

Innovative Insulation Strategies

Continuous Insulation (ci) the lesser
spoken of choice...

Why ci works...

3.5" steel stud @ 16" o.c. w/ R-5 continuous insulation	R-5.8
3.5" steel stud @ 16" o.c. w/ R-13 batt insulation	R-6.0
6" steel stud @ 16" o.c. w/ R-19 batt insulation	R-7.1
6" steel stud @ 16" o.c. w/ R-7.5 continuous insulation	R-8.8
6" steel stud @ 16" o.c. w/ R-10 continuous insulation	R-11.3



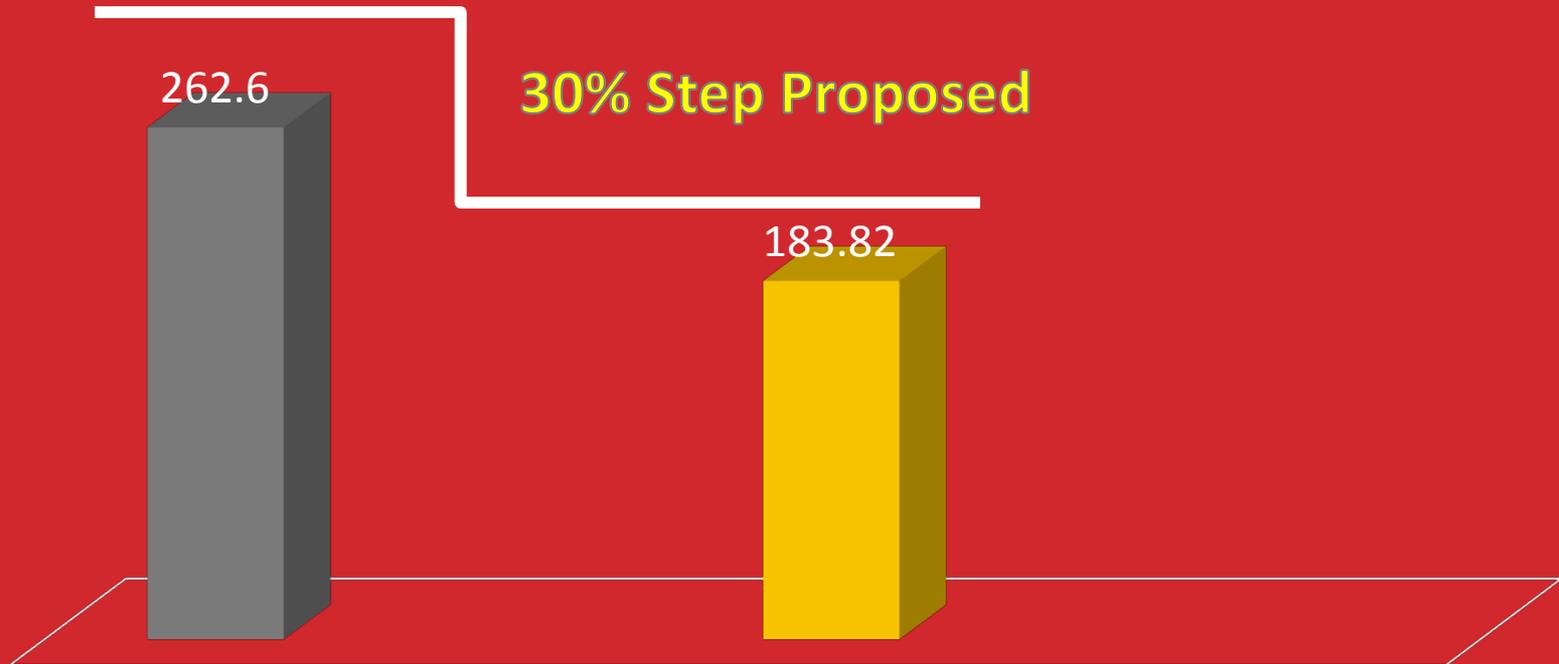
Insulation in Action



Numbers Driven

Expected vs. Proposed Building Energy Use

