

7.0 THE JONES SITE: ARCHAEOLOGY

7.1 SITE EVALUATION: FIELD STRATEGY AND FINDINGS

The NRHP evaluation of the Jones Site was conducted in two stages. The first stage of consisted of shovel testing and the excavation of a limited number of 1-x-1 m (3.3-x-3.3 ft.) test units. A second stage of the investigations included the excavation of additional 1-x-1 m (3.3-x-3.3 ft.) test units and mechanically stripped trenches.

7.1.1 Shovel Testing

In total, 430 shovel tests were excavated during the site evaluation. An additional 133 shovel tests were excavated during the data recovery following the removal of a large earthen berm or spoil pile which was located within the site boundaries. The results of all shovel testing conducted are summarized in this section. The shovel tests were placed at 10-m (32.8-ft.) intervals, with 5-m (16.4-ft.) intervals utilized in areas of dense artifact concentrations (Figure 7-1). Shovel testing served three major purposes. First, close interval testing further delineated site boundaries determined through previous archaeological investigations conducted by UDCAR and LBA. Secondly, additional artifacts provided more concise temporal and functional data for site components. Lastly, the distribution of artifacts identified areas of greatest archaeological potential and provided some indication of feature locations within the site. These data were considered prior to test unit placement. Shovel testing yielded a total of 967 historical and 23 prehistoric artifacts.

A limited number of 18th- and 19th-century historical artifacts were recovered, consisting of over 50 percent brick fragments. Two concentrations of architectural related artifacts, mainly brick, were found across the site; one located to the north (near Trenches 1 and 2), and another in the vicinity of the spoil pile (near Trenches 3-6) (Figure 7-2). While the majority of the historical artifacts came from the plow zone, the heavy concentration of brick fragments in the northern portion of the site suggested the presence of subsurface features.

According to shovel test data, the vast majority of the artifacts were contained in the plow zone (Table 7-1). The small number of historical artifacts occurring below the plow zone was similar in types to those recovered from the plow zone and consisted of brick fragments, a terra cotta drain pipe fragment, and ceramic sherds including coarse red earthenware and stoneware. Further discussion of artifacts appears in Chapter 8.0 Analysis and Discussion.

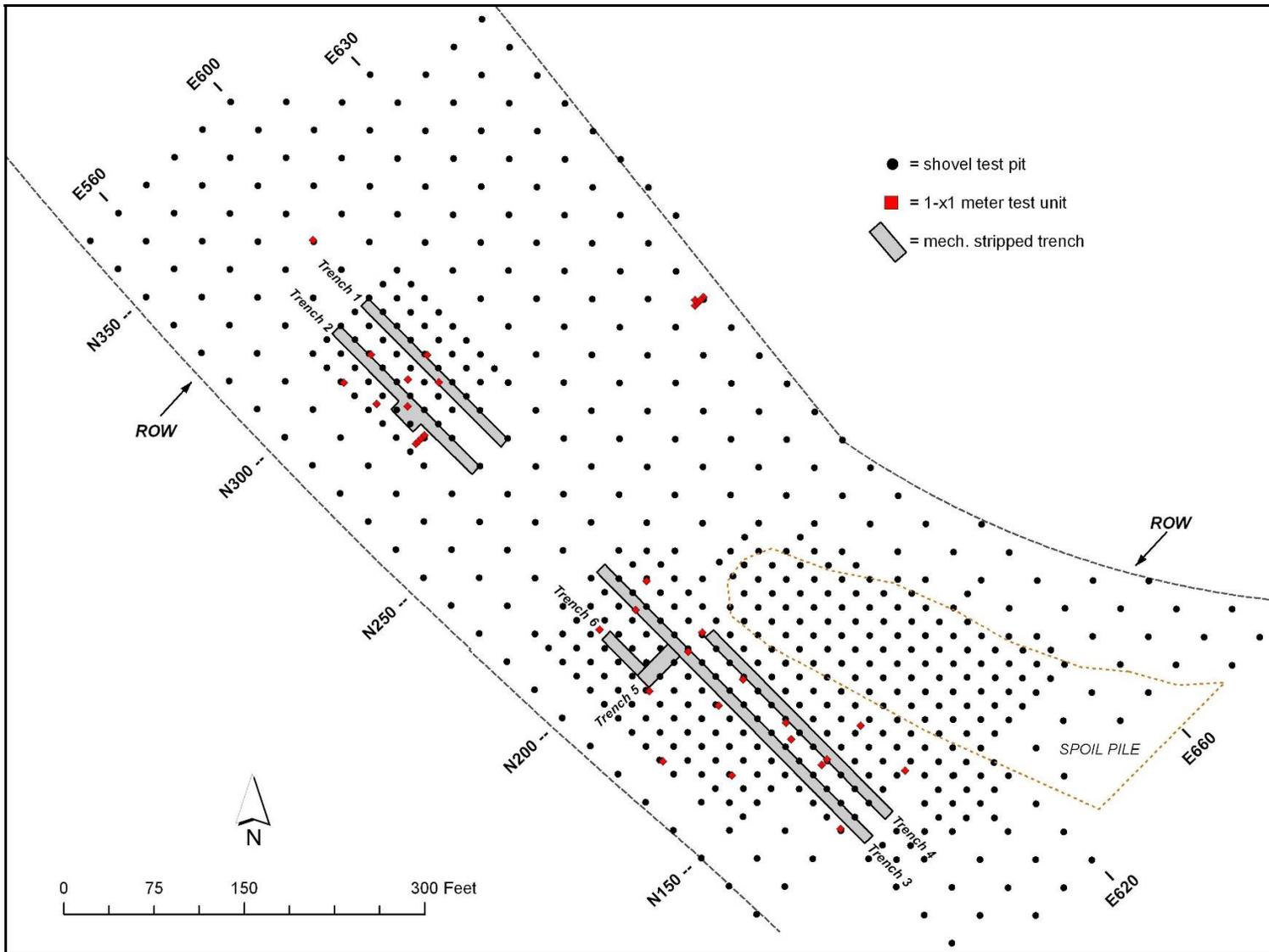


Figure 7-1. Location of Shovel Tests, Test Units, and Trenches Excavated During the Site Evaluation in Relation to the Project Right-of-Way.

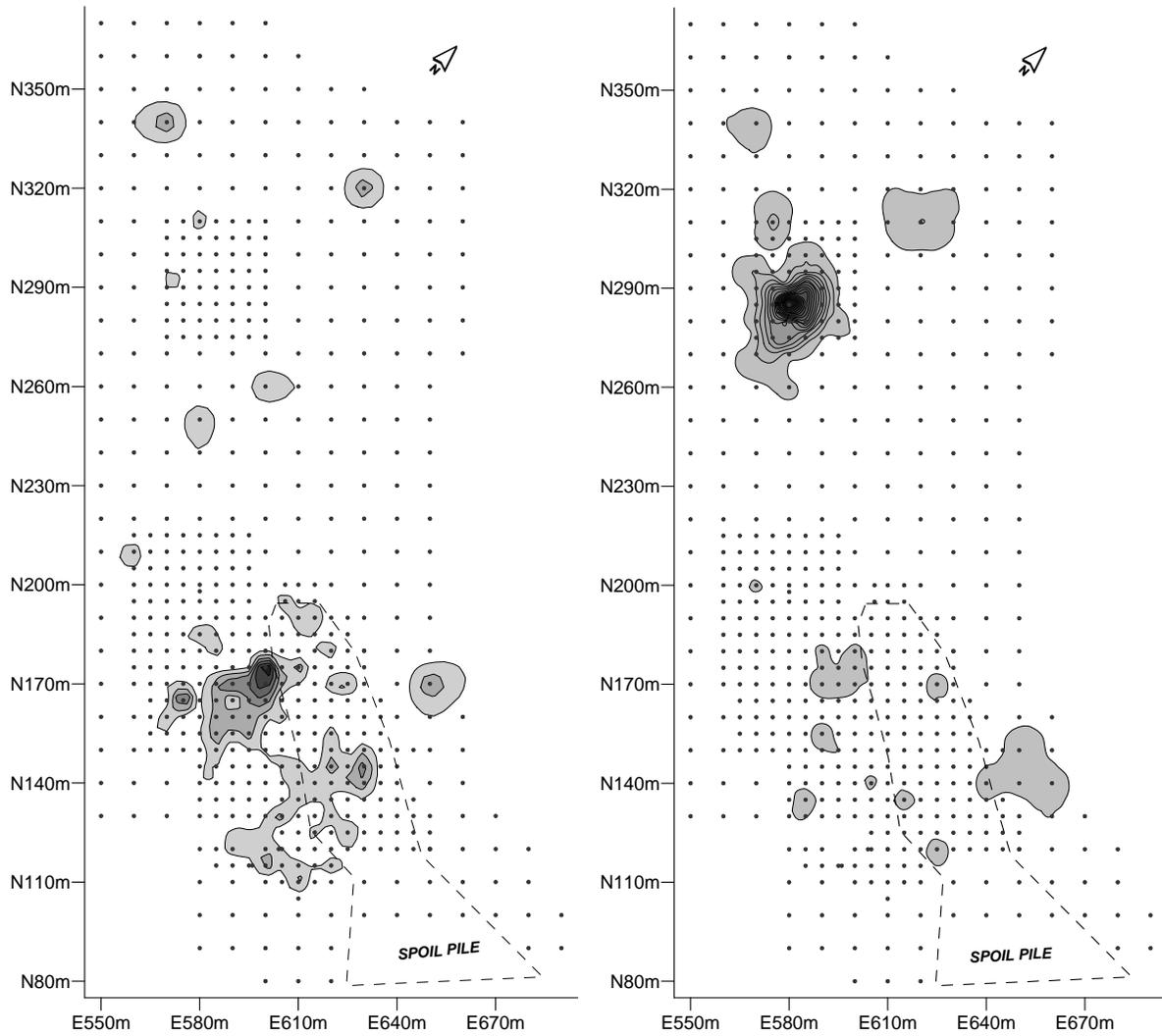


Figure 7-2. Frequency Distribution of Historical Artifacts within Shovel Tests.
 [left: non-brick artifacts (cont. int. = 1); right: brick only (cont. int. = 10)]

Table 7-1. Shovel Test Artifact Distribution by Stratum

7.7.1 Stratigraphic Context	7.7.2 Prehistoric	<i>Historical</i>	<i>Total</i>
Plow Zone	18	956	974
Sub-Plow Zone	5	11	16
Total	23	967	990

The trend in vertical distribution, with nearly all artifacts contained in the plow zone or on the surface, conforms to patterns observed on sites subjected to extensive agriculture. The few artifacts identified below the plow zone likely reflect materials pushed downward during plowing or are the result from natural forces such as bioturbation.

7.1.2 Test Units and Stratigraphy

Following analysis of the shovel test data, 34 1-x-1 m (3.3-x-3.3 ft.) test units were excavated to evaluate stratigraphic integrity, artifact concentrations, and to locate subsurface features. Test unit excavation results indicated locations most likely to contain cultural features and guided the excavation of 961 linear feet of backhoe trenches (9,610 square feet) (see Figure 7-1).

Soils encountered in the test unit excavations exhibited a high degree of uniformity. The representative stratigraphic profile consisted of a brown (10YR4/3) sandy loam plow zone overlying a yellowish brown (10YR5/4-5/8) silty loam subsoil. The plow zone typically measured between 20 cm (7.9 in.) and 30 cm (11.8 in.) deep. Peripheral test units often recorded modern overburden and humus atop the recognized sequence. Test units located in the south central portion of the site exhibited a buried plow zone. When encountered, this layer occurred approximately 20 cm (7.9 in.) below ground level, extending to approximately 30 cm (11.8 in.) below ground level, and consisted of a brown (10YR5/3) compact silty loam.

Test unit excavation resulted in the recovery of 2,256 historical and 16 prehistoric artifacts from non-feature contexts. The historical assemblage consisted primarily of brick but also included other architectural materials as well as domestic, faunal, floral, clothing, personal, and miscellaneous items. Prehistoric artifacts consisted of one jasper point, three fragments of thermally altered stone, and 12 flakes of chert, jasper, quartz and quartzite.

The vertical distribution of artifacts from test units places nearly all artifacts in the plow zone (Table 7-2). The two historical artifacts from a sub-plow zone context consisted of one brick fragment and one non-diagnostic redware sherd, recovered in the same test unit. Agricultural practices, specifically plowing, likely resulted in the downward vertical displacement of both artifacts; however, other mechanical forces such as those responsible for the spoil pile formation and natural forces cannot be excluded. Regardless, complete absence of prehistoric artifacts from sub-plow zone contexts suggests a complete or nearly complete isolation of the American Indian component to the plow zone.

Table 7-2. Test Unit Artifact Distribution by Stratum for the Jones Site*

<i>Stratigraphic Context</i>	<i>Prehistoric</i>	<i>Historical</i>	<i>Total</i>
Plow Zone	16	2,254	2,270
Sub-Plow Zone	--	2	2
Total	16	2,256	2,272

* Does not include artifacts from feature contexts

7.1.3 Features

Mechanical stripping of the plow zone uncovered 17 historical features extending into the underlying subsoil (Table 7-3). No prehistoric features were found during the site evaluation testing. The historical features fell into two categories: the remains of a heat

signature (brick clamp) and associated shallow pit (possibly used for procuring or mixing the clay for the bricks), found in the northern portion of the site (Trenches 1 and 2), and landscape features associated with postholes and post molds (fence lines and possible post-in-ground-constructed structures), found in the southern portion of the site (Trenches 3-6). Terra cotta agricultural drain pipes also were discovered in the northern portion of the site.

Most of the artifacts found below the plow zone came from the heat signature and shallow pit features, and consisted of brick fragments and coal. In the southern end of the site, one posthole contained a single brick fragment; the fence line or ditch feature contained two whiteware fragments. No intact sub-plow zone contexts (such as a “Buried A” or an “E” horizon) were observed at the site.

Table 7-3. Historical Features Identified During Site Evaluation

<i>Feature Number</i>	<i>Provenience</i>	<i>Type</i>
4	N275 E574 and Trench 2	Shallow pit
14	Trenches 1 and 2	Terra cotta agricultural drain pipe
18	Trench 2	Heat Signature
22	Trench 2	Linear Depression with brick
23	Trench 3	Rectangular posthole/ round postmold (double posts)
24	Trench 3	Rectangular posthole/ round postmold (double posts)
25	Trench 3	Rectangular posthole/ round postmold
26	Trench 3	Rectangular posthole/ round postmold
27	Trenches 3, 5, 6/4	Fence line/ditch
32	Trenches 3, 5, 6/4	Fence line/ditch
33	Trench 4	Rectangular posthole/ round postmold
34	Trench 4	Rectangular posthole/ round postmold
35	Trench 4	Rectangular posthole/ round postmold
37	Trench 4	Rectangular posthole/ round postmold
38	Trench 4	Round posthole/mold
43	Trench 4	Rectangular posthole/ round postmold
45	Trench 4	Round posthole/mold

7.1.4 Summary and NRHP Recommendations

Following the completion of site evaluation field work and analysis of the data collected during the investigation, recommendations were made with regard to the eligibility of the Jones site for inclusion in the NRHP.

The American Indian component consisted of 43 artifacts, contained primarily within the plow zone. Only limited quantities of debitage and thermally altered stone occurred; other artifacts included points, a hammerstone, and flake tools. No identifiable artifact concentrations or prehistoric features were recorded during the site evaluation field work.

Analysis of the distribution of these artifacts did not identify concentrations or patterns that were meaningful in terms of site structure. The American Indian component was recommended not eligible for listing in the NRHP under Criteria A, B, C, or D. The component was not associated with specific events, and was not behaviorally or culturally indicative of broad patterns of prehistory in Delaware (Criterion A), nor was it associated with locally or regionally prominent individuals (Criterion B). No structural remains were encountered (Criterion C). The limitations of the American Indian component at the site suggested low potential for contributing substantive information to an understanding of the prehistory of Delaware (Criterion D). No further archaeological investigation was recommended. Concurrence from DESHPO was received on January 13, 2000 (Appendix A).

The historical component at the Jones Site contained sub-plow zone features representing at least two different cultural loci. The Jones Site contained both a potential tenant farmstead component (represented by a series of postholes and postmolds thought possibly to constitute both structural remains and fence lines), as well as a heat signature (brick clamp) and associated shallow pit (possibly for procuring or mixing clay), representing local, rural brickmaking. While a number of tenant farm sites have been investigated in Delaware (Catts et al. 1989; Catts and Custer 1990; Coleman et al. 1983; Grettler et al. 1996; Hoseth et al. 1990, 1993; Taylor et al. 1987; Zebooker et al. 1996), none have been found in possible association with a brick clamp. The brick clamp is only one of two such features excavated in Delaware (Custer 1981; Guerrant 1999).

Based on the results of the site evaluation, the CR Division concluded that the historical component of the site retained sufficient integrity and information potential to meet eligibility criterion D for listing in the NRHP. The site had the potential to address research topics including Domestic Economy (site occupation, site function and economic practices), Manufacturing and Trade (rural industry associated with brick making and cooperage), and Landscape (land use and settlement patterns) in the state of Delaware. The Jones Site was thus recommended eligible for nomination to the NRHP. It was further recommended that, in accordance with the MOA of 1987, data recovery be undertaken to mitigate the adverse effects to the site resulting from construction of the Smyrna-to-Pine Tree Corners segment of SR1. It was anticipated that data recovery would contribute to the historical research priorities established for Delaware. Specifically, the investigations were expected to provide valuable data for the understanding of domestic economy, manufacturing and trade, landscape, and social group identity, behavior, and interaction. The DESHPO concurred with these recommendations in a letter dated January 13, 2000 (Appendix A).

7.2 DATA RECOVERY FEATURE SUMMARY

Data Recovery (Phase III) investigations took place in February and March of 2000 and included the excavation of an additional 133 shovel tests (beneath spoil pile), 27 test units (1-x-1 m), and approximately 2 acres of mechanically stripped plow zone (designated as Blocks A, B, and C) (Figure 7-3).

A variety of features were investigated during the data recovery investigations, including a brick clamp complex, two wells, pits, postholes, and terra cotta drains. Fifteen historical features identified within Blocks A are detailed in Table 7-5 and shown on a plan map in Figure 7-4.

Table 7-5. Historical Features in Block A

Feature Number	Provenience	Type
4	N275 E574 and Trench 2	Large shallow pit (Mixing pit)
14	Trenches 1 and 2	Terra cotta agricultural drain pipe
18	Trench 2	Heat Signature (Brick Clamp)
22	Trench 2	Linear Depression with brick
100	N310.44 E589.89	Posthole
104	N297.84 E594.55	Posthole
113	N302.31 E 581.39	Posthole
121	N290 E 568.15	Posthole/post mold
122	N288.10 E571.31	Posthole/post mold
123	N285.90 E570	Posthole/post mold
124	N286.30 E574.05	Posthole/post mold
125	N284.19 E572.69	Posthole/post mold
128	N286.97 E582.95	Posthole
142	N285.80 E581.31	Linear Depression with brick
146	N287.76 E566.92	Posthole/post mold

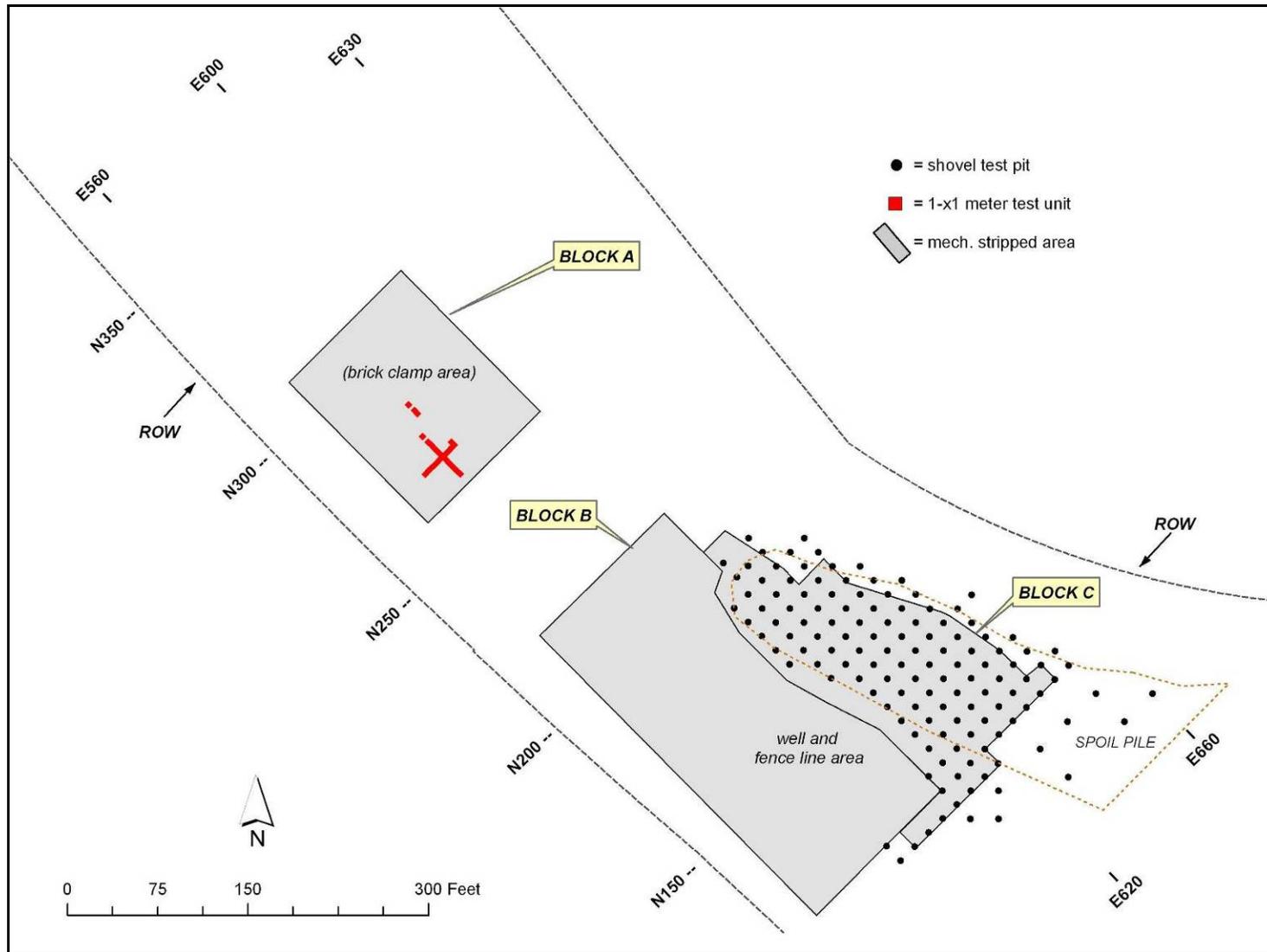


Figure 7-3. Location of Shovel Tests, Test Units, and Mechanically Stripped Blocks Excavated During the Data Recovery in Relation to the Project Right-of-Way.

