

## WHY WALL TRENCHES?

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*Discussions of Mississippian architectural modes have dwelled too much on differentiating flexed-pole and rigid-post buildings, both of which were probably constructed throughout the Mississippian period (A.D. 1050–1350) in the greater Cahokia region. New evidence from recently excavated Richland Complex settlements suggests the innovation of a “curtain-wall construction technique” that, on the one hand, was based on a traditional interior truss structure and, on the other, permitted the prefabrication of exterior walls. Such a hybrid construction mode might have solved the immediate problem of new housing at late-eleventh-century Cahokia while adapting techniques familiar to local builders. Besides highlighting the importance of interior roof-support posts, our conclusion also means that greater attention to post-mold details is required using cross-sectioning rather than post-scooping methods of excavation.*

In eastern North America, the construction of pole-and-thatch buildings using wall-trench construction techniques is a recognized hallmark of the Mississippian period, ca. A.D. 1050–1600 (Griffin 1967). Yet the historical reasons for and implications of this wall foundation type relative to other single-set-post varieties have seldom been explored. In part, this is because the robust, well-dated regional architectural samples necessary to examine historical variability—especially post or trench cross-sections—are scarce outside of the greater Cahokia region.

In a series of recent papers, wall-trench construction has been analyzed in terms of its structural implications, with the central question being whether “flexed-pole” or “rigid-post” construction technologies correlate with the trench foundations (Lacquement 2007, following Lewis and Kneberg 1946:50–54). This question is the jumping-off point for the present consideration, which contextualizes wall trenches with respect to the evidence for a fairly rapid, widespread alteration in architectural conventions in the late-eleventh- and early-twelfth-century Midwest and Southeast. Based on detailed architectural data from the greater Cahokia region, we argue that this question obscures the considerable architectural variation that existed during the Early Mississippian period. Certainly, flexed-pole constructions, where walls and roof were one continuous structure, are demonstrable for a series of pre-Mississippian-style single-set-post buildings in the

greater Cahokia region. Similar flexed-pole construction cannot be so easily demonstrated for most Early Mississippian wall-trench buildings in the same region. For these, there are other options to consider depending on the size, intended purpose, and permanence of the construction.

Knowing how buildings were constructed within specific Mississippian regions through time is significant if we seek to explain the relationships between social organization and labor mobilization or to understand the long-term cultural effects of architectural construction. Such understanding is especially critical around Cahokia, where excavated data suggest that there was an abrupt adoption of wall trenches, ca. A.D. 1050 (Pauketat 1994). But it may be equally critical in other regions, such as around Angel in Indiana, where Mississippian ways seem to have been introduced abruptly in the form of central construction projects (Peterson 2010). The rapidity of this process in turn raises three additional questions: Do wall trenches correspond with a new construction technology? If so, was that technology meaningful or politically charged in ways that older construction modes were not (Alt 2001; Blitz and Lorenz 2002)? And were wall-trench buildings intended to look different from antecedent styles of architecture (Pauketat 1994)?

To answer such questions, it is necessary to closely examine the evidence of post molds (the actual traces of the wooden pole walls) in both single-set-post and wall-trench foundations. Where this information is lacking or poorly documented, as in old, salvage archaeological efforts or other excavations that employ a “post hole scooping” methodology, conclusions made concerning the flexed-pole/rigid-post debate will probably remain tentative. Some of the debate in Cameron Lacquement’s (2007) volume would doubtless be resolved by more robust excavated samples where more attention was paid to structural and depositional details. With detailed floor-plan and cross-section data in hand, additional insights into the Early Mississippian transition to wall-trench architecture may be made.

For present purposes, our consideration of architectural data will remain qualitative, although we draw on a range of recent floor-plan and wall cross-section data from the Cahokia, East St. Louis, Halliday, Horseshoe Lake, Grossmann, and Pfeffer sites in southwestern Illinois. Based on our review, it seems likely that the walls of most Early Mississippian wall-trench buildings in the central Mississippi Valley, whether flexed or rigid, were probably prefabricated on the ground,

permitting rapid construction if not also standardized buildings. We further argue that some wall-trench buildings correlate with a third kind of "curtain-wall" construction that would have facilitated wall repair.

### Background

Digging a narrow ditch of the sort that constitutes a wall trench could have been relatively slow hand work unless one possessed a stone-bladed garden hoe. Small versions of such hoe blades first appeared during the Middle Woodland period in the Midwest, with larger ground- limestone blades being made after about A.D. 600 or so (Fortier 1998). Sometime after 900, stone-workers in southern Illinois began producing the large, chipped Mill Creek chert blades better known from the Mississippian era (Cobb 2000). The earliest wall trenches in the Midwest postdate these first blades, appearing at the inception of the Mississippian period, ca. A.D. 1050, at Cahokia (see Milner et al. 1984; Morse and Morse 1983; Pauketat 1994). Since the wall trenches in the central Mississippi valley are usually about the same width as an Early Mississippian period hoe blade, about 12 to 15 cm, an association between wall trenches and stone hoe blades seems plausible (Pauketat and Alt 2005). Of course, other mollusk-shell or bone-scapula hoes might have been used elsewhere, and the senior author excavated one clear instance of a building whose exceedingly narrow wall trenches had been excavated using a digging stick (Alt et al. 2011).

In any event, compared to digging a structure's 40, 50, or 60 individual wall post holes by hand, wall trenches excavated with hoes might have been recognized as a time saving practice by Early Mississippian homebuilders. For this reason, and based on least-cost principles, some have suggested that wall trenches were adopted widely once people realized these benefits (Morse and Morse 1983). Of course, that line of reasoning leaves unaddressed the issue of why trench foundations correlate with the beginning of the Mississippian period in the Midwest, rather than with the widespread use of stone-bladed garden hoes. It also fails to address the reasons that wall trenches were adopted in localities of the Southeast where stone-bladed hoes were rare.

Besides noting the manner in which trenches might have been dug, most researchers have not directly addressed other possible reasons that wall trenches were adopted across the Midwest and Southeast. Partly this is because the timing and rate of adoption in certain areas remain imprecisely understood. Generally speaking, it has been noted that wall-trench construction was adopted at about the same time all across the Mississippian world owing to some heightened degree of long-distance interaction (Muller 1997). For some

analysts this might seem sufficient, since change happened so rapidly as to defy locating cause and effect.

However, with additional research in several regions, it seems plausible that the history of wall-trench construction may have involved centrifugal emanations of the practice from "Middle Mississippian" regions outward to the north, south, and east (Figure 1). Most clearly, the practice swept the Cahokia site at the beginning of the Lohmann phase (A.D. 1050–1100), appearing to correlate with the redesign and reconstruction of the pre-Lohmann (Terminal Late Woodland period) village into a massive new pyramid-and-plaza center with a population that soon surged to four to 10 times what it had been (Dalan et al. 2003; Pauketat 1994; Pauketat and Emerson 1997). Although resolution remains coarser than desired, it appears from multiple lines of spatial, architectural, and artifactual evidence that the transition to wall-trench construction was coterminous with the superpositioning of Cahokia's Lohmann phase central plan over the old Terminal Late Woodland village. Moreover, once it occurred, the transition at Cahokia was nearly total. There are few examples of pre-Mississippian-style single-set-post domiciles built after c. 1050 on the large excavated residential tracts (see Collins 1997; Pauketat 1994, 1998).