■ kBtu/ft² ■ Proposed



Insulation in Action



Insulation in Action





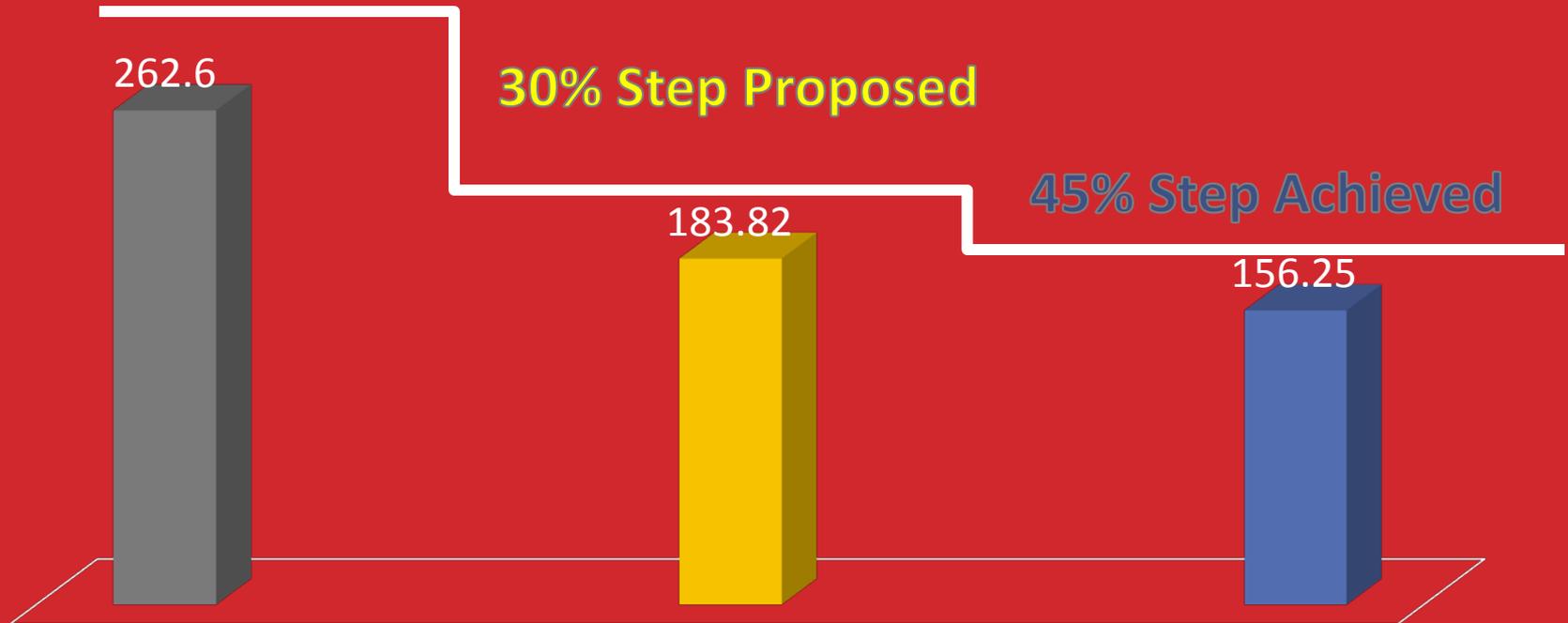




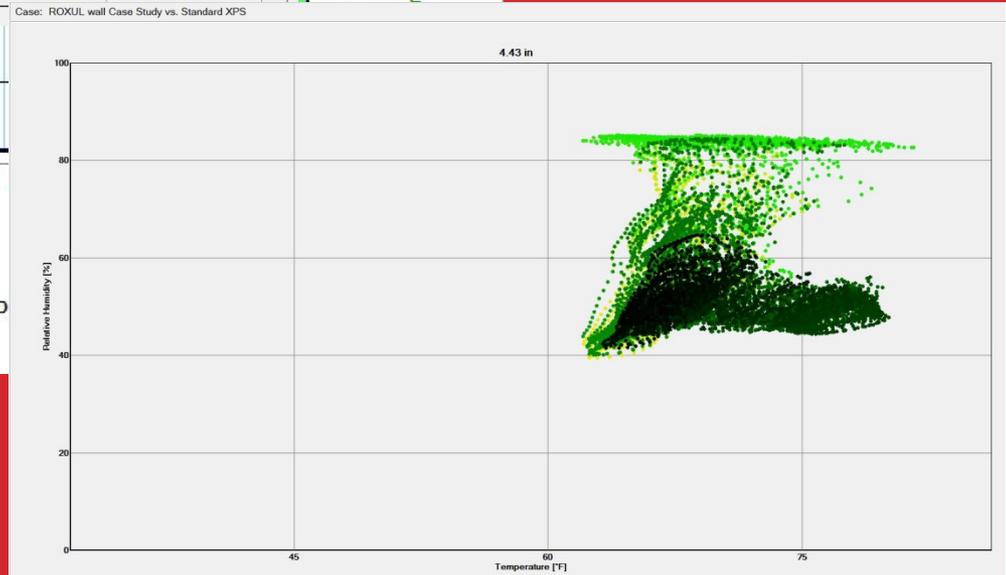
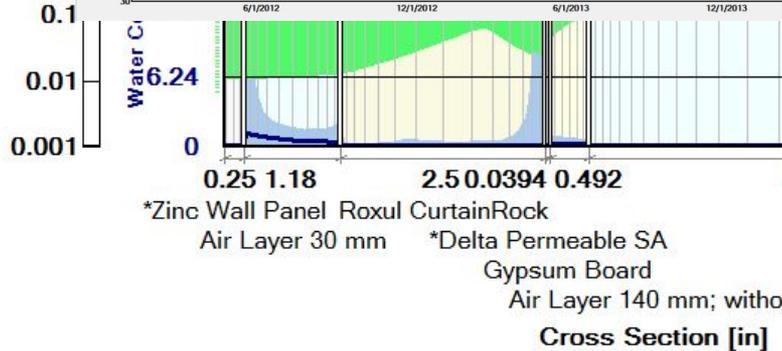
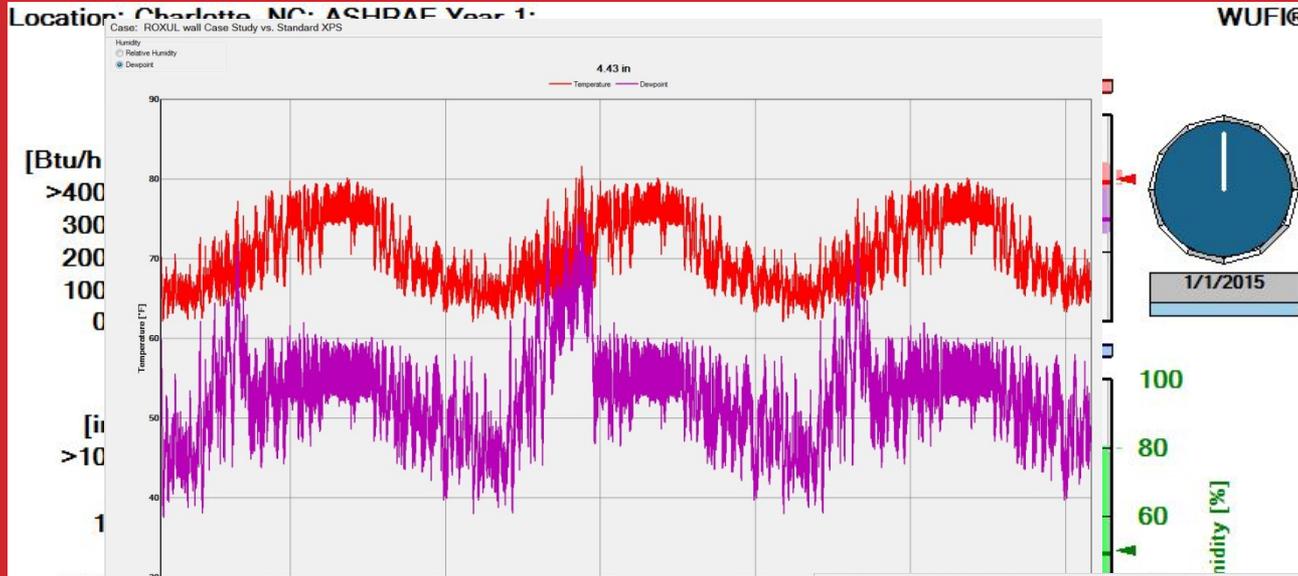
Numbers Driven

