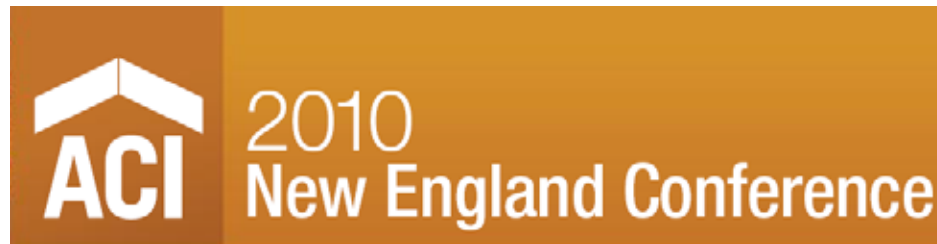


Kohta Ueno

Deep Energy Retrofit Case Studies:

Windows: i.e., The Holes in Your Wall



Water Control: Pan Flashings



- Deep energy retrofits (addition of insulation at existing wall) can make the wall more vulnerable to water leakage
- Previously “survivable” leaks may no longer be able to dry out.

Retrofitting “Superwindows”



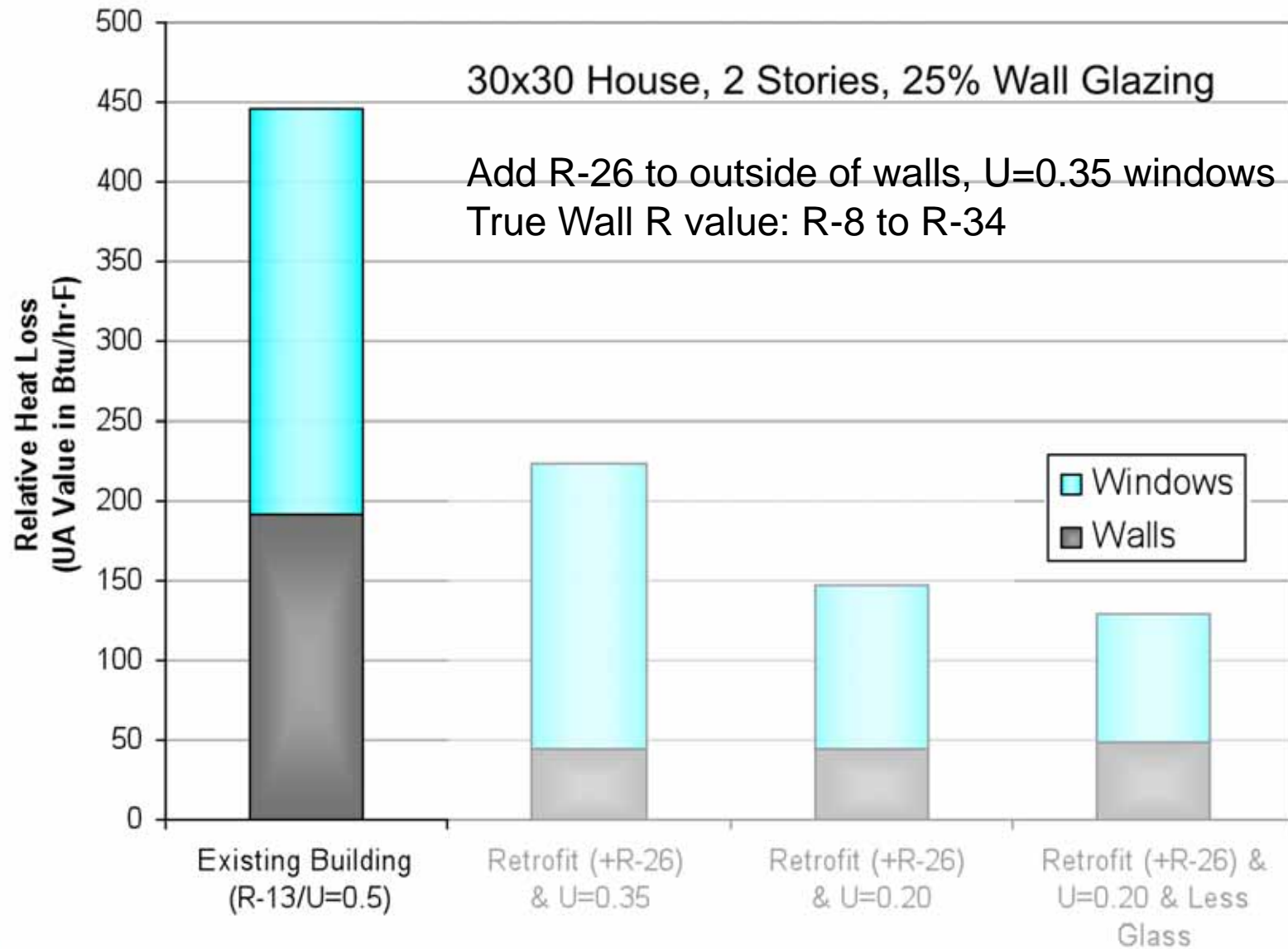
$U=0.25$ to ~ 0.18 for triple glazed +
low E films + Krypton fill gas +
warm edge spacers

