

SOUND GUARD

THE SILENT STEEL FRAMING SYSTEM

Steel-Con

**Steel Construction
Systems**



www.SteelConSystems.com
www.SoundGuardWall.com

» The SoundGuard™ Silent Steel Framing System

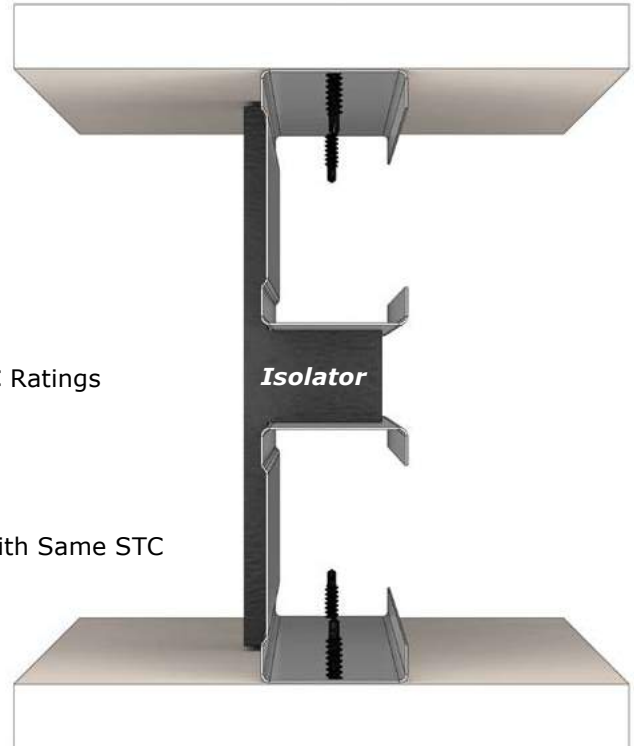
NEW Patented Interior Sound Rated Framing System

Features and Benefits

- **Narrower Walls** - Which Means More Usable Square Feet
- **Lower Material Costs** - No CRC, Thinner Steel, Smaller Web
- **Faster Build-out** - Single Wall Installation
- **STC-Equal or Better** - Compared to chase wall framing
- **1 & 2 HOUR Fire Rating UL V463 & UL W475**
- **Available in 3½", 4", and 6" Wall Assemblies**

Architect/Owner

- **Narrower Allowable Wall Thicknesses** with Better or Equal STC Ratings
 - Increased Room Dimensions
 - Greater Saleable Square Footage
 - Revenue Gains for Owner
- **Equivalent** to Many GA WP Partition and Chase Wall Assemblies with Same STC
 - Eliminates Drywall and/or Resilient Sound Channel
 - Increases Rentable Square Footage
 - Half as Many Studs and Track to Install
 - No Cross Bracing and CRC Lateral Bracing required



Contractor

Replaces GA WP Partition and Chase Wall Assemblies with equal or lesser wall thicknesses

- **Lower Material Costs – Superior STC Ratings**
 - Eliminates Layers of Drywall
 - Reduces the Amount of Studs and Track to Install
 - No Resilient Sound Channel Required
 - No Cross Bracing and CRC Lateral Bracing required
- **Faster Build-Out**, Saves Labor, Field Tested, Contractor Approved, Pre-Assembled With Built-in Air Space
- **Installs Just Like a Typical Single Stud**
- **Substitution Requests** Steel-Con Engineering Services Will Assist With This Process
- **Risk Reduction** Quoting, Planning, Stocking, Waste, Labor Over Runs, Durations
- **Can Be Used With Slotted Track** in 3½", 4", and 6" Widths
- **Engineering Design / Build Solutions**

» Contact Steel-Con Engineering Services

For assistance with ordering or questions on your project, utilize Steel-Con Engineering Services:

Call: 1-407-438-1664

Email: Technical@SteelConSys.com

Cost Benefit Example

26	Floors Containing Condo Units
10	Average Number of Units per Floor
260	Total Number of Units
284,815	Total Square Footage of Condo Space
18,200	Total Lineal Footage of Sound Wall

» Traditional Double Stud Sound Wall

(See Height Comparisons on Page 8)

Two each 2½" studs with 1" air gap

6" total wall width x 18,200 lineal footage of wall = 9,100 sq.ft.

» SoundGuard™ Sound Wall

One each 3⅝" SoundGuard™ stud

3⅝" total wall width x 18,200 lineal footage of wall = 5,498 sq.ft.

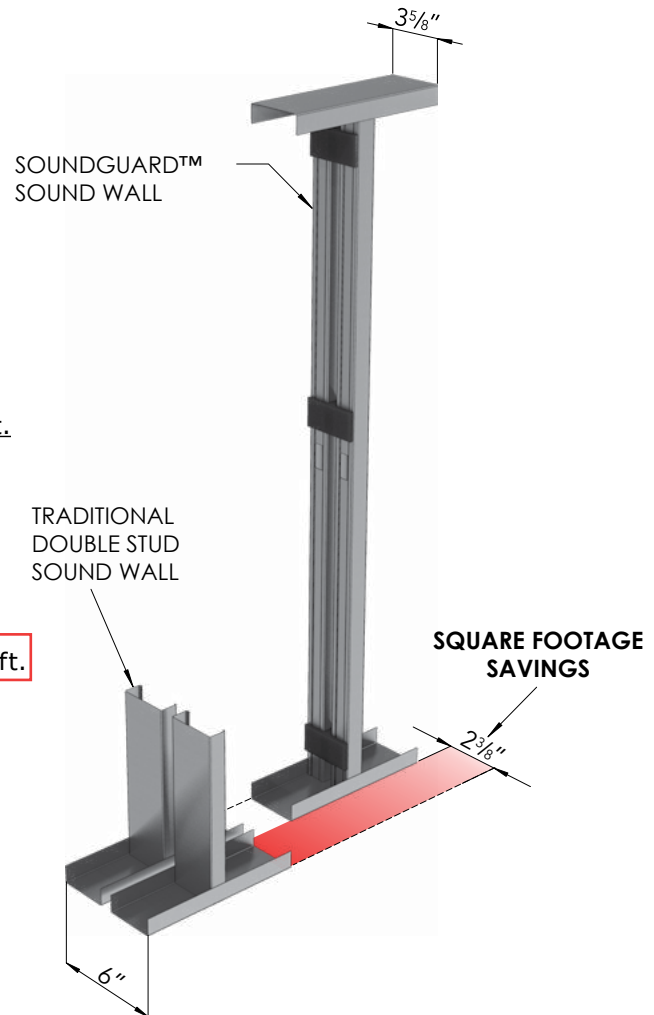
» Savings of Square Footage

Traditional 9,100 sq.ft. - 5,498 sq.ft. SoundGuard™ = 3,602 sq.ft.

» Total Dollar Savings to Owner

3,602 sq.ft. x \$1,650* = \$5,943,300

*Data based on average condo price of \$1,650.00/sq.ft. in Miami, FL from www.highrises.com as of March 2017.



Testing

Riverbank Acoustical Laboratories

Sound assemblies were constructed, thoroughly inspected, and tested by Riverbank Acoustical Laboratories. NVLAP accredited for ASTM E90 & E413, ISO Certified.

Riverbank Acoustical Laboratories is accredited by the US Department of Commerce, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 100227-0) to ISO 17025:2005 laboratory quality management and specific acoustical test standards.

Salter

Salter's team of acoustical consultants tested SoundGuard at the Hyatt Place San Francisco. The project scope included a 230-room, 120,000 square-foot hotel. The SoundGuard partition walls were found to have met the project's designed acoustical specifications. The testing report for this project is available upon request from SCAFCO.



Steel Thickness Reference

Steel Thickness Table

Designation Thickness	Minimum Thickness ¹ (in)	Design Thickness ¹ (in)	Design Inside Corner Radii (in)	Galvanized Thickness
D24	0.0223	0.0235	0.0820	G60
33EQS	0.0280	0.0295	0.0790	G60
43EQS	0.0380	0.0400	0.0712	G60

¹Minimum thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site based on AISI S100-16 Section B7.1

Wall Height Tables

Table Notes

- Allowable composite limiting heights are calculated in accordance using ICC-ES AC 86.
- 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 12 inch on-center for studs at 24 inch spacing, and 16 inch on-center for studs at 16 inch and 12 inch spacing.
- A fastener is to be attached through the stud to the track in each flange. Stud end bearing must be a minimum of 1 inch.
- "f" adjacent to the height value indicates that flexural stress controls the allowable height.
- 3 3/8" wall height tables conservatively use 4" composite testing.

