.776		2.474	2.473	2.473	2.473	3000
	0.711	1.092	1.124	1.124		0.894	1.285	1.364	1.364		1.243	1.632	1.776	1.776		1.690	2.473	2.474	2.473	4500
	0.206	0.371	0.575	0.632		0.255	0.469	0.682	0.767		0.347	0.648	0.879	0.964		0.489	0.896	1.192	1.323	6000

C150 12					C150 15					C150 19					C150 24					C200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	2.315	2.315	2.315	2.315		3.053	3.053	3.053	3.053		4.320	4.320	4.320	4.320		6.128	6.128	6.128	6.128		4.173	4.173	4.173	4.173	3000
4500	2.112	2.288	2.288	2.289		2.686	3.053	3.052	3.053		3.672	4.320	4.320	4.320		4.997	6.103	6.128	6.128		3.830	3.830	3.830	3.830	4500
6000	0.636	1.154	1.302	1.302		0.619	1.481	1.717	1.717		1.167	2.036	2.406	2.430		2.311	2.782	3.335	3.448		1.608	2.399	2.399	2.399	6000
																					0.513	0.968	1.213	1.213	8000

C200 19					C200 24					C250 19					C250 24					C300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	6.485	6.484	6.485	6.485		9.272	9.272	9.272	9.273		7.480	7.480	7.480	7.480		11.791	11.791	11.791	11.791		13.775	13.775	13.773	13.778	3000
4500	6.367	6.485	6.485	6.485		8.703	9.272	9.272	9.272		6.738	6.738	6.738	6.737		11.330	11.331	11.331	11.330		12.205	12.206	12.204	12.206	4500
6000	2.391	3.568	3.648	3.648		3.270	4.893	5.216	5.217		3.115	4.601	4.600	4.601		8.270	9.270	9.269	9.271		8.270	9.270	9.269	9.271	6000
8000	0.731	1.409	1.840	1.845		0.979	1.969	2.517	2.639		0.933	1.858	2.326	2.327		1.235	2.565	3.354	3.355		1.148	2.293	2.862	2.861	8000
10000																					0.557	1.208	1.801	1.937	10000
12000																					0.236	0.499	0.895	1.131	12000
15000																									15000

C300 30					C350 24					C350 30					C400 24					C400 30					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
2000	22.045	22.044	22.044	22.043		13.614	13.615	13.612	13.616		23.516	23.515	23.515	23.521		12.673	12.673	12.670	12.676		22.561	22.560	22.558	22.563	2000
4500	20.275	20.275	20.274	20.274		11.634	11.634	11.633	11.636		20.731	20.731	20.730	20.728		10.625	10.625	10.625	10.624		19.424	19.425	19.423	19.425	4500
6000	11.617	13.230	13.228	13.231		9.815	9.815	9.816	9.814		16.220	16.061	16.059	16.062		8.835	8.835	8.835	8.836		16.485	16.485	16.484	16.486	6000
8000	3.795	6.325	6.689	6.692		5.188	5.943	5.934	9.936		6.812	8.134	8.120	8.124		4.223	6.314	6.484	6.487		5.203	8.890	8.876	8.880	8000
10000	1.533	3.269	4.042	4.083		2.358	3.513	3.623	3.622		3.068	4.890	4.959	4.956		1.673	3.371	3.959	3.957		2.077	4.563	5.419	5.417	10000
12000	0.753	1.623	2.517	2.765		1.211	2.165	2.454	2.452		1.553	2.868	3.358	3.356		0.803	1.793	2.518	2.680		1.006	2.216	2.606	3.669	12000
15000	0.326	0.672	1.255	1.580		0.514	1.031	1.445	1.538		0.648	1.369	1.980	2.105		0.335	0.730	1.367	1.581		0.426	0.909	1.729	2.264	15000

TABLE 11A:
Z SECTION
OUTWARDS

Z100 10					Z100 12					Z100 15					Z100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	1.124	1.124	1.124	1.124		1.387	1.387	1.387	1.387		1.776	1.776	1.776	1.776		2.467	2.467	2.467	2.467	3000
	0.711	1.092	1.124	1.124		0.914	1.302	1.387	1.387		1.243	1.632	1.776	1.776		1.673	2.206	2.467	2.467	4500
	0.206	0.371	0.575	0.632		0.260	0.480	0.692	0.780		0.347	0.648	0.879	0.964		0.480	0.879	1.180	1.311	6000

Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	2.382	2.382	2.382	2.382		3.126	3.126	3.126	3.127		4.406	4.406	4.406	4.406		6.212	6.212	6.212	6.212		4.144	4.144	4.144	4.144	3000
4500	2.140	2.319	2.319	2.319		2.711	3.126	3.126	3.127		3.721	4.407	4.406	4.406		5.053	6.119	6.212	6.212		3.808	3.808	3.808	3.808	4500
6000	0.648	1.170	1.340	1.340		0.874	1.495	1.759	1.759		1.159	2.065	2.432	2.479		1.571	2.816	3.347	3.495		1.598	2.365	2.365	2.365	6000
																					0.512	0.962	1.196	1.196	8000

Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	6.420	6.420	6.420	6.420		9.353	9.354	9.353	9.354		7.455	7.455	7.454	7.455		11.897	11.897	11.897	11.897		13.733	13.733	13.731	13.731	3000
4500	6.343	6.420	6.420	6.420		8.775	9.353	9.353	9.353		6.719	6.719	6.718	6.719		11.365	11.366	11.365	11.366		19.424	19.425	19.423	19.425	4500
6000	2.376	3.554	3.612	3.612		3.322	4.934	5.261	5.262		3.100	4.554	4.554	4.555		4.269	6.615	6.692	6.694		8.245	9.212	9.211	9.212	6000
8000	0.733	1.402	1.826	1.827		0.989	1.993	2.537	2.662		0.937	1.851	2.303	2.304		1.248	2.597	3.384	3.386		2.852	4.569	4.657	4.659	8000
10000																					1.152	2.285	2.844	2.843	10000
12000																					0.559	1.204	1.795	1.925	12000
15000																					0.237	0.501	0.890	1.127	15000

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	21.977	21.979	21.980	21.977		13.614	13.615	13.612	13.616		23.516	23.515	23.515	23.521		12.673	12.673	12.670	12.676		22.561	22.560	22.558	22.563	3000
4500	20.222	20.223	20.221	20.222		11.634	11.634	11.633	11.636		20.731	20.731	20.730	20.728		10.625	10.625	10.625	10.624		19.424	19.425	19.423	19.425	4500
6000	11.579	13.169	13.168	13.171		9.815	9.815	9.816	9.814		16.220	16.061	16.059	16.062		8.835	8.835	8.835	8.836		16.485	16.485	16.484	16.486	6000
8000	3.810	6.289	6.659	6.661		5.188	5.943	5.934	5.936		6.812	8.134	8.120	8.124		4.223	6.314	6.484	6.487		5.203	8.890	8.876	8.880	8000
10000	1.539	3.254	4.020	4.064		2.358	3.513	3.623	3.622		3.068	4.890	4.959	4.956		1.673	3.371	3.959	3.957		2.077	4.563	5.419	5.417	10000
12000	0.755	1.628	2.501	2.752		1.211	2.160	2.459	2.459		1.571	2.816	3.347	3.495		0.512	0.962	1.196	1.196						12000
15000																									15000

C & Z SECTION CANTILEVER 2000 INWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

TABLE 10B:
C SECTION
INWARDS

TABLE 10B: C SECTION INWARDS		C100 10					C100 12					C100 15					C100 19					Span																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		1.124	1.124	1.124	1.124	0.237	1.364	1.364	1.364	1.364	0.287	1.776	1.776	1.776	1.776	0.365	2.456	2.473	2.473	2.474	0.470																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		1.124	1.124	1.124	1.124	0.701	1.316	1.364	1.364	1.364	0.848	1.605	1.776	1.766	1.776	1.079	2.085	2.474	2.473	2.474	1.390																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		0.639	0.632	0.632	0.632	0.111	0.740	0.767	0.767	0.767	0.134	0.897	0.999	0.999	0.999	0.171	1.146	1.374	1.391	1.392	0.220																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

C200 19					C200 24					C250 19					C250 24					C300 24					
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	6.485	6.485	6.485	3.020	9.272	9.272	9.272	9.273	3.880	7.481	7.480	7.480	7.481	5.010	11.791	11.791	11.791	11.791	6.572	13.775	13.774	13.775	13.775	11.316	3000
4500	5.739	6.485	6.485	8.934	7.537	9.273	9.272	9.272	11.479	6.738	6.738	6.738	6.737	14.824	9.722	11.331	11.329	11.331	19.443	12.205	12.205	12.205	12.205	33.481	4500
6000	2.959	3.648	3.648	1.416	3.696	5.217	5.216	5.217	1.818	3.843	4.601	4.600	4.601	2.349	4.646	6.634	6.633	6.634	3.080	6.905	9.270	9.269	9.271	5.304	6000
8000	1.465	1.847	1.845	0.377	1.794	2.543	2.637	2.639	0.485	1.893	2.330	2.326	2.327	0.626	2.241	3.359	3.354	3.355	0.821	3.191	4.695	4.687	4.689	1.415	8000
10000																				1.808	2.867	2.862	2.861	0.624	10000
12000																				1.163	1.854	1.938	1.937	0.337	12000
15000																				0.684	1.101	1.215	1.215	0.164	15000

C300 30					C350 24					C350 30					C400 24					C400 30						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	22.045	22.044	22.043	22.044	14.623	13.615	13.613	13.614	16.618	18.378	23.517	23.515	23.513	23.525	23.625	12.672	12.672	1.671	12.674	22.136	22.561	22.561	22.558	22.563	28.368	2000
4500	19.744	20.275	20.274	20.274	43.263	11.634	11.635	11.634	11.634	54.374	20.730	20.731	20.730	20.728	69.889	10.625	10.625	10.624	10.624	65.493	19.424	19.425	19.424	19.424	83.929	4500
6000	8.532	13.230	13.228	12.230	6.855	9.815	9.815	9.815	9.815	8.614	12.366	16.061	16.060	216.062	11.075	8.835	8.835	8.835	8.835	10.377	11.371	16.485	16.486	16.483	13.298	6000
8000	3.697	6.573	6.689	6.692	1.828	4.398	5.943	5.943	5.936	2.297	5.249	8.133	8.120	8.124	2.953	4.742	6.494	6.484	6.487	2.767	4.895	8.889	8.875	8.879	3.564	8000
10000	2.034	3.807	4.084	4.082	0.806	2.385	3.631	3.623	3.622	1.013	2.832	4.970	4.959	4.956	1.303	2.479	3.870	3.959	3.958	1.221	2.680	5.432	5.420	5.417	1.564	10000
12000	1.282	2.456	2.751	2.765	0.435	1.487	2.374	2.454	2.453	0.547	1.739	3.207	3.358	3.357	0.703	1.568	2.525	2.681	2.680	0.659	1.683	3.448	3.670	3.668	0.844	12000
15000	0.747	1.430	1.640	1.734	0.212	0.858	1.419	1.538	1.538	0.266	0.991	1.834	2.105	2.105	0.342	0.916	1.514	1.664	1.681	0.320	0.977	1.972	2.300	2.301	0.410	15000

