# ARCHITECTURE AS MATERIAL CULTURE: A SURVEY OF RESIDENTIAL AND COMMERCIAL STRUCTURES IN A WESTERN GHOST TOWN

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## ABSTRACT

Bodie State Historic Park, located in the arid eastern Sierra Nevada of California, contains the ghost town of Bodie. This settlement—now a National Historic Landmark—was established in the 1860s to serve the local gold mines. At its height in the late 1870s and early 1880s, the town continued to be an active settlement until the 1940s. As an abandoned mining settlement, Bodie is unusual in that many of the residential and commercial buildings survive. Investigation of these structures documents a vernacular construction tradition that differs strongly from contemporary urban architecture in scale, materials, and techniques, and in the patterning of building repair and modification. This architectural tradition is an economic response to the need for shelter in an isolated area, distant from sources of supply, where winters were legendarily severe.

## INTRODUCTION

For those who approach 19th-century architecture as one form of material culture, certain historical perspectives are available from the research of architectural and industrial historians, cultural geographers and folklorists. Their work provides us with an evolutionary model of American patterns of building: an understanding of the social and economic dominance of certain patterns of choice regarding what and how to build. Just as we expect the wrought nail and the pointless screw to fade from popularity, each in their appointed time, so we expect that post-and-beam construction will be superceded by the balloon frame. Indeed, we believe that America's westward progress was marked by the abandonment of the former for the latter. Some have proposed, in fact, that it was the balloon frame and the cut nail that made possible the instant cities whose rise punctuated the westward movement (Giedion 1942:269-276). And so too, we might suggest that it was these same two factors that allowed the ready construction and popularity of a sequence of Victorian architectural styles that came to dominate the urban landscape.

So—if we view only these larger trends in Victorian America—we would seem unlikely to encounter a western community that does not meet these expectations. But just such a community is the subject of this paper. It was formed in the west during the 1870s, its residents were as diverse as any in the nation, and its economy was firmly tied to the industrial revolution. This settlement exhibited a marked predominance of wood frame construction, but only minimal use of the balloon frame. It is one in which formal architectural style reflected not a dominant esthetic, but rather the tacked-on pretense of only a few home owners. And it is one in which house plans had more in common with the ancestral homes of colonial small farmers in New England and the Chesapeake than with contemporary residences in the urban west.

The town is Bodie, California. And in all these ways Bodie was not unique or aberrant but commonplace. Its architecture spoke the physical language of mining towns throughout America: a dialect that drew on ancient and rustic forms, appealing to them for shelter in a harsh climate and a harsher economy.

Site Location and History

Bodie is located in Mono County, just east of the Sierra Crest at an elevation of 8400 feet. The town and its surroundings were acquired by the State in 1960 and classified as Bodie State Historic Park in 1962. It is also a National Historic Landmark.

The draw to Bodie was the mining of gold. The initial discovery in 1859 attracted a few prospectors and speculators, who enjoyed irregular and mediocre success, until richer strikes were made in deeper veins in the late 1870s. These results sparked a rush of hopeful miners, laborers and merchants, increasing the population from about 1,500 in 1878 to perhaps 9,000 by the end of 1879. Total gold production continued to increase through 1881. By 1880, however, individual operations began to fail or suspend dividends, and as hopes for a bonanza faded, so too did the population. By 1888 only about 500 residents remained. Although the mines continued in operation, production and population continued to decline. The town was effectively abandoned in the 1940s (Whiting 1888; Loose 1971).

With the sudden rise of population in the late 1870s, construction also boomed. From a camp consisting of "some 15 or 20 frame and adobe houses_ [and] a boarding house" (Browne 1865:283), it grew to include about 3,000 buildings. Main Street was lined with businesses for more than a mile, including numerous gambling halls, saloons and restaurants. Although some of these structures were built with permanence in mind, most—especially residences—were never intended for long-term habitation. The continuous decline in population after 1880, however, meant that there was never a shortage of vacant houses. Though many residences were expanded to accommodate growing families in the ensuing decades, the construction of new houses after the boom was rare indeed. Two fires, the first in 1892, the second in 1932, destroyed much of the town, but many buildings remained, and it was the final closing of the mines that led to the abandonment of the town.