Composite - 3 5/8", 4", and 6" Wall Height Tables

Part No.	Fy (ksi)	Design Thickness	Minimum Thickness	Spacing (in) oc	5 psf			7.5 psf			10 psf		
					L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
362SG144-D24	57	0.0235	0.0223	12	17' - 8"	14' - 0"	12' - 0"	15' - 5"	12' - 0"	10' - 0"	14' - 0"	10' - 7"	8' - 8"
				16	16' - 0"	12' - 8"	10' - 7"	14' - 0"	10' - 7"	8' - 8"	12' - 8"	9' - 2"	-
				24	14' - 0"	10' - 7"	8' - 8"	12' - 0"	8' - 8"	-	10' - 7"	-	-
362SG162-33EQS	57	0.0295	0.0280	12	18' - 7"	14' - 9"	12' - 9"	16' - 3"	12' - 9"	10' - 9"	14' - 9"	11' - 4"	9' - 3"
				16	16' - 11"	13' - 5"	11' - 4"	14' - 9"	11' - 4"	9' - 3"	13' - 5"	9' - 11"	8' - 1"
				24	14' - 9"	11' - 4"	9' - 3"	12' - 9"	9' - 3"	-	11' - 4"	8' - 1"	-
362SG162-43EQS	57	0.0400	0.0380	12	20' - 3"	16' - 1"	14' - 1"	17' - 9"	14' - 1"	12' - 0"	16' - 1"	12' - 9"	10' - 3"
				16	18' - 5"	14' - 8"	12' - 9"	16' - 1"	12' - 9"	10' - 3"	14' - 8"	10' - 11"	8' - 11"
				24	16' - 1"	12' - 9"	10' - 3"	14' - 1"	10' - 3"	8' - 5"	12' - 9"	8' - 11"	-
400SG144-D24	57	0.0235	0.0223	12	17' - 8"	14' - 0"	12' - 0"	15' - 5"	12' - 0"	10' - 0"	14' - 0"	10' - 7"	8' - 8"
				16	16' - 0"	12' - 8"	10' - 7"	14' - 0"	10' - 7"	8' - 8"	12' - 8"	9' - 2"	-
				24	14' - 0"	10' - 7"	8' - 8"	12' - 0"	8' - 8"	-	10' - 7"	-	-
400SG162-33EQS	57	0.0295	0.0280	12	18' - 7"	14' - 9"	12' - 9"	16' - 3"	12' - 9"	10' - 9"	14' - 9"	11' - 4"	9' - 3"
				16	16' - 11"	13' - 5"	11' - 4"	14' - 9"	11' - 4"	9' - 3"	13' - 5"	9' - 11"	8' - 1"
				24	14' - 9"	11' - 4"	9' - 3"	12' - 9"	9' - 3"	-	11' - 4"	8' - 1"	-
400SG162-43EQS	57	0.0400	0.0380	12	20' - 3"	16' - 1"	14' - 1"	17' - 9"	14' - 1"	12' - 0"	16' - 1"	12' - 9"	10' - 3"
				16	18' - 5"	14' - 8"	12' - 9"	16' - 1"	12' - 9"	10' - 3"	14' - 8"	10' - 11"	8' - 11"
				24	16' - 1"	12' - 9"	10' - 3"	14' - 1"	10' - 3"	8' - 5"	12' - 9"	8' - 11"	-
600SG144-D24	57	0.0235	0.0223	12	19' - 7"	16' - 0"	14' - 0"	17' - 2"	13' - 11"	12' - 3"	15' - 7"	12' - 8"	11' - 1"
				16	17' - 10"	14' - 6"	12' - 9"	15' - 7"	12' - 8"	11' - 1"	14' - 2"	11' - 6"	10' - 1"
				24	15' - 7"	12' - 8"	11' - 1"	13' - 7"	11' - 1"	9' - 8"	12' - 4"	10' - 1"	8' - 4"
600SG162-33EQS	57	0.0295	0.0280	12	20' - 8"	16' - 8"	14' - 7"	18' - 1"	14' - 7"	12' - 9"	16' - 5"	13' - 3"	11' - 7"
				16	18' - 9"	15' - 2"	13' - 3"	16' - 5"	13' - 3"	11' - 7"	14' - 11"	12' - 0"	10' - 6"
				24	16' - 5"	13' - 3"	11' - 7"	14' - 4"	11' - 7"	10' - 1"	13' - 0"	10' - 6"	8' - 11"
600SG162-43EQS	57	0.0400	0.0380	12	22' - 6"	17' - 10"	15' - 7"	19' - 8"	15' - 7"	13' - 7"	17' - 10"	14' - 2"	12' - 5"
				16	20' - 5"	16' - 3"	14' - 2"	17' - 10"	14' - 2"	12' - 5"	16' - 3"	12' - 10"	11' - 3"
				24	17' - 10"	14' - 2"	12' - 5"	15' - 7"	12' - 5"	10' - 10"	14' - 2"	11' - 3"	9' - 10"



Sound Rating Data

Single Layer 5/8" Type X GWB 1x1 Application

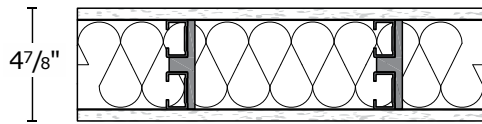
Wall Size	Application	STC Rating	GA-WP Range
3 3/8" Wall	2 - 1 5/8" Studs, Single GWB each side, R-13 Insulation	52*	50-54
4" Wall	2 - 1 5/8" Studs, Single GWB each side, R-13 Insulation		
6" Wall	2 - 2 1/2" Studs, Single GWB each side, R-19 Insulation		

*Based on 4" Wall Testing

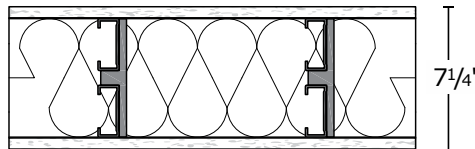
STC Rating: 52*



3 3/8" Wall with 1x1 Application



6" Wall with 1x1 Application

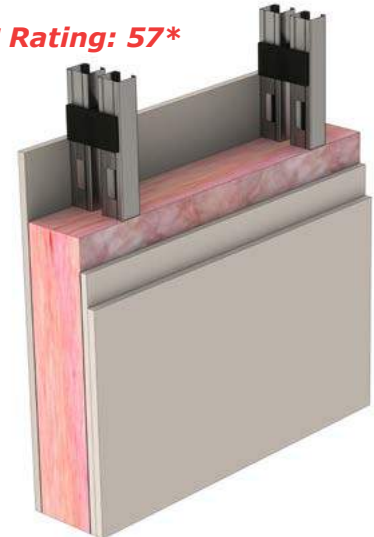


Unbalanced 5/8" Type X GWB 2x1 Application

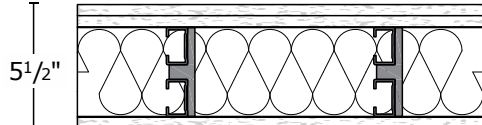
Wall Size	Application	STC Rating	GA-WP Range
3 3/8" Wall	2 - 1 5/8" Studs, Single GWB one side, Double GWB other side, R-13 Insulation	57*	55-59
4" Wall	2 - 1 5/8" Studs, Single GWB one side, Double GWB other side, R-13 Insulation		
6" Wall	2 - 2 1/2" Studs, Single GWB one side, Double GWB other side, R-19 Insulation		