TABLE 11B:
Z SECTION
INWARDS

TABLE 11B: Z SECTION INWARDS		Z100 10					Z100 12					Z100 15					Z100 19					Span
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
		1.124	1.124	1.124	1.124	0.237	1.387	1.387	1.387	1.387	0.288	1.776	1.776	1.776	1.776	0.365	2.441	2.467	2.467	2.467	0.467	
		1.124	1.124	1.124	1.124	0.701	1.328	1.387	1.387	1.387	0.852	1.605	1.776	1.776	1.776	1.079	2.075	2.467	2.467	2.467	1.383	
	0.639	0.632	0.632	0.632	0.111	0.746	0.780	0.780	0.780	0.135	0.897	0.999	0.999	0.999	0.171	1.142	1.366	1.388	1.388	0.219	6000	

Z150 12					Z150 15					Z150 19					Z150 24					Z200 15						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	2.382	2.382	2.382	2.382	0.826	3.127	3.127	3.126	3.126	1.070	4.406	4.406	4.406	4.406	1.370	6.212	6.212	6.212	6.212	1.733	4.144	4.144	4.144	4.145	2.245	3000
4500	2.319	2.319	2.318	2.319	2.443	2.913	3.126	3.127	3.126	3.166	3.781	4.406	4.406	4.406	4.053	4.855	6.212	6.212	6.212	5.246	3.808	3.808	3.808	3.808	6.643	4500
6000	1.324	1.340	1.340	1.340	0.387	1.583	1.759	1.759	1.759	0.502	2.032	2.479	2.479	2.479	0.642	2.493	3.348	3.495	3.495	0.831	2.272	2.365	2.365	2.365	1.053	6000
																					1.139	1.198	1.196	1.196	0.281	8000

Z200 19					Z200 24					Z250 19					Z250 24					Z300 24						
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150		
3000	6.420	6.420	6.420	3.018	9.353	9.353	9.354	9.353	3.893	7.455	7.455	7.454	7.455	5.005	11.897	11.897	11.898	11.897	6.595	13.733	13.732	13.732	13.734	11.304	3000	
4500	5.711	6.420	6.420	8.931	7.589	9.353	9.354	9.353	11.519	6.719	6.719	6.719	6.718	14.808	9.790	11.366	11.365	11.367	19.513	12.176	12.177	12.176	12.176	33.444	4500	
6000	2.940	3.612	3.611	3.612	1.415	3.727	5.262	5.262	5.262	1.825	3.821	4.554	4.554	4.554	2.346	4.688	6.693	6.692	6.694	3.091	6.858	9.211	9.211	9.212	5.299	6000
8000	1.455	1.829	1.826	1.827	0.377	1.808	2.560	2.661	2.662	0.487	1.882	2.306	2.303	2.304	0.626	2.261	3.389	3.384	3.386	0.824	6.858	9.211	9.211	9.212	5.299	8000
10000																					1.797	2.850	2.844	2.843	0.623	10000
12000																					1.155	1.846	1.926	1.925	0.336	12000
15000																					0.684	1.096	1.207	1.207	0.164	15000

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
3000	21.978	21.978	21.977	21.978	14.613	13.615	13.613	13.614	13.618	18.378	23.517	23.515	23.513	23.525	23.625	12.672	12.672	12.671	12.674	22.136	22.561	22.561	22.558	22.563	28.368	3000
4500	19.640	20.223	20.222	20.222	14.235	11.634	11.635	11.634	11.634	54.374	20.730	20.731	20.730	20.728	69.899	10.625	10.625	10.624	10.624	65.493	19.424	19.425	19.424	19.424	83.929	4500
6000	8.540	13.170	13.168	13.170	6.850	9.815	9.815	9.815	9.815	8.614	12.646	16.061	16.060	16.062	11.075	8.836	8.835	8.835	8.835	21.377	11.371	16.485	16.486	16.483	13.298	6000
8000	3.700	6.536	6.569	6.661	1.827	4.398	5.943	5.934	5.936	2.297	5.249	8.133	8.120	8.124	2.953	4.472	6.484	6.484	6.487	2.767	4.895	8.889	8.875	8.879	3.596	8000
10000	2.036	3.782	4.066	4.064	0.806	2.385	3.631	3.623	3.622	1.013	2.832	4.970	4.959	4.956	1.303	2.479	3.870	3.959	3.958	1.221	2.680	5.432	5.420	5.417	1.564	10000
12000	1.283	2.439	2.736	2.752	0.435	1.487	2.374	2.454	2.453	0.547	1.739	3.207	3.358	3.357	0.703	1.568	2.525	2.681	2.680	0.659	1.688	3.448	3.670	3.668	0.844	12000
15000	0.747	1.422	1.630	1.726	0.211	0.858	1.419	1.538	1.538	0.266	0.991	1.834	2.105	2.105	0.342	0.916	1.514	1.664	1.681	0.320	0.977	1.972	2.300	2.301	0.410	15000

C & Z SECTION CANTILEVER 3000 OUTWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

	Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.
BOLD	Grade 8.8 bolts required.
3/SB	For Safebridge® system use data for 3 rows of bridging.

TABLE 12A:
C SECTION
OUTWARDS

C100 10					C100 12					C100 15					C100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	0.499	0.499	0.499	0.499		0.606	0.606	0.606	0.606		0.789	0.789	0.789	0.789		1.099	1.099	1.099	1.099	3000
	0.499	0.499	0.499	0.499		0.606	0.606	0.606	0.606		0.789	0.789	0.789	0.789		1.099	1.099	1.099	1.099	4500
	0.303	0.462	0.499	0.499		0.387	0.549	0.606	0.606		0.548	0.706	0.784	0.789		0.760	0.965	1.083	1.099	6000

C150 12					C150 15					C150 19					C150 24					C200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	1.029	1.029	1.029	1.029		1.357	1.357	1.357	1.357		1.920	1.920	1.920	1.920		2.723	2.723	2.723	2.723		1.895	1.895	1.895	1.895	3000
4500	1.029	1.029	1.029	1.029		1.357	1.357	1.357	1.357		1.920	1.920	1.920	1.920		2.724	2.724	2.723	2.723		1.895	1.895	1.895	1.895	4500
6000	0.900	1.029	1.029	1.029		1.357	1.357	1.357	1.357		1.595	1.741	1.920	1.920		2.178	2.655	2.723	2.723		1.895	1.895	1.895	1.895	6000
																					0.648	1.190	1.445	1.444	8000

C200 19					C200 24					C250 19					C250 24					C300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	2.882	2.882	2.882	2.882		4.121	4.121	4.121	4.121		3.635	3.635	3.635	3.635		5.241	5.241	5.241	5.241		7.324	7.324	7.324	7.324	3000
4500	2.882	2.882	2.882	2.882		4.121	4.121	4.121	4.121		3.635	3.635	3.635	3.635		5.240	5.241	5.241	5.241		7.207	7.207	7.207	7.207	4500
6000	2.752	2.882	2.882	2.882		3.779	4.121	4.121	4.121		3.635	3.635	3.635	3.635		5.047	5.241	5.240	5.241		6.865	6.865	6.865	6.865	6000
8000	0.698	1.720	2.197	2.196		1.228	2.409	3.017	3.140		1.178	2.276	2.771	2.769		1.552	3.146	3.995	3.993		3.545	5.528	5.583	5.580	8000
10000																					1.310	2.579	3.186	3.184	10000
12000																					0.608	1.311	1.944	2.084	12000
15000																					0.249	0.525	0.941	1.187	15000

C300 30					C350 24					C350 30					C400 24					C400 30					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
2000	10.451	10.451	10.451	10.451		7.945	7.945	7.945	7.942		12.689	12.688	12.688	12.688		7.815	7.815	7.813	7.815		12.910	12.909	12.908	12.908	2000
4500	10.452	10.451	10.452	10.451		7.658	7.658	7.657	7.658		12.420	12.420	12.419	12.417		7.459	7.459	7.459	7.457		12.483	12.484	12.484	12.485	4500
6000	10.452	10.451	10.451	10.451		7.112	7.111	7.112	7.112		11.792	11.792	11.792	11.791		6.809	6.810	6.810	6.809		11.663	11.663	11.663	11.662	6000
8000	4.713	7.602	7.967	7.963		6.264	6.322	6.322	6.322		8.283	9.685	9.672	9.668		5.268	5.924	5.924	5.923		6.471	10.450	10.450	10.450	8000
10000	1.744	3.672	4.541	4.544		2.674	3.916	4.034	4.031		3.471	5.462	5.521	5.517		1.909	3.763	4.408	4.405		2.364	5.135	6.034	6.029	10000
12000	0.820	1.763	2.714	2.974		1.315	2.336	2.637	2.638		1.688	3.099	3.609	3.611		0.877	1.948	2.715	2.883		1.096	2.408	3.891	3.947	12000
15000	0.343	0.707	1.320	1.657		0.541	1.082	1.514	1.610		0.683	1.405	2.076	2.203		0.353	0.767	1.437	1.657		0.449	0.955	1.820	2.375	15000

TABLE 13A:
Z SECTION
OUTWARDS

Z100 10					Z100 12					Z100 15					Z100 19					Span
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
	0.499	0.499	0.499	0.499		0.616	0.616	0.616	0.616		0.789	0.789	0.789	0.789		1.096	1.096	1.096	1.096	3000
	0.499	0.499	0.499	0.499		0.616	0.616	0.616	0.616		0.789	0.789	0.789	0.789		1.096	1.096	1.096	1.096	4500
	0.303	0.462	0.499	0.499		0.395	0.557	0.616	0.616		0.548	0.706	0.784	0.789		0.754	0.956	1.074	1.096	6000

Z150 12					Z150 15					Z150 19					Z150 24					Z200 15					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	1.059	1.059	1.059	1.059		1.390	1.390	1.390	1.390		1.958	1.958	1.958	1.958		2.761	2.761	2.761	2.761		1.868	1.868	1.868	1.868	3000
4500	1.059	1.059	1.059	1.059		1.390	1.390	1.390	1.390		1.958	1.958	1.958	1.958		2.761	2.761	2.761	2.761		1.868	1.868	1.868	1.868	4500
6000	0.912	1.059	1.059	1.059		1.168	1.390	1.390	1.390		1.617	1.9232	1.958	1.958		2.206	2.664	2.761	2.761		1.868	1.868	1.868	1.868	6000
																					0.646	1.182	1.424	1.424	8000

Z200 19					Z200 24					Z250 19					Z250 24					Z300 24					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
3000	2.853	2.853	2.853	2.853		4.157	4.157	4.157	4.157		3.598	3.598	3.598	3.598		5.288	5.288	5.288	5.288		7.277	7.277	7.277	7.277	3000
4500	2.853	2.853	2.853	2.853		4.157	4.157	4.157	4.157		3.598	3.598	3.598	3.598		5.288	5.288	5.288	5.288		7.177	7.177	7.177	7.177	4500
6000	2.742	2.853	2.853	2.853		3.812	4.157	4.157	4.157		3.598	3.598	3.598	3.598		5.089	5.288	5.287	5.288		6.838	6.839	6.838	6.838	6000
8000	0.925	1.712	2.175	2.174		1.241	2.436	3.042	3.167		1.183	2.267	2.743	2.741		1.568	3.183	4.031	4.029		3.354	5.509	5.547	5.545	8000
10000																					1.314	2.571	3.166	3.164	10000
12000																					0.610	1.306	1.938	2.071	12000
15000																					0.250	0.527	0.936	1.183	15000

