


Kohta Ueno


Double-Stud Wall Field Monitoring

Sixteenth Annual Westford Symposium on Building Science
July 30, 2012 to August 1, 2012

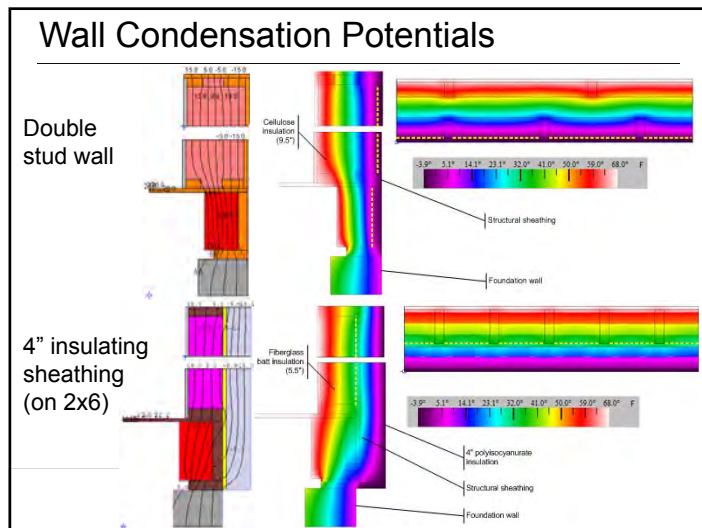


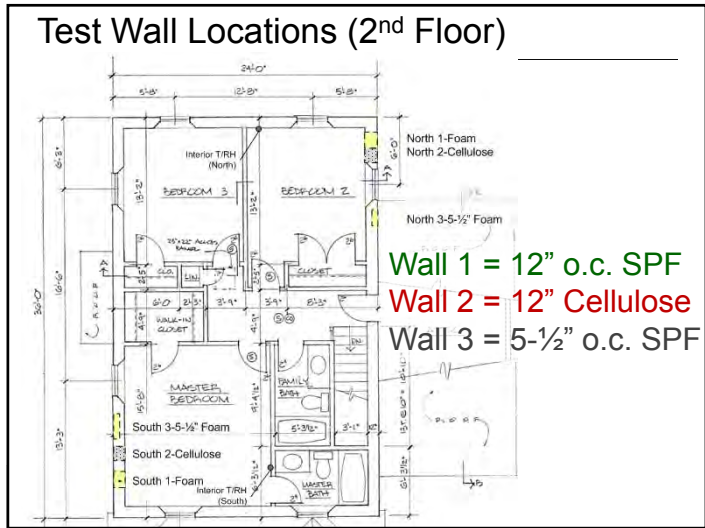
Double Stud Wall Monitoring

- Double stud wall advantages:
 - High R values
 - Simplifies exterior detailing (few changes to standard practice)
 - Lower cost vs. other high-R walls?
- Moisture risks due to interstitial condensation?
 - Most common failure, after rain control issues
 - Air barrier imperfections—increase risk
 - Air permeable low-density insulations—increase risk (including convective looping)
 - Air impermeable insulations—decrease risk
 - Reduce risk with “skim” of spray foam at sheathing?



