



SHOW ME THE MONEY

The Economics of STC-Rated Walls

Course Number EX009

June 5, 2024, 11:45 am

LUS: 0.5 HSW/RIBA/LU

QuietRock®

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PABCO Gypsum

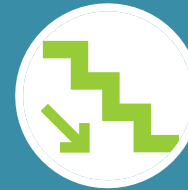
LEARNING OBJECTIVES

Show Me the Money

The Economics of STC-Rated Walls



Learn best practices and design principles of STC-rated designs, including mass, constrained-layer damping, decoupling, sealants, and stud choice and spacing.



Discover how small changes in wall designs impact STC performance.



Deepen your understanding of the current costs associated with designing STC-rated partitions.



Discover the interrelation between environmental impact and economics of a sound-rated wall assembly.

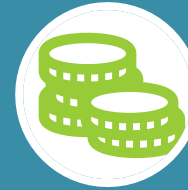
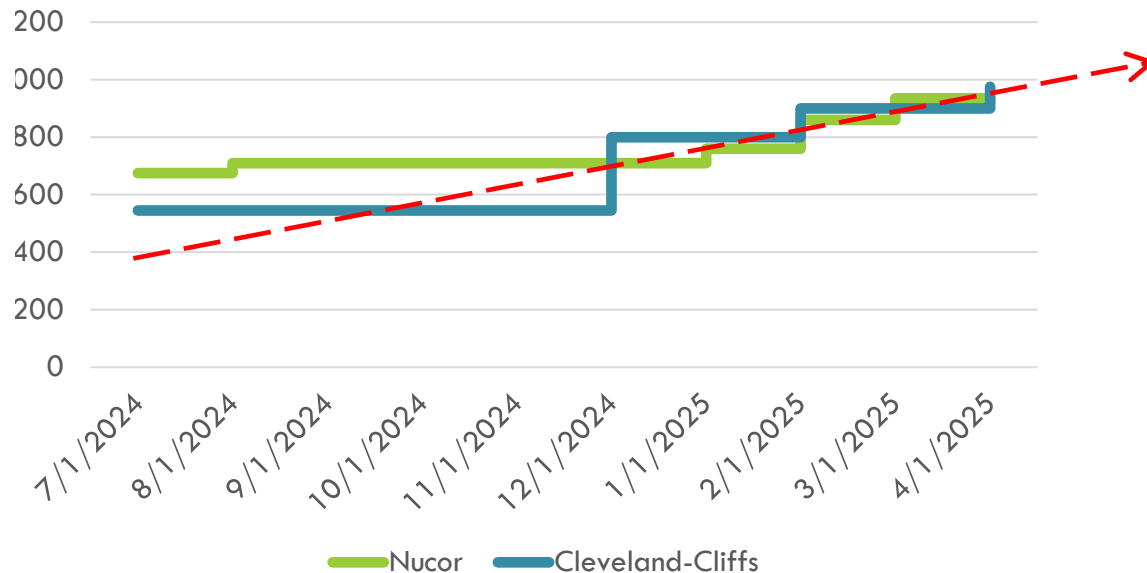
CURRENT ECONOMIC CLIMATE

- Overview
- Which Way is the Wind Blowing Today?