## SURVEY

Today Bodie contains more than 120 structures: a small percentage of the town at its height, but still a large sample of vernacular architecture, little changed from its 19th-century construction. It is this assemblage of abandoned and decaying but relatively intact buildings that led to Bodie's National Landmark status as "the finest example of a mining ghost town in the west." In 1996, the Department of Parks and Recreation initiated a program to stabilize the most threatened of the town's buildings. Preliminary to that work, we began a systematic recordation of the structures.

During the investigation, we became aware of certain patterns of construction, manifested especially in the residences. Some of these will be discussed here. This summary is preliminary: it is based on cursory photographic survey of most of the town, and detailed inspection of less than 50 buildings.

Materials and Methods of Construction

The survey revealed a variety of materials and building techniques. Construction at Bodie included three kinds of masonry, four kinds of frame construction, and a technique that combines frame and masonry.

The masonry techniques include adobe brick, stone masonry and brick masonry. Initially adobe brick was a common building material (Browne 1865:283), but the only remnant of this technique today is a single wall of one house. Only a few examples of stone masonry survive. This form of construction was applied primarily to the foundations and lower walls of industrial buildings, or to buildings where security or cold storage was important. A few residences have stone foundations; in all cases these are relatively large houses built on a significant slope.

Brick masonry was restricted to commercial and industrial uses. Of the former, the two-story Post Office (later the Dechambeau Hotel) on Main Street is the most prominent example. The New Bodie Stamp Mill, located north of town, was also built of brick (Eakle 1919:159), but has long since been demolished. No residences are built of brick, although a few employ brick nogging.

Brick nogging is a technique that combines frame construction and brick infill. It is not often encountered in the west, though it was once widely favored (Wheeler 1855:406-407; Woodward 1859; American Agriculturist 1870). Evidently adapted from colonial half-timbering or the Fachwerk construction of German immigrants, it employed 2x4 or 4x4-inch studs rising from a sill plate on 5 or 6-ft centers, with a wythe of mortared brick laid up between them. Horizontal 1x4" girts were inserted between the studs after every 5-10 courses for stability. Although more expensive than frame construction, nogging had the advantage of providing better insulation. At the same time, it was cheaper than brick construction, since the framework of studs, girts and plates allowed the bricks to be raised in a single wythe, using only half the bricks necessary in a standard brick wall. At least two surviving buildings employ this technique.

The four types of frame construction at Bodie are post-and-beam, pre-fab, balloon-frame and single-wall fabrication. Post-and-beam construction was used here only for industrial buildings, including most of those at the Standard Mill complex. These buildings were constructed in 1898-99 after a fire destroyed the original stamp mill. They employ very little of the complicated joinery that characterizes earlier post-and-beam construction elsewhere, relying instead on nails. All of the buildings are sheathed with corrugated metal.

Kit or pre-fab construction was a well-known contributor to gold-rush era construction in California, and became common again in the first quarter of the 20th century (Peterson 1965). It's use in the intervening years is less well studied. It is exemplified in one Bodie residence (subsequently converted to a barn or storage shed). This building was designed as a variant of post-and-beam construction, the posts set on 34-inch centers and ploughed to accept the tenons on the ends of the horizontal wall boards, the boards being rabbeted on the upper and lower edges to be self-battening.

The balloon frame was developed—at least as a coherent and identifiable construction technique--in Chicago in the early 1830s (Sprague 1981; but see Bell 1983). It featured the use of multiple, closely-spaced vertical members of relatively small dimension (2x4, 3x4 or 2x6-inch studs) rising from the sill plate to the rafter plate or ridge (even on multi-storied buildings), fixed with nails and employing only the simplest of joinery.

The balloon frame was heralded in the last century as gaining rapid favor in the west, and being the dominant form of construction—indeed the universal form of frame construction--in California from the 1850s onward (Woodward 1859; Hittell 1863:320-321; California Architect 1881). This was obviously the case in San Francisco, and presumably in the state's other urban centers as well. But it was by no means true of Bodie. Here, the balloon frame does seem to have been used for one or two public buildings, like the surviving church and the Miners' Union Hall, but otherwise it found only a single 19th-century role: the false fronts of commercial buildings. All the other walls of these buildings were of single-wall construction. Presumably the balloon frame was used on these facades for structural reasons, and perhaps because this was a more expensive framing technique intended to compliment their ostentatious ornamentation. In any case, the pattern of balloon-framed facades fronting more simply-constructed buildings was widespread in the west, used with either single-wall or log structures (Heath 1989).