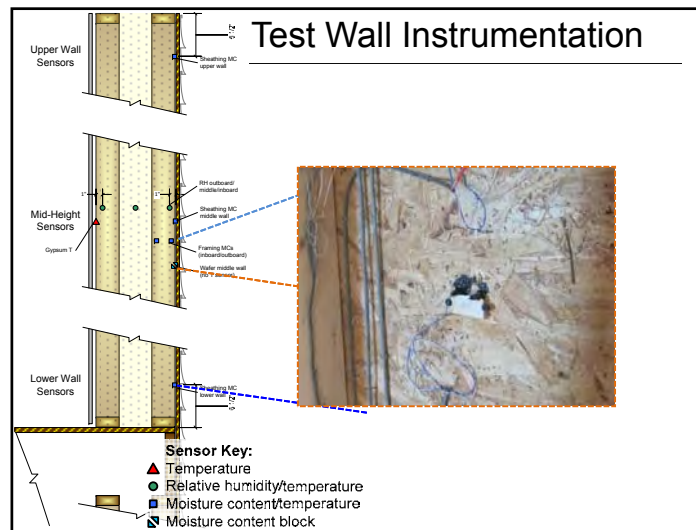
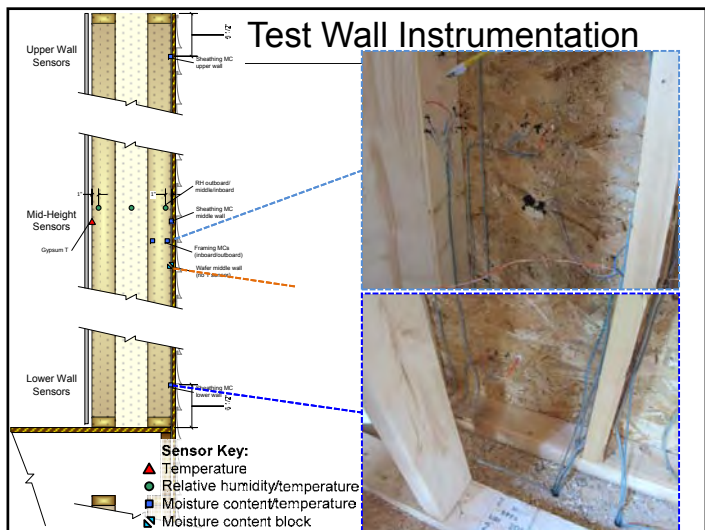
Double-Stud Wall Field Monitoring 2
© buildingscience.com

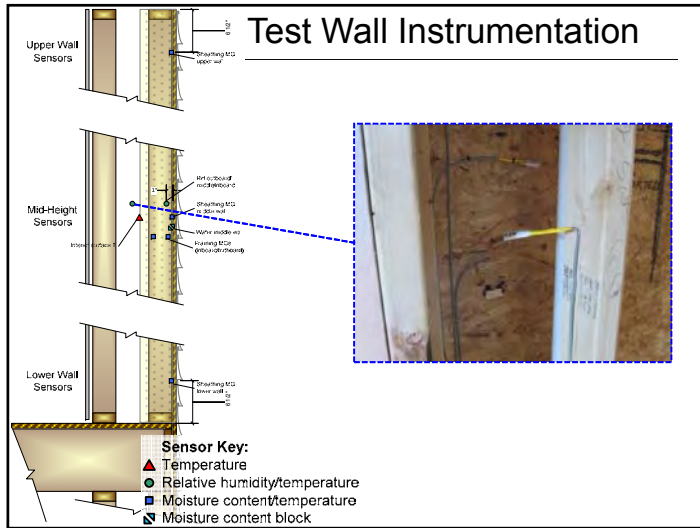




Wall Construction

- Vinyl siding
- ZIP wall sheathing (OSB)
- Class III vapor control (latex paint)
- IRC R601.3.1—vented cladding over OSB