Expected vs. Proposed vs. Actual Building Energy Use

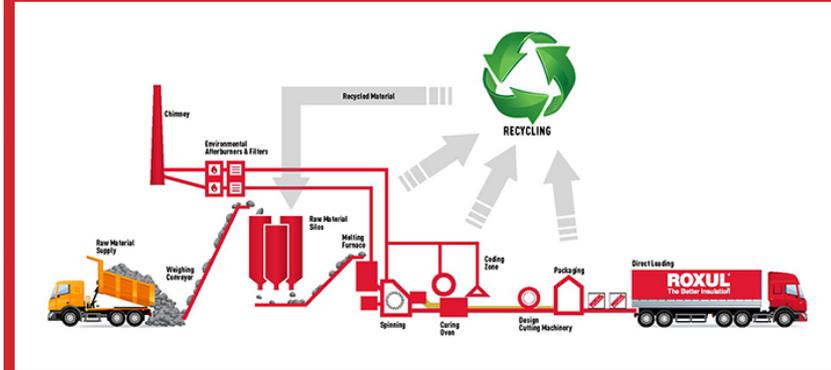
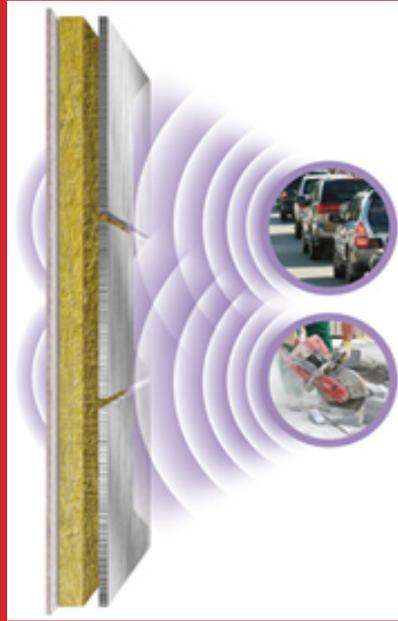
■ kBtu/ft² ■ Proposed ■ Actual



