

# Design Resources

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**Website:** [premiersips.com](http://premiersips.com)

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*Details, illustrations, pictures, and guidelines provided in this Resource Manual give basic information and illustrate examples of Premier SIPS design & installation recommendations. The basic information provided herein is not intended to cover every potential use and application of Premier SIPS. It is the responsibility of the owner and/or the owner's representative to design the insulated wall assembly to perform in a manner ensuring function and durability. Adding an additional insulation component may change the behavior of a wall assembly regarding air movement, water vapor transmittance, bulk water management, and heating, cooling, and ventilation systems. It is the responsibility of the installer to become familiar with each specific application and determine if Premier SIPS are suitable. By commencing work, the installer accepts full responsibility for the proper and safe installation of Premier SIPS at each job site. Furthermore, it is the sole responsibility of the installer to meet all federal and local regulatory requirements for job site safety for every person on the job site while in the execution of all phases of the SIP installation.*

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## PREMIER SIPS STRUCTURAL REVIEW

### ARCHITECT/ENGINEERING REVIEW

The Premier SIPS Load Charts in this Resource Manual have been developed from national testing standards, testing at independent laboratories, and qualified structural engineers. These charts cover most common construction requirements. Each building project should be reviewed by an architect/engineer to determine the suitability of Premier SIPS. Extrapolating design capacities for conditions outside the scope of the load charts is not recommended.

### BUILDING CODES

Premier SIPS are recognized and in compliance with the 2015, 2018 and 2021 International Building Code and 2015, 2018 and 2021 International Residential Code. Premier SIPS should be designed to comply with the deflection limits of the applicable building code.

### EVALUATION REPORTS

The International Code Council Evaluation Service (ICC-ES) has reviewed the independent testing, structural engineering, third party inspections, and QC program for Premier SIPS and has issued Evaluation Report ESR-4524, Listing Report ESL-1207, and Listing Report ESL-1208.



**All current Code Reports can be accessed at [www.premiersips.com](http://www.premiersips.com).**

## PREMIER SIPS R-VALUES & U-FACTORS

SIP R-VALUES						
SIP Thickness	R-value at 75 ° F		R-value at 40 ° F		R-value at 25 ° F	
	EPS Core	GPS Core	EPS Core	GPS Core	EPS Core	GPS Core
4-1/2"	15	18	16	19	17	20
6-1/2"	23	28	24	29	26	30
8-1/4"	30	36	32	37	33	39
10-1/4"	37	45	40	47	42	49
12-1/4"	45	55	48	57	51	59

SIP U-FACTORS						
SIP Thickness	U-factor at 75 ° F		U-factor at 40 ° F		U-factor at 25 ° F	
	EPS Core	GPS Core	EPS Core	GPS Core	EPS Core	GPS Core
4-1/2"	0.066	0.055	0.062	0.052	0.058	0.050
6-1/2"	0.043	0.035	0.041	0.034	0.038	0.033
8-1/4"	0.033	0.027	0.031	0.027	0.030	0.025
10-1/4"	0.027	0.022	0.025	0.021	0.023	0.020
12-1/4"	0.022	0.018	0.020	0.017	0.019	0.016

NOTE: See Detail Premier-102 and Technical Bulletins for additional R-value & U-Factor considerations. Both are available at [www.premiersips.com](http://www.premiersips.com).

## PREMIER SIPS WEIGHT

SIP WEIGHT			
SIP Thickness	OSB Facing Thickness (Both Faces)		
	7/16"	5/8"	3/4"
4-1/2"	3.3	4.6	5.5
6-1/2"	3.5	4.8	5.7
8-1/4"	3.7	5.0	5.9
10-1/4"	3.9	5.2	6.1
12-1/4"	4.0	5.4	6.2

Premier SIPS are typically manufactured with 7/16" OSB facings on both sides. Custom 5/8" or 3/4" OSB facings are available as an alternative. Substitution of one or both 7/16" OSB facings will add 0.65 psf per facing for 5/8" OSB and 1.1 psf per facing for 3/4" OSB. Consult your Premier Representative for additional Code Approved facing options.



# PREMIER SIPS SPLINE BASICS

Premier SIPS are connected by splines.

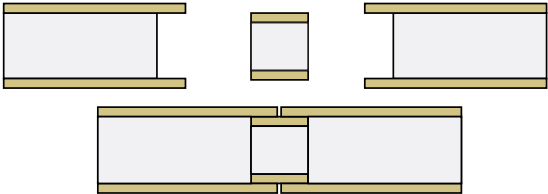
There are three basic types of spline connections:

- Type S
- Type I
- Type L

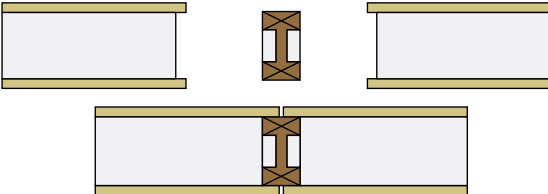
### SPLINE CONSIDERATIONS FOR DESIGN PROFESSIONALS:

- If splines are simply acting as a connection between panels, the “Type S” spline meets this requirement while eliminating thermal bridging.
- If the purpose of the spline is also to provide additional structural support, “Type I” or “Type L” splines can be used.
- Determination of proper spline for each application can be found by referring to the Premier SIPS Load Charts.
- Contractors should refer to SIP Layout Drawings for proper spline installation.

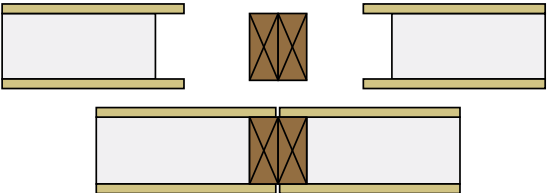
### TYPE S SPLINE



### TYPE I SPLINE



### TYPE L SPLINE





# PREMIER SIPS LOAD CHARTS

## LOAD CHART CONTENTS

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**LOAD CHART #1A**  
**Uniform Axial Loads - PLF<sup>1-4</sup>**  
**Type S Spline**

SIP Thickness	SIP Height (ft.)					
	8'	10'	12'	16	20'	24'
4-1/2"	3500	2553	2453	2117	NA	NA
6-1/2"	4250	4043	3373	3923	2817	2183
8-1/4"	4917	4327	4473	4197	3497	3067
10-1/4"	4600	4414	4228	4417	3389	3248
12-1/4"	3889	3959	4028	4408	3837	3333

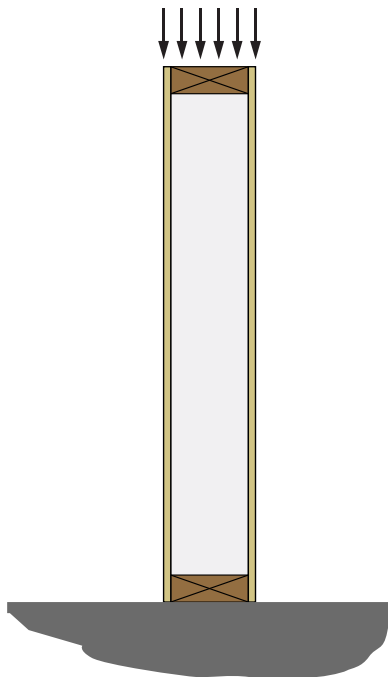
<sup>1</sup> Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

<sup>2</sup> Uniform axial loads.

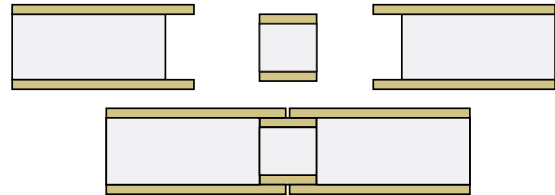
<sup>3</sup> Both facings must bear on the supporting foundation or structure.

<sup>4</sup> Tabulated values for 8-foot (2.44 m) walls apply to SIPs constructed with OSB strength axis oriented either parallel or perpendicular to supports.

