TECHNICAL MANUAL

THIRD EDITION

JJI-Joists











INVESTOR IN PEOPLE

"SPECIFY JJI-JOISTS TODAY, FOR THE CONSTRUCTION OF TOMORROW."

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Whilst every effort was made to ensure the accuracy of this publication at the time of printing James Jones & Sons Ltd cannot be held responsible for changes to Building Regulations, NHBC Standards etc.

INTRODUCTION TO JAMES JONES & SONS LIMITED

James Jones & Sons Ltd is the UK's leading manufacturer of I-Joists based at its Timber Systems Division in Forres, Morayshire. The Timber Systems Division prides itself on building strong partnerships throughout the supply chain, concentrating on its core values of quality and service.

JJI-Joists are manufactured under the strictest quality and environmental standards, and this new edition of the Technical Manual outlines the applications and versatility of JJI-Joists. The range is manufactured to UK sizes and specifications, and is available on a Just-In-Time basis from a comprehensive stock holding. The entire production and distribution process has been audited by third party accreditation systems, and a Life Cycle Assessment has been carried out to ensure full sustainability and environmental compliance.

Through the use of the bespoke, dedicated software programmes, JJI-Joists can be specified and engineered to exacting standards, for applications including floors and roofs of both domestic and commercial buildings.

JJI-Joists are part of a comprehensive building system and are complimented by Glulam and metal connectors and this manual highlights their use and combinations.

JJI-Joists are sold through dedicated Distributors, merchants, timber frame kit manufacturers and roof truss manufacturers situated strategically across the UK and Ireland. These combined resources, backed up by dedicated James Jones & Sons personnel, ensure that the design, specification and supply of JJI-Joists is seamless and of the highest quality.

ROOTS

Mr James Jones started trading in timber and allied products in the middle of the nineteenth century. Since being incorporated in 1905, James Jones & Sons has grown both organically and by acquisition.



"Specify JJI-Joists today, for the construction of tomorrow."

THE COMPANY

James Jones & Sons is one of the largest suppliers of British Timber in the UK today. The company's sawmills are strategically placed to take advantage of the increasing supply of saw logs being produced from post war plantations. These are bought from both private and state owned forests as well as woodlands owned and managed by the company.

FAMILY CONCERN

James Jones & Sons is a real family business. Even with a staff of over 500 it has the culture of a family firm. Like any good family, the company cares for it's members. That concern extends to whole communities in rural areas where the company is a major employer. There is also an equal concern for customer satisfaction. The company's mission is to maintain the highest standards of quality and service in the industry.

CUTTING EDGE

The company strives to maintain its competitive advantages. Variety of product is one. Wood is harvested and processed for specific markets and end uses such as: Construction, Palletwood, Packaging and Fencing.

James Jones & Sons has a team of highly trained professionals who look after the purchasing and harvesting of round timber, making sure that the right logs go to the right mill where they can be processed to best advantage. Good relationships with forest owners are vital and in most cases are of many years standing thus providing the right background for the purchase of our raw material.

Quality comes from modern sawmills staffed by experienced people. James Jones & Sons is fortunate in having many people who are experts in their field and who know about and understand wood. This ensures the quality of our products is maintained at the highest level.

THE FUTURE

As well as investing in state of the art technology for our traditional sawmilling business, James Jones & Sons Ltd have taken the strategic decision to invest in and develop more innovative products. The JJI-Joist, manufactured by James Jones & Sons Ltd, Timber Systems Division, is the direct result of one of the new technologies that has been embraced by the company. Following the successful launch of the JJI-Joist range in 1999 the Timber Systems Division have added a fully automated second production line along with a highly efficient finger jointing line to keep up with demand. In addition to the production investment, the Division has also set up a technical and design office to provide a full design and engineering support service.

THE JJI-JOIST SYSTEM

The JJI-Joist system relies on a unique combination of engineered products designed to compliment each other and deliver outstanding performance.

JJI-JOISTS

The work horse of the system, a versatile light weight structural member ideal for floor joists, rafters, purlins and wall studs.



For more information see page 5

JJ-GLULAM

For the most demanding applications, high strength and stiffness combined with dimensional stability make this the ideal choice for heavily loaded members in floors, roofs and walls.



For more information see page 11

METALWORK

The key to making the system work is being able to connect everything together. A comprehensive range of connectors designed specifically for the JJI-Joist system are available from two approved suppliers.



For more information see page 17

SOFTWARE

The JJI-Joist system is fully supported by three Windows[™] based software packages written in the UK to provide fast and cost effective design solutions for today's construction industry.

These packages are regularly updated to ensure compliance with ever changing Building Regulations and Codes of Practice, each new version incorporating new features and developments to help the designer make the most of the system.



JoistMaster is an extremely powerful beam design tool, which enables the specifier to quickly assess the most cost effective joist solution, tailored to his/her particular design requirements, and provide a calculation printout suitable for Local Authority approval. JoistMaster is freely available to download from www.jji-joists.co.uk

FloorMaster is a comprehensive floor design and layout package allowing trained designers to quickly and accurately produce detailed layout drawings, installation details, material call-offs, calculations and design quotations for any building footprint.

OptiMaster is a stock optimisation package designed to work with the output from FloorMaster.



Consultec® Timber Frame software, one of the UK's leading whole house packages, now contains a JJI-Joist floor design module. This allows the design and specification of JJI-Joist floors as part of the whole house design process.

DISTRIBUTION

The JJI-Joist System is available from a network of builders/ timber merchants and timber frame and engineered timber system manufacturers providing local, quality expertise.

These Distributors are trained to use our software and understand the correct use and specification of our products. This training is ongoing and ensures our Distributors have the skills required to provide an efficient, cost-effective, JJI-Joist solution.

Distributor details are available to download from www.jji-joists.co.uk

CUSTOMER SERVICES AND TECHNICAL SUPPORT

James Jones & Sons, Timber Systems Division has a highly trained team of Technical, Engineering and Sales personnel providing UK and Irish national coverage to ensure simple, safe and quick installation of JJI-Joist Systems. A summary of the services offered is given below.

- Pre and After Sales Assistance
- Engineering Support
- Product Training Courses
- Software and Design Training
- Building Site Training
- Full Design and Engineering Service

APPROVALS

JJI-Joists are an accepted building material within the construction industry thanks to third party certification from both the British Board of Agrément and BM TRADA Certification.







BBA certification and BMTRADA Q-Mark are recognised by NHBC, Zurich, Local Authority Building Control and others.



James Jones & Sons Ltd are founder members of the UK Timber Frame Association (UKTFA) Engineered Wood Products Committee and were involved in the drafting of the Code of Practice for the Design of Engineered Wood Products which provides guidance on the design of structures using I-joists. Design output from James Jones software is produced in full compliance with this Code of Practice providing further assurance that the design is to the highest standard.



QUALITY CONTROL AND QUALITY ASSURANCE

The success of a manufactured product is often determined by its quality. It is for this reason the James Jones & Sons Ltd, Timber Systems Division maintains a thorough Quality Assurance program which enables us to achieve our goal of producing a consistent and uniform product of exceptionally high standards. JJI-Joists are manufactured under a Quality Assurance scheme which complies with ISO 9001:2000 and CE marking.



RESEARCH AND DEVELOPMENT

The Timber Systems Division has an ongoing research and development program designed to find new applications for existing products and to improve the performance in current applications. In addition to this, production methods and technology are continuously reviewed and improved to maximise quality and efficiency.

ENVIRONMENTAL MANAGEMENT

Our ISO 14001:2004 accreditation guarantees compliance with all current and forthcoming environmental legislation. Systematic environmental improvements are targeted, cost effective and innovative. Employee competence has enabled reductions in manufacturing wastes and energy use throughout the site. Sustainable heating systems combine with evolving process technologies to deliver a JJI-Joist with the smallest environmental footprint possible.

Our international environmental accreditation also acts as a framework for guaranteeing sustainable timber supply and implementing Life Cycle Assessments to deliver JJI-Joists with a unique, sector leading Ecohomes rating.



CHAIN OF CUSTODY

Increasingly, UK Government and both public and private sector specifiers requires proof of sustainable timber supply. JJI-Joists again out-perform the sector on this key issue via our Chain of Custody accreditation.

Sustainable timber supply has always been integral to the manufacture of our engineered JJI-Joists. Uniquely JJI-Joists are able to be specified as FSC Certified or PEFC Certified. Through our BM Trada Forest Products Certification, independent Certification details can be supplied through the supply chain to both specifiers and to individual construction sites as required.





BRE ENVIRONMENTAL PROFILE

The Life Cycle Profiling of JJI-Joists is the final complimentary part of the JJI-Joist environment strategy. Our shipping, transport and manufacturing processes are such that our joists are "A" rated in all typical applications utilising the Ecohomes system.

JJI-Joists alone have completed this process, enabling specifiers, architects, and housing associations independent verification of the "excellent" environmental rating of all JJI-Joists supplied. This ongoing detailed appraisal process, has enabled the quantification of environmental improvements in areas such as shipping patterns, new formulation resins, and fossil fuel to biomass energy substitution.

Such a process further strengthens our ISO 14001:2004 and Chain of Custody procedures which combine to deliver true sustainability in practice. Profile Certification details are available from our website together with Environmental Management and Chain of Custody certificates and background information.



INTRODUCTION

A JJI-Joist is a composite engineered timber joist, combining 45mm deep high-grade finger jointed softwood flanges (C24) with a 9mm thick oriented strand board (OSB 3) web. Four flange widths are available at 45, 60, 72 and 97mm wide.



These materials have different specific properties and by combining the two materials in this way to form a composite section you can use the strengths of each one where it is needed most. This results in the new section outperforming the individual materials that it is made from (the sum is greater than its parts) making it more structurally efficient.

Using advanced technology these components are combined to produce an innovative alternative to conventional construction timber with many additional advantages.

