

The Floor System The Others Look Up To

STEEL JOIST SYSTEM PRODUCT MANUAL



The Steel Joist System designed for fast, accurate assembly with a tabbed shear connection system and optional pre-punched service holes up to 200mm.

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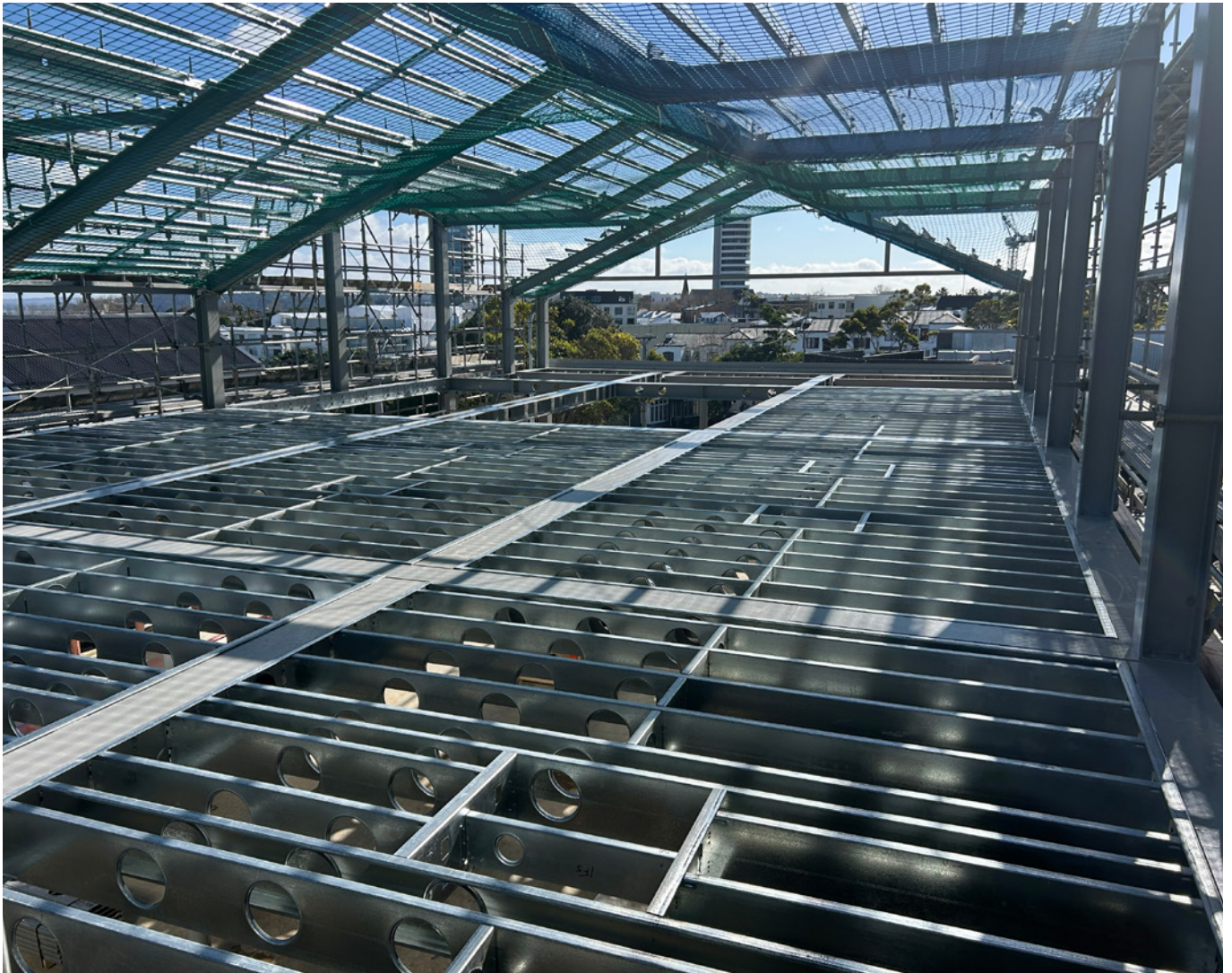
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Overview

The SPEEDFLOOR® Steel Joist System is an engineered floor solution providing exceptional performance and construction efficiency. The joist has been engineered for strength and ease of installation while offering economical spanning performance that is adaptable to a variety of building designs and construction methods.



Practical, durable, simple

The system consists of cold formed, galvanised steel lipped c-section joists and perimeter channels incorporating a tabbed shear connection with an option for pre-punched service holes in the web of the joist.