Comparison $U=0.35$ Mass Code;
 $U=0.30$ Energy Star



Corporation

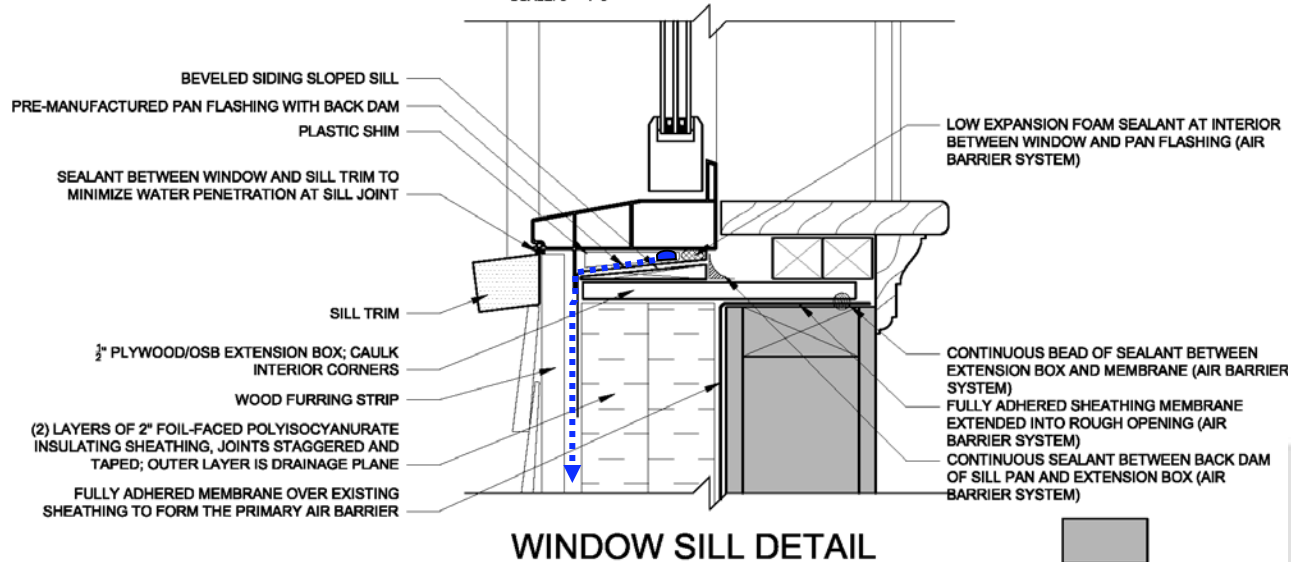
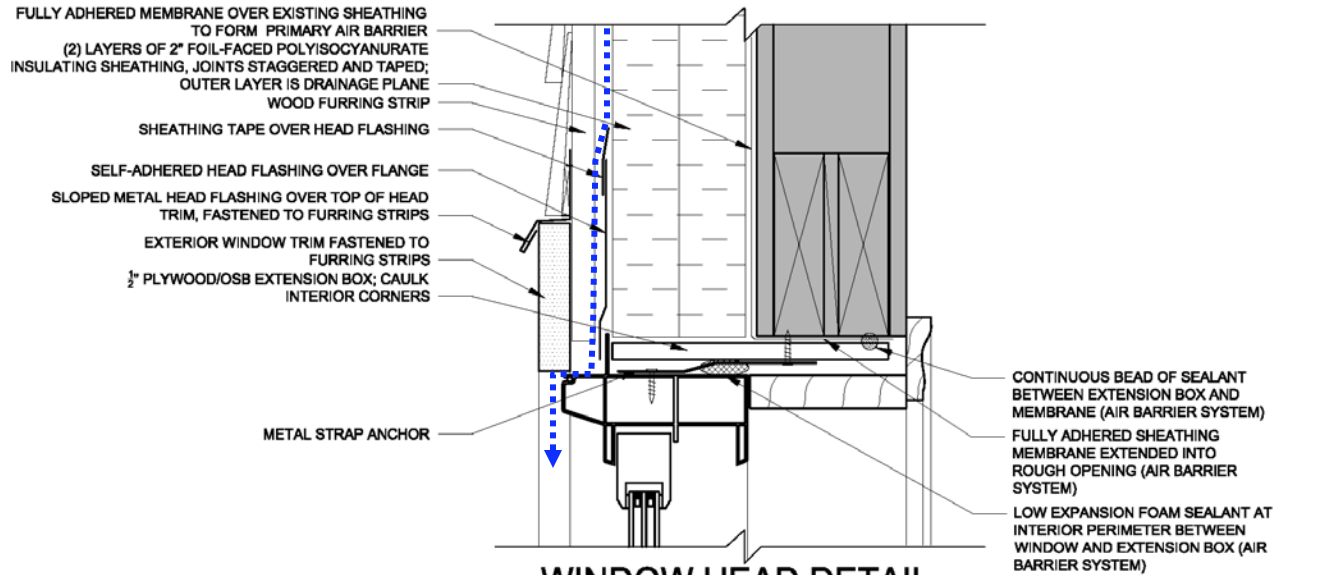
Window Heat Loss in Context