**AXIAL LOAD**



**TYPE S SPLINE**



**LOAD CHART #1B**  
**Uniform Axial Loads - PLF<sup>1-4</sup>**  
**Type L Spline**

SIP Thickness	SIP Height (ft.)					
	8'	10'	12'	16'	20'	24'
4-1/2"	4723	3903	3273	2623	NA	NA
6-1/2"	5850	5890	4277	4310	2933	2837
8-1/4"	6807	6110	5557	5180	4837	4083
10-1/4"	5473	5709	5946	5948	4729	4250
12-1/4"	5667	5474	5281	5775	4729	4223

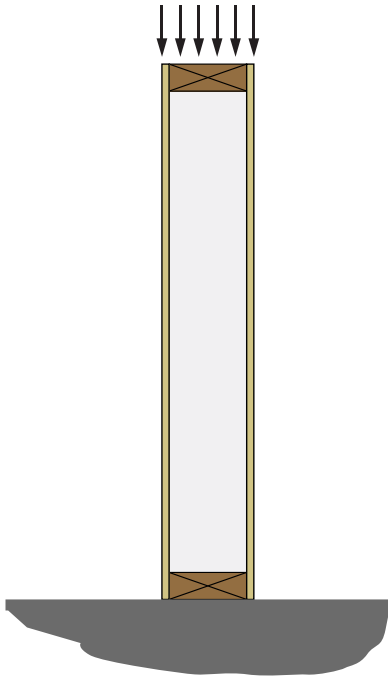
<sup>1</sup> Splines consist of No. 2 or better, Hem-Fir, 1-1/2 inch (38.1 mm) wide with depth equal to the core thickness, spaced to provide no less than two members for every 48 inches (1219.2 mm) of SIPs width. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

<sup>2</sup> Uniform axial loads.

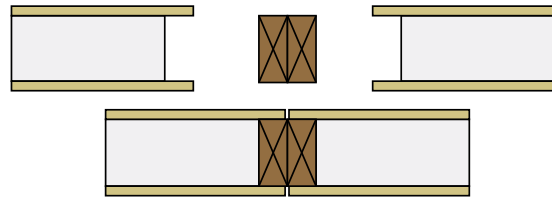
<sup>3</sup> Both facings must bear on the supporting foundation or structure.

<sup>4</sup> Tabulated values for 8-foot (2.44 m) walls apply to SIPs constructed with OSB strength axis oriented either parallel or perpendicular to supports.

**AXIAL LOAD**



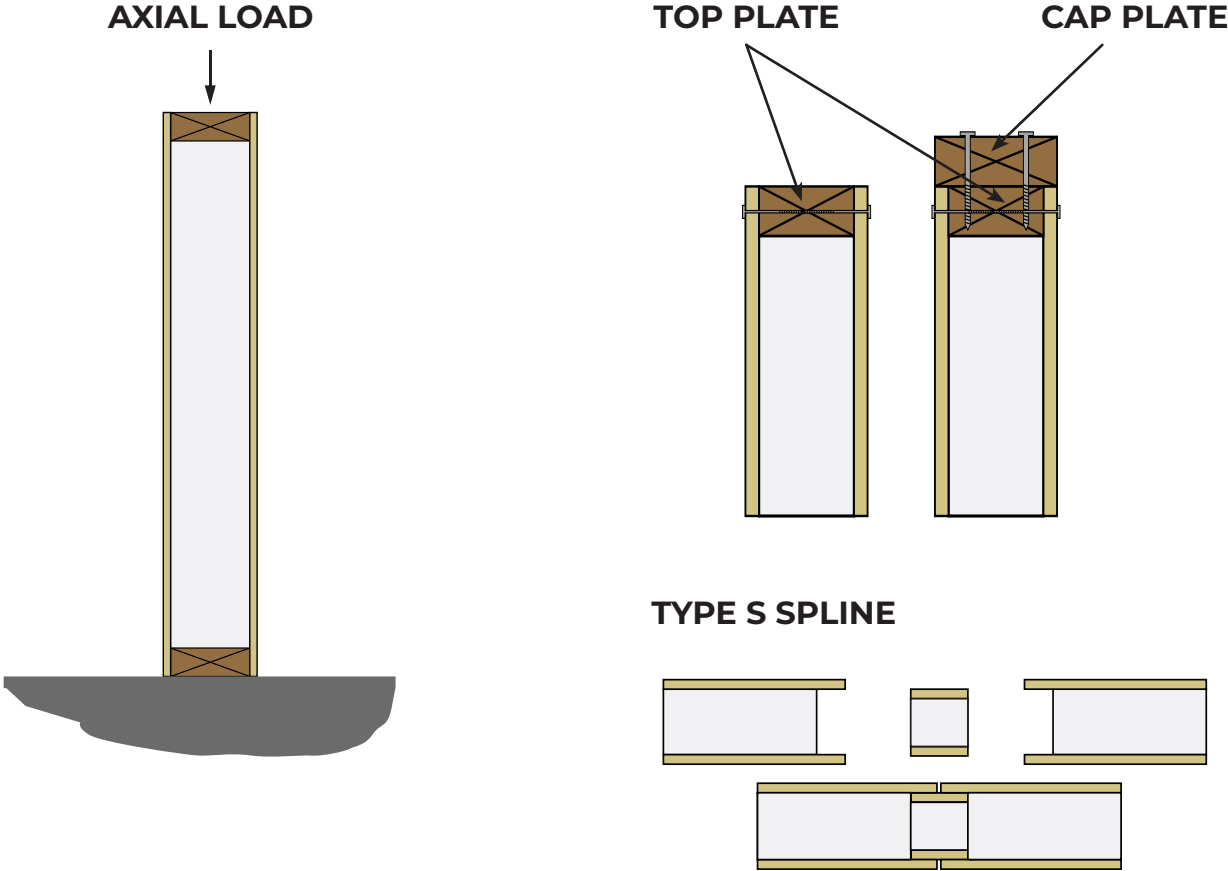
**TYPE L SPLINE**



<b>LOAD CHART #2A</b> <b>Axial Point Loads - LBS <sup>1-2</sup></b> <b>Type S Spline</b>		
Top Plate Configuration	1-1/2" BEARING WIDTH	3" BEARING WIDTH
Single 2x No. 2 or better Hem-Fir Plate	2040	2450
Single 2x No. 2 or better Hem-Fir Plate with 2x No. 2 or Better Cap Plate Ripped to Total Width of SIP.	4030	4678

<sup>1</sup> Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

<sup>2</sup> Tabulated values are based on the strong-axis of the facing material oriented parallel to the span direction.





## LOAD CHART #3A

### Wall Uniform Transverse Loads - PSF <sup>1-3</sup>

#### Type S Spline

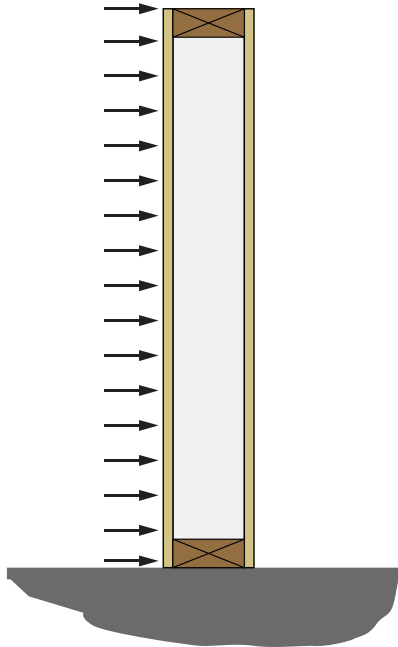
SIP Thickness	Deflection Limit	SIP Height (ft.)								
		8'	10'	12'	14'	16'	18'	20'	22'	24'
4-1/2"	L/360	32	23	18	14	11	NA	NA	NA	NA
	L/240	48	35	27	21	16	NA	NA	NA	NA
	L/180	55	44	36	28	22	NA	NA	NA	NA
6-1/2"	L/360	51	38	29	23	19	15	12	NA	NA
	L/240	67	53	44	35	28	23	19	NA	NA
	L/180	67	53	44	38	33	29	24	NA	NA
8-1/4"	L/360	67	51	40	32	26	22	18	15	13
	L/240	75	60	50	42	37	33	27	23	19
	L/180	75	60	50	42	37	33	30	26	22
10-1/4"	L/360	83	66	52	43	35	29	25	21	18
	L/240	83	66	55	47	41	36	33	30	27
	L/180	83	66	55	47	41	36	33	30	27
12-1/4"	L/360	89	72	60	51	44	37	32	27	23
	L/240	89	72	60	51	45	40	36	32	30
	L/180	89	72	60	51	45	40	36	32	30

<sup>1</sup> Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

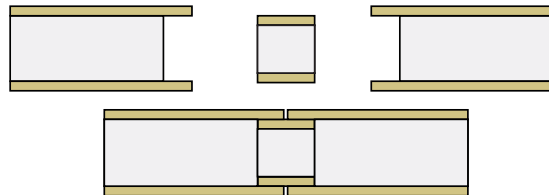
<sup>2</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of applicable building code. Values are based on loads of short duration only.

<sup>3</sup> Table values for 8-foot (2.44 m) spans apply to SIPs constructed with the OSB strength axis oriented either parallel or perpendicular to span direction. Table values for other spans are based on the OSB strength axis parallel to the span direction..

