RESULTS OF THE INVESTIGATIONS

4

RESULTS OF THE SURVEY

The archeological survey resulted in the documentation of six archeological sites consisting of five historic military components, one historic premilitary component and one prehistoric component (Figure 4). Fifteen off-site shovel tests, ranging in depth from 11 to 45 cm, were placed in areas with a high probability of containing buried cultural resources, such as stream valleys or alluvial terraces (see Figure 4). No cultural materials were recovered from any of the tests. Descriptive site data and assessments of the archeological sites and components recorded during the survey are presented below.

Site 41BX1233

Description: Site 41BX1233 is a prehistoric open campsite located in the north-central part of the Lower East Pasture in the Outer Cantonment. It is situated on an eroding upper limestone bench flanked by a small drainage to the west and a major tributary of Salado Creek to the east. Many of the artifacts have washed downslope to the east. The site measures ca. 60 x 80 m and lies at an elevation of 1240–1250 ft msl. Vegetation at the site includes native grasses and a few clusters of juniper and scrub oaks. Limestone bedrock is exposed across the site, with no significant deposits of sediment apparent. Thus, no on-site shovel tests were dug. Impacts to the site include erosion and a two-track road that crosses the western portion of the site.

Cultural Materials Observed and Collected : A sparse scatter of prehistoric cultural remains was observed on the surface, including approximately 10 pieces of lithic debitage, 1 biface fragment, and a light scatter of burned rocks. A proximal fragment of a Nolan dart point was recovered from the two-track road in the western side of the site (Figure 5).

Assessment: A definite age cannot be assigned to the open campsite, although it may date to the middle Archaic based on the presence of the Nolan dart point. Much of the site is badly eroded, and cultural materials appear to be mostly surficial. It is unlikely that further investigations at 41BX1233 would yield significant information due to the low artifact density and lack of buried cultural deposits. It is recommended that the site be considered ineligible for listing in the National Register of Historic Places.

Site 41BX1234

Description: This site is a military small arms range abutment situated in the floodplain of Salado Creek in the western part of the Lower East Pasture in the Outer Cantonment. The site measures ca. 100 x 20 m and lies at an elevation of 1190 ft msl. The target abutment consists of a concrete wall abutted to the south by a large berm of soil. On the north side of the wall are remains of target supports consisting of wood beams and large nails. The abutment has been impacted by channel modifications to a tributary of Salado Creek. The western portion of the concrete wall was removed, as well as part of the berm. A concrete footing is situated in the channel where the butt once existed. Due to these disturbances, firing positions or yardage markers in front or south of the butt were not discovered. Information from a 1908/1917 map of the Leon Springs Military Reservation shows the range extending to the south for 600 yards with firing positions marked at 200-yard intervals. Site 41BX1234 is similar to and most likely contemporaneous with the 1,000-yard range to the east, 41BX1188 (see Kibler et al. 1998). According to Manguso (1990:11), the small arms ranges were first used in July and August of 1907 for the Southwestern Rifle and Pistol Competition.

Cultural Materials Observed : Some unidentifiable scrap metal fragments were located near the abutment, as well as chunks of broken concrete. No other artifacts were observed.

Assessment: Although the site is associated with World War I training activities, it is not significant because the integrity of the site has been compromised. The key elements of the target range, the target abutment, and the shooting positions are not intact and have been

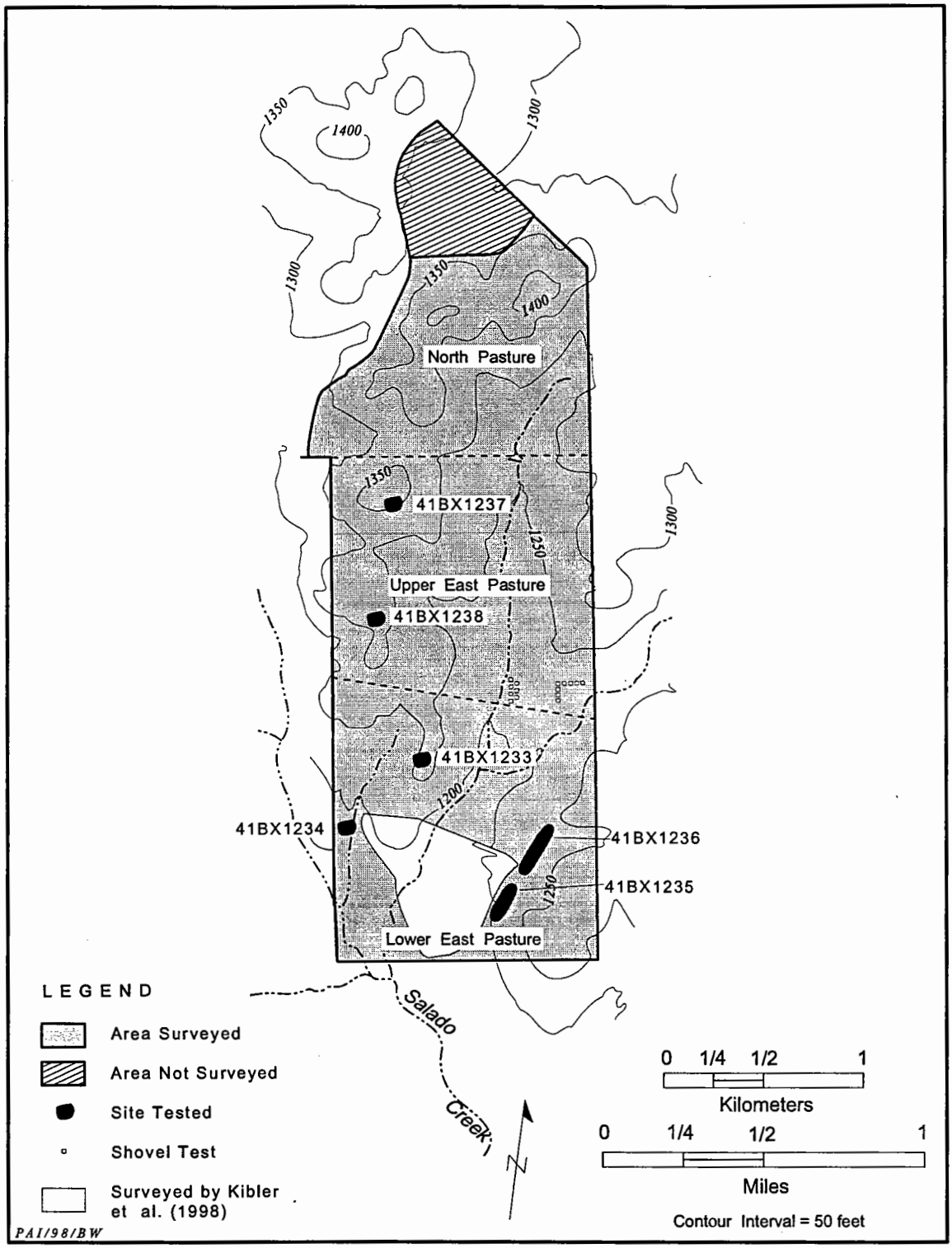


Figure 4. Map showing location of sites and shovel tests.

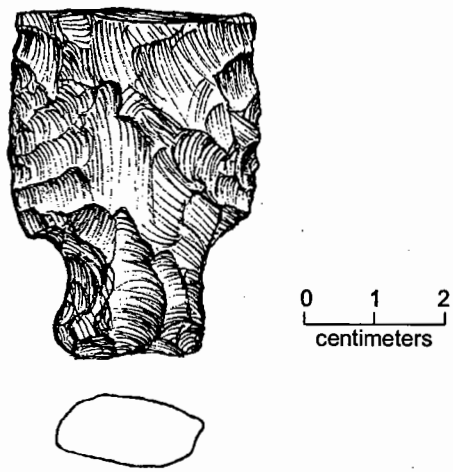


Figure 5. Nolan dart point base from 41BX1233.

greatly disturbed. It is recommended that the site be considered ineligible for National Register nomination.

Site 41BX1235

Description: This site consists of a series of military training trenches cut mostly into the bedrock along the lower southwestern slopes of Light Hill in the southeastern part of the Outer Cantonment (Figure 6). The site is ca. 450 x 150 m in size and ranges in elevation from 1190 to 1210 ft msl. The trenches are in a zigzag configuration and appear to be well preserved, although in some cases juniper and heavy brush have disturbed the trench walls. Two large (ca. 3 x 3 m) square pits are associated with the trenches. Minimal in-filling of the trenches and associated features has occurred. The trenches range in depth from ca. 1 m to almost 2 m in some cases. The similar configuration and close proximity of the 41BX1235 trenches to the trenches at 41BX1163 and 41BX1189 suggest that 41BX1235 is part of the same trench complex found at 41BX1163 and 41BX1189. These trenches were used as World War I training devices and were most likely used in the filming of the 1926 movie *Wings* (Kibler et al. 1998:17, 46).

Cultural Materials Observed: A few small tin containers and other metal fragments were observed on the surface.

Assessment: Based on the results of archeological testing of sites 41BX1163 and 41BX1189 discussed later in this report (see Chapter 4), it is recommended that 41BX1235 be considered eligible for listing in the National Register of Historic Places. The trenches represent the United States's involvement in World War I, as part of a program to train its troops for war in Europe (Criterion A). Furthermore, the zigzag configuration of the trenches illustrates a unique design diagnostic of U.S. involvement in the European Theater at that time (Criterion C). Because the trenches have been cut into the bedrock, their depth and configuration are well preserved and can be ascertained. This structural integrity fulfills the registration requirements for eligibility defined later in this report (see Chapter 4, sites 41BX1163 and 41BX1189, Site History and Context).

Site 41BX1236

Description: Site 41BX1236 is located on the lower western slopes of Light Hill overlooking a tributary of Salado Creek in the southern portion of the Outer Cantonment. The site consists of a historic premilitary component, as well as a military component (Figure 7). The site measures ca. 400 x 200 m and lies at an elevation of 1210–1250 ft msl. The premilitary component consists of a 320-m-long rock wall associated with a nearby farmstead (site 41BX1189; see Kibler et al. 1998:47) that may have belonged to John O. Meusebach from 1853 through 1866 (Freeman 1994b:47). The rock wall appears on a 1908/1917 map of the Leon Springs Military Reservation as part of a much larger rock wall enclosure or corral. The wall has been heavily borrowed from by the military, probably for use at a nearby target range (site 41BX1188; see Kibler et al. 1998:46), and only portions of the first course of rocks remain.

The military component of the site appears to consist of World War I and World War II features. The site contains a series of 21 structures, including 19 timber and cement-wire-mesh fortification facades, 1 concrete bunker, and 1 earth and timber bombproof. The 19 facade structures were part of a fortified area built in 1943 by the 320th Engineer Battalion (Manguso 1990:81; Map drawn by 320th Engineer Battalion, Division Engineer Section, 10 April 1943). Eighteen of the 19 structures are open polygon-shaped facades constructed out of timber frames with wire-mesh walls plastered over with cement. The average facade structure has a total exterior wall length of ca. 5 to 8 m and stands about 2 m high. At the base of the facade wall are 1-m-wide gun portals with embrasures created by building up soil adjacent to the portals. Structure A is constructed from the same materials as the others; however, the layout is far more elaborate, representing a full-size defensive bunker instead of a simple multisided facade. The structures are in various stages of decay from being used as targets. The ones closer to the target range are mostly collapsed, while others farther away maintain most of their original structural integrity. Approximately

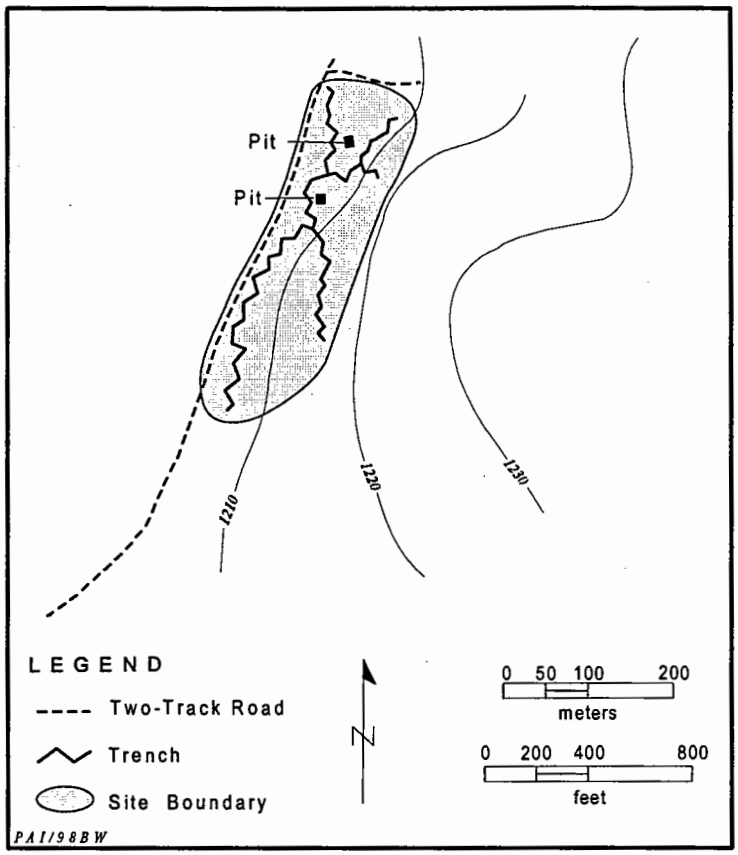


Figure 6. Site map of 41BX1235.

70 m north of Structure A is a poured-concrete-covered bunker (Structure U) which may date to the 1930s or 1940s based on similar bunkers constructed at Camp Bullis during this time (Figure 8a). The bunker is well preserved; however, an entrance is not evident and may be filled in or collapsed. Structure S is a semi-subterranean mounded bombproof constructed from timber, earth, and corrugated metal (Figure 8b). Based on the construction materials, this structure probably dates to World War I (Freeman 1994a:105).

Cultural Materials Observed: No cultural materials were observed at the site other than the structural features.