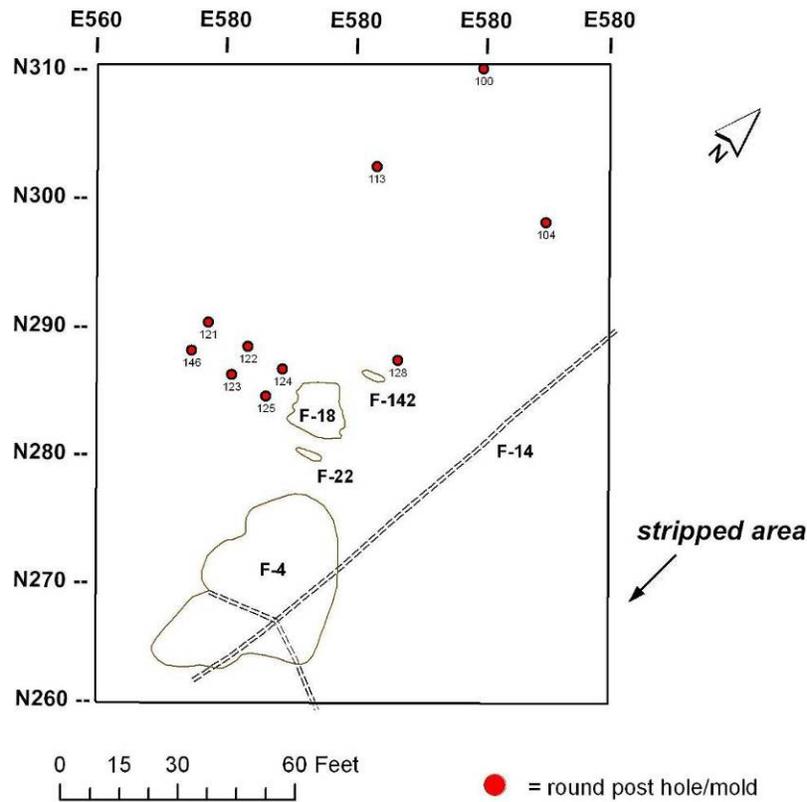


Figure 7-4. Location of Features Identified in Block A.

One hundred twenty-three features were recorded in Blocks B and C. Five features were categorized as non-posthole features and included two wells, a shallow trench, a pit and a drain tile (Table 7-6). One hundred eighteen features were postholes or post molds. Features in Blocks B and C are shown on a plan map in Figure 7-5.

Table 7-6. Historical Features (Excluding Posts) in Blocks B and C

<i>Feature Number</i>	<i>Provenience</i>	<i>Type</i>
27	N191.82 E583.50	Shallow Trench
156	N137.86 E587.22	Brick lined Well
158	N129.80 E585.70	Terra Cotta Drain Tile
159	N128.53 E 603.57	Pit
268	N134 E610	Barrel Well

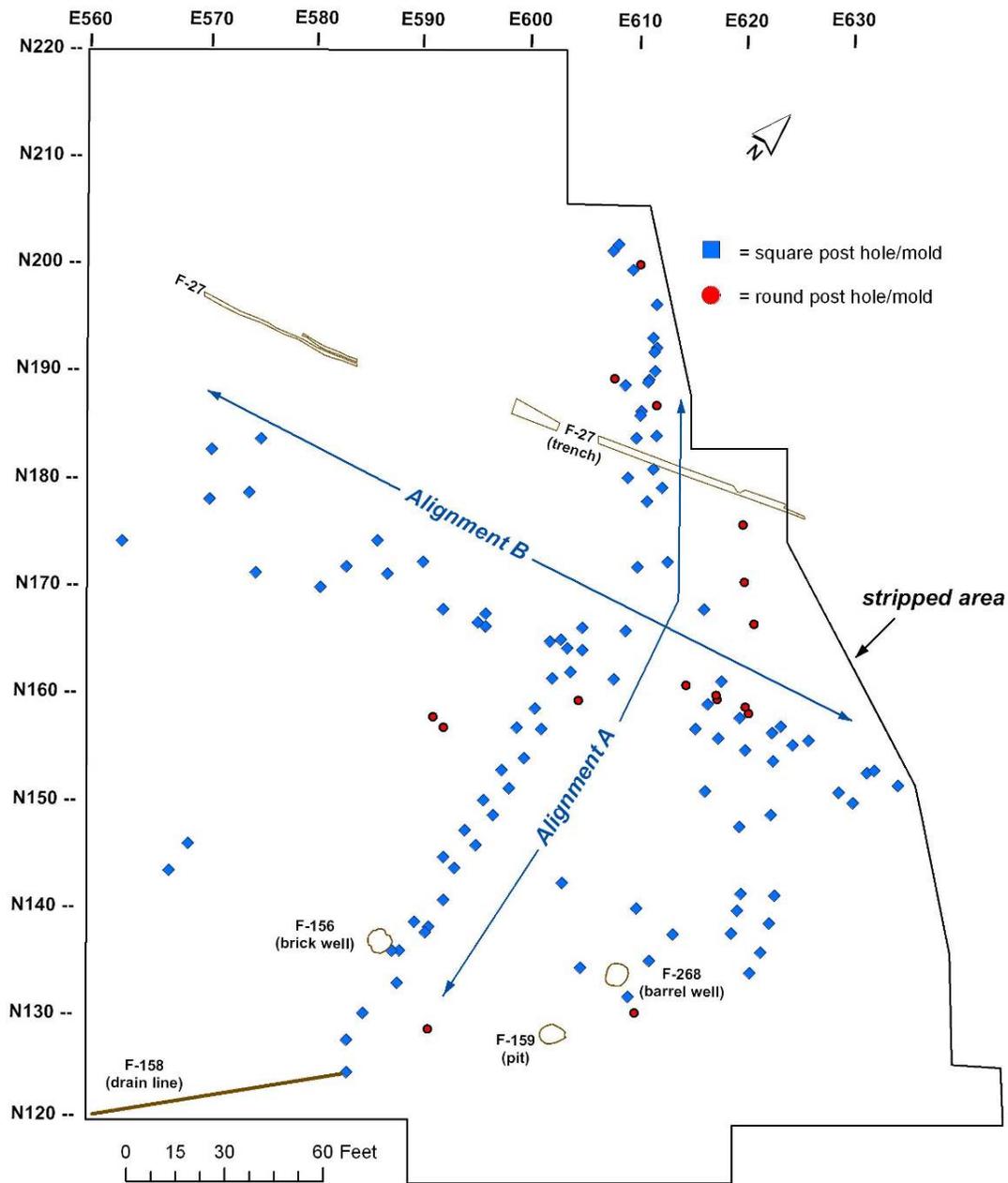


Figure 7-5. Location of Features Identified in Blocks B and C

7.3 THE BRICK CLAMP COMPLEX

The management report from the site evaluation investigations classified Features 4, 18, and 22 on the north end of the site as probable remains of a brick clamp complex (Abell and O’Neill 1999:iv). A detailed description of the historical brickmaking process is provided in the Analysis and Discussion chapter (see Section 8.3). However, illustrative

examples of brick clamps and brick kilns will be interwoven into the discussion of features from the brick clamp in this chapter.

7.3.1 Heat Signature (Feature 18)

Feature 18 was located in the west central portion of Block A and comprised entirely heat-altered earth. The feature was slightly ovoid in planview, measuring 2 m (6.6 ft.) north to south and 2.5 m (78.2 ft.) east to west and was first identified during the site evaluation investigations while stripping a 3 m (9.8 ft.) wide backhoe trench (Figure 7-6; Guerrant 1999). The backhoe trench had been placed within the region of a concentration of brick fragments identified in the plow zone during the 1992 UDCAR survey and redefined during the site evaluation (Bedell and Busby 1997; Abell and O'Neill 1999). A quick field assessment of the artifact assemblage indicated a very low number ($n > 30$) of non-brick artifacts in the immediate vicinity, which, with the presence of the large heat signature, further suggested the feature was not a forge, oven, or burned structure/building. During a field visit from the DESHPO, the heat signature was tentatively identified as the remains of a brick clamp (personal communication with Alice Guerrant, summer 1999).



Figure 7-6. Heat signature (Feature 18) following Plow Zone Removal.

The backhoe bucket damaged part of the eastern portion of the heat signature upon its discovery during the site evaluation investigations, but the remainder of the heat signature below the plow zone was still intact. Almost the entire heat signature feature was uncovered during the site evaluation field work; data recovery investigations only increased the dimensions of the clamp by 30 cm (11.8 in.) to the east just outside the east edge of the backhoe trench (Figure 7-7). The field had probably been continuously cultivated for several decades, perhaps even since the heat signature was fired, as

evidenced by the lack of tree roots disturbing the feature. The edges of the feature were distinct and sharp, not diffuse nor difficult to define. Fortunately, Feature 18 was not impacted by rodent activity.

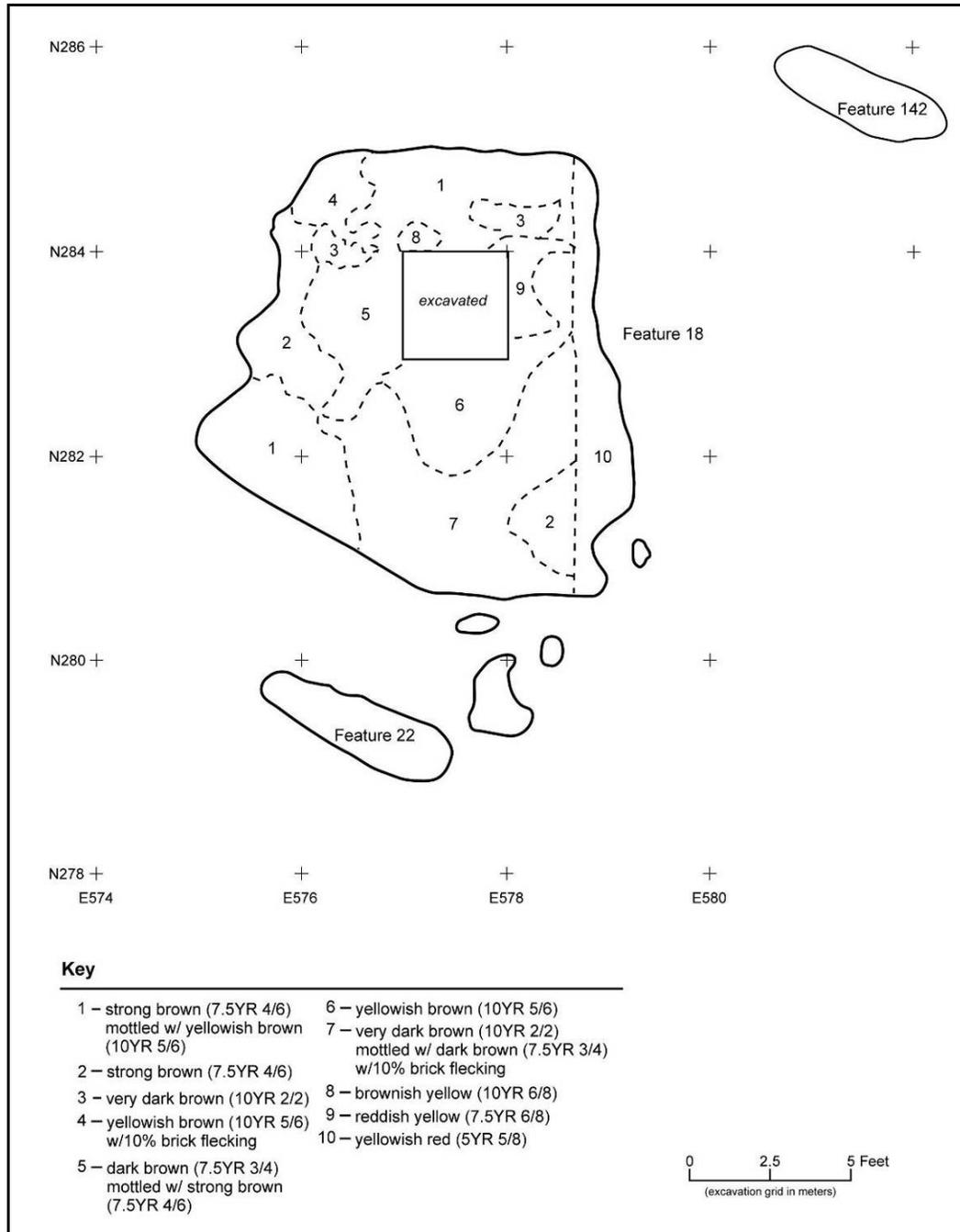


Figure 7-7. Plan View of the Heat Signature (Feature 18).

A single 1 x 1 m (3.3 x 3.3 ft.) test unit was placed in the center of the feature during the site evaluation to provide soil samples and morphological details (Figure 7-8). The heat

signature extended 12-to-14 cm (4.7-to-5.5 in.) into the subsoil below the interface of the plow zone (Figure 7-9). During data recovery investigations, three additional 1-x-1m (3.3-x-3.3 ft.) units were placed adjacent to the original unit to provide a detailed 4m (13.1 ft.)-long profile of the entire heat signature and search for evidence of fire channels (Figure 7-x). The artifact assemblage from the test unit consisted entirely of brick fragments from the plow zone.

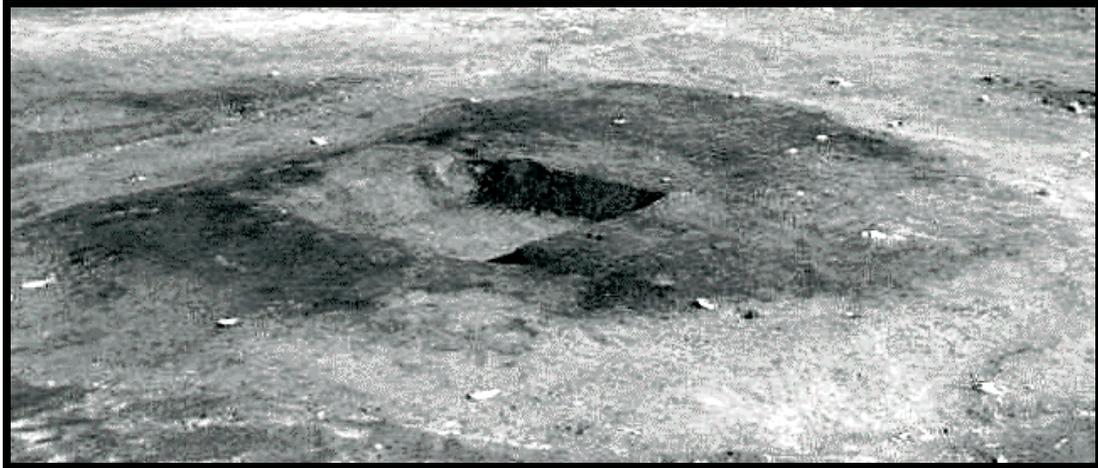


Figure 7-8. Test Unit Excavated in Center of Heat Signature (Feature 18) During Site Evaluation Investigations.



Figure 7-9. Three Additional Test Units Placed to Profile Heat Signature (Feature 18).

No structural patterning within the heat signature was observed in plan view, such as linear oxidation regions suggesting the presence of fire channels. Only amorphous regions of discolored heat altered earth could be seen, with soil colors ranging from strong brown (7.5YR 4/6), yellowish red (5YR 5/8), and reddish yellow (5YR 6/8), to very dark brown (10YR 2/2) and yellowish brown (10YR 5/6). In profile, subtle fluctuations in the oxidized soil possibly suggest one fire channel may have been present, oriented from northwest to southeast across the feature (Figure 7-10). However, the boundaries of the possible channel were difficult to determine and the observation was very inconclusive (Heite 2000b). If the clamp was fired more than once, the channels may have overlapped and diffused the edge of the channel boundaries.

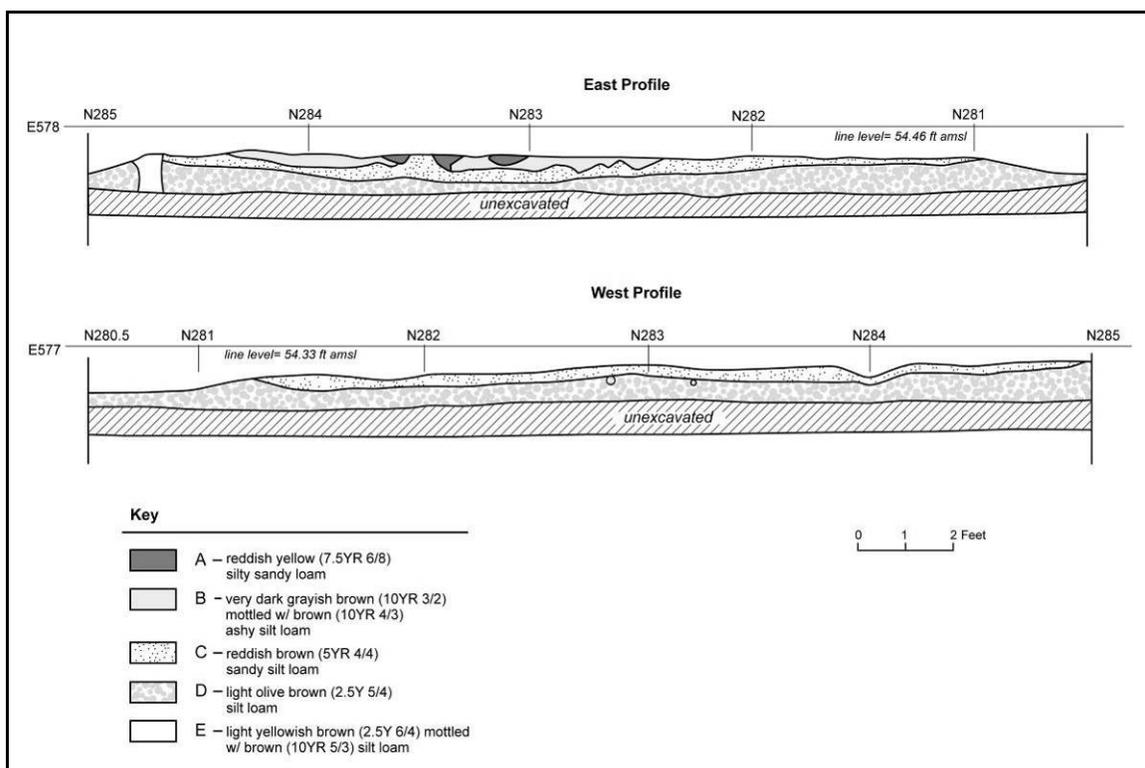


Figure 7-10. East-West Profile Section of Heat Signature (Feature 18).

The heat signature, if indeed it was the remains of a brick clamp, was one of the smallest of the clamps/kilns reviewed in the research domain. Since the plow zone had destroyed the upper portions of the heat signature and structural remains of the clamp, the absolute extent from top to bottom of the heat signature cannot be determined. The total depth of the signature, if known, could have yielded information on the amount of heat or the length of time the clamp was operated, and may have contained more direct evidence of fire channels.

The plow zone averaged 30 cm (11.8 in.) deep around the brick clamp, indicating a possible original depth of 42-to-44 cm (16.5-to-17.3 in.) that the heat had to penetrate if the clamp was constructed on the original ground surface. However, this depth on heat penetration seems unlikely; perhaps the clamp was fired on a surface where the A

horizon had already been removed to mine the material. The heat-altered earth was thinner and closer to the top of the subsoil around the perimeter of the feature, and the original heat signature would have been larger, but not substantially larger, than the observed portion. The surface of the heat signature was hardened, but not an extreme hard pan or crust-like, which can often occur on the earthen surfaces directly in contact with the heat source.

Charcoal clamps were also constructed in Delaware to produce charcoal to fire the bog iron forges and other fuel-dependent industries (Figure 7-11). While theoretically the heat signature of a brick or charcoal clamp could be somewhat similar, the presence of the brick fragments and borrow/mixing pit (Feature 4) more than likely rules out the possibility that Feature 18 represents a charcoal clamp.

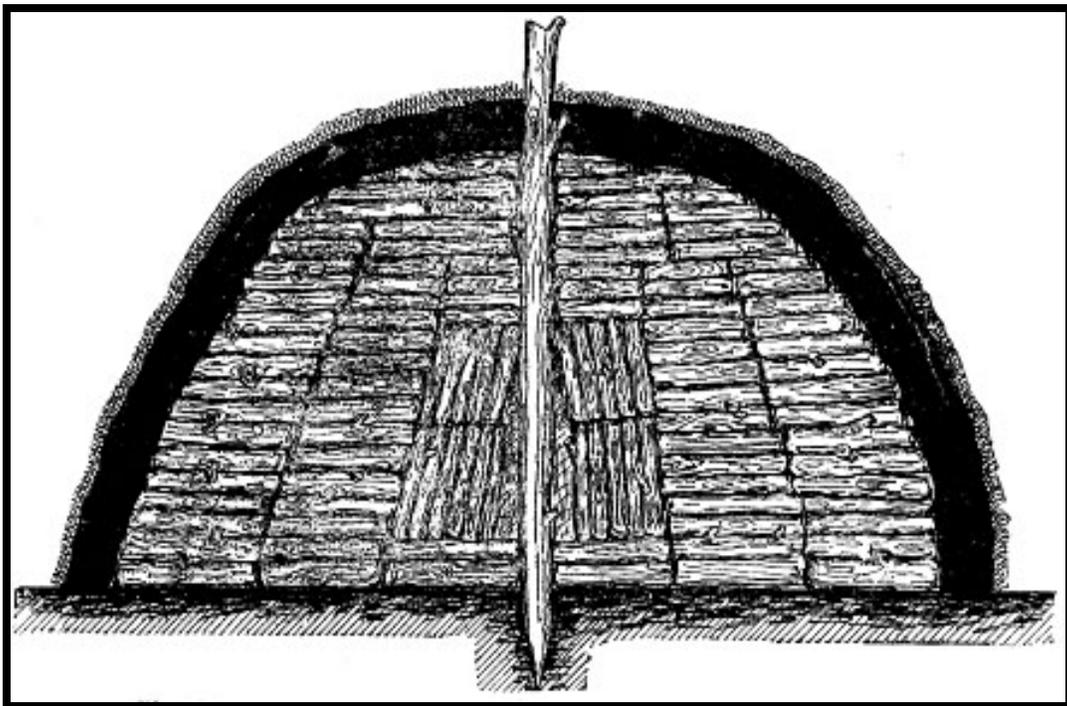


Figure 7-11. Charcoal Clamp (Grimshaw1888:152).

7.3.2 Clay Mixing Pit (Feature 4)

Feature 4 was originally identified during the site evaluation investigations as a clay procurement or mixing pit associated with the possible brick clamp (Guerrant 1999; Abell and O'Neill 1999). The feature was discovered in an exploratory hand-excavated trench just to the south of the heat signature of the clamp, outside the backhoe trench area. Excavation revealed portions of a thin 14-to-17 cm (5.5-to-6.7 in.) depression below the plow zone filled with a dark matrix and low-fired brick (wasters).

The western end of the hand-excavated trench encountered an edge of the depression, indicated by a subtle rise to the plow zone/subsoil interface. The north tip of the depression was observed in the block area removed to uncover the heat signature and the

entire eastern edge of Feature 4 was observed in the backhoe trench. The removal of the plow zone revealed an irregular but circular dark matrix with distinct boundaries measuring at least 4 m (13.1 ft.) north to south and 3 m (9.8 ft.) east to west. No further excavations were conducted on the feature during the site evaluation.