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30					
	0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB		0	1	2	3/SB	
2000	10.404	10.404	10.404	10.404		7.945	7.945	7.945	7.942		12.689	12.688	12.688	12.688		7.815	7.815	7.813	7.815		12.910	12.909	12.908	12.908	2000
4500	10.404	10.404	10.404	10.404		7.658	7.658	7.657	7.658		12.420	12.420	12.419	12.417		7.459	7.459	7.459	7.457		12.483	12.484	12.484	12.485	4500
6000	10.405	10.404	10.404	10.404		7.112	7.111	7.112	7.112		11.792	11.792	11.792	11.791		6.809	6.810	6.810	6.809		11.663	11.663	11.663	11.662	6000
8000	4.731	7.559	7.931	7.927		6.264	6.322	6.322	6.322		8.283	9.685	9.671	9.668		5.268	5.924	5.924	5.923		6.671	10.450	10.450	10.450	8000
10000	1.750	3.655	4.491	4.524		2.674	3.916	4.034	4.031		3.471	5.462	5.521	5.517		1.909	3.763	4.408	4.405		2.364	5.135	6.034	6.029	10000
12000	0.823	1.769	2.697	2.961		1.315	2.336	2.637	2.638		1.688	3.099	3.609	3.611		0.877	1.948	2.715	2.883		1.096	2.408	3.891	3.947	12000
15000	0.344	0.709	1.324	1.646		0.541	1.082	1.514	1.610		0.683	1.405	2.076	2.203		0.353	0.767	1.437	1.657		0.449	0.955	1.820	2.375	15000

C & Z SECTION CANTILEVER 3000 INWARDS LOADING

Data is available for spans 2,000 to 20,000, please contact your local Metroll branch.

Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

TABLE 12B:
C SECTION
INWARDS

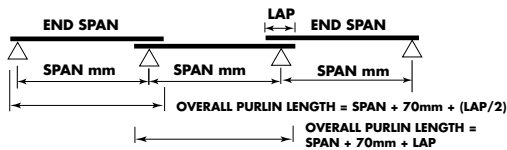
TABLE 12B: C SECTION INWARDS																						
C100 10					C100 12					C100 15					C100 19					Span		
0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150			
0.499	0.499	0.499	0.499	0.499	0.606	0.606	0.606	0.606	0.089	0.762	0.775	0.777	0.778	0.101	1.048	1.069	1.072	1.075	0.131			
0.499	0.499	0.499	0.499	0.700	0.586	0.606	0.606	0.606	0.085	0.736	0.773	0.775	0.777	0.108	1.002	1.065	1.069	1.072	0.139			
0.491	0.499	0.499	0.499	0.132	0.566	0.606	0.606	0.606	0.159	0.704	0.773	0.774	0.775	0.203	0.928	1.062	1.067	1.070	0.261			

TABLE 13B:
Z SECTION
INWARDS

TABLE 13B: Z SECTION INWARDS		Z100 10					Z100 12					Z100 15					Z100 19					Span
		0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
		0.499	0.499	0.499	0.499	0.066	0.616	0.616	0.616	0.616	0.080	0.762	0.775	0.777	0.778	0.101	1.039	1.060	1.063	1.066	0.130	
		0.499	0.499	0.499	0.499	0.070	0.593	0.616	0.616	0.616	0.085	0.736	0.773	0.775	0.777	0.108	0.994	1.057	1.060	1.063	0.138	
		0.491	0.499	0.499	0.499	0.132	0.572	0.616	0.616	0.616	0.160	0.704	0.773	0.774	0.775	0.203	0.922	1.053	1.058	1.061	0.260	

Z300 30					Z350 24					Z350 30					Z400 24					Z400 30						
	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	0	1	2	3/SB	L/150	
2000	10.404	10.404	10.404	10.404	4.059	7.946	7.946	7.945	7.945	5.105	12.689	12.688	12.688	12.689	6.562	7.816	7.815	7.816	7.815	6.149	12.911	12.911	12.909	12.912	7.880	2000
4500	10.404	10.404	10.404	10.404	4.330	7.659	7.658	7.658	7.657	5.445	12.420	12.419	12.419	12.419	7.000	7.460	7.460	7.459	7.458	6.559	12.484	12.484	12.483	12.483	8.405	4500
6000	8.430	10.404	10.404	10.404	8.118	7.112	7.112	7.111	7.111	10.210	11.391	11.792	11.792	11.792	13.125	6.810	6.810	6.810	6.809	12.298	11.610	11.662	11.662	11.661	15.759	6000
8000	3.822	7.730	7.931	7.927	4.599	4.641	6.322	6.322	6.322	5.783	5.589	9.686	9.672	9.668	7.735	4.592	5.924	5.924	5.924	6.966	5.040	10.450	10.450	10.450	8.927	8000
10000	2.077	4.179	4.526	4.524	1.176	2.465	4.023	4.034	4.031	1.479	2.909	5.517	5.520	5.517	1.902	2.519	4.280	4.408	4.405	1.782	2.729	6.002	6.034	6.030	2.284	10000
12000	1.299	2.612	2.942	2.961	0.541	1.517	2.544	2.637	2.638	0.681	1.771	3.428	3.609	3.611	0.875	1.583	2.705	2.882	2.883	0.820	1.701	3.682	3.945	3.947	1.051	12000
15000	0.752	1.483	1.707	1.806	0.239	0.866	1.483	1.610	1.610	0.300	0.996	1.910	2.204	2.203	0.386	0.920	1.582	1.743	1.759	0.362	0.981	2.053	2.409	2.408	0.464	15000

TABLE 14A:
Z SECTION
MIXED 3 SPANS LAPPED
OUTWARDS LOADING

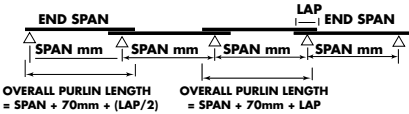


	Z100 10 / Z100 15				Z100 12 / Z100 19				Z150 12 / Z150 19				Z150 15 / Z150 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	10.284	10.282	10.282	10.28	14.327	14.326	14.327	14.326	18.540	18.539	18.539	18.539	30.876	30.876	30.876	30.877	2000
2500	6.394	6.393	6.394	6.394	8.195	8.194	8.194	8.194	11.854	11.853	11.850	11.848	20.479	20.477	20.477	20.466	2500
3000	4.025	4.104	4.104	4.104	4.860	5.093	5.093	5.093	8.290	8.288	8.290	8.290	13.518	13.516	13.519	13.518	3000
3500	2.537	2.799	2.799	2.799	3.119	3.473	3.472	3.473	6.111	6.111	6.111	6.110	9.511	9.512	9.512	9.511	3500
4000	1.676	2.031	2.031	2.031	2.113	2.520	2.520	2.520	4.673	4.673	4.673	4.673	6.577	6.944	6.944	6.944	4000
4500	1.136	1.542	1.542	1.542	1.485	1.908	1.912	1.912	3.617	3.676	3.676	3.676	4.623	5.123	5.123	5.123	4500
5000	0.791	1.190	1.210	1.210	1.073	1.443	1.500	1.500	2.586	2.958	2.958	2.958	3.365	3.936	3.936	3.936	5000
5500	0.572	0.909	0.975	0.975	0.795	1.116	1.209	1.209	1.885	2.374	2.374	2.374	2.510	3.120	3.119	3.119	5500
6000	0.428	0.703	0.802	0.802	0.605	0.878	0.995	0.995	1.392	1.928	1.928	1.928	1.914	2.534	2.533	2.533	6000
6500		0.578	0.743	0.748	0.493	0.747	0.899	0.928	1.052	1.588	1.597	1.597	1.483	2.048	2.099	2.099	6500
7000		0.447	0.602	0.630		0.594	0.735	0.781	0.814	1.300	1.345	1.345	1.167	1.671	1.767	1.767	7000
7500			0.492	0.538		0.478	0.608	0.667	0.642	1.073	1.148	1.148	0.936	1.379	1.508	1.508	7500
8000				0.406			0.507	0.566	0.517	0.882	0.991	0.991	0.757	1.149	1.302	1.302	8000
8500							0.427	0.482	0.425	0.729	0.865	0.865	0.619	0.964	1.136	1.136	8500
9000								0.414		0.604	0.761	0.761	0.513	0.813	0.985	1.000	9000
9500										0.513	0.701	0.726	0.441	0.717	0.903	0.954	9500
10000										0.609	0.609	0.646		0.609	0.783	0.848	10000
10500										0.527	0.578			0.520	0.683	0.759	10500
11000										0.456	0.520			0.446	0.598	0.673	11000
11500											0.464				0.525	0.598	11500
12000											0.464				0.463	0.534	12000
12500												0.414			0.433	0.517	12500
13000																0.461	13000
13500																0.412	13500
Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.																	
Grade 8.8 bolts required.																	
For Safebridge® system use data for 3 rows of bridging.																	