ADVANTAGES

JJI-Joists are designed to give a superior strength to weight ratio enabling the manufacture of longer and lighter structural members. The JJI-Joist, with a softwood flange:

- Is capable of spanning longer distances
- Is easier to handle
- Is easier to fix and nail
- Is less prone to splitting and delamination
- Is quicker to install
- Is extremely stable
- Reduces building maintenance
- Provides a less complex design solution
- Is simple to specify using superior software
- Has Part E compliant details available
- Is FSC/PEFC accredited
- Has a BRE Environmental Profile

JJI-JOIST RANGE AND TOLERANCES

JJI-Joists are available in a comprehensive range of sizes, designed specifically for the UK market, and in lengths of up to 12m.

Islat Dauth	A	В	C	D	Timber
Joist Depth	45mm	60mm	/2mm	9/mm	Grade
145	1				C24
195	1	1	1	1	C24
220	1	1	1	1	C24
235	1	1	1	1	C24
245	1	1	1	1	C24
300	1	1	1	1	C24
350			1	1	C24
400			1	1	C24
450				1	C24

Table 1. JJI-Joist Product Range

Member Dimension	Tolerance (mm)
Overall Joist Length	+/-3.0
Overall Joist Depth	+/-2.0
Flange Thickness/Depth	+/-2.0
Web Thickness	+/-0.8

Table 2. JJI-Joist Manufacturing Tolerance

JJI-JOIST IDENTIFICATION AND MARKING

JJI-Joists are identified by an alpha numeric code that specifies the joist depth, flange size and flange grade (see example below). This code is printed at regular intervals along the centreline of the web along with the production time and date to facilitate on-site identification and traceability.



In addition to the above information, the clear warning "DO NOT CUT FLANGES" is printed along the length of each flange as a precaution against creating unnecessary structural damage.

JJI-JOIST PROPERTIES

It is possible to design JJI-Joist structures using either a Permissible Stress Design Code (BS5268 Part 2) or a Limit State Design Code (EN1995-1-1/Eurocode 5). Each code requires properties that are derived and presented in a different way. Permissible stress design properties, intended for use with BS5268 Part 2 can be found in BBA Certificate No.99/3633. Characteristic capacities, intended for use with Eurocode 5, can be found in European Technical Approval 05/0224.

	Joist Weight	Moment Flexural S Capacity Rigidity Ri			Shear Capacity	End Bearing				Intermediate Bearing		
	Ū	M _d	EI	GA	V _d	45	mm	89	mm	89	mm	
Joist Type	(kg/m)	(kNm)	(10ºNmm ²)	(10 ⁶ N)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	
JJI 145A	2.18	1.75	115	0.61	2.61	2.38	N/A	2.92	N/A	5.02	N/A	
JJI 195A	2.48	2.56	250	0.98	3.29	3.00	5.90	3.55	5.90	6.34	8.90	
JJI 195B	3.08	3.23	334	"	"	"	"	"	"	"	"	
JJI 195C	3.57	3.73	402	"	"	"	"	"	"	"	"	
JJI 195D	4.58	4.27	542	"	"	"	"	"	"	"	"	
JJI 220A	2.62	2.96	338	1.17	3.64	3.31	5.90	3.86	5.90	7.00	8.90	
JJI 220B	3.23	3.73	452	"	"	"	"	"	"	"	"	
JJI 220C	3.72	4.32	543	"	"	"	"	"	"	"	"	
JJI 220D	4.73	5.47	733	"	"	"	"	"	"	"	"	
JJI 235A	2.71	3.19	397	1.29	3.84	3.50	5.90	4.05	5.90	7.39	8.90	
JJI 235B	3.32	4.02	531	"	"	"	ш	"	"	"	"	
JJI 235C	3.80	4.65	639	"	"	"	u	"	"	"	"	
JJI 235D	4.82	5.89	862	"	"	"	"	"	"	"	"	
JJI 245A	2.77	3.38	440	1.36	3.98	3.63	5.90	4.17	5.90	7.66	8.90	
JJI 245B	3.38	4.23	588	"	"	"	"	"	"	"	"	
JJI 245C	3.86	4.90	707	"	"	"	u	"	"	"	"	
JJI 245D	4.87	6.20	954	"	"	"	ш	"	"	"	"	
JJI 300A	3.09	4.20	716	1.77	4.73	3.51	5.90	4.32	5.90	6.91	8.90	
JJI 300B	3.70	5.30	956	"	"	"	"	"	"	"	"	
JJI 300C	4.18	6.14	1150	"	"	"	ш	u	"	"	"	
JJI 300D	5.20	7.77	1550									
JJI 350C	4.48	7.23	1640	2.15	5.42	3.14	5.90	3.79	5.90	6.06	8.90	
JJI 350D	5.49	9.16	2210	"	"	"	ш	u	"	"	u	
JJI 400C	4.77	8.30	2240	2.53	6.10	2.87	5.90	3.39	5.90	5.42	8.90	
JJI 400D	5.78	10.52	3000	"	u	"	ш	"	u	u	u	
JJI 450D	6.07	11.85	3920	2.90	6.79	2.65	5.90	3.09	5.90	4.94	8.90	

Table 3. Long Term Permissible Design Properties for JJI-Joists (BS5268:2)

Notes for Table 3:

- 1. Do not mix values from Table 3 and Table 4.
- 2. Values given are for long term load durations only (k_3 =1.0).
- 3. Values are applicable to joists in Service Class 1 only.
- 4. Figures in bold indicate that web stiffeners are required to attain the stated value. In BBA Certificate No.99/3633 these values are limited to the shear capacity of the joist. The values given here allow for the possibility of point loads from above.
- All strength properties are given for joists used in a load sharing situation. Non-load sharing values can be obtained as follows: Moment Capacity – Divide the tabulated value by 1.07.
- Shear and Bearing Capacity Divide the tabulated value by 1.04.
- 6. The bearing capacities are based on the bearing lengths shown.
- 7. Minimum end bearing length = 45mm (A longer bearing may be required were the joists are used to restrain external masonry walls).
- 8. Minimum intermediate bearing length = 89mm.
- 9. The long term uniformly distributed bottom flange pull-off load is 5.5kN/m.
- 10. End bearing capacities for bearing lengths between 45-89mm can be found by linear interpolation.



	Weight Mean	Moment Capacity	Moment Capacity	Flexural Rigidity	Shear Rigidity	End B	earing	Intermedia	ate Bearing	Shear
		system	System	EI	GA	451	nm	89	mm	value
Joist Type	(kg/m)	(kNm)	(kNm)	(10ºNmm ²)	(10 ⁶ N)	(kN)	(kN)	(kN)	(kN)	(kN)
JJI 145A	2.18	3.75	4.13	118	0.748	9.10	9.10	17.70	17.70	9.38
JJI 195A	2.48	5.48	6.02	256	1.230	9.10	9.10	17.70	17.70	10.49
JJI 195B	3.08	6.92	7.62	342	"	12.20	12.20	23.60	23.60	11.61
JJI 195C	3.57	8.03	8.83	411	"	14.40	14.60	28.30	28.30	12.44
JJI 195D	4.58	10.22	11.24	555	н	14.40	19.70	30.10	31.20	14.06
JJI 220A	2.62	6.37	7.01	348	1.480	9.10	9.10	17.70	17.70	11.18
JJI 220B	3.23	8.05	8.85	464	н	12.20	12.20	23.60	23.60	12.27
JJI 220C	3.72	9.32	10.26	557	н	14.40	14.60	28.30	28.30	13.09
JJI 220D	4.73	11.86	13.04	750	н	14.40	19.70	30.10	31.20	14.71
JJI 235A	2.71	6.92	7.61	409	1.620	9.10	9.10	17.70	17.70	11.62
JJI 235B	3.32	8.73	9.60	546	н	12.20	12.20	23.60	23.60	12.70
JJI 235C	3.80	10.11	11.12	655	н	14.40	14.60	28.30	28.30	13.51
JJI 235D	4.82	12.85	14.14	883	н	14.40	19.70	30.10	31.20	15.12
JJI 245A	2.77	7.28	8.01	454	1.720	9.10	9.10	17.70	17.70	11.93
JJI 245B	3.38	9.19	10.11	605	н	12.20	12.20	23.60	23.60	12.99
JJI 245C	3.86	10.64	11.70	725	н	14.40	14.60	28.30	28.30	13.80
JJI 245D	4.87	13.52	14.87	977	н	14.40	19.70	30.10	31.20	15.40
JJI 300A	3.09	9.34	10.28	740	2.250	9.10	9.10	17.70	17.70	13.73
JJI 300B	3.70	11.75	12.92	984	н	12.20	12.20	23.60	23.60	14.72
JJI 300C	4.18	13.58	14.94	1180	н	13.90	14.60	28.30	28.30	15.49
JJI 300D	5.20	17.22	18.95	1590	н	13.90	19.70	30.10	31.20	17.07
JJI 350C	4.48	16.31	17.94	1690	2.740	10.80	14.60	28.30	28.30	17.16
JJI 350D	5.49	20.65	22.71	2270	н	10.80	19.70	30.10	31.20	18.70
JJI 400C	4.77	19.09	21.00	2310	3.230	9.50	14.60	28.30	28.30	18.91
JJI 400D	5.78	24.12	26.53	3090	н	9.50	19.70	30.10	31.20	20.41
JJI 450D	6.07	27.64	30.40	4040	3.711	7.80	19.70	25.00	31.20	22.18

 Table 4. Characteristic Capacities for JJI-Joists (Eurocode 5)

Notes for Table 4:

- 1. Do not mix values from Table 3 and Table 4.
- 2. Figures in bold indicate values that are obtained using web stiffeners.
- 3. The bearing capacities are based on the bearing lengths shown.
- $\label{eq:alpha} 4. \quad \mbox{Minimum end bearing length} = 45 \mbox{mm.} \mbox{ (A longer bearing may be required where the joist is used to restrain)}.$
- 5. Minimum intermediate bearing length = 89mm.
- 6. Advice on choosing appropriate partial factors for limit state design can be found in ETA-05/0224.

