GRK FASTENERS™ UberGrade

Conversion Guide

GRK RSS vs. Lag Bolt

No more pre-drilling... Just grab a screw and drill!!

Convert from a lag screw to GRK RSS Fasteners

PERFORMANCE DATA

(Compliant for use with Canadian National Building Code)

FACTORED RESISTANCES PERFORMANCE COMPARISON FOR D.FIR MEMBERS [1,2,3,4,5]
APPLICATION: 2" LEDGER BOARD TO 2" RIM BOARD (LBS)

LAG SCREWS				GRK SCREWS		
LAG SIZE	LENGTH	SHEAR RESISTANCE	PULL-OUT	TYPE OF SCREW	SHEAR RESISTANCE	PULL-OUT
1/4"	3	171	360	GRK RSS (3") (10273)	366	517
1/4"	4	200	360	GRK RSS (4") (10275)	466	517
3/8"	3	249	618	GRK RSS (3") (10273)	366	517
3/8"	4	322	618	GRK RSS (4") (10275)	466	517
1/2"	3	320	779	GRK RSS (3") (10273)	366	517
1/2"	4	427	779	GRK RSS (4") (10275)	466	517
5/8"	3	385	920	GRK RSS (3") (10273)	366	517
5/8"	4	513	920	GRK RSS (4") (10275)	466	517

[1] Lag Screw Factored Resistances have been developed in accordance with 12.6 CSA 086-14. Apply adjustment factors where applicable.

[2] Factored withdrawn resistance shown assume the entire threaded portion of the screw is installed In to the main member

[3] Minimum spacing ,edge and end distances shall be in accordance with 12.6 .2 CSA 086-14

[4] GRK RSS Screw spacing must comply with 12.11.5 CSA 086-14 (See Spacing Tables)

[5] Dimensions of Lag screw based on Table 15 & 16 ASME B18.2.1-2012

EXAMPLE DECK DESIGN: ATTACHING LEDGER BOARD TO YOUR HOUSE!

Assumptions:

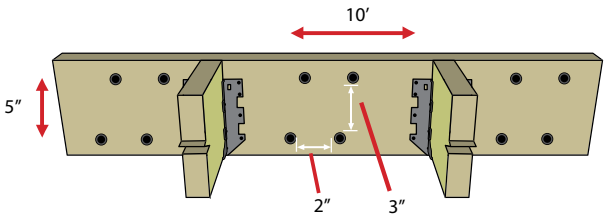
- Deck Span = 8′ out from the house
- 10′ Wide
- LL = 40 PSF; DL = 10 PSF

Total lateral resistance required = 2900 lbs

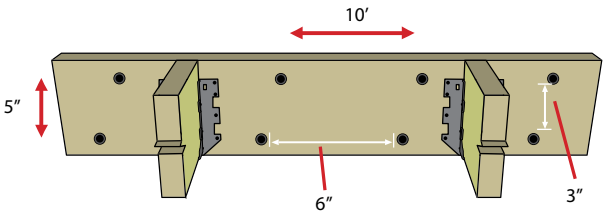
Possible Solutions:

Using 1/4″ by 3″ Lag Bolts = 2900 / 242 = 12 lags
Using 3/8″ by 3″ Lag Bolts = 2900 / 249 = 12 Lags (see example below)
Using 1/2″ by 3″ Lag Bolts = 2900 / 320 = 9
Using 5/8″ by 3″ Lag Bolts = 2900 / 385 = 8
Using 3/8 * 3.125 RSS = 2900 /366 = 8 screws (see example below)

LAG SOLUTION: 12 LAG SCREWS



RSS SOLUTION: 8 RSS SCREWS[1] NO PRE-DRILLING



[1] RSS Spacing must comply with 12.11.5 CSA 086-14

GRK FASTENERS™ UberGrade

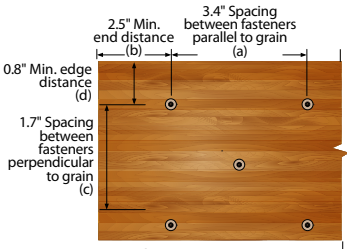
ITW Construction Products

Call our toll free number **800-387-9692** or visit **www.itwconstruction.ca** for general information.
Visit GRK Fasteners web site **www.grkfasteners.com** for the most current product and technical information.