TABLE 14B:
Z SECTION
MIXED 3 SPANS
LAPPED
INWARDS
LOADING

TABLE 14B: Z SECTION MIXED 3 SPANS LAPPED INWARDS LOADING	Z100 10 / Z100 15					Z100 12 / Z100 19					Z150 12 / Z150 19					Z150 15 / Z150 24					Span
	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	
	10.284	10.282	10.282	10.282	13.044	13.187	14.325	14.326	14.326	16.600	18.539	18.539	18.539	18.540	49.671	30.876	30.878	30.877	30.876	64.533	
	6.130	6.393	6.394	6.394	6.594	7.151	8.194	8.194	8.195	8.391	11.854	11.853	11.850	11.848	25.112	18.126	20.478	20.475	20.476	32.624	
	3.830	4.104	4.104	4.104	3.778	4.465	5.093	5.093	5.093	4.807	8.290	8.289	8.289	8.29	14.379	11.292	13.516	13.518	13.518	18.680	
	2.601	2.799	2.799	2.799	2.360	3.036	3.472	3.473	3.473	3.003	6.066	6.111	6.111	6.110	8.974	7.393	9.512	9.512	9.511	11.658	
	1.865	2.031	2.031	2.031	1.571	2.184	2.519	2.519	2.520	1.999	4.284	4.673	4.673	4.673	5.966	5.201	6.944	6.944	6.944	7.751	
	1.387	1.542	1.542	1.542	1.097	1.632	1.912	1.912	1.912	1.396	3.172	3.676	3.676	3.676	4.163	3.847	5.123	5.123	5.123	5.408	
	1.058	1.210	1.210	1.210	0.796	1.253	1.500	1.500	1.500	1.013	2.431	2.958	2.958	2.958	3.018	2.951	3.936	3.936	3.936	3.921	
	0.821	0.975	0.975	0.975	0.596	0.981	1.209	1.209	1.209	0.758	1.911	2.374	2.374	2.374	2.256	2.326	3.119	3.120	3.120	2.931	
0.646	0.802	0.802	0.802	0.458	0.779	0.995	0.995	0.995	0.582	1.532	1.928	1.928	1.928	1.731	1.873	2.533	2.533	2.533	2.248		
0.540	0.748	0.748	0.748		0.667	0.928	0.928	0.928	0.464	1.245	1.597	1.597	1.597	1.356	1.532	2.099	2.099	2.099	1.762		
0.429	0.630	0.630	0.630		0.538	0.781	0.781	0.781		1.022	1.345	1.345	1.345	1.082	1.268	1.767	1.767	1.767	1.406		
	0.538	0.538	0.538		0.437	0.667	0.667	0.667		0.846	1.148	1.148	1.148	0.877	1.060	1.508	1.508	1.508	1.140		
	0.464	0.464	0.464			0.576	0.576	0.576		0.705	0.991	0.991	0.991	0.721	0.893	1.302	1.302	1.302	0.937		
	0.405	0.405	0.405			0.497	0.497	0.497		0.591	0.865	0.865	0.865	0.600	0.757	1.136	1.136	1.136	0.779		
						0.429	0.429	0.429		0.499	0.761	0.761	0.761	0.504	0.647	1.000	1.000	1.000	0.655		
										0.440	0.726	0.726	0.726	0.433	0.579	0.954	0.954	0.954	0.562		
											0.646	0.646	0.646		0.496	0.847	0.848	0.848	0.481		
											0.578	0.578	0.578		0.428	0.752	0.759	0.759	0.414		
											0.52	0.52	0.520			0.670	0.683	0.683			
											0.471	0.471	0.471			0.599	0.618	0.618			
											0.425	0.425	0.425			0.538	0.562	0.562			
											0.419	0.438	0.438			0.527	0.575	0.575			
																0.474	0.521	0.525			
																0.428	0.472	0.481			
																	0.428	0.482			
																		0.407			
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TABLE 15A:
Z SECTION
MIXED 4 SPANS LAPPED
OUTWARDS LOADING



Bolt capacity exceeded. M12 bolts for 100 - 250 series, M16 bolts for 300 series or greater.

BOLD Grade 8.8 bolts required.

3/SB For Safebridge® system use data for 3 rows of bridging.

	Z100 10 / Z100 15				Z100 12 / Z100 19				Z150 12 / Z150 19				Z150 15 / Z150 24				Span
	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	0	1	2	3/SB	
2000	9.200	9.199	9.199	9.198	12.859	12.858	12.858	12.856	15.872	15.872	15.873	15.873	28.815	28.815	28.814	28.815	2000
2500	5.779	5.778	5.779	5.779	7.417	7.417	7.417	7.417	10.435	10.435	10.432	10.432	18.139	18.139	18.136	18.133	2500
3000	3.731	3.731	3.731	3.731	4.594	4.625	4.625	4.625	7.403	7.401	7.403	7.403	12.108	12.108	12.109	12.109	3000
3500	2.465	2.552	2.552	2.552	2.989	3.164	3.164	3.164	5.502	5.502	5.502	5.501	8.574	8.574	8.574	8.574	3500
4000	1.664	1.857	1.857	1.857	2.056	2.302	2.302	2.302	4.230	4.230	4.230	4.230	6.230	6.287	6.287	6.287	4000
4500	1.159	1.412	1.412	1.412	1.469	1.750	1.750	1.750	3.340	3.340	3.340	3.340	4.429	4.649	4.650	4.649	4500
5000	0.822	1.110	1.110	1.110	1.0800	1.369	1.376	1.376	2.556	2.695	2.693	2.693	3.264	3.581	3.581	3.581	5000
5500	0.595	0.880	0.896	0.896	0.811	1.068	1.110	1.110	1.901	2.164	2.164	2.164	2.469	2.844	2.844	2.844	5500
6000	0.444	0.689	0.738	0.738	0.621	0.847	0.915	0.915	1.436	1.761	1.761	1.761	1.905	2.314	2.314	2.314	6000
6500		0.581	0.685	0.685	0.507	0.733	0.848	0.849	1.096	1.461	1.461	1.461	1.493	1.919	1.919	1.919	6500
7000		0.458	0.577	0.577	0.404	0.590	0.698	0.716	0.848	1.232	1.232	1.232	1.189	1.594	1.618	1.618	7000
7500			0.476	0.493			0.580	0.612	0.669	1.028	1.053	1.053	0.957	1.324	1.383	1.383	7500
8000							0.488	0.529	0.537	0.864	0.910	0.910	0.780	1.111	1.196	1.196	8000
8500							0.413	0.457	0.438	0.725	0.795	0.795	0.646	0.940	1.044	1.044	8500
9000								0.414		0.608	0.700	0.700	0.537	0.800	0.920	0.920	9000
9500										0.530	0.664	0.665	0.461	0.714	0.858	0.874	9500
10000										0.444	0.579	0.592		0.611	0.748	0.778	10000
10500											0.508	0.530		0.526	0.655	0.697	10500
11000											0.447	0.478		0.455	0.577	0.628	11000
11500												0.433			0.510	0.568	11500
12000															0.452	0.508	12000
12500															0.428	0.495	12500
13000																0.444	13000
13500																0.412	13500

TABLE 15B:
Z SECTION
MIXED 4 SPANS
LAPPED
INWARDS LOADING

Z100 10 / Z100 15					Z100 12 / Z100 19					Z150 12 / Z150 19					Z150 15 / Z150 24					Span
0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	
9.200	9.198	9.200	9.199	14.523	12.244	12.858	12.859	12.857	18.479	15.873	15.872	15.873	15.872	55.969	28.815	28.815	28.815	28.814	72.719	2000
5.718	5.778	5.779	5.779	7.285	6.637	7.417	7.417	7.417	9.266	10.435	10.434	10.432	10.431	28.129	16.906	18.135	18.133	18.132	36.544	2500
3.578	3.731	3.731	3.731	4.149	4.150	4.625	4.625	4.625	5.276	7.403	7.401	7.403	7.403	16.005	10.587	12.108	12.109	12.108	20.790	3000
2.437	2.552	2.552	2.552	2.580	2.828	3.164	3.164	3.164	3.280	5.502	5.502	5.502	5.501	9.932	6.925	8.574	8.574	8.573	12.902	3500
1.755	1.857	1.857	1.857	1.711	2.040	2.302	2.302	2.302	2.175	4.056	4.230	4.230	4.230	6.572	4.873	6.287	6.287	6.287	8.537	4000
1.314	1.412	1.412	1.412	1.192	1.532	1.750	1.750	1.750	1.515	3.005	3.340	3.340	3.340	4.568	3.606	4.649	4.649	4.649	5.933	4500
1.012	1.110	1.110	1.110	0.863	1.184	1.376	1.376	1.376	1.097	2.306	2.695	2.694	2.692	3.301	2.769	3.581	3.581	3.581	4.287	5000
0.796	0.896	0.896	0.896	0.644	0.936	1.110	1.110	1.110	0.819	1.817	2.164	2.164	2.164	2.461	2.185	2.844	2.844	2.844	3.197	5500
0.637	0.738	0.738	0.738	0.494	0.752	0.915	0.915	0.915	0.628	1.461	1.761	1.761	1.761	1.883	1.762	2.314	2.314	2.314	2.446	6000
0.545	0.685	0.685	0.685		0.651	0.849	0.849	0.849	0.504	1.194	1.461	1.461	1.461	1.473	1.445	1.919	1.919	1.919	1.913	6500
0.442	0.577	0.577	0.577		0.533	0.716	0.716	0.716	0.402	0.987	1.232	1.232	1.232	1.173	1.202	1.618	1.618	1.618	1.524	7000
	0.493	0.493	0.493		0.441	0.612	0.612	0.612		0.825	1.053	1.053	1.053	0.950	1.010	1.383	1.383	1.383	1.233	7500
	0.427	0.427	0.427			0.529	0.529	0.529		0.694	0.910	0.910	0.910	0.779	0.856	1.196	1.196	1.196	1.012	8000
	0.405	0.405	0.405			0.462	0.462	0.462		0.588	0.795	0.795	0.795	0.647	0.731	1.044	1.044	1.044	0.841	8500
						0.402	0.407	0.407		0.501	0.700	0.700	0.700	0.544	0.629	0.919	0.920	0.920	0.706	9000
										0.442	0.665	0.665	0.665	0.469	0.563	0.874	0.874	0.874	0.609	9500
											0.592	0.592	0.592	0.401	0.490	0.778	0.778	0.778	0.520	10000
											0.530	0.530	0.530		0.429	0.697	0.697	0.697	0.448	10500
											0.478	0.478	0.478			0.626	0.628	0.628		11000
											0.433	0.433	0.433			0.561	0.568	0.568		11500
											0.425	0.425	0.425			0.504	0.517	0.517		12000
											0.419	0.438	0.438			0.492	0.526	0.526		12500
																0.444	0.479	0.480		13000
																0.402	0.434	0.440		13500
																		0.405		14000
																				14500

