

## Technical Bulletin

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### Roof Panel Design Charts - National Building Code of Canada 2005

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This bulletin provides transverse design load charts for the Insulspan® Structural Insulating Panel (SIP) System used as a roof system component designed in accordance with the **National Building Code of Canada 2005**. Insulspan has completed structural testing of the Insulspan SIP System for this application using a third party testing laboratory following the requirements of ASTM E72, **Standard Test Methods of Conducting Strength Tests of Panels for Building Construction**.

The attached **Roof Panel Transverse Design Load** charts dated January 20, 2010 summarize design loads for Insulspan SIP roof panels with joint configurations as noted.

- Table R-1-S – OSB Surface Spline or Insulspline
- Table R-2-L – Single 2x Lumber
- Table R-3-I – Wood I-Joist
- Table R-4-DL – Double 2x Lumber
- Table R-5-LVL – Single 1.8E LVL
- Table R-6-DLVL – Double 1.8E LVL

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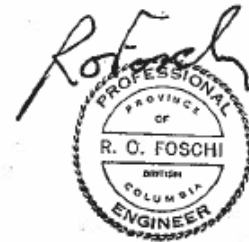
**Table R-1-S ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

OSB SURFACE SPLINE OR INSULSPLINE JOINTS (TIMBER FRAME STRUCTURES ONLY)				
Thickness		Allowable Deflection	PANEL SPAN (feet)	
SIP	EPS		4'-0" Max. Span	6'-0" Max. Span
4 1/2"	3 5/8"	L/360	43	27
		L/240	66	42
		L/180	87	56
6 1/2"	5 5/8"	L/360	60	40
		L/240	89	61
		L/180	112	81
8 1/4"	7 3/8"	L/360	70	49
		L/240	100	74
		L/180	123	95
10 1/4"	9 3/8"	L/360	78	61
		L/240	107	88
		L/180	130	111
12 1/4"	11 3/8"	L/360	84	64
		L/240	113	92
		L/180	136	113

**Notes:**

1. The tabulated values are total design loads based upon design requirements of National Building Code of Canada 2005. For allowable deflection of L/360, the values are allowable variable loads (live, snow, rain and wind). For allowable deflection of L/240 and L/180, a minimum dead load of 10 psf is included.
2. The span of a sloped roof panel must be measured along the slope. Design loads are to be calculated as normal loads acting perpendicular to the face of the panel.
3. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
4. Insulspan SIP skins are nailed to the OSB splines at longitudinal panel joints using minimum 8d box nails @ 6" o.c. or equivalent.
5. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of CAN/ULC - S701, type 1.
6. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1 and CAN/CSA-O325.0 (span rating 1R24/2F16).

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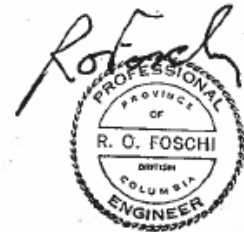
**Table R-2-L ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

Thickness		Allowable Deflection	SINGLE 2 x LUMBER SPLINE JOINTS @ 4'-0" On Center																
SIP	EPS		PANEL SPAN (feet)																
			4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4 1/2"	3 5/8"	L/360	98	72	46	37	28	23	19	16	13	11	10	-	-	-	-	-	-
		L/240	143	106	70	57	44	37	30	25	21	18	16	-	-	-	-	-	-
		L/180	149	120	91	74	57	48	39	33	28	24	21	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	198	145	93	74	55	45	36	30	24	21	19	17	15	13	11	10	9
		L/240	201	161	121	101	82	68	55	46	37	33	30	26	23	21	19	17	15
		L/180	201	161	121	106	92	82	72	60	49	44	39	34	30	27	25	22	20
8 1/4"	7 3/8"	L/360	209	177	146	115	85	71	57	48	40	34	29	26	23	20	18	16	14
		L/240	212	179	147	125	104	94	84	72	60	52	45	40	35	31	28	25	23
		L/180	212	179	147	125	104	94	84	77	70	64	58	51	45	40	36	33	30
10 1/4"	9 3/8"	L/360	293	239	186	154	122	103	84	72	60	52	44	39	34	30	27	24	22
		L/240	295	241	188	155	123	108	93	85	78	72	66	58	51	46	41	37	33
		L/180	295	241	188	155	123	108	93	85	78	72	66	61	57	53	50	46	43
12 1/4"	11 3/8"	L/360	320	258	196	169	143	123	104	93	83	73	63	55	48	43	38	34	30
		L/240	322	260	198	171	144	124	105	94	84	78	72	67	62	58	54	50	46
		L/180	322	260	198	171	144	124	105	94	84	78	72	67	62	58	54	51	48

**Notes:**

1. The tabulated values are total design loads based upon design requirements of National Building Code of Canada 2005. For allowable deflection of L/360, the values are allowable variable loads (live, snow, rain and wind). For allowable deflection of L/240 and L/180, a minimum dead load of 10 psf is included.
2. The span of a sloped roof panel must be measured along the slope. Design loads are to be calculated as normal loads acting perpendicular to the face of the panel.
3. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
4. Acceptable 2x lumber for assembly of the Insulspan SIP System is SPF #2 or better.
5. Insulspan SIP skins are nailed to the lumber splines at longitudinal panel joints using minimum 8d box nails @ 6" o.c. or equivalent.
6. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of CAN/ULC-S701, type 1.
7. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1 and CAN/CSA-O325.0 (span rating 1R24/2F16).