*Based on 4" Wall Testing

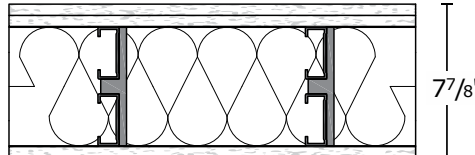
STC Rating: 57*



3 3/8" Wall with 2x1 Application



6" Wall with 2x1 Application

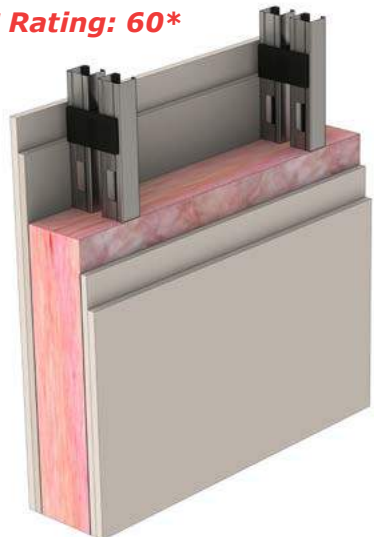


Double Layer 5/8" Type X GWB 2x2 Application

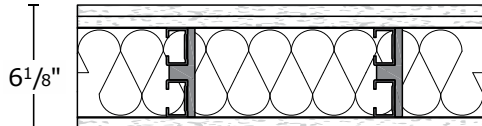
Wall Size	Application	STC Rating	GA-WP Range
3 3/8" Wall	2 - 1 5/8" Studs, Double GWB each side, R-13 Insulation	60*	60-64
4" Wall	2 - 1 5/8" Studs, Double GWB each side, R-13 Insulation		
6" Wall	2 - 2 1/2" Studs, Double GWB each side, R-19 Insulation		

*Based on 4" Wall Testing

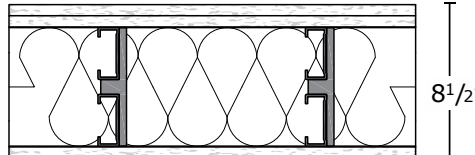
STC Rating: 60*



3 3/8" Wall with 2x2 Application



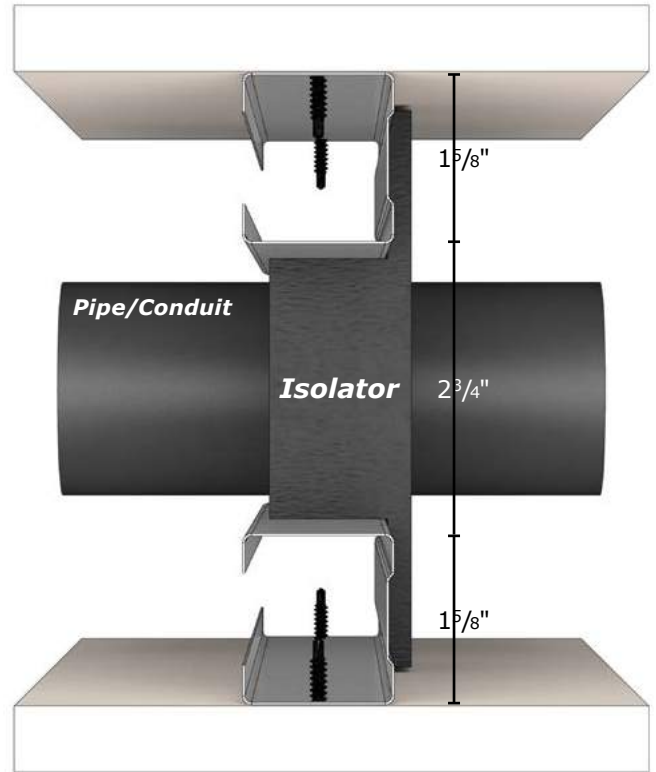
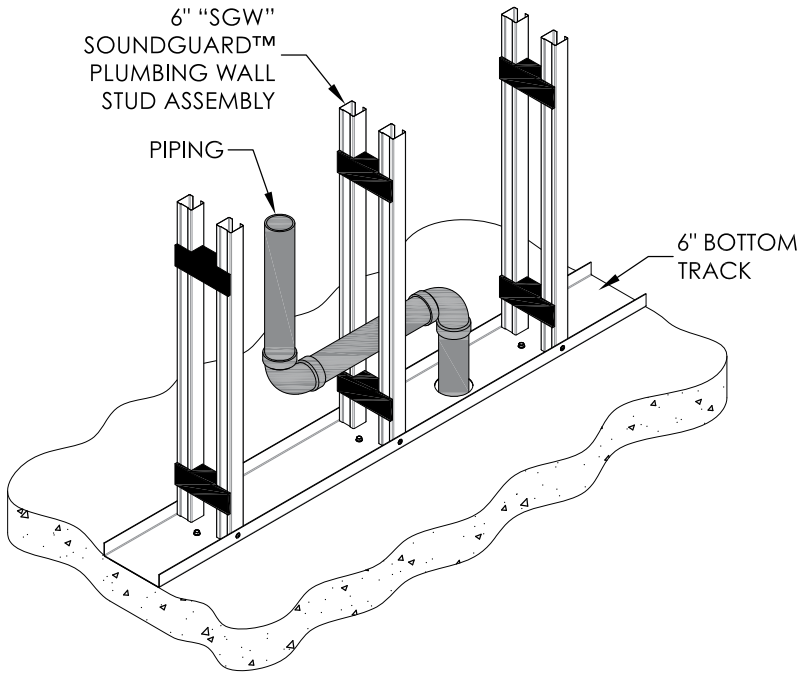
6" Wall with 2x2 Application



» SoundGuard™ Plumbing Wall Design

Features and Benefits

- 2¾" Gap to Allow for Pipes and Electrical Conduit Lines
- Compact 6" Framing Assembly but Still Allows for Plumbing
- Solves Framing Issues with Conduits and Pipes



Wall Height Tables

Table Notes

1. Allowable composite limiting heights are calculated in accordance using ICC-ES AC 86.
2. 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 12 inch on-center for studs at 24 inch spacing, and 16 inch on-center for studs at 16 inch and 12 inch spacing.
3. A fastener is to be attached through the stud to the track in each flange. Stud end bearing must be a minimum of 1 inch.
4. "f" adjacent to the height value indicates that flexural stress controls the allowable height.
5. Table utilizes 4" wall testing

» Composite - 6" Plumbing Wall Height Tables

Part No.	F _y (ksi)	Design Thickness	Minimum Thickness	Spacing (in) oc	5 psf			7.5 psf			10 psf		
					L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
600SGW144-D24	57	0.0235	0.0223	12	17' - 8"	14' - 0"	12' - 0"	15' - 5"	12' - 0"	10' - 0"	14' - 0"	10' - 7"	8' - 8"
				16	16' - 0"	12' - 8"	10' - 7"	14' - 0"	10' - 7"	8' - 8"	12' - 8"	9' - 2"	-
				24	14' - 0"	10' - 7"	8' - 8"	12' - 0"	8' - 8"	-	10' - 7"	-	-
600SGW162-33EQS	57	0.0295	0.0280	12	18' - 7"	14' - 9"	12' - 9"	16' - 3"	12' - 9"	10' - 9"	14' - 9"	11' - 4"	9' - 3"
				16	16' - 11"	13' - 5"	11' - 4"	14' - 9"	11' - 4"	9' - 3"	13' - 5"	9' - 11"	8' - 1"
				24	14' - 9"	11' - 4"	9' - 3"	12' - 9"	9' - 3"	-	11' - 4"	8' - 1"	-
600SGW162-43EQS	57	0.0400	0.0380	12	20' - 3"	16' - 1"	14' - 1"	17' - 9"	14' - 1"	12' - 0"	16' - 1"	12' - 9"	10' - 3"
				16	18' - 5"	14' - 8"	12' - 9"	16' - 1"	12' - 9"	10' - 3"	14' - 8"	10' - 11"	8' - 11"
				24	16' - 1"	12' - 9"	10' - 3"	14' - 1"	10' - 3"	8' - 5"	12' - 9"	8' - 11"	-