### TRANSVERSE LOAD



### TYPE S SPLINE



## LOAD CHART #3B

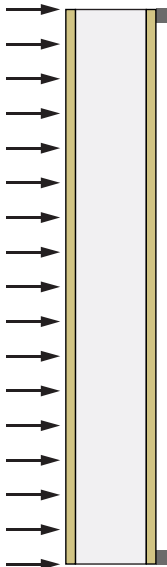
### Curtain Wall Uniform Transverse Loads - PSF <sup>1-3</sup>

#### Type S Spline

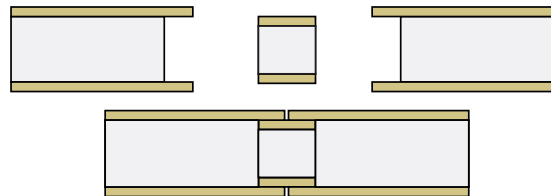
SIP Thickness	Deflection Limit	SIP Height (ft.)									
		4' <sup>4</sup>	8'	10'	12'	14'	16'	18'	20'	22'	24'
4-1/2"	L/360	100	32	23	18	14	11	NA	NA	NA	NA
	L/240	143	48	35	27	21	16	NA	NA	NA	NA
	L/180	143	63	47	36	28	22	NA	NA	NA	NA
6-1/2"	L/360	105	51	38	29	23	19	15	12	NA	NA
	L/240	162	76	57	44	35	28	23	19	NA	NA
	L/180	191	80	61	50	42	36	30	24	NA	NA
8-1/4"	L/360	120	67	51	40	32	26	22	18	15	13
	L/240	179	94	71	57	48	40	33	27	23	19
	L/180	179	94	71	57	48	41	36	32	26	22
10-1/4"	L/360	131	86	66	52	43	35	29	25	21	18
	L/240	168	94	75	63	54	47	41	36	32	27
	L/180	168	94	75	63	54	47	41	36	33	28
12-1/4"	L/360	132	94	75	63	53	44	37	32	27	23
	L/240	163	94	75	63	54	47	42	37	34	31
	L/180	163	94	75	63	54	47	42	37	34	31

- <sup>1</sup> Table values assume a simply supported SIP with 1-1/2 inches (38.1 mm) of continuous bearing. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load. Values do not include the dead weight of the SIP.
- <sup>2</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of applicable building code. Values are based on loads of short duration only and do not consider the effects of creep.
- <sup>3</sup> Table values for 8-foot (2.44 m) spans apply to SIPs constructed with the OSB strength axis oriented either parallel or perpendicular to span direction. Table values for other spans are based on the OSB strength axis parallel to the span direction.
- <sup>4</sup> SIPs shall be a minimum of 8-foot (2.44 m) long spanning two 4-foot (1.22 m) spans.

#### TRANSVERSE LOAD



#### TYPE S SPLINE



**LOAD CHART #4A**  
**Shear Loads - PLF<sup>1-7</sup> Seismic Design Categories A-C**  
**Type S or Type L Spline**

Framing Minimum SG	Minimum Facing Connections <sup>4</sup>			Shear Load (PLF)
	Chord <sup>4,5</sup>	Plate	Spline	
0.50	0.113"x 2-1/2" nails 6" on center	0.113"x 2-1/2" nails 6" on center	(7/16" OSB Faced x 3" wide Box/Block Spline) 0.113"x 2-1/2" nails, 6" on center	410
0.50	0.113"x 2-3/8" nails 6" on center Staggered (2 rows)	0.113"x 2-3/8" nails 6" on center	(7/16" OSB Faced x 3" wide Box/Block Spline) 0.113"x 2-3/8" nails, 6" on center <sup>6</sup>	460
0.42	0.113"x 2-3/8" nails 6" on center Staggered (2 rows)	0.113"x 2-3/8" nails 4" on center Staggered (2 rows)	(7/16" OSB Faced x 3" wide Box/Block Spline) 0.113"x 2-3/8" nails, 4" on center <sup>6</sup>	700
0.42	0.148"x 2-3/8" nails 6" on center Staggered (2 rows)	0.148"x 2-3/8" nails 3" on center	(23/32" OSB Faced x 3" wide Box/Block Spline) 0.148"x 2-3/8" nails, 3" on center stagger (2 rows) <sup>7</sup>	1000

<sup>1</sup> Wind and seismic loads in seismic design categories A, B, C.

<sup>2</sup> Aspect ratio (height:width) does not exceed 2:1.

<sup>3</sup> Shear wall height-width ratios greater than 2:1, but not exceeding 3.5:1, are permitted for assemblies using lumber splines provided the allowable shear strength values in the table are multiplied by 2w/h.

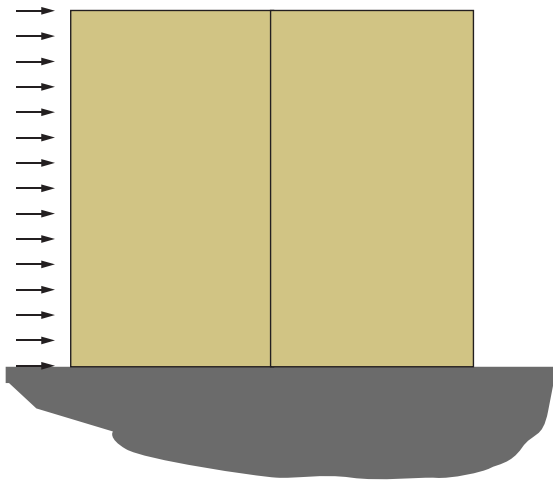
<sup>4</sup> Required connections must be made on each side of the SIPs. Dimensional or engineered lumber shall have an equivalent specific gravity not less than specified.

<sup>5</sup> Chords, hold-downs and connections to other structural elements must be designed by a registered designer professional in accordance with accepted engineering practice.

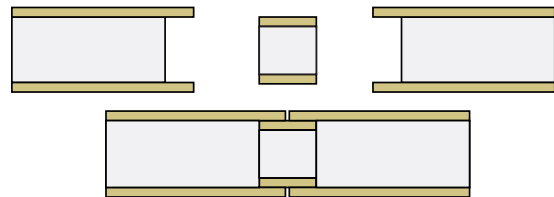
<sup>6</sup> 4 inch (101.6 mm) wide spline.

<sup>7</sup> 4 inch (101.6 mm), 23/32 inch (18.25 mm) thick facing.

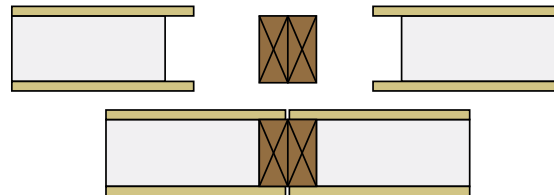
**SHEAR LOAD**



**TYPE S SPLINE**



**TYPE L SPLINE**



<b>LOAD CHART #4B</b>				
<b>Shear Loads - PLF<sup>1-7</sup> Seismic Design Categories A-F • Type S or Type L Spline</b>				
Framing Minimum SG <sup>4</sup>	Minimum Facing Connections <sup>4</sup>			Shear Load <sup>2-3</sup> (PLF)
	Chord <sup>5</sup>	Plate	Spline <sup>4</sup>	
0.50	0.113" x 2-1/4" nails, 6" on center	0.113" x 2-1/4" nails, 3" on center	(7/16" facing thickness, 3" wide Box/Block spline) 0.113" x 2-1/4" nails, 6" on center	360
0.50	0.113" x 2-1/4" nails, 6" on center	0.113" x 2-1/4" nails, 6" on center	(3/4" facing thickness, 3" wide Box/Block spline) 0.113" x 2-1/4" nails, 6" on center	360
0.50	0.113" x 2-3/8" nails, 3" on center staggered (3/8" edge distance and 3/4" edge distance)	0.113" x 2-3/8" round head nails, 3" on center staggered (3/8" and 3/4" edge distances)	(23/32" thick facing 3" wide Box/Block spline) 0.113" x 2-3/8" nails, 3" on center staggered (3/8" edge distance and 3/4" edge distance)	720
0.50	0.113" x 2-3/8" nails, 2" on center staggered (3/8" edge distance and 3/4" edge distance)	0.113" x 2-3/8" round head nails, 2" on center, staggered (3/8" and 3/4" edge distances)	(23/32" thick facing 3" wide Box/Block spline) 0.113" x 2-3/8" nails, 3" on center staggered (3/8" edge distance and 3/4" edge distance)	920

<sup>1</sup> Seismic loads in seismic design categories A, B, C, D, E and F. Walls shall be designed using the seismic design coefficients and limitations provided in ASCE 7-10 for light-framed walls sheathing with wood structural panels rated for shear resistance. SIP walls shall use the following factors for design: Response Modification Coefficient, R = 6.5; System Overstrength Factor,  $\Omega_0$  = 3.0; Deflection Amplification Factor,  $C_d$  = 4.0.