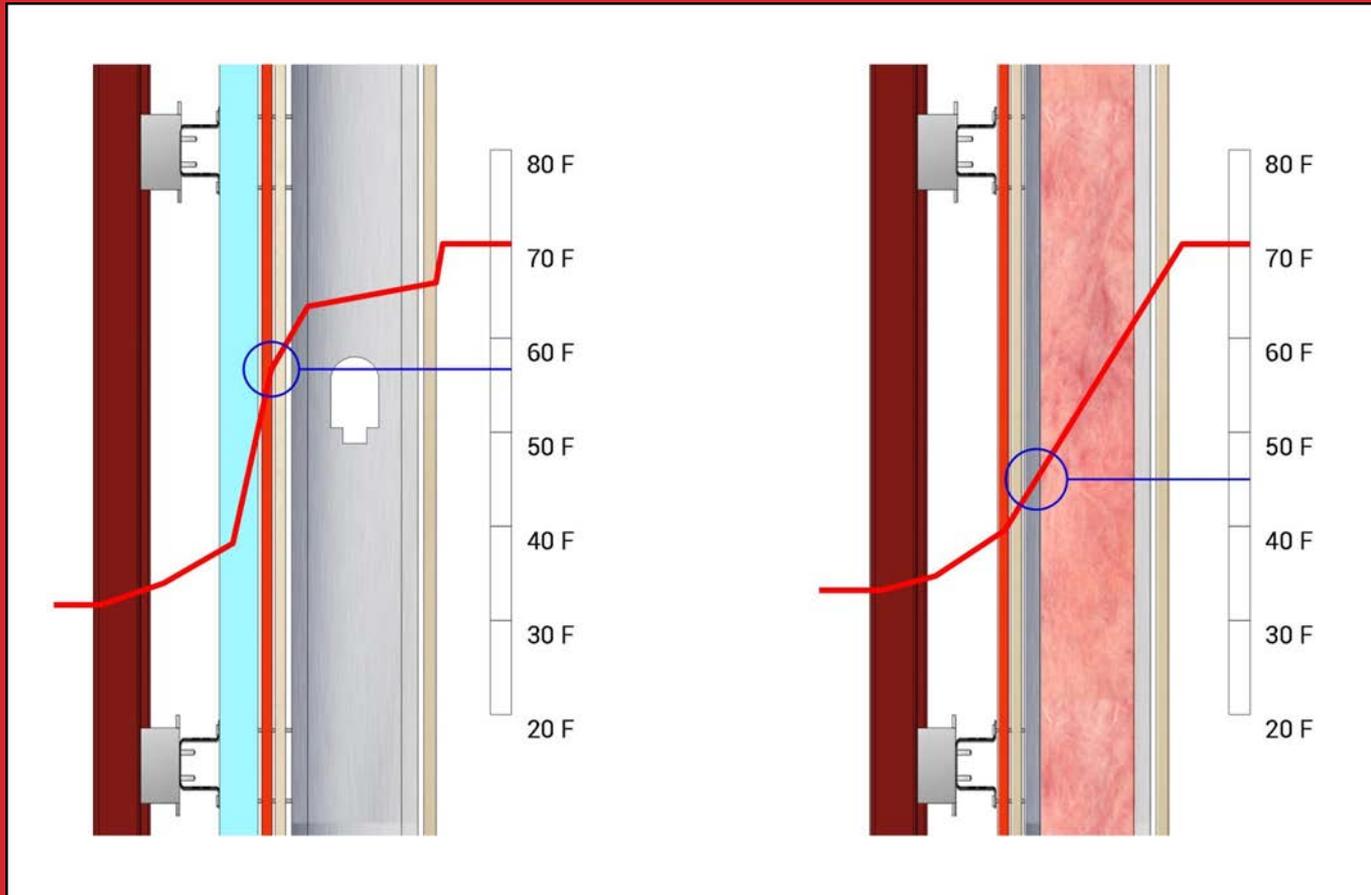
Why did we recommend ROXUL?