Sound Rating Data 6" Plumbing Wall

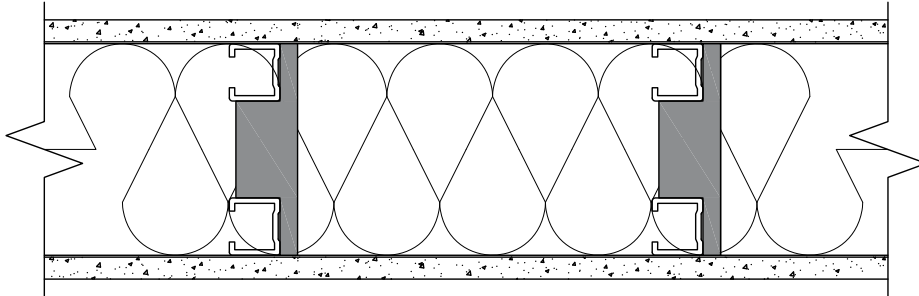


Single Layer 5/8" Type X GWB 1x1 Application

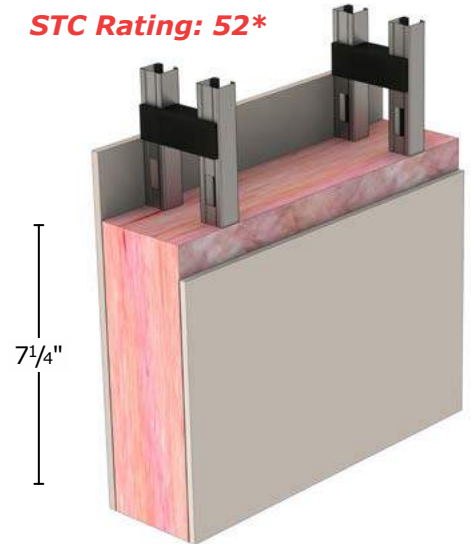
Wall Size	Application	STC Rating	GA-WP Range
6" Plumbing Wall	2 - 1 5/8" Studs, Single GWB each side, R-13 Insulation, 2 3/4" cavity	52*	50-54

*Based on 4" Wall Testing

6" Wall with 1x1 Application



STC Rating: 52*

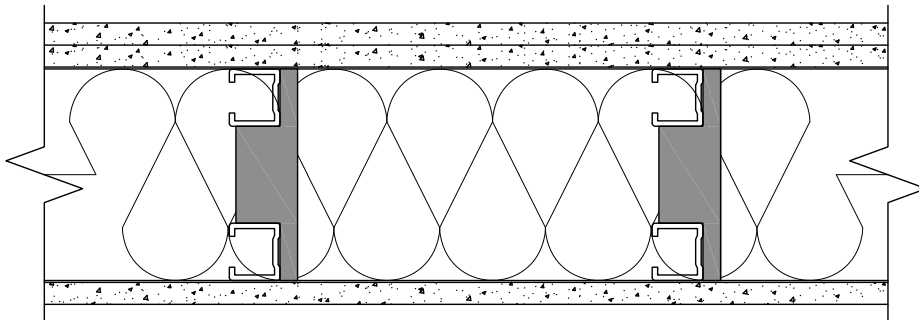


Unbalanced 5/8" Type X GWB 2x1 Application

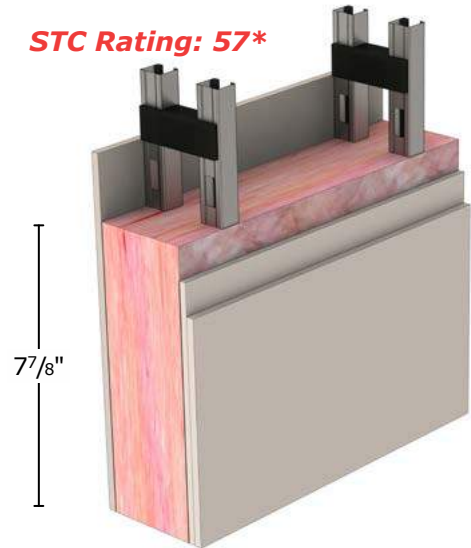
Wall Size	Application	STC Rating	GA-WP Range
6" Plumbing Wall	2 - 1 5/8" Studs, Single GWB one side, Double GWB other side, R-13 Insulation, 2 3/4" cavity	57*	55-59

*Based on 4" Wall Testing

6" Wall with 2x1 Application



STC Rating: 57*

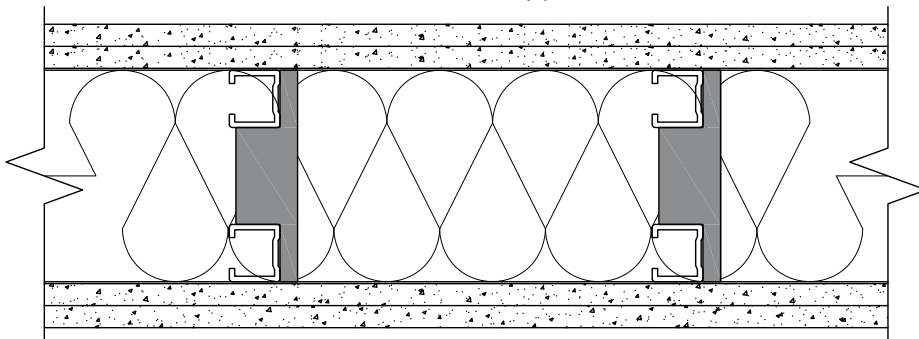


Double Layer 5/8" Type X GWB 2x2 Application

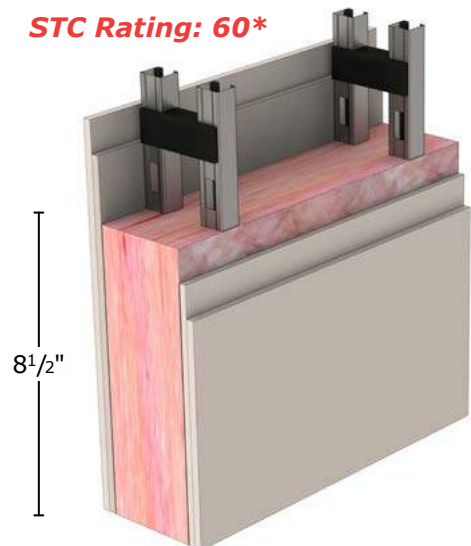
Wall Size	Application	STC Rating	GA-WP Range
6" Plumbing Wall	2 - 1 5/8" Studs, Double GWB each side, R-13 Insulation, 2 3/4" cavity	60*	60-64