By far the most common form of construction at Bodie is single-wall (or box-frame) construction. This type of framing consists of vertical 1x12-inch boards rising from the sill plate to the rafter plate, with no other vertical members to provide support. There is thus no distinction between siding and frame (Fig. 1). The vast majority of the town's residential and commercial construction employs this technique. Even buildings constructed of brick or with brick nogging have single wall internal

partitions or later additions.

Though evidently beneath the notice of architects, single-wall construction was widely employed in the 19th-century, wherever milled lumber was at a premium, builders were poor, or construction was viewed as transitory. If its appearance in architectural surveys is a guide, such construction was particularly common in mining towns (Herrin 1984; Mulroony 1989; Randall 1985) and in Appalachian and Ozark mountain communities (Martin 1984; Sizemore 1994; Williams 1990). It is encountered with sufficient frequency in other contexts, however, to suggest that it once enjoyed a more widespread appeal among rural, pioneer and working class builders.

House Forms

Bodie's surviving residences exhibit floor plans in considerable variety (Fig. 2), many of them sufficiently complex and idiosyncratic as to preclude association with any national trends in house form. In part, however, this appearance of uniqueness is due to a tendency toward the construction of additional rooms on the rear and sides of originally small houses. In some cases, these additions have converted two-room cabins into sprawling domiciles, extending rearward on narrow and irregularly shaped lots until they reach and incorporate the privies. In other cases, added ells and entry rooms so modify the appearance of the house as to make its original plan unascertainable without detailed inspection. We have called this common tendency the "additive vernacular" (Fig. 3). It is worth noting that even the apparent randomness of this secondary construction follows patterns of some regularity. In any case, once this additive tendency is taken into account, most of the original residences can be grouped into several well-known house forms: single-cell, Pyramid, Central Hall, and Hall-Parlor houses.

Single-cell houses (one-room cabins) once constituted a major component of Bodie housing, presumably to provide residences for single miners who took their meals elsewhere. At least ten of these cabins survive. All are simple gable-roofed structures, most with subsequent additions.

Pyramid-roof (Pyramid, Foursquare) houses are a common late 19th-century house form. Roughly square on plan and usually divided into four cells, they are covered by a characteristic hip roof so constructed as to be pyramidal, or virtually so. Such houses were quite popular in some localities, but only two examples were encountered in our survey.

Central Hall (Central Passage) houses include those with at least two rooms separated by a central hallway. Such houses were quite popular in the 19th century, especially in the two-story form commonly called the I-house. Only three examples have been identified thus far at Bodie. All—like the vast majority of the town's residences—are single-story.

Hall-Parlor houses, judging by the present sample, were the most common form of residential housing in Bodie: at least 37 examples survive. These gable-roofed buildings incorporate a two-cell plan, one of the rooms being slightly larger than the other. Typically, they are built with a gable-side plan, the façade featuring a central door opening into the larger room and flanked by a window to either side. In some, however, the plan is turned—presumably to accommodate a narrow lot—so that the gable end becomes the principal façade.

Unusual Insulation and sheathing

An important aspect of single-wall construction, *as lived in*, is its poor performance in heat retention. The difficulty of heating such buildings is a repeated theme of historical accounts in Bodie and elsewhere (Smith 1925:70; Williams 1990), and it is still the retrospective plaint of those who grew up in the town. To deal with this problem, residents devised a variety of solutions. Some of these are quite simple: applying additional layers of vertical boards over exterior walls, stuffing rags into the eaves or cracks in the walls, or facing interior walls with layers of newspaper, muslin or cardboard. Others are more unusual, such as nailing vertical 2x4-inch boards flush against the walls and applying horizontal siding to the exteriors while filling the resulting cavities with sawdust, wood shavings or other insulating materials.

One truly striking aspect of Bodie construction is the varied and frequent uses found for old tin cans. This is especially apparent in their frequent employment as shingles: the can tops were removed, the sides spread out and crimped together into long panels which were laid on the roof in overlapping courses. The same technique was used occasionally on exterior walls. Other uses for this material included flashing, metal battens for covering gaps between wall or floor boards, small metal clips between wall boards to prevent bowing, and use of can tops to cover knot holes in walls or floors.