Application

The long spanning capability and construction flexibility, along with other features, allow ease of inclusion into a variety of building designs and construction methodologies.

The SPEEDFLOOR® Joist System is fully engineered and offers span tables that assist with council approvals. Specifications for fire ratings and acoustic solutions for architects, engineers, and developers are also available.

Applications include mezzanine floors in commercial buildings, floors in portal framed sheds, platforms for industrial structures, residential mid floors, sub floors on piled foundations and transportable units.

Mechanical Properties

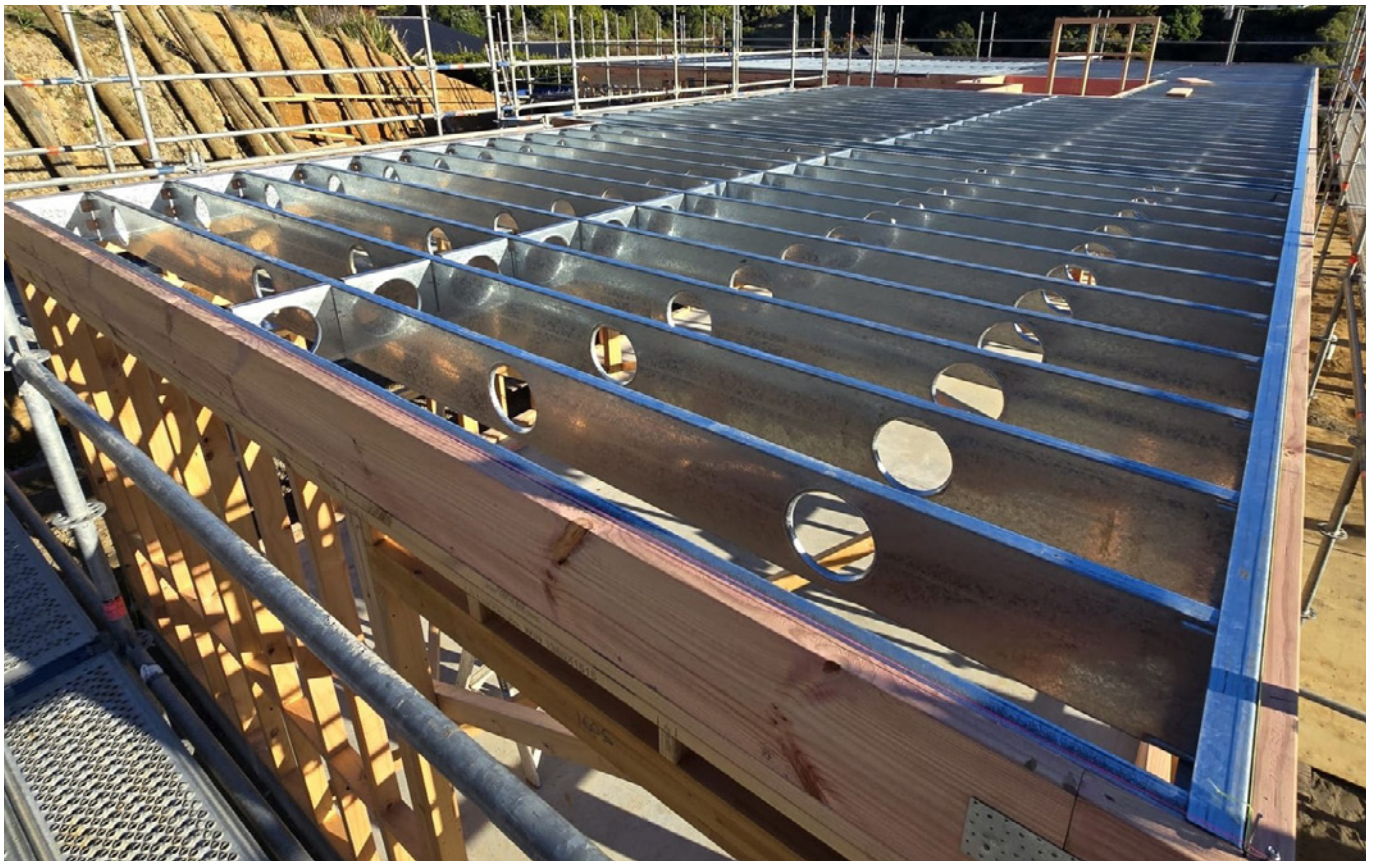
The SPEEDFLOOR® Steel Joist is manufactured from steel which has a minimum yield stress of 250MPa, a minimum tensile stress of 280MPa and a minimum galvanised coating thickness of 275g/sq m. The cold formed process enhances the yield stress and tensile strength of the roll-formed shape and along with the flanged holes, produces an accurate, rigid section that has a high load carrying capacity.