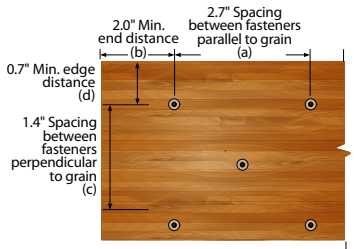
GRK RSS Spacings

MINIMUM ROW SPACING, SPACING IN ROW AND EDGE DISTANCES AS SPECIFIED IN CLAUSE 12.11.2 CSA 086 2016.

SCREW THREAD DIAMETER (IN.)	SCREW SHANK DIAMETER (IN.)	GEOMETRY	MINIMUM DIMENSIONS (in)	
			D. FIR-L	S-P-F
1/4	0.169	a - Spacing parallel to grain	3.4	2.7
		b - End distance parallel to grain	2.5	2.0
		c - Spacing perpendicular to grain	1.7	1.4
		d - Edge distance perpendicular to grain	0.8	0.7

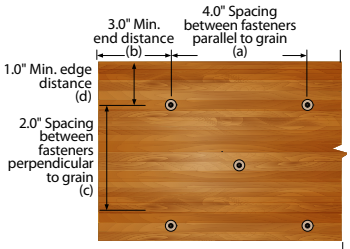


D-Fir Larch Spacing Requirements

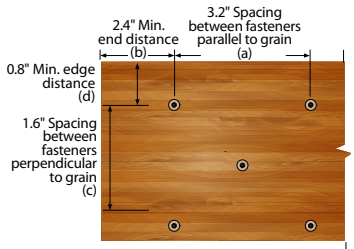


S-P-F Spacing Requirements

SCREW THREAD DIAMETER (IN.)	SCREW SHANK DIAMETER (IN.)	GEOMETRY	MINIMUM DIMENSIONS (in)	
			D. FIR-L	S-P-F
5/16	0.1988	a - Spacing parallel to grain	4.0	3.2
		b - End distance parallel to grain	3.0	2.4
		c - Spacing perpendicular to grain	2.0	1.6
		d - Edge distance perpendicular to grain	1.0	0.8

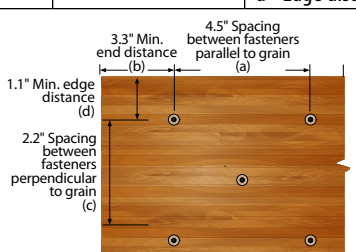


D-Fir Larch Spacing Requirements

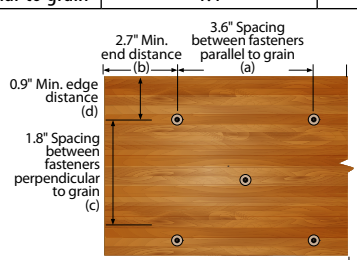


S-P-F Spacing Requirements

SCREW THREAD DIAMETER (IN.)	SCREW SHANK DIAMETER (IN.)	GEOMETRY	MINIMUM DIMENSIONS (in)	
			D. FIR-L	S-P-F
3/8	0.2228	a - Spacing parallel to grain	4.5	3.6
		b - End distance parallel to grain	3.3	2.7
		c - Spacing perpendicular to grain	2.2	1.8
		d - Edge distance perpendicular to grain	1.1	0.9



D-Fir Larch Spacing Requirements



S-P-F Spacing Requirements

1. Table values have been developed in accordance to Clause 12.6.2.6 CSA 086 2016. Designer to note additional provision in Clause 12 in CSA 086 2016 for service conditions and other factors affecting connection layout and capacity.