Assessment: The majority of the structures at site 41BX1236, primarily the 19 timber and cement/wire-mesh fortification facades (Structures A–R and T), are in a state of collapse and lack structural integrity. Their use would have been related to light nonfiring defensive training activities and possibly light weapons training. The remaining timber construction and earth-covered structure (S) and the poured-concrete structure (U) appear to be observation stations and may have served as assault positions for a ground-moving-attack (offensive) training exercise. These types of structures do not represent a significant training advancement to develop a modern Army fighting force, nor are they representative of a specialized design or construction. Their construction and use as a typical expedient training device do not contribute significantly to national, local, or Army history. Therefore, none of the structures identified at site 41BX1236 meet any criteria for eligibility for inclusion in the National Register.

Site 41BX1237

Description: Site 41BX1237 is situated on the southeast slope of Steele Hill in the Upper East Pasture of the Outer Cantonment. The site consists of a cluster of five poured-in-place concrete-walled structures that served as artillery practice positions (Figure 9). The site is ca. 80 x 60 m with an elevation of 1330–1340 ft msl. Current vegetation consists of small clusters of junipers, live oaks, and brush set in a grassy open area. Four of the five structures are aligned along a northeast-southwest line, while the fifth is set back about 20 m behind the front four (Figure 10). The unit farthest southwest on the front line is L-shaped; all of the others are U-shaped. The structures measure ca. 3.5 x 2.5 m and stand about 1.75 m high. The walls are approximately 0.50 m thick and are fairly smooth, with some occasional illegible graffiti etched on the surface and spall marks from gunfire. The four front-line structures have a dug-out and bermed area to one side, probably for gun placement. The date of construction for these structures is uncertain; however, Freeman (1994a:63) provides an architectural drawing dated to the 1930s of a battery emplacement at Camp Bullis (site 41BX822) very similar to 41BX1237. It is certain that 41BX1237 was constructed prior to 1934, as the site is identifiable on a set of 1934 aerial photos. It is likely that the structures were used during the development of tactics by the Triangular Division of the 1930s.

Cultural Materials Observed: Nonstructural materials include rock piles and wood beams within the structures. Scattered across the site and in small piles,

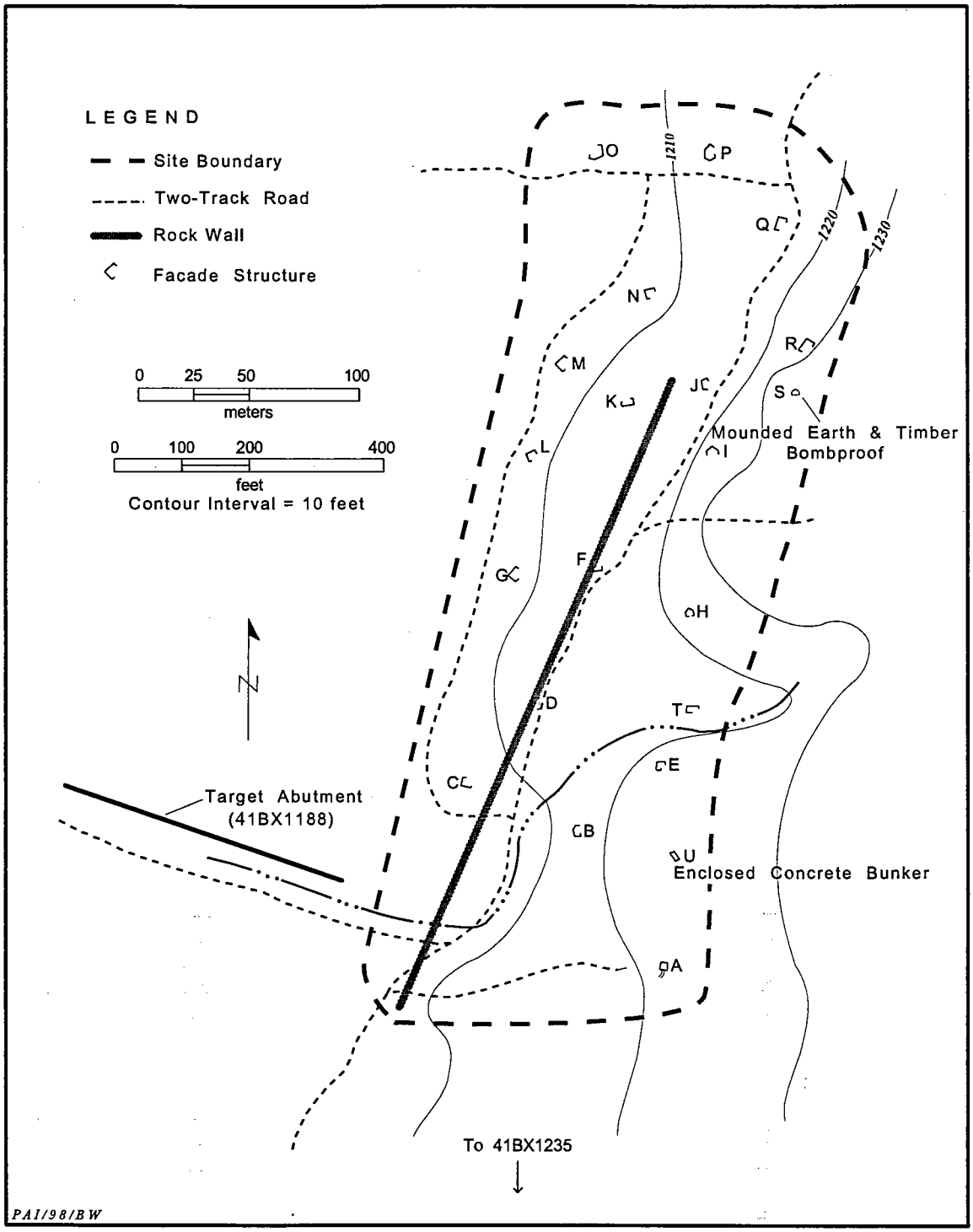


Figure 7. Site map of 41BX1236.

a

b

Figure 8. Photographs of 41BX1236. (a) West side of enclosed bunker; (b) north side of bombproof.

ammunition storage casings for 75-mm artillery shells were also observed. These casings are made of tin and cardboard and measure 60 cm in length and 9 cm in diameter with a folded seam down the center and small lead plug in the bottom. Also scattered on the site surface were rusty metal discs with pull rings, metal cable, and barbed wire.

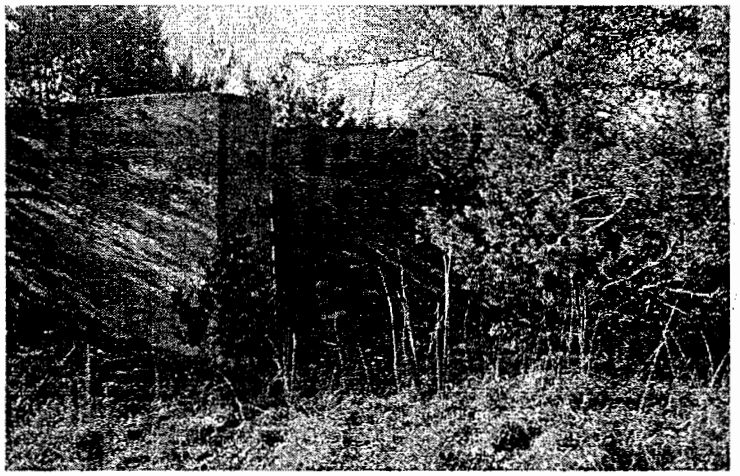
Assessment: Site 41BX1237 consists of a series of five three-sided, poured-concrete, open structures that were used as practice firing positions. Their use historically, and even contemporarily, has been that of containment in case of a failure associated with a gun or event associated with a prepared weapon round. These structures were built as safety devices and are not associated with any significant advancements in military technology or design or the fielding of a modern fighting force, nor do their characteristics embody that of a unique design or construction. Their construction and use as a safety device do not contribute significantly to national, local, or Army history. Therefore, none of the structures identified at site 41BX1237 meet any criteria for eligibility for inclusion in the National Register.

Site 41BX1238

Description: Site 41BX1238 is another artillery practice position strategically located on the southeast slope of Wells Hill in the Upper East Pasture of the Outer Cantonment. This site measures ca. 80 x 70 m and lies at an elevation of 1310–1320 ft msl. Vegetation at the site includes clusters of junipers, live oaks, cacti, and greenbrier brush in a fairly flat, grassy, open setting. The layout, design, and state of preservation are similar to 41BX1237, having five poured-in-place structures, four aligned along a north-south line and one structure set back. The structures have maintained their integrity (Figure 11). However, at 41BX1238, three large piles of metal ammunition containers (75-mm artillery shell casings) were present east of the front four structures, and no wood beams were found in the structures. This site also appears on a 1934 aerial photo. The structures at 41BX1238 most likely were used during tactical training maneuvers by the Triangular Division during the 1930s.

Cultural Materials Observed: Surface artifacts included a few wire nails, abundant rusty metal discs with pull rings, and one railroad spike. The ammunition container piles probably represent middens where the containers were dumped after practice.

Assessment: Site 41BX1238 consists of a series of five three-sided, poured-concrete, open structures that were used as practice firing positions and that are identical to those at 41BX1237. Their use historically, and even contemporarily, has been that of containment in case of a failure associated with a gun or event



a

b

Figure 9. South views of (a) Strucure 3 and (b) Structure 5 at 41BX1237.

associated with a prepared weapon round. These structures were built as safety devices and are not associated with any significant advancements in military technology or design or the fielding of a modern fighting force, nor do their characteristics embody that of a unique design or construction. Their construction and use as a safety device do not contribute significantly to national, local, or Army history. Therefore, none of the structures identified at site 41BX1238 meet any criteria for eligibility for inclusion in the National Register.

Summary of Cultural Resources

Of the six sites recorded during the 991-acre survey at Camp Stanley, only one has a prehistoric component. Site 41BX1233 represents an open campsite containing scattered burned rocks and lithic material. The site has a middle Archaic occupation based on the presence of a Nolan dart point base recovered from the site. This site yields a prehistoric site density of 0.2 sites/km^2 for the survey area, compared to a density of 2.3 sites/km^2 reported for Camp Stanley by Kibler et al. (1998:43). When the current survey numbers are combined with those of Kibler et al. (1998), the overall prehistoric site density for Camp Stanley is 1.7 sites/km^2; this is much lower than the figures of 2.7 sites/km^2 (Boyd et al. 1990; Gerstle et al. 1978) and 3 sites/km^2 (Kibler and Gardner 1997) calculated for neighboring Camp Bullis. An uneven distribution of resources in the region (e.g., chert resources) in ancient times may have played a role in determining settlement patterns, resulting in an uneven geographical distribution of sites. Prehistoric groups may have moved toward sources of chert and possibly more-reliable water sources near Cibolo Creek, north of Camp Stanley; however, this cannot be clearly demonstrated at this time. More likely, the low density figure of prehistoric sites at Camp Stanley is a reflection of more-recent land-use practices rather than of ancient land-use patterns. The Outer Cantonment area consists of highly eroded uplands that have been subject to years of ranching, farming, and military activities. These activities most likely have had an adverse impact on prehistoric sites.

Historic sites recorded during the survey have both premilitary and military components. The premilitary component at site 41BX1236 consists of a portion of a rock wall from a nineteenth-century ranch. The wall was heavily borrowed from by the military for use at a nearby target range. The rock wall appears on a 1908/1917 map as part of some larger ruins that include a series of corral walls, a well, and the remains of a structure. An examination of the archival resources by Freeman (1994b:47) strongly suggests that the site of the old ruins was the house of John Meusebach. Meusebach moved

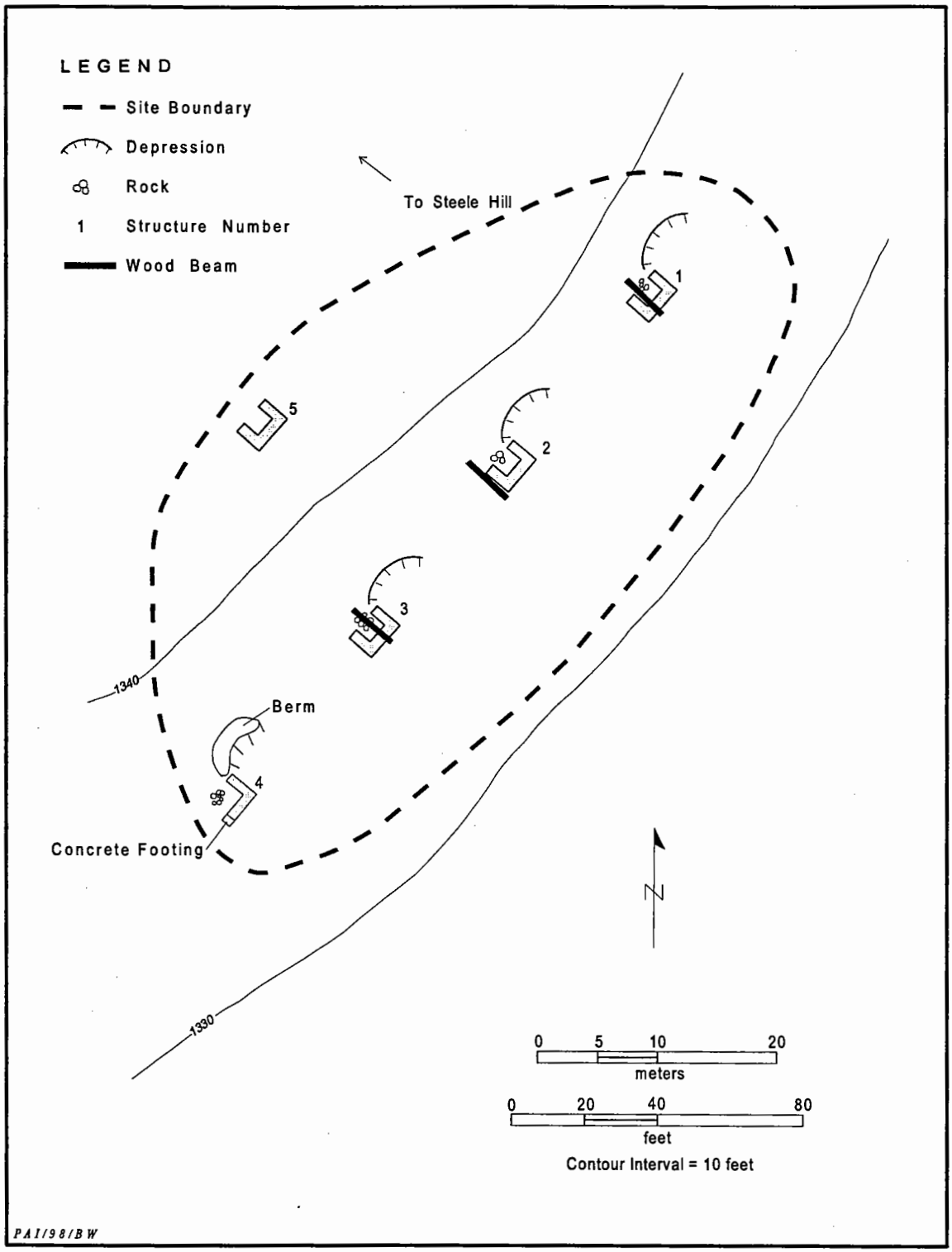


Figure 10. Site map of 41BX1237.