SPEEDFLOOR® offer the SPEEDFLOOR® Steel Floor Joist System in a range of section sizes

"C"Section	Thickness (mm)	Second moment of area (full)		Section modulus (full)	Moment Capacity (distortional buckling)	Shear capacity (reduced for web penetrations)	End Connection Capacity*
		I _x (10 ⁶ mm ⁴)	I _y (10 ⁶ mm ⁴)	Z _x (10 ³ mm ³)	ΦM _{dbx} (kNm)	ΦV _v (kN)	kN
140x45	1.55	1.110	0.102	15.840	3.56	9.08	4.70
150x45	1.55	1.110	0.102	15.840	3.56	9.08	4.70
190x45	1.55	2.303	0.112	24.240	4.71	13.79	4.70
200x45	1.55	2.608	0.113	26.080	5.07	13.06	4.70
240x45	1.85	4.818	0.138	40.150	7.21	18.41	12.00
250x45	1.85	5.329	0.139	42.630	7.53	18.80	12.00
290x45	2.5	10.240	0.184	70.630	13.28	36.54	12.00
300x45	2.5	11.150	0.185	74.370	13.98	35.28	12.00
350x45	2.5	16.500	0.192	94.310	14.50	30.10	12.00

Notes

Joist spans over 3m are to have at least 1 row of full depth mid span blocking. For definition of distortional buckling, refer AS/NZS 4600:2018. The section modulus Z_x in the table is for the full section. The actual section modulus varies depending on design stress. This table should be used in conjunction with the design requirements of AS/NZS 4600:2018. *End connection capacity is based on full scale testing completed at Auckland University Structural Laboratories.