<sup>2</sup> Aspect ratio (height:width) does not exceed 1:1 for Type S spline or 2:1 for Type L spline.

<sup>3</sup> Shear wall height-width ratios greater than 2:1, but not exceeding 3.5:1, are permitted for assemblies using lumber splines provided the allowable shear strength values in the table are multiplied by 2w/h.

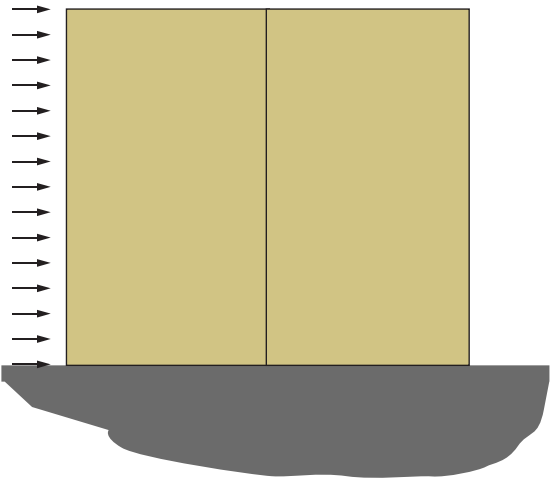
<sup>4</sup> Required connections must be made on each side of the SIP. Dimensional or engineered lumber shall have an equivalent specific gravity not less than specified in the table for the framing.

<sup>5</sup> Chords, hold-downs and connections to other structural elements must be reviewed and approved by a registered design professional.

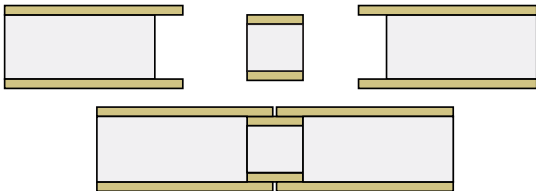
<sup>6</sup> Solid chord members are required at each end of each shear wall segment. Dimensional double lumber splines must be interconnected using 10d common nails ([0.148-inch-diameter x 3 inches (3.8 mm x 76 mm)] spaced 5-inches (127 mm) on center.

<sup>7</sup> 3 inch (76.2 mm) wide, 3/4 inch (19 mm) thick facing.

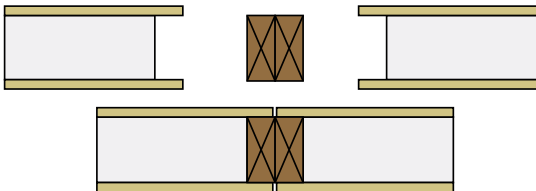
**SHEAR LOAD**



**TYPE S SPLINE**



**TYPE L SPLINE**



LOAD CHART #5A SIP Header Uniform Loads - PLF <sup>1-5</sup>						
Header Depth <sup>3</sup> (inches)	Header Spline <sup>5</sup>	Deflection Limit <sup>4</sup>	Header Span (ft.)			
			4'	6'	8'	10'
12"	NO	L/480	740	384	228	142
		L/360	740	384	229	142
		L/240	740	384	229	142
	YES <sup>5</sup>	L/480	345	243	156	99
		L/360	450	295	190	125
		L/240	630	382	236	153
18"	NO	L/480	798	574	385	311
		L/360	798	574	385	311
		L/240	798	574	385	311
	YES <sup>5</sup>	L/480	705	388	254	235
		L/360	750	482	302	281
		L/240	750	482	302	281
24"	NO	L/480	886	629	429	361
		L/360	886	629	429	361
		L/240	886	629	429	361
	YES <sup>5</sup>	L/480	698	556	368	350
		L/360	896	556	368	350
		L/240	896	556	368	350

<sup>1</sup> Vertical loads only. Lateral loads shall be transferred to the edges of the openings through continuous plate(s) designed in accordance with accepted engineering practice. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

<sup>2</sup> Tabulated values are based on the strong-axis of the facing material oriented perpendicular to the direction of the header span.

<sup>3</sup> Minimum depth of facing above opening.

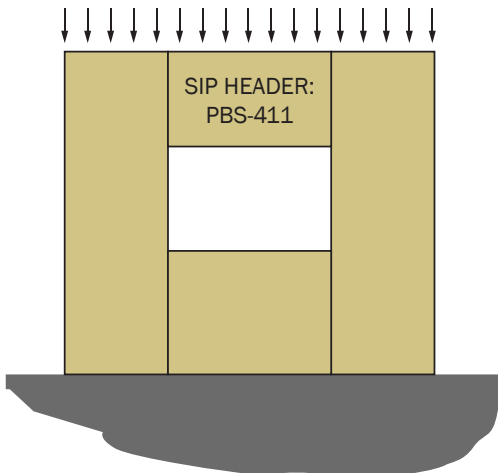
<sup>4</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and requirements of applicable building code.

<sup>5</sup> SIP header may contain a spline a minimum of 6 inches from edge of opening.

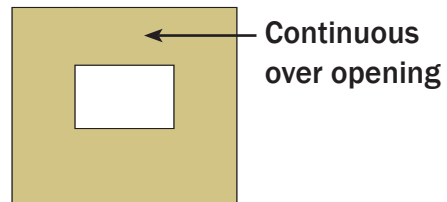
## HEADER LOAD

### 4-PIECE ASSEMBLY: NO HEADER SPLINE

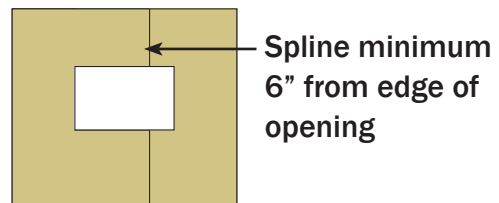
Note: Engineer to review SIP header nailing



### NO HEADER SPLINE



### HEADER WITH SPLINE



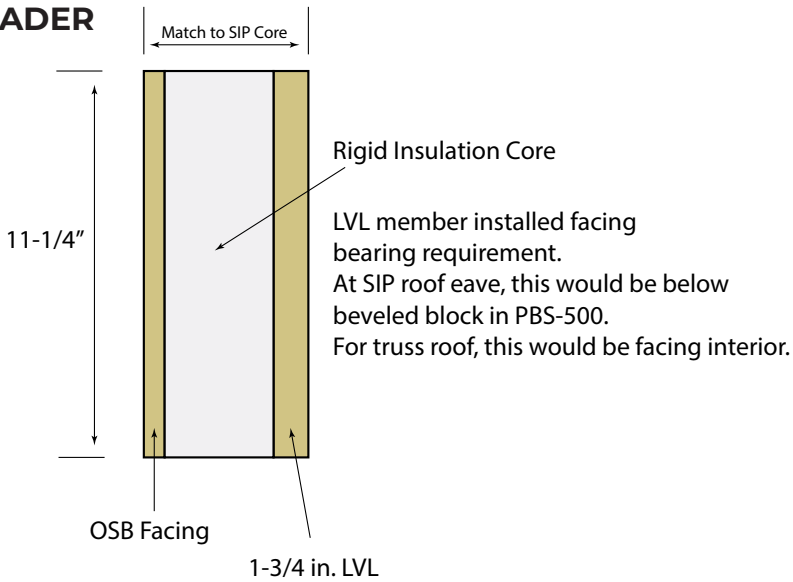
## LOAD CHART #5B

### Premier 1 PLY Insulated Header Beams Uniform Loads - PLF <sup>1</sup>

No. of Trimmer Studs	Deflection	Header Span (ft.)							
		2'	3'	4'	5'	6'	7'	8'	
1	L/480	1968	1312	984	787	656	562	492	
	L/360	1968	1312	984	787	656	562	492	
	L/240	1968	1312	984	787	656	562	492	
2	L/480	3937	2625	1968	1575	1312	1125	901	
	L/360	3937	2625	1968	1575	1312	1125	984	
	L/240	3937	2625	1968	1575	1312	1125	984	
No. of Trimmer Studs	Deflection	Header Span (ft.)							
		9'	10'	11'	12'	13'	14'	15'	16'
1	L/480	437	393	346	267	210	168	136	112
	L/360	437	393	357	328	280	224	182	150
	L/240	437	393	357	328	302	281	262	225
2	L/480	632	461	346	267	210	168	136	112
	L/360	843	615	462	356	280	224	182	150
	L/240	875	769	635	534	420	336	273	225

<sup>1</sup> Values listed for each deflection represent the least value of the bearing capacity of the trimmer, shear or beading capacity of the header or the actual deflection at the design load. Trimmer stud design capacities must be reviewed. LVL denotes 1-3/4" x 11-1/4" 2.0E RedLam material where E = 2,000,000 psi, Fb = 3,125 psi, Fv = 285 psi, and Fc-perp = 750 psi. Duration factors have not been applied to these capacities. The effects of long-term loading have not been included.

