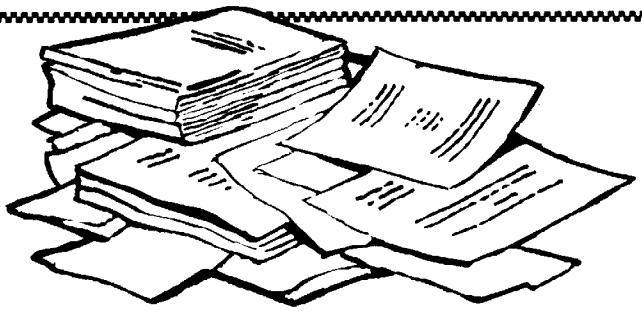
Letters



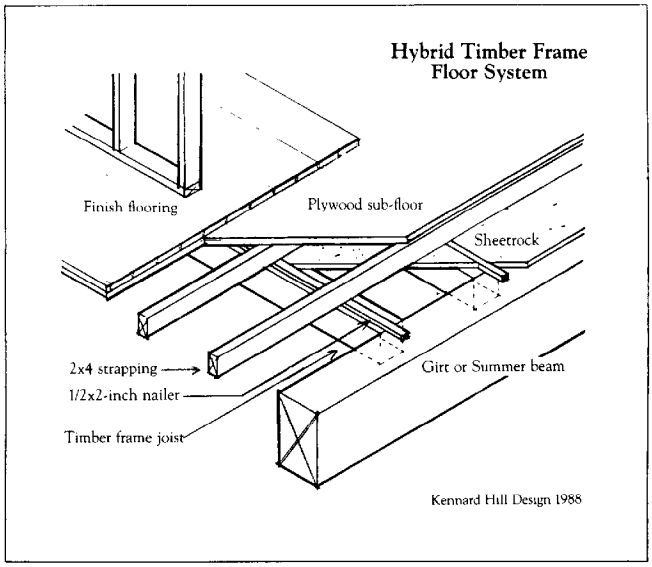
Timber Frame Hocus Pocus

To the Editor:

I would like to respond to Steve Chappell's article on "Hybrid Timber Frames," *NEB* 4/88.

Dave Lindeman (see lead photo in article) and I developed the hybrid frame in response to design problems that were present in several houses. The goal was to create structural integrity and visual interest in "public" areas, such as living, dining, kitchen, and sunrooms. It seemed absurd to timber-frame the entire structure to achieve a limited design element in a limited area.

We also began to experiment with correcting deficiencies that occur in any "purist" type timber frame. We created a second frame above the girts and joists (see illustration) that drastically limited the deflection in the timber joists. It also allowed us to use drywall for ceilings to increase reflected light. Furthermore, a space was created for wiring and HVAC, especially in kitchen areas where vents and recessed lights are common and impossible to accommodate in a purist timber frame that has a floor that is usually no more than 2¼ inches thick.



Another area that we have focused on is the elimination of expensive and often poorly vented cathedral ceilings created by timber frames. In our climate we have to carefully vent the roof to avoid ice-damming. We frequently use a cold attic with soffit, ridge, and gable-end vents. The timber frame frequently stops at the second floor; the stick framing continues through the completion of the roof. In cases where we want a cathedral area (as in a sunroom or open-plan living area) we erect the timber frame and then apply the finished ceiling and vapor barrier to the outside of the frame. The next step is to strap the roof (2 feet on-center) using 2x10s as secondary rafters. These rafters transfer the load to the purlins and provide space for insulation, wiring, recessed lights, etc. This also gives us the opportunity to vent the roof from soffit to ridge. This venting is indeed the bare minimum required so we also steepen the pitch to reduce the chance of ice-damming.

Perhaps the best result of our efforts has been to keep the costs within reason while achieving design goals. With timber-frame prices (frame only) starting at $12 per-square-foot, it pays to keep your crew doing just frames. But propagating the myth that the only way a homeowner can avoid the "hocus-pocus" is to have a complete timber frame built is self-serving, at best.

We enjoy your journal and hope that you will continue to explore the evolution of materials and techniques available to builders and designers.

Ken Wilson
Kennard Hill Design
Kezar Falls, Me.

Dave Lindeman
Sunsite Homes, Inc.
Gorham, Me.

Too Many Specialists

To the Editor:

Harris Hyman's article on cantilevers could have been instructive; but little charts, tables, and rules-of-thumb leave us only more aware of our ignorance and perpetuate the division of knowledge which too many specialists try to maintain. A few formulas, however, would have given us the tools to expand our understanding and apply it as needed.