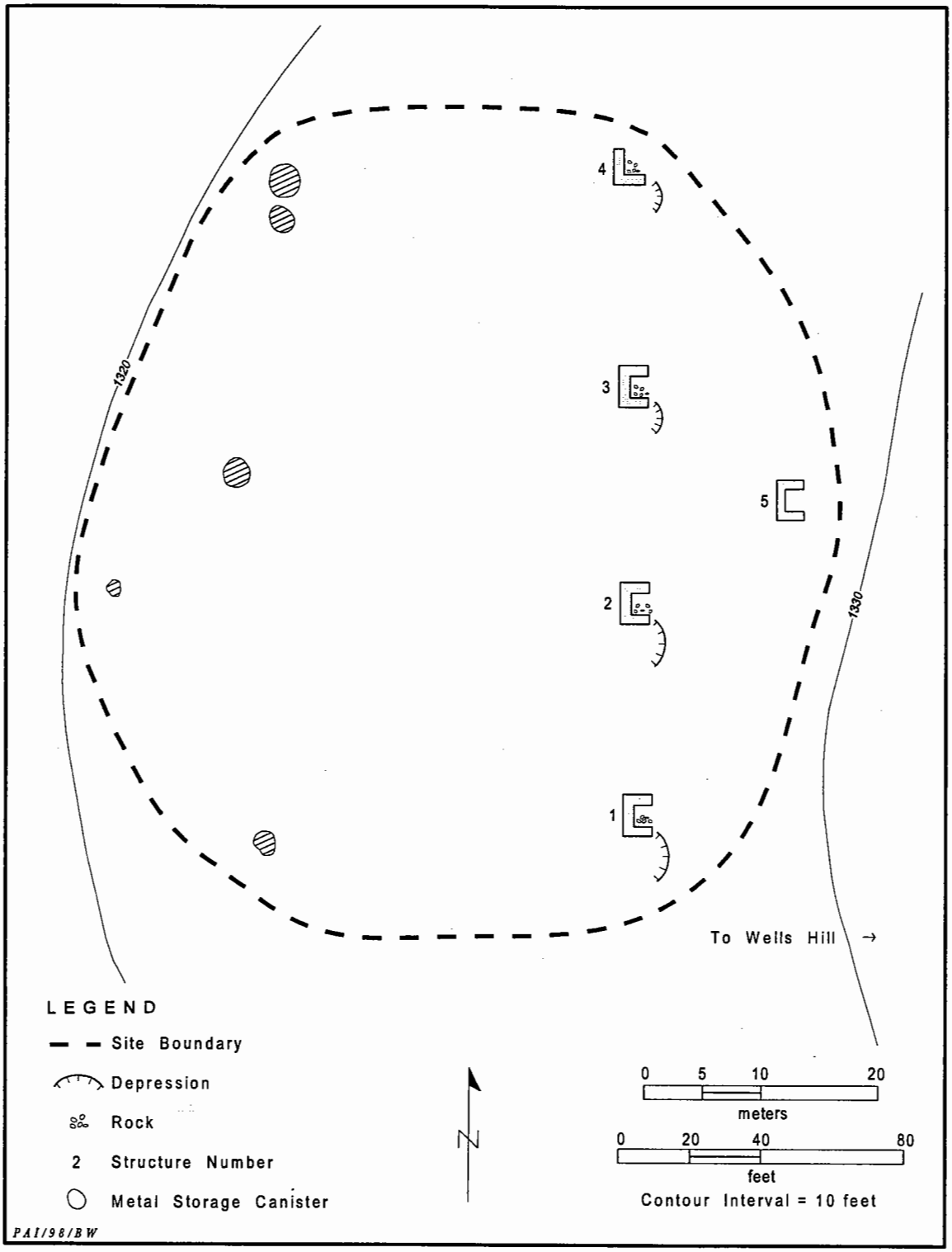


Figure 11. Site map of 41BX1238.

up the Salado Creek valley from the Comanche Springs area to a second homestead in 1853 (Freeman 1994b:47). A likely candidate for this house site is the late-nineteenth-century structural remains at site 41BX1189 recorded by Kibler et al. (1998:43). The fact that no other signs of a historic farmstead were found in the area reportedly occupied by Meusebach supports the notion that the premilitary historic component at site 41BX1189 (Kibler et al. 1998:43) is most likely the second house of Meusebach and that the late-nineteenth-century artifacts recovered at the site simply represent later occupants of the house.

Camp Stanley is covered with military debris ranging from barbed wire to spent cartridge cases to shrapnel to unexploded ordnance. The scattered, disturbed, and overlapping nature of this debris makes it impractical to consider such resources as sites. Therefore, the only notable (recordable) sites are those where features are visible and well defined.

Five of the six sites recorded have components related to military use. Site 41BX1234 is a target range abutment potentially dating from the World War I era; it has been heavily impacted by subsequent activities. Site 41BX1235 consists of a series of zigzag-aligned training trenches similar to those recorded previously at 41BX1163 and 41BX1189. Site 41BX1236 has a series of defensive training emplacements, a possible World War I–era earth-covered observation bunker, and a probable World War II–era concrete observation bunker. Two sites, 41BX1237 and 41BX1238, were utilized as firing points and are safety barricades designed to contain gun explosions. Of the five military sites, only 41BX1235, the training trenches, has notable significance and should be considered eligible for inclusion in the National Register.

RESULTS OF TEST EXCAVATIONS

Site 41BX1180

Site Description

Site 41BX1180, located in the northwestern part of the Outer Cantonment, is a prehistoric open campsite exhibiting a small burned rock midden (Figure 12). The site is situated on a low-gradient bench formed along the middle and southwestern to southern slopes of an interfluve that overlooks the northern branch of Salado Creek to the west and a small unnamed tributary to the south. The bench forms a 1–1.5-m-high scarp along the western margin of the site. The site measures approximately 75 x 100 m and lies at an elevation of 1295–1315 ft msl. Vegetation consists of moderate to dense juniper stands, some live oaks, and sparse grasses, with dispersed open areas of short grasses and scattered stands of juniper and live oak in the western part of the site. The small burned rock midden is situated on the edge of the bench to the west, and a scatter of artifacts is found in the southern and eastern parts of the site. Parts of the site have suffered from erosion and the deflation of deposits, as bedrock is exposed across portions of the site. The site also has been impacted by the clearing of vegetation and activities related to the construction and maintenance of fence lines, firebreaks, and a two-track road west of the site.

Previous Investigations

Site 41BX1180 was recorded by Kibler et al. (1998:35) as a prehistoric open campsite measuring 160 x 170 m. A moderate scatter of prehistoric cultural materials was observed across the southeastern part of the site, with only sparse materials noted elsewhere. A burned rock midden was discovered in the western part of the site. Surface artifacts included approximately 80–100 pieces of lithic debitage, 9 biface fragments, and 1 hammerstone. Additionally, 4 dart points (1 Ensor, 1 Pedernales, and 2 possible Frio fragments) and a Taylor biface were collected from the surface, indicating middle and late Archaic occupations at the site. Of the nine shovel tests excavated by Kibler et al. (1998), four produced lithic materials and two of these yielded burned rocks. A fifth shovel test yielded a single burned rock and another, adjacent to the burned rock midden, yielded several burned rocks but no lithic artifacts. These materials were recovered from 0–48 cm below the surface. Kibler et al. (1998) concluded that the presence of a burned rock midden demonstrated a degree of integrity and intact stratigraphy, despite the impacts of erosion. The site had potential to yield significant data, and it was recommended to be potentially eligible for listing in the National Register of Historic Places pending further testing.

Work Accomplished

The current investigations included re-locating the site, examining the area for surface artifacts and features, shovel testing, establishing a baseline and grid, excavating test units, and collecting sediment, flotation, and charcoal samples. Site baseline and grid layout was accomplished using a transit, and site mapping was completed with a total station using grid points as mapping stations. A vertical datum was established by setting a large nail in the base of a large live oak tree north of the burned rock midden.

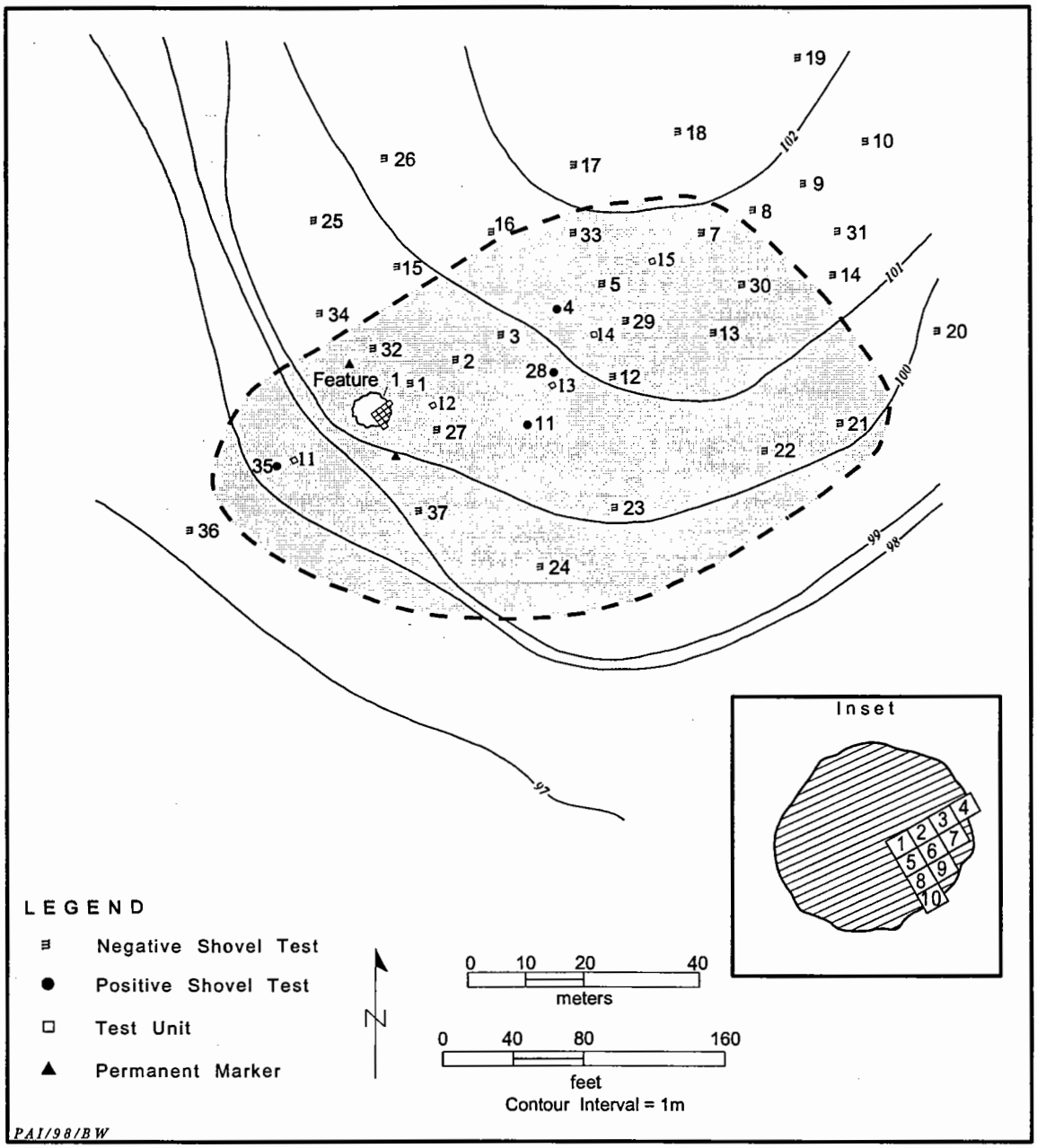


Figure 12. Site map of 41BX1180.

The datum was given an arbitrary elevation of 100 m. Two permanent markers set in concrete were placed on the site. Thirty-seven shovel tests were excavated to better define the extent and depth of the site. All shovel tests reached bedrock, with depths ranging from 4–46 cm. Fifteen 1-x-1-m test units were excavated; 10 contiguous units were placed on the southeastern portion of the burned rock midden and 5 isolated test units were laid out away from the midden. The depths of the test units within the block excavation ranged from 4 cm in Test Unit 10 to 40 cm in Test Unit 2. The five test units excavated outside of the block excavation ranged in depth from 20 cm in Test Unit 15 to 68 cm in Test Unit 13. In

all, an estimated 5.7 m^3 was excavated from the test units. Selected walls from all test units were photographed and profiled and Munsell soil colors were recorded. Ten sediment samples were collected—three from the burned rock midden and seven from proveniences outside of the midden. These samples were sent to the Soils and Physical Geography Laboratory, University of Wisconsin-Milwaukee, for grain-size and chemical analyses. One charcoal sample recovered from Feature 1 was submitted to Beta Analytic, Inc., for dating by radiocarbon assay. Eight flotation samples were collected in the field and processed in the laboratory.

Site Extent and Depth

Site 41BX1180 was originally estimated to be 160 x 170 m (Kibler et al. 1998:35); however, current investigations suggest that the site measures 75 x 100 m based on the distribution of surface artifacts and positive shovel tests. An unknown portion of the site has been lost or disturbed due to erosion along the northern margin of the site. Portions of the southeastern margin possibly have been impacted by the removal of trees for a deer blind.