### 1 PLY HEADER

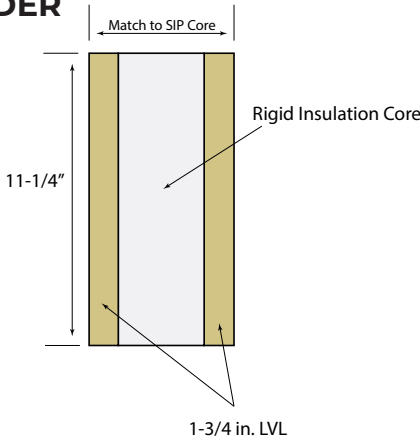




LOAD CHART #5C									
Premier 2 PLY Insulated Header Beams Uniform Loads - PLF <sup>1</sup>									
No. of Trimmer Studs	Deflection	Header Span (ft.)							
		2'	3'	4'	5'	6'	7'	8'	
1	L/480	3937	2625	1968	1575	1312	1125	984	
	L/360	3937	2625	1968	1575	1312	1125	984	
	L/240	3937	2625	1968	1575	1312	1125	984	
2	L/480	7875	5250	3937	3150	2625	2250	1802	
	L/360	7875	5250	3937	3150	2625	2250	1968	
	L/240	7875	5250	3937	3150	2625	2250	1968	
No. of Trimmer Studs	Deflection	Header Span (ft)							
		9'	10'	11'	12'	13'	14'	15'	16'
1	L/480	875	787	693	534	420	336	273	225
	L/360	875	787	715	656	560	446	364	300
	L/240	875	787	715	656	650	562	525	450
2	L/480	1265	922	693	534	420	336	273	225
	L/360	1687	1230	924	712	560	448	364	300
	L/240	1750	1538	1271	1068	840	672	546	450

<sup>1</sup> Values listed for each deflection represent the least value of the bearing capacity of the trimmer, shear or beading capacity of the header or the actual deflection at the design load. Trimmer stud design capacities must be reviewed. LVL denotes 1-3/4" x 11-1/4" 2.0E RedLam material where E = 2,000,000 psi, Fb = 3,125 psi, Fv = 285 psi and Fc-perp = 750 psi. Duration factors have not been applied to these capacities. The effect of long-term loading have not been included.

**2 PLY HEADER**

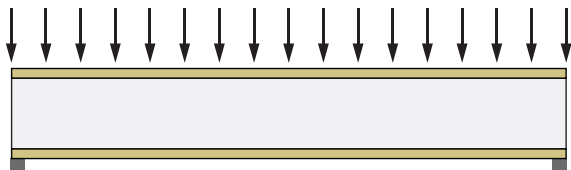


**LOAD CHART #6A**  
**Roof/Floor Uniform Transverse Loads - PSF** <sup>1-4</sup>  
**Type S Spline**

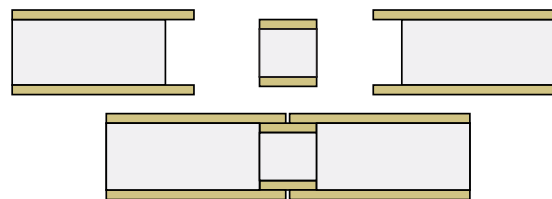
SIP Thickness	Deflection Limit	SIP Span (ft.)									
		4' <sup>4</sup>	8'	10'	12'	14'	16'	18'	20'	22'	24'
4-1/2"	L/360	100	32	23	NA	NA	NA	NA	NA	NA	NA
	L/240	143	48	35	NA	NA	NA	NA	NA	NA	NA
	L/180	143	63	47	NA	NA	NA	NA	NA	NA	NA
6-1/2"	L/360	105	51	38	29	23	NA	NA	NA	NA	NA
	L/240	162	76	57	44	35	NA	NA	NA	NA	NA
	L/180	191	80	61	50	42	NA	NA	NA	NA	NA
8-1/4"	L/360	120	67	51	40	32	26	22	NA	NA	NA
	L/240	179	94	71	57	48	40	33	NA	NA	NA
	L/180	179	94	71	57	48	41	36	NA	NA	NA
10-1/4"	L/360	131	86	66	52	43	35	29	25	21	NA
	L/240	168	94	75	63	54	47	41	36	32	NA
	L/180	168	94	75	63	54	47	41	36	33	NA
12-1/4"	L/360	132	94	75	63	53	44	37	32	27	23
	L/240	163	94	75	63	54	47	42	37	34	31
	L/180	163	94	75	63	54	47	42	37	34	31

- <sup>1</sup> Table values assume a simply supported SIP with 1-1/2 inches (38.1 mm) of continuous bearing. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load. Values do not include the dead weight of the SIP.
- <sup>2</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of applicable building code. Values are based on loads of short duration only and do not consider the effects of creep.
- <sup>3</sup> Table values for 8-foot (2.44 m) spans apply to SIPs constructed with the OSB strength axis oriented either parallel or perpendicular to span direction. Table values for other spans are based on the OSB strength axis parallel to the span direction.
- <sup>4</sup> SIPs shall be a minimum of 8-foot (2.44 m) long spanning two 4-foot (1.22 m) spans.

**TRANSVERSE LOAD**



**TYPE S SPLINE**



**LOAD CHART #6B**  
**Roof/Floor Uniform Transverse Loads - PSF**<sup>1-4</sup>  
**Type I Spline**

SIP Thickness	Deflection Limit	SIP Span (feet)									
		4 <sup>4</sup>	8	10	12	14	16	18	20	22	24
10-1/4"	L/360	197	164	124	72	67	61	48	34	29	24
	L/240	336	164	124	107	96	84	70	49	43	36
	L/180	336	164	124	107	96	84	76	65	56	47
12-1/4"	L/360	258	143	103	86	83	77	61	42	37	32
	L/240	318	143	103	93	85	77	68	59	54	46
	L/180	318	143	103	93	85	77	68	59	54	49

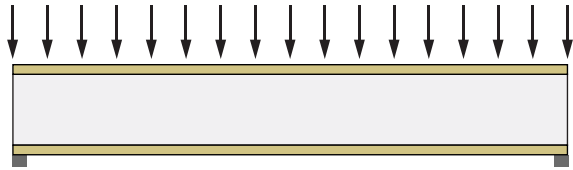
<sup>1</sup> Table values assume a simply supported SIP with 1-1/2 inches (38.1 mm) of continuous bearing. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load. Splines consist of Premier I-beam, 2-1/4 inch (57.2 mm) wide flange (minimum) with a depth equal to the core thickness, spaced not to exceed 48 inches (1219.2 mm) on center.

<sup>2</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of applicable building code.

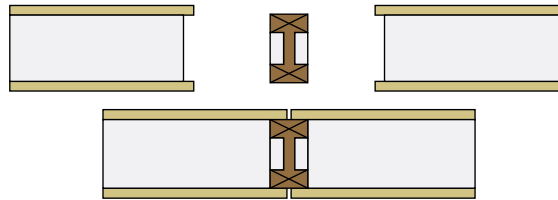
<sup>3</sup> Table values for 8-foot (2.44 m) spans apply to SIPs constructed with the OSB strength axis oriented either parallel or perpendicular to span direction. Table values for other spans are based on the OSB strength axis parallel to the span direction.

<sup>4</sup> SIP shall be a minimum of 8 foot (2.44 m) long spanning a minimum of two 4-foot (1.22 m) spans.