RSS™ Rugged Structural Screws

Factored Resistances (RSS 1/4")

FACTORED RESISTANCES FOR D.FIR MEMBERS

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	D-FIR-L										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10217	1/4	2.5	0.169	1.5	230*	---	---	---	---	---	---	---	---	---	332
					1.02*	---	---	---	---	---	---	---	---	---	1.48
22400		3.125		2	287	259	---	---	---	---	---	---	---	---	457
					1.28	1.15	---	---	---	---	---	---	---	---	2.03
10163		3.5		2.75	305	305	230*	---	---	---	---	---	---	---	646
					1.36	1.36	1.02*	---	---	---	---	---	---	---	2.87

FACTORED RESISTANCES FOR S-P-F MEMBERS (LBS)

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	SPF										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10217	1/4	2.5	0.169	1.5	197*	---	---	---	---	---	---	---	---	---	253
					0.88*	---	---	---	---	---	---	---	---	---	1.12
22400		3.125		2	246	222	---	---	---	---	---	---	---	---	348
					1.10	0.99	---	---	---	---	---	---	---	---	1.55
10163		3.5		2.75	268	268	197*	---	---	---	---	---	---	---	491
					1.19	1.19	0.88*	---	---	---	---	---	---	---	2.19

[1] End-grain installation is not permitted.

[2] Factored lateral resistances shown have been developed in accordance with Clause 12.11 CSA 086 2016 **Wood Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **wood screws** in accordance with CSA 086 2016.

[3] Factored lateral resistances according to Clause 12.6 CSA 086 2016 **Lag Screw** provisions can be obtained upon request. Please contact ITW Canada for more information. Designer to note provisions for net area and group of fasteners per Clause 12 in CSA 086 2016.

[4] Factored withdrawal resistances shown have been developed in accordance with Clause 12.6 CSA 086 2016 **Lag Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **lag screws** in accordance with CSA 086 2016.

[5] Factored withdrawal resistances shown assume the entire threaded portion of the screw is installed into the main member. This accounts for the tip length reduction as per 12.6 CSA 086 2016 **Lag Screw** provisions.

[6] Minimum row spacing, spacing in row and edge distances shall be as specified in Clause 12.6.2.6 CSA 086 2016. Designer to note additional provision in Clause 12 in CSA 086 2016 for service conditions and other factors affecting connection layout and capacity. The minimum spacing table can be used for reference.

*The penetration length is less than the minimum as per Lag Screw provision but it meets the penetration length according to the Wood Screw provision on Clause 12 of CSA 086 2016. See footnote 6.

[7] Convert inches to millimetres by multiplying the value by 25.4 (1 in. = 25.4 mm).

Factored Resistances (RSS 5/16")

FACTORED RESISTANCES FOR D.FIR MEMBERS

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	D-FIR-L										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10217	5/16	2.5	0.1988	1.5	268*	---	---	---	---	---	---	---	---	---	378
					1.19*	---	---	---	---	---	---	---	---	---	1.68
10219		2.75		1.75	295	---	---	---	---	---	---	---	---	---	449
					1.31	---	---	---	---	---	---	---	---	---	2.00
10221		3.125		2.125	335	302*	---	---	---	---	---	---	---	---	556
					1.49	1.34*	---	---	---	---	---	---	---	---	2.47
10223		3.5		2.5	376	376	268*	---	---	---	---	---	---	---	664
					1.67	1.67	1.19*	---	---	---	---	---	---	---	2.95
10225		4		2.75	404	429	402	268*	---	---	---	---	---	---	735
					1.80	1.91	1.79	1.19*	---	---	---	---	---	---	3.27
10231		5.125		3.5	404	459	488	472	418	302*	---	---	---	---	949
					1.80	2.04	2.17	2.10	1.86	1.34*	---	---	---	---	4.22
10235		6		3.875	404	459	488	488	488	459	402	268*	---	---	1056
					1.80	2.04	2.17	2.17	2.17	2.04	1.79	1.19*	---	---	4.70

FACTORED RESISTANCES FOR S-P-F MEMBERS (LBS)

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	SPF										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10217	5/16	2.5	0.1988	1.5	230*	---	---	---	---	---	---	---	---	---	288
					1.02*	---	---	---	---	---	---	---	---	---	1.28
10219		2.75		1.75	253	---	---	---	---	---	---	---	---	---	342
					1.13	---	---	---	---	---	---	---	---	---	1.52
10221		3.125		2.125	287	259*	---	---	---	---	---	---	---	---	454
					1.28	1.15*	---	---	---	---	---	---	---	---	1.88
10223		3.5		2.5	322	322	230*	---	---	---	---	---	---	---	505
					1.43	1.43	1.02*	---	---	---	---	---	---	---	2.25
10225		4		2.75	357	368	345	230*	---	---	---	---	---	---	559
					1.59	1.64	1.53	1.02*	---	---	---	---	---	---	2.49
10231		5.125		3.5	357	403	439	415	369	259*	---	---	---	---	723
					1.59	1.79	1.95	1.85	1.64	1.15*	---	---	---	---	3.21
10235		6		3.875	357	403	439	439	439	403	345	230*	---	---	804
					1.59	1.79	1.95	1.95	1.95	1.79	1.53	1.02*	---	---	3.58

[1] End-grain installation is not permitted.