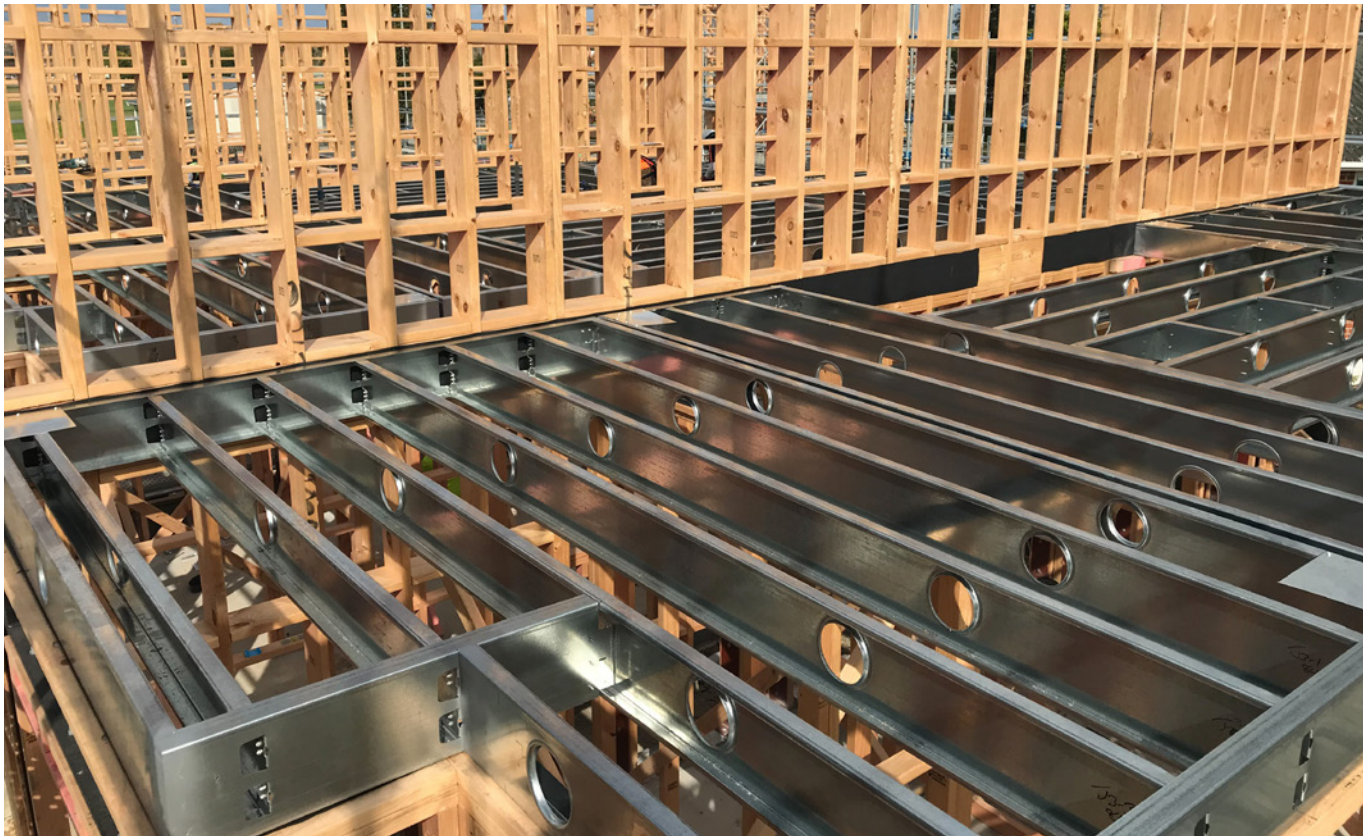


Design

Design principles: SPEEDFLOOR® Steel Joists have been designed to comply with NZS 3404, AS/NZS 4600:2018 and AS 4100:2020. They also comply with sensitivity deflection and dynamic vibration requirements imposed by AS 3623 and NZS 1170.0. Loading is based on NZS 1170.1.

Material: SPEEDFLOOR® joists are roll-formed from zinc coated steel coil conforming to AS 1397. The minimum mass coating of galvanising is 275g/m². The standard steel used is Grade 250 and has a minimum yield stress of 250MPa and a minimum tensile stress of 280MPa.

The deadload of the span tables is calculated at 0.5kPa. For continuous spans the max span is to be reduced by 15%. Service holes are to be placed 300mm minimum away from any load bearing supports and at a minimum of 1000mm centres.



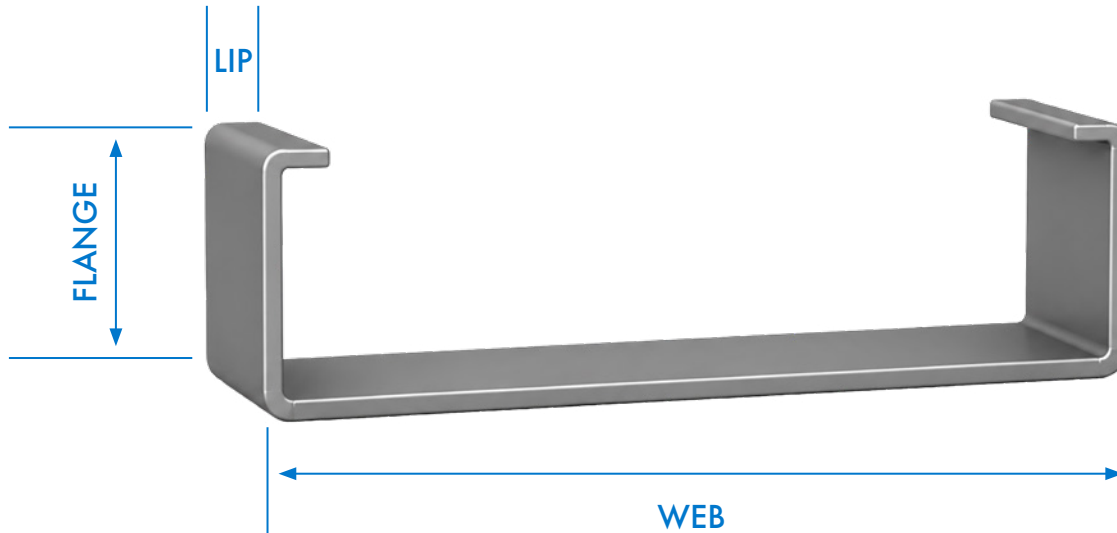
Service Hole Sizes

- A. FJ140/150 - 50mm diameter
- B. FJ190/200 - 90mm diameter
- C. FJ240/250 - 140mm diameter
- D. FJ290/300/350 - 200mm diameter

Maximum service openings have been calculated in accordance with AS/NZS 4600:2018 Clause 3.3.4.2, except for 200 mm diameter penetrations, which have been independently verified through full-scale testing at the Waikato University Structural Laboratories.

Joist Selection

Live load span tables – Floor Joist



Max Span (m) of joists at nominated centres (mm) for 1.5kPa live load – Typical for Residential applications.