**TRANSVERSE LOAD**



**TYPE I SPLINE**

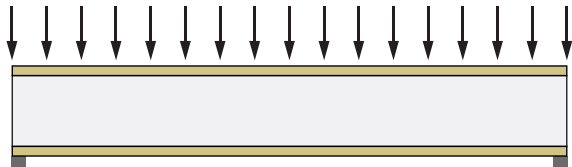


**LOAD CHART #6C**  
**Roof/Floor Uniform Transverse Loads - PSF<sup>1-4</sup>**  
**Type L Spline**

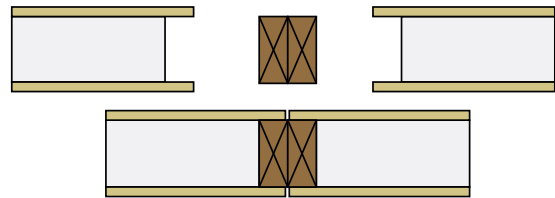
SIP Thickness	Deflection Limit	SIP Span (feet)									
		4 <sup>4</sup>	8	10	12	14	16	18	20	22	24
4-1/2"	L/360	103	45	33	24	NA	NA	NA	NA	NA	NA
	L/240	225	68	47	34	NA	NA	NA	NA	NA	NA
	L/180	297	91	61	45	NA	NA	NA	NA	NA	NA
6-1/2"	L/360	307	129	57	42	34	25	20	NA	NA	NA
	L/240	307	182	87	61	49	37	30	NA	NA	NA
	L/180	307	182	112	80	65	49	39	NA	NA	NA
8-1/4"	L/360	253	171	82	66	54	41	32	23	NA	NA
	L/240	288	188	128	100	81	61	48	35	NA	NA
	L/180	288	188	133	117	105	80	63	45	NA	NA
10-1/4"	L/360	286	188	117	101	80	58	47	36	32	27
	L/240	326	188	147	134	120	90	71	52	47	41
	L/180	326	188	147	134	121	106	93	68	61	53
12-1/4"	L/360	327	188	167	141	116	91	75	58	47	36
	L/240	327	188	167	153	132	110	97	83	69	53
	L/180	327	188	167	153	132	110	97	83	83	70

- <sup>1</sup> Table values assume a simply supported SIP with 1-1/2 inches (38.1 mm) of continuous bearing. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load. Splines consist of No. 2 or better Hem-Fir, 1-1/2 inches (38.1 mm) wide with a depth equal to the core thickness, spaced to provide not less than two members for every 48 inches (1219.2 mm) of SIP width.
- <sup>2</sup> Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of applicable building code.
- <sup>3</sup> Table values for 8-foot (2.44 m) spans apply to SIPs constructed with the OSB strength axis oriented either parallel or perpendicular to span direction. Table values for other spans are based on the OSB strength axis parallel to the span direction.
- <sup>4</sup> SIP shall be a minimum of 8 foot (2.44 m) long spanning two 4-foot (1.22 m) spans. No single span condition is allowed.

**TRANSVERSE LOAD**



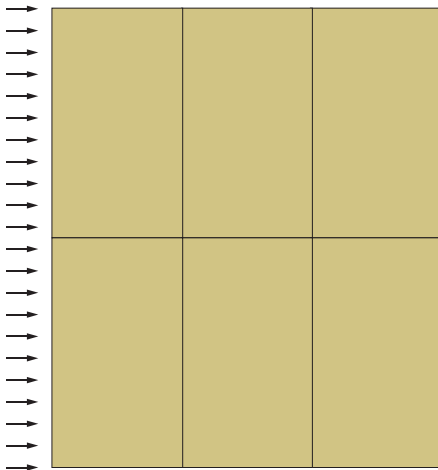
**TYPE L SPLINE**



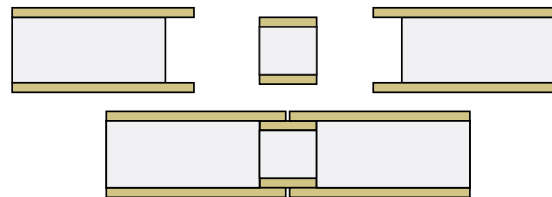
LOAD CHART #7A						
Roof/Floor Diaphragms Loads - PLF <sup>1, 5</sup> • Type S Spline						
Minimum Connections <sup>2</sup>				Allowable Shear Load (PLF)	G' Apparent Shear Stiffness (lbf/in)	Maximum Aspect Ratio
Interior Supports <sup>2</sup>	Spline <sup>3</sup>	Boundary <sup>4</sup>				
		Support	Spline			
PBS No. 14 SIP Screw with 1" penetration 12" on center	0.113" x 2-1/2" nails, 3" on center 7/16" x 3" OSB Box/Block Spline	PBS No. 14 SIP Screw with 1" penetration 12" on center	0.113" x 2-1/2" nails, 6" on center	430	24000	4:1
PBS No. 14 SIP Screw with 1" penetration 12" on center	0.113" x 2-1/2" nails, 3" on center, 2 rows, staggered 7/16" x 3" OSB Box/Block Spline	PBS No. 14 SIP Screw with 1" penetration 3" on center	0.113" x 2-1/2" nails, 4" on center	460	30300	4:1
PBS No. 14 SIP Screw with 1" penetration 2" on center	0.113" x 2-1/2" nails, 3" on center, 2 rows, staggered 7/16" x 3" OSB Box/Block Spline	PBS No. 14 SIP Screw with 1" penetration 2" on center	0.113" x 2-1/2" nails, 1-1/2" on center	655	41300	4:1
PBS No. 14 SIP Screw with 1" penetration 4" on center	0.113" x 2-1/2" nails, 3" on center, 2 rows, staggered 7/16" x 3" OSB Box/Block Spline	PBS No. 14 SIP Screw with 1" penetration 4" on center	0.113" x 2-1/2" nails, 3" on center	795	93700	3:1
PBS No. 14 SIP Screw with 1" penetration 4" on center	0.113" x 2-1/2" nails, 6" on center, 2 rows, staggered 23/32" x 4" OSB Box/Block Spline	PBS No. 14 SIP Screw with 1" penetration 4" on center	0.113" x 2-1/2" nails, 6" on center	1130	110600	3:1

- <sup>1</sup> The maximum diaphragm length-to-width ratio shall not exceed 4: 1. Load may be applied parallel to continuous panel joints.
- <sup>2</sup> Interior supports shall be spaced not to exceed 12 feet (3.66 m) on center and have a minimum width of 3-1/2 inches (88.9 mm) and a specific gravity of 0.42 or greater. Specified fasteners are required on both sides of panel joint where panels are joined over a support. See Figure 4A.
- <sup>3</sup> Box/Block Spline fastened at top only, at interior panel-to-panel joints. Specified fasteners are required on both sides of panel joint. See Figure 4B.
- <sup>4</sup> Boundary spline shall be solid 1-1/2 inches (38.1 mm) wide, minimum, and have a specific gravity of 0.42 or greater. Boundary supports shall have a minimum width of 3-1/2 inches (88.9 mm) and a specific gravity of 0.42 or greater. Specified spline fasteners are required through both facings. See Figure 4C.
- <sup>5</sup> Diaphragms shall be designed by a registered design professional in accordance with accepted engineering practice.

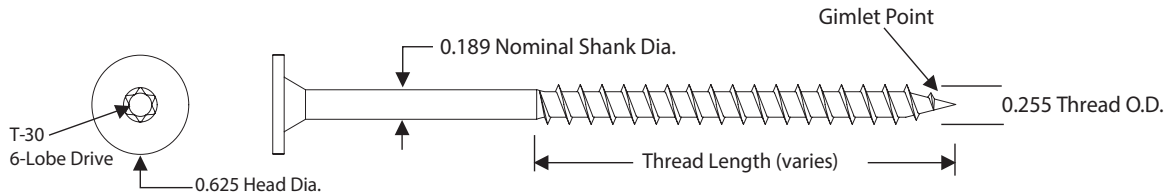
## DIAPHRAGM LOAD



## TYPE S SPLINE



# PREMIER WOOD SCREWS



WOOD SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3555	2580	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: LUMBER & ENGINEERED WOOD - LBS./IN. <sup>1,2</sup>							
SPF/HF (0.42)		DF/SP (0.50)		LVL (0.50)		LSL (0.50)	OSB (7/16")
Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Face
799	615	899	702	556	495	711	265

<sup>1</sup> Load values include fastener tip.

<sup>2</sup> 1" fastener embedment into face / edge grain.

WITHDRAWAL: CONCRETE & CMU - LBS. <sup>1</sup>		
2500 psi Concrete	5000 psi Concrete	CMU <sup>2</sup>
682	869	713

<sup>1</sup> Fastener penetrates 1" into concrete or CMU block, including the tip.

<sup>2</sup> Concrete Masonary unit (CMU) conforming to ASTM C90.

HEAD PULL-THRU - LBS.	
7/16" OSB	SIP
490	630

LATERAL LOAD RESISTANCE - LBS.		
Main Member	Side Member	Load
SPF <sup>1,2</sup>	4-1/2" to 12-1/4" SIP	943

<sup>1</sup> 1-3/4" fastener embedment into edge grain, including tip.

<sup>2</sup> 1" fastener embedment into face grain, including tip.

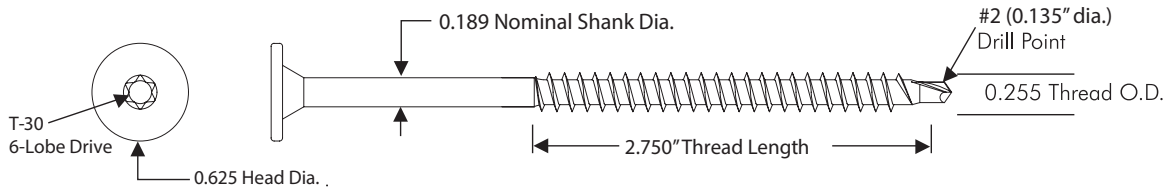
## NOTE:

Premier Wood Screw properties are provided. All values are average ultimate values. As determined by the project architect/engineer, appropriate safety factors must be used in design.