Robert Hurwitz
Greenfield, Mass.

Leave Chimney Relining to Experts

To the Editor:

The question about types of loose-fill insulation for stainless-steel liners ("Insulation for Flues" in On the House 4/88) was making a false presumption. The problem with loose-fill insulation with rigid liners is that as the sections expand and contract with heat, the screw or rivet holes stretch and the vermiculite proceeds to drain into the liner. With flexible liners, the pipe seldom ends up centered enough to ensure proper thermal protection with loose-fill insulation, as the liner inevitably sags against the walls of the chimney.

The ultimate answer to this question should be to hire a certified, professional chimney reliner whenever possible. If the questioner (and answerer) failed to know that ceramic wool is the preferred insulating material, how would they know about other essentials of stainless relining such as a tee section and cleanout, supporting the liner from above and below, etc. On the face of it, chimney relining, like so many things, is a simple procedure. Yet in practice, a safe installation requires a thorough knowledge of chimney construction and building codes as well as current knowledge of materials and techniques. And even then it always presents its own unique challenges.

There is considerable liability exposure in chimney relining—and for good reason. An improperly lined chimney can be a real fire hazard and should be left to people who do it for a living.

Stephen Bushway
Village Chimney Sweep Co.
Williamstown, Mass.

Cupping Clapboards Not Foam's Fault

To the Editor:

William Lotz, in his "Case in Point" article (*NEB*, June 1987) makes several statements that are simply not true.

At this point, there are over 500,000 buildings sheathed with just one particular brand of extruded polystyrene foam covered with a variety of clapboards, otherwise known as lap wood siding. To the best of our knowledge, less than 50 of these buildings are having or have had siding problems. Does this sound as though "there is a compatibility problem between wood clapboards and extruded polystyrene sheathing," to quote Mr. Lotz? In every single case which has been investigated, misapplication of the clapboards has turned out to be the chief culprit.

Regardless of the underlying sheathing, wood is still wood, an innately variable material, with properties that react to climatic conditions. If a person is ignorant of or ignores these natural characteristics, problems will occur whether the clapboards are over foam, plywood, or some other type of sheathing.

It's true that good application practices are recommended both by the foam manufacturers as well as the clapboard manufacturers. These same practices were widely recommended long before insulating foam sheathing arrived on the scene.

In the Kentucky lawsuit referred to by Mr. Lotz, the "major extruded polystyrene manufacturer" was only one of nearly a dozen defendants in the case, others being the manufacturers and suppliers of the wood siding, the architect, the contractor, and the siding applicator. (I was also an expert witness in this same case.) Contrary to Mr. Lotz's statement, the foam manufacturer did not settle for "big bucks," (nor for product misperformance), but for a lot less money than it would have cost it in legal and other fees to actually conduct a court trial. This was also true of the other defendants.

It is a fact that extruded polystyrene foam does not absorb moisture and that it acts as an insulator. It is also a fact that the in-service temperature and moisture content of wood siding is virtually the same whether the underlying sheathing is foam or wood. This has been proven time and again in numerous field tests by the Forest Products Laboratory of the U.S. Department of Agriculture., and by participants in the Joint Industry Committee on Wood Siding and Foam Sheathing of the National Forest Products Association and the Society of the Plastics Industry, Inc. I have been an active member of this Committee since 1982. The committee's real-life field tests have shown time after time that lap wood siding behaves the same over extruded polystyrene foam sheathing as it does over wood fiberboard sheathing. Regardless of the sheathing, good application practices are in the best interests of everyone.

The Joint Committee's "Guidelines for Installing and Finishing Wood and Hardboard Siding over Rigid Foam Sheathing" is readily available by contacting either of the sponsoring organizations. These guidelines are based on real investigated facts, not on opinion.

Lap wood sidings (clapboards) have been around for a long time, and have worked very well except for a minority of problems caused largely by improper nailing and inadequate finishing, or by the use of unsuitable wood. These were problems long before the advent of insulating foam sheathing, and will continue to be problems as long as

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ignorance and lack of basic common sense occur. The competent and concerned builder will avail himself of state-of-the-art knowledge, to the satisfaction of all concerned.

Albert A. Hill
Bert Hill, Inc.
De Bary, Fla.

This is a contentious issue that NEB has reported on several times—most recently in Bill Lotz's column in June 1987 and in "Wood Siding Over Foam: An Update," in June, 1988. The Joint Industry Committee referred to above was formed in 1982 to investigate the problem. The letter writer, Albert Hill, represented Dow Chemical on the committee.