The depth of cultural deposits varies due to the varying thicknesses of Holocene-age (culturally relevant) deposits across the site. These deposits are thicker in the northern, western, and central parts of the site and become thinner to the east and south. Positive shovel tests (Shovel Tests 4, 11, and 28) in the central and north-central part of the site encountered bedrock at depths from 28 to 36 cm, with artifacts found at up to 36 cm. Test Unit 13, situated in the central part of the site, recovered cultural materials to a depth of 55 cm. The burned rock midden excavations in the west-central part of the site reached a maximum depth of 40 cm. Just below the low scarp along the western margin of the site, the deposits became thin and shallow; Test Unit 11 yielded artifacts to a depth of 20 cm with bedrock at 28 cm, and nearby positive Shovel Test 35 recovered materials to bedrock at a depth of 10 cm. In the southern part of the site, cultural materials were only visible on the surface. Four negative shovel tests (Shovel Tests 21, 22, 23, and 24) were excavated to bedrock at depths ranging from 14–35 cm. The eastern portion of the site contains surface artifacts and generally thin cultural deposits, as exemplified in Test Unit 15 where cultural materials were recovered to a depth of about 15 cm. In this area, bedrock was encountered at depths ranging from 4 to 16 cm in three negative shovel tests (Shovel Tests 7, 14, and 30).

Sediments and Stratigraphy

Site 41BX1180 is situated on a limestone bench on the middle, southwestern, and southern slopes of a small interfluve dividing the northern branch of Salado Creek to the west and an unnamed ephemeral drainage to the south. This interfluve is part of the lower southwestern slopes of an upland ridge or divide between the Salado and Cibolo Creeks drainage basins. The limestone bench is mantled by fine-grained to gravelly deposits of colluvium, sheetwash sediments, and sediments derived from the in situ weathering of limestone bedrock. This mantle thickens (downslope) across the site from the northeast and east, where weathered bedrock is exposed across much of the surface, to the southwest and west, where the mantle ranges from 40 to 55 cm thick. The soils at 41BX1180 are mapped as part of the Tarrant series. This series consists of shallow, dark-colored, stony Mollisols (Godfrey et al. 1973; Taylor et al. 1966).

Typical soil profiles observed at 41BX1180 consist of A-Bw-Cr horizons in thicker portions of the mantle to A-Cr and O-A-Cr profiles where the mantle is thinner (see Appendix A). The A-Bw-Cr soils typically have 4–8-cm-thick A horizons of very dark grayish brown (10YR 3/2) to dark brown (10YR 3/3) clay loam to gravelly clay loam. Underlying Bw horizons are up to 18 cm thick and consist of very dark grayish brown (10YR 3/2) to dark brown (10YR 3/3) gravelly clay loam. The Cr horizons consist of very dark grayish brown (10YR 3/2) to dark yellowish brown (10YR 4/6) very gravelly clay loam to loam. The Cr horizons lie directly on the limestone substrate and contain many weathered pieces of limestone. The A and Cr horizons of the thinner A-Cr and O-A-Cr soils have color and textural characteristics similar to those of the deeper soils.

Based on the degree of pedogenic development observed at 41BX1180, the soil mantle is probably late Holocene in age. High carbonate contents (see Appendix B) throughout the soil profiles are inherent to the carbonatic mineralogy of the locally derived soil materials, and indicative of the immaturity (lack of leaching) and shallow nature of the soil mantle. Organic matter contents are high (3.0 to 10.1 percent) throughout the soil profiles and typical of thin Mollisols, particularly those supporting dense stands of juniper. Total phosphorus tends to decrease with depth within the soil profiles (see Appendix B).

Materials Recovered

CHIPPED STONE ARTIFACTS

One hundred twenty-eight chipped stone artifacts were recovered during testing of site 41BX1180 from both shovel tests and test units. This assemblage includes 3 projectile points, 9 bifaces, 1 uniface, 32 edge-modified flakes, and 83 pieces of unmodified debitage.

Projectile Points

One proximal fragment of a dart point is identified as a possible Ensor type attributed to the late Archaic (cf. Suhm and Jelks 1962:189; Turner and Hester 1993:114) (Figure 13a). The fragment exhibits a slightly concave base and expanding stem. Only the specimen's thickness was discernible. The Kent point is a complete specimen dating to the late Archaic (cf. Suhm and Jelks 1962:199; Turner and Hester 1993:136) (Figure 13b). The point exhibits some patination. Its blade is triangular with a slight medial ridge; the shoulders are square, and the contracting stem appears to be slightly ground on the lateral edges. The base is relatively straight. The specimen, identified as a late Paleoindian Victoria point, is also complete (cf. Kelly 1983) (Figure 13c). Similar dart points recovered from Victoria County have been described by Birmingham and Hester (1976:Figure 4) as weak-shouldered lanceolate dart points. Kelly (1983) believes that this style is contemporaneous with Angostura, which Hester (1980) dates to ca. 8450–7950 B.P. The specimen from 41BX1180 has a contracting stem exhibiting ground edges and a slightly concave base. The specimen has convex serrated blade edges and weakly defined shoulders. Metric and provenience data for each specimen are presented in Table 1.

Bifaces

All of the nine bifaces recovered at 41BX1180 are unburned fragments. They consist of one medial, one distal, one proximal, and six indeterminate fragments. All represent early and middle stage reduction except one, which exhibits attributes of a late reduction stage. Provenience and metric data for the bifaces are provided in Table 2.

Uniface

The only uniface recovered is an unburned intact side scraper from Test Unit 1, Level 2. The specimen exhibits cortex on its dorsal surface and is 64 mm long, 50 mm wide, and 20.5 mm thick.

Edge-Modified Debitage

Thirty-two utilized or edge-modified flakes were recovered at 41BX1180. Provenience and attributes for each specimen are presented in Table 3. Of the 32 flakes analyzed, 19 represent complete flakes, 5 are proximal fragments, 7 are chips, and 1 specimen is a chunk. Most of the edge-modified debitage (n = 23, 72 percent) has a maximum dimension of 21–40 mm. Four specimens (13 percent) have a maximum dimension greater than 40 mm, while five flakes (16 percent) are less than 21 mm in maximum dimension. The minimum number of working edges per specimen is one, and the maximum is four (mean = 1.75).

The 23 specimens with maximum dimensions of 21–40 mm exhibit one (n = 10), two (n = 12), and four (n = 1) working edges. This size class (21–40 mm) has an average of 1.65 working edges. The smaller specimens (< 21 mm) have an average of 1 working edge per specimen, and specimens greater than 40 mm have a mean of 3.25 working edges. Although the assemblage is small, there does appear to be a slight trend in number of working edges increasing with flake size. Tertiary flakes (no dorsal cortex) or flake fragments (n = 19, 59 percent) make up most of the assemblage, while 12 specimens (38 percent) represent

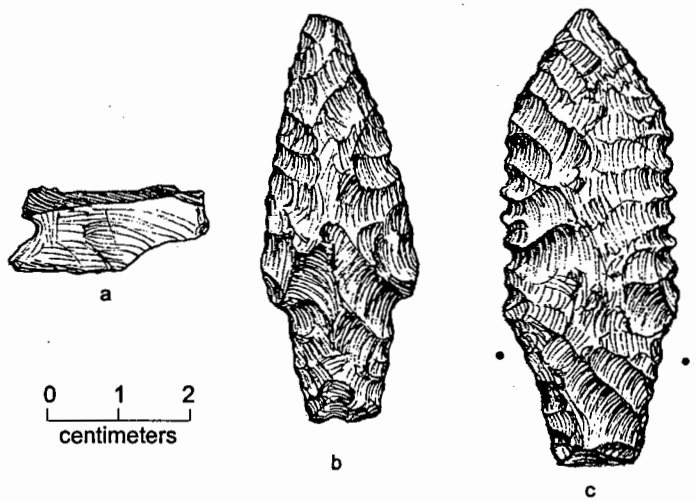


Figure 13. Projectile points recovered at 41BX1180. (a) Ensor stem fragment; (b) Kent; (c) Victoria.

Table 1. Projectile Points from 41BX1180

Type	Provenience	Maximum Length	Maximum Blade Width	Maximum Thickness	Haft Length	Neck Width	Base Width
Ensor	Test Unit 13, Level 4	–	–	5.0	–	–	–
Kent	Test Unit 13, Level 3	56.6	21.9	8.1	16	15.0	10
Victoria	Test Unit 6, Level 4 (99.36 m)	62.3	24.2	7.0	20	20.4	11

Note: All measurements are in millimeters.

Table 2. Bifaces from 41BX1180

Reduction Stage	Provenience	Tool Completeness	Maximum Length	Maximum Width	Maximum Thickness
Early	Test Unit 4, Level 2 (99.6–99.5 m)	Distal fragment	–	–	16.0
	Test Unit 7, Level 2 (99.6–99.5 m)	Proximal fragment	–	–	12.0
	Test Unit 13, Level 4	Indeterminate	–	–	17.9
	Test Unit 14, Level 1	fragment	–	–	13.2
		Indeterminate fragment			
Middle	Test Unit 13, Level 3	Indeterminate	–	–	8.2
	Test Unit 13, Level 4	fragment	–	–	8.0
	Test Unit 13, Level 4	Indeterminate	–	–	7.0
	Test Unit 14, Level 1	fragment	–	–	9.3
		Indeterminate fragment			
		Indeterminate fragment			
Late	Test Unit 1, Level 2 (99.6–99.5 m)	Medial fragment	–	–	8.5

Note: All measurements are in millimeters.

secondary flakes (1–99 percent dorsal cortex) or flake fragments. Only 1 specimen exhibits evidence of burning.

Unmodified Debitage

Eighty-three pieces of chipped stone debitage were recovered from shovel tests and test units at 41BX1180. Attributes of the unmodified debitage are listed in Table 4 by provenience. Of the 83 pieces of debitage, 42 (51 percent) are complete flakes, 13 (16 percent) represent proximal flake fragments, 26 (31 percent) are chips, and 2 (2 percent) are chunks or lithic shatter. The majority of the debitage (n = 47, 57 percent) has a maximum dimension of less than 20 mm. The 21–30-mm range is represented by 29 pieces, 35 percent of the assemblage. Overall, nearly 92 percent of the debitage ranges from 1–30 mm in maximum dimension. The rest of the debitage (n = 7, 8 percent) has a maximum dimension of 31–60 mm. Secondary flakes represent 24 percent (n = 20) of the assemblage. No primary flakes (100 percent dorsal cortex) were recovered during testing. The majority of the assemblage (n = 61, 73 percent) consists of tertiary flakes. Evidence of burning is found on 20 specimens and is present on all flake types.

OTHER MATERIALS

Other materials recovered at 41BX1180 include a ground stone tool and burned rocks. The ground stone tool, recovered from Test Unit 1 in Level 1, consists of a burned limestone cobble fragment weighing 2.3 kg. Over 1,279 kg of burned rocks were recovered from the 15 test units in both feature and nonfeature contexts. Only three of the five size classes were recovered: <5 cm, 5–15 cm, and >15–25 cm. Data for all burned rocks recovered during testing, including proveniences, counts, weights, and size classes, are presented in Appendix C. Eight flotation samples were collected during test excavations, seven from Feature 1 and one from Feature 3. Artifacts and materials recovered consist of debitage (>5 mm and =5 mm), charred seeds and nut fragments, wood charcoal, and small burned rock fragments. Provenience, counts, and weight for flotation recovery are presented in Table 5.

Table 3. Edge-Modified Debitage from 41BX1180

Provenience	Flake Type	Maximum Dimensions (mm)	Working Edges	Dorsal Cortex %, or Presence of Cortex on Chunks
Test Unit 2, Level 3 (99.5–99.4 m)	Complete	61–70	3	1–50
Test Unit 3, Level 2 (99.6–99.5 m)	Complete	21–30	1	0
Test Unit 5, Level 2 (99.6–99.5 m)	Chip	11–20	1	1–50
Test Unit 6, Level 2 (99.6–99.5 m)	Complete	41–50	4	0
Test Unit 7, Level 3 (99.5–99.4 m)	Complete	31–40	2	0
Test Unit 11, Level 1	Complete	31–40	2	1–50
Test Unit 12, Level 3	Chip	21–30	1	1–50
Test Unit 13, Level 3	Complete	31–40	2	0
Test Unit 13, Level 3	Chip	31–40	2	0
Test Unit 13, Level 3	Complete	21–30	2	0
Test Unit 13, Level 3	Proximal	21–30	1	1–50
Test Unit 13, Level 3	Chip	11–20	1	0
Test Unit 13, Level 3	Proximal	21–30	2	0
Test Unit 13, Level 3	Complete	11–20	1	0
Test Unit 13, Level 4	Complete	41–50	4	0
Test Unit 13, Level 4	Complete	31–40	1	50–99
Test Unit 13, Level 4	Complete	31–40	1	1–50
Test Unit 13, Level 4	Proximal	21–30	1	50–99
Test Unit 13, Level 4	Complete	21–30	2	0
Test Unit 13, Level 4	Proximal	21–30	2	0
Test Unit 13, Level 4	Complete	21–30	4	0
Test Unit 13, Level 4	Chip	21–30	2	0
Test Unit 13, Level 4	Chip	11–20	1	0
Test Unit 13, Level 5	Proximal	21–30	1	1–50
Test Unit 13, Level 5	Complete	21–30	1	1–50
Test Unit 14, Level 1	Complete	41–50	2	1–50
Test Unit 14, Level 1	Chunk	31–40	2	No
Test Unit 14, Level 1	Complete	21–30	2	0
Test Unit 14, Level 2	Complete	31–40	2	1–50
Test Unit 14, Level 3	Complete	31–40	1	0
Test Unit 15, Level 1	Complete	21–30	1	0
Test Unit 15, Level 1	Chip	11–20	1	0

Cultural Features

FEATURE 1

Feature 1 is a small burned rock midden measuring 7 m north-south by 8 m east-west. It lies along the edge of the small scarp in the western portion of the site. Feature 1 has a maximum thickness of approximately 40 cm in the central part of the feature and tends to thin in all directions to a thickness of less than 8 cm along the feature's periphery (Figure 14). The burned rock midden lies directly on a weathered limestone substrate, which shows no evidence of burning or alteration from heating. The structural and ancillary elements of Feature 1 can be assembled into three groups: coarse-grained matrix, fine-grained matrix, and cultural features and materials. Samples of these attributes were recovered and analyzed from the block excavation in the southeastern quadrant of the feature. It is estimated that the block excavation sampled approximately one-quarter of the burned rock midden.