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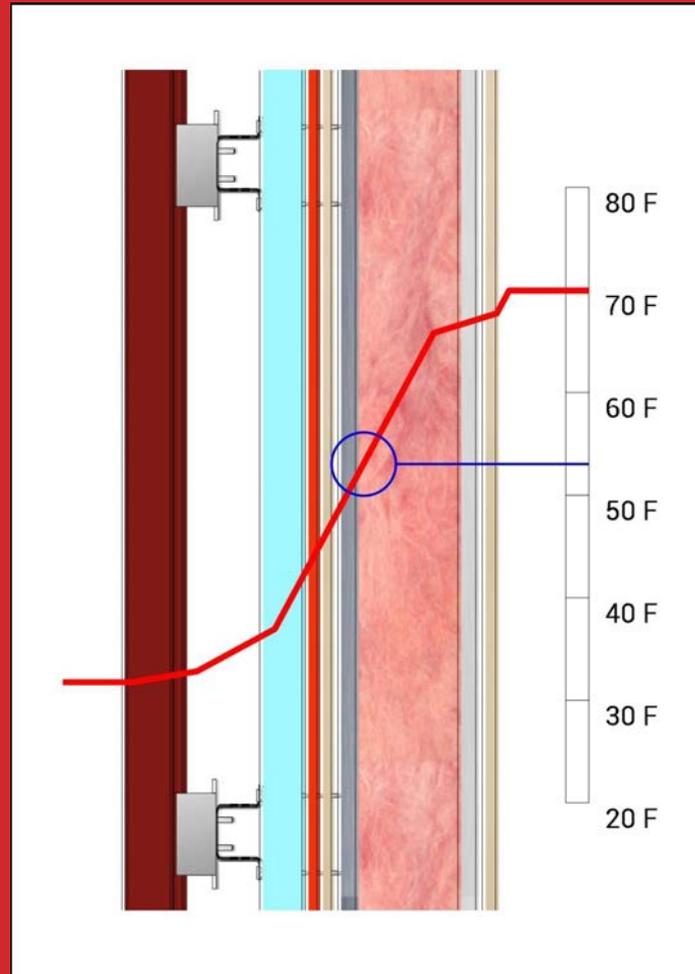


