



Where Roofs Meet Walls

by Gordon F. Tully

Most houses have highly visible roofs that must join highly visible walls. The joints between wall and roof (an eave when the slope of the roof is at an angle to the wall, a rake when the slope is parallel) are crucial elements in a building. If they are detailed poorly, the entire house suffers; if cleverly done, however, they can salvage what might otherwise be a hopeless design.

The problem is how to choose among the almost endless possibilities for detailing rakes and eaves. Should there be an overhang? If so, how big? How elaborate should the trim be? How do windows and dormers relate to the roof edges? How thick should the roof edge be? What should happen at the gable end? How does the roof-edge detail relate to the other trim, to the pitch of the roof, and to the height of the wall?

Form Follows Function, Sometimes

One myth from modern architecture that has hardened in our minds like cement is that "form follows function." When we are caught up in the technology of building, we sometimes seek to justify design decisions entirely on practical grounds.

To the farmers who settled this country, a home was functional rather than expressive. Its details were rooted in old craft traditions modified to suit a new environment with a harsh climate and an abundance of wood.

If you look closely at the eaves of very early colonial houses, you will see little embellishment—just an extension of the rafters far enough to shed water, and some kind of enclosure to neaten up the overhang and keep insects from nesting. The detailing of these houses continues to this day on sheds, barns, and outbuildings: functional, unadorned, and unselfconscious.

The noble simplicity of such buildings recommends their functionalism as a model for our own buildings. But think about the rest of the image: these buildings were invariably asymmetrical; the windows were small, medieval casements; the materials were uniform boards and shingles, usually unpainted; trim was minimal; and the houses tended to be isolated from each other. Their beauty lies in how these features work together. One thing they hold in common is a lack of interest in order for its own sake.

Roof-Edge Functions

Here is a partial list of functional requirements for roof edges. AS you read them, think of the visual effect, or lack of effect, each might have on the detailing.

1. The rafter ends must be deep enough to carry the vertical roof loads without splitting from the shearing stresses.
2. If the roof is to overhang the wall, the overhang must be supported either by an extension of the

rafters—with some minimum thickness determined by the size of the overhang—by brackets, or by some kind of box-like structure secured to the wall.

3. Gable-end (rake) overhangs are limited to about 12 inches unless special transverse members are let in to the top of the rafters to carry the overhang in cantilever action, or unless brackets are added.

4. The roof as a whole delivers horizontal wind or earthquake loads to the walls through nails or bolts, with little effect on design.

5. A pitched roof without a structural ridge needs some form of tie to keep the rafters from kicking out at the eaves. Ties aren't normally expressed on the exterior.

6. Sometimes the walls extend up from the top floor and resist the rafter thrust by acting as cantilevers—as in a typical Greek Revival house. Only small windows are possible in this knee wall.

7. Windows in general need headers above them to support the rafters and attic floor. The header gets deeper as the window gets wider.

8. The very edge of the roof must be equipped with a drip edge to prevent water from running back up under the roof through capillary action.

9. Either an overhang or gutters, or both, are required to keep water and snowmelt off the walls below.

10. Deep overhangs work much

better than gutters where they cannot be kept clean (under dense trees).

11. Deep overhangs are also highly functional in hot, sunny climates.

12. If a house is over-glazed on the south wall, an overhang is essential to prevent overheating in summer. Over-glazing on the east and west requires direct shading to control overheating.

13. A deep overhang set close to the top of a window obscures useful sunlight in the spring and fall.

14. If a home has casement or sliding windows, the overhang shouldn't be far above the windows, so they can be left open in a rainstorm.

Form *can* and in some instances *should* follow function. But this edict is honored in the breach. If a house doesn't look right, it isn't loved and doesn't sell. In almost every case—but certainly in the case of roof-edge details—function by itself isn't enough to determine what an eave should look like.

The Georgian Style: Self-Conscious Detailing

By 1760 Gothic functionalism had given way to the highly ordered, symmetrical Georgian style, where form and function had equal weight.

Houses were generally simple boxes with gable roofs, but with elaborate detailing of eaves, cornices, and wall corners—taken largely from plan books—to celebrate the important marriage of roof and wall. Also, these design changes reflected the new social relationships of the era. Design ceased to be a shared folk tradition, and instead became a complex balancing of individual elements. For example, in Georgian cornices, part of the detail completes the roof, part completes the wall below, yet the whole can be seen as both the top of the wall and as the roof pouring over the wall.

Furthermore, the cornice and rake details in a Georgian design form part of a whole ensemble of details, including window and door trim, corners, and water tables. None of these details can be eliminated or weakened without damage to the whole.

20th-Century Disasters

When we reinterpret these handsome and balanced designs using our current standards, we generally retain only a few of their carefully worked-out details. As the exterior trim—especially eaves and gable-end details—is pared down, disaster strikes the overall form of the house.

The problem is that a minimal eave is appropriate for an early colonial house with a continuous, one-color skin and small windows. But all the other details reflect a later, more urban house. Our standard contemporary "colonial" has tiny eaves and corner boards framing a wall that is almost covered with windows and shutters. The windows are pushed right up to the eaves, leaving the roof to sit awkwardly on the thin window head.

The result is a caricature of a house, with no dignity or scale. The solution is dead simple. If you wish to recapture the dignified image of Georgian architecture, put back the dignified exterior trim. ■

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