The data recovery investigations were designed to uncover the entire brick clamp complex and possible associated features. The original boundary for Block A would have only uncovered a portion of the projected limits of Feature 4. Therefore, the boundaries of Block A were enlarged to the south and to the west to incorporate all of depression Feature 4. The dark brown plow zone, averaging a depth of 24 cm (9.4 in.), was not significantly separate or distinct from the Feature 4 matrix, making it difficult for the backhoe operator and archaeological monitor to halt mechanical excavations, and it was decided to manually excavate the last 10 cm (3.9 in.) of plow zone. To further complicate matters, a terra cotta drain pipe system found during the site evaluation fieldwork, was now discovered to terminate within the pit. The terra cotta drain tile lines were Feature 14 and the associated builder's or construction trench was Feature 14a. Three stems of the terra cotta drain tile system joined in the center of Feature 4 and appeared to funnel water into the pit. The nature of the drain tiles and the drainage process are discussed in a separate section of this chapter.

Troweling the freshly stripped surface after plow zone removal quickly defined the entire outside edges of Feature 4 (Figure 7-12). The Feature 4 depression measured a globular 17 m (55.8 ft.) northeast to southwest and 11 m (36.1 ft.) northwest to southeast. The edges of the feature were distinct and sharp, with curved arcing edges billowing to the west and northwest in planview. The arcing edges joined into a sharp point in two locations on the northwest edge of the feature, which may have represented separate procurement borrow pits or separate matrix mixing pits episodes. The clay borrow pits at the John Jay House, a mid-to-late 18th-century complex in New York State, contained such arcing and billowing characteristics and were attributed to distinct borrow pit activity (Feister and Sopko 1996:57). Horse-drawn sleds were used to scrape the clay or matrix into a hopper to be taken to the mixing area on many brick manufacturing complexes (Figure 7-13). The billowing edges may be the result of a sled gouging or scooping up matrix, or someone with a shovel digging up the edge of the pit and throwing the matrix towards the center.

Feature 4 was photographed in association with the other brick clamp features before the onset of formal test excavation units for spatial and visual references (Figure 7-14). A cruciform-shaped 1-x-1m (3.3-x-3.3 ft.) excavation trench bisected the pit to provide morphological information. The placement of the units was designed to encounter both the Feature 4 pit and the Feature 14 terra cotta drain tile system and provide information on their relationship. The feature matrix was screened and all artifacts, including all brick fragments, were recovered.

Profiles were drawn of the east wall of the north-south trench (Figure 7-15) and of the north wall in the east-west trench (Figure 7-16). Feature 4, a brown (10YR 4/3) silt loam, extended to an average depth of 25-to-30 cm (9.8-to-11.8 in.) below the plow

zone/feature interface. The subsoil directly below the depression was a light yellowish brown (10YR 6/4) silt loam. The profiles related that the drain tile system (Features 14 and 14a) had definitely been constructed over (and superimposed upon) Feature 4. Brick fragments and 12 cm (4.7 in.) of Feature 4 matrix were observed under the base of the tiles and builder's trench (Features 14 and 14a).

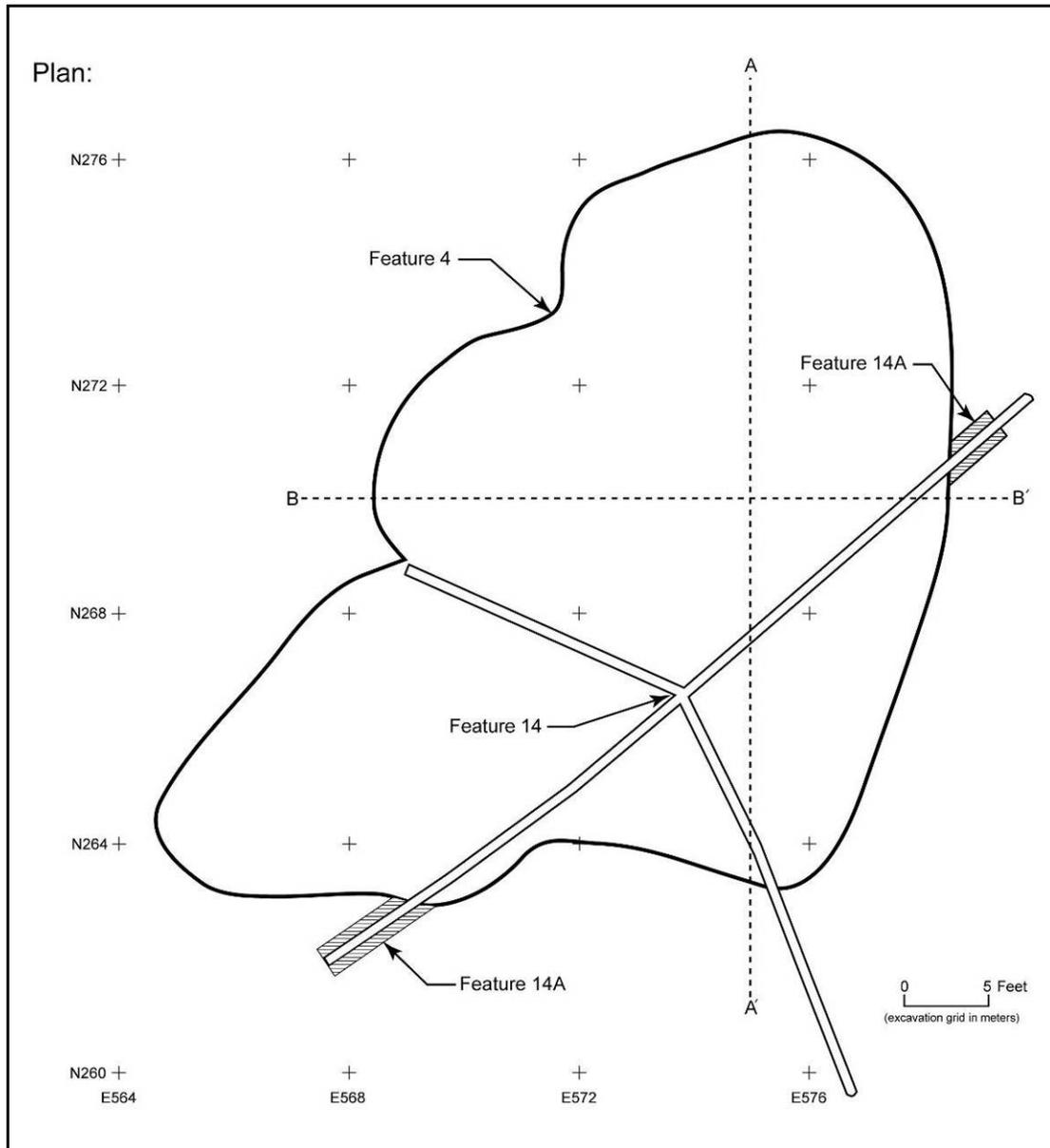


Figure 7-12. Plan View of Possible Clay Mixing Pit (Feature 4) and Drain Line (Feature 14).

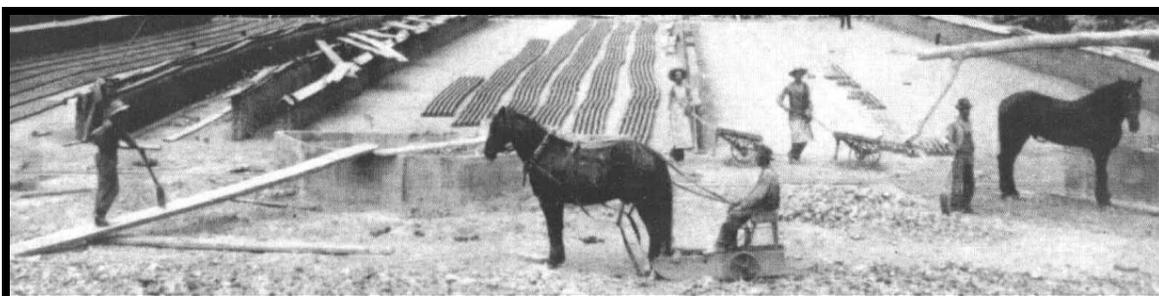


Figure 7-13. Horse-drawn Sleds were used to Quarry Clay for Large-Scale Brick Production; c. 1885 Photograph (Garvin 1994:22).



Figure 7-14. The Mixing Pit Feature 4 was only a few Meters to Southwest of Heat Signature Feature 18.

The base of Feature 4 contained some of the more interesting information of the pit feature. Small 10-to-12 cm (3.9-to-4.7 in.) in diameter circular depressions were observed and excavated across the entirety of the cruciform trench (Figure 7-17 and Figure 7-18). The circular depressions, never varying more than 1-to-2 cm (0.4-to-0.8 in.) in depth, could represent human foot impressions or hoof impressions from a beast of burden, such as an ox or horse. Part of a large mammal tooth, possibly bovine, was recovered from the feature fill. Beasts of burden were used in some of the early brickmaking machinery such as pug mills and mixing pits. Historical research has indicated these features predominately contained a center post area, a prepared circular platform for the animal tread, and a circular area being mixed or pugged, all of which are absent from Feature 4 (Dobson 1971b:8; Garvin 1994:20; Figure 7-19 and Figure 7-20).

No postholes, shovel marks, or dredge/blade marks were found to illustrate how the depression was constructed or used aside from the small, circular depressions. However, it has been documented that breaking up of the soils in the mixing pit was traditionally done by men and/or beasts of burden walking through the pit repeatedly. Pug mills are associated with larger-scale, and later industrialization of the brick-making process (Garvin 1994).

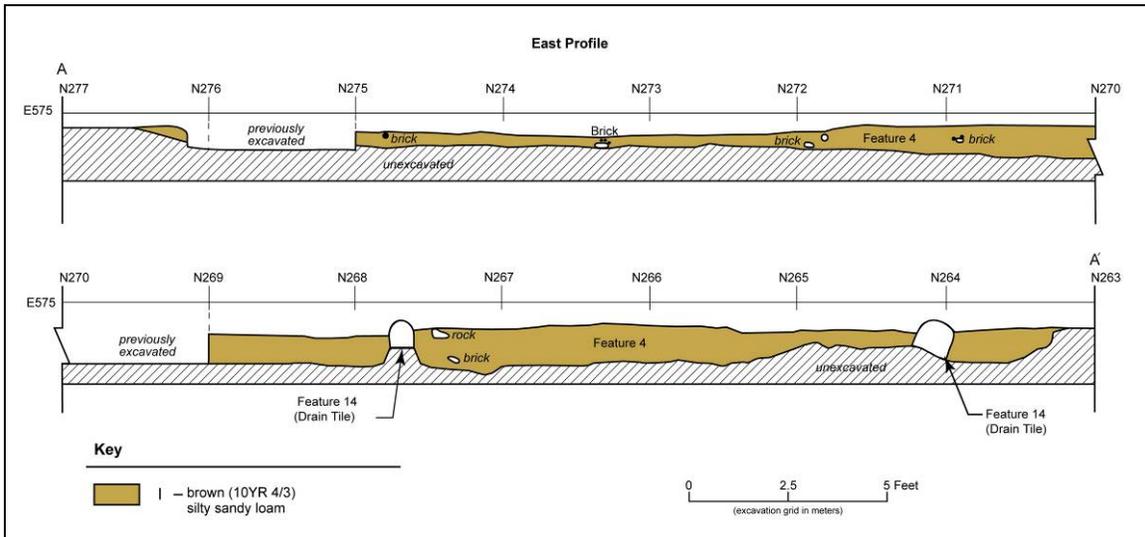


Figure 7-15. Profile of East Wall of Feature 4, with Features 14 and 14A Exposed

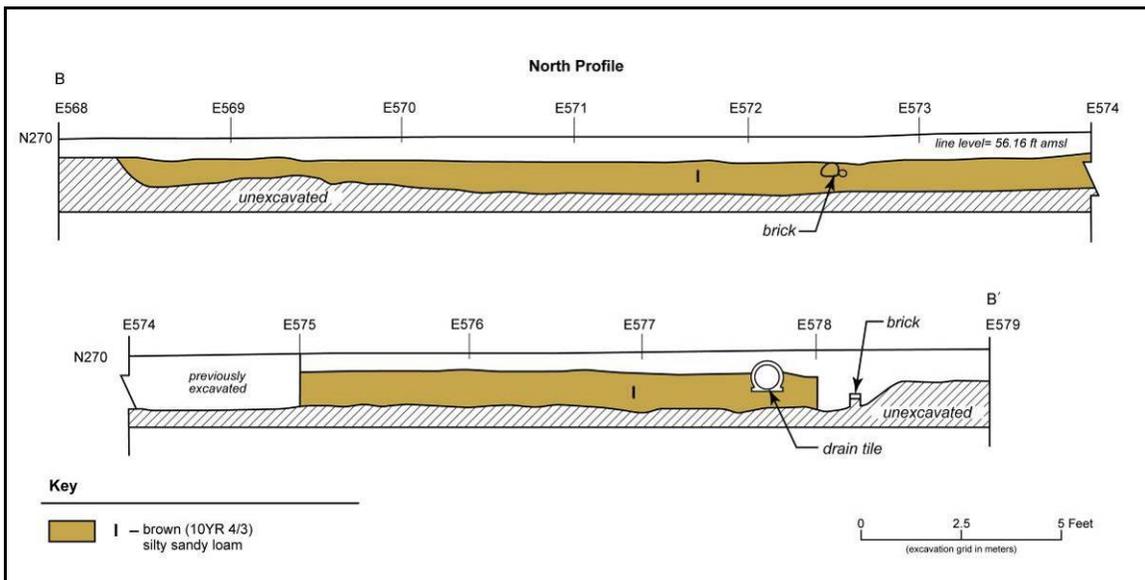


Figure 7-16. Profile of North Wall of Feature 4, with Features 14 and 14A Exposed.



Figure 7-17. Feature 4, View South Showing Excavation Trenches
[Small depressions may be footprints from humans or hoof prints from beasts of burden.]

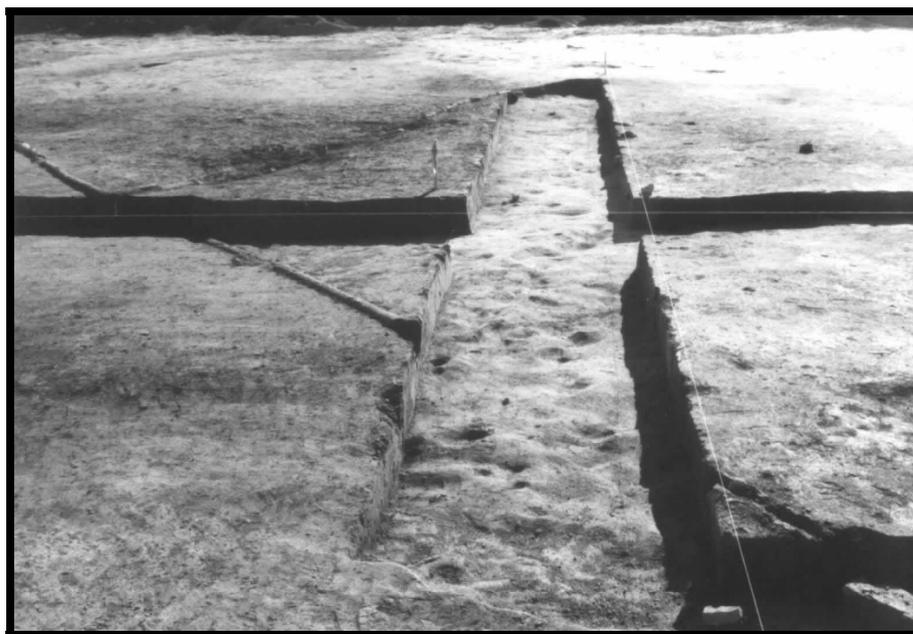


Figure 7-18. Feature 4, View East Showing Excavation Trenches
[Small depressions may be footprints from humans or hoof prints from beasts of burden.]

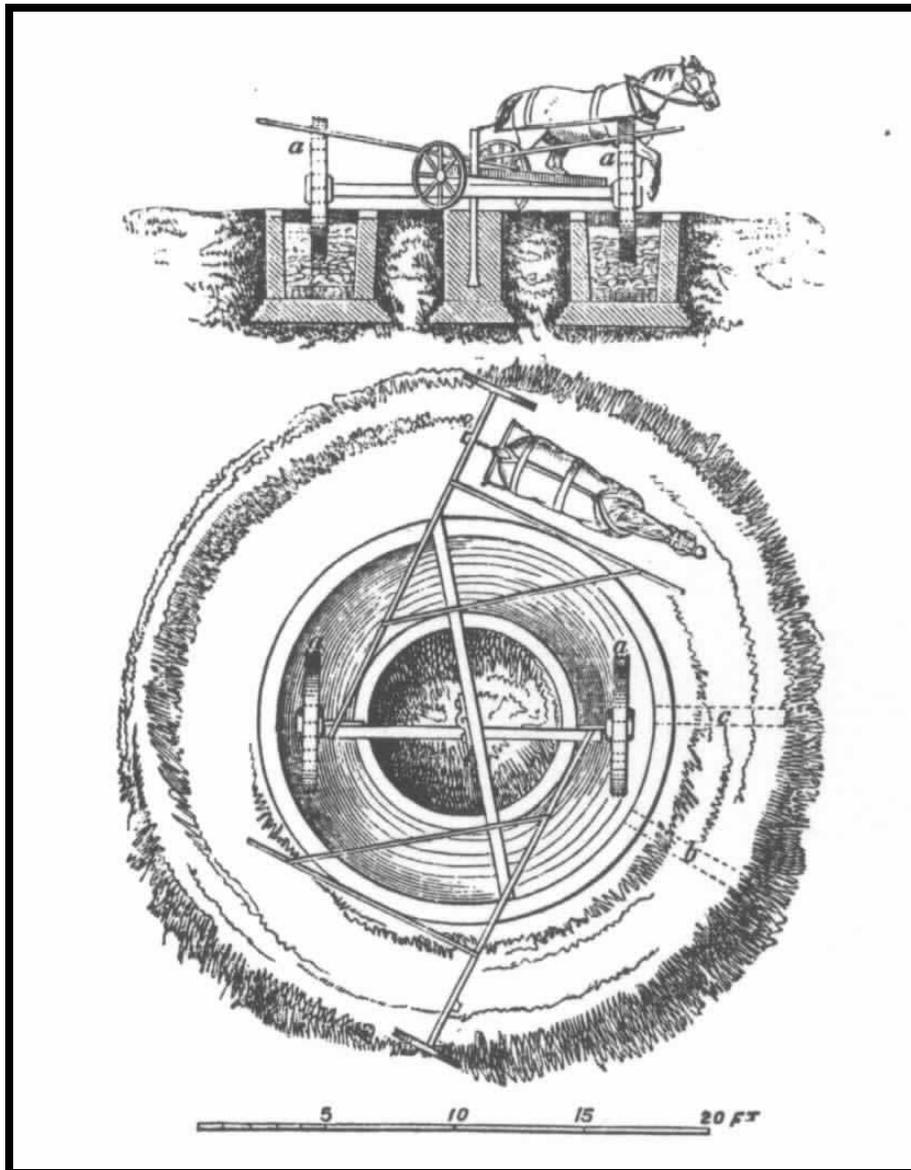


Figure 7-19. Diagram of a Horse-powered Pug Mill (Dobson 1971b:8)

Feature 4 contained low-fired brick fragments that, on the average, were much larger than the brick fragments recovered from the plow zone or other features related to the brick clamp complex. Two bricks from the pit were almost two-thirds the original size. No whole or complete bricks were recovered from the entire brick clamp complex. Feature 4 contained a large amount of brick waster fragments, similar to the other sub-plow zone features of the brick clamp complex. Other historical brick clamp/kiln sites have reported that the highest concentrations of sub-plow zone brick were predominately recovered in the procurement/mixing pits, probably the result of backfilling in the low spot after use (Feister and Sopko 1996:58).



Figure 7-20. Photograph of a Horse-drawn Pug Mills; the Horse is at the Central of Three Tempering Pits; c. 1885 Photograph (Garvin 1994:20)

The John Jay House clay borrow pits ranged in size from 8-to-13 ft. (2.4-to-3.9 m) and from 6-to-12 in. (15.2-to-30 cm) in depth, dimensions that are comparable to Feature 4 (Feister and Sopko 1996:58). One of the pits contained feature fill and brick wasters above an organic lens, thought to be the result of leaving the pit open for an undetermined period of time after the clay was mined, allowing leaves and other organics to blow or wash into the depression (Feister and Sopko 1996:59). No such organic lenses were observed at the Jones Site.

The Feature 4 matrix was very homogenous with no obvious evidence of deposition episodes, pockets of unmixed matrix, subtle differentiation of the soil in any shape, form, or fashion. The homogeneity prevented the classification of the pit as a clay borrow or procurement pit. If Feature 4 was a procurement station, the soil did not contain a high amount of clay, though research has not yet determined the percentage of clay the matrix must contain to be used for making an average quality brick. Dobson (1971) indicated that sandy loam was appropriate for making hand-molded bricks, suggesting that the subsoils from the Jones Site probably did not require additives to enhance the matrix for making bricks.

As stated above, the original construction or mining at Feature 4 had penetrated a silty loam subsoil, not a high clay content matrix. However, when a sump hole was excavated to the southwest of Block A to allow for draining from the block during data recovery investigations, the backhoe penetrated subsoils that contained a higher clay content below the stratum encountered in Feature 4. If the matrix from these deeper subsoils was required to manufacture the brick from the clamp, the procurement pits to extract the matrix were not located within the present highway corridor or they would have been observed during the field investigations. However, an alternate explanation could be that

the clay excavated to create the barrel well shaft (Feature 268; see Section 7.4 Wells) was retained and later used for brickmaking. The clay would typically have been spread to dry out for a summer and then prepared in the mixing pit with water in the fall to break it down and remove impurities. The barrel well may have provided a water source for breaking down the clay in the mixing pit during, for slop-molding the brick molds to ease removal of the green bricks from the mold, and for workers and livestock in the brick clamp area.

The placement of the Feature 4 pit in close association with the Feature 18 heat signature and the presence of waster bricks in the soil filling the pit suggest that the features are contemporaneous with one another. The presence of abundant shallow indentations scattered throughout the lower surface of the pit indicates that the feature was probably wet and muddy during its use, and furthermore that it was necessary for humans and/or animals to enter the pit while it was muddy. This suggests the pit was utilized for preparing/mixing the clay before the bricks were molded.

A water source was commonly used during the traditional brickmaking process for several purposes. One method of preparing clay for brickmaking in use in Great Britain in the early-19th century involved digging the clay during the autumn and letting the soil be exposed to frost conditions during the winter. This was done to let the air “penetrate and divide the particles of earth, which facilitated the subsequent operations of mixing and tempering” (Weiss and Weiss 1966:58). The soil would be repeatedly turned and worked with a spade. In the spring the soil was

broken into pieces and shoveled into shallow pits where it was watered and allowed to remain soaked for several days. Next it was tempered by the treading of men or oxen. Near London the tempering was done by means of a horse mill. This operation was laborious but of necessity was important in the manufacture of brick. Stones were eliminated and the clay was brought to perfectly homogeneous paste with the least quantity of water. Following the tempering the clay was moved to the bench of the moulder who worked it into the brick mould and removed the surplus material.

Weiss and Weiss 1966:58-59.

Perhaps the Feature 4 pit was created and used as described above, for watering the clay briefly and then for tempering the clay by the treading of humans and/or beasts of burden. The presence of a possible bovine tooth in the fill suggests that the work was not done by humans alone. Instead of the formal, circular arrangement of a horse-drawn pug mill, a similar effect presumably could be achieved by men guiding yoked or roped livestock through the clay-filled pit. Perhaps the undulating outline of the pit feature reflects shallow access points for entering and exiting the pit.