The coarse-grained matrix consists of burned, fractured, and broken angular pieces of limestone. A total of 1,243 kg of burned rocks, representing ca. 5,300 rocks (5–25 cm in size), was recovered from the block excavation. The burned rocks tend to be supported by other clasts and are densely packed in most areas of the feature. The rocks are typically gray in color; rocks displaying hues of pink and red are not uncommon, but other hues, such as white and yellow, are very rare. The vast majority of the burned rocks are angular with sharp corners and edges; they tend to have a cubical to tetragonal morphology, particularly those in the 5–15-cm and >15–25-cm size ranges. A few of the rocks are tabular in shape, but they comprise most of the specimens within the >15–25-cm size class. Many of the small burned rocks (< 5 cm) are spalls or small rock fragments; they have a total weight of 84 kg. By weight, the 5–15-cm size class is the largest, representing 1,071 kg of burned rocks.

Table 4. Unmodified Debitage from 41BX1180

Provenience	Flake Type	Maximum Dimensions (mm)	Dorsal Cortex %, or Presence of Cortex on Chunks
Test Unit 2, Level 4 (99.4–99.3 m)	Chip	11–20	0
Test Unit 7, Level 3 (99.5–99.4 m)	Complete	31–40	1–50
Test Unit 8, Level 3 (99.5–99.4 m)	Complete	21–30	1–50
Test Unit 8, Level 3 (99.5–99.4 m)	Complete	31–40	1–50
Test Unit 11, Level 2	Complete	21–30	0
Test Unit 12, Level 1	Chip	11–20	0
Test Unit 12, Level 2	Proximal	11–20	50–99
Test Unit 12, Level 2	Chip	11–20	0
Test Unit 12, Level 2	Chip	21–30	0
Test Unit 13, Level 2	Complete	21–30	50–99
Test Unit 13, Level 2	Complete	11–20	1–50
Test Unit 13, Level 2	Complete	11–20	0
Test Unit 13, Level 2	Complete	11–20	0
Test Unit 13, Level 2	Complete	11–20	0
Test Unit 13, Level 2	Chip	11–20	0
Test Unit 13, Level 2	Chip	11–20	0
Test Unit 13, Level 3	Complete	21–30	50–99
Test Unit 13, Level 3	Proximal	21–30	0
Test Unit 13, Level 3	Complete	11–20	0
Test Unit 13, Level 3	Proximal	11–20	0
Test Unit 13, Level 3	Complete	11–20	0
Test Unit 13, Level 3	Chip	11–20	0
Test Unit 13, Level 3	Complete	11–20	0
Test Unit 13, Level 3	Complete	11–20	0
Test Unit 13, Level 3	Chip	11–20	0
Test Unit 13, Level 3	Complete	11–20	0
Test Unit 13, Level 3	Chunk	21–30	Yes
Test Unit 13, Level 4	Chip	41–50	50–99
Test Unit 13, Level 4	Complete	21–30	1–50
Test Unit 13, Level 4	Complete	11–20	1–50
Test Unit 13, Level 4	Proximal	21–30	1–50
Test Unit 13, Level 4	Complete	11–40	1–50
Test Unit 13, Level 4	Complete	21–30	0
Test Unit 13, Level 4	Complete	21–30	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Complete	11–20	1–50
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Proximal	11–20	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Proximal	11–20	0
Test Unit 13, Level 4	Chip	11–20	0
Test Unit 13, Level 4	Chip	21–30	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Chip	21–30	0
Test Unit 13, Level 4	Chip	21–30	0
Test Unit 13, Level 4	Complete	11–20	0
Test Unit 13, Level 4	Complete	1–10	0
Test Unit 13, Level 4	Proximal	11–20	0
Test Unit 13, Level 4	Chip	11–20	0
Test Unit 13, Level 4	Complete	21–30	1–50
Test Unit 13, Level 4	Chip	11–20	0
Test Unit 13, Level 4	Complete	51–60	50–99

Table 4, continued

Provenience	Flake Type	Maximum Dimensions (mm)	Dorsal Cortex % or Presence of Cortex on Chunks
Test Unit 13, Level 5	Proximal	21–30	0
Test Unit 13, Level 5	Proximal	11–20	0
Test Unit 13, Level 6	Chip	11–20	0
Test Unit 14, Level 1	Complete	11–20	0
Test Unit 14, Level 1	Complete	31–40	0
Test Unit 14, Level 2	Complete	21–30	1–50
Test Unit 14, Level 2	Proximal	11–20	0
Test Unit 14, Level 2	Chip	11–20	0
Test Unit 14, Level 2	Proximal	11–20	0
Test Unit 14, Level 2	Chunk	21–30	Yes
Test Unit 14, Level 3	Proximal	21–30	1–50
Test Unit 14, Level 3	Proximal	21–30	0
Test Unit 14, Level 3	Chip	21–30	0
Test Unit 15, Level 1	Chip	21–30	0
Test Unit 15, Level 1	Complete	21–30	0
Test Unit 15, Level 1	Chip	21–30	1–50
Test Unit 15, Level 1	Chip	21–30	0
Test Unit 15, Level 1	Complete	11–20	0
Test Unit 15, Level 1	Chip	11–20	0
Test Unit 15, Level 1	Chip	11–20	0
Test Unit 15, Level 2	Complete	11–20	0
Test Unit 15, Level 2	Chip	11–20	0
Test Unit 15, Level 2	Complete	21–30	0
Shovel Test 11, Level 1	Chip	21–30	1–50
Shovel Test 11, Level 2	Chip	21–30	0
Shovel Test 28, Level 1	Complete	31–40	1–50
Shovel Test 35, Level 1	Complete	21–30	0
Shovel Test 35, Level 1	Complete	31–40	0

Table 5. Flotation Recovery from 41BX1180

Provenience	Volume (liters)	Debitage Counts >5 mm	Debitage Counts ≤5 mm	Seeds/Nuts Counts	Charcoal (g)	Burned Rocks (g) <5 cm	Burned Rocks (g) 5–15 cm
Test Unit 1, Level 2 (99.6–99.5 m)	ca. 6	–	9	60	–	283	297
Test Unit 3, Level 2 (99.6–99.5 m)	ca. 5.5	1	2	47	–	137	67
Test Unit 5, Level 3 (99.5–99.4 m)	ca. 5.8	2	1	13	–	223	71
Test Unit 6, Level 3 (99.5–99.4 m)	ca. 5.5	–	1	12	<0.1	40	–
Test Unit 6, Level 3 (99.5–99.4 m)	ca. 4.1	1	3	–	0.5	63	48
Test Unit 7, Level 3 (99.5–99.4 m)	ca. 5.8	1	3	15	–	142	50
Test Unit 8, Level 3 (99.5–99.4 m)	ca. 5.5	–	1	40	–	51	–
Test Unit 15, Level 1 Feature 3	ca. 2.8	–	2	2	–	21	–

Overall, the excavated portion of Feature 1 has an average rock density (represented by weight of burned rocks) of 124 kg per test unit. Rock density (per test unit) distributions across the excavation block suggest that Feature 1 is a midden with a central rock-free zone (Figure 15a). This rock-free zone was not apparent topographically or during excavation, but when rock densities throughout the midden are compared, a central zone can be discerned, particularly when the distributions of burned rocks by size class are considered (Figure 15b). The highest concentration of the largest size class (>15–25 cm) of burned rocks documented in Feature 1 is in the central rock-free zone of the midden. So, a small number of clasts account for much of the total burned rock weight recorded for the central feature. It is possible that these larger rocks represent the remnants of larger slabs used to line a central cooking appliance, although no patterned alignment or orientation was observed during excavation. The dense zone of burned rocks surrounding the central feature

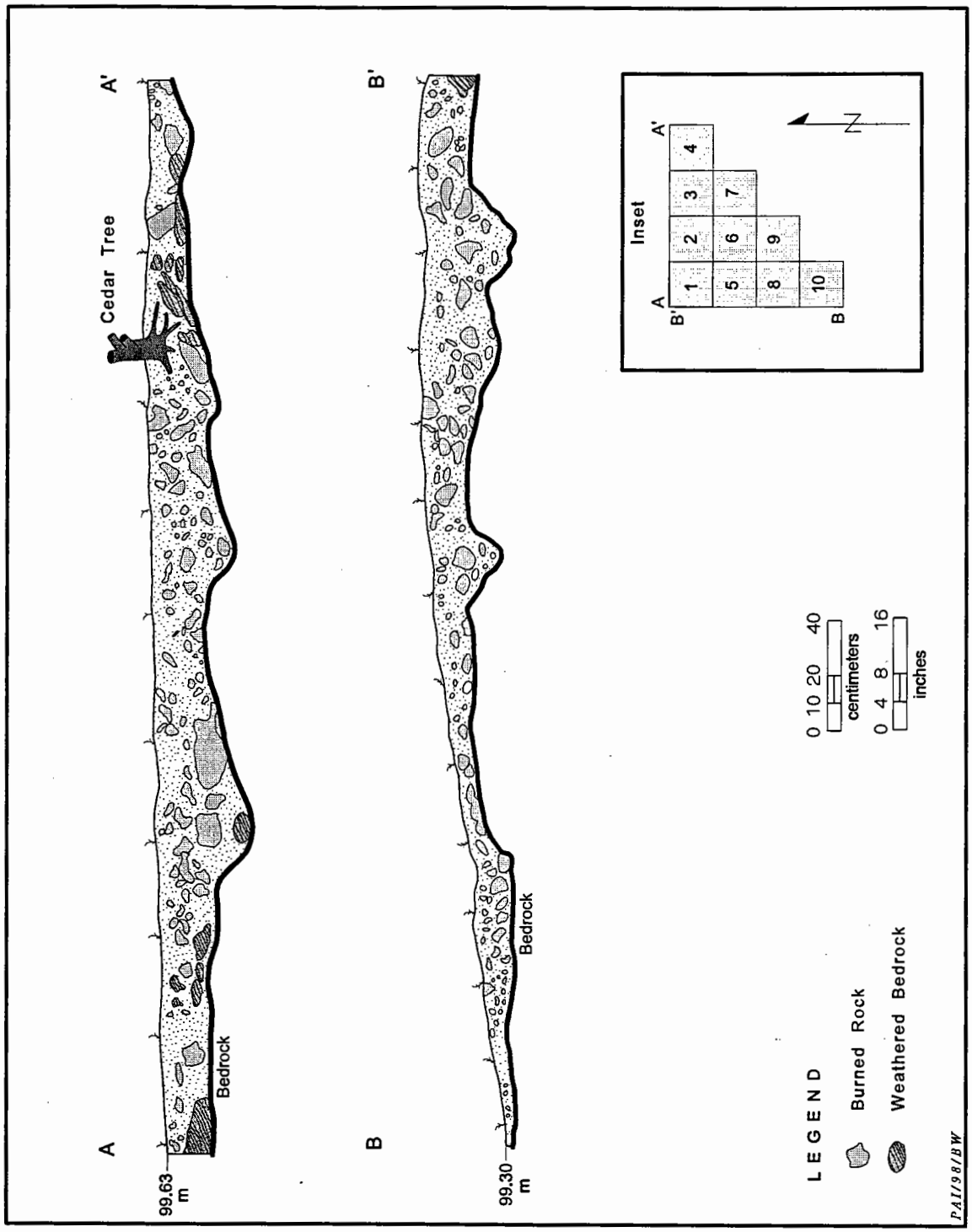


Figure 14. Cross-section profiles of Feature 1 at 41BX1180.

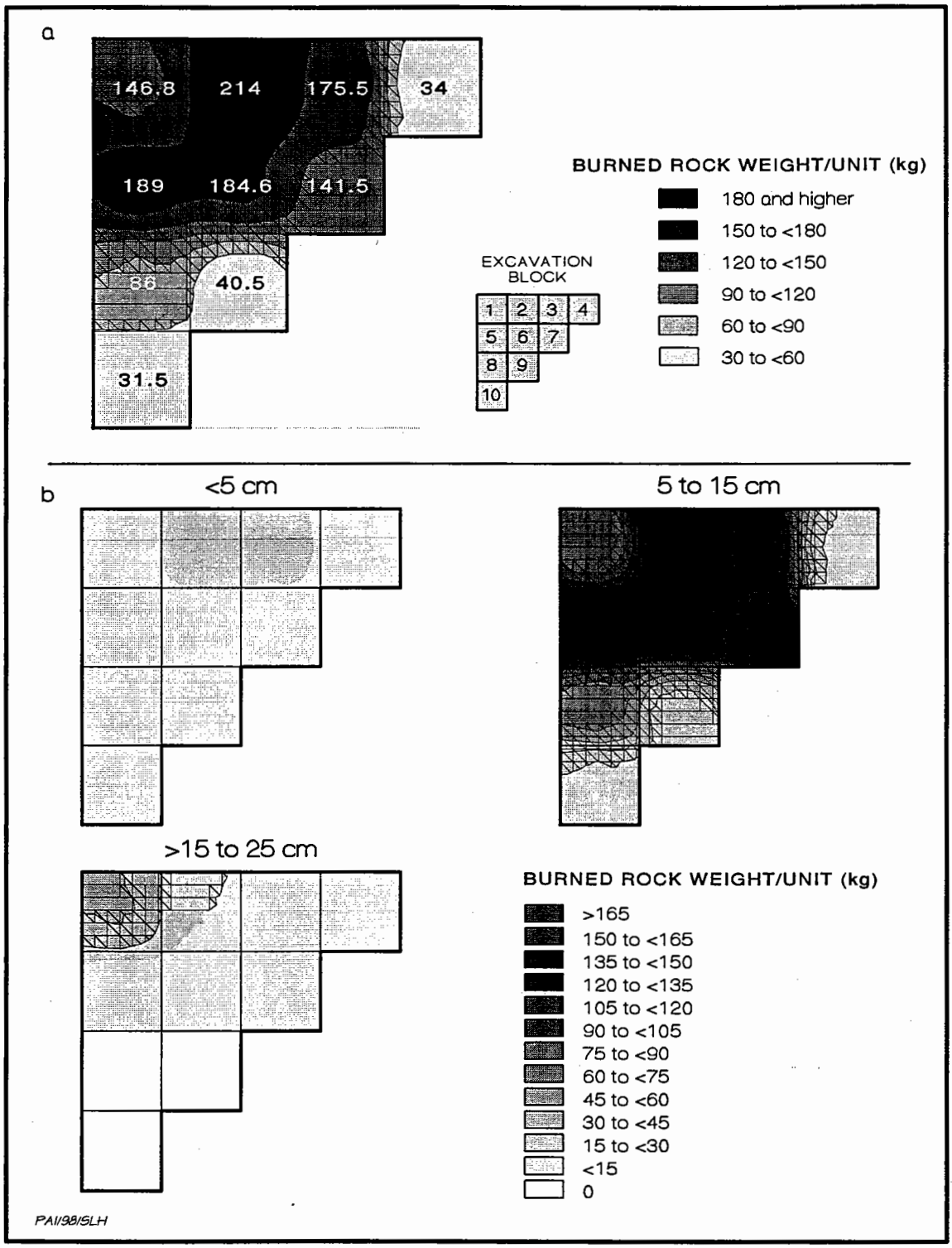


Figure 15. Distribution of burned rocks at 41BX1180. (a) Density per test unit; (b) density by size class.

may represent a toss zone of depleted rocks formerly used to cover the central feature for heat retention.