PERMISSIBLE JJI-JOIST VERTICAL LOAD CAPACITIES

JJI Joist Depth	Maximum long term load per metre run (kN/m)	Maximum single point load (kN)
195	25.0	12.0
220	20.0	12.0
235	20.0	12.0
245	19.0	12.0
300	17.0	10.0
350	15.0	10.0
400	13.0	8.0
450	12.0	8.0

Table 5. Permissible JJI-Joist Vertical Loads

Notes for Table 5:

 Loads are given for long term load duration. Modification factor k₃ has the following values for other load durations 1.25 Medium Term, 1.5 Short Term.



JJI-JOIST HOLE INSTALLATION GUIDE: CIRCULAR AND RECTANGULAR HOLES

Service holes MUST NOT BE CUT in the JJI-Joist flange.

The maximum size of a service hole that can be cut in the web of a JJI-Joist at a particular location depends on the specific load configuration on the joist. Because of this it is not possible to provide general rules that apply to all cases. The table below gives the minimum required distance, L (in metres), from inside face of support to nearest edge of hole for uniformly loaded, simply supported joists under standard domestic loading of 0.75kN/m² dead load and 1.5kN/m² imposed load at up to 600mm centres. Where this is not the case, the hole(s) can be assessed using the JoistMaster software. Contact your Distributor for advice.

		Hole Size D													
Joist	Joist	5	50	7	'5	1	00	1:	25	1	50	1	75	2	00
Depth	Span														
195	3.0	0.30	0.30	0.30	0.30	0.30	0.30								
	3.5	0.30	0.30	0.30	0.32	0.35	0.49								
	4.0	0.30	0.33	0.47	0.57	0.60	0.74								
	4.5	0.43	0.58	0.72	0.83	0.85	1.00								
	5.0	0.68	0.83	0.97	1.08	1.10	1.25								
220	3.5	0.30	0.30	0.30	0.31	0.38	0.48	0.49	0.62						
	4.0	0.30	0.30	0.39	0.56	0.63	0.73	0.74	0.87						
	4.5	0.30	0.45	0.64	0.81	0.88	0.98	0.99	1.12						
	5.0	0.52	0.71	0.89	1.07	1.13	1.24	1.24	1.38						
	5.5	0.77	0.96	1.14	1.32	1.38	1.49	1.49	1.63						
235	3.5	0.30	0.30	0.30	0.30	0.34	0.49	0.51	0.58						
	4.0	0.30	0.30	0.31	0.51	0.59	0.74	0.76	0.83						
	4.5	0.30	0.34	0.56	0.76	0.84	0.99	1.01	1.08						
	5.0	0.39	0.59	0.81	1.01	1.09	1.24	1.26	1.33						
	5.5	0.64	0.84	1.06	1.26	1.34	1.50	1.51	1.58						
245	3.5	0.30	0.30	0.30	0.30	0.30	0.48	0.50	0.60	0.60	0.72				
	4.0	0.30	0.30	0.30	0.45	0.55	0.73	0.75	0.85	0.75	0.97				
	4.5	0.30	0.30	0.48	0.70	0.80	0.98	1.00	1.10	1.09	1.21				
	5.0	0.30	0.50	0.73	0.95	1.05	1.23	1.25	1.35	1.35	1.47				
	5.5	0.55	0.76	0.98	1.21	1.30	1.50	1.50	1.60	1.60	1.72				
300	4.0	0.30	0.30	0.30	0.30	0.30	0.44	0.48	0.75	0.74	0.93	0.90	1.01	0.99	1.11
	4.5	0.30	0.30	0.30	0.30	0.40	0.69	0.73	1.00	0.95	1.18	1.15	1.26	1.24	1.36
	5.0	0.30	0.30	0.30	0.51	0.65	0.94	0.98	1.25	1.23	1.43	1.40	1.51	1.49	1.61
	5.5	0.30	0.30	0.47	0.76	0.90	1.12	1.12	1.50	1.48	1.68	1.65	1.76	1.74	1.86
	6.0	0.30	0.44	0.72	1.01	1.15	1.45	1.48	1.75	1.73	1.94	1.90	2.02	1.99	2.11

Table 6. Allowable Locations for Round and Rectangular Holes (Domestic Applications)

SERVICE HOLE HELP DIAGRAM



Notes for Table 6:

- 1. Where more than one hole is to be cut, the minimum spacing between holes should be 2 times the width of the largest hole.
- 2. Cut hole on the centreline of the web where possible.
- 3. The rectangular hole width b should not exceed 1.5 times the height D.
- 4. Cut all holes carefully. Do not over-cut and do not cut the flanges.
- 5. Where holes are required in the rim and header joists of timber frame construction refer to James Jones & Sons Ltd.
- 6. Plastic plumbing is ideal for use with JJI-Joists. Where copper plumbing is to be used, careful consideration of the sequence of pipe installation is required.
- 7. Refer to Technical Bulletin No.7 for more comprehensive Hole Charts.
- 8. IF IN DOUBT, ASK.

FIRE RESISTANCE

Successful fire tests have been carried out on JJI-Joists by Chiltern International Fire. A half-hour floor, a one-hour floor and a half-hour floor incorporating ceiling downlighters have all been tested. The following details show the approved floor constructions described in Chiltern International Fire Assessment Numbers FEA/F99142A Rev B and FEA/F99142B that provide a half-hour and one hour period of fire resistance respectively.

HALF-HOUR



1. Floor Deck

- 22mm (for 600mm centres joists) and 18mm (for less than 450mm centres joists) flooring grade chipboard
- 18mm flooring grade plywood
- 18mm oriented strand board (OSB)
- 21mm T&G softwood flooring.

2. Structural Member

• JJI-Joist designed to support the applied loads at maximum 600mm centres (excluding 145mm deep).

3. Ceiling

- 15mm gypsum wallboard and no board edge noggings
- 12.5mm gypsum wallboard with 5mm gypsum plaster skim with board edge noggings
- 12.5mm 'fire resisting' plasterboard with board edge noggings
- 15mm 'fire resisting' plasterboard and no board edge noggings.

Optional - Ceiling downlighters up to 130mm diameter at minimum 500mm spacing.

Optional - Glass wool or rock fibre insulation (not shown) laid on back of ceiling lining.

Reference – Chiltern International Fire assessment No FEA/F99142A Rev B

ONE-HOUR



1. Floor Deck

- 22mm (for 600mm centres joists) and 18mm (for less than 450mm centres joists) flooring grade chipboard
- 18mm flooring grade plywood
- 18mm oriented strand board (OSB)
- 21mm T&G softwood flooring.

2. Structural Member

 JJI-Joist designed to support the applied loads at maximum 600mm centres (excluding 145mm deep). 3. Ceiling

- 12.5mm + 19mm gypsum wallboard and no board edge noggings
- 2 layers 15mm gypsum wallboard with edge noggings. **Optional** – Glass wool or rock fibre insulation (not shown)

laid on back of ceiling lining.

Reference - Chiltern International Fire assessment No FEA/F99142B

TREATMENT AND DURABILITY

JJI-Joists are untreated but when used in a Service Class 1 or 2 environment, the BBA certificate advises that they may be taken to have a service life in excess of 60 years.

ACOUSTIC REQUIREMENTS

JJI-Joists can be used in both intermediate and separating floors that comply with Building Regulation requirements for Resistance to the Passage of Sound (Part E) provided appropriate detailing is used.

INTERMEDIATE FLOORS



- 1. Floor Deck 18mm flooring grade chipboard.
- 2. Structural Member 220mm deep JJI-Joists at a minimum 400mm centres.
- **3.** Ceiling 15mm gypsum wall board and no board edge noggings.

COMPARTMENT FLOOR



- 1. 22mm chipboard and 19mm plasterboard plank (13.5kg/m²).
- 2. 70mm dynamic battens at 600mm centres.
- 3. Minimum 25mm quilt between battens (10-33kg/m³).
- 4. Sub-deck board, minimum 15mm.
- 5. 100mm mineral fibre based quilt (10-33kg/m³).
- 6. Resilient bar at 400mm centres.
- 7. Minimum 245mm deep JJI-Joist at centres to suit span.
- 8. 12.5mm plasterboard and 19mm plasterboard plank (minimum 23kg/m²) or 2 no. 15mm plasterboard.

Alternative solutions may be required in Scotland, refer to the Scottish Building Regulations, Part 5: Noise.

INTRODUCTION

Glued laminated timber, Glulam for short, is a high specification engineered timber product made by gluing together strength graded timber laminations to make up larger sections and distribute the natural defects evenly throughout the volume. The laminations are finger jointed to allow long lengths to be formed. This results in a structural unit of great strength and dimensional stability. Glulam beams can be produced in a range of sectional sizes and are available from James Jones & Sons Ltd in lengths up to 12m.

TYPICAL GLULAM SECTIONS



ADVANTAGES

Glulam beams offer many design performance advantages over conventional timber sections making them ideal for use in domestic and commercial JJI-Joist systems where high load capacity is required. Glulam is:

- Strong high specification laminates make high strength Glulam.
- Stiff resulting in small deflections.
- Consistent quality assured production process.
- Stable good dimensional stability and consistent sizing.
- Reliable elimination of the drying splits/shakes common in solid timber.
- Long available in 12m lengths.
- Straight no twist even with large sections and longer lengths.

These characteristics make Glulam ideal for use as trimmers, beams, purlins, rim boards, columns and lintels, etc. In many instances Glulam can be used to replace steel elements making installation and fixing easier.

GLULAM RANGE AND TOLERANCES

James Jones & Sons Ltd can supply JJ-Glulam as part of the JJI-Joist system. JJ-Glulam is a custom made high specification product in sizes to compliment the JJI-Joist range (Table 5). Other sizes and grades are available to special order.