Water also was necessary during the slop molding process of brickmaking, where the brick mold was dipped into a trough of water before the tempered clay mixture was inserted into the mold. This made it easier to remove the green brick from the mold;

alternatively, sand could be used to coat the mold and to ease removal of the green brick. Sand came to be the preferred molding method because it did not add additional moisture to the green brick. Additional moisture would have led to an increase in drying time and the increased likelihood that the brick would become misshapen when removed from the mold for drying.

7.3.3 Drying Canopy/Shed Remains/Postholes (Features 121-125 and 146)

Features 121-125, and 146 were a series of five round and one slightly squared postholes with round post molds, situated to the northwest of the brick clamp (Figures 7-21 and 7-22). The circular postholes ranged from 38-to-45 cm (15.0-to-17.7 in.) in diameter and formed a rectangle measuring 7.5-x-2.3 m (24.6-x-7.5 ft.) (Table 7-7). Post mold diameters ranged from 12-to-20 cm (4.7-to-7.9 in.); all post molds had a flat base. Only one non-brick artifact was found in the post features, a bone fragment from Feature 125.

Table 7-7. Brick Clamp Complex Postholes

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth in cm (in.)	Artifacts
121	38 (15.0)	Circular w/ undulating base	15 (5.9)	Circular w/ flat base	28 (11.0)	None
122	37 (14.6)	Circular w/ tapered walls & flat base	10 (3.9)	Circular w/ flat base	30 (11.8)	1 brick fragment
123	42 (16.5)	Circular w/ tapered walls & flat base	20 (7.9)	Circular w/ flat base	40 (15.7)	Many brick fragments
124	35-x-30 (13.8-x-11.8)	3 square sides w/ u-shaped base; stratigraphy in feature	12 (4.7)	Brick-filled; undetermined shape	32 (12.6)	10+ brick fragments
125	38 (15.0)	Circular w/ straight walls and flat base	20 (7.9)	Brick-filled; circular planview; odd profile	40 (15.7)	37+ brick fragments
146	45 (17.7)	Circular w/ tapered walls & flat base	20 (7.9)	Circular w/ flat base	40 (15.7)	Only brick flecks

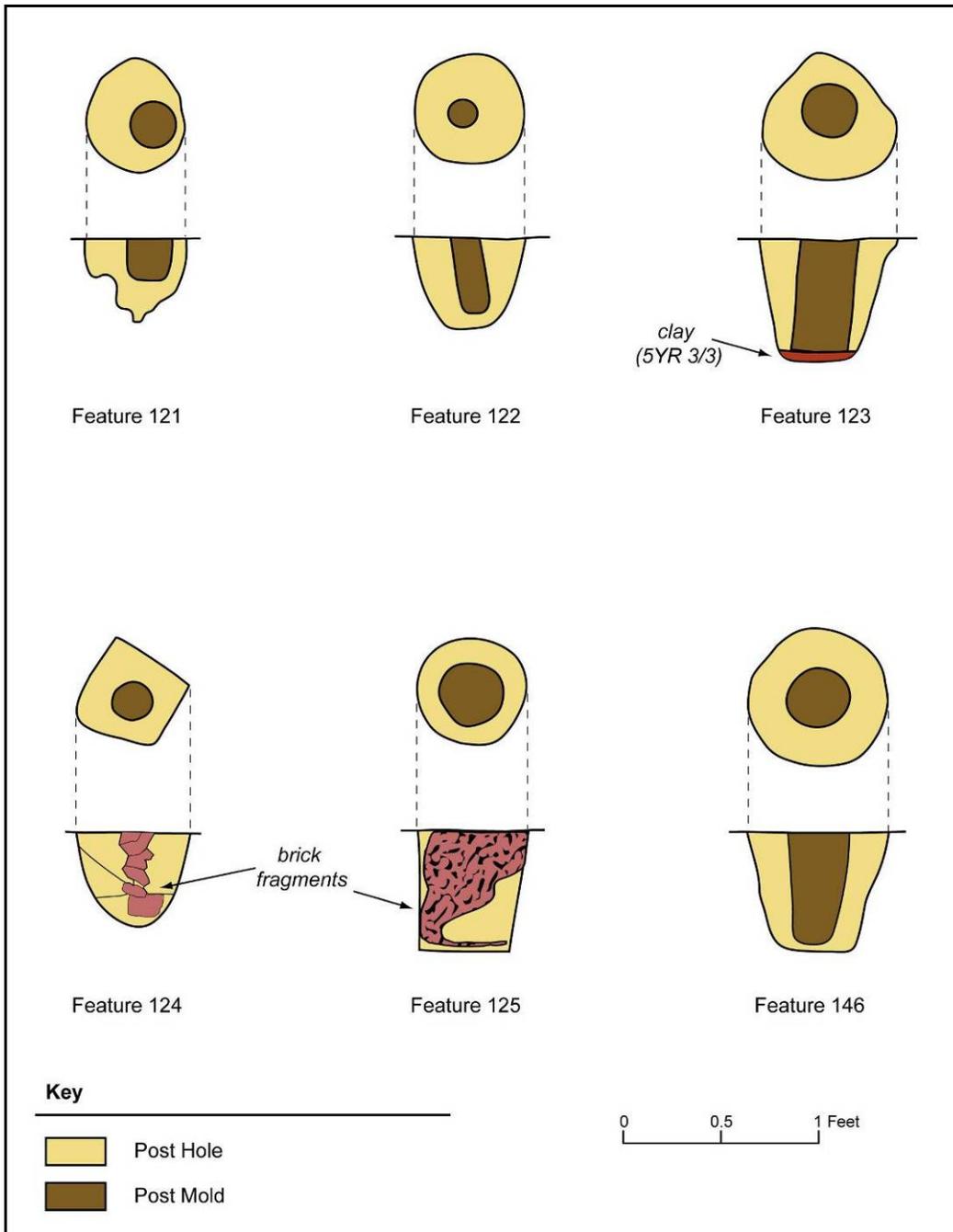


Figure 7-21. Profiles and Plan Views of Postholes and Molds Forming Possible Foundation for Drying Canopy/Shed Area, within the Brick Clamp Complex.

This post series at the Jones Site may have supported a canopy or open-walled shed structure commonly found in relation with clamps and small kilns. Since the posts were not located around the heat signature (Feature 18), the structure would have likely been used for covering a molding or drying shed. A covered structure would have kept the sun and rain off of the molders and the molding tables. Feister and Sopko (1996:62) relate that a 1798 journal entry indicated problems of losing bricks to rain as they were drying.

However, other clamps used a covered shelter to protect the green bricks as they were stacked for firing, and then removed the covering when the fire was lit. Another method is to place the green bricks in an uncovered area but top the stacked bricks with straw. Kelso (1971) found posts at two clamp/kilns at Carter's Grove Plantation near Williamsburg, Virginia, but they were considered to be more than likely a covering for the elements rather than part of a walled structure (Metz and Russ 1991:103). The molding area, storage area, and the brick clamp in the recreated brick clamp at Colonial Williamsburg were all covered with a canopy-covered post structure (Weldon 1989).



Figure 7-22. Photograph of Posthole/Post Mold Features 121-125 and 146, Brick Clamp Complex, Facing Southeast.

The post molds closest to the brick clamp (Features 124 and 125) contained the largest amount of recovered brick rubble and those furthest from the clamp (Features 121 and 146) contained little to no brick (see Table 7-6). The distribution of brick in the posthole features reflects the overall distribution of brick rubble around the clamp area identified from shovel testing (see Figure 7-2 Artifact Distribution Maps). More than likely, when the posts were removed, the brick rubble around the base of the posts fell into the empty post molds. The posts may have been removed during the firing process to add as fuel to the fire, or when the clamp was no longer in operation.

7.3.4 Linear Depressions (Features 22 and 142)

Features 22 and 142 were two linear depressions filled with low-fired brick wasters located on either side of the heat signature (Feature 18) (Figure 7-23). Feature 22 measured 1.8 m (5.9 ft.) northwest to southeast, was 67 cm (2.2 ft.) wide, and extended 12-to-14 cm (4.7-to-5.5 in.) below the plow zone (Figure 7-24). Feature 142 measured 1.7 m (5.6 ft.) northwest to southeast, was 76 cm (2.5 ft.) wide, and extended only 10 cm (3.9 in.) below the plow zone. The elongated features contained an undulating base with

no flat surfaces that would suggest the footprint of flat beams, machinery, or a builder's excavation technique. The bricks within the features were very soft and crumbly, and may have fallen into the depression when whatever was in the depression was removed.

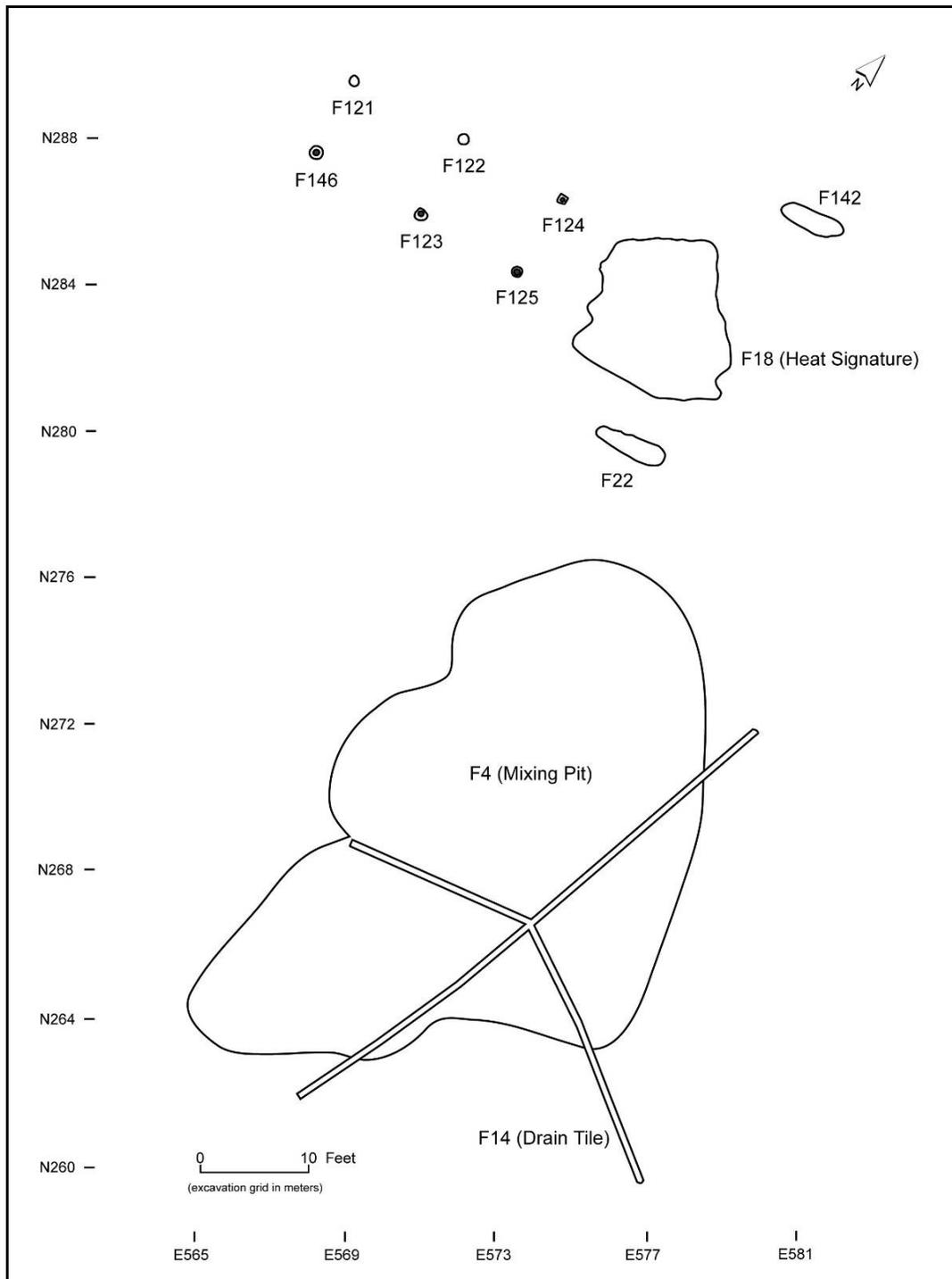


Figure 7-23. Location of Brick-filled Linear Depressions, Features 22 and 142, in Relation to Probable Heat Signature, Canopy Postholes, and Mixing Pit



Figure 7-24. Photograph of Feature 22, Linear Depression Filled with Brick Wasters, Facing North

The long axes of Features 22 and 142 appear to be oriented the same way, and the features seem to be equidistant from the heat signature. The bricks occurred above a 5-to-7 cm (2.0-to-2.8 in.)-deep lens of a yellowish brown (10YR 5/4) silty clay loam, slightly different from the surrounding subsoil. No other artifacts were found and no evidence of burning was observed in the depression. Clamps predominately contained fire channels at the base to allow for the fuel to be added in one end and raked out the other. Often, the archaeological record reveals “shinlogs”, a stack of waster bricks or dirt, even a metal plate that was placed over both entrances to the fire channels to adjust the air flow (Heite 1973:48). Features 22 and 142 could be the base of a shinlog area. However, the depressions were situated at almost a yard from the closest edge of the heat signature and shinlogs should have been adjacent to the heat source.

Perhaps the features were associated with a temporary covering for the brick clamp, to protect it from the elements while the bricks were drying or while the clamp was being assembled. A T-shaped support apparatus might have been created by lashing or connecting two logs or posts together. By turning the “T” upside down, the base would have rested in the trench and the pole would have been upright. A tarp or cloth could have been suspended between the two poles located on opposite ends of the clamp.

The most likely explanation of Features 22 and 142 are that they were trenches or ditches dug by the brick-makers at either edge of the location where green, molded bricks were laid out to dry. A description of contemporary brickmaking in late 17th-century England includes such a scenario:

...he forms a Brick, strikes it, and lays it upon the Pallat, then comes a little Boy...and takes away three of these Bricks and Pallats, and lays them upon a Hackstead, a rais'd place like a Balk, in a Field, or a Border in a Garden, which is a piece of Ground...with a **Gutter on each side about a foot deep and as wide on top**... and the Earth that comes thence raises the Hackstead; this Hackstead must be well beaten, that it may be smooth, level and hard, and upon it the boy lays his Bricks edgeways, the thickness of the pallats one from another, on each

side of the Hackstead a row...and when they are pretty hard, which in dry weather will be in a Day, then the Boy lays another course crossways... till they come to be ten course high, then they are covered with straw till they be hard and dry which usually is in three weeks or a month...(emphasis added; Anonymous 1683, quoted in Lloyd 1925:33-34)

Therefore it appears likely that after the green bricks were molded underneath the canopy structure (posthole Features 121-126 and 146) at the Jones Site, they were moved to a nearby raised platform of hard-packed earth bordered by linear ditches (Features 22 and 142) on either end. The bricks were probably placed along this platform, standing on one of their long edges with small gaps between adjoining bricks, and left to dry before being re-stacked into a clamp for burning. It appears that the clamp (heat signature Feature 18) was immediately adjacent to the probable drying platform, and may have been built up upon the same raised platform of earth (see Figure 7-23, plan view of clamp features).

7.4 WELLS

Two wells were investigated – one composed of three stacked, wooden barrels and one partially lined with machine-made brick. Details of each well are provided below. A comparison of these wells with other known wells from archaeological sites in Delaware and the mid-Atlantic region is included in the Chapter 8.0. For ease of reference, the plan map of features in Blocks B and C is repeated below (Figure 7-25).

7.4.1 Three-barrel well (Feature 268)

Feature 268 was a three-barrel well located on the southwestern quadrant of Block C, originally encountered on its extreme northern end within a shovel test. The feature was first identified during as a 2 m (6.6 ft.)-wide oval feature filled with mottled strong brown clay loam, apparently from a deeper subsoil context as that matrix had not been observed at the subsoil / plow zone interface (Figure 7-26). Slightly off-centered inside Feature 268, was a 1 m (3.3 ft.)-wide dark brown loam circle, resembling the plow zone soil color. The size and shape of the plan view of the feature was similar to the brick-lined well (Feature 156) which had already been excavated at that time.

The feature was bisected in order to provide cross-sectional information. The north half of the feature was removed first with the darker center designated Stratum I and the outer core Stratum II (Figure 7-27). Several water worn, broken cobbles were found between 40 cm (1.3 ft.) and 60 cm (2.0 ft.) below the plow zone inside the upper portion of Stratum I, which was beginning to slope inward. At a depth 60 cm (2.0 ft.), a grayish brown matrix, designated Stratum III, started to form a half circle between the Strata I and III in planview. When Stratum III began to curve inward with depth, the field crew realized the feature was probably a barrel well or barrel privy inside a construction pit, and that Stratum III was the organic stain of a barrel (Figure 7-28). Stratum II was then recognized as the construction pit and Stratum I was the fill inside the well itself.

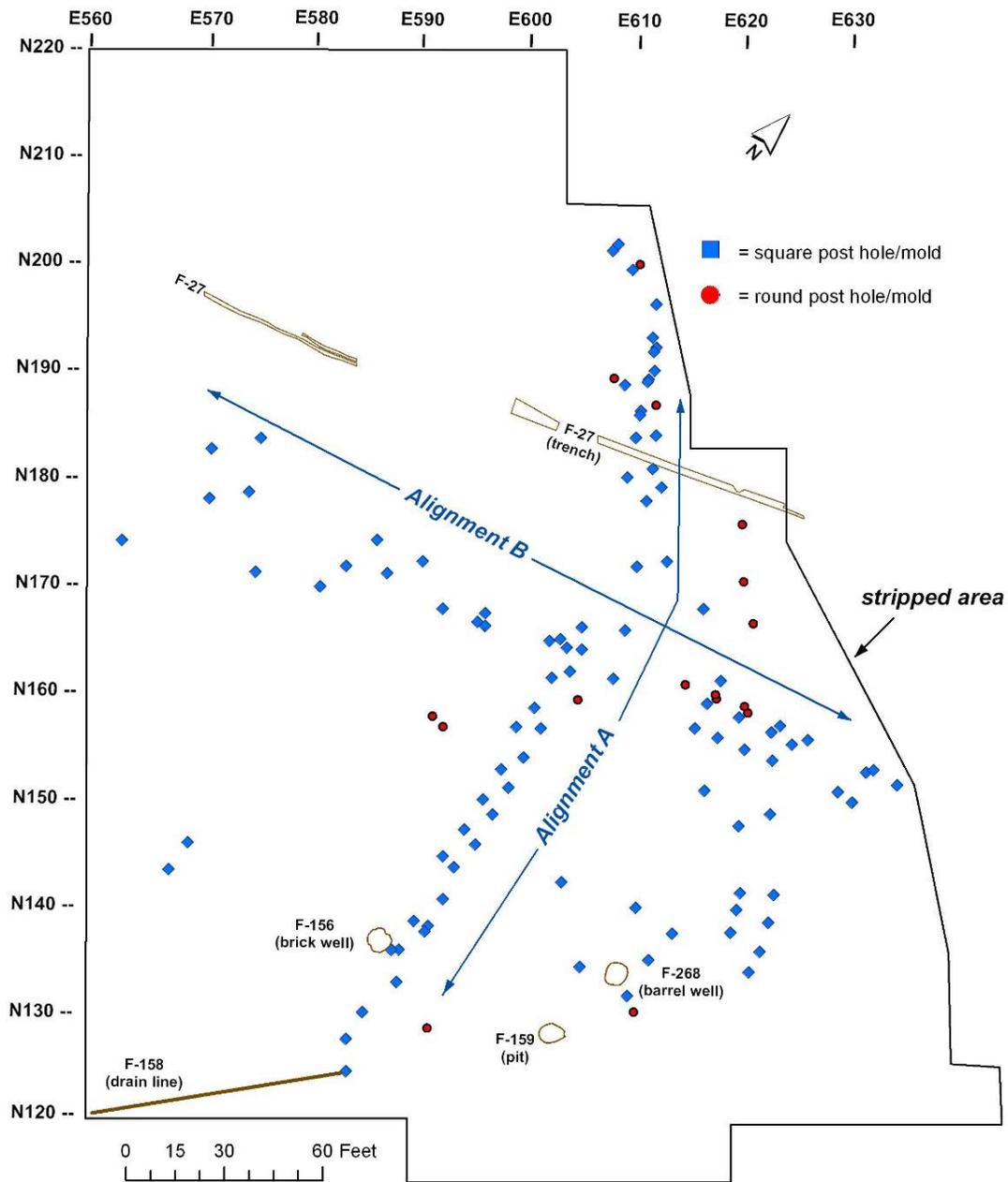


Figure 7-25. Location of Features Identified in Blocks B and C

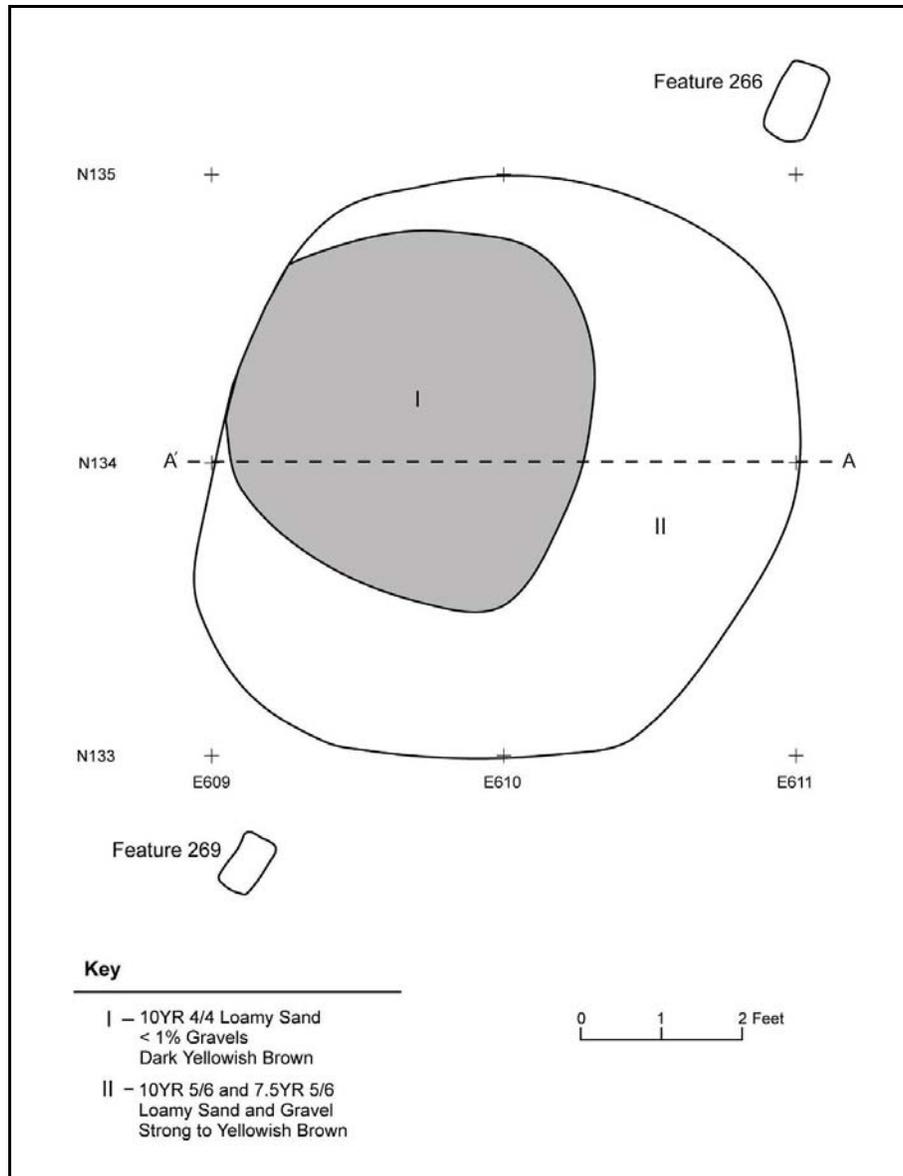


Figure 7-26. Plan View of the Barrel Well (Feature 268).