Profile	Web	Flange	Lip	Material	Max. Span *		
					400 Centres	450 Centres	600 Centres
FJ140/150	140/150	45	15	1.55	3.7	3.4	3.1
FJ190/200	190/200	45	15	1.55	4.7	4.5	4.1
FJ240/250	240/250	45	15	1.85	5.7	5.5	5.1
FJ290/300	290/300	45	15	2.50	6.9	6.7	6.2
FJ350	350	45	15	2.50	7.5	7.3	6.9

Max Span (m) of joists at nominated centers (mm) for 3.0kPa live load – Typical for Commercial applications.

FJ140/150	140/150	45	15	1.55	3.5	3.4	3.0
FJ190/200	190/200	45	15	1.55	4.3	4.0	3.0
FJ240/250	240/250	45	15	1.85	5.1	5.0	4.3
FJ290/300	290/300	45	15	2.50	6.2	6.0	5.6
FJ350	350	45	15	2.50	6.9	6.7	5.8

Max Span (m) of joists at nominated centers (mm) for 5kPa floor live load – Typical for Industrial applications.

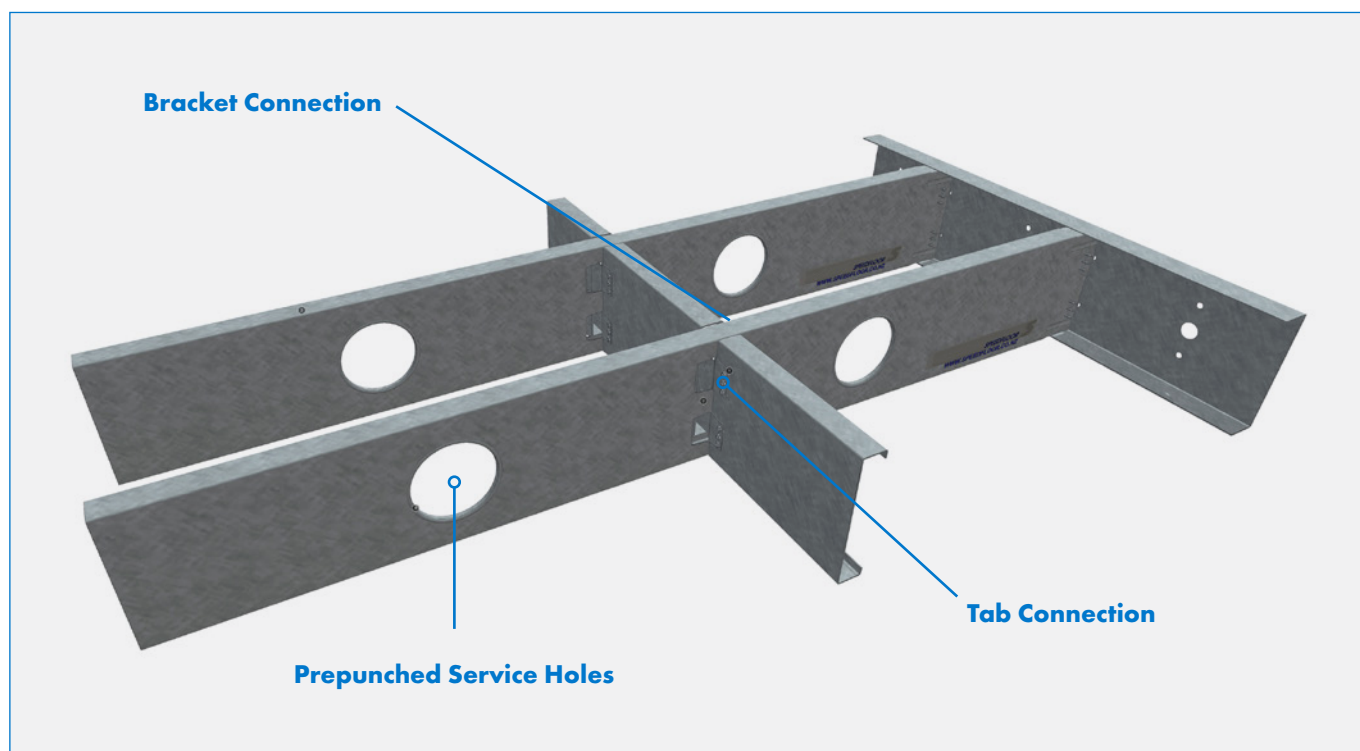
FJ140/150	140/150	45	15	1.55	SED	SED	SED
FJ190/200	190/200	45	15	1.55	SED	SED	SED
FJ240/250	240/250	45	15	1.85	4.2	4.0	3.4
FJ290/300	290/300	45	15	2.50	5.6	5.3	4.6
FJ350	350	45	15	2.50	5.8	5.5	4.8