## DISCUSSION

It should be clear that while Bodie's architecture drew on models prevalent in the larger society, it was influenced by four important factors. First, most of the town's buildings were erected during the town's brief boom, when rapid construction was crucial. Second, many of them were never intended for long-term use or habitation. Third, building materials in this remote and treeless locality were particularly expensive. And fourth, structures erected in the town had to provide shelter during the high Sierra's severe winters.

The first three factors favored single-wall construction. Not only was this faster than balloon-frame construction, but it used less lumber and was therefore less expensive. The major disadvantage of single wall buildings, in this context, was that they were difficult to insulate. Winter cold obviously promoted a variety of innovative attempts to make single-wall buildings more weather-tight. Given the high cost of materials, it also favored nogging over brick masonry, as previously noted.

The common use of recycled tin cans provides a nice example of the exploitation of an abundant resource for unintended uses. All of the town's foodstuffs had to be imported, and many of them arrived packaged in tin. Not surprisingly, can dumps soon accumulated throughout the town, many of which survive to the present day. It is uncertain when these were recognized as a source of material for shingles and other uses, but this use was clearly underway by the 1880s.

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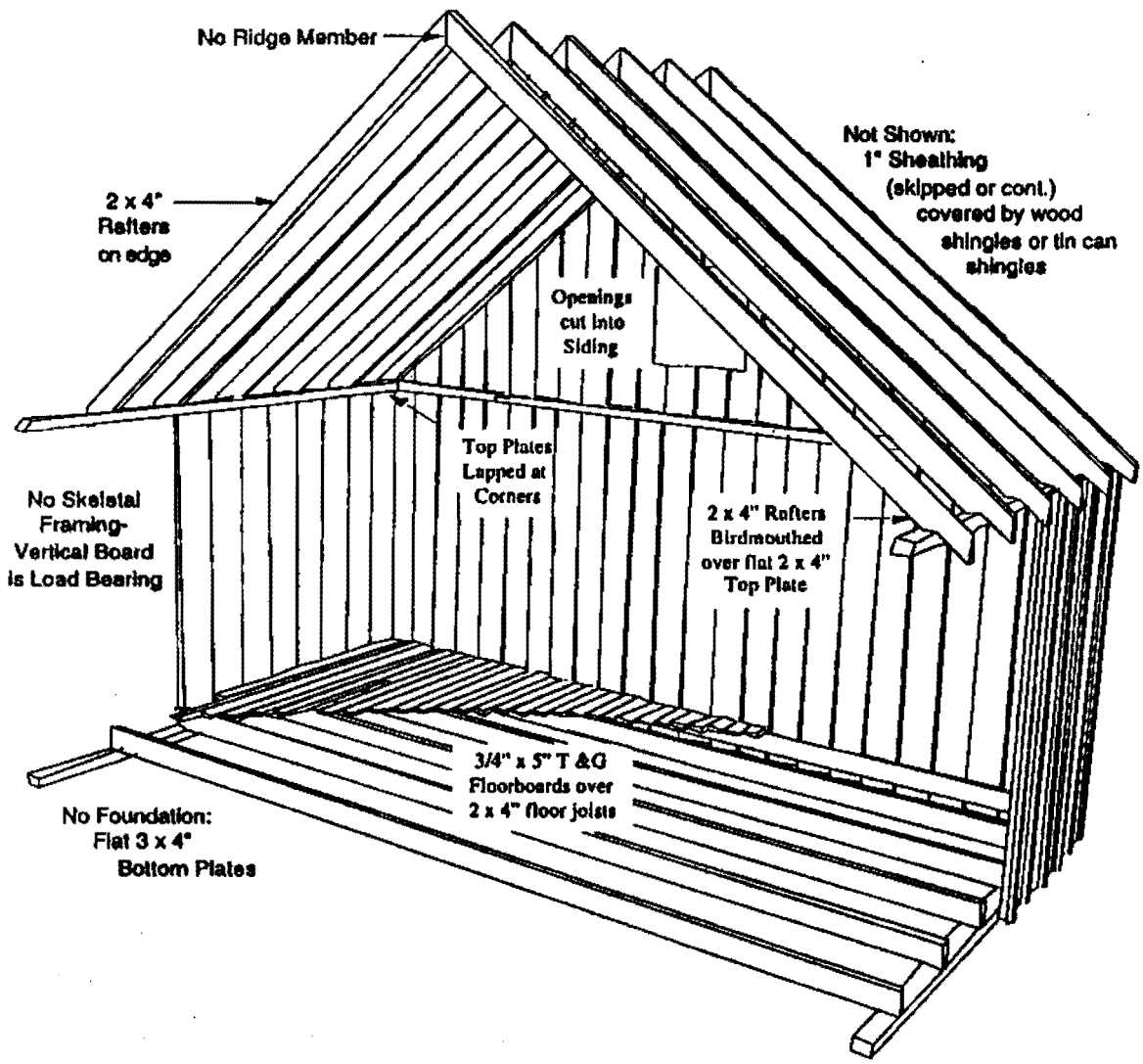


