LightweightSteelFraming

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Technical BULLETIN

Report on:

Member Selection and Structural Design

Volume 7, Number 10

Limiting Height Tables for Composite Non-Structural Walls (Metric)

Introduction

In 2014 the *Steel Framing Industry Association (SFIA)*[1] and the *Steel Stud Manufacturers Association (SSMA)*[2] completed a cooperative research project into the behaviour of composite non-structural wall assemblies. This work was the basis for the limiting height tables in the 2015 edition of ASTM C754 *Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products*. The tables provided herein were developed using the original test data but with metric loads (i.e. 0.25, 0.375 and 0.50 kPa). The CSSBI wishes to thank SFIA and SSMA for providing access to this data.

Notes to Tables

- Gypsum board is 15.9 mm thick, Type X.
- The loads shown are specified uniform lateral loads.
- Factored resistances for strength limit state are based on tests evaluated in accordance with CSA-S136-16, *North American Specification for the Design of Cold-Formed Steel Structural Members*. See also CSSBI LSF Technical Bulletin, *Volume 7, Number 8, Non-loadbearing Steel Stud Composite Limiting Height Calculations for Canadian Applications*, October 2013.
- The gypsum board must be applied full height to each stud flange and installed using minimum No. 6 Type S drywall screws spaced a maximum of 305 mm on-centre for studs at 610 mm spacing, and 406 mm on-centre for studs at 406 and 305 mm spacing.
- No fasteners are required for attaching the stud to the track.
- Stud end bearing must be a minimum of 25 mm.
- Minimum material yield strength equals 230 MPa.
- 'f' adjacent to the height value indicates that flexural strength controls the allowable wall height.
- Limiting heights are calculated using ICC-ES AC86-2012, *Acceptance Criteria for Cold-Formed Steel Framing Members – Interior Nonload-Bearing Wall Assemblies*.
- Non-structural sections must comply with ASTM C645-14, *Standard Specification for Nonstructural Steel Framing Members*.

[1] Steel Framing Industry Association, 513 W. Broad Street, Suite 210, Falls Church, VA, USA https://sfia.memberclicks.net/

[2] Steel Stud Manufacturers Association, 35 East Wacker Drive, Suite 850, Chicago, IL, USA www.ssma.com

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Section Designations

The tables include standard designators to identify the products. This is a four-part code that identifies the size (both depth and flange width), section type, and minimum base steel thickness. The same designator is used for both Imperial and Metric specifications.

Example: **600S125-33**
Member depth: All member depths are taken in 1/100 inches. 6" = **600**,
3-5/8" = **362**, 2-1/2" = **250**
Section type: **S** = stud or joist
Flange width: All flange widths are taken in 1/100 inches. 1-1/4" = **125**
Minimum thickness: Material thickness is the minimum base steel thickness in mils (1/1000 of an inch). 33 mils = 0.0329 in.

Table 1: Maximum Stud Height, m, Single Layer of 15.9 mm (5/8 in.) Type X Gypsum Board, Vertical Application, on Each Side of Minimum 0.455 mm (0.0179 in.) Base Steel Thickness Steel Studs

Member Designator	Stud Spacing (mm)	0.25 kPa			0.375 kPa			0.50 kPa		
		L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
162S125-18	305	3.89f	3.33	2.95	3.17f	2.91	2.58	2.75f	2.64	
	406	3.37f	3.03	2.68	2.75f	2.64		2.38f	2.38	
	610	2.75f	2.64							
250S125-18	305	4.88f	4.25	3.84	3.98f	3.72	3.35	3.45f	3.38	3.05
	406	4.22f	3.86	3.49	3.45f	3.38	3.05	2.99f	2.99f	2.69
	610	3.45f	3.38	3.05	2.82f	2.82f	2.55	2.44f	2.44f	
362S125-18	305	5.56f	5.00	4.37	4.54f	4.37	3.82	3.93f	3.93f	3.46
	406	4.81f	4.55	3.97	3.93f	3.93f	3.46	3.40f	3.40f	3.11
	610	3.93f	3.93f	3.46	3.21f	3.21f	2.97	2.78f	2.78f	2.68
400S125-18	305	5.75f	5.26	4.60	4.69f	4.60	4.02	4.06f	4.06f	3.65
	406	4.98f	4.78	4.18	4.06f	4.06f	3.65	3.52f	3.52f	3.31
	610	4.06f	4.06f	3.65	3.32f	3.32f	3.17	2.87f	2.87f	2.87
600S125-18	305	6.91f	6.85	5.98	5.64f	5.64f	5.22	4.88f	4.88f	4.74
	406	5.98f	5.98f	5.43	4.88f	4.88f	4.74	4.23f	4.23f	4.23f
	610	4.88f	4.88f	4.74	3.99f	3.99f	3.99f			

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Table 2: Maximum Stud Height, m, Single Layer of 15.9 mm (5/8 in.) Type X Gypsum Board, Vertical Application, on Each Side of Minimum 0.836 mm (0.0329 in.) Base Steel Thickness Steel Studs

Member Designator	Stud Spacing (mm)	0.25 kPa			0.375 kPa			0.50 kPa		
		L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
250S125-33	305	5.92	4.70	4.11	5.17	4.11	3.59	4.70	3.73	3.26
	406	5.38	4.27	3.73	4.70	3.73	3.26	4.27	3.39	2.96
	610	4.70	3.73	3.26	4.11f	3.26	2.81	3.67f	2.96	2.48
362S125-33	305	7.26	5.76	5.03	6.34	5.03	4.40	5.76	4.57	4.00
	406	6.60	5.24	4.57	5.76	4.57	4.00	5.24	4.16	3.57
	610	5.76	4.57	4.00	4.97f	4.00	3.40	4.31f	3.57	3.02
400S125-33	305	7.59	6.02	5.26	6.63	5.26	4.60	6.02	4.78	4.18
	406	6.89	5.47	4.78	6.02	4.78	4.18	5.47	4.34	3.78
	610	6.02	4.78	4.18	5.16f	4.18	3.60	4.47f	3.78	3.22
600S125-33	305	10.62	8.43	7.36	9.27	7.36	6.43	8.30f	6.69	5.84
	406	9.64	7.66	6.69	8.30f	6.69	5.84	7.19f	6.08	5.30
	610	8.30f	6.69	5.84	6.78f	5.84	5.08	5.87f	5.30	

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