STEEL PRICES

Volatility

Hot Rolled Coil Steel Pricing



Tariffs



Supply Chain Interruptions



Fluctuating Global Demand



Impact of regional pricing differences and risk management on budgeting

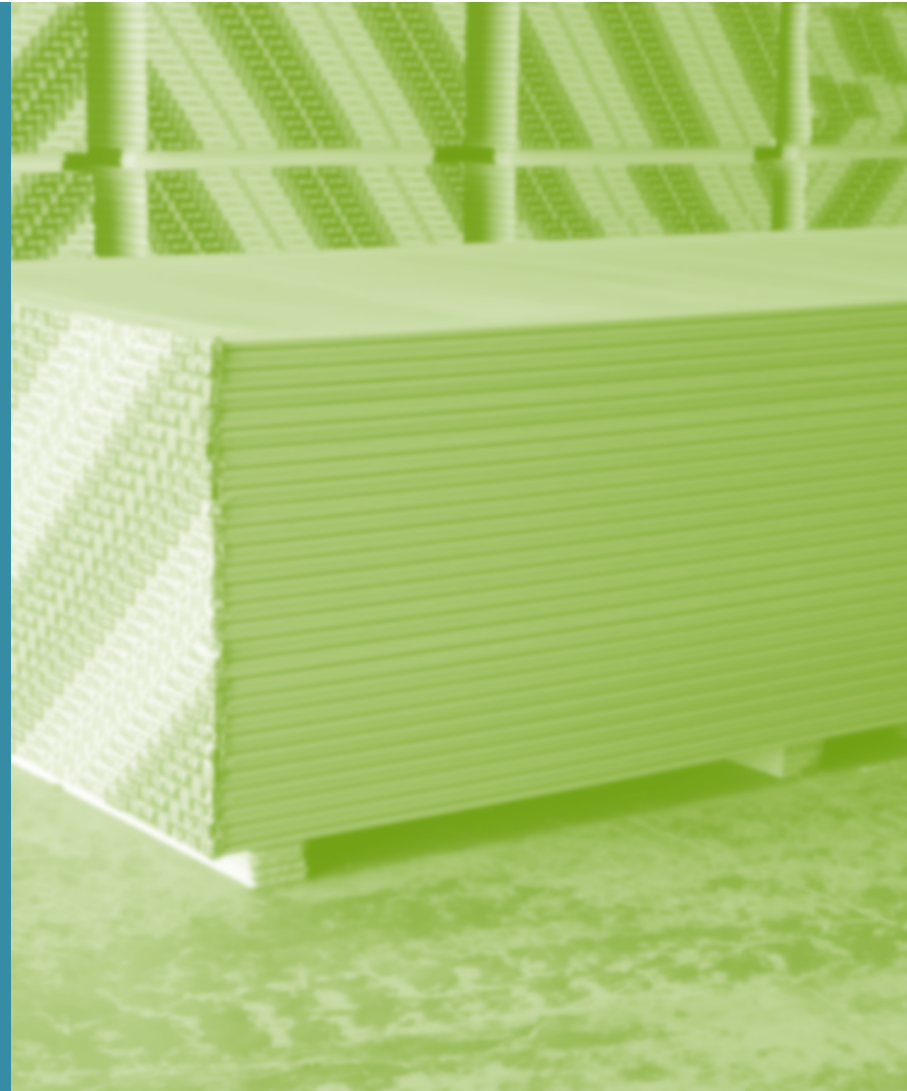
ALTERNATIVE DRYWALL PRODUCTS



Trends in innovative,
lightweight



Price and
performance



LABOR MARKET CONSIDERATIONS

Significant Cost

Less Consideration

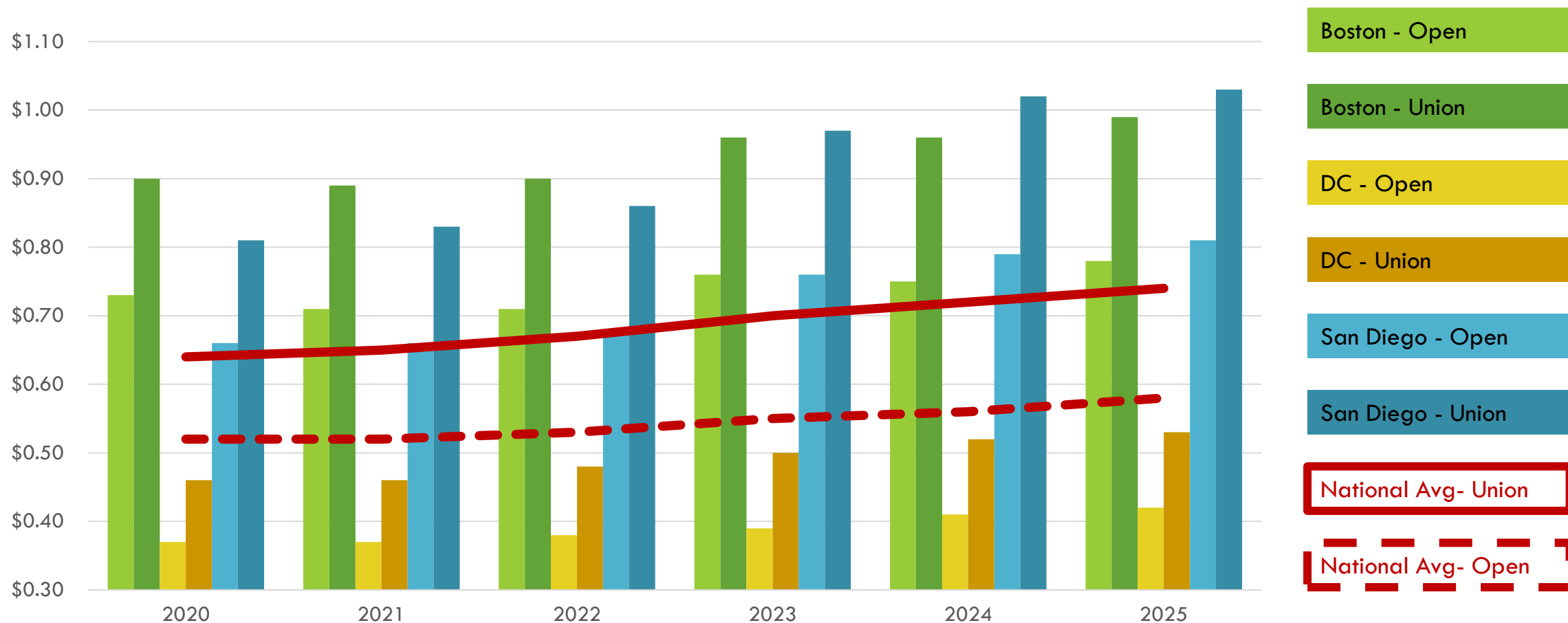
Current labor shortages, wage increases, and their influence on installation costs