Thermal Control



The benefits of Continuous Insulation

Thermal Control

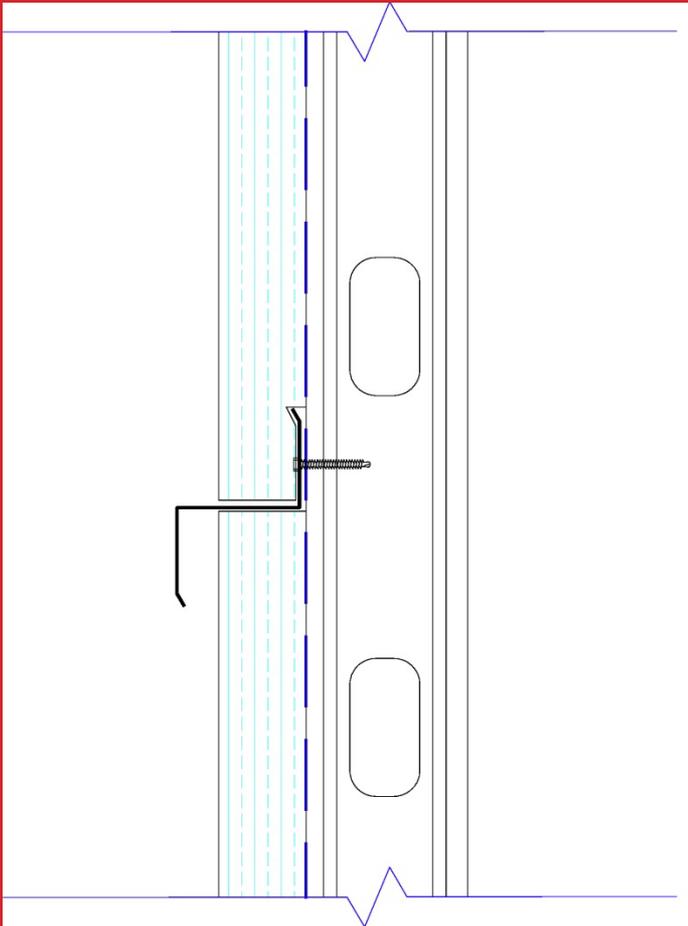


Compromise = Risk

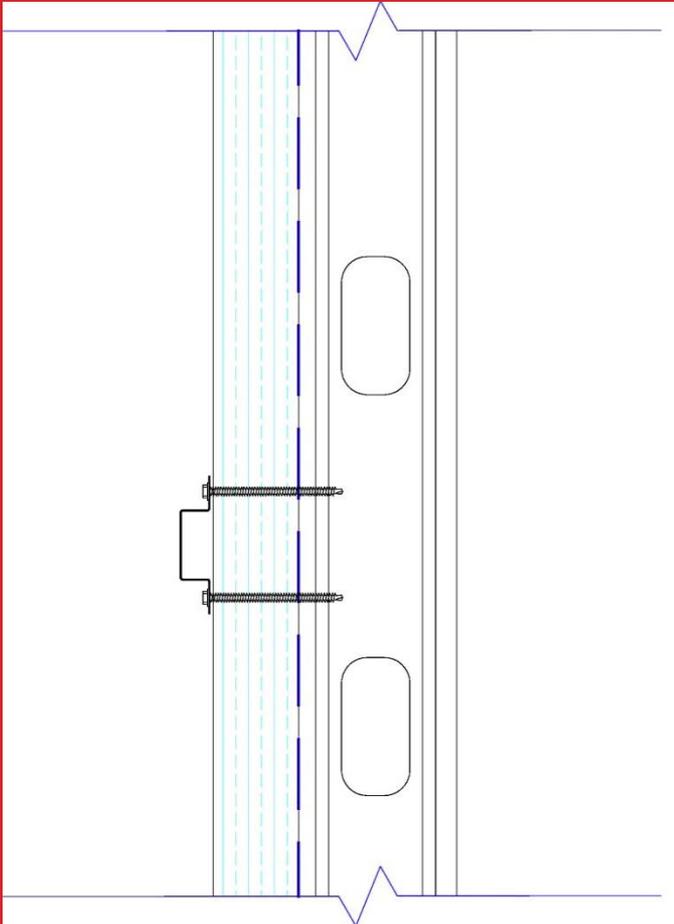
Thermal Bridging

R-value Loss ~ 60%

$R_{10(\text{nominal})} = R_4$ (effective)



Thermal Bridging



R-value Loss < 5%

$R_{10(\text{nominal})} = R_{9+(\text{effective})}$

Thermal Bridging

No, the Screws Won't Bend Under the Weight of the Metal Wall Panel...

$$3.0 \text{ Psf} \times 3' \text{ O.C.} \times 1.33' \text{ O.C.} = 12.0 \text{ Lbs.}$$

$$P = (12 \text{ Lbs} \times 2.5'') / 3'' = 10.0 \text{ Lbs. Per Screw}$$

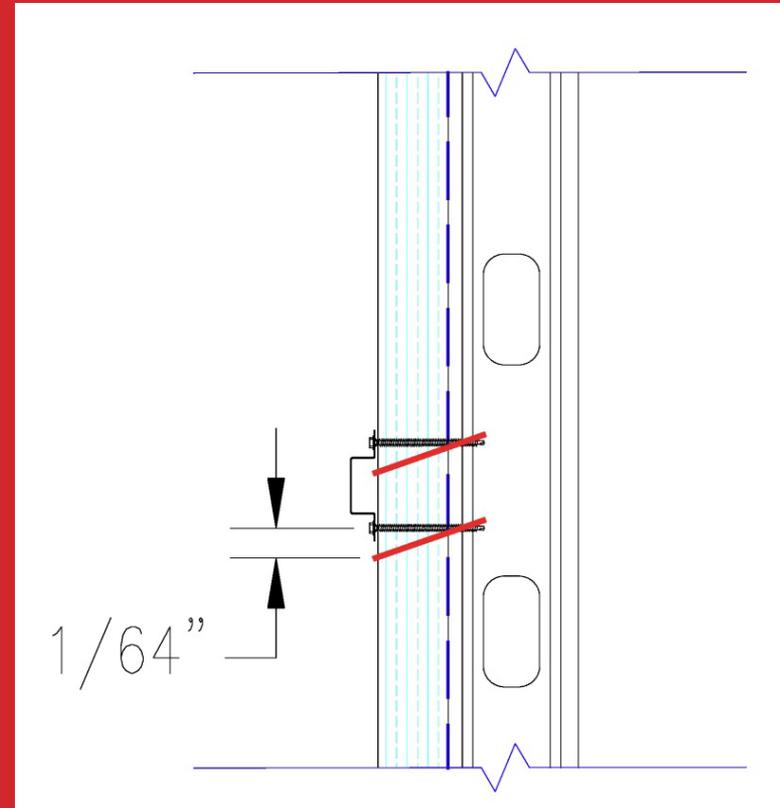
10 Lbs./Screw \sim 0.5% Of Tensile Capacity