SED: Requires specific engineering design

Design Parameters: Max total deadload is 0.5kPa, the span tables are for single span, if joists are used in continuous span the max span should be reduced by 15%. The maximum length of a joist should be no longer than 7.5m. Service holes should be a minimum of 300mm away from any load bearing supports and at a minimum of 1000mm centres apart. Joist spans of over 3.0m are to have at least one row of full depth mid-span blocking installed. Point loads on any joist are to be specifically engineered based on capacity tables.

Joist Selection

Solid Block Connection

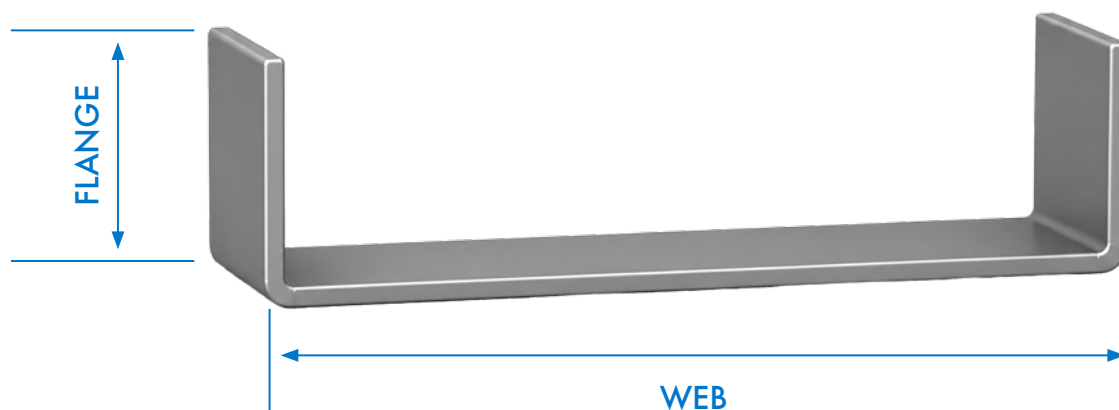


The solid block to pre-punch shear tab connection has been tested and test results exceed the tabulated joist capacities.



Joist Selection

Live load span tables – Perimeter Channel



Max Span (m) of joists at nominated centres (mm).

Joist Span up to:	Size	Thickness	Max Perimeter Channel Span		
			1.5kPa	3kPa	5kPa
3000*	FJ140/150	1.55	1800	1300	1100
	FJ190/200	1.55	2100	1600	1200
	FJ240/250	1.85	2700	2000	1600
	FJ290/300	2.5	3700	2700	2200
	FJ350	2.5	SED	SED	SED
4000*	FJ140/150	1.55	1600	1100	–
	FJ190/200	1.55	1800	1400	1100
	FJ240/250	1.85	2300	1700	1400
	FJ290/300	2.5	3200	2400	1900
	FJ350	2.5	SED	SED	SED
5000*	FJ140/150	1.55	1400	1000	–
	FJ190/200	1.55	1600	1200	1000
	FJ240/250	1.85	2100	1600	1200
	FJ290/300	2.5	2800	2100	1700
	FJ350	2.5	SED	SED	SED
6000*	FJ140/150	1.55	1300	–	–
	FJ190/200	1.55	1500	1100	–
	FJ240/250	1.85	1900	1400	1100
	FJ290/300	2.5	2600	1900	1500
	FJ350	2.5	SED	SED	SED