	Z200 15 / Z200 24					Z250 19 / Z250 24					Z300 24 / Z300 30					Z350 24 / Z350 30					Z400 24 / Z400 30					
	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	0	1	2	3	L/150	
2000	23.168	23.170	23.169	23.171	158.162	37.131	37.133	37.133	37.135	273.985	63.363	63.370	63.367	63.367	610.598	54.336	54.340	54.336	54.339	984.285	47.430	47.430	47.429	47.430	1183.383	2000
2500	15.596	15.594	15.589	15.589	79.459	25.334	25.332	25.327	25.319	138.018	43.629	43.626	43.619	43.612	307.618	37.955	37.953	37.935	37.937	495.962	33.306	33.306	33.290	33.283	596.267	2500
3000	11.348	11.346	11.348	11.348	45.196	18.712	18.711	18.713	18.712	78.651	32.588	32.581	32.587	32.588	175.305	28.868	28.865	28.869	28.869	282.655	25.514	25.509	25.512	25.513	339.822	3000
3500	8.637	8.638	8.636	8.637	28.044	14.461	14.463	14.458	14.458	48.864	25.481	25.481	25.479	25.477	108.910	23.045	23.045	23.044	23.045	175.615	20.537	20.538	20.536	20.532	211.150	3500
4000	6.779	6.779	6.779	6.779	18.555	10.891	11.513	11.514	11.513	32.354	20.522	20.521	20.523	20.522	72.119	18.969	18.970	18.970	18.968	116.293	17.064	17.065	17.064	17.065	139.816	4000
4500	5.187	5.446	5.446	5.446	12.894	7.945	9.368	9.368	9.368	22.499	15.407	16.881	16.882	16.882	50.150	15.951	15.950	15.950	15.949	80.869	14.495	14.496	14.495	14.495	97.224	4500
5000	3.957	4.457	4.454	4.452	9.316	6.040	7.753	7.746	7.741	16.262	11.300	14.110	14.095	14.085	35.248	13.626	13.618	13.601	13.586	58.452	12.513	12.503	12.487	12.472	70.277	5000
5500	3.109	3.707	3.709	3.709	6.946	4.738	6.510	6.514	6.514	12.129	8.617	11.955	11.964	11.965	27.036	11.823	11.771	11.763	11.784	43.594	10.933	10.921	10.935	10.936	52.713	5500
6000	2.500	3.118	3.118	3.118	5.315	3.809	5.539	5.535	5.533	9.283	6.759	10.252	10.245	10.242	20.690	9.675	10.290	10.280	10.275	33.365	9.041	9.650	9.640	9.634	40.115	6000
6500	2.047	2.587	2.587	2.587	4.156	3.116	4.759	4.759	4.759	7.260	5.411	8.771	8.871	8.871	16.183	7.648	9.060	9.060	9.061	26.096	7.214	8.585	8.585	8.585	31.374	6500
7000	1.702	2.181	2.181	2.181	3.311	2.589	4.086	4.086	4.086	5.784	4.422	7.871	7.739	7.738	12.893	6.182	8.032	8.030	8.028	20.791	5.806	7.686	7.683	7.681	24.995	7000
7500	1.431	1.864	1.864	1.864	2.680	2.179	3.493	3.493	3.493	4.682	3.678	6.806	6.807	6.808	10.437	5.090	7.164	7.167	7.167	16.829	4.877	6.920	6.923	6.924	20.234	7500
8000	1.216	1.611	1.611	1.611	2.199	1.855	3.020	3.020	3.020	3.843	3.103	6.027	6.027	6.026	8.566	4.258	6.429	6.428	6.427	13.813	4.106	6.266	6.265	6.264	16.607	8000
8500	1.042	1.407	1.407	1.407	1.829	1.594	2.637	2.637	2.637	3.192	2.650	5.330	5.330	5.330	7.116	3.611	5.795	5.795	5.796	11.475	3.501	5.697	5.697	5.696	13.797	8500
9000	0.900	1.239	1.239	1.239	1.534	1.381	2.323	2.323	2.323	2.681	2.287	4.695	4.695	4.695	5.976	3.101	5.248	5.248	5.247	9.637	3.108	5.199	5.198	5.199	11.586	9000
9500	0.800	1.178	1.178	1.178	1.323	1.219	2.207	2.207	2.207	2.311	2.003	4.461	4.461	4.461	5.512	2.765	5.030	5.029	5.028	8.308	2.634	4.996	4.995	4.995	9.988	9500
10000	0.699	1.048	1.048	1.048	1.131	1.070	1.965	1.965	1.965	1.975	1.759	3.970	3.971	3.971	4.403	2.420	4.580	4.580	4.581	7.100	2.311	4.582	4.583	4.583	8.536	10000
10500	0.615	0.939	0.939	0.939	0.974	0.945	1.760	1.760	1.760	1.701	1.555	3.557	3.557	3.557	3.792	2.130	4.186	4.187	4.187	6.115	2.042	4.216	4.217	4.217	7.352	10500
11000	0.543	0.846	0.846	0.846	0.844	0.838	1.586	1.586	1.586	1.476	1.384	3.187	3.204	3.204	3.289	1.889	3.841	3.839	3.839	5.304	1.815	3.892	3.891	3.890	6.377	11000
11500	0.481	0.766	0.766	0.766	0.737	0.747	1.436	1.436	1.436	1.288	1.238	2.857	2.902	2.902	2.871	1.686	3.534	3.534	3.534	4.630	1.623	3.602	3.602	3.602	5.567	11500
12000	0.428	0.697	0.697	0.697	0.647	0.668	1.307	1.307	1.307	1.131	1.113	2.573	2.641	2.641	2.521	1.514	3.261	3.260	3.260	4.065	1.459	3.341	3.341	3.340	4.888	12000
12500	0.400	0.708	0.708	0.708	0.586	0.616	1.302	1.327	1.327	1.024	1.015	2.498	2.681	2.681	2.282	1.380	3.254	3.297	3.296	3.679	1.325	3.372	3.372	3.372	4.424	12500
13000		0.647	0.647	0.647	0.520	0.556	1.178	1.211	1.211	0.908	0.920	2.259	2.448	2.448	2.023	1.249	2.950	3.049	3.049	3.262	1.202	3.083	3.135	3.135	3.992	13000
13500		0.593	0.593	0.593	0.463	0.502	1.070	1.110	1.110	0.808	0.838	2.052	2.244	2.244	1.802	1.135	2.685	2.828	2.827	2.905	1.093	2.804	2.921	2.921	3.493	13500
14000		0.545	0.545	0.545	0.414	0.454	0.975	1.022	1.022	0.723	0.765	1.870	2.064	2.065	1.612	1.035	2.453	2.626	2.626	2.599	0.998	2.561	2.727	2.726	3.124	14000
14500		0.503	0.503	0.503		0.412	0.891	0.943	0.943	0.649	0.701	1.711	1.906	1.906	1.447	0.948	2.249	2.424	2.424	2.334	0.914	2.346	2.552	2.552	2.806	14500
15000		0.466	0.466	0.466			0.816	0.873	0.873	0.585	0.643	1.570	1.765	1.765	1.305	0.870	2.068	2.244	2.244	2.104	0.840	2.157	2.392	2.391	2.529	15000

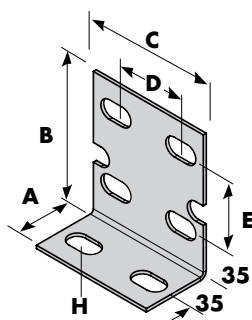
BRIDGING

Metroll Bridging is made up of basic components and as well as proprietary components from the Metroll Met-Lock Bridging System.

BASIC BRIDGING COMPONENTS

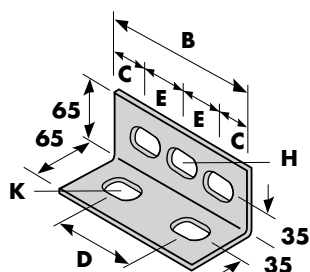
All Metroll components are manufactured from zinc coated steel and form an integral part of the Metroll purlin and girt system.

GENERAL PURPOSE BRACKET - GPB



SIZE	A	B	C	D	E	H
100	60	110	70	40	50	20 x 17
150	60	125	110	60	65	30 x 17
200	60	135	160	110	75	30 x 17
250	65	135	210	160	75	30 x 17

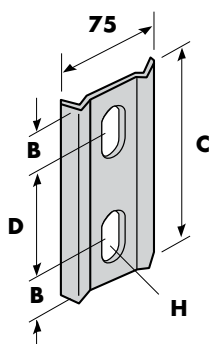
ANGLE CONNECTOR



SIZE	B	C	D	E	H	K
100	90	-	-	-	1 @ 60 x 17	1 @ 60 x 17
150	140	33	74	37	3 @ 30 x 17	2 @ 30 x 17
200	190	40	110	55	3 @ 30 x 17	2 @ 30 x 17
250	240	40	160	57	4 @ 30 x 17	2 @ 30 x 17

CLAMP PLATE

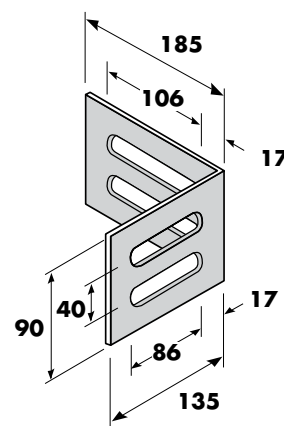
SIZE	B	C	D	E	H
100	25	90	40	-	20 x 17
150	40	140	60	37	30 x 17
200	40	190	110	55	30 x 17
250	40	240	160	57	30 x 17



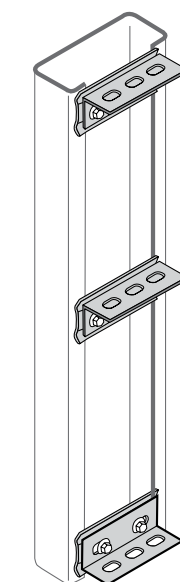
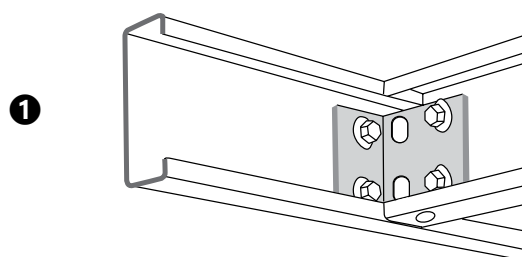
RAKING GIRT BRACKET

SIZE 100 ONLY

WA - Available on request only



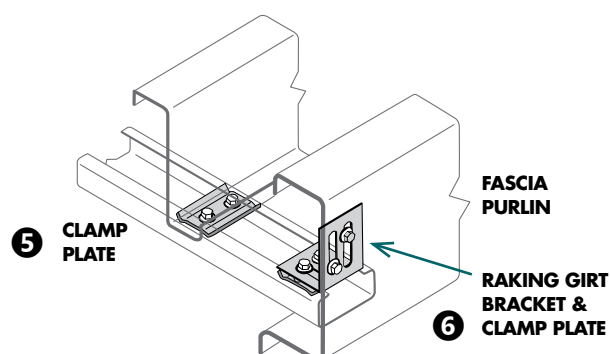
TYPICAL BASIC COMPONENTS ASSEMBLIES



② CLAMP PLATE AND ANGLE CONNECTOR AS A TRIMMER TO DOOR HEAD CONNECTION

③ CLAMP PLATE AND ANGLE CONNECTOR FOR GIRT CONNECTION

④ CLAMP PLATE AND ANGLE CONNECTOR AS A FOOT CONNECTION



MET-LOCK BRIDGING*

Met-Lock Bridging by Metroll is an uncomplicated proprietary system developed for fast installation and optimum compatibility with Metroll purlins and girts. (In WA this system is called Tab-Lok Bridging and components differ).

Met-Lock Bridging can be installed in a number of ways. The usual method is to commence installation at the fascia and proceed up the roof slope to the ridge.

The system consists of solid bridging assemblies between purlins/girts and adjustable bridging assemblies at locations such as ridges, eaves and the bottom of girts (girt foot).

BRACING

Purlins display two types of lateral instability; lateral deflection and twist (rotation and roll). It is necessary to control these instabilities by installing suitable bracing as close as possible to the flanges of a section.

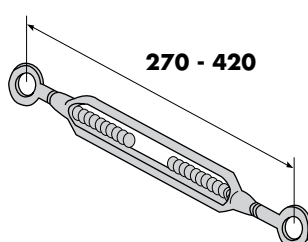
Bracing can be continuous (cladding fastened to the flange), or point braced at the midspan region or at several points on the midspan region. Point bracing is required to stabilise and straighten the purlins and girts prior to the fixing of cladding in order to facilitate the fixing operation.

Common point bracing types are ties, these can be loaded in tension only. Because they are solid members, Met-Lock components secured to the web of purlins and girts can be loaded in tension, compression and bending. For this reason a continuous run of bridging is the most effective stabiliser for both roof and walls. It is also the most widely accepted by design engineers.