At the very base of the upper barrel (Stratum III), the top of a second barrel could be seen in profile and plan view of the north half. The stain signifying the second barrel was a very dark brown matrix, much different from the upper barrel. This matrix probably indicated longer contact with the water table, which was still 40-to-50 cm (1.3-to-1.6 ft.) deeper than the top of the second barrel. The presence of the second barrel suggested the feature was a probably a barrel well instead of a barrel privy. Halfway through the second barrel, the remains of a cast iron pot were encountered, encrusted in a bright orangey yellow matrix, resembling the consistency of clay (Figure 7-29). The cast iron pot fragment was removed in its entirety.

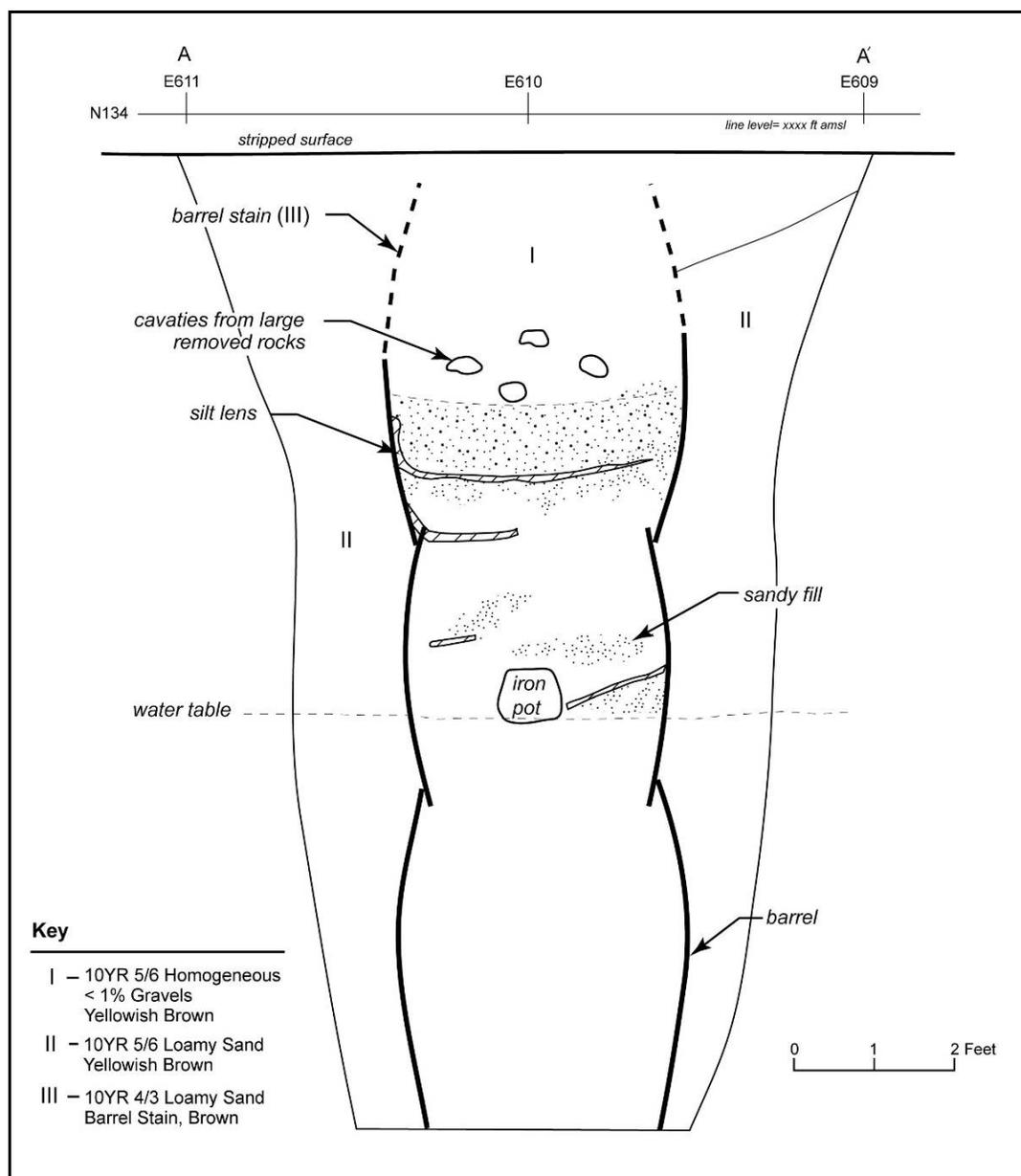


Figure 7-27. Profile of the Barrel Well (Feature 268)

At the same level of the cast iron pot fragment, the barrel stain (Stratum III) began to transform into actual wood remnants instead of only an organic stain. At the bottom of the second barrel with the north half removed, small fragments of intact barrel staves, although heavily rotted, could still be seen in situ in a perfect half circle in plan view. Samples of the heavily rotted staves were taken as well as soil samples.

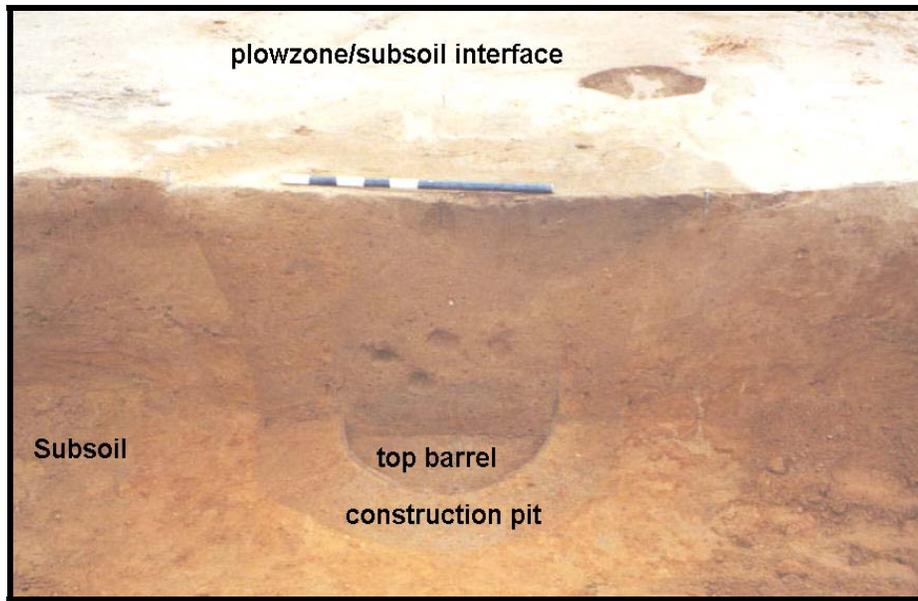


Figure 7-28. Barrel Well (Feature 268) with the Upper Portion of Top Barrel Exposed

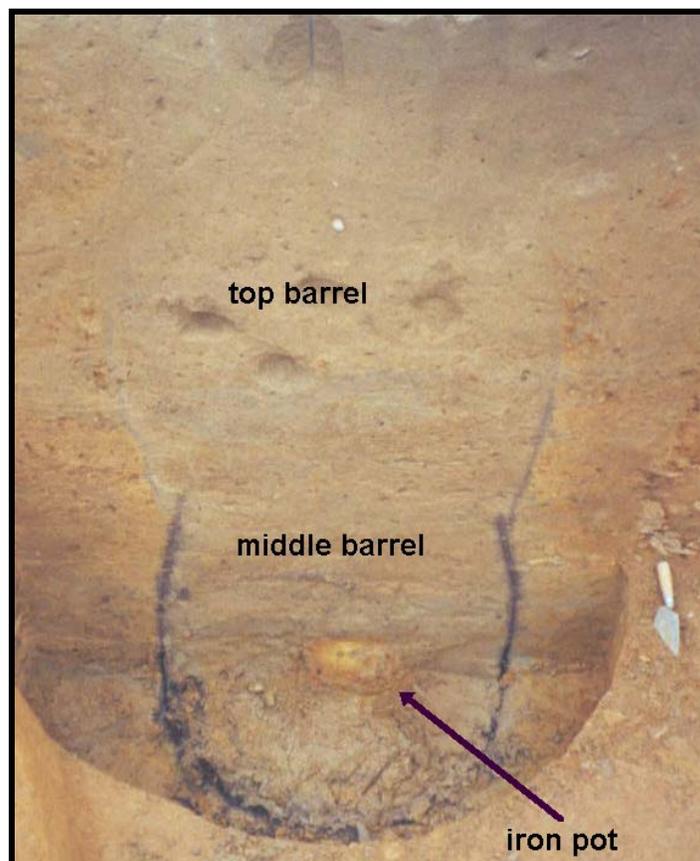


Figure 7-29. Barrel Well (Feature 268), Second Barrel with Iron Pot and Wooden Staves Exposed.

The matrix within the second barrel slumped into the excavation trench when the base was exposed, but was screened and saved in context. When cleaning the slump out, the staves, both stain and intact wood, could be observed in the back side of the second barrel. The top of yet another barrel, a third barrel, was then identified at the base of the second barrel (Figure 7-30).

Before the third barrel could be excavated, the south half of the upper portion of the well, and both south halves of the upper and second barrel, had to be removed so the entire area could be stepped back to facilitate the deep excavation required for the third barrel, and others if there were more underneath. The third barrel was relatively intact with actual wood present in the uppermost staves. Using an electric pump and buckets, the contents of the third barrel were removed as upper and lower barrel for provenience. Large artifacts, such as brick halves, a wrought iron hardware item, a pot hook, and leather items were found in the bottom half of the third barrel.

The excavation of other wells, particularly barrel wells, in the archaeological record has been problematic because of the depth and the potential for collapse with water-logged soils seeking to fill the void of the removed matrix after excavation. By the time the contents of the third barrel were removed, the water was pouring into the barrel at a rapid rate, but feeling by hand around the base of the barrel, it was determined that the third barrel was probably the bottom of the feature. Even at that depth, the construction pit (Stratum II) was observed in plan view, but the pit was barely larger than the third barrel, also indicating the base of the feature was near.

A large sump was excavated next to the third barrel inside the stepped area and the water was pumped out to keep the walls from slumping into the excavated area. A portion of the subsoil outside the northwest side of the barrel was removed to see what the exterior of the barrel was like, and encountered barrel hoops/rings across the outside surface in several places (Figure 7-31). The hoops literally fell off of the barrel once the subsoil was removed, but were all recovered for analysis. A bung hole and plug still intact were found in this area on the side of the barrel. The plug was removed to allow the water to flow out of the barrel into the sump area. Then, each stave was removed and placed on the side of the first step until all were removed.

Once two or three staves were removed, the rest of the barrel staves quickly separated once they were not wedged together, and could easily be removed. No other artifacts were found under the third barrel. The majority of the artifacts from the barrel well were found in the bottom half of the third barrel.

The construction pit for the barrel well had been excavated to a depth of about 3 m (9.8 ft.) below ground surface. The top of the construction pit (Stratum II) was conical, probably to allow the dirt to be thrown out as well as allow access for the excavator. The side sloped inward until the last few feet were just a few centimeters larger than the wooden barrel that was to be placed inside. The matrix inside Stratum II, the construction pit, was very close in color to the subsoil, but was markedly different in

consistency, suggesting it had been disturbed. One artifact of note was found in the construction pit approximately 90 cm from the surface, a late-18th-century waist coat button.

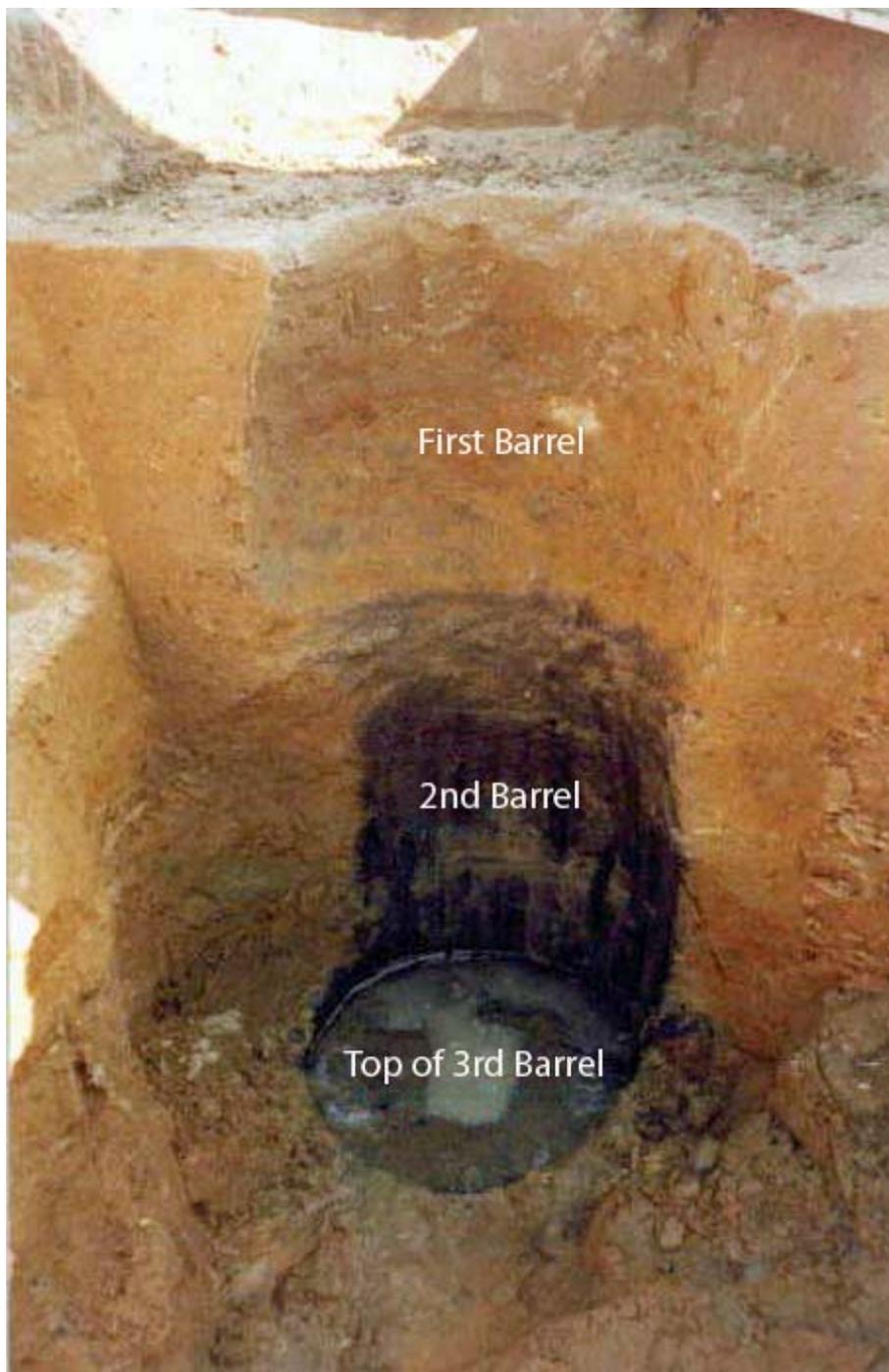


Figure 7-30. Barrel Well (Feature 268), Bottom Barrel and Second Barrel Staves Exposed



Figure 7-31. Barrel Well (Feature 268), Showing Intact Third Barrel

One of the more common types of late 18th-century buttons is that type made from flat brass discs with an eye soldered to the back. Numerous discs of the desired size were stamped out of sheets of brass. Shanks were attached to the backs of these discs along with a drop of solder flow, securing the shanks to the button backs. Afterwards, designs could be engraved or, during the final decade of the century, stamped onto the face and possibly backs of the buttons. These were then normally “gilded” [sic] or tinned. At times, Sheffield plate was applied to sheets of copper before the discs were stamped; the resultant buttons would have a silvered face (Hinks 1988).

Such buttons were common toward the end of the 18th century. Hughes and Lester suggested they were used between 1770 and 1800 (Hughes and Lester 1981:178), while Olsen indicated their use was from about 1785 to 1800 (Olsen 1963:552-553, Figure 1G). None of these buttons was found in the deposits at Fort Michilimackinac dating between 1715 and 1781 (cf. Stone 1974:45-76), indicating they were not common on the Michigan frontier prior to 1781. Olsen and Hughes and Lester explain a significant distinction between 18th- and 19th-century flat brass buttons. In the 18th century the brass or copper wire shanks were “alpha” shanks, not having the bent-over ends present on the “omega” shanks used from the very early 19th century (Olsen 1963:552-553; Hughes and Lester 1981:221). In summary, those flat buttons having the “alpha” shanks were used from the 1770s until around 1800, while those with “omega” shanks were used after about 1800 (Hinks 1988).

Three barrels had been placed inside the construction pit with no preparation of the base for their placement. The top and bottom barrel were slightly larger than the middle barrel. Therefore, the top and bottom lip of the middle barrel rested inside the lips of the top and bottom barrel. No sheathing or support held the barrels together, nor was there any sort of wooden sleeve or shaft liner observed. The well also did not contain any sort of apparatus that would suggest the presence of a pump. The recovered barrel parts were analyzed in the archaeological laboratory in Fairfax, Virginia. Further discussion of the barrel parts appears in Chapter 8.0 and in Appendix D – Barrel Analysis Forms and Data.

Feature 268 was excavated in 10 cm (3.9 in.) arbitrary levels within three discernible feature strata (Table 7-8): Stratum I (well fill), Stratum II (builder's shaft) and Stratum III (barrel stains).

Presumably, some of the same soil that had been excavated to create the barrel well would have been used after the barrels were put in place, to fill the void between the barrels and the builder's shaft walls. Artifacts from the builder's shaft, Stratum II, should represent what was already present in this location at the time of initial excavation, plus items that fell into the backdirt from the builders themselves during its removal or replacement.

Blown in mold glass (ca. 1840-1920s) does occur in the uppermost level but was associated with undecorated creamware (1762-ca. 1820) suggesting a mixed layer. Temporally diagnostic artifacts throughout the lower levels are contemporaneous with the exception of the Chinese porcelain teacup (Famille Rose) in Stratum I, level 15 which reflects a mid-18th-century time frame.

Several separate levels of deposition inside Stratum I were identified in the profile, but the matrix was not removed in such layers, so they will not be discussed in detail. Perhaps four or five major fill episodes over a period of time were the major events for filling the well. The majority of the artifacts from the well were found in the bottom half of the bottom barrel, including flat pieces of boards thought to be barrel cask head slats. It is not known if these cask head pieces represent a head left in place when the barrels were set into the pit to act as a filtering system, or if they represented wood from a bucket or water removal device. They could also represent a well cover/lid that fell into or was discarded into the well.

The location of the cast iron pot at the water table with no other associated artifacts suggests that maybe it was used for a period to remove water from the well. In general, the presence of the late-18th-century waist coat button, the scratch blue ceramic (mid-to-late-18th century), and the hand molded brick all suggest a date of construction and use for the well in the late-18th to very early-19th century. This would coincide with the suggested date range for the brick clamp complex, which was mainly based on only three pieces of historic ceramics, as well as deed references to a log cabin located somewhere on the parcel by 1816.

As mentioned previously in discussion of the brick clamp complex, the clay excavated to create the barrel well shaft may have been retained and used later for brickmaking. In essence, the well shaft may have been a borrow pit as well. The clay for brickmaking would typically have been spread to dry out for a summer and then prepared in the mixing pit with water in the fall to break it down and remove impurities. The barrel well may have provided a water source for breaking down the clay in the mixing pit, for slop-molding the brick molds to ease removal of the green bricks from the mold, and for workers and livestock in the brick clamp area.

7.4.2 Brick-lined Well (Feature 156)

Feature 156 was a brick-lined well located on the southern end of Block B on the bottom of a slope bounded by a swamp to the south. Only a dark oval stain, measuring between 2.2 m (7.2 ft.) and 2.35 m (7.7 ft.) in diameter, was observed at the interface of the plow zone and the top of the fill after the plow zone was mechanically removed. A piece of whiteware was found at the plow zone and feature interface. The edges of the feature in plan view were sharp and distinct, but very irregular in shape (Figure 7-32).

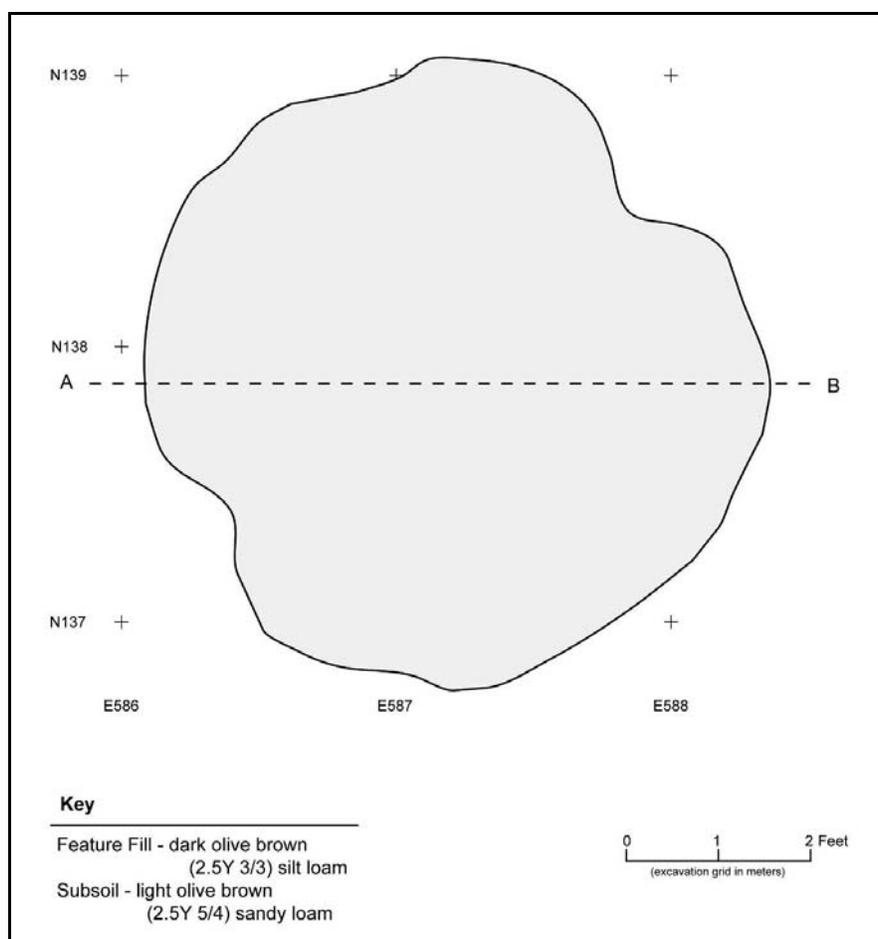


Figure 7-32. Plan View of Brick-lined Well (Feature 156).