		Width	
Section Depth	38	45	90
195	1	<i>√</i>	✓
220	1	✓	✓
235	1	<i>√</i>	✓
245	1	✓	✓
300	∕*	✓	✓
350		∕*	✓
400		✓*	1
450		∕*	✓

Table 7. JJ-Glulam Product Range

Notes for Table 7:

 * Indicates sections where the depth to breadth ratio exceeds 7:1. For stability these depths should only be used in multiply members or rim beams.

	Tolerance
Member Dimension	(mm)
Width	+/- 2.0 mm
Depth	+/- 2.0 mm
Length	+/- 5.0 mm
0	

Table 8. Glulam Manufacturing Tolerances

JJ-GLULAM IDENTIFICATION AND MARKING

JJ-Glulam is only available through our Distributors and is generally not marked on the product so that It may be left visible if desired. Care should be take to ensure that Glulam used onsite has been supplied by the Distributor and not a similar but lower specification product from another source.

JJ-GLULAM PROPERTIES

JJ-Glulam should be designed to Eurocode 5 and requires the use of characteristic values as shown in Table 9. If designing to BS5268:2 the designer can conservatively use the properties for C27 softwood.

Glulam Characteristic	/alues	JJ-Glulam	Units
Bending strength	f _{m,g,k}	32	N/mm ²
Tension strength	f _{t,0,g,k}	22.5	N/mm²
	^f t,90,g,k	0.5	N/mm²
Compression strength	f _{c,0,g,k}	29	N/mm²
	^f c,90,g,k	3.3	N/mm²
Shear strength	f _{v,g,k}	3.8	N/mm²
Modulus of elasticity	E _{0,g,mean}	13700	N/mm²
	E _{0,g,05}	11100	N/mm²
	E _{90,g,mean}	460	N/mm²
Shear modulus	G _{g,mean}	856	N/mm²
Density	e _{g,k}	430	Kg/m ³

Table 9. Characteristic Values

PARTIAL FACTORS

Care should be taken to ensure that all partial factors used to convert the characteristic values to design values are correctly chosen for the prevailing design conditions. For example, load duration, member depth, service class, etc.

DURATION OF LOAD

	Load Duration Class									
Service	Perma-	Long	Medium	Short	Instan-					
class	nent	term	term	term	taneous					
1	0.60	0.70	0.80	0.90	1.10					
2	0.60	0.70	0.80	0.90	1.10					
3	0.50	0.55	0.65	0.70	0.90					

Table 10. k_{mod} for JJ-Glulam design

MATERIAL

The material modification factor can be taken as $\gamma_m=$ 1.25.

SERVICE CLASS

Service class	kdef
1	0.60
2	0.80
3	2.00

Table 11. $k_{\mbox{def}}$ for JJ-Glulam design

To assist designers who are not familiar with Eurocode 5, Table 12 has been prepared by applying the appropriate factors to the characteristic values of JJ-Glulam for a domestic floor application.

				Section Modulus	Moment of Inertia	Flexural Bigidity	Shear Bigidity		Depth Factor	Moment	Shear
Width	Depth	Area	Weight	Z	l	El	GA	d/w	Kh	Capacity	Capacity
(mm)	(mm)	(mm²)	(kg/m)	(10⁵mm³)	(10 ⁷ mm ⁴)	(10 ⁹ Nmm ²)	(10 ⁶ N)	()	(_)	(kNm)	(kN)
38	195	7410	3.71	2.41	2.35	322	6.30	5.1	1.10	3.62	8.01
	220	8360	4.18	3.07	3.37	462	7.11	5.8	1.10	4.60	9.04
	235	8930	4.47	3.50	4.11	563	7.59	6.2	1.10	5.24	9.65
	245	9310	4.66	3.80	4.66	638	7.91	6.4	1.09	5.68	10.06
	300	11400	5.70	5.70	8.55	1171	9.69	7.9	1.07	8.34	12.32
45	195	8775	4.39	2.85	2.78	381	7.46	4.3	1.10	4.28	9.48
	220	9900	4.95	3.63	3.99	547	8.42	4.9	1.10	5.45	10.70
	235	10575	5.29	4.14	4.87	667	8.99	5.2	1.10	6.21	11.43
	245	11025	5.51	4.50	5.51	756	9.37	5.4	1.09	6.72	11.92
	300	13500	6.75	6.75	10.13	1387	11.48	6.7	1.07	9.88	14.59
	350	15750	7.88	9.19	16.08	2203	13.39	7.8	1.06	13.24	17.02
	400	18000	9.00	12.00	24.00	3288	15.30	8.9	1.04	17.06	19.46
	450	20250	10.13	15.19	34.17	4682	17.21	10.0	1.03	21.34	21.89
90	195	17550	8.78	5.70	5.56	762	14.92	2.2	1.10	8.57	18.97
	220	19800	9.90	7.26	7.99	1094	16.83	2.4	1.10	10.90	21.40
	235	21150	10.58	8.28	9.73	1333	17.98	2.6	1.10	12.42	22.86
	245	22050	11.03	9.00	11.03	1511	18.74	2.7	1.09	13.44	23.83
	300	27000	13.50	13.50	20.25	2774	22.95	3.3	1.07	19.75	29.18
	350	31500	15.75	18.38	32.16	4405	26.78	3.9	1.06	26.48	34.05
	400	36000	18.00	24.00	48.00	6576	30.60	4.4	1.04	34.12	38.91
	450	40500	20.25	30.38	68.34	9363	34.43	5.0	1.03	42.68	43.78

Table 12. JJ-Glulam Design Values for Domestic Flooring Applications

Notes for Table 12:

- 1. The moment and shear capacities are applicable for domestic floor applications only.
- 2. Strength modification factor kmod = 0.8.
- 3. Partial material factor γ_M = 1.25.
- 4. Partial load factor $\gamma_F =$ 1.5.
- 5. Depth factor = $(600/h)^{0.1}$.
- 6. Larger section properties are available upon request.

PERMISSIBLE JJ-GLULAM VERTICAL LOAD CAPACITIES

JJ-Glulam width	Maximum long term load per metre run (kN/m)	Maximum single point load (kN)
38	53	32
45	63	38
90	126	76

Table 13. Permissible JJ-Glulam Vertical Loads

Notes for Table 13:

1. Loads are given for Eurocode 5 Medium Term load duration $k_{mod} = 0.8$.

STORAGE ON SITE

JJ-Glulam will typically arrive on site with a moisture content between 10% and 15%, and will achieve a moisture content of approximately 12% when installed in Service Class 1 conditions.

JJ-Glulam should be stored clear of the ground on a flat level surface and protected from the weather.

Once installed, if the structure will not be weather tight for a prolonged period of time, the Glulam should be protected from the weather to avoid excessive changes in moisture content, and associated dimensional changes.

TREATMENT AND DURABILITY

JJ-Glulam is untreated. When used in a Service Class 1 or 2 environment it will have a natural durability comparable to that of solid timber.

Following discussions with the NHBC it has been confirmed that when used as a rim beam in timber frame construction and protected by a layer of sheathing and breather paper, no additional preservative treatment is required.

Prior to preservative treatment advice should be sought from the manufacturer.

FIRE RESISTANCE

For the purpose of calculating fire resistance of Glulam members, a charring rate of 0.66mm per minute should be used.

SERVICE HOLES IN JJ-GLULAM

Holes or notches should be formed in accordance with the guidelines given for solid timber members in The Building Regulations Approved Document "Timber Intermediate Floors for Dwellings", clause 2.5. The hole and notch diagram is applicable to uniformly loaded single span beams only. For all other applications, consult the JJI-Joist Distributor.

SERVICE HOLE HELP DIAGRAM



In addition to the rules given above a 35mm circular hole can be drilled at any location along the centre line of a JJ-Glulam member provided the following rules are observed:

- The hole must be a minimum of one member depth away from the end of the joist.
- The hole must be a minimum of one member depth away from the nearest support.
- No two adjacent holes should be located any closer together than 70mm edge to edge.
- For holes larger than 35mm contact your Distributor for advice.

FIXING OF MULTIPLY JJ-GLULAM MEMBERS

Multiply JJ-Glulam members can be fixed together using nails, screws or bolts depending on availability and preference.

Screws - Where possible, James Jones & Sons Ltd recommend the use of large diameter self tapping screws in preference to nails or bolts. The following products can be supplied by the approved JJI-Joist metalwork suppliers.

- Cullen Building Products LedgerLok @ Ø5.8mm •
- Simpson Strong-Tie SDS screw @ Ø6.15mm

For details of the available screw sizes and advice on how they should be used please refer to the relevant metalwork manufacturer's technical literature (see page 16 for contact details).

For cases where large diameter self tapping screws are not available this section provides some standard nailing and bolting details for uniformly loaded multiply members loaded from one face only (e.g. incoming joists on hangers at 600mm centres or less).

Nails – For two ply 38mm and 45mm members nails are the cheapest and most easily made fixing. Nails can also be used in three ply 38mm and 45mm members although designers are encouraged to use a screwed connection solution where possible.

Bolts - Bolts can be used to connect together up to 5 ply 45mm members.

Section Makeup	2 ply			3 ply		4 ply		5 ply	
Ply Thickness (mm)	38	45	90	38	45	38	45	38	45
Overall width (mm)	76	90	180	114	135	152	180	190	225
2 rows of 3.1x75mm nails (300 centres)	5.08	5.08	-	3.81	3.81	-	-	-	-
3 rows of 3.1x75mm nails (300 centres)	7.62	7.62	-	5.72	5.72	-	-	-	-
2 rows of M12 bolts (600 centres)	13.36	15.83	23.09	9.68	11.46	8.60	10.19	8.07	9.55
2 rows of M12 bolts (400 centres)	20.04	23.74	34.63	14.52	17.19	12.91	15.28	12.10	14.33
2 rows of M12 bolts (300 centres)	26.72	31.65	47.17	19.36	22.92	17.21	20.37	16.13	19.10

Table 14. Maximum Uniform Line Load (kN/m) for Multiply JJ-Glulam Beams Loaded from One Face

Notes for Table 14.