SED: Requires specific engineering design

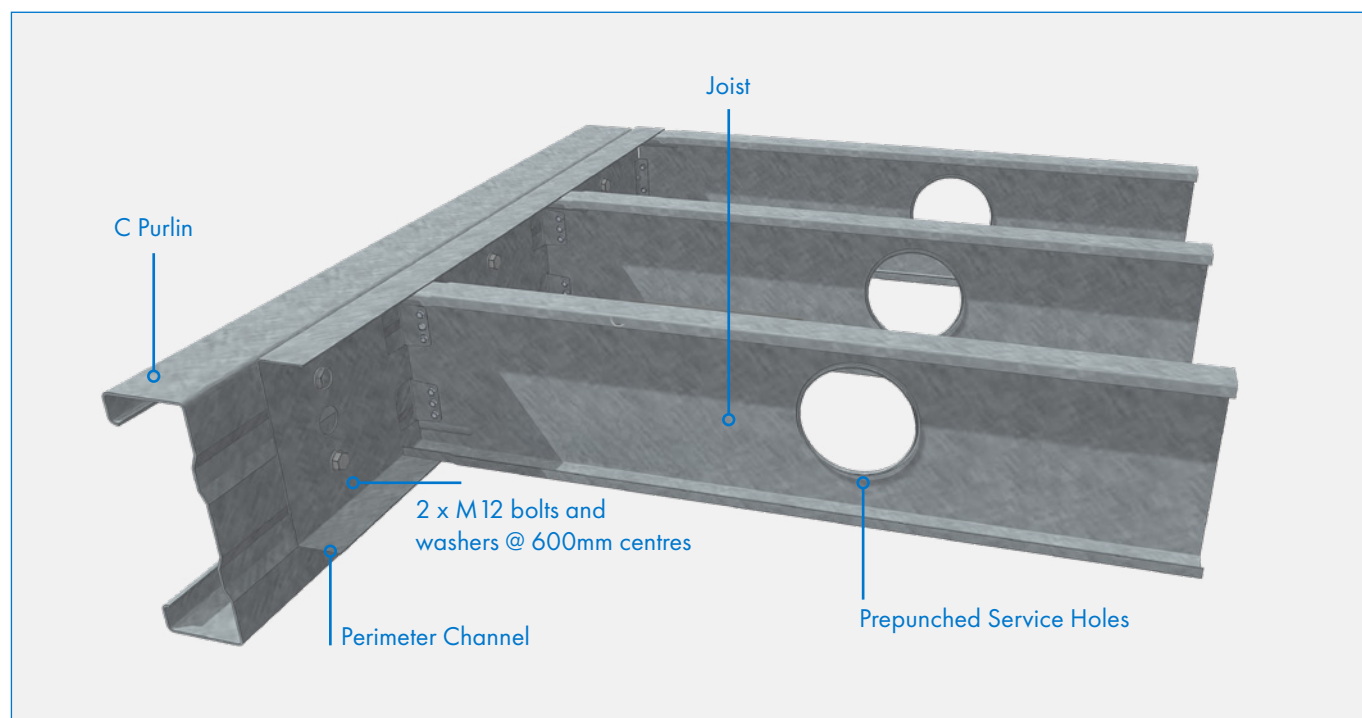
*Perimeter Channel spans are not applicable for support of a loadbearing wall or roof loads.

*Balustrade connecting to the channel need to be independently assessed for suitability.

*No service holes are allowed within the span of the Perimeter Channel.

Live Load Span Tables

- Composite C section Perimeter Channels.