At one time, wall-trench construction was assumed to characterize all Lohmann phase occupations across the entire Cahokia region (Milner 1998; Milner et al. 1984). However, despite the complete conversion of architectural styles at Cahokia proper, excavations in the upland "Richland complex" east of Cahokia have demonstrated that the trench construction was not so readily adopted with distance from Cahokia. In some portions of the greater Cahokia region, it probably lagged by as much as two or three decades behind Cahokia proper (Alt 2001, 2002; Pauketat 2003). During that time, hybrid-style single-post-and-trench or "faux wall trench" buildings were constructed at upland settlements. These seem to indicate an attempted accommodation or emulation of the novel construction practice by the farmers living in these more distant places. Elsewhere, the senior author has argued that such hybrid practices might have been locally designed to recognize Cahokia's new architectural standard without sacrificing aspects of the familiar nonprefabricated, pre-Mississippian-style practices of the farmers residing in the late-eleventh-century countryside (Alt 2001).

Whether such localized construction lags happened elsewhere across the Midwest and Southeast is largely unknown. As documented at various town sites from Wisconsin to Louisiana and Georgia, the earliest houses built using wall-trench construction seem to fall within the Early Mississippian period, although possibly still

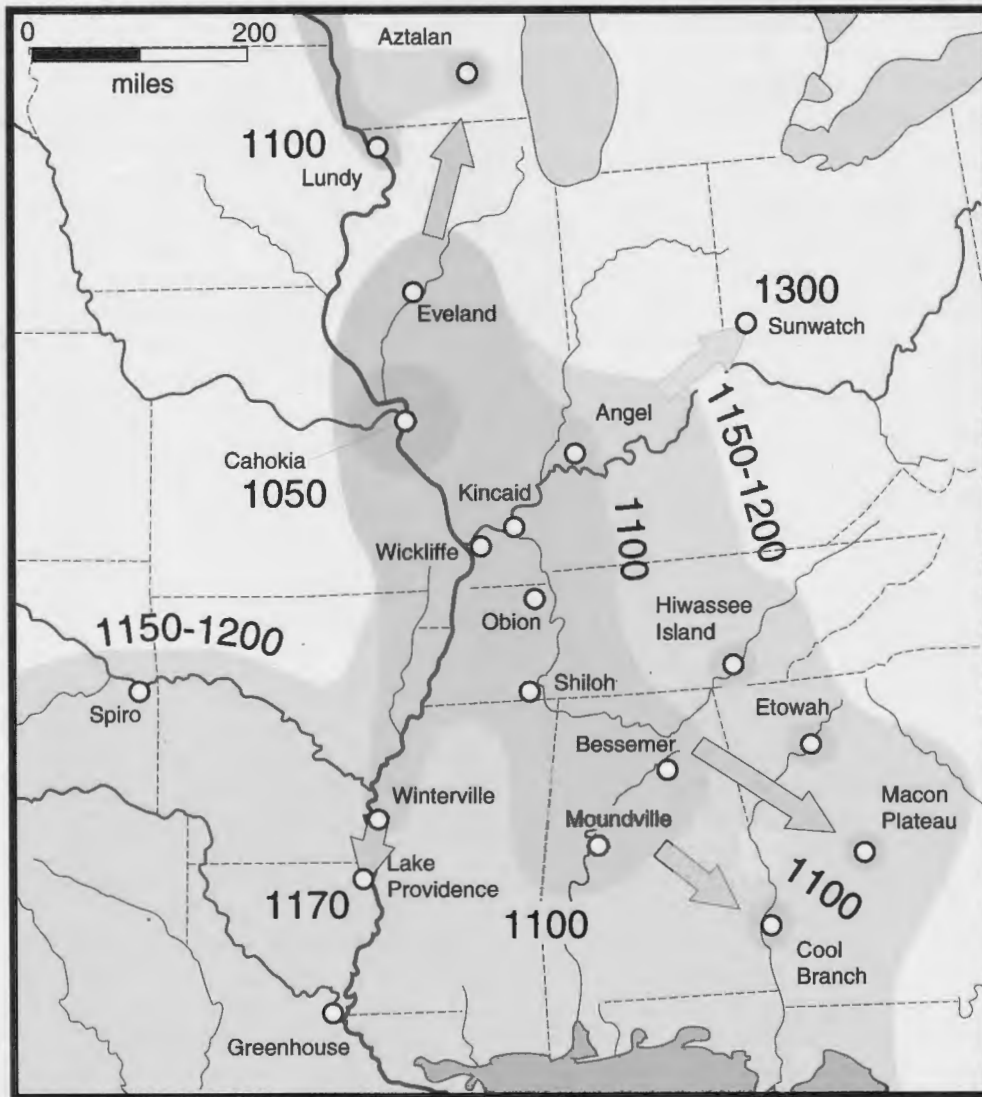


Figure 1. Distribution of Early Mississippian wall-trench architecture (adapted from Pauketat 2007).

later than Cahokia. To the north, wall trenches were carried to or adopted at Aztalan, Lundy, and Trempealeau sometime during or shortly after the late eleventh century (Emerson et al. 2007; Goldstein and Richards 1991; Pauketat et al. 2010). Wall-trench construction is also early at Angel, in southeastern Indiana (Peterson 2010), but it is not known to the northeast, save one building at the Fort Ancient site of Sunwatch sometime after 1300 (Cook 2004). Downriver, the earliest securely dated trenches are known from beneath Mound F at Winterville, with calibrated intercepts of A.D. 1060–1150 (Jackson 2006). Farther south, at the Coles Creek/Plaquemine site of Lake Providence, Louisiana, the earliest date falls in the late twelfth century (Wells and Weinstein 2007). To the east, at Summerville and Moundville in Mississippi and Alabama, they are known from the Early Mississippian period, which is dated in one chronological revision to just after 1100

(Maxham 2004; Pauketat 2007; following Knight et al. n.d.). And south and east of there in southern Georgia, Schnell et al. (1981) and Blitz and Lorenz (2002) now believe the earliest intrusive Mississippian people arrived with wall-trench architecture at about 1100.

Researchers assign the first wall-trench houses to an Early Mississippian period in eastern Tennessee and Georgia and, in turn, use the date A.D. 1000 as the beginning of that period (see Schroedl et al. 1990; King 2003). In this case, that date may be too early by a century (Adam King and Lynne Sullivan, personal communications, 2008); over seven of the 11 Early Mississippian Hiwassee Island dates and four of the seven early Etowah phase dates have intercepts that fall after 1100 (King 2003:table 8; Schroedl et al. 1990:table 21; Pauketat 2005:208fn). Of course, a late-eleventh- or early-twelfth-century date in the interior Appalachian region is still early and indicates at a

minimum a very rapid adoption of a construction practice that was part and parcel of the transregional Mississippianization process. Peterson's (2010) recognition that the Angel site, in southern Indiana, might have experienced an abrupt planned construction, like Cahokia's, or Blitz and Lorenz's (2002, 2006) sense of intrusive immigrants in the Deep South, support an argument that wall-trench construction was inextricably linked to a cultlike spread of a new cultural and political order (Pauketat 2007). It might also have been appreciated as an efficient mode of rebuilding architecture in short order (see "Discussion" section below).

As in the case of Cahokia, there are reports of early public buildings at Obion, Hiwassee Island, and Kincaid as either lacking wall trenches or as built only partially using wall trenches (Cole et al. 1951; Garland 1992; Lewis and Kneberg 1946:61). Taking such reports at face value, it is conceivable that wall-trench construction may have spread so rapidly across portions of the central Mississippi, lower Ohio, Obion, and Tennessee Rivers, say, over the course of two or three decades, to present construction challenges to local builders whose knowledge base remained pre-Mississippian. On the other hand, according to Tamira Brennan (personal communication, 2008), at this scale, (1) digging a wall trench may have been no less work than single posts (especially considering the depth that some of these posts reach), (2) prefabricated walls of this size may not have been a viable option, or (3) in the case of roofed buildings there could be a technological need for a "tighter fit" in order to add structural stability.