# PREMIER LIGHT DUTY METAL SCREWS



LIGHT DUTY METAL SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3390	2490	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: CORRUGATED STEEL DECK - LBS.						
24 ga. (36 ksi)	22 ga. (36 ksi)	22 ga. (85 ksi)	20 ga. (36 ksi)	18 ga. (36 ksi)	16 ga. (36 ksi)	16 ga. (100 ksi)
250	381	435	449	694	896	1186

\* Minimum 3/4" penetration of fastener through deck from underside of deck.

WITHDRAWAL: LUMBER & ENGINEERED WOOD - LBS./IN. <sup>1</sup>							
SPF/HF (0.42)		DF/SP (0.50)		LVL (0.50)		LSL (0.50)	OSB (7/16")
Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Face
662	497	732	720	540	469	646	284

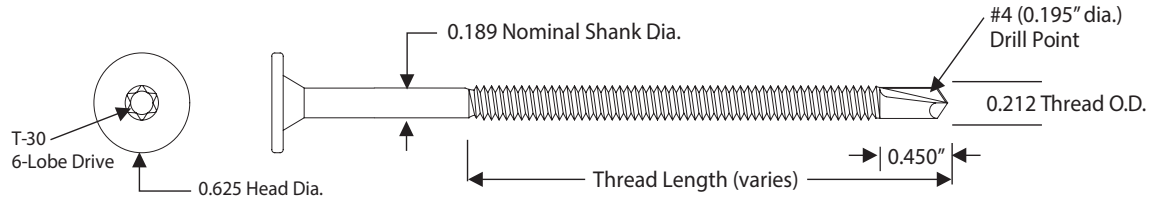
<sup>1</sup> Load values include fastener tip.

HEAD PULL-THRU - LBS	
7/16" OSB	SIP
490	630

## NOTE:

Premier Light Duty Metal Screw properties are provided. All values are average ultimate values. As determined by the project architect/engineer, appropriate safety factors must be used in design.

# PREMIER HEAVY DUTY METAL SCREWS



HEAVY DUTY METAL SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3855	2625	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: CORRUGATED STEEL DECK - LBS. <sup>1</sup>					
16 ga. (36 ksi)	16 ga. (100 ksi)	12 ga. (50 ksi)	1/8\"	3/16\"	1/4\"
491	794	1255	1454	3098	3814

<sup>1</sup> Minimum (3) threads of penetration of fastener through deck as measured from underside of steel.

HEAD PULL-THRU - LBS.	
7/16\" OSB	SIP
490	630

LATERAL LOAD RESISTANCE - LBS.		
Main Member	Side Member	Load
1/8\" Structural Steel <sup>1</sup>	4-1/2\" to 12-1/4\" SIP	929

<sup>1</sup> Minimum (3) threads of penetration of fastener through steel as measured from underside of steel.

**NOTE:**

Premier Heavy Duty Metal Screw properties are provided. All values are average ultimate values. As determined by the project architect/engineer, appropriate safety factors must be used in design.

# SCREW WITHDRAWAL CAPACITIES OF OSB

To finish a project that utilizes Premier SIPS for the walls and roof of a structure, many types of materials need to be fastened to SIPs. These materials can include siding, roofing materials, other structural elements, cabinets and a host of others.

In many of these applications screws are the preferred method of fastening. To help quantify the performance of screw withdrawal from OSB, a major manufacturer of OSB generated test data on various screw types and sizes withdrawn from various thicknesses of OSB. Prior to the withdrawal testing, the OSB was exposed to three different environmental conditions – dry, wet, wet/dry. Fifteen repetitions of both direct and lateral withdrawal from the environmentally conditioned OSB were conducted on the screw types and sizes shown in the charts below. The following tables summarize the lowest ultimate average value achieved for each screw type and size when withdrawn from three different thicknesses of environmentally conditioned OSB.

## Average Direct Withdrawal (Pullout) - lbs.

Screw Size	7/16" OSB	5/8" OSB	3/4" OSB
#6 Deck Screw	177	272	324
#8 Deck Screw	182	309	359
#10 Deck Screw	198	355	363
#12 Roofing Screw	190	312	360
#14 Roofing Screw	177	340	393

These values are ultimate values. Appropriate safety factors should be applied to obtain design values.

## Average Lateral Withdrawal (Shear) - lbs.

Screw Size	7/16" OSB	5/8" OSB	3/4" OSB
#6 Deck Screw	198	273	295
#8 Deck Screw	118	197	224
#10 Deck Screw	143	260	301
#12 Roofing Screw	436	581	561
#14 Roofing Screw	466	630	797

These values are ultimate values. Appropriate safety factors should be applied to obtain design values.

## NAIL WITHDRAWAL CAPACITIES OF OSB

---

With the use of Premier SIPS, the attachment of finishing materials such as roof shingles, siding, drywall, etc., is required. The application of these materials is typically accomplished with conventional nail products. An independent code recognized testing agency conducted withdrawal tests following ASTM D1037 procedures to provide data on the direct withdrawal resistance of nail fasteners when driven into the 7/16" OSB face of SIP. The following is a summary of the average ultimate values achieved for various nail fasteners.

### Average Direct Withdrawal (Pullout) – Lbs.

Nail Size & Description	Avg. Ultimate Pullout	Nominal Shank Diameter
4d ring shank-drywall nail	133	0.109"
6d smooth galvanized	59	0.12"
Roofing Nail-smooth galvanized	51	0.11"
8d smooth coated sinker	150	0.134"
8d smooth galvanized spiral shank	112	0.12"
8d galvanized ring shank	77	0.12"
8d smooth galvanized	65	0.134"
8d bright box	107	0.148"
10d galvanized ring shank	164	0.165"
16d smooth galvanized	63	1.35"
16d bright box	90	TBD

These values are ultimate values. Appropriate safety factors should be applied to obtain design values.

This data has been compiled to provide manufacturers, designers and engineers with values for the assessment of fastener requirements.

# PREMIER SIPS ACCESSORIES

Premier Building Systems has designed, developed, and tested compatible accessories for your Premier SIPS products to achieve the maximum performance. With decades of use in the field, you can be sure these accessories have proven themselves year after year.

**ACCESSORIES CONTENTS**

- Premier SIPS Screws.....DR-24
- Premier Screw Length Guide.....DR-24
- Premier SIPS Sealant.....DR-25
- Premier SIPS Tape.....DR-26
- Premier SIPS Building Wrap.....DR-27



# PREMIER SIPS SCREWS

Premier SIPS screw fasteners are factory made and supplied with your order. The screws were developed specifically for connecting Premier SIPS to each other, beams, purlins and posts of wood and light gauge metal.

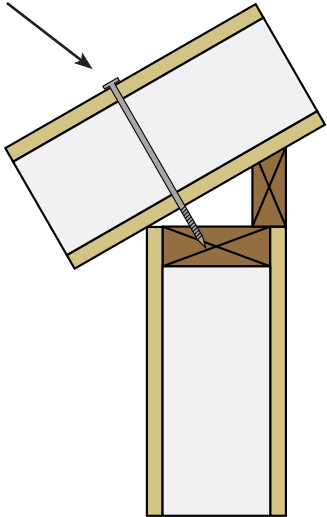
### ADVANTAGES

- Corrosion resistant coating
- Excellent pull-out resistance
- State-of-the-art tempering and coating technology
- Sizes from 5" to 18" in increments of 1"

### APPLICATIONS

- Fasten siding, roofing, structural elements, cabinets and many other components
- To clarify the performance of screws installed in OSB, refer to the "Screw Withdrawal Load Tables" that follow
- Dimensional 2x's require a minimum 1" penetration
- Wall connections require that screws be used 2' o.c.
- Roof connections require that screws be used 1' o.c.
- Frequency of screw fasteners depends on the imposed loads the that SIPS must resist. Installers must follow the requirements specified on Layout Drawings.

### PREMIER SCREW



# PREMIER SCREW LENGTH GUIDE

SIP THICKNESS <sup>1</sup>					
Slope	4-1/2"	6-1/2"	8-1/4"	10-1/4"	12-1/4"
2/12	6"	8"	10"	12"	14"
4/12	6"	8"	10"	12"	14"
6/12	7"	9"	10"	12"	14"
8/12	7"	9"	11"	13"	15"
10/12	8"	10"	12"	14"	16"
12/12	8"	10"	12"	14"	16"

<sup>1</sup> Minimum 1" thread penetration required.