Across the excavation block, rock densities per level average 249 kg, or 37 kg per level per test unit. The highest density of burned rocks occurs in Level 2 (99.6–99.5 m) with a total weight of 642 kg, or 71 kg per each test unit of Level 2. Viewed in cross section, the central rock–free zone is evident in Level 1 (99.7–99.6 m) of Test Units 1 and 2 (Figure 16). In Level 2 it is limited to Test Unit 1.

The underlying surface of the limestone bedrock is highly weathered, undulating, and pockmarked. The central feature area of the midden overlies or occupies a small pocket in the bedrock. This may be fortuitous, however, since several other pockets and depressions, some even larger, are present on the bedrock surface underlying Feature 1.

Although the coarse-grained matrix is densely packed and tends to be clast supported, a fine-grained matrix fills the interstitial voids and pockets of the feature. The fine-grained matrix consists of a very dark gray (10YR 3/1) to very dark grayish brown (10YR 3/2) clay loam. The high carbonate content (ranging from 67.2–72.1 percent) reflects the carbonatic mineralogy of the fine-grained matrix (see Appendix B). It is probable that most of the fine-grained matrix is colluvium and that locally derived organic detritus trapped by the midden filtered down through the open spaces of the feature. Charcoal is also part of the fine-grained matrix, but very little of it was observed or recovered from Feature 1. The eight flotation samples collected from the midden yielded very little in terms of wood charcoal (<6 g) and other charred botanical remains. Charcoal recovered from Test Unit 6 (at 99.54 m) yielded a conventional radiocarbon age of 140 ± 60 B.P. (Beta-103583; raw radiocarbon age = 160 ± 60 B.P., d ^{13}C = –26.4 ‰, 1-sigma calibrated age range A.D. 1670 [1690, 1735] 1780 and A.D. 1795 [1815, 1925] 1945). The fine-grained matrix has an organic matter content ranging from 5.9 to 7.0 percent. Total phosphorus ranges from 288 to 370 ppm (mean = 325 ppm), which is essentially equivalent to the total phosphorus amounts from nonmidden contexts (mean = 302 ppm) at the site (see Appendix B).

No other cultural features are present within or associated with Feature 1. What was believed to be a small basin-shaped feature was tentatively defined as Feature 2 in Test Unit 6. However, upon further examination it is believed that Feature 2 is merely a pocket in the underlying bedrock fortuitously filled with burned rocks and a few pieces of charcoal associated with the midden. Cultural materials associated with Feature 1 include lithic tools and debitage (Figure 17). The formal lithic tools consist of one dart point (Victoria type), three biface fragments, one unifacial side scraper, and one ground stone tool fragment. A total of 34 pieces of lithic or chipped stone debitage was recovered from the burned rock midden, including 25 specimens recovered from the flotation samples (20 are microdebitage, ≤5 mm in size). Five of the 34 pieces of debitage are utilized or show evidence of use wear, while one specimen is burned.

The age and cultural affiliation of Feature 1 is not clearly understood. A radiocarbon assay and temporally diagnostic projectile point (Victoria type) offer two extreme ages on opposite ends of the prehistoric cultural sequence of Central Texas. The radiocarbon assay yielded calendrical dates of A.D. 1670–1780 and A.D. 1795–1945 (1-sigma calibrated age range), while the Victoria point, though not well dated or formally recognized by many researchers, is believed to be contemporaneous with late Paleoindian dart points such as Angostura, which Hester (1980) dates to ca. 8450–7950 B.P.

Not clearly associated with Feature 1 are several middle to late Archaic dart points, which were recovered from the site during survey (Kibler et al. 1998:37) and testing. It would be simple to attribute a middle to late Archaic age to the midden because burned rock midden use was so prevalent during these periods, but as previously stated, a clear association between Feature 1 and these dart points cannot be made. In addition, the late Paleoindian period of Central Texas is not normally associated with burned rock middens, and the provenience of the Victoria point (recovered from the base of the midden at its contact with the underlying bedrock) suggests that the dart point predates the construction and use of Feature 1 by at least a few thousand years. Greater accuracy in the calibration of the radiocarbon age cannot be obtained since two large deviations in the calibration curve occur during the late seventeenth through twentieth centuries (see Stuiver and Pearson 1993:Figure 1A). These deviations, or wiggles in the curve, result in multiple intercepts over a 275-year span (1-sigma calibration range) for the radiocarbon age obtained from Feature 1, making it possible for a sample from the early twentieth century to date to the late seventeenth century and vice versa. Add to this the thin and surficial nature of Feature 1 and the fact that the area has witnessed vegetation clearing by the military and ranchers through the years, and it is very likely that modern charcoal has been introduced into the feature by bioturbation or some other means. Therefore, the conventional radiocarbon assay of 140 ± 60 B.P. is considered erroneous. This suggests that

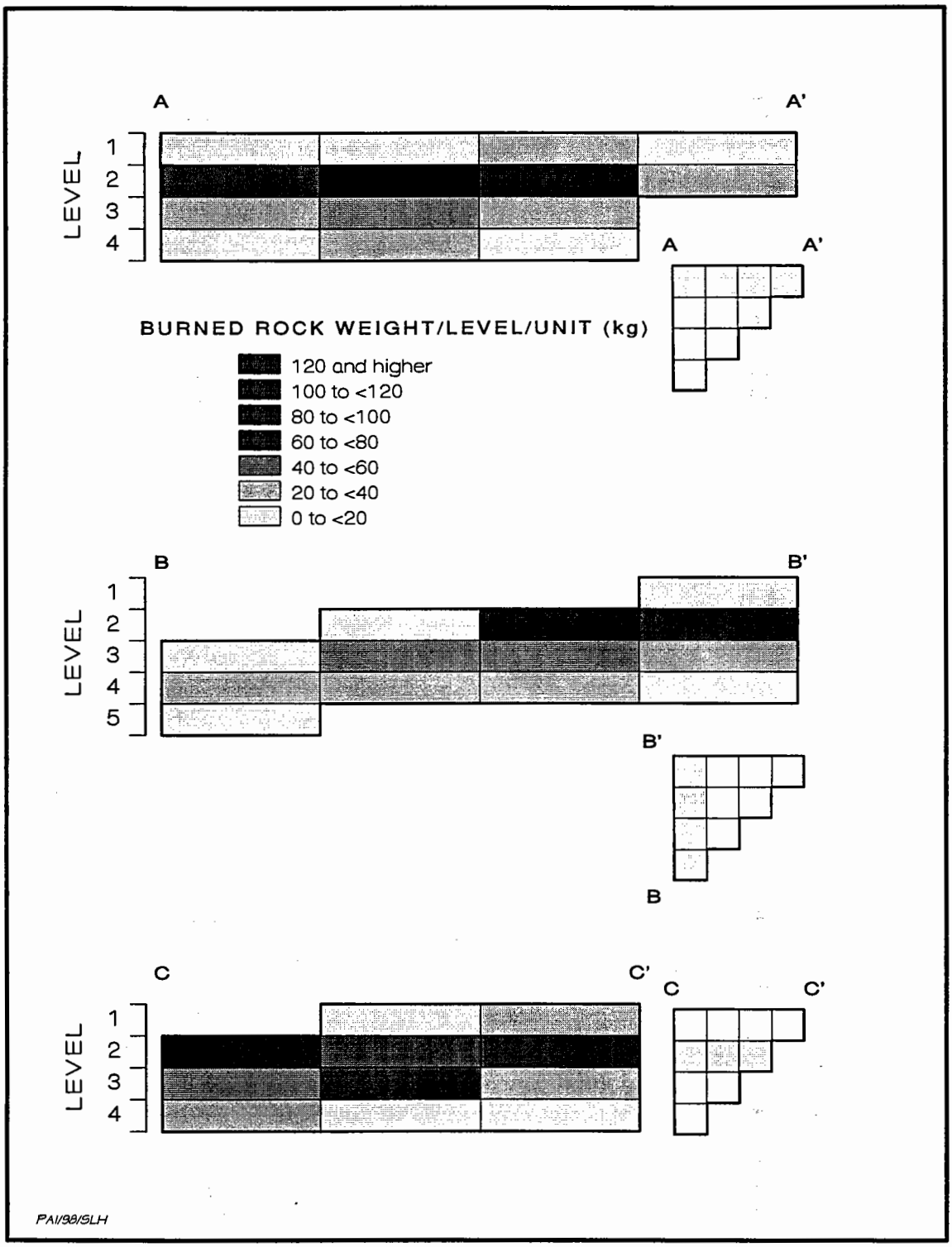


Figure 16. Cross sections of Feature 1 at 41BX1180 depicting burned rock density per level.

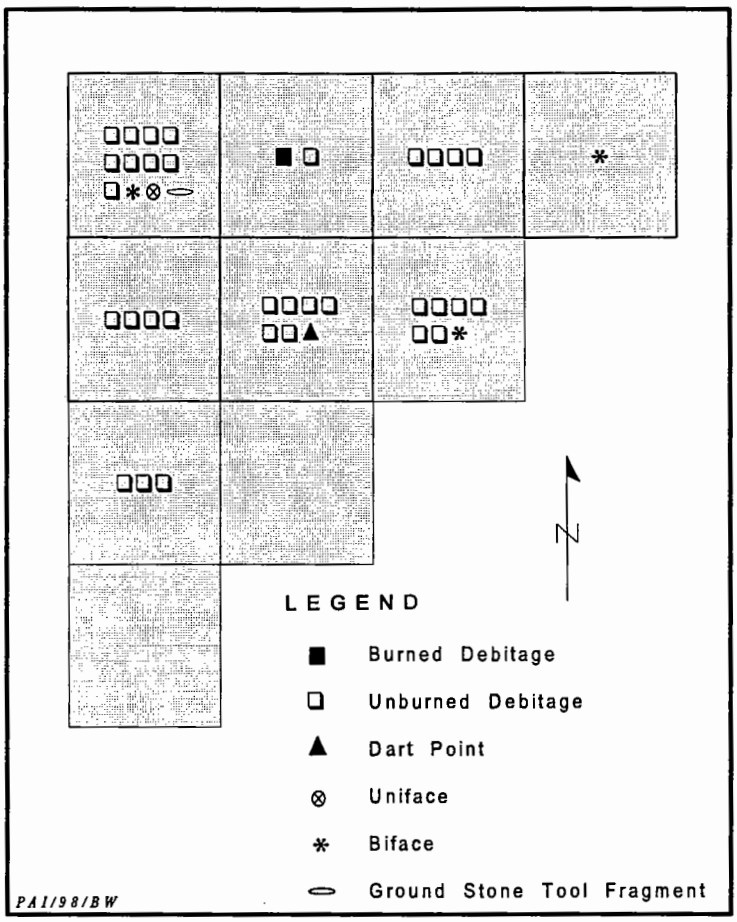


Figure 17. Distribution of artifacts within Feature 1 at 41BX1180.

at least portions of the contextual integrity of the feature have been compromised.

FEATURE 3

Feature 3 was encountered on the surface of the site as a relatively circular concentration of pink and gray burned rocks (Figure 18). Most of the feature was examined through the excavation of Test Unit 15; however, the feature was found to extend west of Test Unit 15 in both Levels 1 and 2, 0–18 cm below the ground surface. The feature as recorded in Test Unit 15 measures 55 cm north-south by at least 46 cm east-west. It is lenticular in cross section and rests directly on weathered limestone bedrock, which exhibited evidence of surficial burning through discoloration. Feature fill consisted of a very dark grayish brown clay loam yielding no evidence of oxidized sediment or charcoal. Feature 3 contained 13.5 kg of burned rocks. No artifacts were discovered directly associated with the feature during excavation; however, a flotation sample from the northern half of the feature yielded two pieces of debitage <5 mm in size and two charred seed/nut fragments. Twelve pieces of both edge-modified (n = 2) and unmodified (n = 10) debitage were recovered from the rest of Test Unit 15.

Site Chronology and Components

The cultural chronology and components of site 41BX1180 are tentatively identified based on the recovery of temporally diagnostic projectile points. The current investigations have delineated two cultural components: late Paleoindian and late Archaic. A middle Archaic component was attributed to the site by Kibler et al. (1998:37) based on the collection of a Taylor biface. However, the current phase of work has failed to recover any evidence attributable to a middle Archaic component. The two components (Paleoindian and late Archaic) are loosely defined, and clear separation or isolation of these components cannot be made.