1. The values in the table above are applicable to JJ-Glulam members loaded to one face only.

Nail diameters indicated are based on common sizes of power driven nails, hammer driven nails up to 4.5mm may be used. 2.

- З. 38mm diameter x 3mm thick washers are required under each head and nut on M12 bolts. Bolts to be minimum 4.6 grade.
- 4 Sections over 180mm wide should be loaded equally from both sides unless checked by an Engineer.

Nails in two ply members should be fixed in two rows 45mm in from the top and bottom edge and one row along the centre line if required, driven from alternate sides. The minimum end distance "e" should be 90mm.

А 45 \bigcirc 45 📘 c/c c/c c/c Section A-A

NAILING PATTERN FOR 2 PLY JJ-GLULAM MEMBERS

Nails in three ply members should be fixed in two rows 45mm in from the top and bottom edge and one row along the centre line if required, driven through each outer ply into the central one. Note that nails from any one face should be at the specified centres with the nails from the opposite face offset by half the centres distance. The minimum distance "e" from the last column of nails to the end of the member should be 90mm.



Bolts should be fixed in two rows 65mm in from the top and bottom edge. Bolt holes should be drilled at Ø12mm and bolts tapped into place. The minimum end distance "e" should be 48mm.



POINT LOADS

Multiply JJ-Glulam members are often used as trimming joists parallel with the short edge of stair wells resulting in significant point loads from the trimmer. In situations like this where an isolated point load is to be carried by a multiply member, the designer needs to consider a localised fixing close to the incoming member. Table 15 below gives maximum long term point loads that can be carried if the fixing details on the following page are used.









BOLTING PATTERN FOR JJ-GLULAM MEMBER (UP TO 4 PLY) WITH AN INCOMING POINT LOAD



Section Makeup	2 ply		3 ply		4 ply		
Ply Thickness (mm)	38	45	90	38	45	38	45
Overall width (mm)	76	90	180	114	135	152	180
Nail Detail	9.14	9.14	-	6.85	6.85	-	-
Bolt Detail	16.03	18.99	27.70	11.62	13.75	10.33	12.22

Table 15. Maximum isolated point load [kN] for multiply JJ-Glulam beams loaded from one face

Notes for Table 15:

- 1. The values in the table above are applicable to JJ-Glulam members loaded to one face only.
- 2. Capacities for nail details are based on 3.1mm diameter power driven nails (75mm long for 38mm thick plies and 90mm long for 45mm plies), hammer driven nails up to 4.5mm diameter may be used.
- 3. 38mm diameter x 3mm thick washers are required under each head and nut on M12 bolts. Bolts to be minimum 4.6 grade.

JJI-JOIST CONNECTION HARDWARE

James Jones & Sons Ltd continues to work closely with the UK's leading timber engineering hardware manufacturers, developing ranges of fixings to suit JJI-Joists and JJ-Glulam. The products include a complete range of fixings for timber to timber, timber to masonry and timber to steel connections. Only hardware approved by James Jones & Sons Ltd should be used with JJI-Joists and JJ-Glulam to ensure quality construction standards. In addition, all approved hardware is automatically specified by James Jones & Sons JoistMaster and FloorMaster software.

All connection hardware/fixings are available from JJI-Joist Distributors as part of the JJI-Joist system.



Cullen Building Products 1 Wheatstone Place Southfield Industrial Estate Glenrothes Fife KY6 2SW Tel: 01592 771132 Fax: 01592 771182

Examples of suitable metalwork from Cullen Building products:

The FFI Hanger – the face fix timber to timber connector for an economical solution and a flat finished surface The Stopper – the easy solution for Building Regulation compliance at I-joist ends when building into masonry walls The I-Clip – an alternative solution to traditional filler

blocks for simple integrity inspection and a quicker on-site construction

The RA Hanger – the easy to use safety solution for timber to masonry connections which is built off the same course of blockwork as built-in joists

The UI Hanger – a wrap over timber to timber connector that omits traditional backer block requirements

SIMPSON Strong-Tie

Simpson Strong-Tie® Winchester Road Cardinal Point Tamworth Staffordshire B78 3HG Tel: 01827 255600 Fax: 01827 255616

Examples of suitable metalwork from Simpson Strong-Tie:

The Safety Fast Hanger – a masonry hanger that can support load without the need for propping or masonry above to hold the hanger in place

The Safety Fast Joist Cap – a robust way to achieve an air tight seal when joists are built in to masonry walls The ITB Hanger – a timber hanger which significantly reduces the amount of Backer Blocks required The HES Restraint Strap – a 1.5mm thick restraint strap that is lighter, quicker and easier to fit than traditional 5mm thick straps

The ZS Clip – the easiest and quickest way to fit I-Joist noggings and timber noggings to supporting joists

General Notes

- For details of newly approved manufacturers contact James Jones & Sons Ltd.
- Refer to approved manufacturers literature for details of hanger ranges, safe working loads, nailing requirements and installation instructions.
- Web stiffeners are not required when approved hangers are used unless the JJI-Joist design states otherwise.
- DO NOT USE NON-APPROVED HANGERS IF IN DOUBT, ASK.

FACTORS AFFECTING FLOOR PERFORMANCE

The following list describes factors that affect floor performance and consideration of these factors may be helpful when designing and installing a JJI-Joist floor system:

Joist Depth

Deeper joists create a stiffer floor thereby reducing deflection. A deep floor joist solution may in fact be cheaper than a shallow joist solution as you may be able to use thinner joists at wider centres.

Deck Fixing

A correctly nailed floor deck will improve floor performance by about 12%*. Gluing the floor deck to the joists, and gluing tongued and grooved joints is required by NHBC Standards Section 6.4 S1.9 and S2.0, and is also recommended in BS7916:1998. In addition, the floor performance can improve by as much as 70% when the floor deck is glued to the joists*.

Deck Thickness

Thicker floor deck material will improve the floor performance.

Ceiling Treatments

Directly applied ceiling finishes will improve floor performance by about 3%.*

Blocking

Full depth blocking will improve floor performance.

Workmanship

Good quality workmanship is essential to achieve good floor performance. The provision of well prepared and level bearings, methodical erection procedure, diligent installation of all fixings and in particular fixing of the floor deck (including gluing where required) will have a significant effect on floor performance. The maximum acceptable tolerance on the level of bearings is +/- 3mm.

* Figures obtained from independent laboratory tests originating from a government (DETR) research project.

SPECIAL CONSIDERATION FOR GROUND FLOOR DESIGN

Timber in ground floor construction is in a more moist environment than timber is an upper floor. As such, JJI-Joists for use in ground floors should be designed using joist properties for Service Class 2 conditions. For further guidance on this and other aspects of ground floor design, consult JJ&S Technical Bulletin No. 9.

Insulation

Thermal insulation is required in all ground floors and each different building type should be assessed individually to identify the specific U-value requirements and thus the corresponding thickness of insulation to be used. Three options for providing ground floor insulation are as follows:

- 1 **Quilt insulation** supported on plastic netting or breather membrane.
- 2 Quilt insulation supported on a board fixed to the top side of the bottom flange of the JJI-Joist.
- **3** Solid insulation supported on bottom flange of the JJI-Joist.

F38 | TYPICAL TIMBER FRAME GROUND FLOOR DETAIL



Internal ground covering to comply with Building Regulations
Insulation in floor void omitted for clarity

F44 TYPICAL MASONRY GROUND FLOOR DETAIL



Most heat loss through a ground floor occurs around the floor perimeter and so the inclusion of insulation at the edges helps maintain overall insulation levels.

Resistance to Moisture

All suspended ground floors should be constructed to resist the ingress of moisture. Where external ground level is above the ground cover level, then the ground cover should be laid to fall to a suitable drainage outlet.

Ventilation

All parts of the void underneath the suspended floor require a ventilation path to the outside. The ventilation openings should be at least 1500mm² for each metre run of two opposite sides of the floor, or alternatively in Scotland, an opening area 500mm² for every 1m² of floor area may be provided.

Radon Gas

The construction of suspended timber ground floors in areas affected by Radon gas requires specialist advice.

Access for the Disabled

For guidance on providing access thresholds consult JJ&S Technical Bulletin No.9 or DETR booklet *Accessible thresholds in new housing.* The domestic intermediate floor span table below is based on the following design criteria:

- Dead Load including partition allowance is 1.15kN/m² for flats or 0.75kN/m² for houses.
- Imposed Load 1.5kN/m² (Domestic floor imposed load).
- Deflection limit 0.003 times span or 12mm (NHBC requirement) whichever is lesser.
- The spans given are for simply supported and uniformly loaded joists only, assuming a 90mm end bearing.
- The calculation of the spans includes a load sharing factor.
- Adequate lateral restraint to the top flange of the joists is assumed to be provided by the floor deck. 18mm chipboard or equivalent for joists up to 400mm centres and 22mm chipboard or equivalent for joists at up to 600mm centres.

- The joists are designed using the principles of BS5268: Part 2, 2002, the joist properties contained in this manual and the design formulae in Agrément Certificate No.99/3633.
- Where the load conditions are different to those described above, refer to the JJI-Joist supplier for further assistance.

JJI-Joist calculation sheets display a Serviceability Index (SI) which is a measure of the joist performance, maximum allowable deflection/actual deflection. The minimum permissible serviceability index value is 1.0. The spans given in the table below have a serviceability index of 1.0 for a 0.003 x span or 12mm deflection limit (NHBC) but this does not include any of the beneficial effects of the various factors described previously.