How time schedules and installation efficiency affect overall project economics



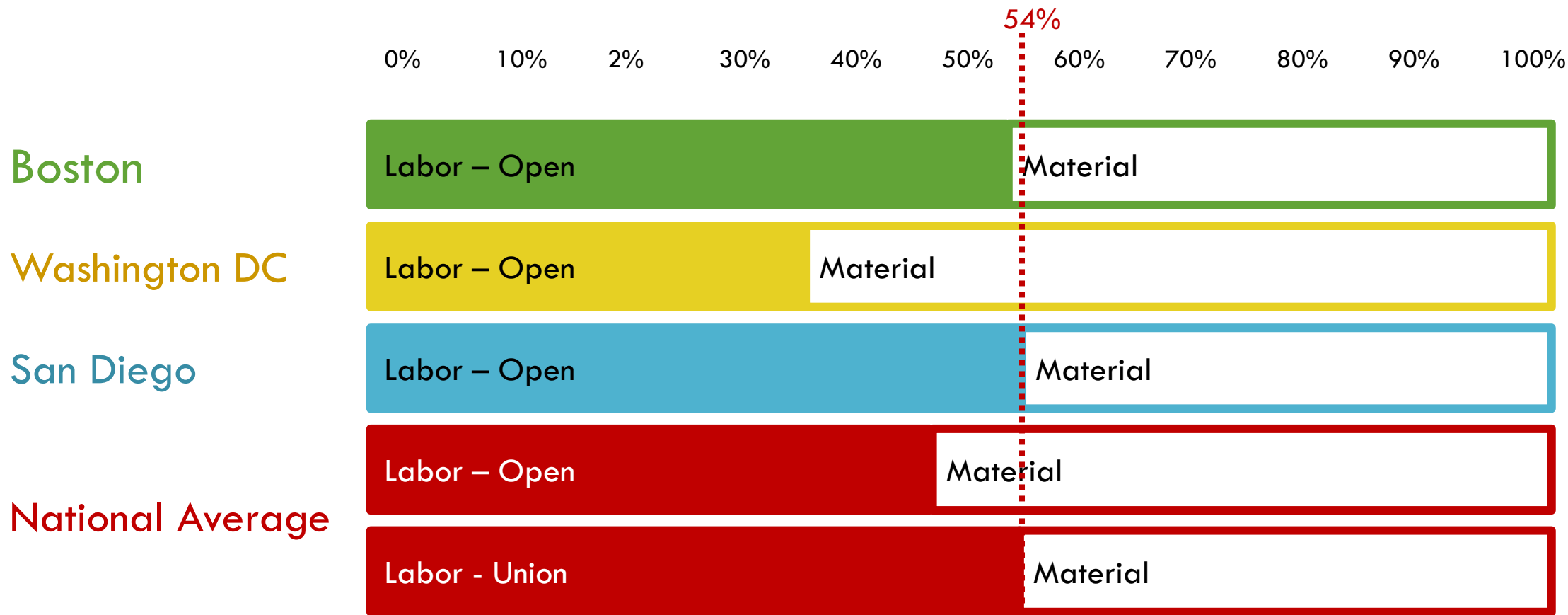
LABOR RATES

Gypsum wallboard installation labor comparisons



LABOR RATES

Installed Cost % Labor to Materials



DESIGNING STC-RATED WALLS

Common Methods

Elements

Best Practices

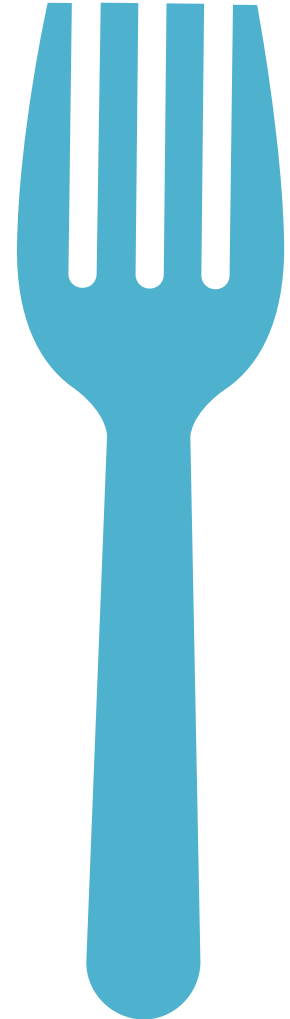
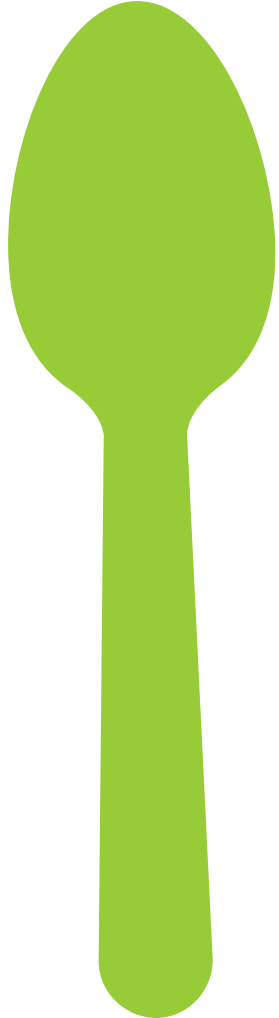
- △ A STC 45
- △ A1 STC 35
Delete Acous. Insul.
- △ A2 STC 30
Delete Acous. Insul.
G.W.B. One Side Only

- △ B STC 50
- △ B1 STC 44
Delete Acous. Insul.

- △ C STC 47
- △ C1 STC 40
Delete Acous. Insul.
- △ C2 Substitute 1/2" FT Plywood
for One Layer of G.W.B.
Delete Acous. Insul.

- △ D STC 55
- △ D1 STC 55
Substitute 1/2" of FT
Plywood for one layer of
G.W.B.