LATE PALEOINDIAN COMPONENT

The late Paleoindian component is defined based on the recovery of a Victoria dart point. Although not clearly dated, Kelly (1983) classifies Victoria points as a late Paleoindian dart point style and suggests contemporaneity with other late Paleoindian darts, such as Angostura, which Hester (1980) dates to ca. 8450–7950 B.P. While the presence of the dart point indicates a late Paleoindian occupation of 41BX1180, it is difficult to assess and delineate the nature of this component and the kinds of activities associated with it. No other deposits, features, or artifacts can be clearly attributed to or associated with this component or the Victoria point. This difficulty is due primarily to the thin and shallow nature of the site, which does not permit a distinct separation of components and discrete

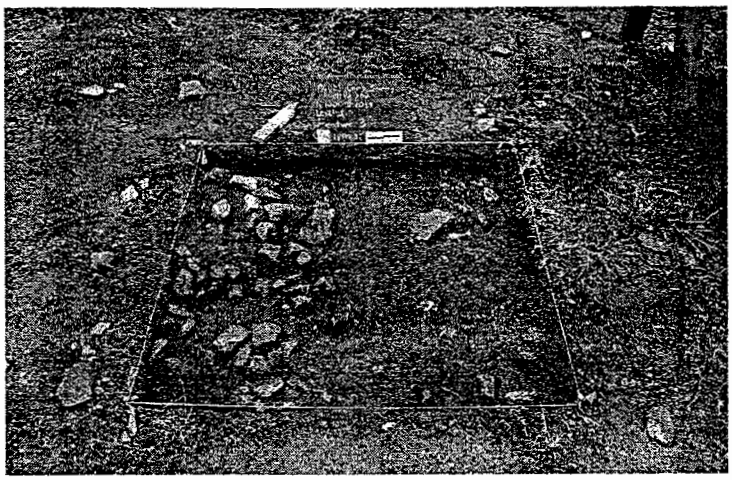


Figure 18. View to the north of Feature 3 at 41BX1180.

cultural deposits and stratigraphy. It is very probable that the Victoria point is an isolated occurrence, although this cannot be clearly demonstrated.

LATE ARCHAIC COMPONENT

The late Archaic component is defined based on the recovery of one Kent and one possible Ensor dart point. The vast majority of the deposits, features, and artifacts (excluding the Victoria point, Feature 1, and artifacts associated with Feature 1) are thought to be associated with the late Archaic component. This encompasses almost all artifacts and cultural materials collected or observed on the surface and recovered from all shovel tests and Test Units 11–15. However, this is a gross assumption because the component cannot be clearly delineated and/or isolated. Tentatively, 1 burned rock feature (Feature 3), 114 chipped stone artifacts, and 22 kg of nonfeature burned rocks are believed to be associated with the late Archaic component. Feature 3 is a circular concentration of burned rocks found resting on discolored, weathered limestone bedrock. Although no significant artifacts were directly associated with the feature, artifacts from the same test unit included 10 pieces of unmodified debitage and 2 edge-modified flakes. The 22 kg of nonfeature burned rocks may represent other burned rock features, such as hearths and cooking basins, that have been disturbed by erosion and bioturbation. The chipped stone artifacts include 2 dart points, 6 biface fragments, 27 pieces of edge-modified debitage, and 79 pieces of unmodified debitage. The lithic debitage, unmodified and edge-modified, represents the latter stages of bifacial reduction, as no primary flakes (flakes with 100 percent dorsal cortex) and only a small number of secondary flakes (1–99 percent dorsal cortex) were noted in the assemblage. Small decorticate cores or decorticate early bifaces probably were brought to the site for later reduction and biface manufacture. The six bifaces in the assemblage represent early to middle stage bifaces and appear to be manufacturing failures that subsequently were abandoned. Finished bifacial tools are limited to two projectile points. This suggests that while the manufacturing and finishing of bifaces took place at site 41BX1180 during the late Archaic, the occupations were short term and probably related to a specific activity or activities. What these activities might be, other than late bifacial reduction and finishing, is not known due to the lack of other materials, such as faunal and floral remains and a less than diverse tool assemblage. Of course the lack of such remains, limited tool kit, small burned rock feature, and the possible remains of other small features may suggest that the late Archaic component represents a series of short-term hunting camps where hunting and game-processing tool kits were replenished, tools were resharpened, and flakes were used for expedient tasks such as the processing and cooking of small game.

Site Summary and Assessment

Archeological test excavations at 41BX1180 have delineated two components: late Paleoindian and late Archaic. Evidence of a middle Archaic component defined by Kibler et al. (1998) was not recovered or identified. The two components are loosely defined based on a limited number of temporally diagnostic artifacts. The recognition and presence of these two components is believed to be fairly unquestionable; however, clear separation or isolation of these components is somewhat nebulous and in some ways cannot be demonstrated. Many of the deposits, features, and nondiagnostic artifacts cannot be clearly associated with either component. This is primarily due to the thin nature of the late Holocene mantle at the site and the erosion and deflation of this mantle.

The late Paleoindian component is defined by the recovery of a Victoria dart point. It is believed that the artifact represents an isolated occurrence and that none or very few of the other artifacts or cultural materials recovered from 41BX1180 can be associated with it.

The late Archaic component is tentatively associated with the vast majority of the cultural materials recovered from test excavations (Test Units 11–15 and all shovel tests). These materials were excavated from slightly disturbed to mixed contexts at best, but are believed to represent a series of short-term occupations by small hunting parties processing and cooking small game and maintaining tool kits. Not clearly understood is the age and association of Feature 1. The thin nature of the feature, the limited amounts of associated artifacts, and similar total phosphorous signatures with nonmidden contexts suggest that Feature 1 may have witnessed a limited amount of use. Such a feature, if its contextual integrity is sound, could provide valuable data regarding the construction and use of burned rock middens in Central Texas. However, the lack of clearly associated diagnostic artifacts, the paucity of charred botanical remains, and a radiocarbon assay suggesting that the feature is disturbed limit the interpretability of Feature 1 and in turn the interpretation of site 41BX1180. While thin, limited-use middens may be a valuable archeological data set, they must have contextual integrity and suitable materials providing a suite of radiocarbon assays that confirm their limited use. Based on these factors, it is recommended that 41BX1180 be deemed ineligible for listing on the National Register of Historic Places.

Sites 41BX1163 and 41BX1189

Site Description

Sites 41BX1163 and 41BX1189, located in the south-central part of Camp Stanley in both the Inner and Outer Cantonments, consist of a series of World War I–era zigzag-configured training trenches (Figure 19). This area was used after World War I as a movie set for the production of *Wings*, winner of the 1927 Academy of Motion Pictures award for best picture, the first such award given. The trenches closest to the former locality of the First Officers Training Camp (FOTC) in the Salado Creek floodplain could have been constructed by the members of the camp in 1917–1918, and those farther away and cut into the limestone bedrock may have been constructed in the 1920s as a movie prop. However, it is more likely that the movie producers re-used the existing trenches built by the FOTC and that any new trenches necessary for film production were constructed by the 2nd Division, 23rd Infantry, whose members also starred as extras in the film (Chastaine 1926).

Sites 41BX1163 and 41BX1189 were recorded by Kibler et al. (1998) as two separate sites within two separate survey parcels (see Figure 3). Site 41BX1189 contained both prehistoric and historic nonmilitary components; however, only the historic military component—the trenches—were considered potentially eligible for listing in the National Register and recommended for testing due to their structural integrity and uniqueness as a warfare training device pertaining to U.S. involvement in World War I. The current field survey discovered the presence of trenches between the two sites. A 1934 aerial photo further confirms that the trenches from both sites once formed a contiguous set of trenches. Therefore, sites 41BX1163 and 41BX1189 are considered one site and are referred to as site 41BX1163/1189.

The site is situated on the floodplains of Salado Creek and an unnamed tributary, as well as on the bedrock- exposed valley margin north and east of the floodplains. The site spans an area ca. 700 x 400 m and lies at an elevation of approximately 1170–1210 ft msl. Vegetation at the site consists of clusters of live oaks, grasses, and sparse groups of juniper trees. Impacts to the site include construction and maintenance of paved and two-track roads, fence lines, and flood control berms. Portions of the site are currently used as grazing land for cattle, and the extreme eastern edge of the site area has been naturally impacted by the meandering of the unnamed tributary.

Work Accomplished

Current investigations at site 41BX1163/1189 involved defining site boundaries, identifying individual trench works and other features, excavating backhoe trenches for cross-section profiles of the trench features, test unit excavations, and extensive site mapping. All identifiable trenches were mapped with the total station, recording centerline points at each bend of a trench. The locations of other related features such as foxholes and post and corrugated metal shoring were also recorded with the total station. Two permanent markers set in concrete were placed on the site. Nine backhoe trenches were excavated along eight different trench features and one foxhole. Backhoe trench sizes averaged ca. 1 m wide and 5–6 m long, and ranged in depth from 1.1–1.6 m. Backhoe trench profiles were recorded and photographed. Five 1-x-1-m test units were excavated; a depth of 50 cm was reached in Test Units 2 and 3, with a depth of 60 cm in Test Units 1, 4, and 5. Two artifacts were recovered: a fragment of solarized purple container glass from Test Unit 1, Level 2, and a .30-caliber bullet from Test Unit 4, Level 2. The bullet is most likely a .30-06 round from a 1903 Springfield rifle. It cannot be determined

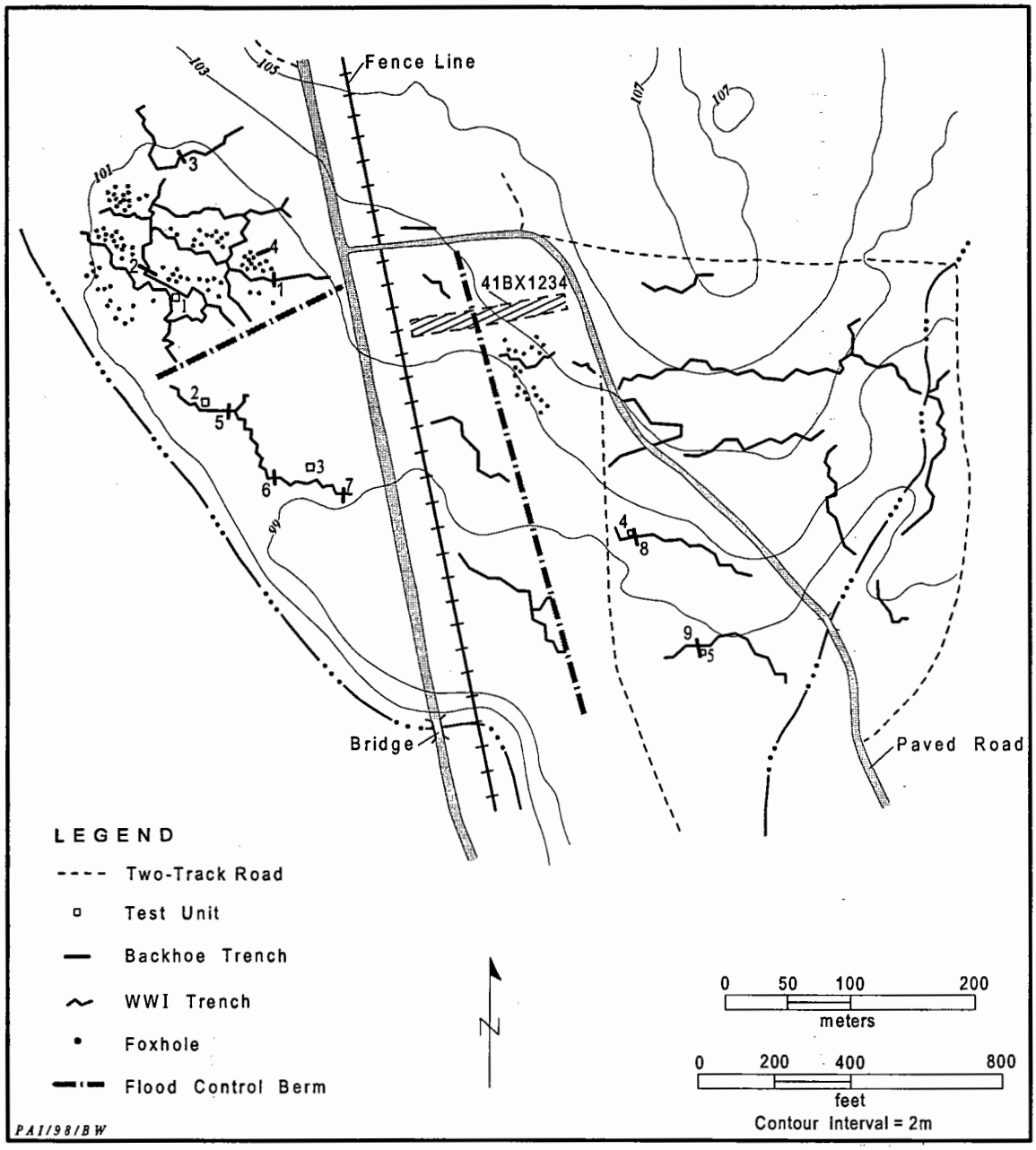


Figure 19. Site map of 41BX1163/1189.

if these artifacts are directly associated with the trench features, especially since weapons fire has been predominant since 1907 in that area of the base around the small arms ranges.

Trench and Other Cultural Features

Site 41BX1163/1189 can be described as a series of entrenched works with individual zigzag-configured trenches cut into alluvial deposits or bedrock. Trenches cut into the alluvium exhibit much in-filling from subsequent alluvial deposition, while those cut into the bedrock have only minimal in-filling from weathering rock walls and bioturbation (Figure 20). Trenches cut into the valley alluvium appear as linear depressions across the floodplain with low berms on either side.

Topographically, all trenches range in depth from ca. 50–175 cm.

The nine backhoe trenches, which cross-sectioned eight segments of World War I trench features and one circular depression feature, were dug to the bottom of the trenches. The World War I trench features appeared in the profiles as a black clay fill, occasionally containing gravels, that crosscut another clay zone varying in color from black to dark brown to yellowish brown. Some of the World War I trench features extended into a basal yellowish brown clay with weathered limestone bedrock. Three basic trench types were defined from the backhoe trench profiles, based primarily on the depth of the trench feature. Type I is a very shallow trench with a ca. 30-cm-deep cut; Type II trenches have an intermediate cut, approximately 50–60 cm deep; and Type III trenches have a deep cut (ca. 1.4–1.5 m). Type I was found in Backhoe Trench 5; it exhibited a 30-cm-deep cross section with about a 1–1.5-m-wide flat bottom. This trench type has berms or parapets for firing protection on both sides (Figure 21a). Type II trenches have two varieties, IIa and IIb. The first variant, IIa, is 50–60 cm deep and has a 70–80-cm-wide flat bottom. Remnants of a parapet are present (Figure 21b). The second variant, IIb, exhibits similar dimensions but has an added step or ditch cut into the floor (Figure21c). Both Type I and II have parapet features, most likely remnants of sandbags built up on the trench sides for fire protection and to increase the relief of these shallower trenches (as seen in Figure 22). Backhoe Trenches 6 and 7 cross-sectioned Type IIa, while Backhoe Trenches 8 and 9 cross-sectioned Type IIb. Trench Type III also has two varieties; IIIa is 1.4–1.5 m deep, with a 70-cm-wide flat bottom floor and minimal evidence of parapets (Figure 23a). This type is found in Backhoe Trenches 1 and 3. The second variety, IIIb, found only in Backhoe Trench 2, exhibits a deeply cut trench similar to IIIa but also has a step or ditch cut into the trench floor (Figure 23b).