[2] Factored lateral resistances shown have been developed in accordance with Clause 12.11 CSA O86 2016 **Wood Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **wood screws** in accordance with CSA O86 2016.

[3] Factored lateral resistances according to Clause 12.6 CSA O86 2016 **Lag Screw** provisions can be obtained upon request. Please contact ITW Canada for more information. Designer to note provisions for net area and group of fasteners per Clause 12 in CSA O86 2016.

[4] Factored withdrawal resistances shown have been developed in accordance with Clause 12.6 CSA O86 2016 **Lag Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **lag screws** in accordance with CSA O86 2016.

[5] Factored withdrawal resistances shown assume the entire threaded portion of the screw is installed into the main member. This accounts for the tip length reduction as per 12.6 CSA O86 2016 **Lag Screw** provisions.

[6] Minimum row spacing, spacing in row and edge distances shall be as specified in Clause 12.6.2.6 CSA O86 2016. Designer to note additional provision in Clause 12 in CSA O86 2016 for service conditions and other factors affecting connection layout and capacity. The minimum spacing table can be used for reference.

*The penetration length is less than the minimum as per Lag Screw provision but it meets the penetration length according to the Wood Screw provision on Clause 12 of CSA O86 2016. See footnote 6.

[7] Convert inches to millimetres by multiplying the value by 25.4 (1 in. = 25.4 mm).

Factored Resistances (RSS 3/8")

FACTORED RESISTANCES FOR D.FIR MEMBERS

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	D-FIR-L										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10273	3/8	3.125	0.2228	1.5	373	336*	---	---	---	---	---	---	---	---	403
					1.66	1.50*	---	---	---	---	---	---	---	---	1.79
10275		4		2.75	474	478	448	---	---	---	---	---	---	---	791
					2.11	2.13	1.99	---	---	---	---	---	---	---	3.52
10278		5.125		3.5	474	534	590	549	486	336*	---	---	---	---	1024
					2.11	2.37	2.62	2.44	2.16	1.50*	---	---	---	---	4.56
10281		6		4	474	534	590	590	590	534	448	---	---	---	1180
					2.11	2.37	2.62	2.62	2.62	2.37	1.99	---	---	---	5.25
10285		7.25		4.5	474	534	590	590	590	590	590	564	373*	---	1335
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.51	1.66*	---	5.94
10287		8		4.375	474	534	590	590	590	590	590	590	534	---	1335
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.62	2.37	---	5.94
10293		10		5	474	534	590	590	590	590	590	590	590	534	1490
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.37	6.63
10299		12		5.875	474	534	590	590	590	590	590	590	590	590	1762
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	7.84
10307		14.125		5.875	474	534	590	590	590	590	590	590	590	590	1762
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	7.84
10311		16		5.75	474	534	590	590	590	590	590	590	590	590	1762
					2.11	2.37	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	7.84

[1] End-grain installation is not permitted.

[2] Factored lateral resistances shown have been developed in accordance with Clause 12.11 CSA 086 2016 **Wood Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **wood screws** in accordance with CSA 086 2016.

[3] Factored lateral resistances according to Clause 12.6 CSA 086 2016 **Lag Screw** provisions can be obtained upon request. Please contact ITW Canada for more information. Designer to note provisions for net area and group of fasteners per Clause 12 in CSA 086 2016.

[4] Factored withdrawal resistances shown have been developed in accordance with Clause 12.6 CSA 086 2016 **Lag Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **lag screws** in accordance with CSA 086 2016.

[5] Factored withdrawal resistances shown assume the entire threaded portion of the screw is installed into the main member. This accounts for the tip length reduction as per 12.6 CSA 086 2016 **Lag Screw** provisions.