Table 7-8. Temporally Diagnostic Artifacts Associated with Feature 268 Barrel Well Stratigraphy

Barrel	Level	Stratum I Barrel Fill			Stratum II Well Builder's Shaft			Stratum III Barrel Stain		
		Artifact Count	Temporally Diagnostic Artifacts	Time Frame	Artifact Count	Temporally Diagnostic Artifacts	Time Frame	Artifact Count	Temporally Diagnostic Artifacts	Time Frame
Barrel 1	1	13	Pearlware (hand painted); white salt glazed stoneware (scratch blue); cut nail; wrought nail	Late 18 th -early 19 th century	1	--	--	2	Cut nail	Late 18 th -19 th century
	2	86	Cut nail	Late 18 th -19 th century	3	Creamware (undecorated)	Late 18 th -early 19 th century	1	Cut nail	Late 18 th -19 th century
Barrel 2	3	8	Pearlware (undecorated)	Late 18 th -early 19 th century	1	--	--	1	--	--
	4	6	Cut nail	Late 18 th -19 th century	--	--	--	--	--	--
	5	3	Cut nail; cut/wrought nail	Late 18 th -19 th century	1	--	--	--	--	--
	6	2	--	--	6	--	--	1	Cut nail	Late 18 th -19 th century
	7	8	Cut nail	Late 18 th -19 th century	6	--	--	--	--	--
	8	3	Cut nail	Late 18 th -19 th century	--	--	--	--	--	--
Barrel 3	slump	62	Creamware (undecorated); cut nail; blown in mold glass	Late 18 th -19 th century	--	--	--	--	--	--
	9	3	--	--	1	--	--	1	--	--
	10	--	--	--	--	--	--	--	--	--
	11	--	--	--	--	--	--	--	--	--
	12	--	--	--	1	--	--	--	--	--
	13	1	Pearlware (undecorated)	Late 18 th -early 19 th century	--	--	--	--	--	--
	14	2	--	--	--	--	--	--	--	--
	15	1	Chinese porcelain (Famille Rose)	Second half 18 th century	3	--	--	--	--	--
	16	--	--	--	1	--	--	--	--	--
	17	--	--	--	--	--	--	--	--	--
18	--	--	--	1	Creamware (undecorated)	Late 18 th -early 19 th century	--	--	--	
19	1	--	--	--	--	--	--	--	--	
		199			25			6		

The south half of the feature was removed to provide morphological information. As the excavation progressed, the sides of a conical depression were found and extended to a depth of 70 cm (2.3 ft.). The center of the depression was a 1.5 m (4.9 ft.) wide with dark olive brown (2.5Y 3/3) silty loam extending to a depth of 53 cm (1.7 ft). The outer layer of the conical depression was a 35-to-40 cm (13.8-to-15.7 in.) thick with an olive brown (2.5Y 4/4) sandy clay loam lens. Between the two zones of the depression, there were splotches of a dark olive brown (2.5Y 3/3) sandy loam. The outer edges of the depression were smooth but undulating.

Broken bricks were encountered at the base of the depression; however, water was seeping into the feature as fast as fill could be removed. Since the depression tapered to a narrow base, the north half was removed to allow the excavators to remove the lower portion of the feature. At that point, rising groundwater and a high water table necessitated the use of a sump pump and the subsoil was stepped back to meet OSHA regulations. A 6 m (19.7 ft.) radius was stepped back from the well to a depth of 1 m (3.3 ft.), and a 1.5 m (4.9 ft.) wide was excavated another 1 m (3.3 ft.) into the subsoil. The steps allowed the excavators to go to a depth of 3 m (9.8 ft.) below the plow zone (Figure 7-33).



Figure 7-33. Stepped Area around Feature 156, the Brick-lined Well

At the base of the conical depression, the outline of a circular 1 m (3.3 ft.) wide builder's shaft was observed (Figure 7-34). The unlined shaft extended to a depth of 1.5 m (4.9 ft.) below the plow zone where vertical wood slats and several courses of brick were encountered. Hardwood vertical slats (probably oak) lined the sides of the lower 1 m (3.3 ft.) of the builder's shaft and two circular wooden collars were nailed to the interior of the slats a few inches above the base. Bricks were placed on the wooden collars to line the interior walls against the wooden slats.

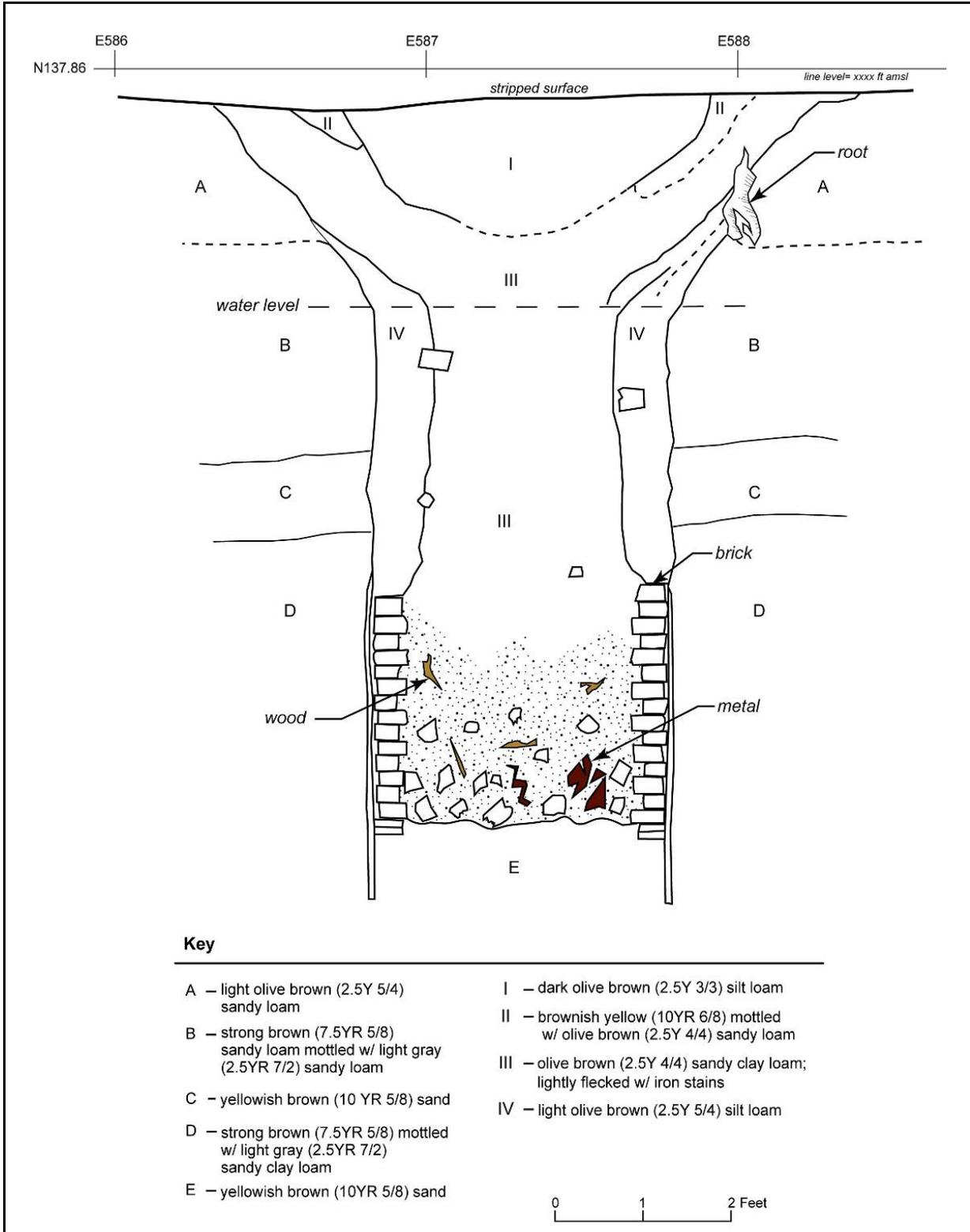


Figure 7-34. Profile of Feature 156 Brick-lined Well

Only fourteen courses of brick remained intact, each course containing fourteen brick. The bricks were dry laid in alternately breaking joints (Swindell 1860:33) in a stretcher configuration; no mortar was observed in or around the bricks, and no mortar was found in the screen. The top of the wooden slats were jagged and broken directly above the top course of brick. The well bottom extended into sandier subsoils, identified by auger probe to a depth of at least 1.5 m (4.9 ft.) below the base of the well and into the sides of the feature.

Large wood fragments and 90 half broken bricks were found inside the well, suggesting the constructed wooden and brick walls had extended further towards the depression area that collapsed, slumped inward, perhaps occurring as result of robbing of whole bricks from the well. The number of half-bricks suggests the walls may have extended at least another four to five courses.

Feature 156 was excavated in four distinct strata: Strata I and II represented the upper fill of the well, Stratum III was identified as the lower fill and Stratum IV was the builder's shaft. Recovered artifacts from the well included several large water worn cobbles, fragments of an enameled bucket, leather straps, metal straps, dozens of rusted nails (predominately cut and cut/wrought), turtle shell, metal sheet fragment, fence staples, a hinge, an undecorated creamware fragment, a blue shell-edged pearlware fragment, an undecorated whiteware fragment, an undecorated hard paste porcelain fragment, window glass, peach pits, a plow share, a piece of barbed wire/strip and barrel hoops. The feature fill contained artifacts characteristic of the late 18th through 20th century (wire, cut and wrought nails, undecorated creamware and whiteware, shell edged pearlware, and barbed wire); no artifacts were recovered from the builder's shaft (Table 7-9). Pearlware (1770s-1830) and the barbed wire fragment with a patent date of 1881 were recovered from the lower fill of the feature and suggest that the well was open in the late 19th century.

Table 7-9. Temporally Diagnostic Artifacts Associated with Brick-lined Well Feature 156 Stratigraphy

<i>Stratum</i>	<i>Count</i>	<i>Temporally Diagnostic Artifacts</i>	<i>Time Frame</i>
I and II Upper Fill	139	Creamware (undecorated); whiteware (undecorated); cut nail; cut/wrought nail; wrought nail	Late 18 th - 19 th century
III Lower Fill	482	Pearlware (blue shell- edged); barbed wire; cut nail; cut/wrought nail; wrought nail	Late 18 th - 19 th century
IV Builder's Trench	0	None	
Total	621		

The wood slats in the well suggests that perhaps a wooden caisson of oak slats was nailed around two wooden collars near the inside base. This caisson could have then been slid into the construction shaft probably already a few feet below the original ground surface. The digger

would then be able to dig inside the caisson and throw the dirt out without the walls of the hole collapsing. When the desired depth was achieved, the inside base was lined with machine made bricks.

A wooden well collar was recovered from Feature 156. It was flat and plank-like but with a curved body. It was 73.2 cm (28.8 in.) long, 9.8 cm (3.9 in.) wide and 2.54 cm (1.0 in.) thick. Marks from cutting or sawing the piece were evident. Eight cut nails were hammered into it. Several of the nails had “snapped” or broken perpendicular to the length or axis of the nail shank. This type of breakage was typical of early cut nails, which were made with the grain flow perpendicular to the nail shank. Also, slag inclusions contributed to the weakness of the nails during this period. These particular nails appeared to have irregular early cut heads and thus might date from the 1815s to the late 1830s (Leach 2000:38-39). A deteriorated wooden plank was also recovered from Feature 156. It was 70.5 cm (27.8 in.) long, 10.5 cm (4.1 in.) wide and ca. 15 mm (0.6 in.) thick. It was more heavily deteriorated at one end.

7.5 PITS AND AMORPHOUS FEATURES

7.5.1 Shallow Ditch (Feature 27)

Feature 27 was first encountered during the site evaluation investigations and described as a possible fence or shallow ditch feature. The feature was a low linear depression oriented east-west found just below the plow zone. The feature did not contain artifacts but did yield charcoal and some coal slag fragments. During the data recovery investigations, Feature 27 was found to extend into the northern end of Block C, but was intermittent, and non-contiguous (see Figure 7-25, map of features in Blocks B and C). For much of its extent across Block C, the feature was approximately 0.6 m (2.0 ft.) wide. The ephemeral nature of the feature and shallowness suggested that the feature was a large plow scar and it was not investigated further. However, the width, placement and orientation of the feature when superimposed upon a 1926 aerial photograph of the project area (US Army Air Corps 1926) suggests that Feature 27 was a 20th-century drainage or irrigation ditch (Figure 7-35). Feature 27 appears to be heading toward or from the wetlands adjacent to the east edge of Block C. The feature parallels and is between the two linear strips of darker soil visible in the 1926 aerial photograph. The linear strips may have been planting beds in 1926, perhaps for vegetables for the local canning industries. Perhaps the strips were raised beds, prepared by adding additional soil and fertilizer on top of natural grade. This could increase the productivity of a portion of the farm that tended to collect excess water at its natural grade.

7.5.2 Feature 149

Feature 149 was a heat altered stain adjacent to a square posthole (Feature 149b) on the southwestern portion of Block B that may not have been cultural. The feature was globular in plan view and measured 90 cm (35.4 in.) north to south and 75 cm (29.5 in.) east to west, extending to a depth of 14 cm (5.5 in.) below the plow zone (Figure 7-36). The heat signature was a brownish yellow (10YR 6/8) silt loam with some brown (10YR 5/3) silt loam mottles and formed an undulating u-shaped base (Feature 7-37). Charcoal was found primarily in the upper 6 cm (2.4 in.) of the feature and mainly in the central portion of Feature 149. The function of the feature was unclear, and it may be natural. Originally the feature was perceived to be a tree burn, but no offshoots of tap roots were observed. Feature 149 may have been a depression formed from the removal or burning of the nearby post in Feature 149b.

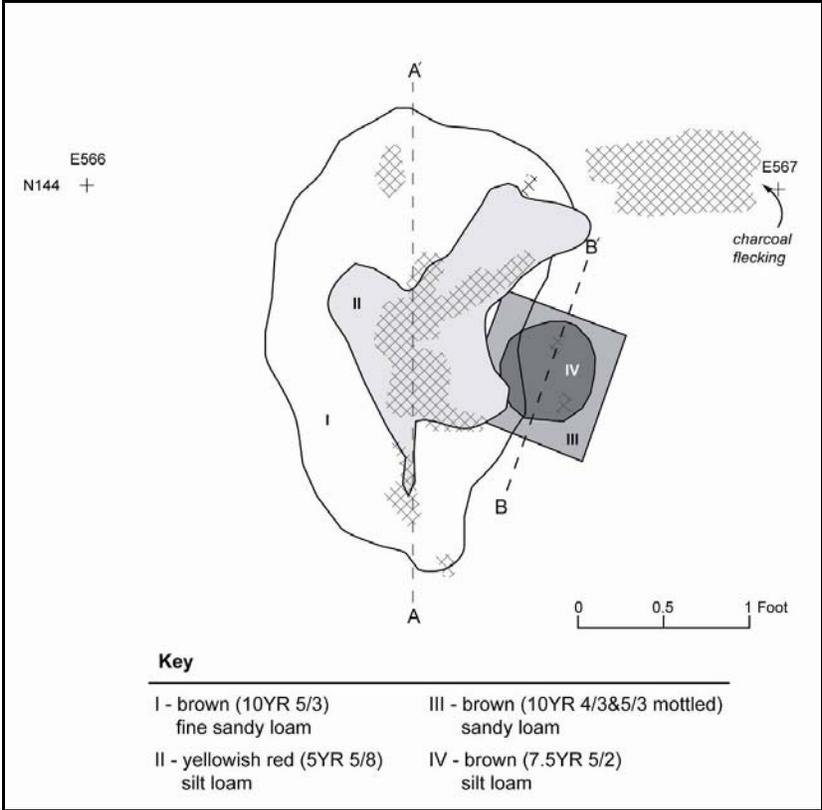


Figure 7-36. Plan View of Feature 149

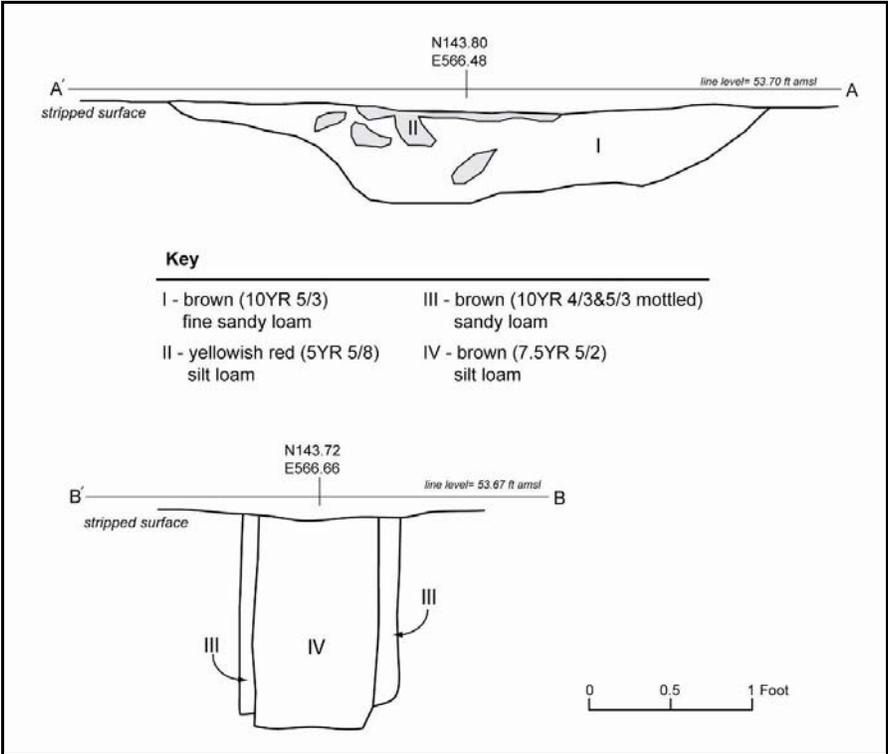


Figure 7-37. Profile Section of Feature 149

7.5.3 Historical Pit (Feature 159)

Feature 159 was a large historic pit containing both historical and prehistoric artifacts located in the southeast corner of Block B (see Figure 7-25, map of features in Blocks B and C). The feature was oval-shaped and measured 245 cm (96.5 in. or 8.0 ft) east-to-west and 182 cm (71.7 in. or 6.0 ft) north to south, extending to a depth of 34 cm (13.4 in.) below the plow zone (Figure 7-38). The edges of the pit were sharp and very distinct in plan view, common in historic features. The sides of the depression were fairly smooth, with no obvious undulations or excavation marks.

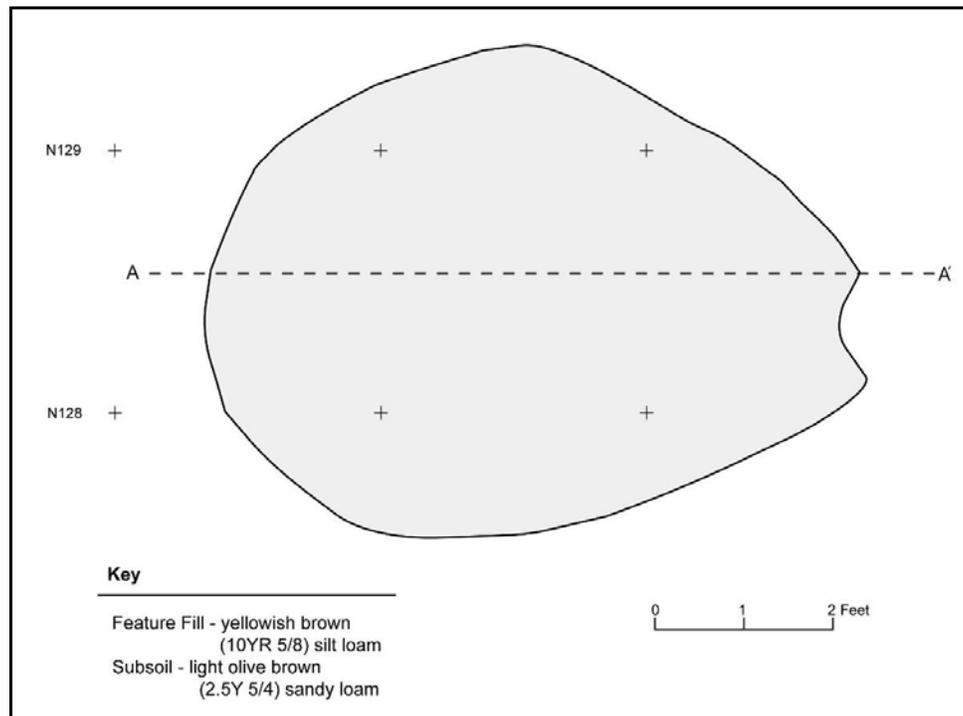


Figure 7-38: Plan View of Feature 159

Four zones were defined in the pit profile, all being a silt loam (Figure 7-39). Located across the base of the feature, but globular in profile was Zone 4, an olive brown (2.5Y 4/4) with distinct boundaries. Zone 1 was an olive brown (2.5Y 4/3) on the south side of the pit and probably a continuation of Zone 4, but only a slightly different color. Zone 3 was a yellowish brown (10YR 5/8) extending across two-thirds of the pit above Zone 4, with an undulating base to match Zone 4 and a slightly U-shaped upper boundary; Zone 3 matched the surrounding subsoil. Zone 2 was a yellowish brown (10YR 5/6) that comprised the majority of the feature matrix and was the upper most zone of the pit below the plow zone.

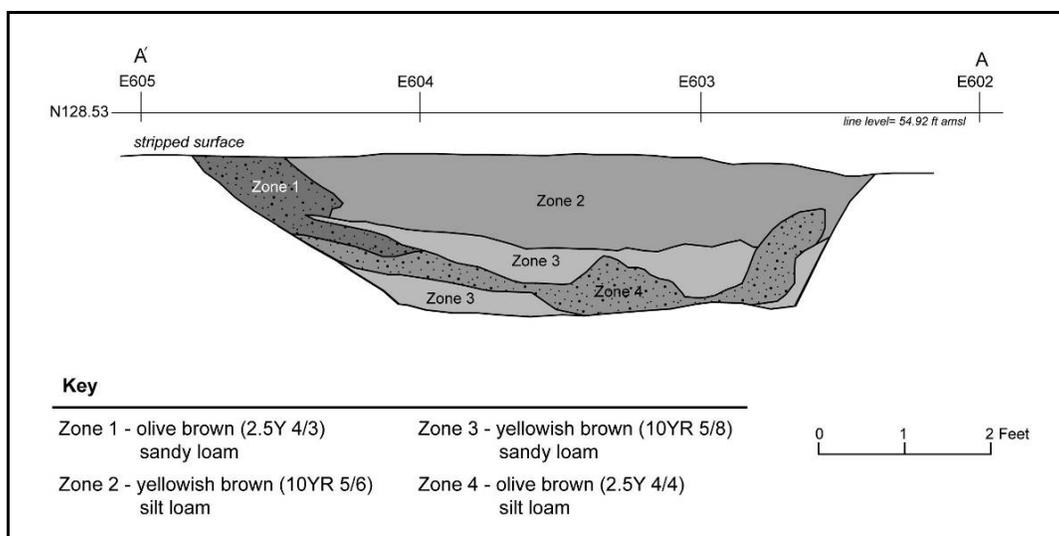


Figure 7-39: Profile of Feature 159

Five hand-molded bricks fragments, a cow tooth fragment, and 35 thermally altered stones were found in Feature 159 (Table 7-10). The pit also contained several prehistoric artifacts including 8 flakes, 4 cores, and 1 hammer stone. The majority of the historical artifacts were situated at the lower elevations of the pit, but not situated directly on the feature floor. The prehistoric component of the pit consisted of one lithic tool (a core) and two pieces of debitage, and is presumed to have been added/mixed with the historical artifacts rather than indicating a contact site, or historical impact on a prehistoric feature.