3 COMMON METHODS *for* SOUND CONTROL



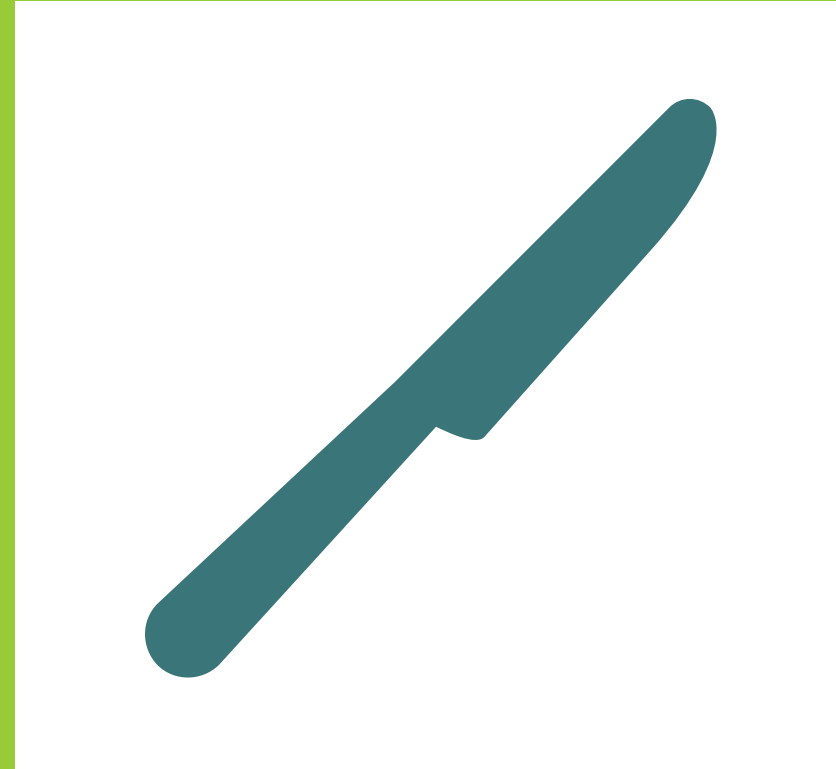
3 COMMON METHODS *for* SOUND CONTROL

Mass



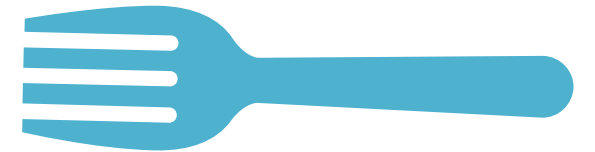
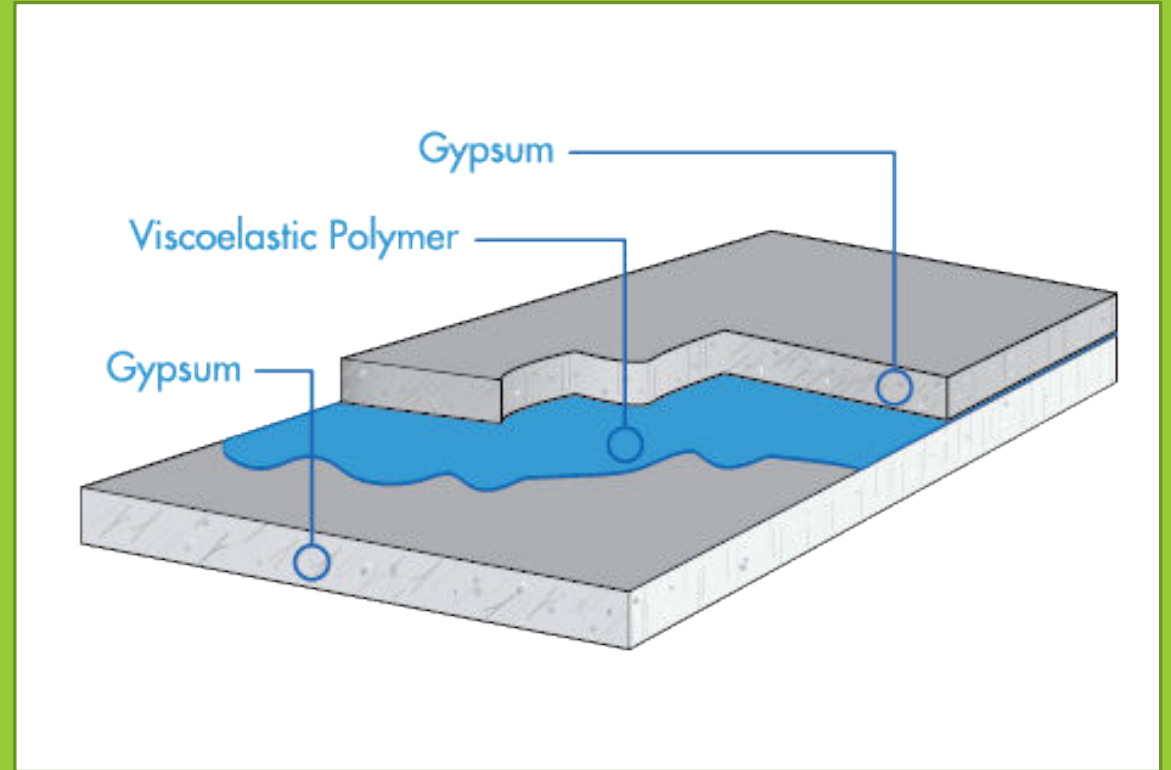
3 COMMON METHODS *for* SOUND CONTROL