Minimally, that is, the rapid wall-trench adoption rate among domestic groups in conjunction with other pan-eastern changes, along with the hints of tentative adoptions or hybrid styles, indicate that wall trenches were, or were part of, knowledgeable and meaningful elements of pole-and-thatch architectural constructions (Alt 2001; Blitz and Lorenz 2002; Pauketat 1994). Meaning here may have been located in a new, more efficient way of digging building foundations, at least for ordinary-sized houses. It may have been embedded in the ways that walls could have been prefabricated and then set into place. Or there might have been some new ethos of building, perhaps because the kinds of labor organizations implied in building wall-trench houses exceeded pre-Mississippian family groups. Meaning, technology, and social organization, that is, might have been inseparable, and some people could have had multiple reasons for adopting wall-trench construction.

In any case, as further indicated by the possible patchy distributional or hybrid-style data from greater Cahokia to Hiwassee Island and Etowah, wall-trench construction was likely contingent on the scale of construction and subject to local social, environmental,

and technological exigencies that might ultimately have led to divergent building construction histories or alternate wall-trench styles in different regions of the greater Mississippian world. Thus it remains possible that, depending on such local factors, wall trenches might correlate with either flexed-pole or rigid-post construction, or both, in some regions (see papers in Lacquement 2007). In other regions, this analytical dichotomy might even conceal additional construction variants.

### Methodological Issues

Further obscuring possible construction variants are field-methodological issues. Paramount among these are problems of feature definition and wall-foundation documentation. Depending on soil or feature-fill conditions, the definition of post holes and wall trenches can be difficult. Fill matrix color, texture, and moisture may differ in subtle ways from background subsoils, inhibiting accurate feature delineation. Wall trenches can be particularly difficult to identify when soil conditions are dry, since they were commonly backfilled by the builders with the very same subsoil extracted from them in order to stabilize the emplaced wall.

Lewis and Kneberg (1946) recognized this problem at Hiwassee Island. There, structure post molds were often relatively simple to define, especially since many buildings had been burned and the charred posts stood out clearly. Given the limited use of canvas tarps to cover ongoing excavations, however, exposed structure floors and wall foundations would have baked-out to the point of invisibility. Regardless of the skill of the excavators, certain old excavation details must be critically reevaluated today.

For instance, during the 1960s salvage excavations at Cahokia, prior to the ready availability of plastic sheeting used to shield features from the summer sun and impede evaporation, archaeologists frequently overlooked wall trenches or incorrectly delineated them as a series of shallow or short, discontinuous segments (see, for example, Tract 15A-Dunham features H38, H111, H112, H126, H161, H215, and unnumbered structures A, F, and J; Pauketat 1998). These excavators were sometimes only able to see the darker and patchy upper zones of some wall trenches, overlooking the organic-free lower zones. More recent large-scale excavations have largely corrected this problem through diligence, ample supplies of black plastic sheeting, and thorough cross-sectioning of all possible posts and wall trenches (see Emerson and Walthall 2006; e.g., Alt 2006; Fortier 2007; Hanenberger 2003; Jackson et al. 1992; Pauketat 2005).

Of course, cross-sectioning everything, and recording profiles of all post holes, trenches, or depressions, has the disadvantage of producing less-than-photogenic house floors. Perhaps for this reason, merely scooping out the fills of post molds or wall trenches from above, in the hopes that the post bottoms will somehow be sensed by the excavator, might seem like a reasonable alternative (following standard 1930s public archaeological practice). However, post holes and wall trenches often have multiple fill zones, including the lower, largely sterile backfills difficult to see even during full exposure in a cross-section profile, much less with a spoon at the bottom of a dark narrow hole. Moreover, a post mold's shape, orientation, or slant, relative to the post hole or wall trench, can provide a measure of the former upright's degree of flex or tilt (see Brennan 2007:82).

Such measurement, a valuable form of architectural data, is difficult if not impossible to determine without bisecting wall-foundation features. Likewise, the fill characteristics of post holes or post molds, whether compressed, jumbled, laminated, organically enriched, and so on, are revealing of the mode of building abandonment, again difficult to observe without systematic cross-sectioning. When seeking to establish whether a wall was built using flexed-pole or rigid-post techniques (never mind whether or not it was later removed or allowed to rot in place), accurately gauging the relationship of the trench or post hole to the post mold is essential.

### Architectural Modes

Fortunately, the recovery of building construction details has been an explicit component of the Illinois State Archaeological Survey and the University of Illinois' Early Cahokia Project and Richland Archaeological Project excavations at sites in the southwestern Illinois uplands (Pauketat 2003). As a result, floor-plan and wall cross-section data from the East St. Louis, Halliday, Horseshoe Lake, Grossmann, and Pfeffer sites in southwestern Illinois exist that can be compared to older excavations at Cahokia and elsewhere. For present purposes, we highlight pre-Mississippian-style buildings at the Cahokia, Halliday, and Pfeffer sites compared to public architecture at Grossmann, Horseshoe Lake, and Pfeffer, and to wall-trench domiciles from all of the above.

#### *Rectilinear Single-Set-Post Buildings*

The general characteristics of Terminal Late Woodland single-set-post domiciles in the greater Cahokia region is well known (see Emerson and Jackson 1984;

Kelly 1990; Kelly et al. 1990; Pauketat 1998). These small, rectilinear, semisubterranean structures, which were primarily sleeping quarters for households, possessed floors that typically covered between 6 and 12 m<sup>2</sup>. Along the perimeters of the floors, spaced 20 to 30 cm apart, were individually dug post holes into which uprights had been placed. The interior floor area often featured the refilled remains of larger post holes, one or two along each long wall, and, sometimes, a wide but shallow post hole or depression midway along one long wall.

Similar architecture, much of it dating to the mid-eleventh century A.D., exists at the Halliday site (11-S-27), excavated as part of the Early Cahokia Project between 1995 and 2000 (Pauketat 2003). There, the pattern of interior roof support posts, two along each long wall, and a fifth stepping post or depression is the norm (Figure 2). Of 41 post structures at Halliday, only nine did not possess the four-post interior structure (and seven of these were small, square storage huts or anomalous in some other way [notes on file, University of Illinois, North American archaeology lab]). These interior roof supports may have been very similar to the rigid interior frameworks, or trusses, used to support many eastern indigenous buildings (that illustrated by Newcombe [2001:figure 4] inside a Wichita "grass lodge" is a particularly good example). Their size, roughly 10–15 cm in diameter, suggests a substantial structure supporting what would have been an outer flexed wall-roof superstructure (Figure 3).

Also commonplace in pre-Mississippian-style architecture is (1) an absence of prominent wall corner posts and (2) evidence of inwardly flexed walls. Regarding the former, it is noteworthy that the larger posts often appear to be located toward the center of any given wall. As for the latter, indications of flexed walls include vertical post holes with slight lipping on their inner edges as well as obviously dipping post molds, sometime within post holes clearly dug at angles of several degrees in order to facilitate a low wigwam-style roof (Figure 4).

In short, there are ample indications that pre-Mississippian-style single-set-post buildings possessed flexed-pole, arbor or wigwam-style walls and roofs. Based on the post-abandonment fills in the semisubterranean house basins at sites such as Halliday, and rare instances of burned structural remains (including a Terminal Late Woodland house at the Hal Smith site, 11-S-885), it appears that these buildings were not daubed. Instead, earth was probably heaped up against the lower outer walls while the upper sections were thatched. Such construction was not limited only to small domiciles, although larger examples are rare, and include a semisubterranean, single-set-post building at the Pfeffer site (see Pauketat and Alt 2005).