“Innie” and “Outtie” Windows

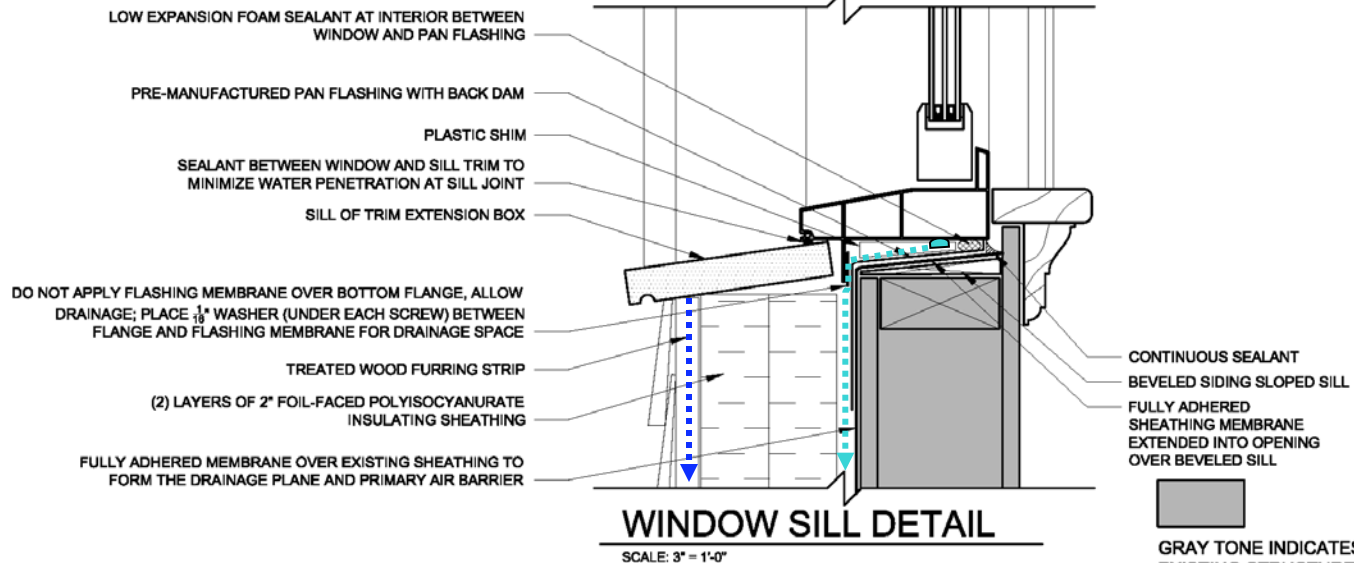
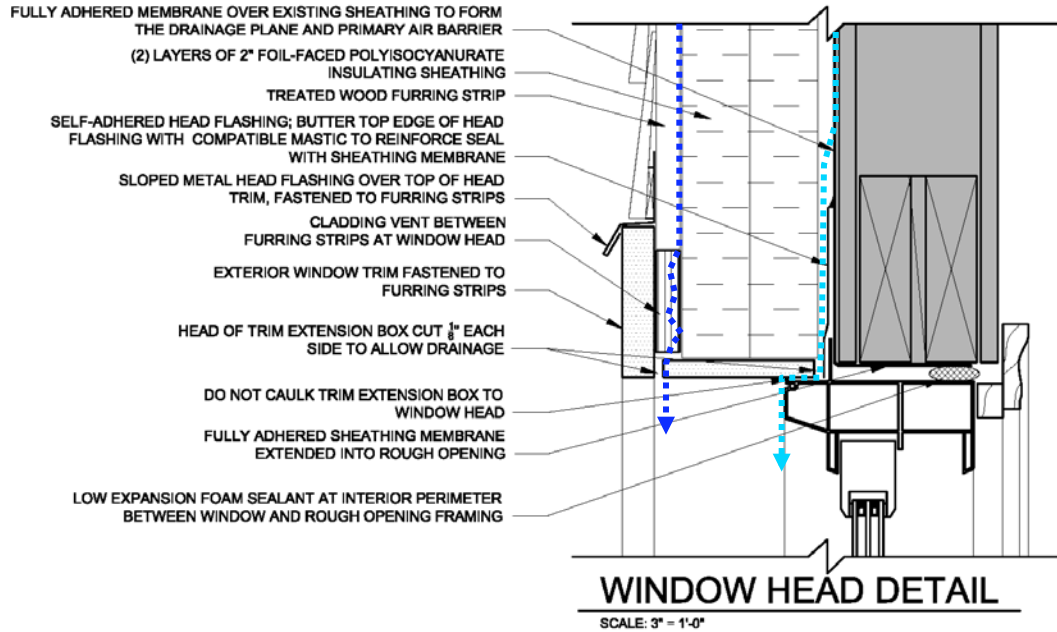


“Outie” Window



GRAY TONE INDICATES EXISTING STRUCTURE

“Innie” Window



Recommend placing drainage plane at window location (whichever method you use—innie or outie)!

“Innie” vs. “Outie” Windows

- “Outie” Advantages
 - Simpler drainage plane connections/geometry
 - Lower cost (extension trim is interior material)
 - Similar appearance to conventional construction



“Innie” vs. “Outie” Windows

- “Innie” Advantages
 - Window supported by lumber frame (foam install)
 - Greater protection from wind-driven rain (inset)
 - Less condensation risk (?)
 - Can use existing window trim
 - Solar shading (advantage or disadvantage)



Other Topics (for Discussion)

- Low-E storm windows
- Interior vs. exterior storm windows
- Window replacement vs. restoration
(cost effectiveness)
- Windows in historic preservation situations