$$D\ell = L_o \times (P/A) / E$$

$$= 2.5'' \times (10\#/0.0194 \text{ In}^2) / 29 \times 10^6 \text{ Psi}$$

$$= 0.000044 \text{ Inches}$$

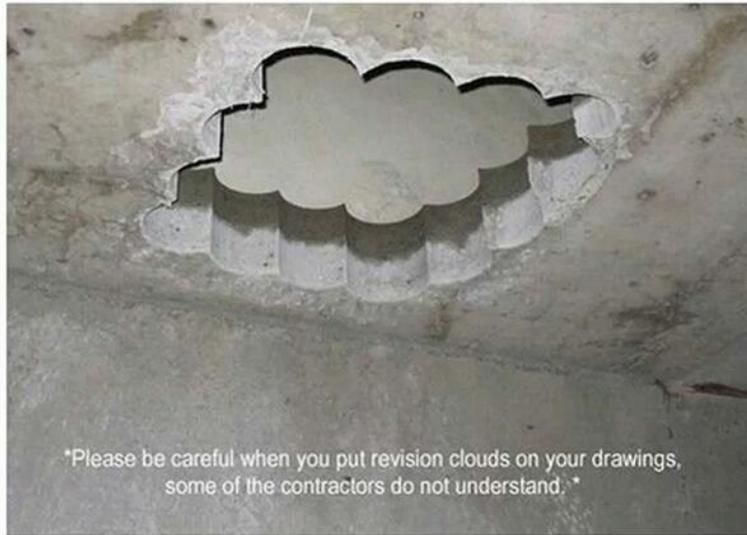
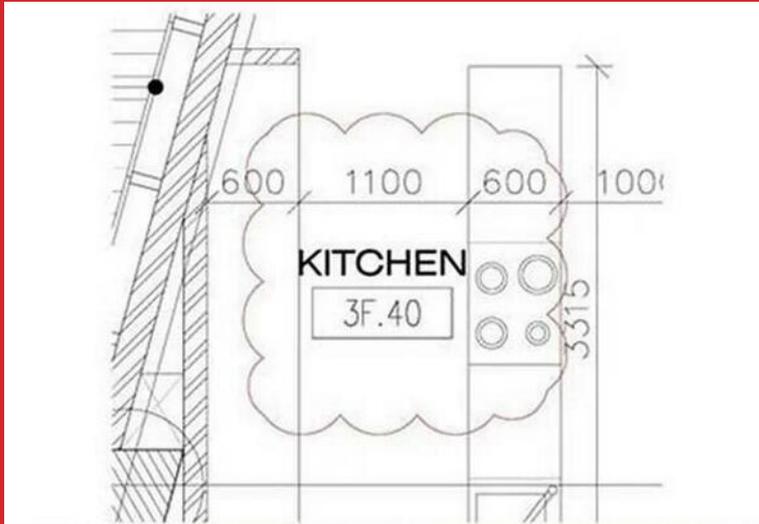
$$D = (2.500044^2 - 2.5^2)^{(1/2)} < 0.015'' \sim 1/64''$$



Takeaways of ci

- Easy to Install
- If placed to the exterior of the WRB detailing of the ci gets much easier
- Need better manufacturer input and sign on
- Punched Opening detailing is critical
- Multiple products are available now and readily accessible in the marketplace

Anything that isn't understood?



Please be careful when you put revision clouds on your drawings, some of the contractors do not understand.



Jarrett B. Davis AMB, CGP, CDT, LEED AP BD+C

Director of Building Science
501 N. Church Street, Suite 201
Charlotte, North Carolina 28202
704-334-2101
jdavis@hallarch.com

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8024 Esquesing Line
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Canada
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