Technical Bulletin #4b

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WALL PANEL DESIGN LOADS

Building materials that are utilized to create structural components such as walls are subject to a combination of loads. Wall assemblies must be able to withstand axial forces, while at the same time resisting a bending load. Most building materials including concrete, steel lumber and other engineered wood products determine their acceptability for application, in an assembly, through the use of a well-known engineering formula known as the Unity Equation.

The Unity Equation takes into account the ultimate load capacity for a product in both the axial and transverse directions. These ultimate loads are divided by a factor of safety which yields design values. In determining if a product is acceptable for use, the product must meet the following formula:

$$\frac{f_a \ \text{(Design Axial Load)}}{F_a \ \text{(Allowable Axial Load)}} + \frac{f_b \ \text{(Design Bending Load)}}{F_b \ \text{(Allowable Bending Load)}} < 1$$

Premier SIPs have under gone extensive testing that allows design professionals to utilize this engineering formula in their work with Premier SIPs. Premier SIPs has the necessary data through full scale destructive testing at independent code recognized laboratories. Attached is a compilation of this data in the form of a Load Design Chart. The chart has been put together with the design axial load listed on top and the design transverse load beneath..

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WALL PANEL ALLOWABLE DESIGN LOADS TYPE S Panels							
Panel Core		8'	10'	12'	16'	20'	24'
3 ½"	Axial Load plf	3500	2553	2452	2118	N/A	N/A
	Trans Load psf	61	57	45	21	N/A	N/A
5 ½"	Axial Load plf	4250	4042	3373	3358	2817	N/A
	Trans Load psf	80	60	46	34	21	N/A
7 ¼"	Axial Load plf	4917	4325	4473	4194	3496	3067
	Trans Load psf	85	75	69	50	31	24
9 ¼"	Axial Load plf	4200	4200	4200	4200	3389	3247
	Trans Load psf	86	65	57	46	39	34
11 ¼"	Axial Load plf	3890	3890	3890	3890	3890	3333
	Trans Load psf	94	76	59	51	39	33
Axial loads represent ultimate divided by a safety factor of 3.							
Transverse loads are less than or equal to L/180 deflection or ultimate load divided by a safety factor of 3.							
Loads do not reflect secondary effect of PΔ.							

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WALL PANEL ALLOWABLE DESIGN LOADS TYPE L Panels							
Panel Core		8'	10'	12'	16'	20'	24'
3 ½"	Axial Load plf	4723	3903	3094	2350	N/A	N/A
	Trans Load psf	91	61	45	23	N/A	N/A
5 ½"	Axial Load plf	5849	5889	4278	4311	2933	N/A
	Trans Load psf	182	112	80	49	29	N/A
7 ¼"	Axial Load plf	6850	6111	5556	5181	4835	4082
	Trans Load psf	188	133	117	80	44	24
9 ¼"	Axial Load plf	5470	5470	5470	5470	5470	4250
	Trans Load psf	188	147	134	108	68	53
11 ¼"	Axial Load plf	4500	4333	4167	3750	3750	3333
	Trans Load psf	188	167	153	110	83	70
Axial loads represent ultimate divided by a safety factor of 3.							
Transverse loads are less than or equal to L/180 deflection or ultimate load divided by a safety factor of 3.							
Loads do not reflect secondary effect of PΔ.							
2x's are spaced at 4' on center.							