Joist		Aparti	ments			Но	uses					
Type /		Dead Load up	to 1.15kN/m ²			Dead Load up	to 0.75kN/m ²		M	ost Economica	al Solution [1-10	0]
Flange		Joist Space	cing (mm)			Joist Spa	cing (mm)			Joist Spa	cing (mm)	
	300	400	480	600	300	400	480	600	300	400	480	600
JJI 145A	2940	2627	2442	2228	3130	2802	2608	2383	-	-	-	-
JJI 195A	3882	3481	3245	2972	4067	3705	3456	3170	50	23	10	1
JJI 195B	4166	3822	3560	3257	4358	4025	3794	3477	60	33	17	4
JJI 195C	4349	4012	3772	3449	4551	4201	3991	3684	64	37	19	6
JJI 195D	4661	4295	4076	3783	4897	4500	4272	4006	80	54	38	16
JJI 220A	4205	3877	3616	3316	4397	4065	3850	3534	57	30	13	2
JJI 220B	4504	4159	3952	3635	4711	4353	4137	3877	68	41	22	8
JJI 220C	4702	4339	4121	3850	4920	4543	4316	4052	79	53	36	15
JJI 220D	5039	4645	4409	4133	5375	4866	4621	4334	88	69	49	28
JJI 235A	4385	4035	3832	3516	4585	4239	4032	3746	58	32	14	3
JJI 235B	4697	4337	4121	3854	4912	4539	4315	4053	71	43	25	9
JJI 235C	4903	4525	4298	4033	5129	4737	4501	4226	83	56	42	20
JJI 235D	5254	4844	4598	4310	5499	5074	4818	4520	92	75	55	35
JJI 245A	4502	4161	3956	3646	4706	4352	4139	3884	61	34	18	5
JJI 245B	4821	4452	4231	3973	5042	4659	4429	4161	73	45	27	11
JJI 245C	5032	4645	4413	4141	5265	4862	4621	4339	84	62	46	24
JJI 245D	5393	4973	4720	4425	5644	5208	4946	4610	94	81	65	44
JJI 300A	5100	4715	4484	4214	5331	4931	4691	4411	67	39	21	7
JJI 300B	5493	5043	4794	4502	5709	5277	5017	4715	76	47	31	12
JJI 300C	5697	5261	4998	4692	5959	5505	5233	4915	87	66	48	26
JJI 300D	6104	5630	5346	5013	6387	5896	5600	5255	97	85	74	52
JJI 350C	6246	5768	5481	5146	6532	6036	5738	5390	89	70	51	29
JJI 350D	6689	6171	5860	5497	6999	6461	6139	5762	98	91	80	63
JJI 400C	6753	6237	5928	5566	7062	6527	6205	5830	93	77	59	40
JJI 400D	7230	6672	6336	5944	7565	6985	6637	6230	99	95	86	71
JJI 450D	7736	7139	6781	6362	8094	7474	7102	6667	100	96	90	78

Table 16. Maximum Clear Span for Domestic Intermediate Floors

Notes for Table 16

- 1. If bearings are reduced to 45mm, web stiffeners may be required.
- The effect of the dead weight of non-load bearing partitions in flats can be assumed to be included in the design where self-weight of the partition does not exceed 0.8kN/m run and the self-weight of the floor construction does not exceed 0.9kN/m².
- The effect of the dead weight of non-load bearing partitions in houses can be assumed to be included in the design where self-weight of the partition does not exceed 0.8kN/m run and the self-weight of the floor construction does not exceed 0.5kN/m².
- 4. Permissible web holes to be drilled in accordance with JoistMaster software or hole chart Table 6 on page 8.
- 5. For all solutions that work for a particular span the one with the lowest Most Economical Solution index will be the cheapest.

INSTALLATION GUIDELINES

This diagram indicates temporary erection bracing only. It is applicable to both timber frame and masonry construction.

1.5m max Nail all binders and braces to each joist with 2no. 3.35x65mm nails Construction materials shall only be stored in the 1.5m edge zone Min 675mm cured masonry above hanger level or as advised by at one end of the joist only hanger manufacturer 22x97mm diagonal brace Decking can be laid in lieu of diagonal bracing 2.4m max Do not store construction material close to trimmers 2. AM Max 22x97mm continuous longitudinal binders must be connected to a diagonally braced and blocked 38x125mm solid timber stability blocks system at one end of the joist run or I-Joist blocking panels

STABILITY BLOCKING NOTES

- Use timber blocks or JJI-Joist blocking pieces.
- Timber blocks to be minimum 38x125mm cut squarely and accurately to maintain joist spacing. Fasten with minimum 2no. 3.35x65mm nails.
- Stability blocks need to be fixed to 3 joists and cover a minimum distance of 1200mm.
- Timber blocks in the diagonally braced systems are required in each run of joists and at cantilever supports.
- When joists are continuous over interior supports, install blocks at these supports when total joist length exceeds 6000mm.
- When joists butt on an interior support, block both sets of joists.
- Additional braced and blocked systems should be provided at 12m spacing in long joist runs.

TEMPORARY ERECTION BRACING NOTES

The builder is responsible for identifying and minimising the risks involved in erecting JJI-Joists to ensure that the health and safety of all workers is maintained. Builders should be aware of the health and safety responsibilities imposed on them by the Construction (Design and Management) Regulations 1994. Proper erection procedures and bracing are vital to the safe construction of JJI-Joists floors. The following notes may assist builders in preparing a safety assessment.

- 1. Do not allow workers to walk on unbraced joists.
- 2. Do not store building materials on unbraced joists.
- JJI-Joists should be erected straight and vertical. The maximum deviation from horizontal should not exceed 10mm and the maximum deviation from the vertical should not exceed 2mm.

- 4. JJI-Joists are unstable until fully braced Bracing includes: Longitudinal binders, Diagonal bracing, Stability blocking, Rim Joist/Rim Boards.
- 5. All longitudinal binders, diagonal braces, stability blocks, and hangers should be completely installed and fully nailed as detailed.
- 6. Lateral strength should be provided by a diagonally braced and blocked system across at least 3 joists as shown in the Erection Bracing Details. Additional braced and blocking systems should be provided at 12m spacing in long joist runs.
- Construction materials may only be stored on joists when all bracing is in place and the material should be spread over at least 4 joists and not more than 1500mm from a support. Floor/ceiling boards may be stacked up to 250mm high (150kg per joist at 600mm centres, 100kg per joist at 400mm centres) on braced floors.
- 8. Flooring should be fully fixed to the JJI-Joists before additional loads are placed on the floor.
- 9. The ends of cantilevers should be stabilised with longitudinal binders fixed to the top and bottom flanges.
- 10. Temporary bracing may be progressively removed as decking is fixed.

REMOVE SAFETY BRACING AS DECKING PROCEEDS





DO NOT CUT HOLES TOO CLOSE TO EACH OTHER -SEE HOLE INSTALLATION GUIDE

DO NOT SPLIT THE FLANGE, ENSURE

DO NOT STACK BUILDING MATERIALS ON UNBRACED JOISTS

DO NOT USE NON-APPROVED HANGERS

PROPER TOE NAILING

DO NOT OVER-CUT WEB HOLES

> DO NOT CUT OR NOTCH FLANGES













The Floor Designer is responsible for ensuring the joist design is adequate to support the wall



F14 SINGLE JOIST TO JOIST







Approved mini-hanger secured through all nail holes (refer to approved connector manufacturers guidelines)







of incoming loads (see F15). Provide continuous filler block when repeated loads are applied (see F40)

FILLER AND BACKER BLOCK TABLE F20

JJI-Joist Depth (mm)	Filler and Backer Block Depth (mm)	JJI-Joist Flange Type	Backer Block / Web Stiffener Thickness (mm)	Filler Block Thickness (mm)						
195	100	A 18 36								
220	125	B 25 50								
235	145	С	32	63						
245	150	D	44	2x44						
300	200	• Refer to de	etails provided by t	he JJI-Joist						
350	125+125	supplier fo	r required locations	s of filler						
400	150+150	and backe	r blocks							
450 200+150 • Where a continuous filler block is used see detail F40										

• Filler and backer blocks should be kiln dried timber, structural grade plywood or OSB3

F21 FILLER AND BACKER BLOCK NAILING DETAIL



be fixed tight to the top flange with a 3mm gap at the bottom

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L=3	50mm to 6	500mm
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INali	lengths (r	nm)
Flange	Backer	Filler
Spec	Block	Block
0000	DIOOK	DIOOK
A	65	65
В	65	90
-		

Minimum nail diameter 3.1mm



F18 JOIST TO ENGINEERED TIMBER



F25 STAIR STRINGER CONNECTION





F27 LOAD BEARING WALL PARALLEL TO JOIST RUN











- A continuous filler block should be utilised with multiple incoming loads
- A continuous backer block could also be provided
- Where continuous filler block is used, fix with 2 rows of nails at 300mm centres from both faces





Refer to approved connector manufacturer's guidelines



F43 FIXING DOUBLE JOISTS





TIMBER FRAME CONSTRUCTION DETAILS









F32 JOIST BEARING ON PARTY WALLS











JOIST PARALLEL TO EXTERNAL WALL



TIMBER FRAME DETAIL NOTES

- 1. See Table 5 and Table 13 for vertical load capacities
- 2. Rimboard thickness to timber frame kit manufacturer's Consulting Engineer's specification / approval
- 3. Rimboard fixed to bearing with 3.34x65mm nails at 150mm c/c
- 4. Secure rimboard to JJI-Joist with 2no 3.35x65mm ring shank nails, one each to top and bottom flanges
- 5. Fix JJI-Joist to bearing with 2 no $3.35 \times 65\,\text{mm}$ nails, 40 mm from joist end
- 6. Minimum joist bearing length 45mm
- 7. Ensure the Building Designer is satisfied with fixing between the wall and floor



MASONRY CONSTRUCTION DETAILS

- Alternative proprietary systems may be used if approved by JJ&S Restraint straps will be required for greater than 2 storeys





WALL RESTRAINT, BLOCK WALL HANGER SUPPORT F10



JOIST TO STEEL BEAM/MASONRY F30 675mm of cured masonry before hanger loaded, see approved connector manufacturer's H&S guidelines Brick course may be required where steel is shallower than incoming joist Approved masonry hangers built into bed joint Do not fix joists to steel lintels unless approved by lintel manufacturer Bottom of flange must rest against bottom flange of steel beam Refer to approved metalwork supplier's literature for further information







 F48
 ALTERNATIVE AIRTIGHTNESS DETAIL 2

 Nogging/dwang (min 38x45mm) securely fixed with 3.35x65mm skew nailing or approved clip
 Image: Comparison of the secure F47 ALTERNATIVE AIRTIGHTNESS DETAIL 1

INTRODUCTION

By making the most of their long spanning capabilities, JJI-Joists are ideally suited for use in roofs allowing the designer the freedom to create large, open room spaces without the need for additional supports.