*Based on 4" Wall Testing

6" Wall with 2x2 Application

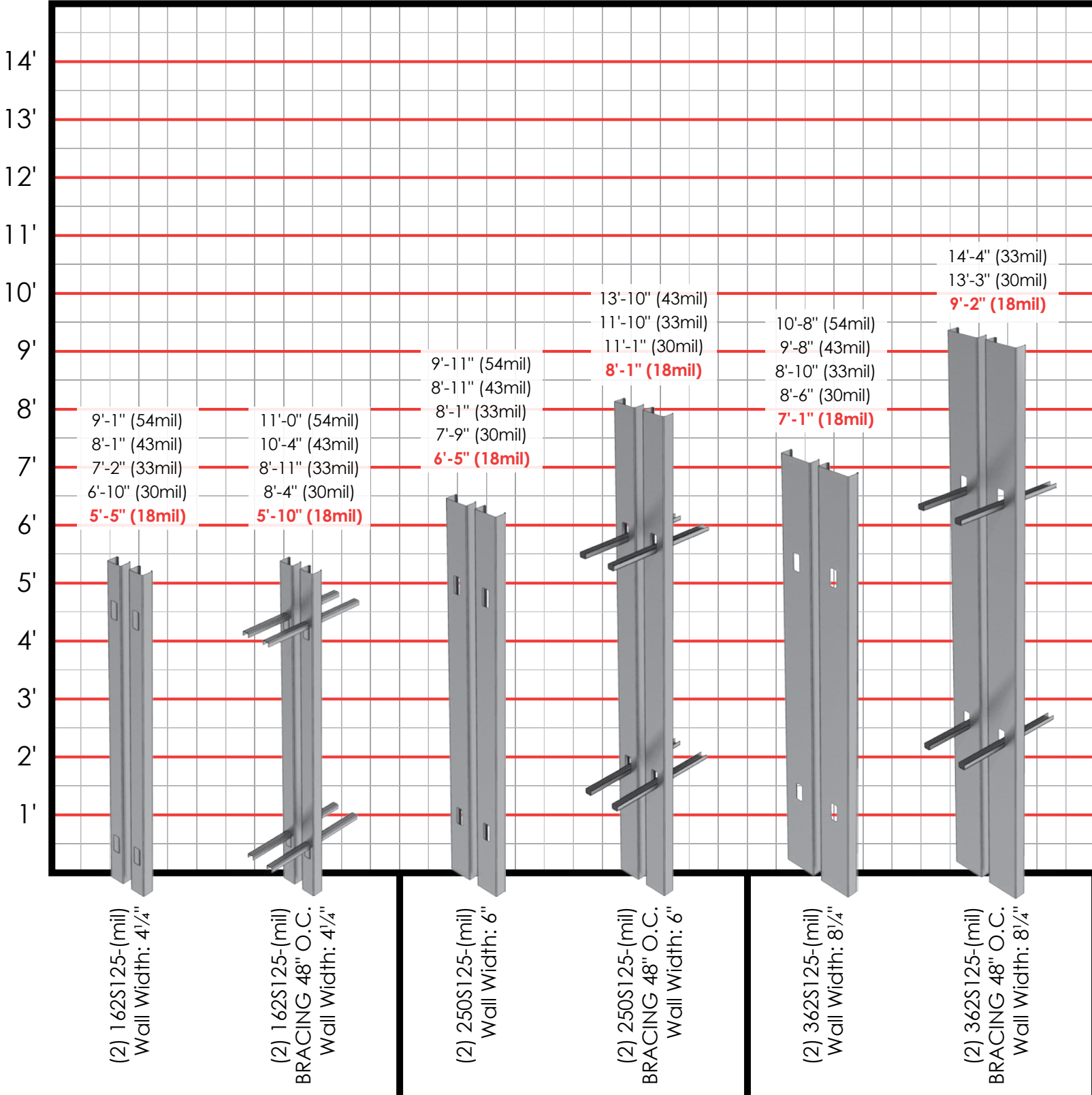


STC Rating: 60*



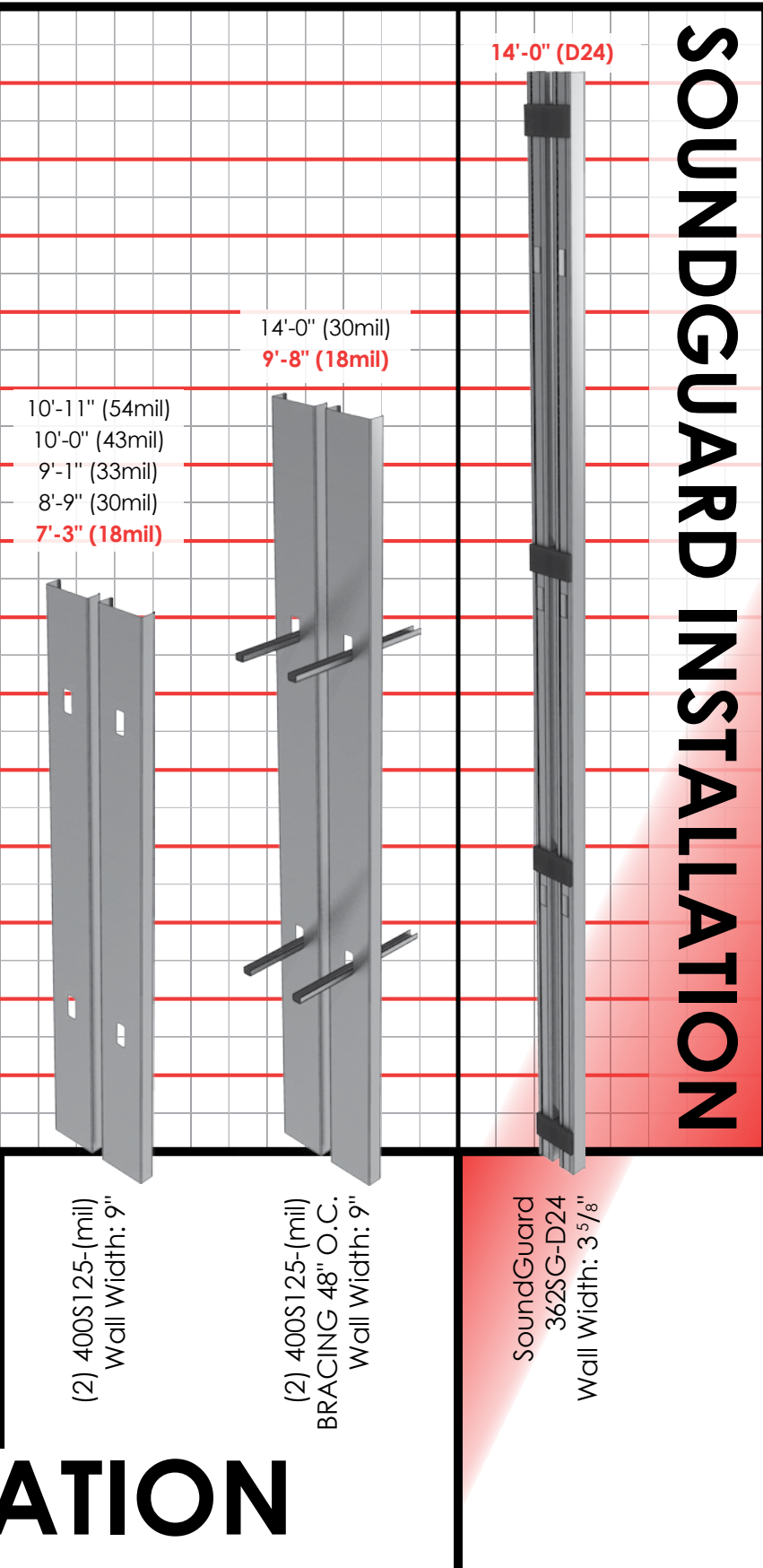
SoundGuard Wall Heights Comparison

*All heights represent interior loading conditions with a 5psf lateral pressure, and L/120 deflection criteria.



CONVENTIONAL INSTALLATION

» Tested and Certified Assemblies vs. Modified Assemblies

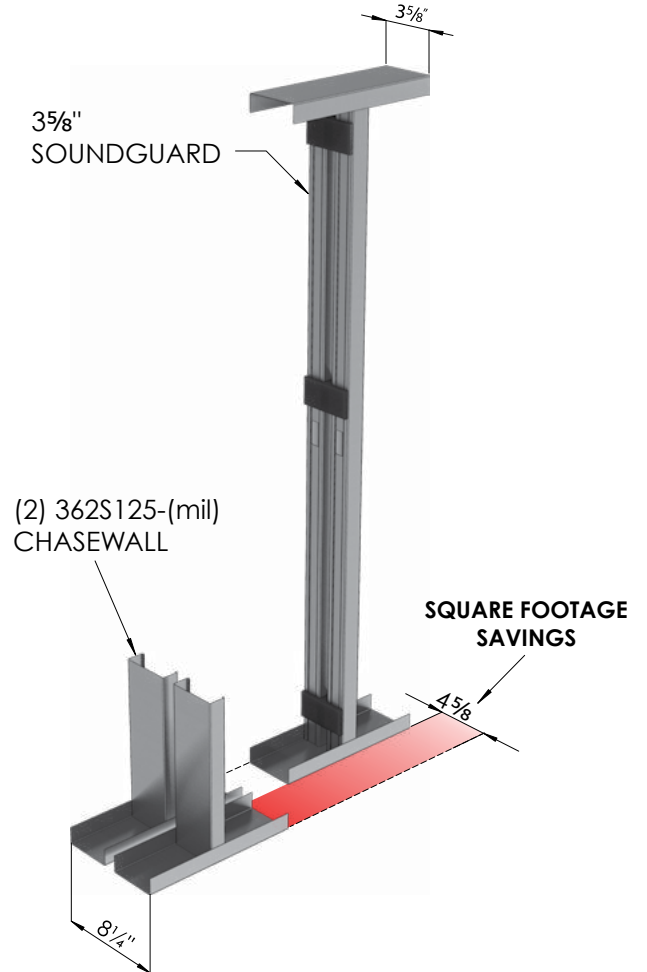


Steel stud walls will perform with superior sound transmission class (STC) ratings when they are constructed with thinner steel material. This will reduce the amount of paths that the soundwave vibrations can travel through the assembly. They are typically tested with 18mil (25 ga.) to maximize performance.

The allowable wall height of the members is often ignored while performing the sound tests. When constructing these walls in the field, the back flange is unsupported, resulting in low wall heights and limited design capabilities.

To reach specific wall heights, these sound rated assemblies are often altered by increasing the steel thickness or by installing lateral bracing (cold rolled channel), resulting in an assembly that is not equivalent to the tested sound wall design listed in the GA Fire Resistance Design Manual.