**Figure 1. Bodie Construction**

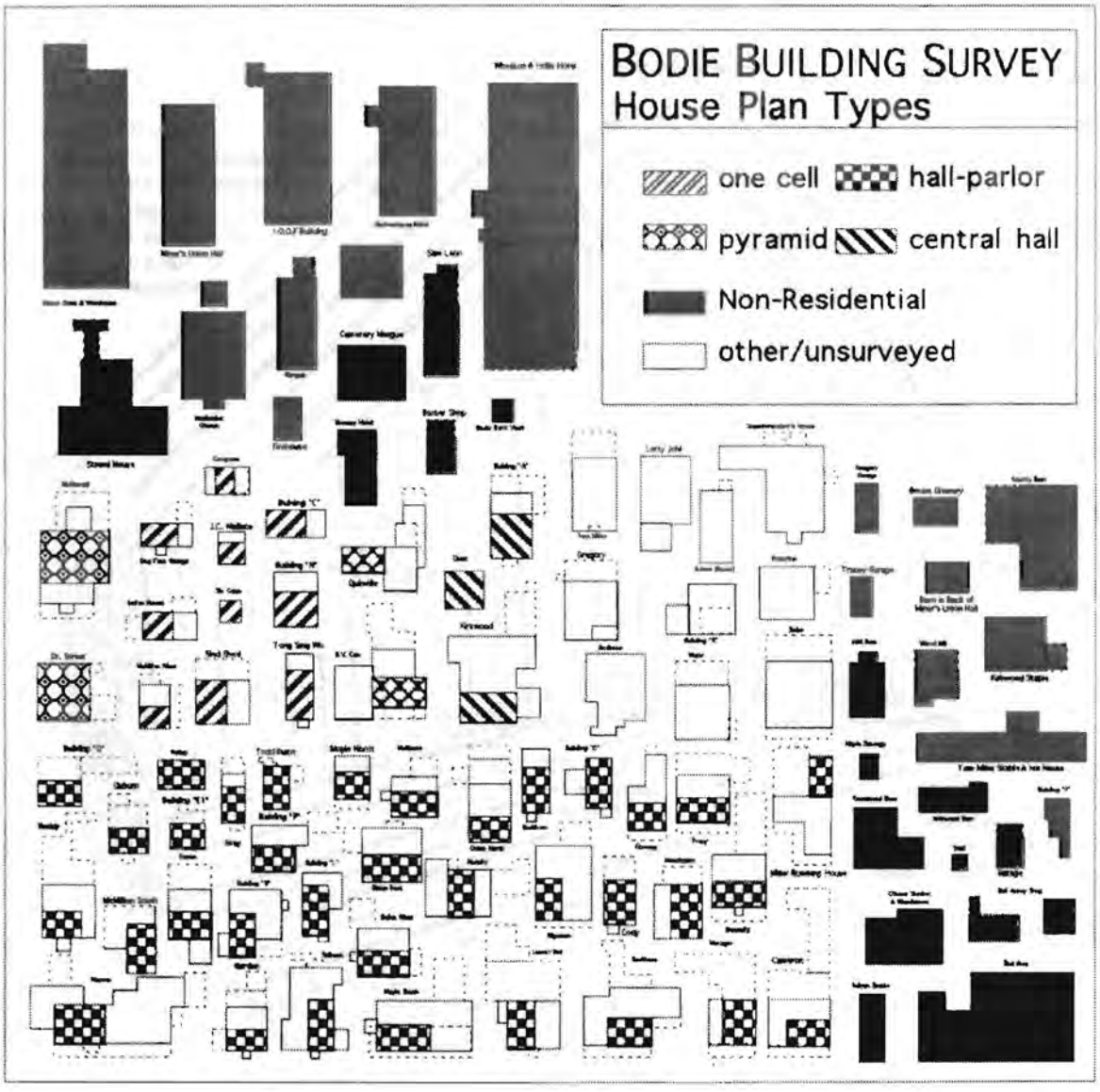