DESIGN CONSIDERATIONS

Unlike a floor design, a full roof design requires many additional considerations due to its location on the exposed external surface of the building and also its potentially complex geometry. Unlike floors, a roof is exposed to wind and snow loading.

Loading

Dead loads should be calculated for each job based on the specified roof makeup. Refer to BS648 Weights of Building Materials or manufacturers literature for material data.

Imposed Snow and Wind loads should be based on the location of the building if known or alternatively on conservative estimates. BS 6399:3 and BS 6399:2 should be used for snow and wind loading respectively.

Joist Stability

Roofs should be braced during the erection process, refer to temporary erection bracing notes.

The compression flange of the joist requires lateral restraint at regular centres to prevent lateral buckling. This can be achieved by using a permanent structural sarking layer directly fixed to the joist or alternatively by battens/firring strips fixed perpendicular to each joist.

Where a wind load analysis indicates that the rafters will experience a stress reversal under wind suction loads care should be taken to ensure that the bottom flange of the joist is suitably restrained. This can be achieved by, for example, directly applying a ceiling/soffit lining to the underside of the joists. Blocking or Cross-bracing (see R10) may be required at support locations unless joists are held in place by alternative means.

Building Stability

Lateral restraint to gable walls etc. can be provided using details similar to those used for floors.

Racking of the whole roof structure should be prevented by the use of structural sarking or a system of triangulated bracing (this is required where only felt and tiling battens are used).

Deflection Limits

When considering member deflection a maximum limit of 0.003 x span is recommended. When a finished ceiling is applied to the underside of the roof, for long spans, the designer should consider restricting the maximum deflection further to avoid damage to the finishing. The designer should also consider a more strict deflection limit for principal members such as ridge beams and purlins to minimise combined deflection.

Fixings

Fixing of the joists to supports needs to be specified by accounting for axial, tangential, horizontal and vertical loads. Particular care should be taken when considering uplift forces due to wind suction.

Responsibilities

A full roof design will address all the above issues, however, they may be dealt with by different parties (Roof Component Designer, Roof Designer, Building Designer). It is vital that the responsibility of each party is clearly defined at the start of the design process.

JJI-JOIST FLAT ROOFS

- Dead Load should take account of all components of the roof makeup including ceiling linings.
- Imposed Load 0.75kN/m² (Snow).
- Deflection limit 0.003 times span.
- Joist design includes a 0.9kN Man Load check at mid span.
- The spans given are for simply supported and uniformly loaded joists only, assuming a 90mm end bearing.
- The calculation of the spans includes a load sharing factor.
- Adequate lateral restraint to the top flange of the joists is assumed to be provided by the roof deck.
- The joists are designed using the principles of BS5268: Part 2, 2002.
- Where the load conditions are different to those described above, refer to the JJI-Joist supplier for further assistance.

Joist Type / Flange		Dead load up Joist Spac	to 0.75kN/m ² ing (mm)		Dead load up to 1.0kN/m² Joist Spacing (mm)				
	300	400	480	600	300	400	480	600	
JJI 145A	2960	2810	2710	2585	2810	2655	2545	2410	
JJI 195A	4255	4020	3820	3580	4020	3770	3605	3375	
JJI 195B	4795	4515	4275	3930	4515	4220	4030	3705	
JJI 195C	5175	4860	4540	4175	4860	4535	4280	3930	
JJI 195D	5835	5350	4995	4585	5465	5050	4710	4320	
JJI 220A	4865	4580	4330	3980	4580	4285	4085	3760	
JJI 220B	5475	5080	4755	4370	5340	4805	4490	4130	
JJI 220C	5990	5400	5045	4640	5670	5095	4760	4375	
JJI 220D	6605	5945	5560	5105	6245	5616	5245	4810	
JJI 235A	5430	4890	4580	4215	5130	4625	4325	3980	
JJI 235B	5970	5380	5035	4635	5650	5080	4750	4370	
JJI 235C	6345	5710	5345	4920	5995	5395	5045	4640	
JJI 235D	6990	6290	5880	5410	6610	5950	5550	5100	
JJI 245A	5620	5070	4745	4370	5320	4790	4480	4125	
JJI 245B	6180	5570	5210	4795	5845	5270	4920	4530	
JJI 245C	6570	5920	5535	5090	6215	5595	5230	4805	
JJI 245D	7245	6520	6095	5600	6850	6160	5750	5460	
JJI 300A	6650	5995	5620	5180	6295	5670	5310	4895	
JJI 300B	7305	6595	6170	5690	6920	6240	5835	5375	
JJI 300C	7770	6995	6550	6040	7340	6620	6195	5695	
JJI 300D	8560	7720	7220	6640	8105	7290	6820	6270	
JJI 350C	8770	7910	7410	6835	8305	7480	7010	6450	
JJI 350D	9670	8720	8160	7520	9145	8245	7715	7100	
JJI 400C	9760	8800	8255	7610	9240	8340	7805	7195	
JJI 400D	10735	9680	9070	8355	10160	9165	8580	7900	
JJI 450D	11760	10620	9940	9170	11140	10050	9400	8660	

Table 17. Maximum Clear Span For JJI-Joist Flat Roofs

Notes for Table 17:

- 1. If bearings are reduced to 45mm, web stiffeners may be required.
- 2. Designs based on the dead load as shown + 0.75kN/m2 imposed snow load.
- 3. Permissible web holes to be drilled in accordance with JoistMaster software.
- 4. Design in accordance with BS 6399:Pt 3 4.3.1 (Minimum imposed load on roof with no access).
- 5. No allowance for rafter overhangs within table.

DEFINITION OF CLEAR SPAN FOR RAFTERS

JJI-JOIST PITCHED RAFTERS

Support Requirements

When designing a JJI-joist pitched rafter the designer should ensure that there are at least two vertical supports under the rafter. Typically these would be a load bearing wall or ridge beam at the top end and a load bearing wall at the lower end. Additional intermediate supports may be provided by, for example, purlins.

It is possible to design the rafters with only one support at the lower end if the top end (Ridge) is resting on another rafter leaning in the opposite direction. This, however, leads to horizontal reactions at the lower end and higher axial loads that need to be considered by a qualified Engineer.



Joist													
Type /		Dead Load up	to 0.434kN/m ²			Dead Load up	to 0.685kN/m ²		Dead Load up to 0.878kN/m ²				
Flange		Max Rafter Sp	ban @ 600 c/c			Max Rafter Sp	pan @ 600 c/c			Max Rafter Sp	ban @ 600 c/c		
	15°	30°	35°	45°	15°	30°	35°	45°	15°	30°	35°	45°	
JJI 145A	2837	2680	2834	2873	2592	2445	2595	2567	2448	2308	2451	2396	
JJI 195A	3857	3680	3728	3770	3585	3407	3420	3376	3416	3240	3236	3156	
JJI 195B	4238	4046	4101	4151	3938	3745	3761	3716	3751	3560	3557	3473	
JJI 195C	4500	4298	4357	4414	4180	3977	3995	3950	3980	3779	3778	3691	
JJI 195D	4955	4735	4803	4871	4599	4379	4401	4357	4377	4160	4161	4070	
JJI 220A	4288	4090	4142	4186	3988	3789	3802	3751	3802	3605	3599	3509	
JJI 220B	4714	4499	4558	4611	4383	4167	4183	4130	4177	3963	3958	3862	
JJI 220C	5003	4777	4840	4899	4650	4423	4441	4388	4430	4205	4202	4102	
JJI 220D	5511	5266	5339	5409	5120	4873	4895	4842	4875	4631	4630	4525	
JJI 235A	4536	4327	4381	4426	4221	4010	4023	3968	4025	3816	3809	3712	
JJI 235B	4988	4760	4821	4875	4639	4410	4426	4369	4422	4195	4190	4086	
JJI 235C	5297	5057	5123	5183	4925	4684	4702	4644	4694	4454	4450	4343	
JJI 235D	5835	5574	5650	5721	5423	5160	5183	5124	5165	4905	4903	4790	
JJI 245A	4701	4484	4539	4586	4375	4156	4169	4111	4172	3955	3948	3847	
JJI 245B	5168	4931	4994	5049	4807	4569	4585	4525	4583	4347	4341	4233	
JJI 245C	5487	5237	5305	5367	5102	4852	4870	4809	4863	4614	4610	4498	
JJI 245D	6044	5773	5851	5924	5618	5345	5368	5306	5352	5082	5079	4961	
JJI 300A	5565	5306	5369	5421	5183	4922	4936	4864	4945	4686	4676	4553	
JJI 300B	6116	5835	5906	5966	5694	5411	5427	5352	5431	5150	5141	5009	
JJI 300C	6490	6193	6270	6337	6040	5741	5760	5683	5760	5464	5455	5319	
JJI 300D	7149	6825	6914	6993	6650	6325	6349	6269	6340	6017	6011	5865	
JJI 350C	7349	7011	7097	7168	6844	6503	6523	6432	6529	6191	6180	6022	
JJI 350D	8095	7726	7823	7908	7534	7163	7188	7094	7185	6818	6808	6639	
JJI 400C	8169	7791	7884	7960	7610	7230	7250	7146	7262	6885	6871	6692	
JJI 400D	8993	8582	8687	8305L	8374	7960	7985	7877	7989	7578	7565	7375	
JJI 450D	9854	9401	9515	8305L	9179	8723	8749	8305L	8758	8306	8291	8079	

Table 18. Maximum Clear Spans for JJI-Joist Pitched Rafters @ 600mm c/c

See Notes for Table 19.