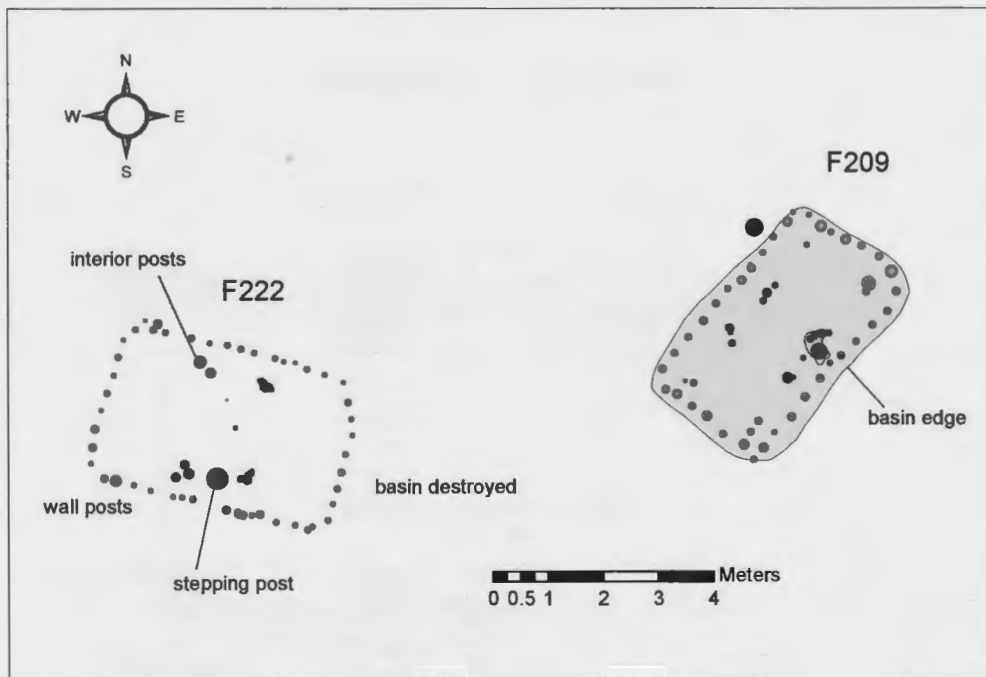


Figure 2. Plan view of pre-Mississippian-style single-post buildings at the Halliday site, St. Clair County, Illinois.

However, other large single-set-post buildings, such as public buildings at the Range site, were not built in basins and were not necessarily built with flexed-pole construction (Kelly 1990). In fact, larger Mississippian versions of these same public buildings include the

large, square “council houses” at the Grossmann site, which measure about 10 m on a side (Alt 2006). The post holes of these buildings range from 10 to 20 cm in diameter, and are deepest in the middle portions of walls, reminiscent of pre-Mississippian domiciles (Fig-

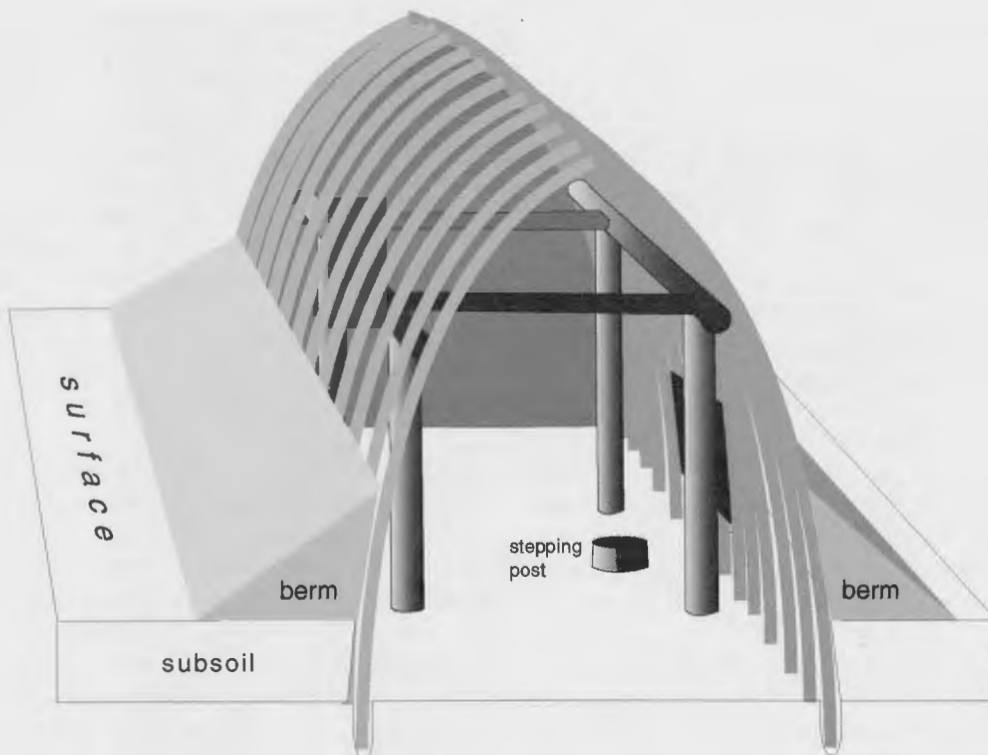


Figure 3. Cutaway view of projected pre-Mississippian-style structure.

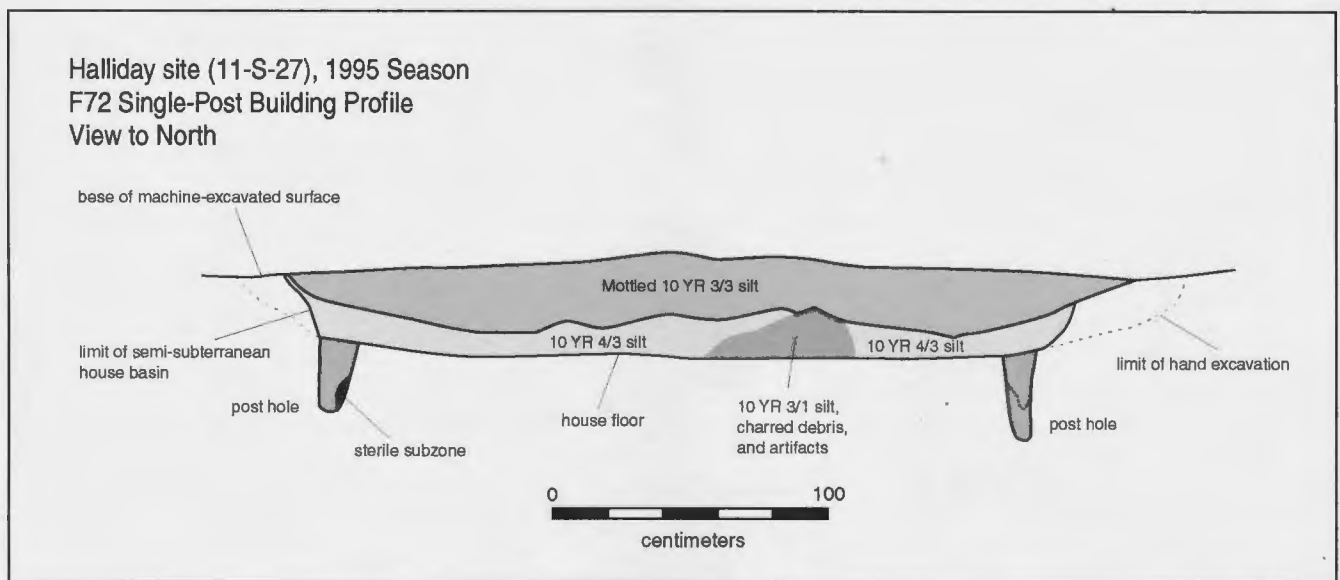


Figure 4. Composite profile of single-post building at the Halliday site, St. Clair County, Illinois.

ure 5). The deep middle posts have been thought by McConaughy (2007:111) as consistent with flexed-pole walls. However, the posts in these oversized houses were presumably large, equal to or greater than 10 cm in diameter, and may not have been flexible (see Brennan 2007; Lacquement 2007). Moreover, the roof of each building was supported by a sizeable central post (30–40 cm in diameter), a structural feature duplicated in similar meeting houses at Cahokia and Mitchell (Alt 2006; Pauketat 1998; Porter 1974).