Table 7-10. Artifacts Recovered from Feature 159.

<i>Artifact Type</i>	<i>Count</i>	<i>Comments</i>
brick fragment	6	includes 4 brick halves
iron pot fragment	7	--
cow tooth	3	--
flake	2	--
core	1	--
thermally altered stone	31	mean weight : 540 g
Total	50	

The largest artifact from Feature 159 consisted of three fragments from a heavily rusted cast iron pot. The pot was in three pieces that could be refitted: a rim and shoulder area, body and base area, and one foot. A remnant of another iron pot was found in Feature 268, the barrel well, only a few meters to the east of Feature 159; however, they are not from the same vessel.

The date of construction and use of Feature 159 is difficult to determine. The historical artifacts consist of the hand-molded brick bats and the iron pot fragments, both difficult to give a temporal affiliation. However, the artifacts would be consistent with those found in the nearby barrel well (Feature 268), which has been assigned a construction and use date from the late-18th to the early-19th century. The reddish color of Zones 1 and 4 in Feature 159 suggests the strata

were possibly the remnants of a heat signature from a firing episode in the pit and the presence of thermally altered stone in the feature also support this scenario. The cobbles were located at the base of Zone 3, on top of the reddish matrix, and could be the result of cobbles placed in the pit to rest the pot on and perhaps they were somewhat covered and allowed to slowly cool and therefore were not fractured like the stones that show evidence of thermal alteration.

It is possible that the pit was used twice – once during the late prehistoric era as a storage pit, and again during the historical era as a cooking pit. Perhaps the workers who dug the barrel well found that there was already a depression in this spot from the slumped-in former pit and re-dug another, deeper pit in which to prepare their meals. If the late 18th-century time period and possible functional association between the brick clamp and the barrel well are assumed, then Feature 159 may have served as a cooking pit for the brick clamp workers as well. The pit may have been lined with cobbles to contain the fire; the iron pot may have been a discarded cooking vessel.

7.6 POSTHOLE FEATURES

Forty-four square, 52 rectangular, and 22 round postholes were documented in the southern portion of the site (Blocks B and C) during both phases of archaeological investigations at the Jones Site. The majority of the square postholes identified were part of two possible fence alignments across the excavation blocks designated Alignment A and Alignment B (Figure 7-40). Alignment A extended from the south central edge of Block B to the north central portion of Block C. Alignment B extended from the upper west central portion of Block B to the lower east edge of Block C. In many cases, the square posts were systematically staggered, possibly from a snake fence or worm fence construction pattern, though they may be too far apart for this. Another possibility is that the posts formed two parallel fence lines on opposite sides of a narrow farm lane. Such a lane would have been a mere 8 ft.-wide along much of Alignment A. An overlay of these features on a 1926 aerial photograph was included earlier in this chapter (see Figure 7-35).

Measurements on the posthole features in Blocks B and C are provided in Table 7-11. Seventeen of the square and rectangular postholes had round post molds inside the hole, with only six molds extending deeper than the posthole (Features 23, 26, 149, 161, 187, and 196). The deeper molds could indicate the post was either rammed into the ground deeper than the hole intentionally, or that the post was a weight bearing post. However, a plot showing the locations of these deeper post molds indicates that five of the six molds were part of fence Alignments A and B, and one was isolated on the southwestern quadrant of Block B. The majority of the round postholes was randomly placed and did not align with any feature or feature complex on the Jones Site (see Figure 7-40).

The majority of the postholes had similar matrix, similar color, and were relatively of similar size, and depth, suggesting most were placed relatively at the same time period. Most of the postholes were a brown (10YR 4/3) silt loam, ranging from 25-to-30 cm (9.8-to-11.8 in.) below the plow zone. The actual function of the possible post alignments is unknown, probably to

demarcate the edge of a field, corral, or land boundary, but the historical late-18th to mid-19th century land boundary is slightly to the east, only 100 to 200 ft. away.

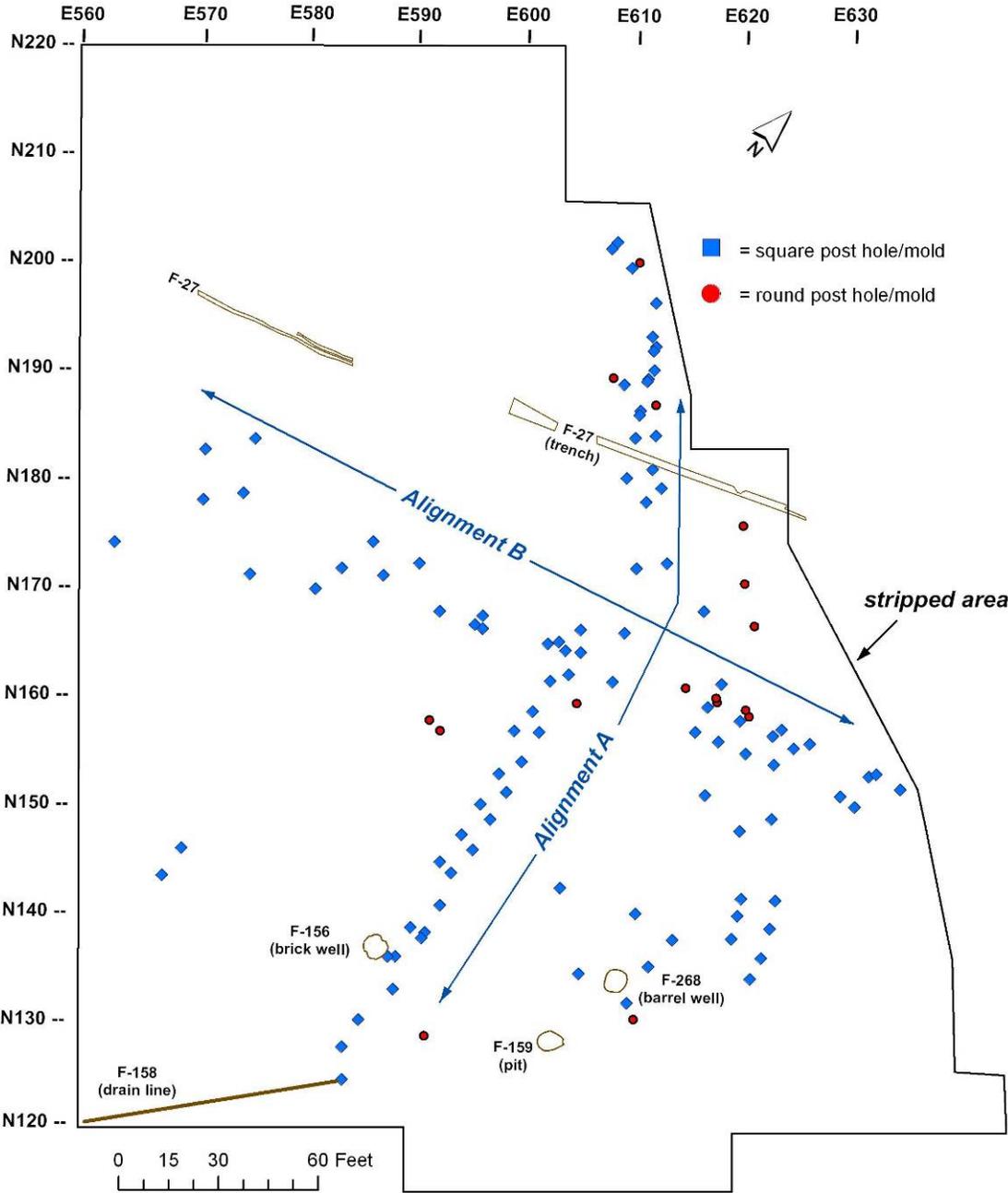


Figure 7-40: Fence Post Alignments in Blocks B and C

Table 7- 11. Postholes Identified within Blocks B and C

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
23	50 x 40 (19.7 x 15.7)	rectangular	none	none	22 (8.7; posthole), 36 (14.2; post mold)	None; Phase II
24	44 x 36 (17.3 x 14.2)	square (double post)	20 x 10 (7.9 x 3.9) & 15 x 10 (5.9 x 3.9)	both oval	45 (17.7)	1 brick fragment; Phase II
25	54 x 30 (21.3 x 11.8)	rectangular	36 x 22 (14.2 x 8.7)	round	55 (21.7)	None; Phase II
26	40 x 40 (15.7 x 15.7)	square	20 (7.9)	round	16 (6.3; posthole), 26 (10.2; post mold)	None; Phase II
33	--	square	--	--	--	unexcavated
34	--	square	--	--	--	unexcavated
35	--	square	--	--	--	unexcavated
36	--	oval	--	--	--	unexcavated
37	40 x 20 (15.7 x 7.9)	rounded rectangular	18 (7.1)	round	20 (7.9)	none; Phase II
38	25 (9.8)	circular	none	none	9 (3.5)	none; Phase II
43	unexcavated	square	unknown	unknown	unexcavated	Phase II
45	unexcavated	circular	unknown	unknown	unexcavated	Phase II
149	25 x 25 (9.8 x 9.8)	square	12 (4.7)	circular	32 (12.6)	none
154	30 x 21 (11.8 x 8.3)	rectangular	none	none	30 (11.8)	none
161	46 x 32 (18.1 x 12.6)	rectangular	20 (7.9)	circular	30 (11.8)	none
162	44 x 40 (17.3 x 15.7)	circular w/ tapered sides	none	none	28 (11.0)	1 brick fragment
163	44 x 42 (17.3 x 16.5)	square	38 + (15.0 +)	circular	32 (12.6)	none
164	40 x 20 (15.7 x 7.9)	rectangular	none	none	36 (14.2)	None
165	41 x 36 (16.1 x 14.2)	rectangular	none	none	34 (13.4)	1 redware; 1 brick fragment
166a	35 x 30 (13.8 x 11.8)	rectangular; superimposed on Feature 166b	9 (3.5)	circular	26 (10.2)	Fence staple
166b	40 x 40 (15.7 x 15.7)	square; impacted by	none	none	32 (12.6)	1 window glass; 1

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
		Fea.166a				oyster shell
167	37 x 27 (14.6 x 10.6)	rectangular w/ circular base	none	none	26 (10)	None
168	38 x 29 (15.0 x 11.4)	rectangular	none	none	34 (13.4)	None
170	33 x 28 (13.0 x 11.0)	rectangular	12 (4.7)	circular	32 (12.6)	1 chert flake
171	44 x 43 (17.3 x 16.9)	square	none	none	~30 (11.8)	near well F156
172	14 x 13 (5.1 x 4.7)	square	none	none	~30 (11.8)	near well F156
173a	30 x 30 (11.8 x 11.8)	square; superimposed on Feature 173b	none	none	~30 (11.8)	near well F156
173b	40 x 20 (15.7 x 7.9)	rectangular; impacted by Feature 173a	none	none	~30 cm (11.8)	near well F156
174	40 x 38 (15.7 x 15.0)	square	none	none	~30 cm (11.8)	near well F156
175	33 x 30 (13.0 x 11.8)	square w/ slightly rounded base	none	none	~30 cm (11.8)	near well F156
176a	30 x 30 (11.8 x 11.8)	square; adjacent to Feature 176b	none	none	26 (10.2)	None
176b	30 x 30 (11.8 x 11.8)	Square; adjacent to Feature 176a	none	none	40 (15.7)	None
177	48 x 44 (18.9 x 17.3)	rectangular	none	none	24 (9.4)	1 whiteware
178	20 x 10 (7.9 x 3.9)	rectangular w/ u-shaped base	none	none	11 (4.3)	1 wood fragment
179	40 x 30 (15.7 x 11.8)	rectangular	none	none	40 (15.7)	1 glass fragment
180	36 x 26 (14.2 x 10.2)	rectangular; undulating base	none	none	10 (3.9)	1 nail fragment; 1 brick fragment
181	32 x 28 (12.6 x 11.0)	square w/ rounded base	14 (5.5)	circular	36 (14.2)	None
184	48 x 35 (18.9 x 13.8)	rectangular	16 (6.3)	circular	44 (17.3)	1 redware
187	40 x 40 (15.7 x 15.7)	square	20 (7.9)	circular	43 (16.9)	1 brick fragment
188	46 x 35 (18.1 x 13.8)	rectangular	none	none	33 (13.0)	1 flake

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
189	25 x 25 (9.8 x 9.8)	square, rounded corners	none	none	28 (11.0)	none
191	54 x 34 (21.3 x 13.4)	rectangular, tapered base	none	none	46 (18.1)	7 nail fragments
192	20 x 20 (7.9 x 7.9)	square	none	none	14 (5.5)	None
193	18 x 16 (7.1 x 6.3)	square, tapered base	none	none	12 (4.7)	1 brick fragment
194	39 x 28 (15.4 x 11.0)	rectangular	none	none	42 (16.5)	1 redware
195	28 x 28 (11.0 x 11.0)	square w/ rounded base	none	none	23 (9.1)	None
196	37 x 22 (14.6 x 8.7)	rectangular w/rounded side	14 (5.5)	circular	44 (17.3)	None
210	20 x 20 (7.9 x 7.9)	square	unknown	unknown	unexcavated	
211	26 x 26 (10.2 x 10.2)	square	unknown	unknown	unexcavated	
215	16 (6.3)	circular	none	none	6 (2.4)	
216	16 (6.3)	circular	unexcavated	unexcavated	unexcavated	
218	33 x 23 (13.0 x 9.1)	rectangular	unknown	unknown	unexcavated	
220	26 x 26 (10.2 x 10.2)	square	unknown	unknown	unexcavated	
221	38 x 32 (15.0 x 12.6)	rectangular	unknown	unknown	unexcavated	
222	35 x 25 (13.8 x 9.8)	rectangular	unknown	unknown	unexcavated	
224	18 (7.1)	circular	unknown	unknown	unexcavated	
225	39 x 33 (15.4 x 13.0)	rectangular	unexcavated	unexcavated	unexcavated	
226	26 x 20 (10.2 x 7.9)	rectangular	unknown	unknown	unexcavated	
227	26 x 34 (10.2 x 13.4)	rectangular	unknown	unknown	unexcavated	
228	37 x 28 (14.6 x 11.0)	rectangular	none	none	14 (5.5)	
231	19 (7.5)	circular	unknown	unknown	unexcavated	
232	32 x 30 (12.6 x 11.8)	square	unknown	unknown	unexcavated	
233	37 x 27 (14.6 x 10.6)	rectangular	unknown	unknown	unexcavated	
235	31 x 28 (12.2 x 11.0)	square	unknown	unknown	unexcavated	
236	37 x 37 (14.6 x 14.6)	square	unknown	unknown	unexcavated	
238	32 x 30	square	17 (6.7)	circular	unexcavated	

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
	(12.6 x 11.8)					
239	32 x 26 (12.6 x 10.2)	rectangular	unexcavated	unexcavated	unexcavated	
240	25 x 25 (9.8 x 9.8)	square	unknown	unknown	unexcavated	
241	33 x 24 (13.0 x 9.4)	rectangular	none	none	26 (10.2)	none
244	36 x 36 (14.2 x 14.2)	square	unknown	unknown	unexcavated	
245	23 x 23 (9.1 x 9.1)	square	unexcavated	oval	unexcavated	
247	33 x 30 (13.0 x 12.8)	square	unknown	unknown	unexcavated	
249	31 x 22 (12.2 x 8.7)	rectangular	unknown	unknown	unexcavated	
250	32 x 28 (12.6 x 11.0)	rectangular	unknown	unknown	unexcavated	
251	32 x 32 (12.6 x 12.6)	square	unknown	unknown	unexcavated	
252	24 x 17 (9.4 x 6.7)	rectangular	unknown	unknown	unexcavated	
253	40 x 33 (15.7 x 13.0) & 24 x 24 (9.4 x 9.4)	double square posthole	none	none	35 (13.8)	
254	34 x 27 (13.4 x 10.6)	rectangular	unknown	unknown	unexcavated	
255	30 x 20 (12.8 x 7.9)	rectangular	unknown	unknown	unexcavated	
257	28 x 27 (11.0 x 10.6)	square	unknown	unknown	unexcavated	
260	12 (4.7)	circular	none	none	18 (7.1)	
263	80 x 50 (31.5 x 19.7)	rectangular	unknown	unknown	unexcavated	
265	25 x 20 (9.8 x 7.9)	rectangular	unknown	unknown	unexcavated	
266	25 x 20 (9.8 x 7.9)	rectangular	none	none	20 (7.9)	no artifacts; next to barrel well F268
269	20 x 20 (7.9 x 7.9)	square	none	none	20 (7.9)	no artifacts; next to barrel well F268
270	20 (7.9)	circular	unknown	unknown	unexcavated	
271, 272, 274, 275, 277,- 278	--	--	--	--	--	See Table 7-12: possible structural

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
276	25 x 25 (9.8 x 9.8)	square	10 (3.9)	circular	14 (5.5)	none
279	25 x 25 (9.8 x 9.8)	square	unknown	unknown	unexcavated	
280	32 x 25 (12.6 x 9.8)	rectangular	unknown	unknown	unexcavated	
282	30 x 20 (12.8 x 7.9)	rectangular	unknown	unknown	unexcavated	
283	60 x 40 (23.6 x 15.7)	double rectangular	unknown	unknown	unexcavated	
284	50 x 50 (19.7 x 19.7)	square	unknown	unknown	unexcavated	
285	60 x 35 (23.6 x 13.8)	rectangular	unknown	unknown	unexcavated	
286	55 x 45 (21.7 x 17.7)	circular	none	none	22 (8.7)	
287	48 x 45 (18.9 x 17.7)	circular	none	none	45 (17.7)	
289	45 x 40 (17.7 x 15.7)	rectangular	unknown	unknown	unexcavated	
290	40 x 30 (15.7 x 12.8)	rectangular	unknown	unknown	unexcavated	
291	50 x 45 (19.7 x 17.7)	rectangular	unexcavated	unexcavated	unexcavated	
292	60 x 55 (23.6 x 21.7)	circular	unknown	unknown	unexcavated	
293	40 (15.7)	circular	unknown	unknown	unexcavated	
294	35 (13.8)	circular	unknown	unknown	unexcavated	
295	55 x 25 (23.6 x 9.8)	rectangular	unknown	unknown	unexcavated	
297	35 (13.8)	circular	unknown	unknown	unexcavated	
298	50 x 40 (19.7 x 15.7)	circular	none	none	52 (20.5)	possible tap root
299	35 (13.8)	circular	none	none	8 (3.1)	
300	40 x 20 (15.7 x 7.9)	rectangular	unknown	unknown	unexcavated	
301	28 x 25 (11.0 x 9.8)	square	unexcavated	circular	unexcavated	
302	60 x 38 (23.6 x 15.0)	rectangular	unknown	unknown	unexcavated	
303	38 x 35 (15.0 x 13.8)	rectangular	none	none	40 (15.7)	1 pearlware, 1 yellow ware, 1 debitage
304	21 x 20 (8.3 x 7.9)	square	unknown	unknown	unexcavated	
305	32 x 30 (12.6 x 12.8)	square	unknown	unknown	unexcavated	

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth below PZ, in cm (in.)	Artifacts/ comments
306	22 x 20 (8.7 x 7.9)	square	unknown	unknown	unexcavated	
307	35 x 30 (13.8 x 12.8)	square	unknown	unknown	unexcavated	
308	42 x 27 (16.5 x 10.6)	L-shaped (double posthole?)	none	none	32 (12.6)	
309	39 x 28 (15.4 x 11.0)	rectangular	unknown	unknown	unexcavated	
310	--	--	--	--	--	See Table 7-12: possible structural

Not all of the postholes from Blocks B and C were part of the two suggested fence alignments. The following text presents posthole features that may have non-fence line associations.

Features 266 and 269 were a set of rectangular and square postholes located on either side of the barrel well (Feature 268) in Block C (see Figure 7-40). Neither post had a post mold and did not contain any artifacts. Their close proximity to the barrel well, and an absence of nearby postholes, suggests the two posts were possibly part of a support for a bucket crank or well house.

Features 171, 172, 173 a & b, 174, and 175 were a series of square postholes that were located in the vicinity of the brick-lined well (Feature 156) in the southern half of Block B. The features were within fence Alignment A, but were not found during the initial blading and shovel scraping of the area after the removal of the plow zone. When the area around the well was stepped back for compliance with state and federal safety regulations, and some of the darker matrix surrounding the well was removed, the post features were encountered. None of the postholes from this series contained artifacts.

During the excavation of the stepped area around the brick lined well (Feature 156), five square postholes (Features 171-175) were discovered near the well that had not been observed at the plow zone/subsoil interface. A thin lens of the strong brown subsoil covered the area around the well, including the postholes. The postholes could either be part of a structure covering the well area, or a platform near the same, or part of the double row of postholes that extend to the northeast of the well.

Feature 149b was an isolated square posthole and round post mold found during the excavation of Feature 149 on the southwestern portion of Block B. The feature was not observed at the onset of the excavation of Feature 149, but was discovered when the profile of the latter was exposed. The square posthole was 25-x-25 cm (9.8-x-9.8 in.) and extended 28 cm (11.0 in.) below the plow zone and had a flat base. The round post mold measured 19 cm (7.5 in.) in diameter, extending slightly deeper than the posthole, to a depth of 32 cm (12.6 in.) below the plow zone, and also had a flat base. Charcoal was found in small flecks throughout the posthole

and post mold, similar to the charcoal observed in the depression Feature 149. The relationship between Feature 149 and 149b was not clear, but perhaps the former was a depression resulting in the removal of the post from the latter. Then, a fire appears to have affected the area. The heat altered earth, or evidence of a fire that attained enough heat to alter the earth, was not observed in any other features in that portion of Block B.

Possible Structural Postholes

One of the main areas of focus of the data recovery investigations was to explore the area around the brick clamp (Feature 18) and the region in the southern half of the site where late-18th to early-20th century domestic artifacts and some architectural artifacts were found in hopes of finding an associated structure. By reviewing the matrix and dimensions of each posthole from the site, a series of seven postholes in Block C, two rounded and five square, deserve attention in the search for a possible structure on the Jones Site (Table 7-12). Features 271, 272, 274, 275, 277, -278, and 310 each contained a yellowish brown (10YR 5/4) silt loam, slightly lighter in color than the majority of the square postholes in Blocks B and C, which were predominately brown (10YR 4/3). Furthermore, the posthole series were shallower than the other postholes in Blocks B and C, ranging from only 1-to-14 cm (0.4-to-5.5 in.) instead of 25-to-30 cm (9.8-to-11.8 in.) below the plow zone. This series of eight postholes were isolated from the fence line postholes and outlying postholes of Blocks B and C. However, this patterning of posts does not appear to exhibit the 90-degree angles expected for a rectangular structure. Also, shallower posts tend to be less stable than those set deeper in the ground, so shallower translates to less stable, less permanent, and less able to provide support. Perhaps this cluster of shallow posts represents a less formal function, such as an animal pen, or hitching posts for horses or oxen.

Table 7-12: Possible Structural Postholes from Block C.