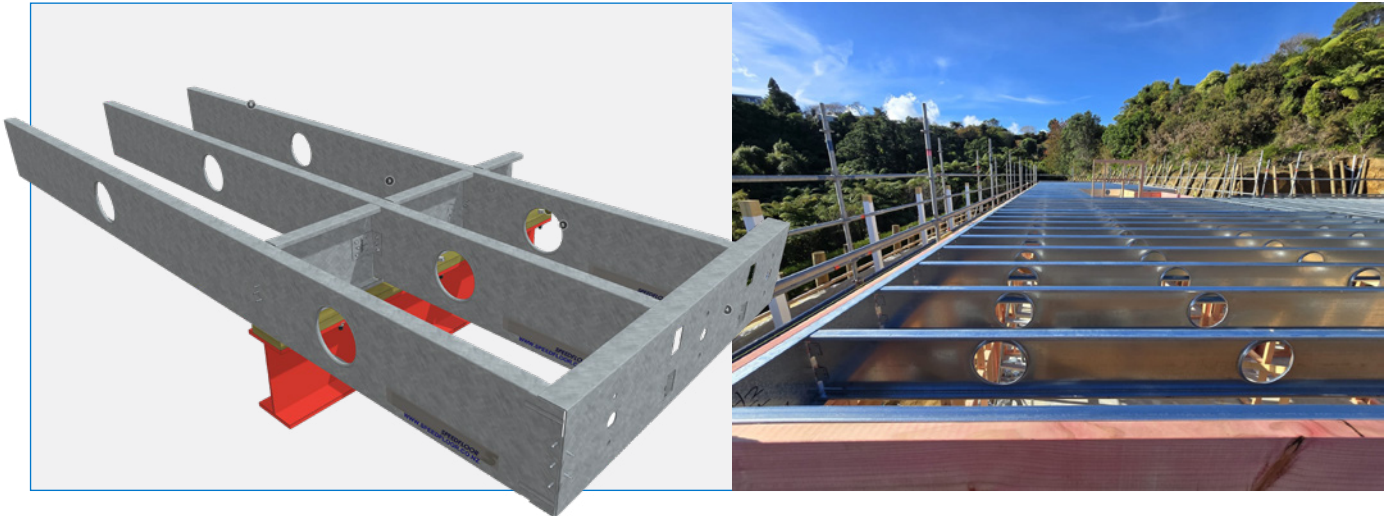


Joist Span up to:	Composite Section Size	1.5kPa	3kPa	5kPa
3000*	PC140/150 + C200/18	4.2	3.6	2.8
	PC190/200 + C200/18	4.3	3.6	2.9
	PC240/250 + C250/18	5.1	4.4	3.6
	PC290/300 + C300/18	6.0	5.2	4.1
	PC350 + C350/18	SED	SED	SED
4000*	PC140/150 + C200/18	3.9	3.1	2.5
	PC190/200 + C200/18	4.0	3.1	2.5
	PC240/250 + C250/18	4.7	3.9	3.1
	PC290/300 + C300/18	5.6	4.5	3.6
	PC350 + C350/18	SED	SED	SED
5000*	PC140/150 + C200/18	3.7	2.8	2.2
	PC190/200 + C200/18	3.8	2.8	2.2
	PC240/250 + C250/18	4.5	3.5	2.8
	PC290/300 + C300/18	5.3	4.0	3.2
	PC350 + C350/18	SED	SED	SED
6000*	PC140/150 + C200/18	3.4	2.5	2.0
	PC190/200 + C200/18	3.4	2.5	2.0
	PC240/250 + C250/18	4.2	3.2	2.5
	PC290/300 + C300/18	4.9	3.7	2.9
	PC350 + C350/18	SED	SED	SED

SED: Requires specific engineering design

* Tables relate to single span floors. Perimeter Channels to be fixed every 600mm with 2 x M12 bolts and washers to C Purlin.

Cantilever Joists



Profile	Web	Flange	Lip	Material	Max Span *		
					400 Centres	450 Centres	600 Centres
FJ140/150	140/ 150	45	15	1.55	0.9	0.9	0.8
FJ190/200	190/ 200	45	15	1.55	1.2	1.1	1.0
FJ240/250	240/ 250	45	15	1.85	1.5	1.5	1.3
FJ290/300	290/ 300	45	15	2.50	2.0	1.9	1.7
FJ350	350	45	15	1.85	SED*	SED*	SED*

*SED: Requires specific engineering design

NOTE: Minimum Back Span required is 2 x Cantilever Span. Maximum live load of 5kPa. Dynamic vibration of cantilevers is based on NZS1170.0:2002 with a 1-2mm deflection under a 1kN point load and assumes a rigid wall below. For cantilever joists supported by beams, specific vibration design should be undertaken. No service penetrations on cantilever span.



3D Models



SF 290 Joist to LGSF Wall A



SF 240 or 290 Joist to LGSF Wall B



SF 140 or 190 Joist to LGSF Wall C



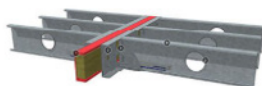
SF 140 or 190 Joist to LGSF Wall D



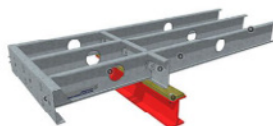
SF Joist to Concrete Wall



SF Joist to Side of Timber Wall



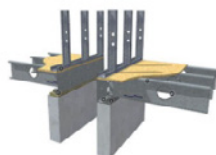
SF Joist to PFC Beam



SF Joist Cantilever Detail



SF Joist Standard Detail Perimeter Channel to C Purlin Bearer



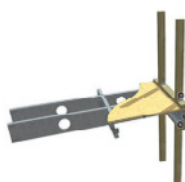
SF Joist on Top of Concrete Wall



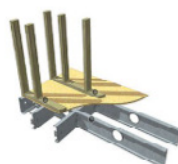
SF Joist Blocking Standard Detail



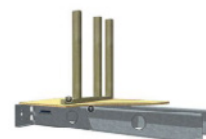
Speedfloor Steel Joist Ext Wall Bracket Detail



Speedfloor Steel Joist Ext Wall GIB Handybrac



Speedfloor Steel Joist interior Wall Screw Fix 2



Speedfloor Steel Joist Interior Wall Screw Fix



Speedfloor Steel Joist Int Wall GIB Handybrac



Speedfloor Steel Joist Int wall Bracket detail



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