#### *Large Rectilinear and Curvilinear Wall-Trench Buildings*

Similar to the large single-set-post buildings above, large rectilinear and curvilinear buildings constructed in wall trenches suggest likely rigid-post construction. The most obvious examples are also the largest buildings in the greater Cahokia region: the residence, temple, or hall atop the highest terrace of Monks Mound; rectangular buildings north of the Woodhenge and the Tract 15B compound; and the circular rotundas on Tract 15B and under East St. Louis's Cemetery Mound (Kelly 1997; Pauketat 1998:114, 2005:figure 4.5, 2008; Reed 1977). All exceed 18 m in length or width and feature at least one large central roof-support post. In addition, at least two of these buildings (and others at East St. Louis) had squared post molds, revealing that the uprights were logs that had been planed into their final shapes.

The Tract 15B rotunda had been rebuilt at least once, as indicated by its wide, redug wall trench, and appears to have had a series of associated external post pits (Figure 6). While the 1960 salvage excavation notes on this 15B building are unclear on the

association, it is possible that this rotunda had been built using a rigid-post technique similar to that of Plains earthlodges, which featured tilted exterior supports in addition to rigid-post wall uprights (Roper and Pauls 2005).

#### *Small Rectilinear and Curvilinear Wall-Trench Buildings*

While the large rotundas, halls, temples, elite residences, or council houses were probably built with rigid-post technology, this same rule does not necessarily extend to all rectilinear and curvilinear wall-trench buildings. At least one small circular building atop an early stage of the Horseshoe Lake mound, dating to the Lohmann phase, clearly features an inwardly slanted wall trench (Pauketat et al. 1998). That building, and possibly other small circular buildings or "sweat lodges" in the region, likely sported a wigwam-style flexed-pole frame. Still other circular buildings, with vertical wall trenches and central roof-support posts, might have had vertical rigid-post walls.

Similar variation in construction might have characterized small, domestic-sized rectilinear wall-trench buildings. The floors of Early Mississippian wall-trench buildings, typically covering 10 to 20 m<sup>2</sup>, sometimes reveal a rigid-post interior framework and sometimes do not in ways that might correlate with size or intended longevity. For instance, the Early Mississippian architecture at the Grossmann site routinely featured the internal four-post roof trusses similar to the Terminal Late Woodland flexed-pole buildings (Figure 7).

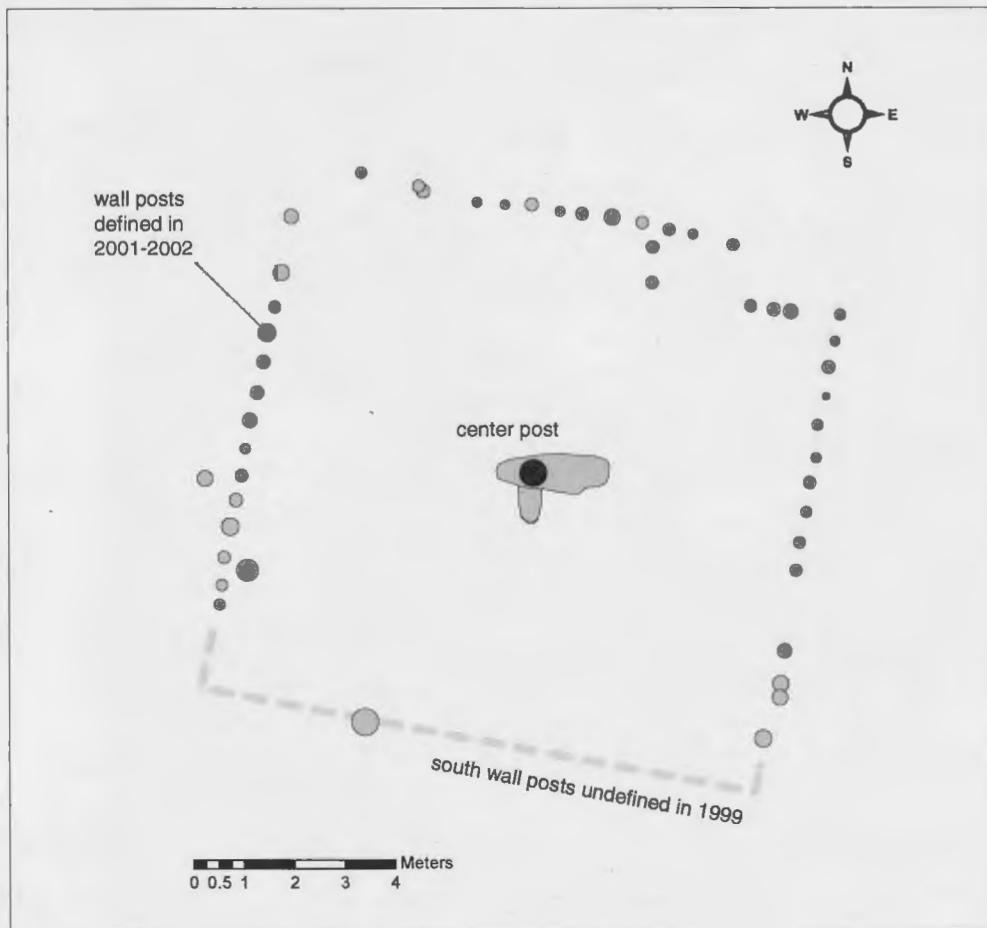


Figure 5. Plan view of Council House, Grossmann site, St. Clair County, Illinois.

Of course, the Grossmann buildings might have been components of a special "outpost," or home to Cahokian administrators or religious specialists (Alt 2006). Here, as at Cahokia and several other sites in the region, were special-purpose rectilinear buildings, the homes of important people, religious temples, and shrine houses. Some of these possessed side rooms, enclosed porticos or alcoves that gave them elaborate L, T, or cruciform shapes in plan view (Alt 2006; e.g., Collins 1997; Pauketat 1993, 1998; Smith 1977). In such cases, additional posts sometimes lined the wall interior, signatures of substantial internal structural support.