Feature	Posthole Diameter in cm (in.)	Posthole shape	Post mold diameter in cm (in.)	Post mold shape	Feature Depth (below PZ) in cm (in.)	Artifacts
271	25 x 20 (9.8 x 7.9)	square	17 (6.7)	circular	14 (5.5)	none
272	26 x 19 (10.2 x 7.5)	oval	21 (8.3)	circular	7 (2.8)	1 creamware
274	20 x 20 (7.9 x 7.9)	rounded square	none	none	7 (2.8)	none
275	28 x 28 (11.0 x 11.0)	square	none	none	2 to 10 (0.8 to 3.9)	none
277	22 x 22 (8.7 x 8.7)	square	none	none	6 (2.4)	none
278	20 x 20 (7.9 x 7.9)	square	none	none	1 (0.4)	none
310	27 x 20 (10.6 x 7.9)	square	6 x 12 (2.4 x 4.7)	rectangular	3 (1.2, posthole), 12 (4.7, post mold)	none

Five circular postholes in the area of the eastern half of fence Alignment B (Features 286, 287, 292, 293, and 294) could be part of a structure, as the artifact assemblage for the earlier component for the site was somewhat concentrated in that area. One of the square posts a few meters east of the five circular postholes contained creamware and yellow ware. Alternatively, they might represent posts from a swinging gate that opened into the southeastern enclosure.

7.7 TERRA COTTA DRAIN TILE SYSTEM

Two separate systems of terra cotta drain tiles were encountered at the Jones Site. Each is described below. Details of field drainage systems and the local tile-making industry in Delaware are provided below.

7.2.1 Terra Cotta Drain Line (Feature 14) and Associated Builder's Trench (Feature 14a)

Features 14 and 14a were a terra cotta drain tile line (Feature 14) and associated builder's or construction trench (Feature 14a) (Figure 7-41). Originating in the southwestern portion of Block A, the features impacted the large shallow pit (Feature 4) as three separate drain heads joining together within Feature 4. No adapter or separate piece was used to connect the three sections, which joined at oblique angles with a broken tile piece laid over the gap to possibly stem the slumping of the upper matrix into the drain tile system. The drain system extended through a slight rise in the topography to the east side of Block A then down the slope to the northeast to a drainage ditch bounding the eastern edge of the Jones Site. The terminus of the drain tile system was not located, but an active spring was present at the juncture of the tile system, field drainage ditch, and the swamp.

The builder's trench (Feature 14a) measured 22 cm (8.7 in.) wide and was an average of 24 cm (9.4 in.) below the plow zone (Figure 7-42). Outside of Block A, the builder's trench extended an average of 26 cm (10.2 in.) below the modern ground surface. The tile system was approximately 25 cm (6 in.) higher just to the east of Block A between the terminus in the swamp and the three-legged mouth, probably not allowing for a well-drained field. An alternate explanation is that the drain lines were designed to drain the wooded wetlands that lay to the north of the project area, and that the tile system was placed to funnel water southward into the site in the area of Feature 4. The swampland and mosquitoes could have been a health concern. In the late 1860s and early 1870s, a well-regulated fall of three inches per hundred feet was recommended for drain tile systems (Weaver 1964:118). The systems were not capable of draining for large storms and rainfalls, but would remove the water enough for practical purposes (Weaver 1964:118). It was also recommended that the fall should not increase as the pipe gets closer to the outlet, otherwise, the backup could result in silt buildup (Weaver 1964:119). The computation was that for every 1 ½ inch of rainfall, over 20,360 gallons of water had to be removed for each acre of land (Weaver 1964:119).

Two different styles of terra cotta tiles were present at the Jones Site, and three different sizes of each. A horseshoe sole tile, u-shaped in profile with a flat base, usually was placed directly on the bottom of the construction trench, as were the tiles of Feature 14 (Weaver 1964:127). The

second tile style was an omega tile, shaped like the Greek letter, also with a flat base (Figure 7-43).

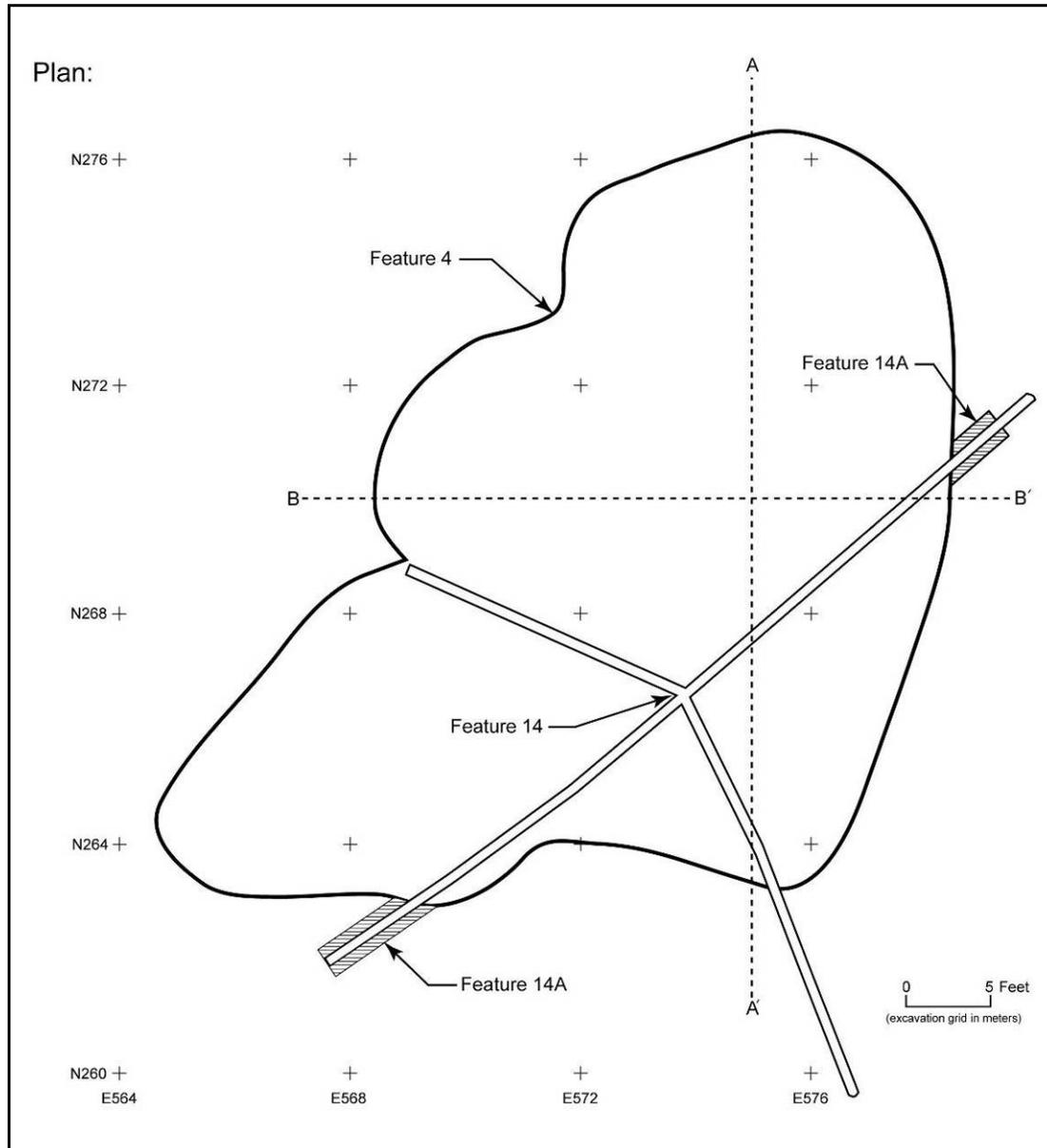


Figure 7-41. Plan of the Terra Cotta Drain System in Block A

At first glance, the context of the drain system directly over the possible procurement/mixing pit for the brick clamp suggested the drain system had been constructed to remove water during brick clamp operation. Additionally, a temporal overlap for terra cotta drain tiles and hand-molded bricks existed. Furthermore, the existence of drains with clamps and kilns had been established. Excavations at the John Jay House site in New York encountered a stone drain, which functioned to remove water from the brick manufacturing area (Feister and Sopko 1996:59).

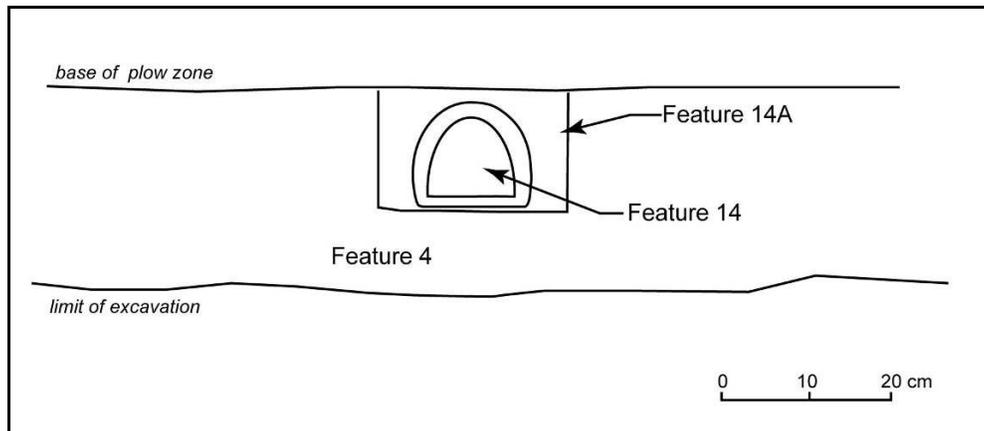


Figure 7-42. Profile of Builder's Trench (Feature 14a) and Terra Cotta Drain Tiles (Feature 14)



Figure 7-43. A 1904 Local Advertisement Depicting Omega-shaped Drain Tile (*Smyrna Times* L(11):20).

Excavations, however, indicated the drain tile system was constructed after the brick clamp operation had ceased. The partially filled mixing pit with brick fragments mixed with the fill dirt would have created a low spot that acted like a French drain, collecting and draining water from the surrounding area. When the nearby farm fields were improved later to reclaim wet areas, the low spot created by the filled/slumped pit seems to have been chosen as the target for the outflow ends of several terra cotta drain lines.

Terra Cotta Drain Tile System (Feature 158)

Feature 158 in the southwest quadrant of Block B was also a terra cotta drain tile system, first encountered during the data recovery investigations. The head of Feature 158 was located near Feature 25, one of the many square post holes of one of the fence lines on the site, and extended southwest to the edge of Block B and beyond to an unknown terminus (see Figure 7-25, plan of features in Blocks B and C). The head was only 23 ft. south of Feature 156, the brick-lined well, and could indicate use of the drain system to remove excess water from the well area, perhaps to form a cattle tank or watering trough. As with Feature 4, the terra cotta drain tiles from Feature 158 did not exhibit manufacturing marks to provide datable information. No construction trench, such as Feature 14A, was observed during the field investigations.

Terra cotta drain tiles rarely contained manufacturing marks; however, some tiles have been observed with scratched markings into the outside of the tiles for names, dates, or symbols (Weaver 1964). With no identifying marks on the Jones Site drain tile, a date range or place of manufacturing would be conjectural. However, the local landowner, Charles Adams Sr., stated he remembered that the WPA, or some other entity, constructed drains somewhere in the field in the 1930s. It is possible that Features 14, 14A, and 158 were constructed at that time.

Land Drainage History

The first farmer in America to use drainage tiles to drain his land was said to be John Johnston of Geneva, New York in 1838 (Klippart 1862:27). Johnston was born in Scotland in 1791 and moved to the United States in 1821, settling on a farm in Geneva with a heavy clay soil which drained poorly (Weaver 1964). Mr. Johnson imported the horseshoe-shaped drain tiles from England since they were not yet being manufactured in America (Klippart 1862:29). These early tiles were reportedly shaped by hand over a stick since machinery for producing drain tiles had not yet been invented. Later versions were shaped over a cylinder. His farm, which was “previously sodden with water, and utterly unfruitful, in one season was covered with luxuriant crops” (Klippart 1862:30). Johnston was so encouraged by these results that he proceeded to invest in more drain tiles, and by 1856 had laid 210,000 tiles or almost fifty miles of drain line on his farm (Klippart 1862:30).

Johnston advocated digging lateral drainage ditches two and a half feet deep, thirteen inches wide at the top, and sloping inward to a bottom just wide enough to accept the tile. He recommended beginning at the foot of each ditch and digging toward the head. Working uphill allowed for preserving the natural fall more easily. Main drainage ditches to accept the water from lateral drain were three and a half to four feet deep, with two four-inch tiles placed eight inches apart, with an arch-shaped piece of tile with a nine-inch span placed on top (Klippart 1862:31-32).

The 1839 *Farmers Magazine* was predicting that in the near future draining the land would reclaim much of the boggy, swampy, and fertile regions of Delaware (Huffington 1839:197). The article mentioned the use of drain pipes, but does not specify whether pipes infer metal or terra cotta systems.

Machinery to produce clay drain tiles was invented in Europe in the 1840s. By the 1860s, over 50 different machines had been introduced and were in use in England, France, and Germany (Klippart 1862:343). Machines for this purpose developed in the United States by this time

included the Mattice and Penfield machine, which could grind the clay, mold the tile, and place the tile on a drying board. The drying boards rested upon a carriage with an endless belt underneath which led to the kilns for firing. Another version, called the American Tile Maker, was cast iron, eight feet in length and mounted on wheels. It could produce horseshoe or sole tile, depending on the shape of die used (Klippart 1862:343-346).

Terra cotta tile sections were available in central Delaware prior to the Civil War, but increased dramatically in the second half of 19th century. The *Smyrna Times* of August 28, 1862 (Vol. 8, No. 8, Page 2) contained the following advertisement:

Draining Tile Manufactory

Thos. J. Smedley

Wishes to notify Farmers and others

that he is now manufacturing

AT BLACKISTON CROSSROADS

near Smyrna. DRAINING TILE of all sizes

and of the very best quality

is being prepared to supply and

guarantee at the

lowest manufacturing prices

A “Tile and Brick Works” factory was illustrated on the 1868 Beers Atlas at the intersection of Brick Store Road and Smyrna Landing Road, with three buildings associated, suggesting a rather large operation (Figure 7-44). The factory was located just a little over two miles to the southeast of the Jones Site. Terra cotta tiles were still manufactured in the area as late as the 1920s (personal conversation with Ned Heite April 2000).

Another tile works, known as Matthews & VanDyke, was operating in Appoquinimink Hundred in the mid-19th century (Scharf 1888). Situated about a mile south of Odessa, they had a capacity of three hundred thousand tiles per year. Only in business for a few years, the tile works closed in the 1860s. Cosgriff & Reynolds were manufacturing drain tiles near Smyrna in the first decade of the 20th century (see Figure 7-43).

Land reclamation, either by draining surplus water from wetlands to make sowable fields, or blocking off marshland from tidal inundation, has been commonplace along the Delaware Bay and Chesapeake Bay regions. In New Castle County, Delaware, reclaimed lands accounted for 10,000 out of 15,000 acres of marshland in 1885. Embanked land in Kent County, Delaware

totaled 5,000 acres while that in Sussex County was 3,000 acres. All of this reclamation was along the Delaware Bay and its tributaries (Sebold 1992:7).



Figure 7-44: Tile and Brick Works Factory in Southeastern New Castle County near Smyrna (Baist 1868)

7.8 ISOLATED FEATURES

Five isolated postholes with no associated post molds were identified in Block A (Table 7-13). An area with several shallow stains (Feature 107) was also noted. For ease of reference, a plan view of features in Block A is repeated below (Figure 7-45).

Table 7-13. Isolated Postholes, Block A

Feature	Posthole Diameter in cm (in.)	Posthole shape	Feature Depth (below Ap) in cm (in.)	Artifacts/ comments
100	14 x 14 (5.5 x 5.5)	oval	12 (4.7)	--
104	40 x 30 (15.7 x 11.8)	kidney-shaped	25 (9.8)	--
113	20 (7.9)	circular	37 (14.6)	--
114a	20 (7.9)	circular	51 (20.1)	Charcoal; incised into pit Feature 114
128	60 x 50 (23.6 x 19.7)	rectangular	32 (12.6)	--

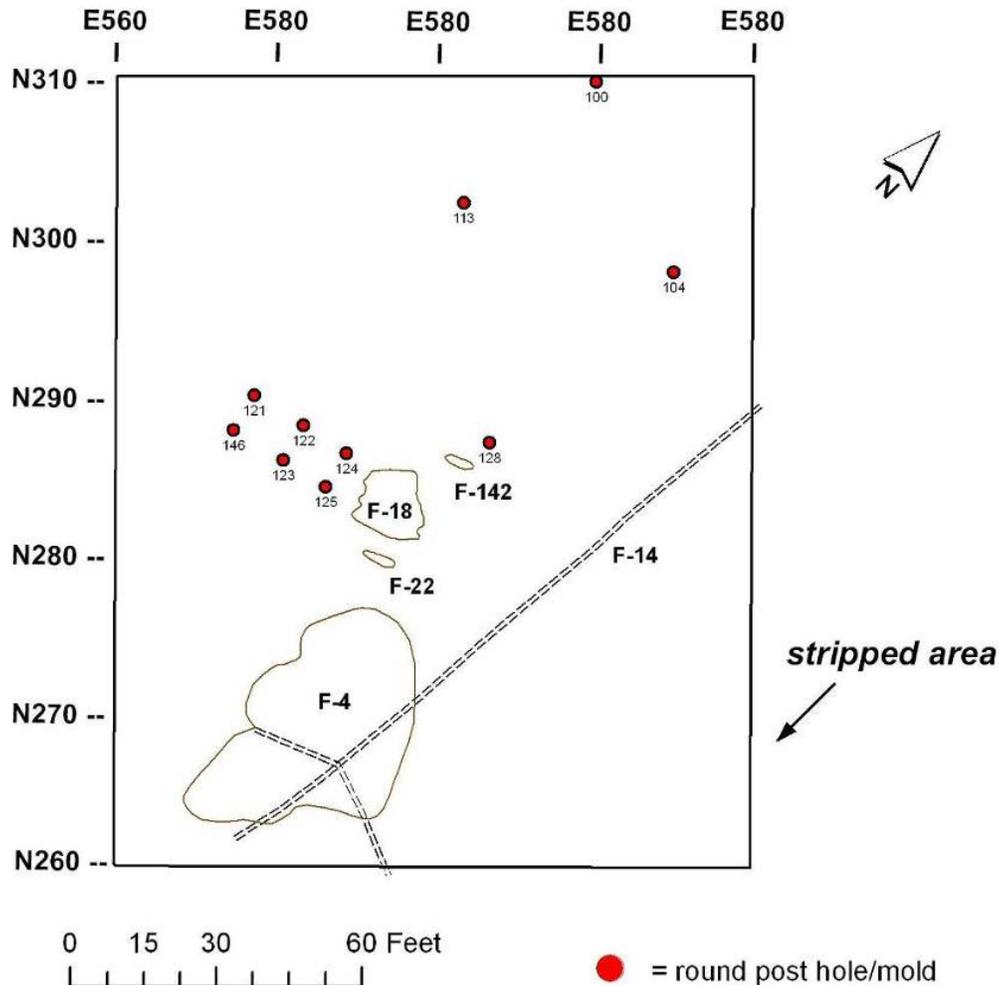


Figure 7-45. Location of Features Identified in Block A.

Feature 100 was an isolated oval posthole located in the northeast portion of Block A and measured 14-x-14 cm (5.5-x-5.5 in.). The feature was angular or v-shaped in profile extending 12 cm (4.7 in.) into the subsoil. Feature 100 could have been a paling post rammed or pounded into the ground without the need for a pre-excavated hole with the aid of the tapered point. No artifacts were recovered from the feature.

Feature 104 was a kidney-shaped, isolated posthole located on the northeast portion of Block A. The feature measured 30 cm (11.8 in.) north to south and 40 cm (15.7 in.) east to west, and produced a deep u-shape profile 25 cm (9.8 in.) below the plow zone. Feature 104 could be the remains of a double posthole. No artifacts were recovered from the feature.

Feature 107 was a representative sample of a small cluster of stains identified at the interface of the plow zone and subsoils northeast of the heat signature (Feature 18). Each with a surface dimension measuring no more than 5 cm (2.0 in.) in diameter, these thin splotches of matrices were amorphous in shape with a feel of a fine silt loam to clay, without the sandier matrix

present in the subsoil of the immediate area. The clusters were only between the plow zone and subsoil interface and did not penetrate into the subsoil.

Feature 113 was an isolated circular posthole located on the north-central portion of Block A and measured 20 cm (7.9 in.) in diameter, extending to a depth of 37 cm (14.6 in.) below the plow zone. The sides of the feature tapered inwards with depth, and the base was only 8 cm (3.1 in.) wide. No artifacts were found in the feature and it does not appear to relate to the brick clamp complex.

Feature 114a was a posthole incised into pit Feature 114 measuring 20 cm (7.9 in.) in diameter and extending 51 cm (20.1 in.) into Feature 114. The walls of the feature tapered in slightly towards the base and the matrix was a yellowish brown (10YR 5/4) with some charcoal present. Even though the post cuts into a possible American Indian feature, it is assumed to be historical in origin.

Feature 128 was an isolated, oblong posthole positioned north of the brick clamp, approximately 10 ft. north of linear depression Feature 142. It measured 60-x-50 cm (23.6-x-19.7 in.) and extended to a depth of 32 cm (12.6 in.) below the plow zone. The proximity to linear Feature 142 - hypothesized to represent a ditch placed at one edge of the drying platform for green bricks, suggests the post was associated with the brick clamp operation. Perhaps it was a hitching post for horses or oxen. The plan view of the feature was generally circular with one side extending out to a point 20 cm (7.9 in.) from the edge of the circle, suggesting it was a round posthole possibly enlarged when the post was removed.

7.9 SUMMARY

Our excavation across the Jones site found groups of features and a limited number of artifacts that can give us the beginnings of an idea about how occupants of the site used the location. Taking the historical research as a point of departure, it seems that the features and artifact concentrations we found can be grouped broadly into two major periods of site use (Table 7-14). One spanning from the patenting of the parcel in 1760 to its apparent temporary abandonment sometime after 1816, and the other beginning around midcentury when the owners combined several tracts into the farm named "Australia" and lasting into the 20th century. The relatively low number of diagnostic artifacts (indeed, the relatively low number of artifacts of any kind), makes dating the site a challenge. But broadly speaking, the complex of features in Area A (except for the obviously later ceramic drain tiles) appear to relate to a discrete episode of brick making associated with the earlier period of occupation. Roughly contemporary with it are the barrel-lined well and pit feature in the southeast corner of the site. We found architectural artifacts in this part of the site (brick fragments, nails, and a small amount of window glass) along with some post holes not associated with the apparent fence alignments. But specific evidence for where the occupants of the site might have built a structure, or what purpose such a structure or structures served is inconclusive. The low number of domestic artifacts and faunal remains suggest that people either only worked here, but lived elsewhere, or that they occupied the site only briefly or intermittently.

Table 7-14: Occupation Summary

Site Occupation Period	Major Features
1760-1820	Brick Clamp (Feature 18)
	Possible Clay Procurement/Mixing Pit (Feature 4)
	Post hole foundations for shed associated with brick making
	Barrel Well (Area B/C, Feature 268)
	Pit Feature (Area B/C, Feature 159)
1850-1930	Fence lines
	Brick-lined well (Area B/C, Feature 156)
	Drainage Tiles (Features 14, 158)