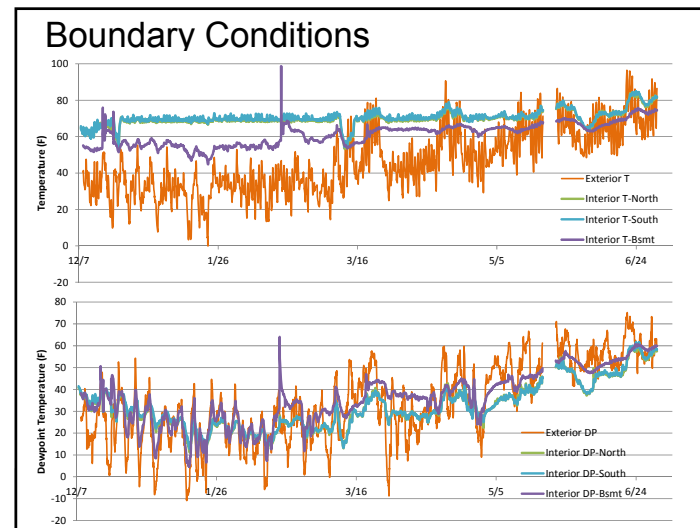
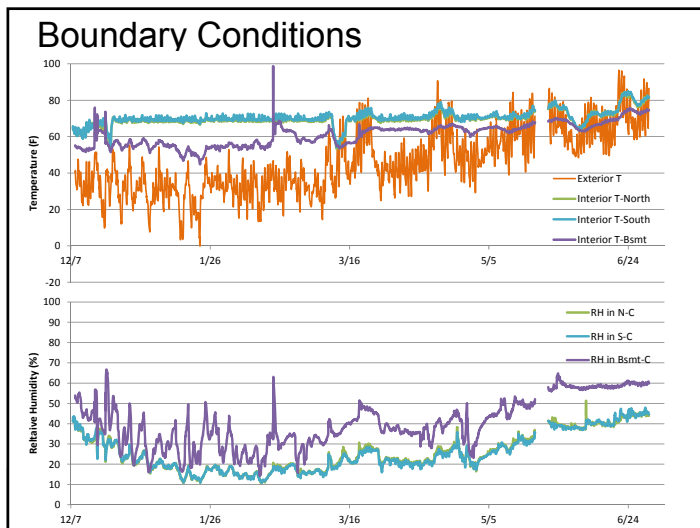
Preliminary Results