Met-Lock components are simple yet robust. Installers do not have to worry about additional clips or ends that distort with slight impact. Locators and Clamps have hook centres to match holes punched in corresponding purlins and girts.

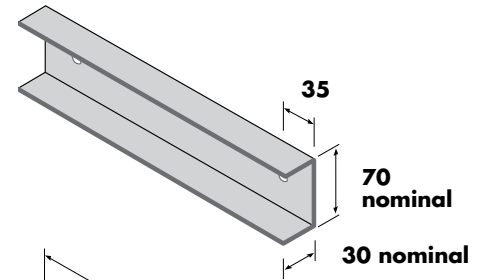
MET-LOCK BRIDGING COMPONENTS

TURNBUCKLE

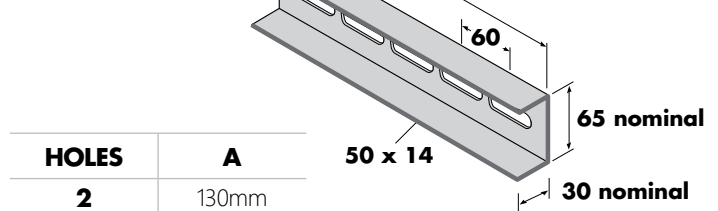


CHANNEL

Cut to length with a hole at each end



SLOTTED CHANNEL

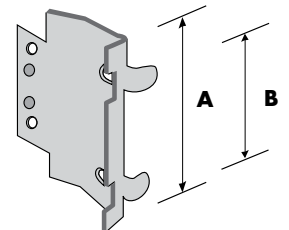


HOLES	A
2	130mm
3	190mm
5	310mm

LOCATOR END

SIZE	A (NOMINAL)	B (NOMINAL)
100	65mm	40mm
150	110mm*	60mm
200	140mm	110mm
250	190mm	160mm

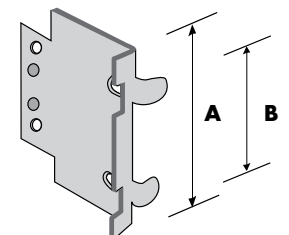
*90mm in VIC



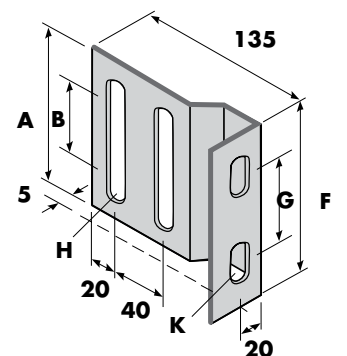
CLAMP END

SIZE	A (NOMINAL)	B (NOMINAL)
100	65mm	40mm
150	110mm*	60mm
200	140mm	110mm
250	190mm	160mm

*85mm in VIC



FASCIA BRACKET



SIZE	A	B	F	G	H	K
150	110	-	110	65	2 @ 80 x 14	2 @ 19 x 14
200/260	160	80	190	135	4 @ 65 x 14	2 @ 39 x 14

*NOTE: In WA the bridging system is called Tab-Lok. Components vary.

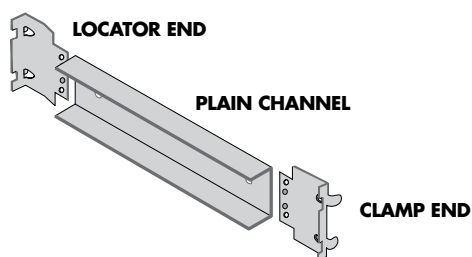
TYPICAL MET-LOCK BRIDGING ASSEMBLIES

INTERMEDIATE BRIDGING

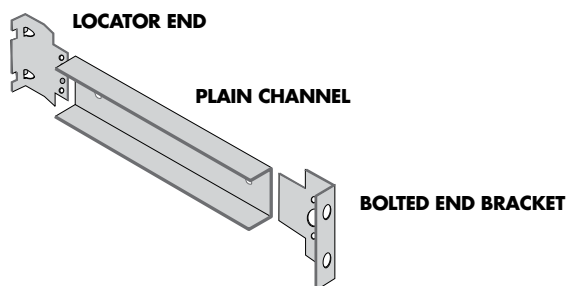
Intermediate Bridging is the basic connecting member between purlins and generally comprises a Locator End and a Clamp End attached to cut-to-length Plain Channel.

All bridging lengths should be centre to centre dimensions. Metroll programming deducts the purlin thickness to ensure the correct spacing is manufacturing.

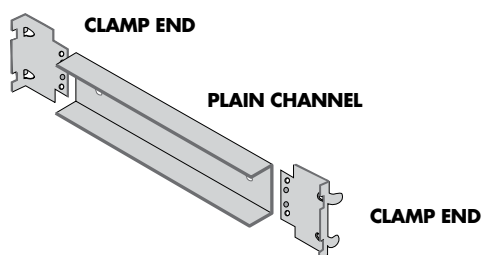
IBLC - INTERMEDIATE BRIDGING LOCATOR/CLAMP



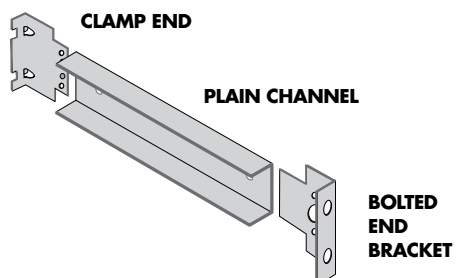
IBLB - INTERMEDIATE BRIDGING LOCATOR/BEB



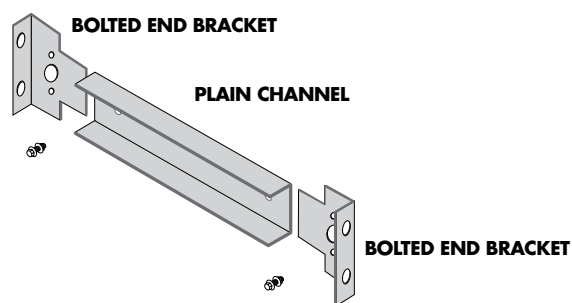
IBCC - INTERMEDIATE BRIDGING CLAMP/CLAMP



IBCB - INTERMEDIATE BRIDGING CLAMP/BEB

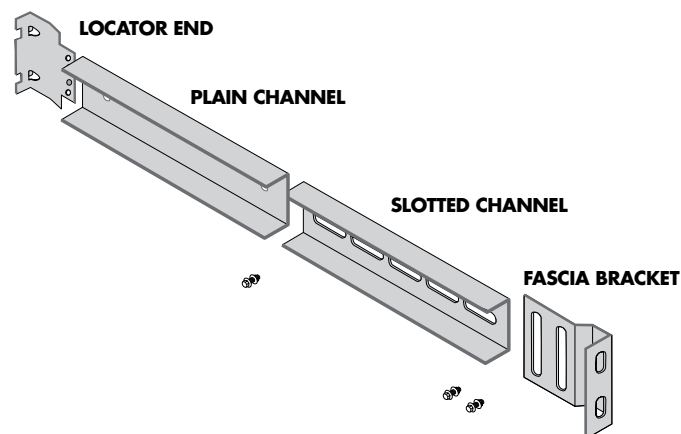


IBBB - INTERMEDIATE BRIDGING BEB/BEB



FASCIA BRIDGING

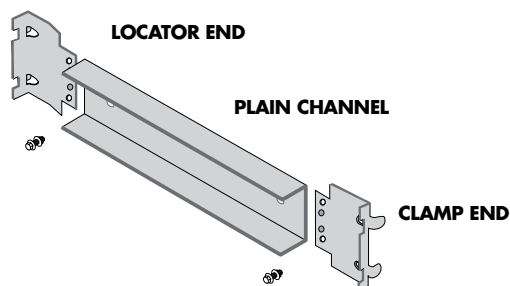
Fascia Bridging is used to provide support to the first internal purlin and for straightening and securing the Fascia Purlin. The standard combination consists of a Fascia Bracket, Slotted Channel, Plain Channel and a Locator End.



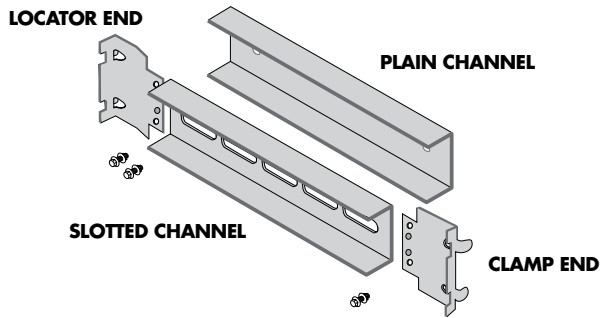
EXPANSION JOINT BRIDGING

Expansion Joint Bridging is used to accommodate a step or joint in the roof plane and is often an adjustable or swivel assembly. Combination variations are outlined below:

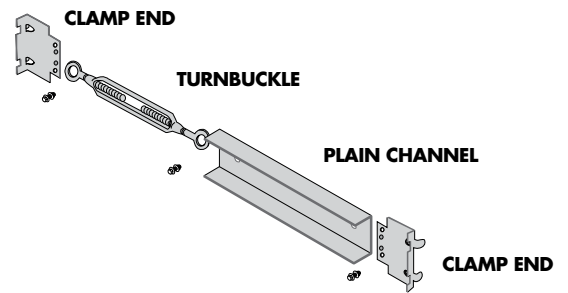
ALTERNATIVE - SWIVEL ENDS



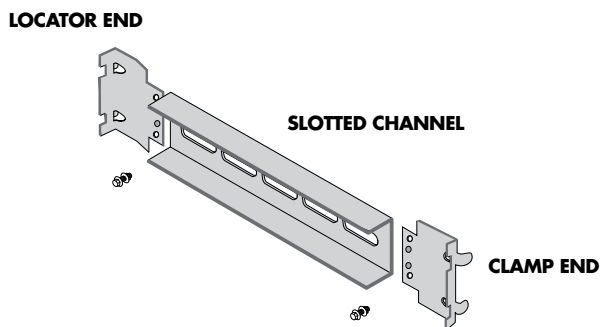
ALTERNATIVE - ADJUSTABLE



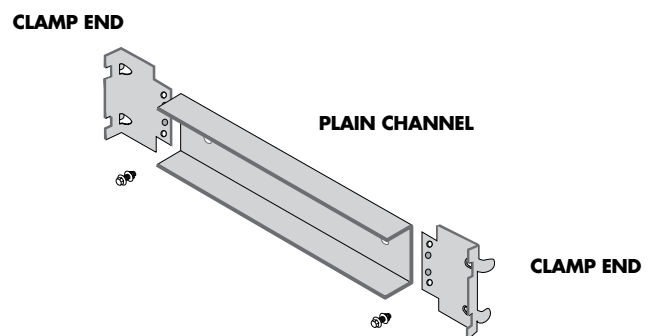
ALTERNATIVE - TURNBUCKLE WITH CHANNEL



ALTERNATIVE - SLOTTED CHANNEL



ALTERNATIVE - SWIVELS ENDS WITH CHANNEL



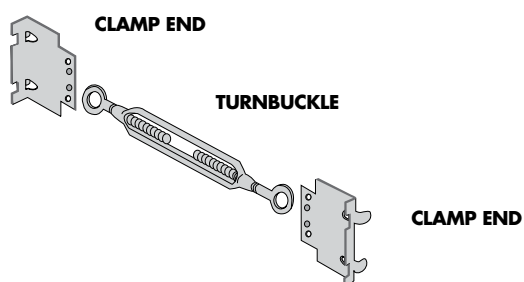
TIE ROD BRIDGING

Tie Rod Bridging is a light duty, versatile application commonly used for alignment and adjustment. This bridging may be used anywhere a bolted end is used, but is not suitable for sustaining compressive loads.