This chart depicts the maximum height for standard sound wall configurations that can be found in the GA Manual. **SoundGuard provides substantially increased wall heights that well exceed conventional wall assemblies with the assurance of a lab tested STC rating.**



LEED® Credit Contributions

LEED® certified buildings save money and resources and have a positive impact on the health of occupants, while promoting renewable clean energy.

Utilizing SoundGuard™ products on your project will assure the highest quality steel framing materials are used while helping your project attain LEED® Certification. The following information provides possible attainable credits based on the most current LEED® certification program.



» Steel-Con Steel Applicable Credit Contributions:

1. **Building Product Disclosure and Optimization Environmental Product Declaration:** Steel-Con complies with specific product disclosure requirements, including Type III Environmental Product Declaration performed by the Steel Recycling Institute as an industry wide study which has a life of product scope. This contributes to Product Disclosure and Optimization – Environmental Product Declaration.
2. **Construction and Demolition Waste Management:** Steel-Con uses only certified prime steel for all steel framing products. Steel-Con Steel Studs and accessories are 100% recyclable and can contribute to Construction and Demolition Waste Management Credits.
3. **Building Product Disclosure and Optimization Sourcing of Raw Materials:** Steel-Con's steel products contain an average of approximately 36.9% recycled steel which can be utilized under the responsible extraction criteria, option 2 of the Building Product Disclosure and Optimization- Sourcing of Raw Materials.
4. **Regional Materials:** Steel-Con's steel products, comply with the Health Product Declaration (HPD) as supplied from the American Galvanizers Association, and contribute to Building Product Disclosure and Optimization – Material Ingredients.

» SoundGuard™ Silent Framing System Applicable Credit Contributions:

5. **Innovation:** Utilizing SoundGuard's products can contribute to Option 3: Additional strategies to achieve exemplary performance in an existing LEED v4 prerequisite or credit that is allowed per LEED Reference Guide, v4 edition. Exemplary performance is earned for achieving double the credit requirements or the next incremental percentage threshold in order to achieve the Innovation Credit.
6. **Acoustic Performance:** For New Construction Projects that qualify for an Indoor Environmental Quality Credit for Enhanced Acoustical Performance. Test results for the SoundGuard™ Silent Framing System using the Supreme Framing System products have confirmed high levels of sound transmission reduction, with STC ratings as high as 60.



Framing Solution for Wall-Hung-Items

Resilient Channel Sandwiching Major Acoustic Concerns:

Resilient Channel is often times used in conjunction with plywood shear panels or with backing boards and materials for the installation of cabinets or shelves. In this process the plywood or other materials are attached to the wall studs in parallel with the RC Channel, and then gypsum wall board (GWB) is attached to the face of the RC Channel and plywood. This type of construction is known as RC 'Sandwich' Installation, and is seen as a major construction error.

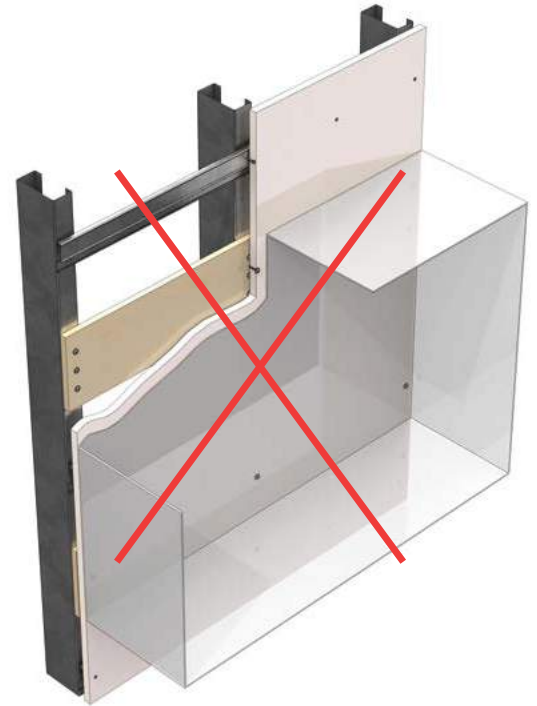
- Backing Creates an Acoustic Short Circuit
- RC Channel Is Ineffective
- Acousticians Agree that it Will Reduce the STC Rating
- Will Perform as a Regular Low Grade Acoustical Wall

Veneklasen Associates is one of the few Consultants in Acoustics that has performed tests on RC 'Sandwich' Installation, and in their 2009 Inter-Noise Article, "Quantitative Comparisons of Resilient Channel Designs and Installation Methods," they stated:

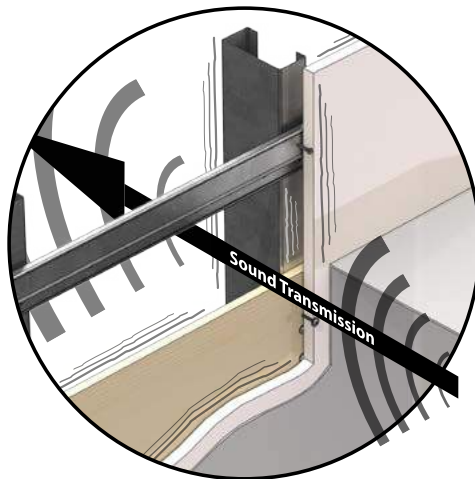
"This is a catastrophic construction technique from an acoustical perspective, virtually negating the value of the resilient channel over much of the frequency range.

...Of the common installation errors presented, installing the resilient channel over a solid surface ("sandwiched" resilient channel) is by far the most egregious, resulting in up to 20 dB reduction in performance."

Veneklasen Associates

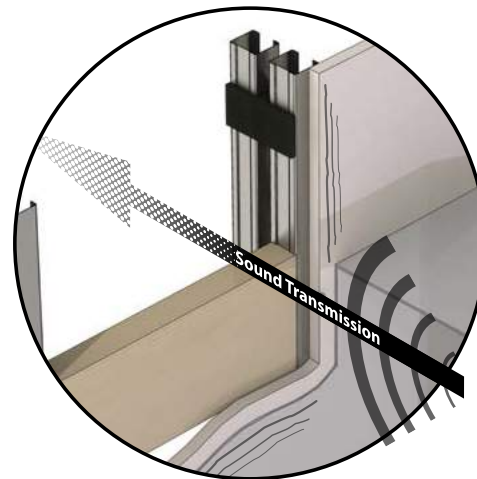


'Sandwiched' Resilient Channel



Backing board renders the RC Channel ineffective.

SoundGuard Solution



SoundGuard's Foam Isolators efficiently retain high STC ratings.

All of this leads us to the question that has remained for quite some time:

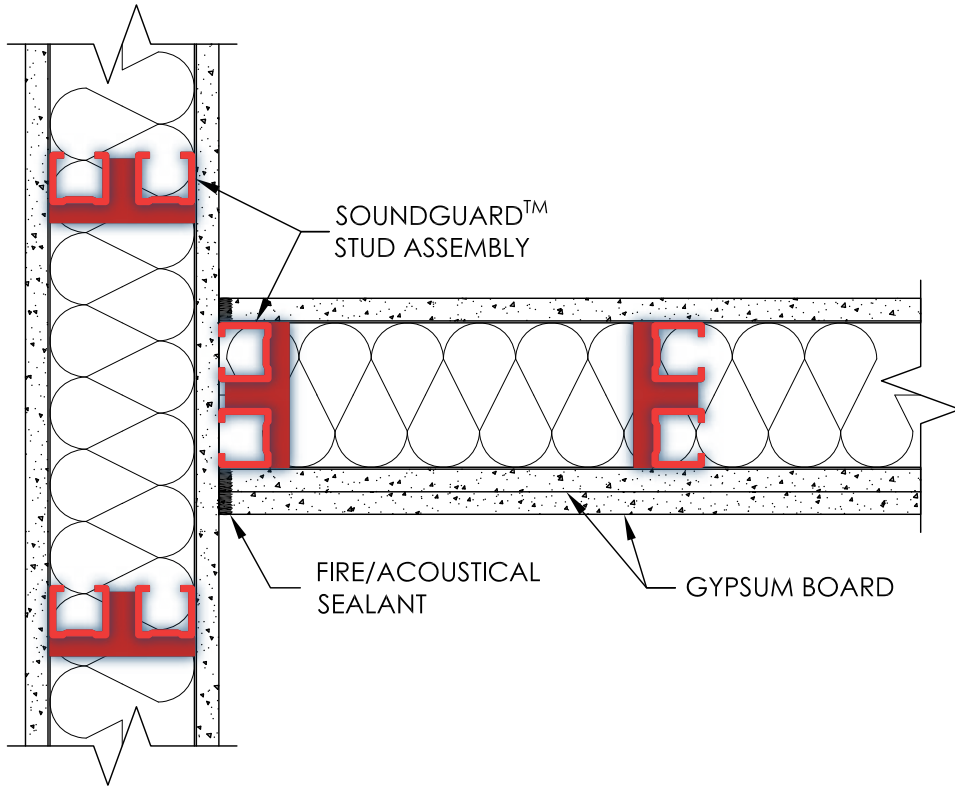
"How do we construct a wall that can allow for the attachments of cabinets and shelving with backing panels, which will not degrade the acoustical performance of the wall assembly?"