Decoupling



3 COMMON METHODS *for* SOUND CONTROL

Constrained- Layer Damping



3 COMMON METHODS *for* SOUND CONTROL



Mass



Decoupling

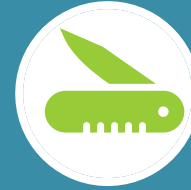


Constrained-Layer Damping

	Mass	Decoupling	Constrained-Layer Damping
Material Investment	Low-Moderate Each drywall layer \$0.40-\$0.70/ft ²	Moderate Channels & clips \$0.75 - \$1.50/ft ² Additional studs \$1.00-\$1.50/ft ²	High Factory laminated \$2.00-3.50 /ft ²
Labor Impact	Low Incremental cost for each layer	Moderate-High Channel/clip layout; extra framing	Low Installs like standard drywall
Space Efficiency	Poor Adds 5/8" for each layer	Varies Channels/clips +1-2" Staggered or Double Studs +4-6"	Excellent Does not add thickness to wall
Performance Gain*	Low Adds 3-6 STC points per layer Diminishing returns with each layer	Moderate Adds 5-10 STC points Depending on assembly	Moderate-High Adds 5-15 STC points Depending on assembly

DESIGN BEST PRACTICES

You can achieve it all



Use optimally performing materials



Use less materials



Use fire and sound tested assemblies



Specify every component

SUBSTITUTIONS *and* VALUE ENGINEERING

Pitfalls

Impact on Performance

Value?

PITFALLS *of* SUBSTITUTIONS

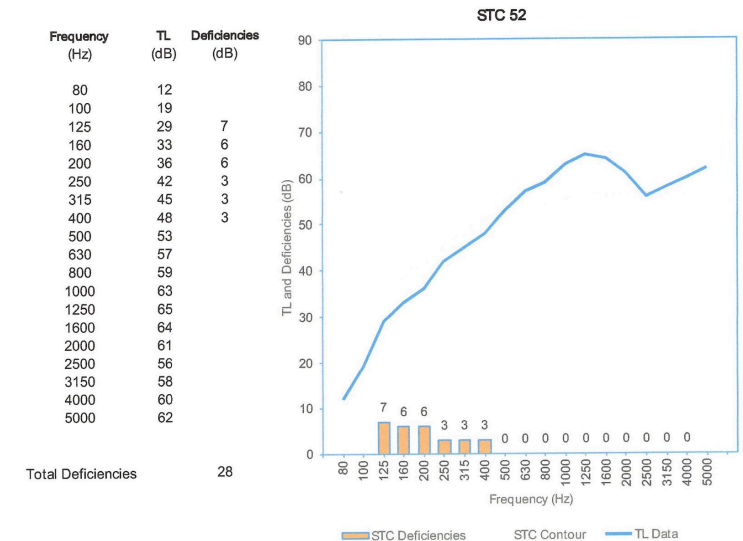
STC Tested Assemblies
are specific to
the materials and
method of attachment

Any deviation from the
tested assembly will
change the results.

Substitutions require
performance reevaluation



Test Number: NOAL 18-0522
Test Date: 5/17/18
Report Date: 6/9/18
Page 2 of 8



ASSEMBLY ELEMENTS: (From Source Room Side to Receive Room Side)

Sheathing 5/8" **Product Name** 1.25" #6 type S screws spaced 8" OC perimeter and 12" OC field
Framing 3-5/8" 18 mil (25 ga.) steel studs spaced 24" OC
Insulation 3-1/2" glass fiber insulation
Sheathing 5/8" **Product Name** 1.25" #6 type S screws spaced 8" OC perimeter and 12" OC field

See Appendix C on pages 6 and 7 for a full description of Assembly Elements

SMALL CHANGES CAN IMPACT PERFORMANCE

Common Changes

- Stud Thickness
- Stud Spacing
- Drywall Products

Direct Material Cost
+ Installation Labor
+ Time Schedule Costs

+/- Δ STC
+/- Δ STC

New Installed Cost of Assembly

New STC Performance

Does the new cost meet performance requirements?

ENVIRONMENTAL IMPACT

Integrating cost savings across design, installation, and environmental impacts

- Materials coming in
- Waste
- Waste going to landfill



THE COST OF NOISE CONTROL

Compare Assembly Approaches

Baseline



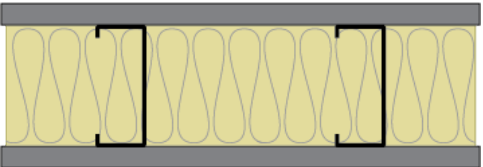
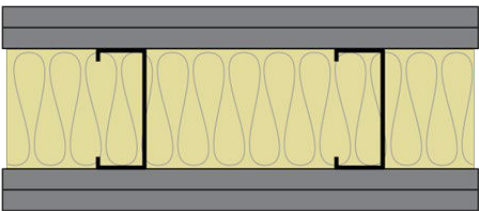
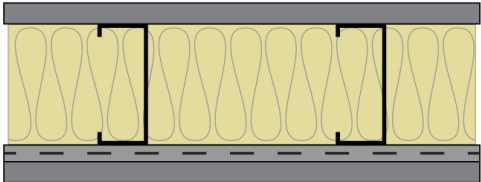
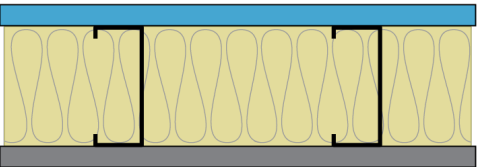