In contrast, small rectilinear wall-trench buildings at other sites did not have internal roof support posts. For example, of 10 wall-trench structures excavated at the Halliday site, all but one of which were smaller than the average single-set-post house at the same site, only one had the four-post interior structure that characterized the earlier buildings. The rest had none. A similar lack of interior posts is seen in a number of buildings at Cahokia, although the older salvage excavations may be unreliable (e.g., Pauketat 1998). Larger and later Mississippian domiciles, with floors covering in excess

of 20 m<sup>2</sup>, do characteristically feature one or more roof-support posts, but not the rigid trusses of the earlier forms (Figure 8). Reed (2007:28) suggests that such modest to missing internal roof support might be consistent with flexed-pole construction, although his specific logic is countered by that of Brennan (2007). McConaughy's (2007) consideration of bent timbers in burned structures suggests that at least some of the buildings in the greater Cahokia region and elsewhere in Illinois might have had flexed-pole components (see Discussion, below).<sup>1</sup>

#### Discussion: Trusses and Curtain Walls

Our review of large and small single-set-post and wall-trench buildings seems to indicate that both flexed-pole and rigid-post buildings were constructed in the greater Cahokia region in ways that varied through time. Initially, during the Terminal Late Woodland period, flexed-pole structures were probably the norm, with most architecture consisting of domiciles built by family groups. Rigid-post construction was most obviously used in the construction of the



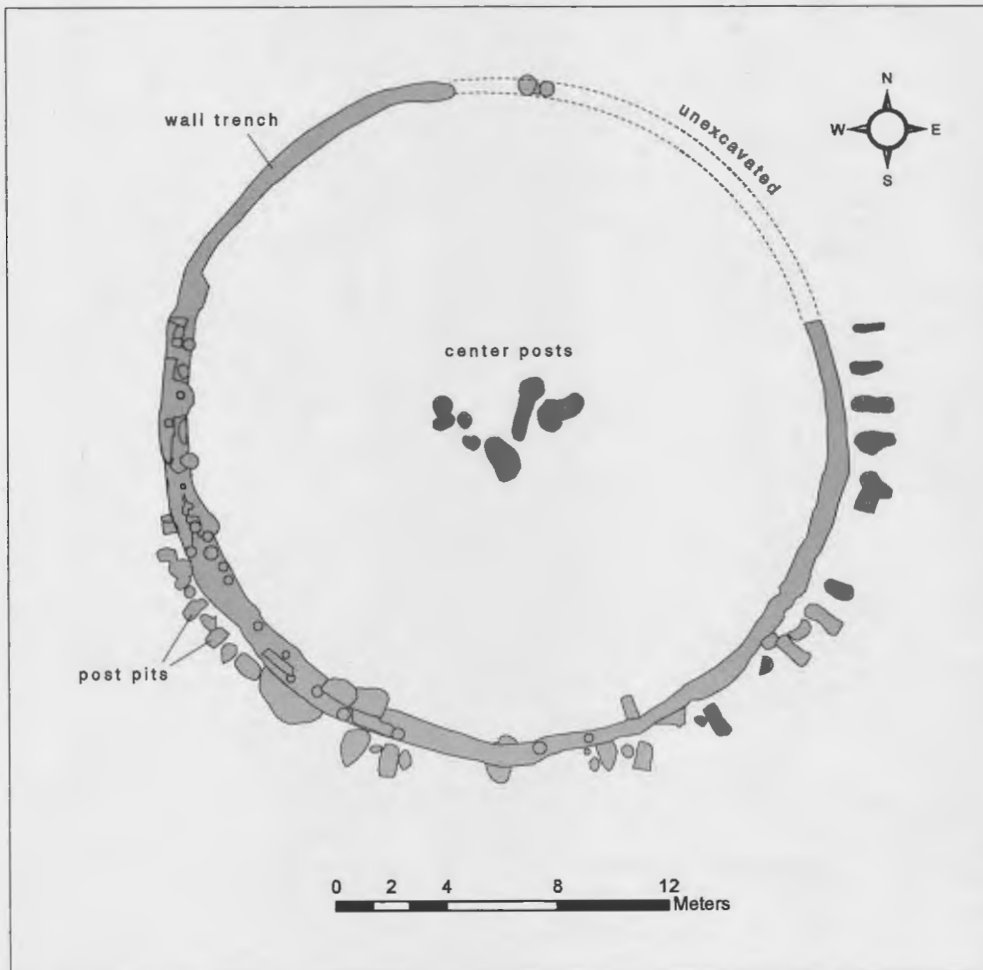


Figure 6. Plan view of Rotunda Feature 238, Tract 15B, Cahokia.

large public buildings at least by the Lohmann phase at and around Cahokia. Such techniques might have ranged from standard gabled- or hipped-roof buildings with large internal roof-support posts to more complex rotundas with earthlodge-like rigid-post walls and roofs. At least some flexed-pole buildings, such as the small circular sweat lodge atop the Horseshoe Lake mound, are likely.

However, the question remains as to whether or not flexed-pole or rigid-post construction techniques were employed to frame-up the majority of the other Early Mississippian rectilinear buildings. Based on the evidence, it would seem premature to exclude rigid-post, gabled- or hipped-roof constructions, as does Reed (2007), without considering data on the positions of wall posts in wall trenches. This is particularly the case for Early Mississippian buildings, and perhaps less true of the later phase buildings. In any case, while Reed's (2007) selection of floor plans from various excavations may support his conclusion that load-bearing walls set in trenches (without basins or interior

trusses) were doomed to fail, there are other construction options to consider (see also Brennan 2007).

We suspect, based in large part on our identification of the interior four-post trusses of Early Mississippian buildings in the greater Cahokia region, that there may be a third construction technique, in addition to the simple flexed-pole versus rigid-post option. We will call this technique "curtain wall" construction. As we envision it, curtain-wall construction may have been an innovation that built on the pre-Mississippian-style domicile, which is not merely a flexed-pole structure after all, but a rigid-post interior structure supporting an exterior flexed-pole superstructure.

From such a pre-Mississippian foundation, it may have been a small but potentially significant architectural step to construct a curtain-wall building. And, as it turns out, a number of native North American groups not only built both flexed-pole and rigid-post architecture into the twentieth century but also built structures with rigid-post walls but flexed-pole roofs similar to one possible variant of our proposed curtain-wall style.

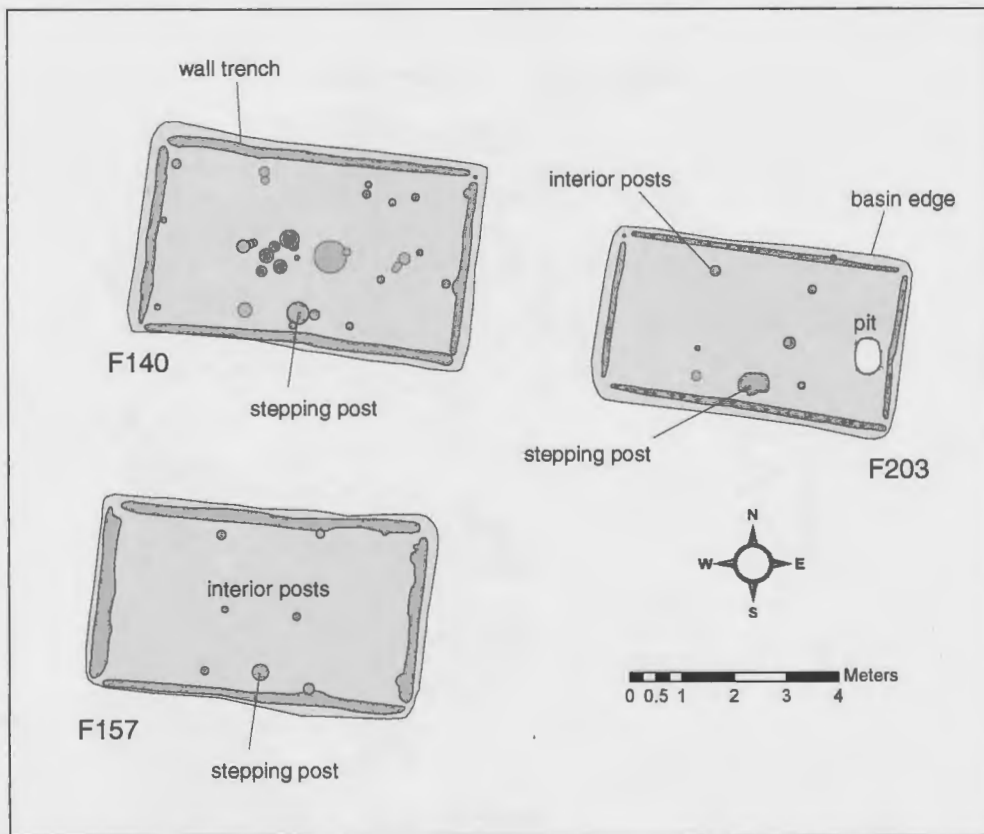


Figure 7. Plan view of Early Mississippian wall-trench buildings at the Grossmann site, St. Clair County, Illinois.