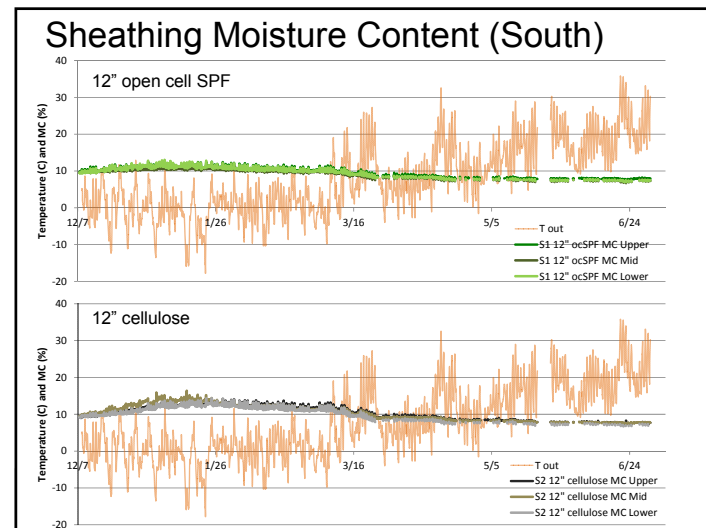
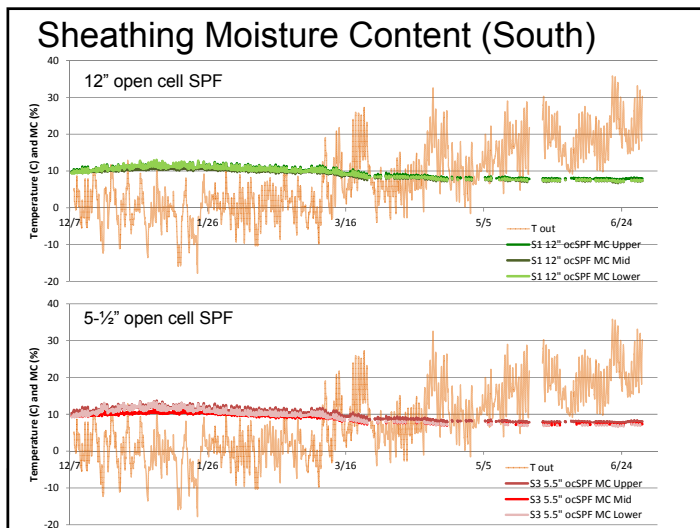
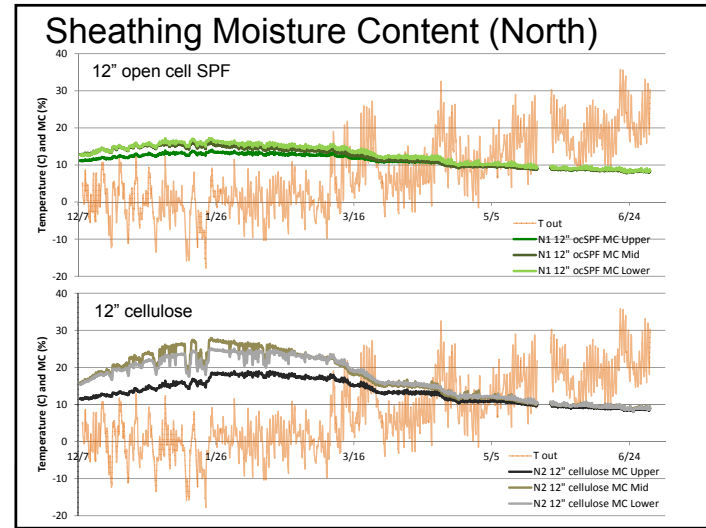
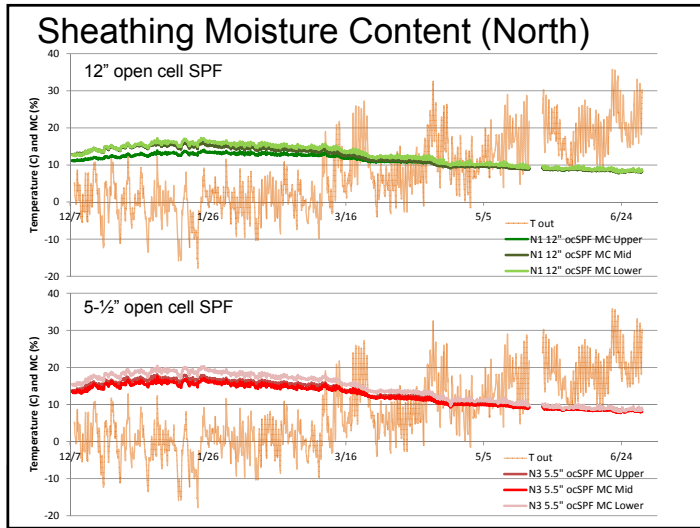
- First 8 months of data (December 2011-July 2012)
- Winter data unoccupied conditions
- No occupant moisture generation, but construction moisture drying
- Seriously weak-ass winter
- 4400 HDD Base 65 vs. 5600 HDD “normal”