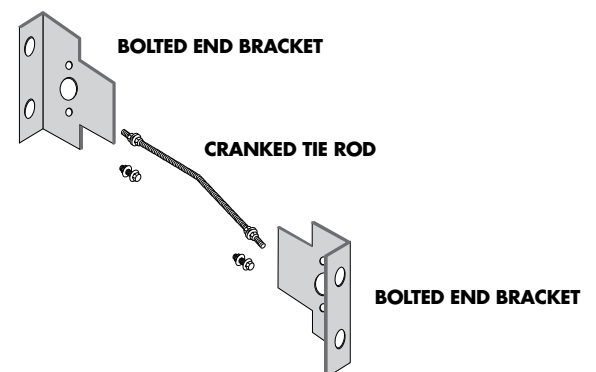
RIDGE BRIDGING

Like all Met-Lock Bridging the Ridge Tie or Bridging is simple and efficient. As the name implies this bridging is used at the apex of the roof and is usually adjustable. Several alternatives are outlined below:

ALTERNATIVE - TURNBUCKLE



ALTERNATIVE - CRANKED TIE ROD



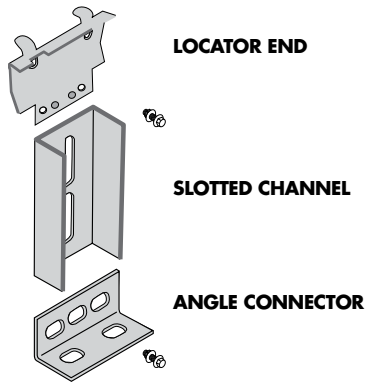
GIRT BRIDGING

Girt Bridging is usually made up of: an Adjustable Girt Foot, Intermediate Bridging and a Girt Hanger. The recommended installation procedure and precautions are required.

1. The roof sheeting should be installed before the Turnbuckle or Girt Hanger is used to level the Girts which would impose loads on the fascia system; and
2. A temporary girt support under the bottom girt is required until installation of the wall cladding is complete.

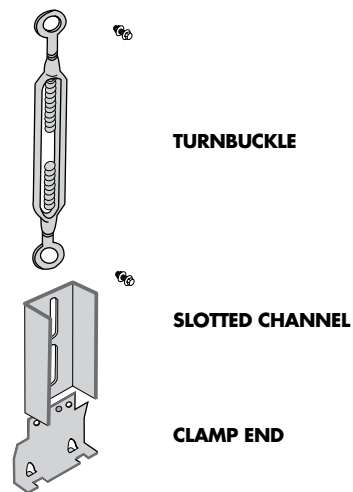
GIRT FOOT

Girt Foot assemblies are used to transfer downward forces in girt bridging to the floor. They also provide some adjustment and alignment to the bottom purlin.



GIRT HANGER

Primarily used to assist in alignment and stabilisation. A Girt Hanger is usually attached to a Slotted Channel by a Turnbuckle in the Fascia Bridging assembly. Girt Hangers should not be used to suspend the wall girts.



GIRT BRIDGING INSTALLATION

The recommended procedure for the installation of Girt Bridging is to start at floor level and work up the walls toward the fascia or eaves. A typical installation is as follows:

STEP 1:

Install the Girt Foot assembly by engaging the Locator into the appropriate holes in the bottom girt. Due to the transference of loads, Girt Feet assemblies must be anchored to the slab.

STEP 2:

Adjust the Girt Foot assembly to level the bottom girt. Where the slab has not been poured or a Girt Foot not specified, the bottom purlin must be temporarily supported to keep it level.

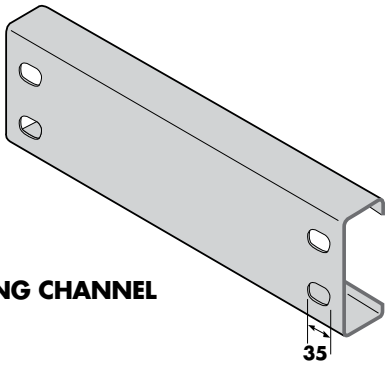
LARGE BRIDGING

Metroll's Large Bridging is for Metroll's large purlin range (C/Z300, C/Z350 and C/Z400 series). Like the Met-Lock range, the heavy duty range is simple and easy to install.

LARGE BRIDGING BASIC COMPONENTS

All Metroll components are manufactured from zinc coated steel and form an integral part of the Metroll purlin and girt system. Components are larger because the sections are more substantial.

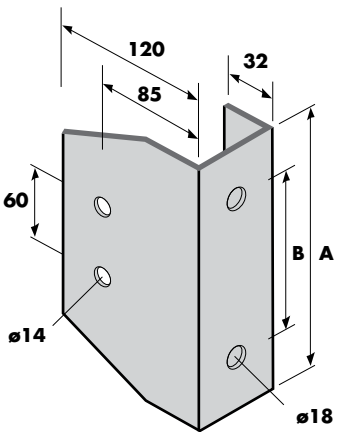
Generally the Bridging Channel is a C150 section firmly bolted to end plates at 90°. If a particular angle is required at the bridging ends it must be specified at the time of order. Additional costs may apply.



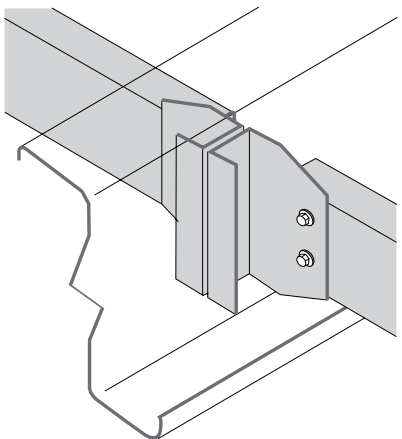
**C150 PURLIN
USED AS A BRIDGING CHANNEL**

**LARGE SERIES
END PLATE**

SIZE	A	B
250	210	160
300	260	210
350	310	260
400	360	310



**TYPICAL
LARGE
BRIDGING
ASSEMBLY**

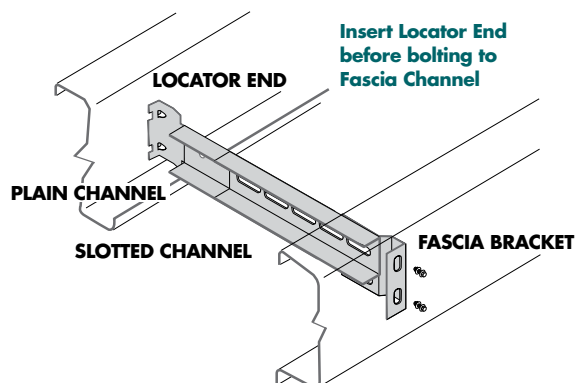


BRIDGING INSTALLATION

Following are the recommended safe and practical steps for the installation of the Met-Lock Bridging System. Procedures will vary from state to state, however standard practice is to commence purlin installation at the fascia and work up the roof slope to the ridge line.

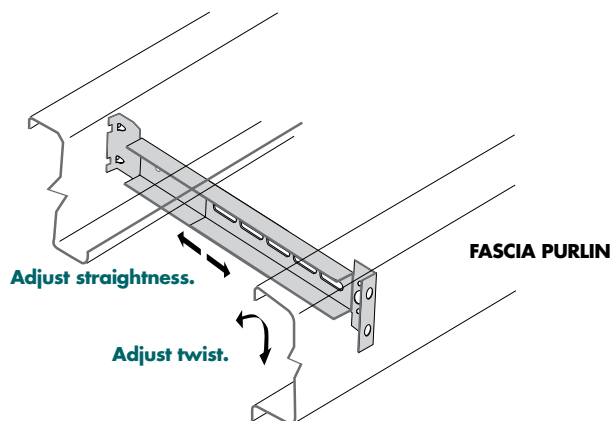
STEP 1: FIX FASCIA BRIDGING

Install the Fascia Bridging by inserting the Locator End into the holes of the first purlin and bolting the Fascia Bracket to the Fascia Purlin. Adjust the Slotted Channel to straighten the fascia and bolt firmly.



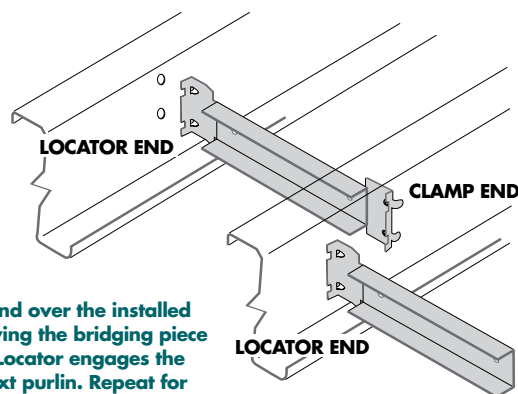
STEP 2: ADJUST FASCIA BRIDGING

Adjust the Slotted Channel to straighten the fascia and bolt firmly.



STEP 3: INSERT INTERMEDIATE BRIDGING

Install the Intermediate, Locator/Clamp Bridging up the roof slope and finish at the ridge. Intermediate bridging is installed by fitting the Clamp End (the straight bracket) over the previously installed Locator (the cranked bracket) and swinging the bridging piece around until the Locator engages the holes of the next purlin.



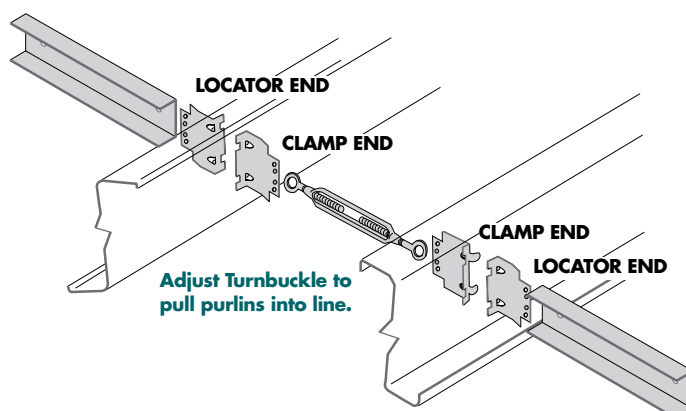
STEP 4: REPEAT WHERE APPLICABLE

Repeat Step 1 and Step 2 where applicable on the opposite side of the roof. Face bridging pieces in the same direction for a neat appearance.