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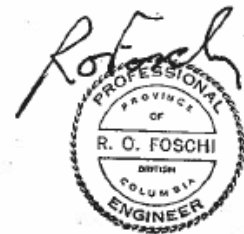
**Table R-3-DL ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

Thickness		Allowable Deflection	PANEL SPAN (feet)																
SIP	EPS		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4 1/2"	3 5/8"	L/360	135	96	57	45	33	27	21	18	15	13	11	-	-	-	-	-	-
		L/240	188	137	86	68	51	42	34	29	24	20	17	-	-	-	-	-	-
		L/180	188	150	112	89	67	56	45	38	32	27	23	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	207	168	129	99	70	57	45	38	31	27	23	20	17	15	13	11	10
		L/240	209	189	170	137	104	86	69	58	48	41	35	31	27	24	21	19	17
		L/180	209	189	170	144	118	103	89	76	63	54	46	41	36	32	28	25	23
8 1/4"	7 3/8"	L/360	214	201	189	153	118	96	74	62	51	44	37	32	28	25	22	19	17
		L/240	217	204	192	168	145	127	109	93	77	66	56	49	43	38	34	30	27
		L/180	217	204	192	168	145	127	109	99	89	81	73	64	56	50	44	40	36
10 1/4"	9 3/8"	L/360	293	244	195	185	176	147	119	99	80	69	58	51	44	39	34	30	27
		L/240	295	246	198	188	179	156	134	119	104	95	87	77	67	59	52	47	42
		L/180	295	246	198	188	179	156	134	119	104	95	87	80	74	68	63	58	54
12 1/4"	11 3/8"	L/360	320	259	198	189	181	168	156	137	118	101	85	74	64	57	50	45	40
		L/240	322	261	201	192	184	170	157	139	121	109	98	90	83	77	72	66	60
		L/180	322	261	201	192	184	170	157	139	121	109	98	90	83	77	72	67	62

**Notes:**

1. The tabulated values are total design loads based upon design requirements of National Building Code of Canada 2005. For allowable deflection of L/360, the values are allowable variable loads (live, snow, rain and wind). For allowable deflection of L/240 and L/180, a minimum dead load of 10 psf is included.
2. The span of a sloped roof panel must be measured along the slope. Design loads are to be calculated as normal loads acting perpendicular to the face of the panel.
3. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
4. Acceptable 2x lumber for assembly of the Insulspan SIP System is SPF #2 or better.
5. Insulspan SIP skins are nailed to the lumber splines at longitudinal panel joints using minimum 8d box nails @ 6" o.c. or equivalent.
6. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of CAN/ULC-S701, type 1.
7. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1 and CAN/CSA-O325.0 (span rating 1R24/2F16).

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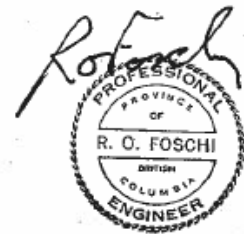
**Table R-4-LVL ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

Thickness		Allowable Deflection	SINGLE LVL SPLINE JOINTS @ 4'-0" On Center																
SIP	EPS		PANEL SPAN (feet)																
			4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4 1/2"	3 5/8"	L/360	118	85	52	41	30	25	20	17	14	12	10	-	-	-	-	-	-
		L/240	172	125	79	63	47	39	31	26	22	19	17	-	-	-	-	-	-
		L/180	182	142	103	81	60	50	40	34	29	25	22	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	203	157	112	87	63	51	40	34	28	24	20	18	16	14	12	11	10
		L/240	206	184	163	128	94	77	60	51	42	36	31	27	24	21	19	17	16
		L/180	206	191	177	149	121	99	77	65	54	47	40	35	31	28	25	23	21
8 1/4"	7 3/8"	L/360	212	198	185	144	103	84	65	54	44	38	32	28	24	21	19	17	15
		L/240	215	202	189	169	149	123	97	81	66	57	48	42	37	33	30	27	24
		L/180	215	202	189	178	167	145	124	104	84	73	62	54	47	42	38	34	30
10 1/4"	9 3/8"	L/360	293	243	193	177	162	132	102	86	71	61	51	44	38	34	30	27	24
		L/240	295	245	196	185	175	161	148	126	104	90	76	66	57	51	45	40	36
		L/180	295	245	196	185	175	167	160	146	133	122	111	91	72	64	57	51	46
12 1/4"	11 3/8"	L/360	320	259	198	188	178	163	148	125	102	88	75	65	56	49	43	38	34
		L/240	322	261	200	190	181	175	170	159	148	128	109	96	83	73	64	57	51
		L/180	322	261	200	190	181	175	170	165	160	150	140	122	105	93	81	73	65