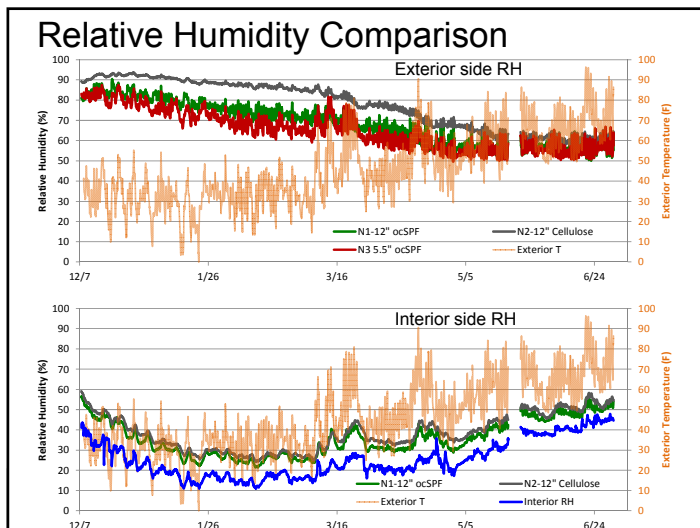
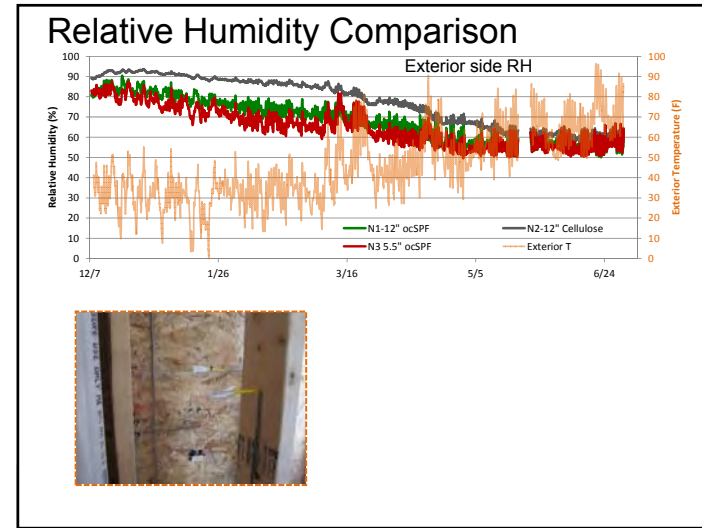
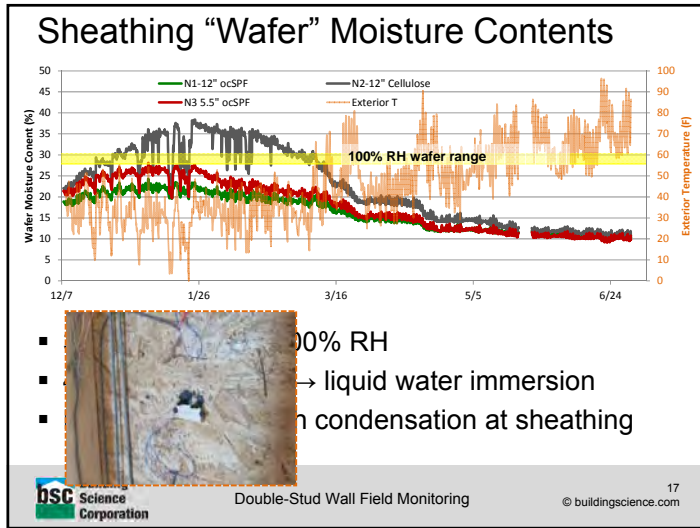


Double-Stud Wall Field Monitoring

© buildingscience.com 10







So What's Going On?

- Air leakage?
- 12" o.c. SPF (LaPolla)—1.8 to 2.5 perms
 - Add 10 perm Class III = 1.5 to 2.0 perms
- 5-1/2" o.c. SPF—4.0 to 5.5 perms
 - Add 10 perm Class III = 2.9 to 3.5 perms
- 12" cellulose—7 to 10 perms (dry/wet cup)
 - Add 10 perm Class III = 4.0 to 5.0 perms
- Have not measured paint permeance at this site
- Previous gypsum + latex measurements ~7-11 perm dry cup

DSC Building Science Corporation Double-Stud Wall Field Monitoring © buildingscience.com 20

And What's Next?

- Keep looking at data through winter 2012-2013
 - Higher interior relative humidity—interior generation
 - Will it be a non-weak-ass winter?
- If higher moisture contents—dries down 2013?
- Vapor retarder paint winter 2013-2014?
 - If experiment continues, and homeowner agrees
- Intrusive disassembly of walls unlikely—occupied

- Are the high sheathing moisture contents actually a problem? (Borates; moisture storage)



Double-Stud Wall Field Monitoring

© buildingscience.com 21

Many thanks...



Questions?

Kohta Ueno
 kohta@buildingscience.com



Double-Stud Wall Field Monitoring

© buildingscience.com 23