[6] Minimum row spacing, spacing in row and edge distances shall be as specified in Clause 12.6.2.6 CSA 086 2016. Designer to note additional provision in Clause 12 in CSA 086 2016 for service conditions and other factors affecting connection layout and capacity. The minimum spacing table can be used for reference.

*The penetration length is less than the minimum as per Lag Screw provision but it meets the penetration length according to the Wood Screw provision on Clause 12 of CSA 086 2016. See footnote 6.

[7] Convert inches to millimetres by multiplying the value by 25.4 (1 in. = 25.4 mm).

Factored Resistances (RSS 3/8") continued on page G 15

Factored Resistances (RSS 3/8")

FACTORED RESISTANCES FOR S-P-F MEMBERS (LBS)

MODEL/ BULK PART NO.	SIZE		SHANK DIAMETER	THREADED LENGTH (in)	SPF										
	THREAD DIA (in)	LENGTH (in)			FACTORED LATERAL RESISTANCE WOOD SIDE MEMBER THICKNESS (in)										FACTORED WITHDRAWAL
					1.5	2	2.5	3	3.5	4	4.5	5	6	8	
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
					kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
10273	3/8	3.125	0.2228	1.5	320	288*	---	---	---	---	---	---	---	---	307
					1.42	1.28*	---	---	---	---	---	---	---	---	1.37
10275		4		2.75	410	410	410	---	---	---	---	---	---	---	602
					1.82	1.82	1.82	---	---	---	---	---	---	---	2.68
10278		5.125		3.5	419	470	521	483	416	288*	---	---	---	---	780
					1.86	2.09	2.32	2.15	1.85	1.28*	---	---	---	---	3.47
10281		6		4	419	470	521	531	521	470	384	---	---	---	898
					1.86	2.09	2.32	2.36	2.32	2.09	1.71	---	---	---	3.99
10285		7.25		4.5	419	470	521	531	531	531	531	496	320*	---	1016
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.21	1.42*	---	4.52
10287		8		4.375	419	470	521	531	531	531	531	531	470	---	1016
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.36	2.09	---	4.52
10293		10		5	419	470	521	531	531	531	531	531	531	470	1134
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.36	2.36	2.09	5.04
10299		12		5.875	419	470	521	531	531	531	531	531	531	531	1341
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.36	2.36	2.36	5.96
10307		14.125		5.875	419	470	521	531	531	531	531	531	531	531	1341
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.36	2.36	2.36	5.96
10311		16		5.75	419	470	521	531	531	531	531	531	531	531	1341
					1.86	2.09	2.32	2.36	2.36	2.36	2.36	2.36	2.36	2.36	5.96

[1] End-grain installation is not permitted.

[2] Factored lateral resistances shown have been developed in accordance with Clause 12.11 CSA 086 2016 **Wood Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **wood screws** in accordance with CSA 086 2016.

[3] Factored lateral resistances according to Clause 12.6 CSA 086 2016 **Lag Screw** provisions can be obtained upon request. Please contact ITW Canada for more information. Designer to note provisions for net area and group of fasteners per Clause 12 in CSA 086 2016.

[4] Factored withdrawal resistances shown have been developed in accordance with Clause 12.6 CSA 086 2016 **Lag Screw** provisions. Values must be multiplied by all applicable modification factors as specified for **lag screws** in accordance with CSA 086 2016.

[5] Factored withdrawal resistances shown assume the entire threaded portion of the screw is installed into the main member. This accounts for the tip length reduction as per 12.6 CSA 086 2016 **Lag Screw** provisions.

[6] Minimum row spacing, spacing in row and edge distances shall be as specified in Clause 12.6.2.6 CSA 086 2016. Designer to note additional provision in Clause 12 in CSA 086 2016 for service conditions and other factors affecting connection layout and capacity. The minimum spacing table can be used for reference.

*The penetration length is less than the minimum as per Lag Screw provision but it meets the penetration length according to the Wood Screw provision on Clause 12 of CSA 086 2016. See footnote 6.

[7] Convert inches to millimetres by multiplying the value by 25.4 (1 in. = 25.4 mm).