**Notes:**

1. The tabulated values are total design loads based upon design requirements of National Building Code of Canada 2005. For allowable deflection of L/360, the values are allowable variable loads (live, snow, rain and wind). For allowable deflection of L/240 and L/180, a minimum dead load of 10 psf is included.
2. The span of a sloped roof panel must be measured along the slope. Design loads are to be calculated as normal loads acting perpendicular to the face of the panel.
3. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
4. Acceptable LVL for assembly of the Insulspan SIP System is 1.8E LVL or better.
5. Insulspan SIP skins are nailed to the LVL splines at longitudinal panel joints using minimum 8d box nails @ 6" o.c. or equivalent.
6. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of CAN/ULC-S701, type 1.
7. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1 and CAN/CSA-O325.0 (span rating 1R24/2F16).

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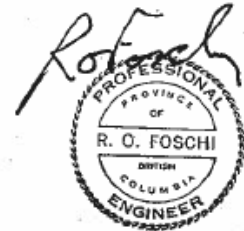
**Table R-5-I ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

Thickness		Allowable Deflection	WOOD I-JOIST SPLINE JOINTS @ 4'-0" On Center																
SIP	EPS		PANEL SPAN (feet)																
			4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
10 1/2"	9 5/8"	L/360	293	242	191	166	141	115	89	75	62	54	46	40	35	31	27	24	22
		L/240	295	244	194	185	177	153	129	110	92	80	69	60	52	47	42	38	34
		L/180	295	244	194	185	177	167	158	138	118	103	88	77	67	60	53	48	43
12 7/8"	12"	L/360	320	255	191	184	178	148	119	101	84	73	62	55	48	42	37	33	30
		L/240	322	258	194	187	180	173	166	144	122	107	92	81	71	63	56	50	45
		L/180	322	258	194	187	180	173	166	157	148	132	117	104	91	81	71	64	58

**Notes:**

1. The tabulated values are total design loads based upon design requirements of National Building Code of Canada 2005. For allowable deflection of L/360, the values are allowable variable loads (live, snow, rain and wind). For allowable deflection of L/240 and L/180, a minimum dead load of 10 psf is included.
2. The span of a sloped roof panel must be measured along the slope. Design loads are to be calculated as normal loads acting perpendicular to the face of the panel.
3. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
4. Acceptable wood I-joists for assembly of the Insulspan SIP System are Nascor NJH, Jager JSI2000 and Trus Joist TJI 100C or better.
5. Insulspan SIP skins are nailed to the wood I-joist splines at longitudinal panel joints using minimum 8d box nails @ 6" o.c. or equivalent.
6. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of CAN/ULC-S701, type 1.
7. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1 and CAN/CSA-O325.0 (span rating 1R24/2F16).

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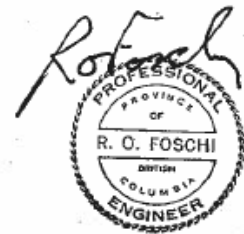
**Table R-6-DLVL ROOF PANEL TRANSVERSE DESIGN LOAD (psf)**

Thickness		Allowable Deflection	PANEL SPAN (feet)																
SIP	EPS		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4 1/2"	3 5/8"	L/360	168	118	68	53	38	31	24	20	16	13	11	-	-	-	-	-	-
		L/240	194	148	102	80	58	47	37	31	26	22	19	-	-	-	-	-	-
		L/180	194	163	133	104	75	61	48	41	34	29	25	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	210	185	160	122	85	69	54	45	36	30	25	22	19	17	15	13	11
		L/240	213	200	187	156	126	103	81	67	54	46	38	34	30	26	23	21	19
		L/180	213	200	187	174	162	133	105	87	70	60	50	44	38	34	30	27	24
8 1/4"	7 3/8"	L/360	215	202	190	168	147	119	91	76	62	53	44	38	32	28	24	21	19
		L/240	218	205	193	183	174	154	134	113	92	79	66	57	49	43	38	34	30
		L/180	218	205	193	183	174	166	159	139	119	102	85	74	63	56	49	44	39
10 1/4"	9 3/8"	L/360	293	244	195	186	177	163	149	124	100	86	72	62	53	46	40	36	32
		L/240	295	246	198	189	180	174	169	158	147	127	107	93	80	70	61	54	48
		L/180	295	246	198	189	180	174	169	164	160	140	121	112	103	90	78	70	62
12 1/4"	11 3/8"	L/360	320	260	200	191	183	177	172	159	147	127	107	93	80	71	62	55	48
		L/240	322	262	202	193	185	180	175	170	166	161	157	138	119	105	92	82	72
		L/180	322	262	202	193	185	180	175	170	166	163	161	157	153	136	119	106	93

**Notes:**

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