Mass



Decoupling



Constrained-Layer Damping

Wall Design				
Insulation	3-5/8" 33-mil 24"oc 3-1/2" R13 fiberglass			
Decoupling				
Gypsum Layers	1 layer 5/8" type X gypsum drywall each side	2 layers 5/8" type X gypsum drywall each side	1 layer 5/8" type X gypsum drywall each side	1 layer 5/8" type X CLD panel one side and 1 layer 5/8" type X gypsum drywall on the other

THE COST OF NOISE CONTROL

Compare Performance

Baseline



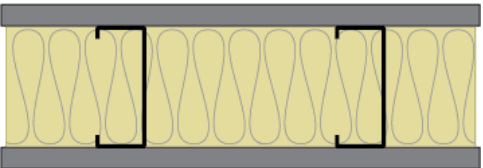
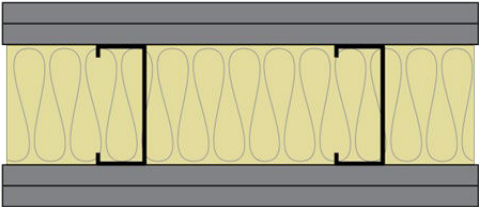
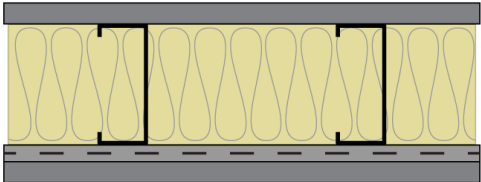
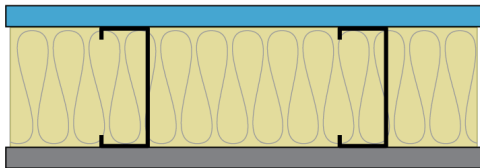
Mass



Decoupling



Constrained-Layer Damping

Wall Design				
Acoustic Performance	45 STC NOAL 19-0714	50 STC NOAL 19-0715	50 STC NOAL 19-0713	52 STC NOAL 22-0918
Fire	1 Hour UL 425	2 Hour UL 425	1 Hour UL 425	1 Hour UL 425
Space Efficiency	4-7/8" Thick 5.1 lb/ft ²	6-1/8" Thick (+1-1/4") 9.3 lb/ft ² (+4.2 lb/ft ²)	5-3/8" Thick (+1/2") 5.3 lb/ft ² (+0.2 lb/ft ²)	4-7/8" Thick 5.6 lb/ft ² (+0.5 lb/ft ²)

THE COST OF NOISE CONTROL

Boston - Union

Compare Cost

Baseline



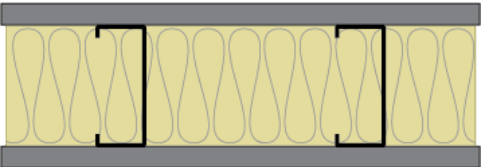
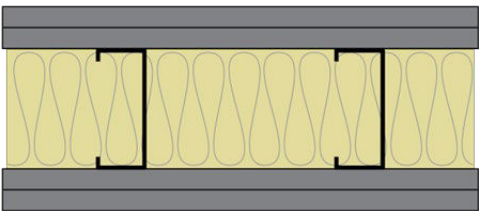
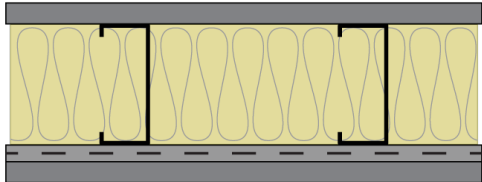
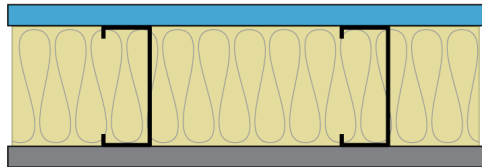
Mass



Decoupling



**Constrained-
Layer Damping**

Wall Design				
Materials	\$3.26	\$4.60	\$4.69	\$4.80
Labor	\$6.47	\$8.45	\$10.36	\$6.47
Total	\$9.73	\$13.05	\$15.05	\$11.27

THE COST OF NOISE CONTROL

Washington DC - Union

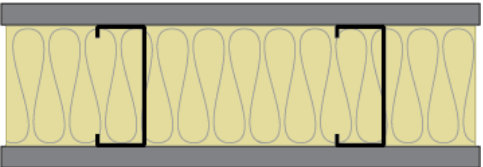
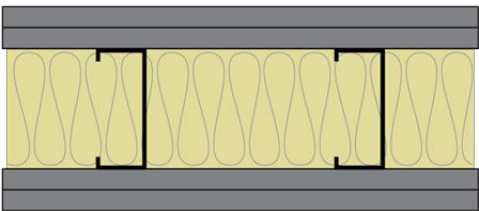
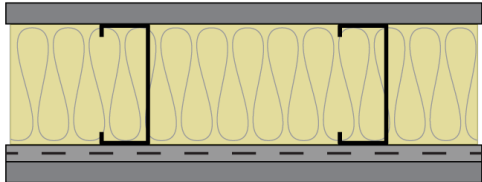
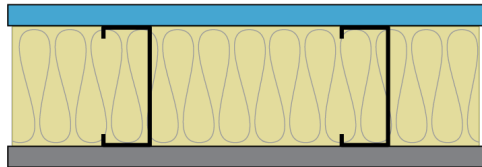
Compare Cost