Joist Type / Flange		Dead Load up Max Rafter Sp	to 0.434kN/m²)an @ 400c/c			Dead Load up Max Rafter Sp	to 0.685kN/m² ban @ 400c/c		Dead Load up to 0.878kN/m² Max Rafter Span @ 400c/c				
	15	30	35	45	15	30	35	45	15	30	35	45	
JJI 145A	3028	2864	3289	3326	2811	2655	3018	2978	2679	2529	2856	2784	
JJI 195A	4376	4122	4314	4354	4018	3780	3965	3906	3810	3581	3756	3656	
JJI 195B	4919	4657	4748	4796	4519	4250	4362	4301	4273	4015	4132	4025	
JJI 195C	5226	4986	5048	5100	4864	4576	4636	4573	4593	4316	4391	4279	
JJI 195D	5760	5498	5568	5631	5358	5094	5113	5047	5108	4843	4840	4722	
JJI 220A	4967	4716	4789	4831	4584	4307	4403	4336	4337	4072	4173	4060	
JJI 220B	5465	5211	5272	5322	5090	4834	4847	4776	4856	4561	4592	4471	
JJI 220C	5803	5534	5601	5657	5404	5133	5148	5075	5155	4886	4877	4750	
JJI 220D	6399	6106	6182	6248	5956	5661	5680	5603	5680	5387	5379	5244	
JJI 235A	5253	5005	5063	5106	4895	4612	4656	4584	4642	4356	4413	4293	
JJI 235B	5780	5510	5574	5625	5384	5113	5125	5049	5138	4869	4857	4728	
JJI 235C	6141	5856	5926	5982	5720	5433	5447	5368	5457	5173	5162	5026	
JJI 235D	6771	6460	6539	6606	6304	5990	6009	5926	6013	5702	5692	5548	
JJI 245A	5442	5186	5244	5289	5072	4814	4824	4748	4842	4545	4573	4448	
JJI 245B	5986	5706	5773	5825	5577	5296	5309	5229	5323	5043	5031	4897	
JJI 245C	6359	6063	6135	6193	5923	5626	5641	5558	5652	5357	5345	5205	
JJI 245D	7012	6689	6771	6839	6529	6204	6223	6136	6228	5906	5895	5745	
JJI 300A	6434	6130	6197	6246	6000	5693	5704	5612	5730	5426	5409	5258	
JJI 300B	7076	6744	6820	6877	6597	6262	6275	6177	6299	5966	5950	5788	
JJI 300C	7511	7160	7242	7306	7001	6648	6663	6561	6684	6333	6317	6147	
JJI 300D	8281	7897	7990	8065	7716	7329	7349	7242	7364	6981	6965	6783	
JJI 350C	8498	8100	8191	8259	7924	7523	7539	7421	7568	7169	7149	6954	
JJI 350D	9367	8932	9034	8305L	8732	8293	8313	8187	8336	7901	7881	7671	
JJI 400C	9439	8996	9095	8305L	8804	8357	8373	8240	8410	7966	7942	7723	
JJI 400D	10400	9914	9649L	8305L	9697	9208	9228	8305L	9260	8775	8751	8305L	
JJI 450D	11389	10212L	9649L	8305L	10622	10085	9650L	8305L	10145	9612	9585	8305L	

Table 19. Maximum Clear Spans for JJI-Joist Pitched Rafters @ 400mm c/c

Notes for Tables 18 and 19:

- 1. If bearings are reduced to 45mm, web stiffeners may be required.
- 2. Figures followed by "L" denote clear spans limited by the maximum manufactured JJI-Joist length of 12m.
- Designs based on the dead load as shown + 0.75kN/m² imposed snow load up to 30° pitch reducing linearly thereafter to zero at 60° pitch (alternative imposed loads may apply seek Roof Designer guidance).
- 4. The tabulated tile design loads include an allowance of 0.11kN/m² for felt, battens and the JJI rafter self weight. If the ceiling finish is directly applied to the JJI rafter then we suggest an additional load of 0.25kN/m² (Design in accordance with JoistMaster software).
- For roof pitches of 30 degrees or less a short term man load of 0.9kN is applied to the middle of the rafter span to account for construction and maintenance loading. For steeper pitches it is assumed that a roof ladder would spread the load.
- 6. Spans assume the rafter top flange is laterally restrained at maximum 400mm c/c using battens or rigid sarking.
- 7. Permissible web holes to be drilled in accordance with JoistMaster software.
- 8. Design in accordance with BS 6399:Pt 3 4.3.1 (Minimum imposed load on roof with no access).
- 9. No allowance for rafter overhangs within table.









R5 LOOSE TIMBER OVERHANGS Solid timber overhang for soffit supports











R10 BLOCKING AND VENTILATION HOLES



R11 FLUSH PURLIN BEAM

Approved angle bracket connector fixed to both sides of joist Ply/timber bevelled web stiffener required on each face. Fix in accordance with F22

RAFTER FIXING TO WALL PLATE



R12

INTRODUCTION

JJI-Joists are ideally suited to use as wall studs where their availability in depths up 450mm allow the designers to insulate external walls to unprecedented levels. Even when shallower joists are used the narrow web profile provides a restricted path to heat transfer (reduced cold bridging) when compared with solid timber.

Where the wall is subjected only to horizontal wind loads with no vertical axial loads (e.g. ground level to eaves level infill panels in a portal frame structure) JJI-Joists allow very tall walls to be built using a continuous structural member.

James Jones & Sons Ltd recommend that JJI-Joists are incorporated into prefabricated wall panels in order to take advantage of the improved precision and quality typically available in a factory environment.

For further information on u-value calculation and axial compression strengths please contact James Jones & Sons.

Each timber frame kit manufacturer will typically produce their own set of standard details to suit their specific production, manufacturing and technical requirements.

Structural design of studs is not currently available in the James Jones & Sons Ltd software and this should be undertaken by a suitably qualified Engineer who should pay particular attention to buckling restraint, axial load distribution between inner and outer flanges and member to member fixings.

However it is our recommendation that structural design of JJI-Joist studs is best suited to external wall closed panel type manufacturing with a separate service zone on the inside face of the internal sheathing. Finally, it is beneficial to manufacture long panels due to the JJI-Joist's being lightweight and particular care should be taken when insulating, to avoid cold spots.

EXAMPLE OF JJI-JOISTS USED AS WALL ELEMENTS IN A LARGE PROJECT









W4 EXTERNAL WALL, INVERTED CORNER







Backer Block

Timber or ply block nailed to web of l-joist beam to allow fixing of joist hangers.

Beam

A principal member carrying other floor members.

Compression Block Solid Timber block fixed to Rim Joists or Header Joists where substantial loads occur.

Dead Load The self weight of the building components.

Deflection

Vertical deformation of a joist or beam due to the applied load up to a maximum of 0.003L or 12mm, whichever is the lesser.

Diagonal Brace

22 x 97mm timber used as part of erection bracing and fixed diagonally across top of JJI-Joists.

Erection Bracing

Temporary bracing used to stabilise the joists during construction.

Filler Block

Timber block used to fix multiple l-joists together.

Flange

The timber part at the top and bottom of an I-joist.

Header Joist

JJI-Joist section used on the perimeter of a building parallel to the span of the joists.

I-Joist

A structural timber composite formed in the shape of an I-section.

Imposed Load

The load due to the occupancy of the building. Often referred to as Live Load.

Longitudinal Binder

22 x 97mm timber used as part of erection bracing.

OSB

Oriented Strand Board, formed from wood strands glued together.

Rafter

A structural roof member aligned with the fall of the roof pitch.

Rim Board/Rim Joist

JJI-Joist or JJ-Glulam section used on the perimeter of a building both parallel and perpendicular to the span of the joists.

Serviceability Index

A measure of a joist's performance relative to the minimum Code of Practice requirement.

Service Hole

A hole formed in the web of a JJI-Joist in accordance with prescribed rules.

Stability Blocks

Solid timber blocks fixed at the ends of JJI-Joists as part of stability bracing where the joists are not built into walls or fixed in hangers.

Wall Stud

A vertical structural member forming part of a wall.

Web

The OSB part of an I-joist that separates the Flanges.

Web Stiffener

OSB block nailed to the web of JJI-Joists where large reactions or applied loads occur.



JJI-Joists Distribution



JJI-JOISTS, JJ-GLULAM AND ASSOCIATED CONNECTION HARDWARE ARE READILY AVAILABLE THROUGH A NATIONAL NETWORK OF SPECIALISTS WHO HAVE STAFF SPECIFICALLY TRAINED IN THE DESIGN AND INSTALLATION OF JJI-JOIST SYSTEMS.

- JJI-Joist Distributors are specifically chosen because of their professionalism and close relationships with builders.
- JJI-Joist Distributors are strategically located throughout the UK and Ireland.
- Stocks of JJI-Joists are held by all JJI-Joist Distributors.
- Distributors employ technical staff who are trained in the use of Joistmaster and Floormaster programs.
- Deliveries and lead times are kept to a minimum due to the location of the JJI-Joist Distributor and the production facility being based in the UK.
- Many JJI-Joist Distributors have several depots each with trained staff capable of nationwide distribution.

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