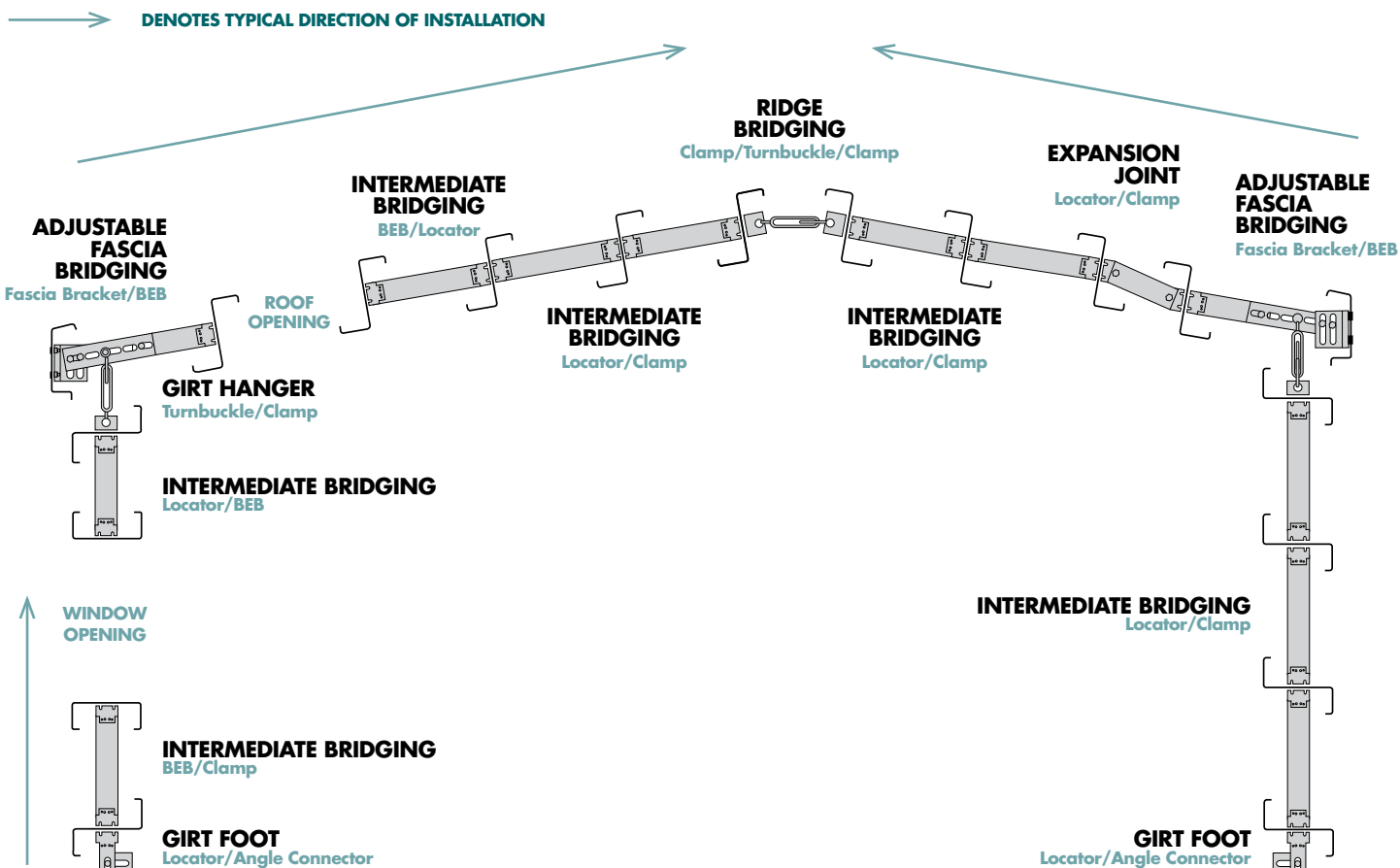
STEP 5: FIX RIDGE BRIDGING

Install the Ridge assembly by fitting the Clamp Ends over the previously installed Locator Ends and tighten the bolts or turnbuckle of the Ridge assembly.

If a Ridge assembly is not used, the last piece of Intermediate Bridging should end in a Bolted End Bracket which can accommodate a Sag Rod if required at a later date. Alternatively the standard bridging can be secured in position by installing a bolt beside the previously installed Locator



BRIDGING SYSTEM - OVERVIEW



SAFEBRIDGE® PURLIN BRIDGING INSULATION SYSTEM

Metroll purlins are compatible with the SafeBridge® Purlin Bridging Insulation System. SafeBridge® is an innovative, award winning roofing system that can be adapted to almost any commercial or industrial roof structure. Fully compliant with the current requirements of the BCA Section J, SafeBridge® utilises the existing purlin space to provide energy efficient roof insulation without compromising roof height, wind rating or structural integrity.

KEY BENEFITS

- Can achieve high thermal performance in any climate zone (as defined by the BCA/NCC).
- Code compliant with BCA/NCC Section J.
- Utilises the purlin space without elevating the overall roof or fascia height. No roof spacers required.
- Suitable for both cyclonic and non-cyclonic regions.
- Retains the structural integrity and load points of the roof interior.
- Suits most roof pitches and complex roof designs.
- Available in foil, decorative or acoustic finishes on the internal faced insulation material.
- Creates a safer roof environment for workers during construction.

IMPORTANT DESIGN CONSIDERATIONS

The SafeBridge® system relies upon specific purlin spacing outlined below. Please ensure you consult with Bradford and Metroll early in the design phase to understand the relationship of purlin depth and spacing to R-value and the BMT relative to your ultimate roof design loads.

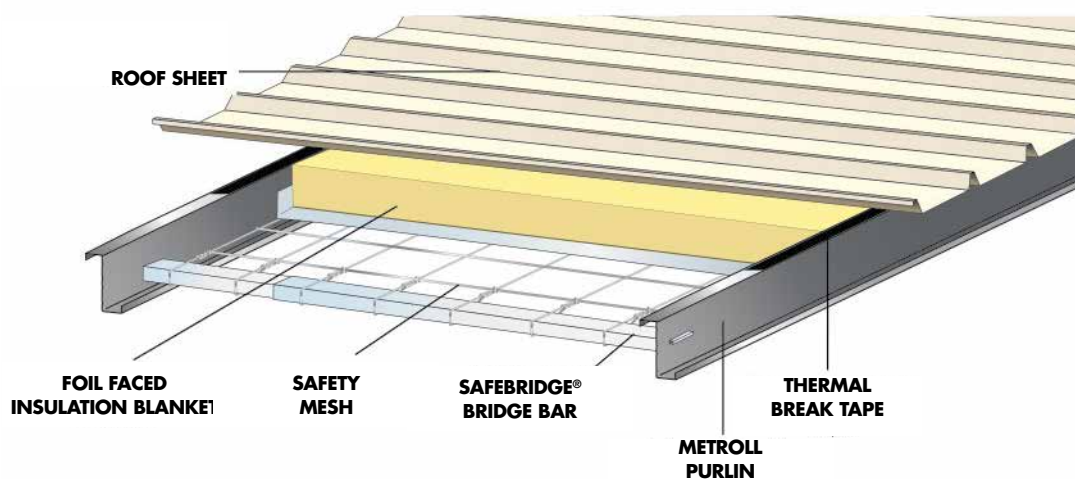
PURLIN & BRIDGE BAR SPACING

Standard Purlin Spacing	Bridge Bar Spacing
610mm	Maximum 1500mm
910mm	
1210mm	
1360mm	

DESIGNING FOR GREEN STAR & BUILDING CODE COMPLIANCE

Minimum energy efficiency standards for commercial buildings are mandatory in the BCA and NCC. Thermal insulation plays a key role in meeting these requirements and contributes to reductions in energy use which is a critical factor in Green Star accreditation. Choosing the right insulation also offers additional benefits of condensation control, noise dampening and control of heat flow in and out of the building.

To achieve the BCA/NCC Section J thermal insulation values, the roof system must allow sufficient space under the roof sheeting for insulation to recover its design thickness and achieve its rated insulation value. Failure to provide enough space will result in compression of the insulation and reduce its performance. SafeBridge® use the depth of purlins to provide a cavity for the insulation to recover its thickness, rather than create a space above the purlin using a roof spacer. Safebridge® allows purlin spacing to be set at a predetermined height during the design phase by way of a patented bridging system and key way.



DESIGNING FOR WORKER SAFETY

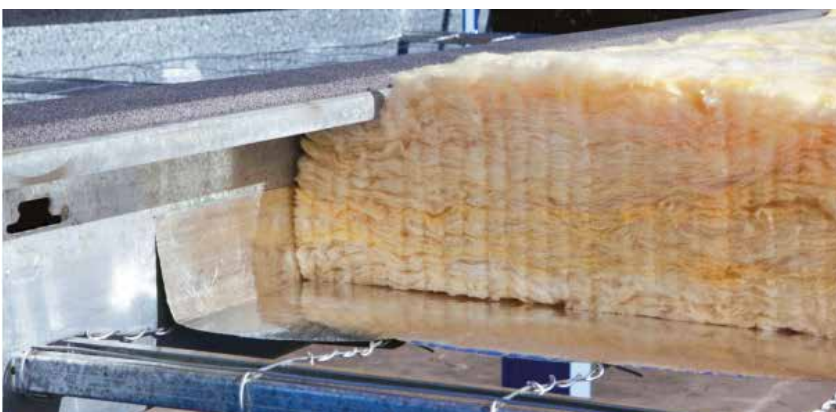
A unique feature of the SafeBridge® system is the application of safety mesh between, rather than over the top of the purlins. This eliminates the need to lap safety mesh and cover the purlins, resulting in immediate material cost savings. This method also facilitates the use of the SafeBridge® Wire Pulley system which saves installation time and also removes workers proximity to the exposed edge of the roof during construction, greatly increasing worker safety.



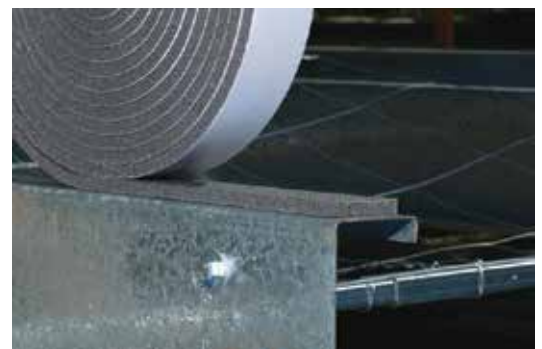
BRIDGE BAR STABILISER
Prevents purlin roll



PURLIN KEYWAY
Simple roofing screw assembly



ANTICON SB Features centre bonded foil lap to protect purlins from condensation



R0.2 THERMAL BREAK TAPE
10mm thick

Can we assist with any additional Steel Building Products?



QLD

Brisbane	07 3375 0100
Bundaberg	07 4155 5999
Cairns	07 4054 0888
Mackay	07 4968 1255
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Townsville	07 4779 8266

NSW

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Canberra	02 6298 2777
Dubbo	02 6883 4800
Lismore	02 6622 6677
Newcastle	02 4954 5799
Smithfield	02 9756 5277
Sydney	1300 766 346
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NT

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