Baseline

Mass

Decoupling

**Constrained-
Layer Damping**

				
Wall Design				
Materials	\$3.50	\$4.96	\$5.07	\$4.99
Labor	\$3.53	\$4.59	\$5.63	\$3.53
Total	\$7.03	\$9.55	\$10.70	\$8.52

THE COST OF NOISE CONTROL

San Diego- Union

Compare Cost

Baseline



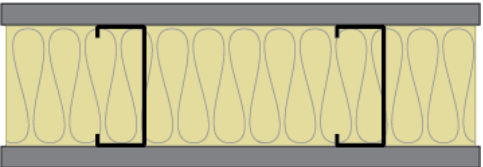
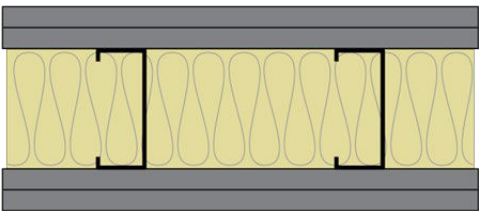
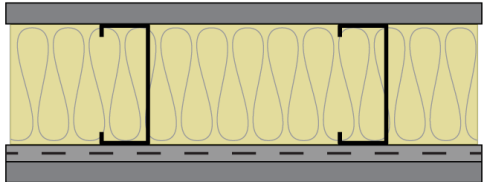
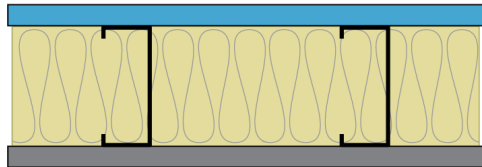
Mass



Decoupling



Constrained-Layer Damping

Wall Design				
Materials	\$3.41	\$4.83	\$4.92	\$4.68
Labor	\$6.61	\$8.67	\$10.68	\$6.61
Total	\$10.02	\$13.50	\$15.60	\$11.29

THE COST OF NOISE CONTROL

National Average - Union

Compare Cost

Baseline



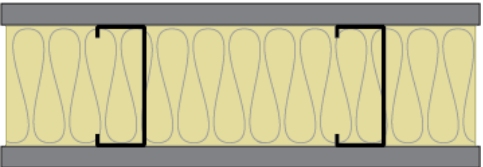
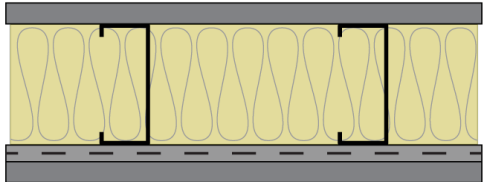
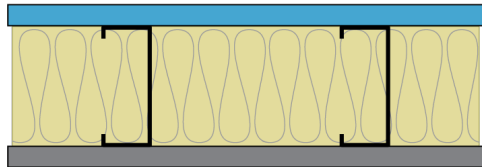
Mass



Decoupling



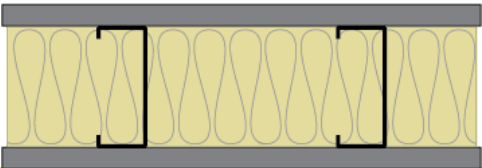
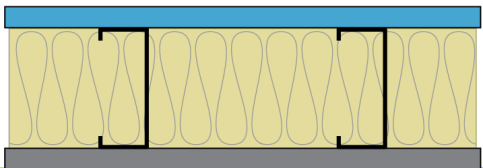
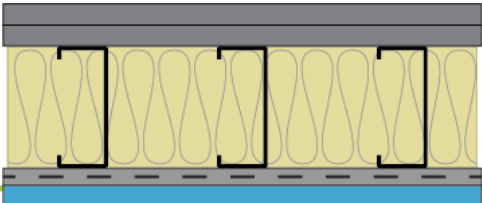
**Constrained-
Layer Damping**

Wall Design				
Materials	\$3.00	\$4.26	\$4.35	\$4.47
Labor	\$4.80	\$6.28	\$7.71	\$4.80
Total	\$7.80	\$10.54	\$12.06	\$9.27

COST *per* STC POINT

Define your Inputs

- Baseline Assembly
 - STC (STC_0)
 - Total Installed Cost ($\$/ft^2_0$)
- Target Assemblies
 - STC (STC_1)
 - Total Installed Cost ($\$/ft^2_1$)

	Baseline	Target ₁	Target ₂
Wall Design			
STC	45	52	58
Total	\$7.80	\$9.27	\$14.90

COST *per* STC POINT

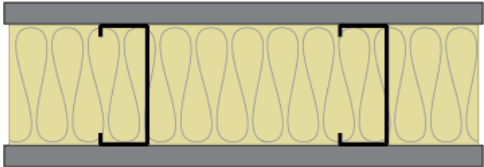
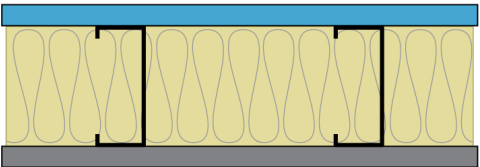
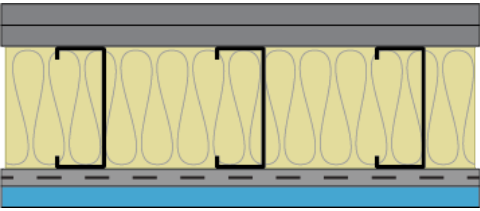
Calculate Δ STC