We spoke recently with several members of the committee (jointly conducted by members of the foam and wood industries) and came up with the following: The research looked at redwood and hardboard siding over foam and fiberboard sheathings. When the research begun in 1982, the test wall was simply a "fence," out in a field. The next year, the south-facing fence was enclosed on one side with a 48-foot long by 4-foot deep shed designed to simulate the moisture and temperature conditions of a real building. Some of the variables studied were the presence of building paper, vapor barriers, and high interior humidity. Due to delays, disputes, and instrumentation problems, however, the only data accepted by the whole committee was collected in the final test period, which run from November 1986 to April 1987.

According to Joint-Industry-Committee secretary Pete Billings, field manager of the Chicago area of the National Forest Products Association, the study's main finding was that "properly installed wood over foam did not have problems." Proper installation, in this case, meant correct nailing and painting (including backpriming), and high quality materials. The wood siding was all-heart, vertical-grain redwood.

Several committee members we spoke with confirmed that the siding acted essentially the same over foam and fiberboard sheathings. They also confirmed that, throughout the tests, no significant siding problems were seen with either sheathing.

Committee member Curt Peterson, however, of the American Hardboard Association, points out that the researchers "took extraordinary care in making sure that everything was done absolutely carefully." In that sense, he said, the study did not represent typical installation and finishing in the real world. This sentiment was echoed by other committee members we spoke with from the wood siding industry.

In general, the wood industry participants we spoke with would like to have seen the study run longer, and remain leery about recommending or guaranteeing their products over foam. Yet they report that few field problems involving foam have come to their attention in recent years—lending credence to the argument that most of the earlier problems were caused by poor installation practices. One problem, however, was identified with installing hardboard over foam: That it "takes a little more care due to the compressibility of the foam" to avoid dimpling or waviness, according to Peterson.

We could not obtain specific data from the study. The technical report, says Billings, will probably be available toward the end of 1988.

Just released, however, are the committee's installation guidelines, called Guidelines for Installing and Finishing Wood and Hardboard Siding Over Rigid Foam Sheathing. *These are available for $2 from the National Forest Products Association, 1250 Connecticut Ave. N.W. Suite 200, Washington, D.C. 20036; or from the Society of the Plastics Industry, 1275 K St. N.W. Suite 400 Washington D.C. 20005 (price unavailable at press time).*

—Editor

Not Laser Accurate

To the Editor:

I'm quite sure you can't check the claims of your advertisers. However, I can help you with one. The "Laser Plumb Bob" (page 34, January '88) is not a laser tool and does not deliver pin-point accuracy. It is a crudely made bob with a high-intensity bulb. It's good points are weight (it can be used in breezy conditions), and it may be used in dimly lit areas.

M.F. Marti
Monroe, Ore.

Filling Masonry Cavities

To the Editor:

I find your magazine interesting and useful. Regarding the "On the House" column by Hank Spies, in the March 1988 issue: My experience is that when the cavity is filled with perlite or vermiculite it can become wet, and remain so for a long time, resulting in mildew and other problems. What have you found?

I think it is essential that cavities remain clear of insulation, mortar debris, etc. to function properly.

David L. Adler
Simpson Gumpertz & Heger, Inc.
Arlington, Mass.

Hank Spies responds:

Perlite that has been treated with a water repellent should allow drainage of the normal amount of water penetrating a well-detailed and maintained brick veneer wythe to drain to the weeps rather quickly. Since there is no venting system to dry the cavity whether it is insulated or not, there would seem to be little difference in mildew growth between a filled and an empty cavity.

The installation of foam, however, could lead to bridging of water to the block wall if the cavity was completely filled. If foam board is used, there should still be a space between the foam and the brick for drainage. I would agree that an empty cavity is probably better for the wall, but insulation in the cavity is sometimes the only economical alternative.

More on Thermal Drift

To the Editor:

Recent articles published in *New England Builder* suggest that the diffusion of chlorofluorocarbons (CFCs) out of CFC-containing rigid foam insulation is responsible for the thermal drift phenomenon. Secondly, by generally implying that the CFC diffusion occurs similarly for all products, you have led the reader to believe that all experience similar thermal drift.

Thermal drift, or loss of R-value with time, is due primarily to the diffusion of air into rigid foam insulation. Air has a higher thermal conductivity than CFCs, thus it dilutes the insulating value as it enters the product. While the diffusion of the CFC out of the board also reduces the insulation value, it occurs at a very slow rate (with a half-life on the order of decades), and therefore becomes a relatively insignificant factor in R-value aging.