**Figure 2. Floor Plans**

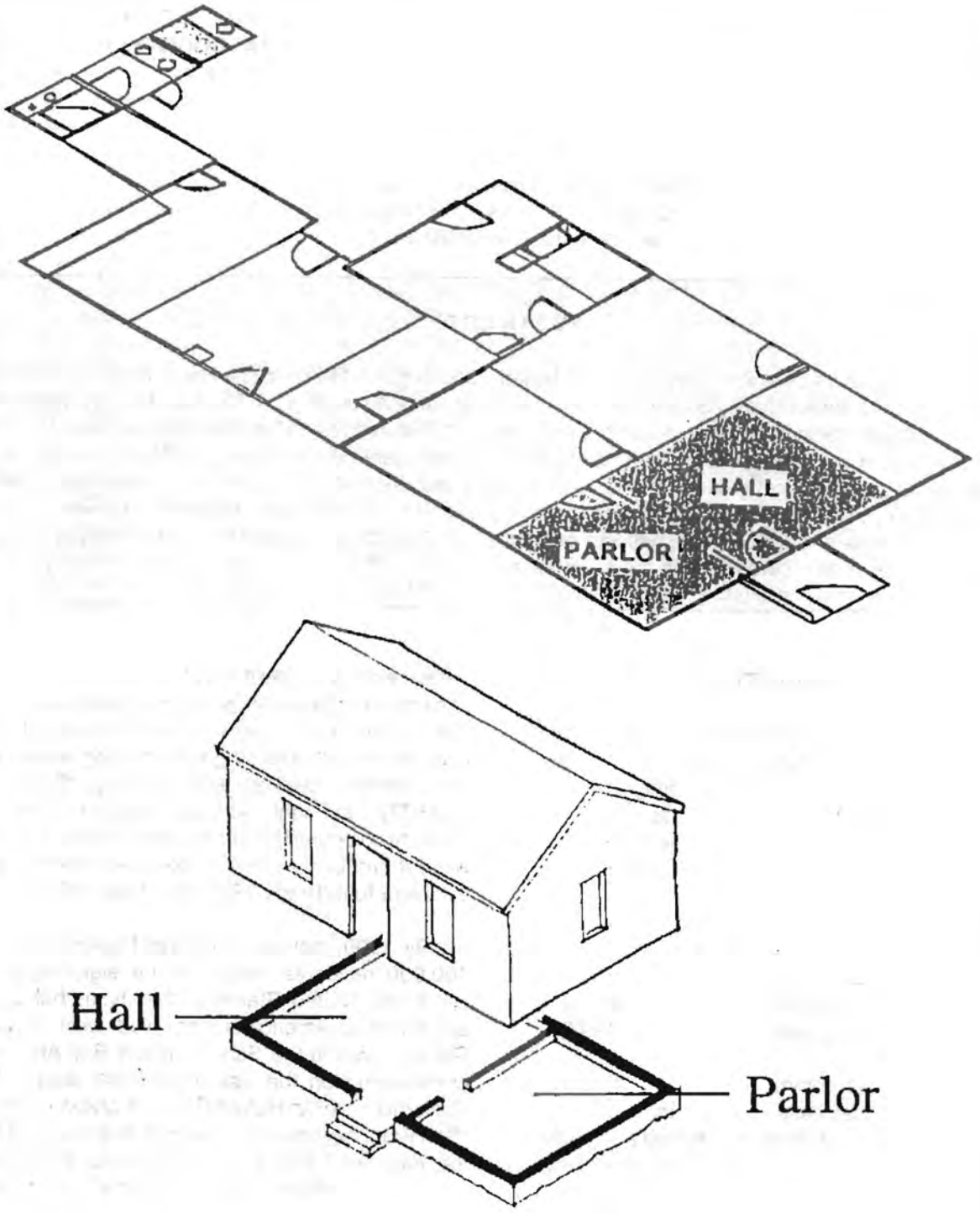


**Figure 3. Additive Vernacular**