Target 1

$$\Delta\text{STC} = \text{STC}_1 - \text{STC}_0$$

Target 2

$$\Delta\text{STC} = \text{STC}_2 - \text{STC}_0$$

	Baseline	Target ₁	Target ₂
Wall Design			
STC	45	52	58
Δ STC		7	13

COST *per* STC POINT

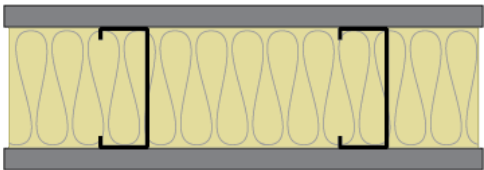
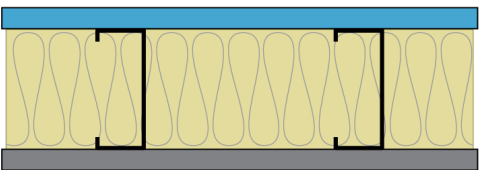
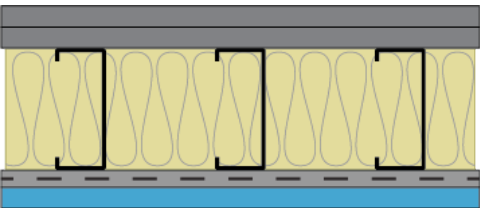
Calculate Δ Cost

Target 1

$$\Delta\text{Cost} = \$/\text{ft}^2_1 - \$/\text{ft}^2_0$$

Target 2

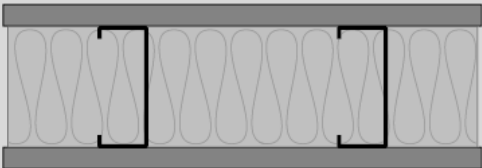
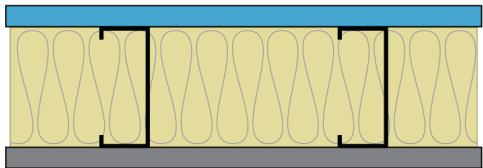
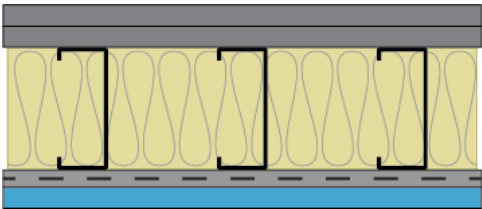
$$\Delta\text{STC} = \$/\text{ft}^2_2 - \$/\text{ft}^2_0$$

	Baseline	Target ₁	Target ₂
Wall Design			
Cost	\$7.80	\$9.27	\$14.90
Δ Cost		\$1.47	\$7.10

Calculate Cost per STC Point

$$\text{Cost per STC Point} = \Delta\text{Cost} / \Delta\text{STC}$$

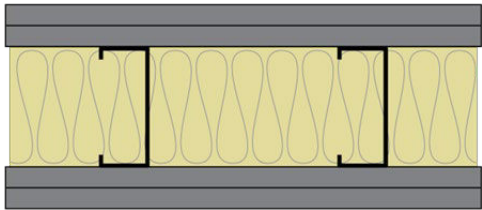
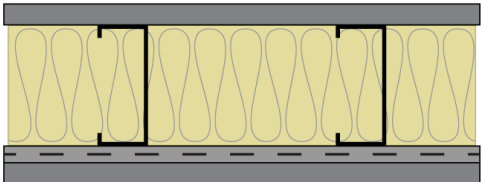
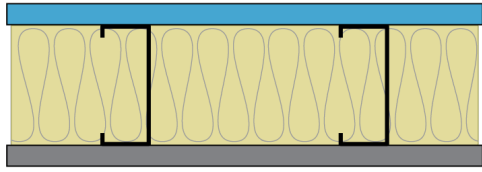
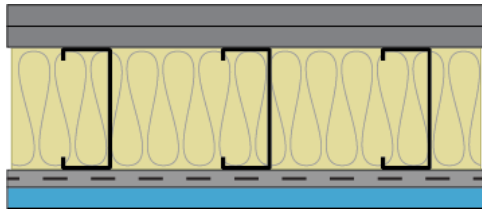
COST *per* STC POINT

	Baseline	Target ₁	Target ₂
Wall Design			
ΔCost		\$1.47	\$7.10
ΔSTC		7	13
\$/STC		\$0.21	\$0.55

Calculate Cost per STC Point

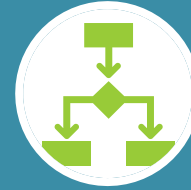
Compare Assemblies

COST *per* STC POINT

	Mass	Decoupling	Constrained-Layer Damping	Everything
Wall Design				
ΔCost	\$2.74	\$4.26	\$1.47	\$7.10
ΔSTC	5	5	7	13
\$/STC	\$0.55	\$0.85	\$0.21	\$0.55

FINDING TRUE VALUE

Value is a Multi-faceted concept



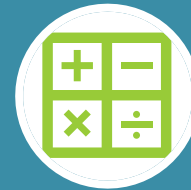
Substitutions



Materials are only one
component



Location, Location, Location



Calculate Cost per STC



THANK YOU

Mike Amaral

QuietRock Product Manager



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Booth #469