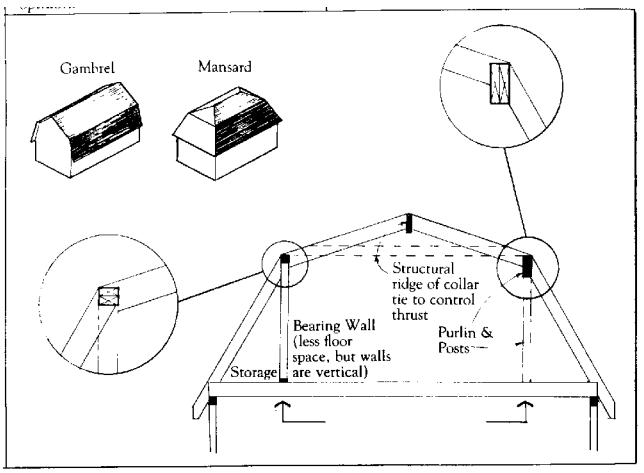
Several papers have been published on the subject of diffusion of air and CFCs in and out of foams, including two by Frances J. Norton which appeared in the Journal of Cellular Plastics: "Thermal Conductivity and Life of Polymer Foams," (January, 1967); and "Diffusion of Chlorofluorocarbon Gases in Polymer Films and Foams," (September/ October 1982).

Factors affecting the actual thermal drift rigid foam insulation will experience include (1) the polymer and its "resistance" to diffusion of air and CFCs, (2) the presence of any "open" cells, (3) the presence of board facers which may retard the diffusion of air into the foam, (4) the quality of the bond of the facer to the board, and (5) the thickness of the board.

While data continues to be. gathered on the relative aging of different rigid foam insulation materials, several studies have already been released. One study sponsored by the Society of the Plastics Industry [published in Dow's *Technical Newsletter* 1.2.2, 1986] showed dramatic differences in the time it takes the R-value of unfaced extruded polystyrene foam and foil-faced polyisocyanurate foam to stabilize. The polyisocyanurate tested continued to age beyond two years, while the extruded polystyrene foam stabilized after only six months.

Therefore, the thermal drift issue should not be confused with the diffusion of CFCs out of rigid foam insulation boards. Secondly, the significant differences in the rate of thermal drift for various foam insulation products must be recognized.

Kathy Wolfgram, Group Leader
Styrofoam Brand Products
Granville, Ohio



Framing Mansard Roofs

To the Editor:

I have a customer interested in obtaining details for framing a Mansard roof. Do you have any information available on this? Or perhaps you could suggest where such information would be available.

Harry Taylor
Taylor & Son
New Milford, Conn.

Paul Hanke replies:

Mansard roofs are variations on the double-pitched Gambrel roof (see sketch). The lower portion is the steepest, typically around 60 degrees (21-in-12 pitch), while the upper section is less steep, perhaps 30 degrees (7-in-12 pitch).

While a Gambrel roof is only pitched on the sides, leaving vertical gable ends, a Mansard is like a hip roof in that all four sides slope inwards. The exact pitches are based on aesthetic judgement and the desired amount of usable floor space inside. (Steeper pitches on the lower sections make greater room inside). This configuration is said to have been developed as a tax dodge at a time in French history when space under the roof was not taxed. Simply leaning the second-story walls in slightly created usable—and presumably tax-free—living space under the new "roof." A modern day variation of this style has a flat upper section, but the appearance is rarely successful and should be avoided in my opinion.

There are two basic methods of construction. Both are designed to provide structural support at the point where the roof changes pitch (see sketch) In the first case a bearing wall is erected below the joint between upper and lower rafters. The top plate of this wall serves as a ridge for the lower rafters and a sole plate for the upper members. This method reduces usable space somewhat, but has the advantage of offering vertical wall surfaces and some storage at the eaves.

In the second method, a continuous beam supports the rafter junction, while a series of posts support the beam. This provides the most open floor area but with angled rather than vertical walls.

In either case it may be necessary to provide structural support from below if the floor joists can't take the load. There is no horizontal thrust in the lower rafters because they are supported at each end. However, there will be thrust in the upper pairs of rafters. This thrust must be curtailed by ceiling ties, a structural ridge, or trussing, as in any hip roof.

Rafter cuts are made similarly to any gambrel-type rafters, as shown. Exact construction details can be found in most carpentry books. Roof Framing *by Marshall Gross (reviewed 5/85 NEB) is a particularly good reference on all aspects of roof framing.*

Keep 'em coming... We welcome letters, but they must be signed and include the writer's address. *New England Builder* reserves the right to edit for grammar, length, and clarity. Mail letters to *NEB*, P.O. Box 5059, Burlington, VT 05402.