Examples of the latter are known historically from numerous eastern Plains and Woodlands groups (e.g., Bailey and Young 2001:figure 5; Reed 2007:figure 2.7, top; Roper and Pauls 2005; Wedel 2001:figure 4, top, lower left). In these examples, arbor roofs may top otherwise rigid-post walls.

For Early Mississippian buildings in the greater Cahokia region, the basin structure for such a curtain-wall building would have consisted of the traditional rigid-post load-bearing interior truss framework set into a semisubterranean basin, perhaps incorporating "tie beams" as suggested by Brennan (2007:83). However, rather than merely arching flexed wall poles over this structure and tying them off to form a roof (as per the common flexed-pole building), curtain-wall construction would have involved a two-part wall-roof construction (Figure 9).

Importantly, the roof of such a building might have itself been made up of either a framework of rigid posts that rested primarily on the interior trusses, or a series of flexed poles attached not to the ground but lashed to horizontal members at the tops of opposing curtain walls and bent over the central ridge pole. The former case is not significantly different from the way in which a Plains earthlodge, a Kickapoo summer house, or an Iowa rectangular bark house was built (among others,

as noted above). In the case of either a rigid-post or bent-pole roof, it was the interior truss framework, not the vertical walls in wall trenches, that carried the roof's weight. The building's exterior curtain walls would have been non-load-bearing. There would have been no structural problems involving sagging corners, as illustrated by Reed (2007:figure 2.2), and very little reason to use heavy timbers for the exterior wall superstructure.

#### *Wall Prefabrication*

Trusses, trenches, and curtain walls also open up some interesting possibilities with regard to the manner in which walls might have been framed, set into place, and replaced later in time. Setting individual posts into individually dug post holes is a straightforward procedure that imparted stability to each upright as construction continued, meaning that a small number of people could implant the posts and subsequently lash on horizontal cross-members or bend the uprights together to form an arbor roof without fear of the various uprights falling over. But that method of construction would have been difficult at best if one attempted to set individual posts into a continuous, open trench. Unstable posts would have

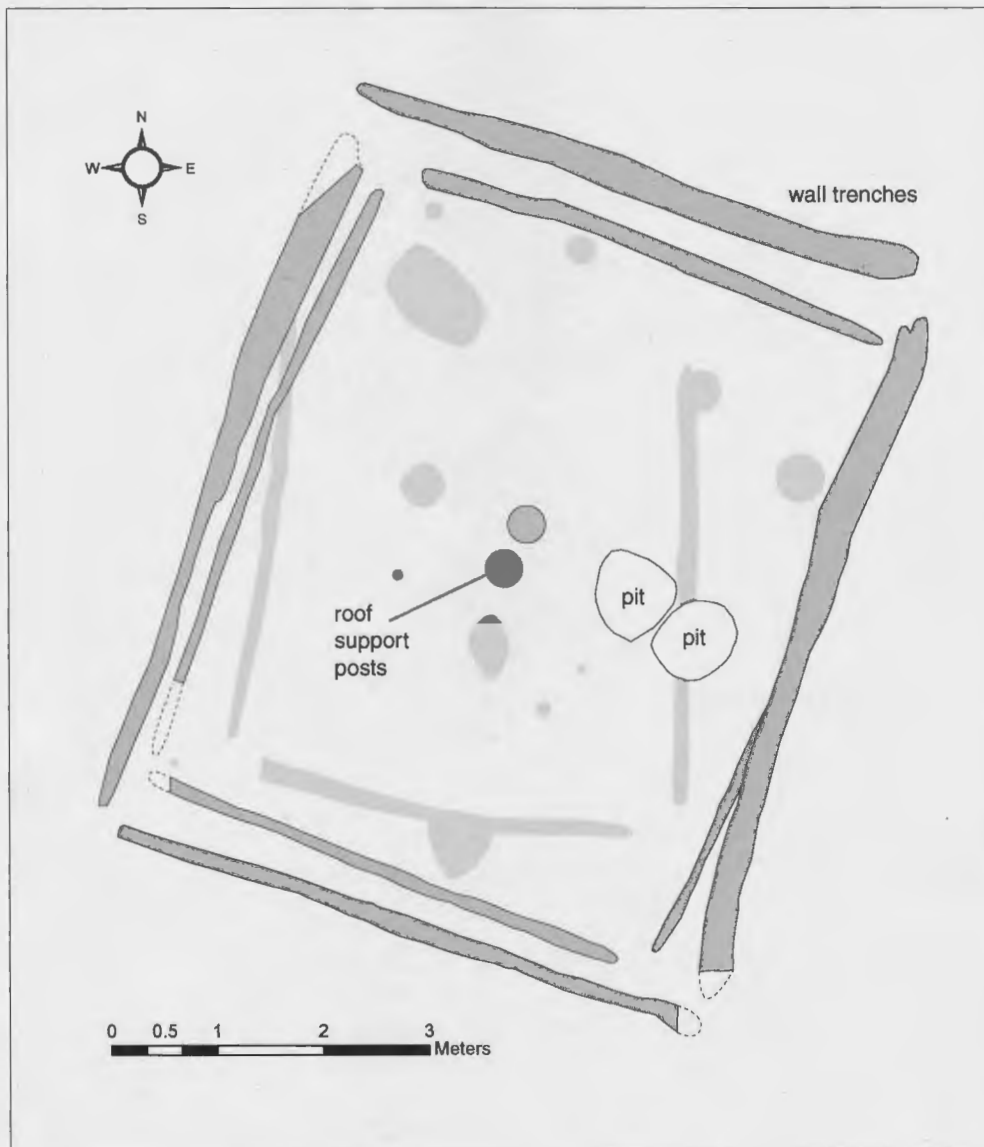


Figure 8. Plan view of Late Mississippian building, Tract 15B, Cahokia.

fallen over until the trench was packed shut with damp clay.

That is, as first noted as a possibility by Lewis and Kneberg (1946:50), wall-trench construction makes likely the practice of prefabricating and then emplacing entire walls, not individual posts, into open wall trenches at once (see also Pauketat 1994; Pauketat and Alt 2005; Pauketat and Woods 1986). This could have been done for flexed-pole walls and rigid-post walls, either of which, standing in place awaiting the emplacement of other walls, might have been more easily supported by individual wall trenches rather than a continuous four-sided trench. Indeed, while Lewis and Kneberg (1946:51) had considered the four "corner gaps" of rectangular wall-trench buildings to be possible entrances or "ventilation" openings, such is unlikely in the cooler climates of the Midwest. There,

most wall-trench buildings were, in fact, built in semisubterranean basins up to a meter deep. Entrances are documented for midpoints of long walls in the form of stepping posts or floor depressions. Thus the open corners presumably were points where the separate non-load-bearing walls would have been lashed together or wattled shut.