The answer to that question is the **SoundGuard™** Silent Framing System. SoundGuard has been acoustically tested and performs with similar acoustical STC ranges as Resilient Channel. The standard framing components of the design allow for plywood or other panel products to be attached just as they would in a standard steel framed wall configuration without degrading the sound quality of the wall.

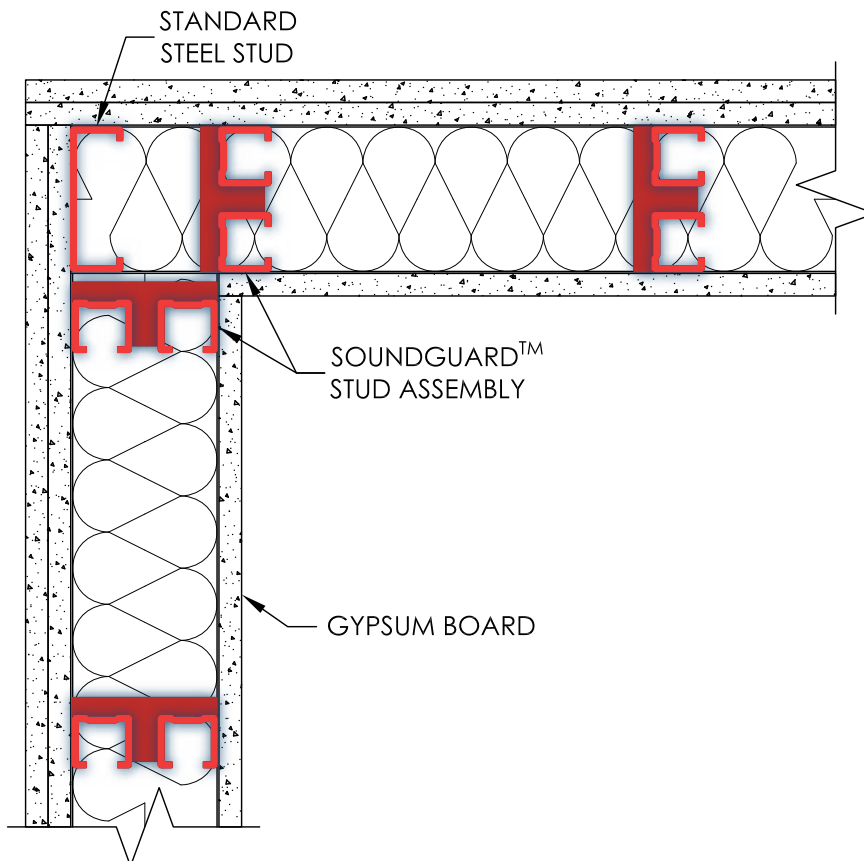
SoundGuard, The Silent Framing Solution, is an efficient solution incorporating chase wall configurations, high STC performance, and standard framing techniques.

