



Mooney Wall -- A retrofitable wall with high R value and low thermal bridging

This description of the Mooney wall appeared in the Breaktime discussion group of the Taunton Publishing discussion forums (Taunton publishes Fine Homebuilding magazine) -- a good place to get all sorts of construction advice.

The Mooney wall provides high R value, low thermal bridging, and good resistance to infiltration. All this at a low cost (especially if you are providing the labor). Thermal bridging refers to the transfer of heat directly through the relatively low R value studs -- this can reduce the R value of the wall substantially from the R value of the insulation placed between the studs. For example a 2X6 stud wall with "R19" insulation only has an R value of 13.5 when the thermal bridging of the wall structure is taken into account (see <http://www.ornl.gov> whole wall calculator).

The Mooney wall can be used for either new construction or as a retrofit to increase the R value of an existing wall.

[Another example of using the Mooney wall here ...](#)

From the BreakTime Post:

The "**Mooney wall**" is the brainchild of [Mike Smith](#) and [Tim Mooney](#). The primary purpose of the MW is to upgrade the insulation of a standard 2x4 (on 16" centers) wall. The MW is well suited to renovation work with superior insulating characteristics to standard 2x4, 2x6, and many variations. In one thread I see Mike estimating the wall at a true R-18 (unlike the artificial R-19 of a 2x6 fiberglass wall, which doesn't take into account the thermal bridging of the wood).

The Mooney Wall's thermal bridge is restricted to the points where the 2x2's (really 1.5"x1.5") contact the 2x4 wall studs. This is a vast improvement over the nearly 30% thermal bridge of a typical 2x4/2x6 wall.



after the stud walls are built, install the 2x2 at 16" oc horizontal,



the electrician roughs in , the boxes can be mounted on 2x2 blocking...



the insul-mesh is stapled and pulled tight..



White glue is rolled onto the mesh and saturates the mesh / stud interface to prevent cellulose dens-pak from getting under the mesh and causing bubbles over the framing



the next day , the glue is dry and the walls are ready to be blown ,



you blow it right thru the mesh in a hole you make with a utility knife, you can see everything as you progress..

Overview:

1. The existing 2x4 wall cavity
2. Horizontal 2x2 (a 2x4 ripped down the middle) @16"
3. Electric rough-ins installed
4. Insul mesh glued to the face of the 2x2 strapping
5. Dense-pack cellulose insulation blown into the cavity created by the 2x4/2x2/mesh
6. Drywall/plaster

the Mooney wall facilitates installation of electric devices and blocking for accessories (like curtain rods, grab bars, etc)..

we use insul mesh , stapled and glued, next day we blow the wall thru the mesh .. just make a small cut every 16" or so..

you can see exactly what you're doing...

first couple of times I special ordered it from Regal Industries (make sure you get insulmesh... you don't want the 1/4" open mesh) now we get it from our insulation supplier .. and we use Elmers White Glue , which we find superior to what we were buying before.

More on the Mooney Wall -- 7/7/06

These are some additional pictures and notes published by Mike S. on a Taunton BreakTime forum.
Comments below are from Mike.

Here's two sequence shows from our latest:

this is after the mesh has been stapled to the Mooney and glued with Elmer's white glue... one day drying time (overnight minimum)

Chuck loading the hopper of our 1980 US Fiber machine with a 2005 Hurricane blower



Here's what our nozzle looks like... it's a 1" copper 1/8 bend taped to the end so it reduces the size which increases the impact speed of the cells.. we also increase the air flow to mix more air with less cells to get the density we want.



We use one hole every 16" ...and work one stud bay at a time.. going from filled to empty



We find it helps to mark the hole locations so you can find them when the dust starts blowing.... then we cut each hole with an X.



Here's one stud bay sequence:
bottom



Next ... working up



Next



Getting to the middle





and topping out...



It took 5 times longer to post this than it took Roy to actually blow that bay..

Chuck & Roy blew the perimeter of the house & breezeway in one day...

Mike Smith [Rhode Island](#) : *Design / Build / Repair / Restore*

Some additional notes from Mike:

Noise Transmission:

"The combination of the Mooney providing a thermal break also means it provides a sound-transmission break,, decoupling the path of sound thru the studs.. the cellulose also has a great dampening effect , so short answer.."

"Mooney wall makes a good sound transmission barrier wall... far superior to the old regular stud wall with fiberglass insulation we all have used at one time or another"

Blowing Insulation After Dry Wall Install:

"As far as blowing after the drywall is hung... yes that saves an enormous amount of the labor.. but you do lose one benefit.. you can absolutely see any pockets that don't get enough insulation with the mesh.. with the drywall it's more of an experience /confidence factor."

DIY Install:

"can DIY'ers do this.. sure, it's labor intensive but material cheap. and the technique of blowing dens-pak is pretty self-evident.. you need a good blowing machine with an adjustable air vent.. most blowing machines that I know of are capable"

"you will probably get a better insulation job with blowing your own dens-pak than you would hiring an insulation sub..mostly because you will take more care.. it's your house."

Installing Dry Wall Over the Mooney Wall:

"The drywall install is easier with Mooney , not harder.. just make sure you have mooney where your joints will fall out."

Cost of an Example Mooney Wall:

we had **2080 sf of Mooney wall**

materials cost \$1071 (\$0.52 /sf)

& labor was \$1596 (\$0.77 / sf) based on rate plus burden = \$28 / man hour

materials were culled 2x matl from our lumber yard (\$120)

glue.....\$25

Insulweb.....\$83

cellulose (94 bales)\$843

labor was :

rip culled matl to 2x2..... 4 hrs

cut & nail mooney (2x2).....21 hrs

install & glue mesh.....16 hrs

blow walls..... 16 hrs

total labor57 man hours or 36 sf / man hour

blowing the attic is separate (2 guys one day) 24" deep ... say 20" settled

settled density of 1.7 lb/ cf = 20/12 x 1.7 = apx 2.8 lb/ sf

cells cost about \$9/ bale (25 lb) delivered including tax

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Note that for new construction, the Mooney wall could be used in conjunction with the efficient wall framing described here:

<http://www.builditsolar.com/Projects/Conservation/Insulation/WallFraming26449.pdf>

This includes such techniques as insulated headers, efficient arrangement of studs at the corners, and in general reducing the thermal bridging areas in the framing.

It seems like using 24 inch stud spacing would provide less thermal bridging, and reduce the work level to some degree. Two by six studs on 24 inch centers with the Mooney 2 by horizontal members would give a full 7 inches of Cellulose -- about R 27. See also the "[Gimme Shelter](#)" wall construction notes.

Gary 04/26/06, updated 7/7/06