**NOTE:**

Premier Screw Length Guide provides recommended Premier SIPS Screw length required based on SIP thickness and roof slope.



# PREMIER SIPS SEALANT

Premier SIPS Sealant (as shown on details and in our specification) is supplied by Premier Building Systems with your order. Specifically formulated to help seal SIP connections, Premier SIPS Sealant consists of polymers that are designed to remain flexible and provide a seal against water vapor transmission and infiltration. **All Premier SIPS details call for 3/8" lines of sealant. It is critical that installers follow this direction and apply per manufacturers construction details and instruction.**

## ADVANTAGES

- Sealant for all types of SIP construction
- Permanent, non-brittle formula
- Gunable at low temperatures
- Withstands cold and freeze-thaw cycles
- Retains flexibility with age
- Resistant to moisture, dampness, and temperature fluctuation
- Impervious to water wash-out
- Seals EPS and GPS foam, wood products and many other materials

## SEALANT QUANTITY ESTIMATING

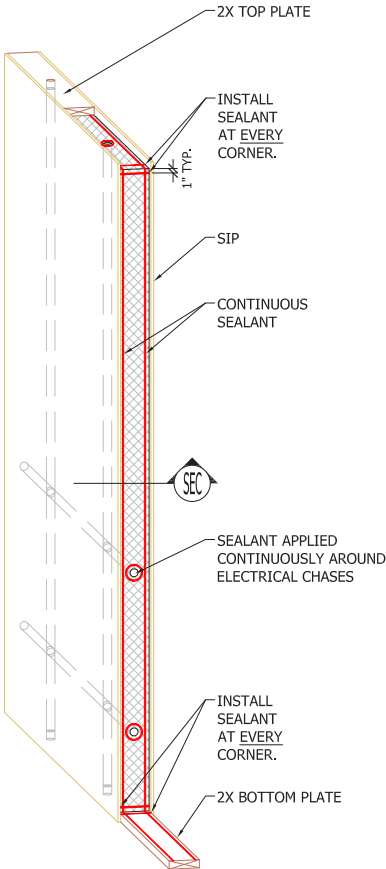
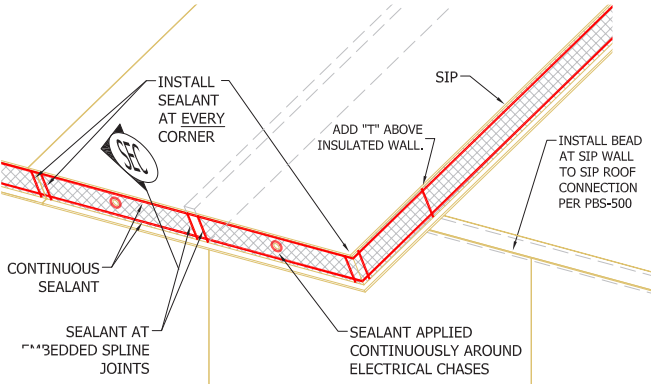
One 20 ounce tube of sealant applied at a 3/8" bead will yield 27 lineal feet. Periodically check your application to ensure that you are applying sealant at the correct rate.

## ADDITIONAL RESOURCES

See Details, Technical Bulletins, and Installation Videos for additional guidance. Current versions are always available online at [www.premiersips.com](http://www.premiersips.com).

## RECOMMENDATION

Using electric and pneumatic caulk guns will assist in forming proper bead size and speed up installation.

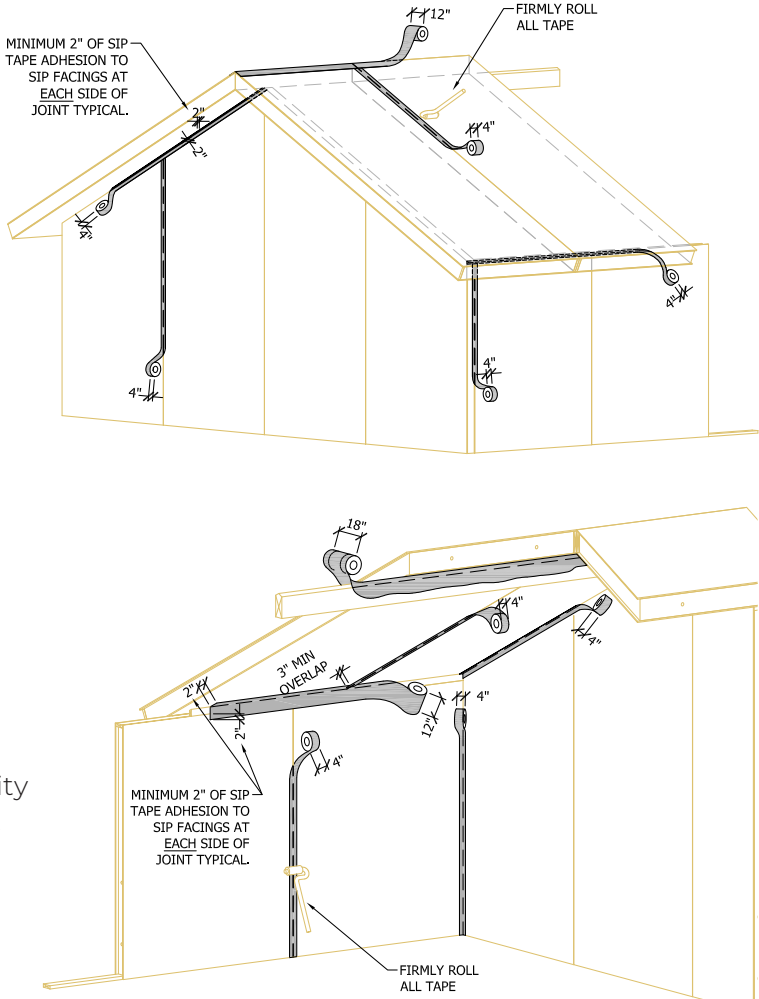


# PREMIER SIPS TAPE

Premier SIPS Tape is a patented pressure sensitive, highly durable and superior tape that prevents moist air from penetrating the seams between SIPS and along roof lines. The tape is formulated with a permeance of less than 1, has no VOCs, and offers excellent adhesion to OSB (tested to ASTM D-3330) and most common building materials. The combination of the OSB skins and the Premier SIPS Tape meets the building code requirements for vapor retarders. The Premier SIPS tape shown on our plans and in our specification is supplied by Premier Building Systems with your order. Consult tape details for proper tape width for various wall, roof, and floor joint applications.

## ADVANTAGES

- Developed for Premier SIPS panelized construction as a durable, all-weather, air and vapor tight joint sealing tape
- Innovative hybrid synthetic rubber specially formulated to develop a strong bond with OSB and engineered wood products
- High initial tack for immediate bond, offering excellent adhesion to OSB
- Facing is thermally stable, smooth and conformable to irregular surfaces
- High peel and shear strength
- VOC free
- No odors or fumes – meets air quality criteria for use as an interior sealant
- Resists common mold growth
- Does not stain
- Working temperature -40°F to 180°F (-40°C to 82°C)
- Quick & easy installation, no priming required
- For surface preparation and tape installation guidelines refer to Details #Premier-105A and 105B



## ADDITIONAL RESOURCES

See Details, Technical Bulletins, and Installation Videos for additional guidance. Current versions are always available online at [www.premiersips.com](http://www.premiersips.com).

# PREMIER SIPS BUILDING WRAP

## OVERVIEW

Premier Building Wrap is a code compliant woven and coated polyethylene fabric with micro-perforations engineered as a Water-Resistive Barrier for use in residential and commercial wall construction (See ICC ESR-2496). Used in conjunction with code approved flashings, helps prevent moisture related issues.



## ADVANTAGES

- Twice the tensile strength of most competitive products
- Translucent: easy to cut, fit, fasten
- Protects from harmful ultra-violet rays
- Water Vapor Permeance exceeds 9 perms for breathability
- Large rolls – 10 ft x 150 ft, 27 lbs each

## PROPERTIES

PROPERTY	RESULT	TEST METHOD
Tensile Strength	MD 50 (lbs/in) & CD 46	ASTM D882
Air Penetration Resistance	<0.02 L/s/m <sup>2</sup> @ 75 Pa <0.004cfm/ft <sup>2</sup> @ 1.57 psf	ASTM D779
Water Resistance	Pass	ASTM D779
Water Vapor Transmission	63.1 (grams /sq. meter)	ASTM E96
Water Vapor Permeance	9.1 (perm)	ASTM E96
Canadian Water Ponding	Pass	CCMC 07193
Pliability	Pass	SBCCI
Flame Spread	Class A	ASTM E84
Smoke Developed	Class A	ASTM E84