SoundGuard

Wall Junction Detail

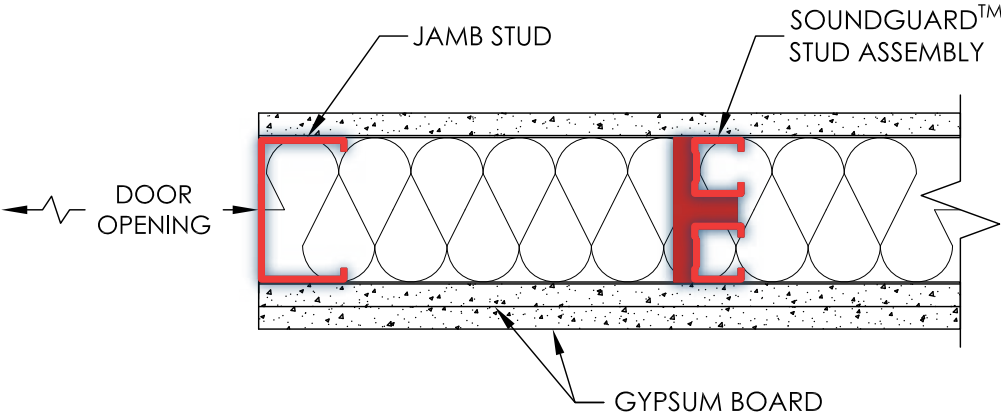


Outside Corner Detail

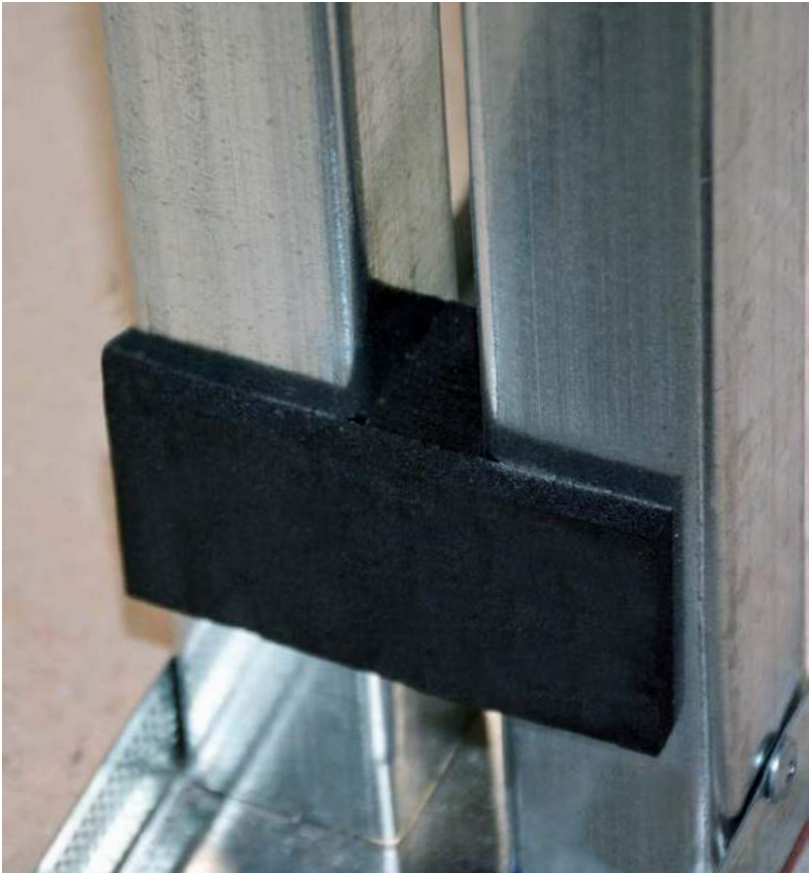


SoundGuard

Jamb Stud Detail



Installation Examples

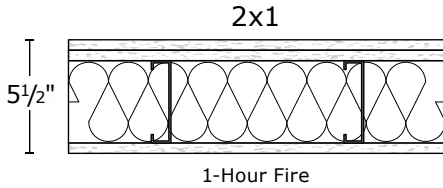


Suitable GA-WP/SoundGuard™ Substitutions

Non Load Bearing / 24" O.C. / 5/8" Type X

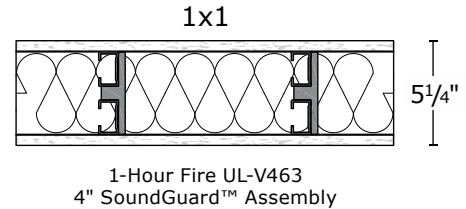
Wall Partition & Assembly

- WP-1052 STC 50-54



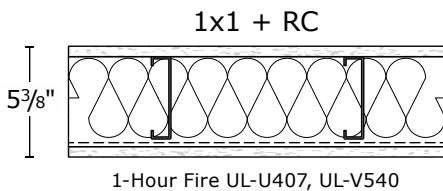
SoundGuard™

- STC 52
- Less Drywall - 1 Layer GWB



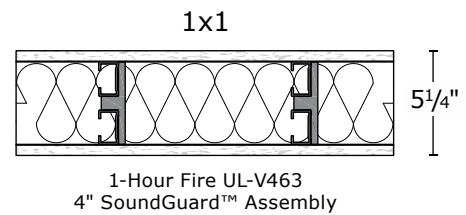
Wall Partition & Assembly

- WP-1049 STC 50-54



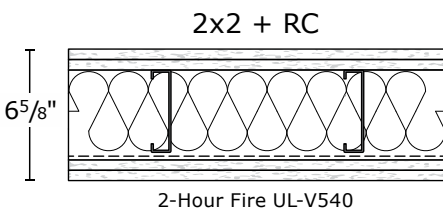
SoundGuard™

- STC 52
- No Resilient Sound Channel Required



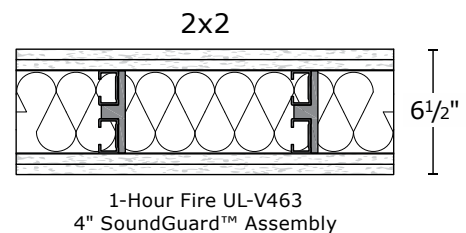
Wall Partition & Assembly

- WP-1450 STC 60-64



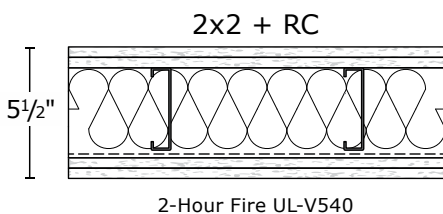
SoundGuard™

- STC 60
- No Resilient Sound Channel Required



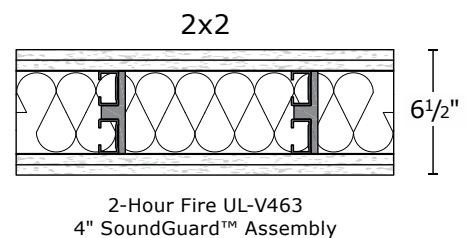
Wall Partition & Assembly

- WP-1451 STC 60-64



SoundGuard™

- STC 60
- No Resilient Sound Channel Required

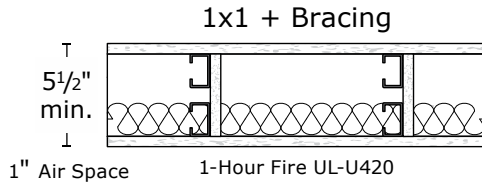


Suitable GA-WP/SoundGuard™ Substitutions

Non Load Bearing / 24" O.C. / 5/8" Type X

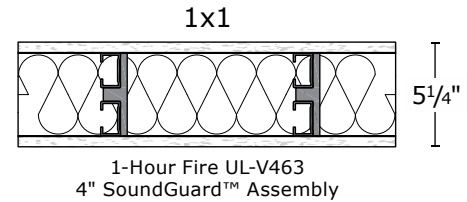
» Chase Wall Assembly

- WP-5015 STC 50-54



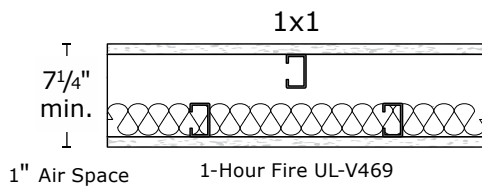
» SoundGuard™

- STC 52
- Eliminate One Wall (Stud + Track)
- No Cross Bracing, No CRC



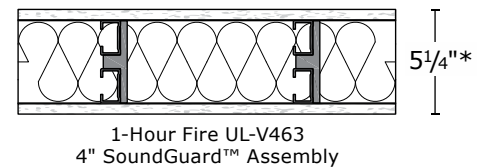
» Chase Wall Assembly

- WP-5017 STC 50-54



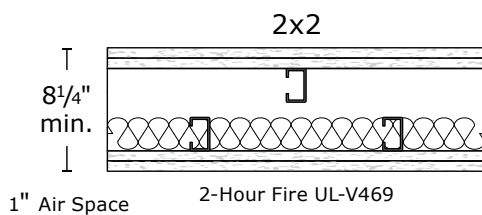
» SoundGuard™

- STC 52
- Eliminate One Wall (Stud + Track)
- Narrower Wall* 1x1



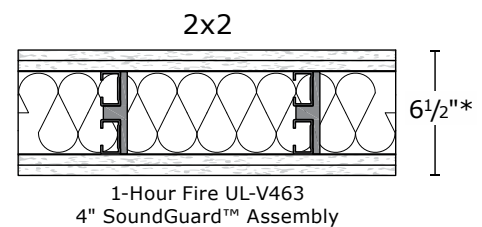
» Chase Wall Assembly

- WP-5071 STC 60-64



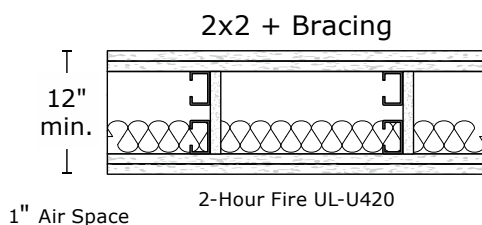
» SoundGuard™

- STC 60
- Eliminate One Wall (Stud + Track)
- Narrower Wall*



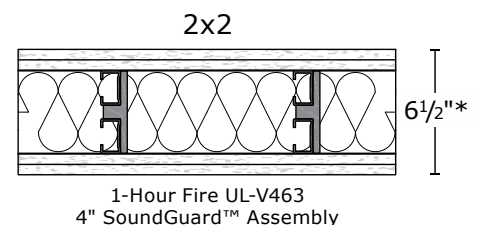
» Chase Wall Assembly

- WP-5105 STC 55-59



» SoundGuard™

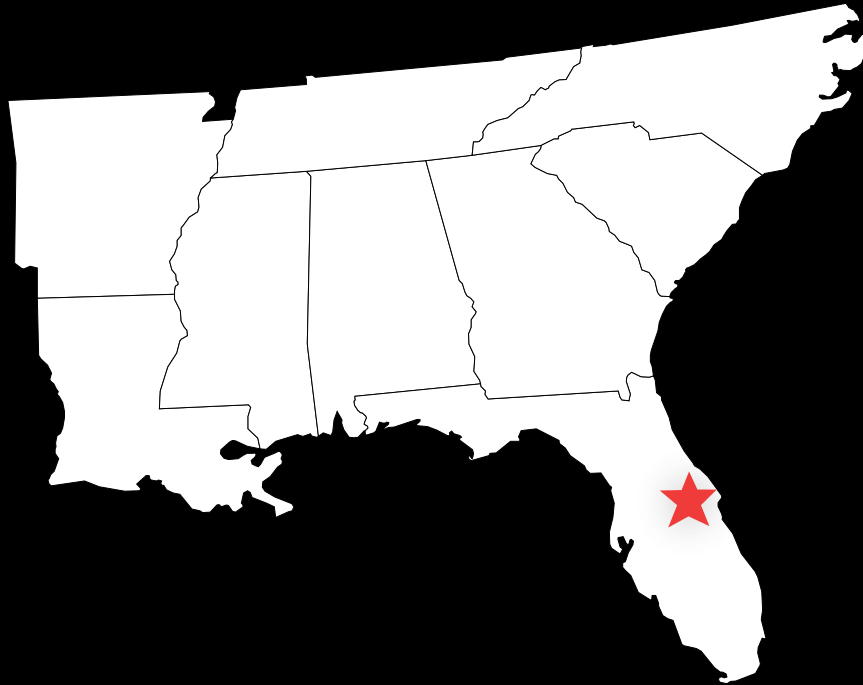
- STC 60
- Eliminate One Wall (Stud + Track)
- No Cross Bracing, No CRC
- Narrower Wall*



*SoundGuard™ Narrower Wall = More Saleable Square Footage

Steel-ConTM

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