In addition, open-cornered, prefabricated non-load-bearing curtain walls would have had distinctive advantages with regard to maintenance over traditional flexed-pole wigwam-style structures. Pole walls are subject to decay at their bases, requiring replacement of the entire wall if not the whole structure. However, replacing rotten curtain walls would never have necessitated reconstructing the entire building. Rather, building repair would have been as simple as cutting the lashed corners, thus freeing the problem wall from

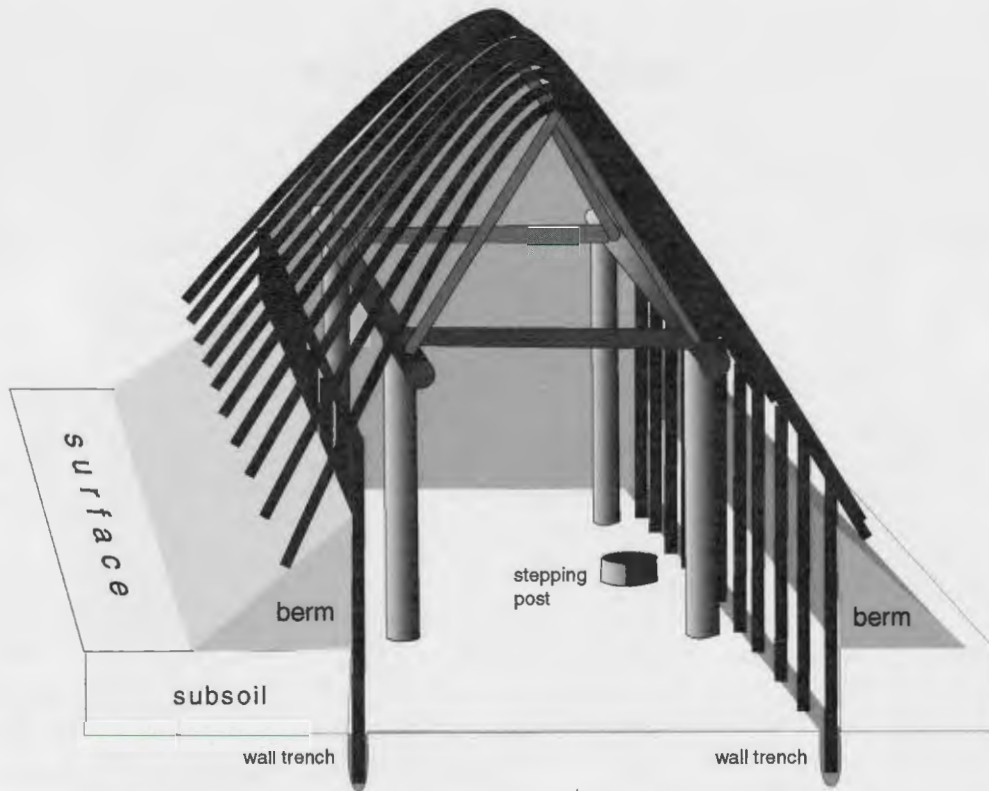


Figure 9. Cutaway view of projected Early Mississippian curtain-wall structure.

the rest of the structure. Subsequently, the individual wall could have been removed and replaced without major alterations to the structure, the roof, or the other curtain walls. Moreover, this may have afforded a greater permanence to buildings.

Of course, both in their prefabricated construction and their ease of replacement, the new houses would have afforded a different social dynamic (and possibly meaning) to the people attached to the building. For instance, rather than obtaining wooden poles and construction materials off site, followed by the aggregation of those materials on site and, finally, the execution of each individual building, wall prefabrication might have afforded some walls to have been lashed together off site. This might have been a viable option, assuming that the walls were not too heavy and could be carried to the construction site, lessening on-site construction time and, possibly, adding more flexibility to the construction effort.

Likewise, such ease of construction that wall-trench architecture afforded might have gone hand in hand with an alteration of the age, gender, or familial composition of work groups needed to raise a building. Such may be particularly true given the constraints that accompanied coordinated construction efforts at some Mississippian centers, particularly Cahokia. Of course, smaller scale coordinated architectural constructions are evident during pre-Mississippian times in the

greater Cahokia region at the scale of community courtyards: Feature-superposition and reconstruction evidence from Terminal Late Woodland residential courtyards at Cahokia's Tract 15A and from the unusual Early Mississippian village of Halliday strongly argues that all of the homes around individual courtyards were rebuilt at once (Pauketat 1994, 1998, 2003). In such instances, family labor might have been sufficient in the rebuilding effort. However, the radically scaled-up coordinated reconstruction of Cahokia at the beginning of the Mississippian period, with thousands of new residents, might have posed an immediate housing crisis. Thus if rapid construction of multiple houses or entire neighborhoods occurred, as Pauketat (1994) has argued for mid-eleventh-century Cahokia proper, prefabrication of walls if not also the innovation of a curtain-wall construction technique—still based on a traditional interior truss structure—might have solved the immediate problem of new housing, in addition to giving the place a whole new look.

### Conclusion

Whatever solutions might be imagined to accommodate the architectural evidence from any one region, the ultimate solution to the question of wall-trench



adoption must also consider the transregional scale of the problem. The conversion to wall trenches happened rapidly across vast stretches of the American mid-continent and mid-South over a few decades to a century. If there was little difference between building a wigwam-shaped domicile using individually dug wall post holes versus doing so using builders' trenches, then why would such a minor alteration in the mode of digging a hole have swept the American midcontinent just after 1050?

Arguably, no change in the built environment—even seemingly minor alterations in how one constructs a wall—could have occurred without impacting in important ways the construction technology, labor organization, or meanings of buildings. Thus wall-trench practices presumably involved more than simply a new way to dig a wall foundation, although the reasons for and ramifications of such new practices remain to be fully understood in most regions where they are known. Perhaps it is simply serendipitous that the invention of this technology occurred at a time when information and exchange networks were rapidly expanding—though highly unlikely, this is certainly a consideration.

In the greater Cahokia region, some builders may have employed “curtain wall” techniques. But flexed-pole and rigid-post buildings of various sorts were probably also constructed throughout the Mississippian period in that region, as well as many others. Minimally, in the vicinity of Cahokia, small or Late Mississippian houses were likely flexed-pole constructions while large, Early Mississippian structures were probably rigid-post constructions. In between, there was variation in building form, as the architectural design standards of the center were probably loosened in outlying localities to accommodate local sensibilities and exigencies.

Of course, however variable across space and through time, the architectural patterns evident in the greater Cahokia region may not apply everywhere. But they do point to the complexity of the issue at hand. Even in the greater Cahokia region, that is, where many hundreds of domiciles and scores of public buildings have been excavated in recent times, and where wall posts and trenches are commonly bisected, the solutions to the question of wall-trench adoption cannot be boiled down to a single wall-construction type.

Ultimately, any larger historical explanation of the transregional phenomenon of wall-trench architecture requires considerably more data from regions outside greater Cahokia. Larger samples of excavated houses are needed, especially samples that provide precise details of wall foundation depths, angles, and diameters. Of course, doing this requires a commitment to a systematic post and trench cross-sectioning methodology—with bisections perpendicular to the orientation

of the wall (in order to catch lipping and post angles)—instead of adherence to a post-scooping approach in all regions of the Midwest and Southeast. This might be the only way to resolve a key pan-eastern conundrum: Why wall trenches?

## Notes

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<sup>1</sup>One particular burned building, excavated at the Lawrence Primas site north of Cahokia, has figured prominently in discussions of flexed-pole versus rigid-post construction. In 1986, Woods and Pauketat suggested that, given this building's center post and wall sill, it had probably been built with prefabricated walls and a hipped roof. McConaughy (2007:113–114), not commenting on the prefabricated wall idea, believes that a curved charred timber probably indicates flexed-pole construction, a position that is consistent with a previously unreported attribute of the charred structural remains in the buildings western wall trench: Upon cross-sectioning that wall in a longitudinal fashion, the junior author discovered that the charred wall studs were slightly tilted, dipping inwardly from the bottom of the wall trench toward a likely flexed-pole roof peak. The prefabrication idea still stands, so to speak, but McConaughy's (2007) conclusion would seem verified by this cross-section detail.

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