Figure 20. Example of World War I trench feature cut into bedrock at 41BX1163/1189.

Other attributes of the World War I trenches include the use of revetments on the trench walls and flooring and drainage systems for the trench bottoms. Engineer field manuals (Chief of Engineers, U.S. Army 1909:327, 1918:371) describe a revetment as a covering or facing on an earth slope enabling it to stand at an inclination greater than its natural slope. Revetments are applied to interior slopes of trenches and a variety of materials may be used, including sandbags, sod, brush works, timber or poles, and metal objects such as cans. More-substantial revetments, such as timber and planks, must be used if a trench is going to be used for any length of time (Chief of Engineers, U.S. Army 1918:328) (Figure 24). The use of post and corrugated metal revetments is evident from Backhoe Trench 2 (see Figure 23b) and from in situ examples in the western part of the site (Figure 25).

The construction of floors and drains is also necessary if the trenches are to be used for any length of time (Chief of Engineers, U.S. Army 1918:313). Although evidence of timber floors is not preserved in the archeological record, the presence of small ditches in the bottom of some trench features (Types IIb and IIIb) suggest that a system of flooring and drainage was employed. If flooring is not used in the construction of a trench, the bottom of trenches should be made convex rather than concave to avoid any accumulation of water, mud, or other debris which can lead to a poor walking surface and subsequent injury (Chief of Engineers, U.S. Army 1918:372). This type of trench bottom treatment was not documented during archeological testing.

Other features and elements of site 41BX1163/1189 include foxholes and the use of wire entanglements. Over 100 circular depressions were mapped and interpreted as foxholes, and one foxhole was cross-sectioned and its profile recorded (Figure 26). Surficially, the feature appears as a circular depression about 3–4 m in diameter and 0.5 m in depth. Other similar but smaller features are 2–3 m in diameter with an unknown depth. Foxholes are not discussed in the

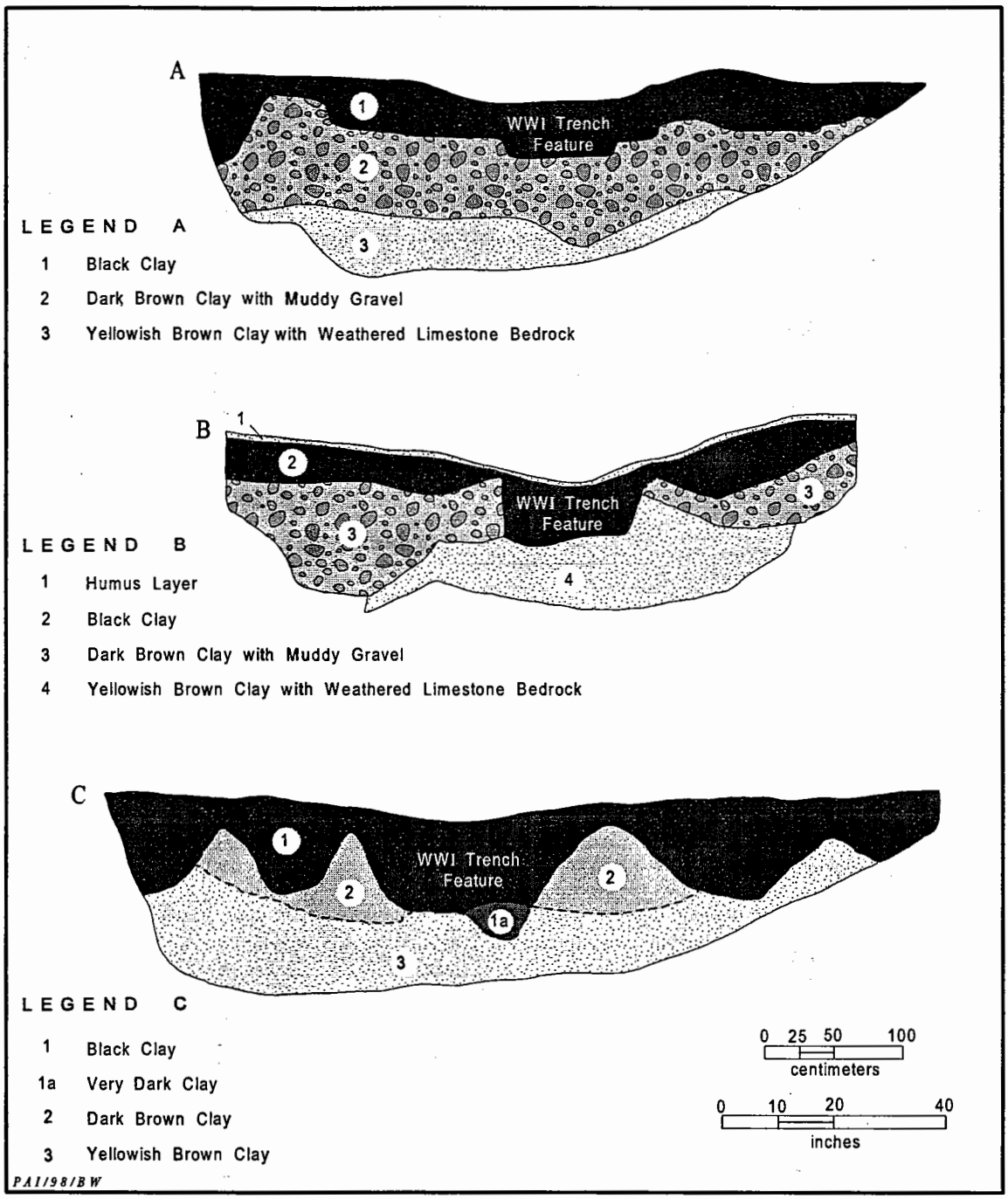


Figure 21. Trench types. (a) Type 1; (b) Type IIa; (c) Type IIb.

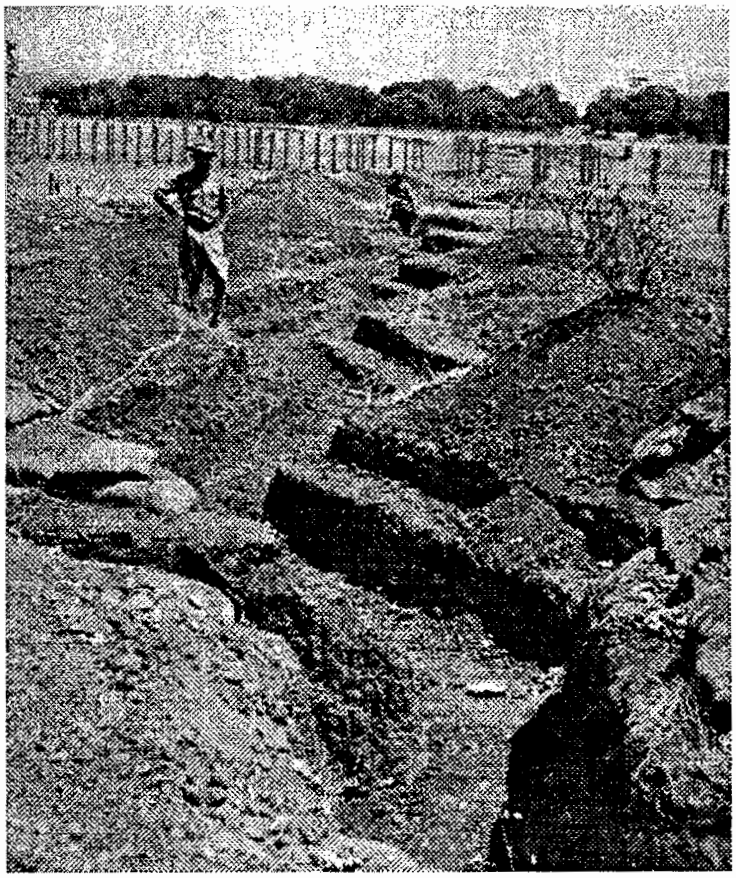


Figure 22. Photograph of trench warfare exercises at Camp Stanley in 1917.

engineer field manuals (Chief of Engineers, U.S. Army 1909, 1918; War Office 1918), nor are they mentioned in other sources regarding field training. Examples of the circular features in association with trench features are seen in a photograph taken during the production of *Wings* (Figure 27). Foxholes are also mentioned in an article about the production of the ground battle scenes from *Wings* (Chastaine 1926:637).

The use of wire entanglements is evident at site 41BX1163/1189; both barbed and unbarbed wire are present at the site. No posts are preserved in the entanglement structure, and in some cases the wire entanglements were found in large piles likely pushed up by bulldozing activities. Other wire entanglements are strung out on the ground surface. Because of disturbances from flooding, cattle grazing, and general army activities over the last 70 years, it is not known if they are still in their original positions. Wire entanglements are an integral part of trench warfare, and engineer field manuals go into much detail about how to construct various entanglement obstacles and where they should be placed during the construction of an entrenched zone (Chief of Engineers, U.S. Army 1918:343–348). Examples of wire entanglements strung out across the trench zone can be seen in Figure 27.

Based on the archeological data recovered from the field and descriptions in the engineer field manuals, the following conclusions were drawn. The three basic trench types defined from field investigations (Types I, II, and III) appear to correspond to three of four types described in the engineer field manuals (Chief of Engineers, U.S. Army 1909, 1918) as skirmisher's, or lying, kneeling, and standing trenches, respectively. All of these trenches are described in greater detail below in the Site History and Context section of this report. Comparison of the backhoe trench profiles with field manual profiles shows no exact matches; however, there are general similarities in the shapes and sizes of the profiles. The differences between the archeological record and the archival record may be the result of construction variation by the Army during trench warfare training and/or a lack of preservation of trench attributes necessary to match the profile types.

Site History and Context

Historically, the portion of Camp Stanley in which a series of training trenches is located was part of the Leon Springs Military Reservation (1906) (Freeman 1994a:9). During World War I, the same area was the location of Camp Funston, a facility established for the use of the First Officers Training Camp (FOTC). The FOTC opened at Camp Funston on May 8, 1917, and trained most of the junior officers for the 90th Division. New officer candidates experienced field training and tactical drills at Camp Funston and practiced trench warfare in July and early August of 1917 (Freeman 1994a:12, 14; Manguso 1990:23).

Camp Funston was redesignated Camp Stanley on October 27, 1917 (U.S. Army, Center for Military History 1988:Vol. 3, Part 2:917). Trench warfare training continued (*San Antonio Express*, February 7, 1918:7) at Camp Stanley, which, with Camp Bullis to

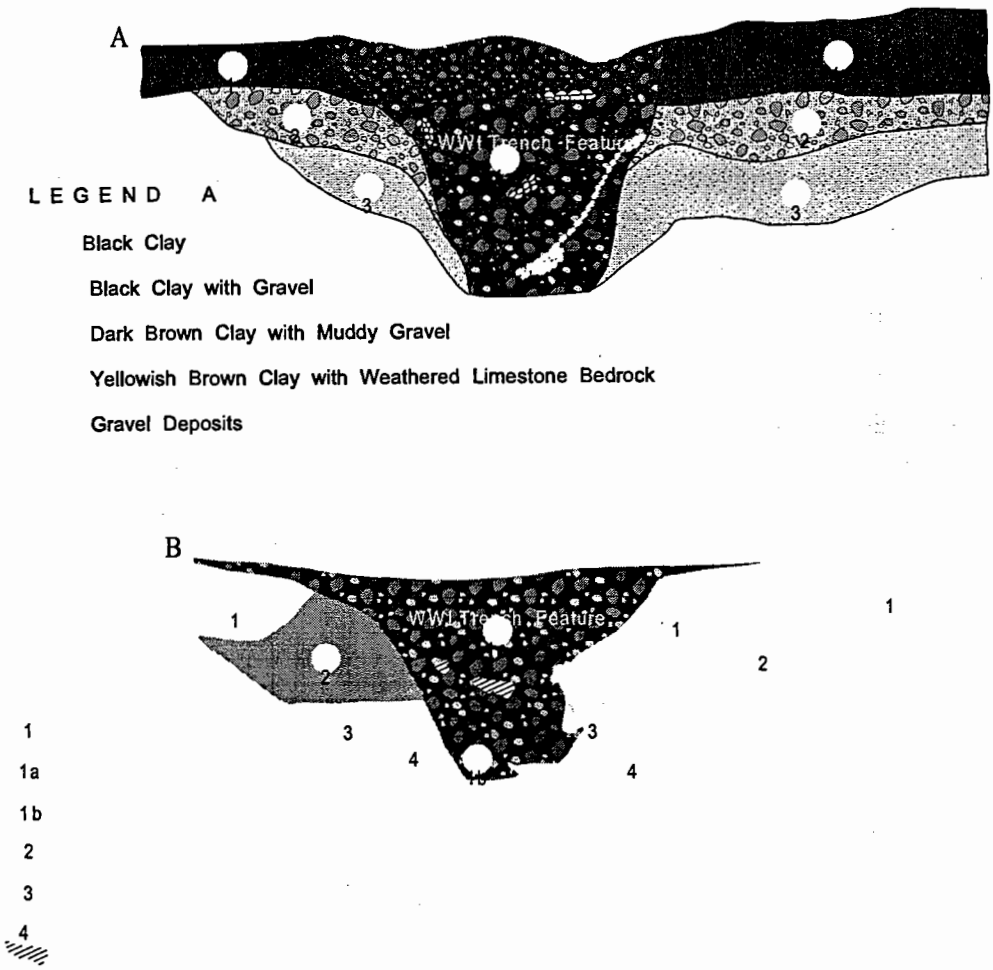


Figure 23.

the south, remained a part of the larger Leon Springs Military Reservation. Approximately 8 years later, the area was used briefly during the filming of the movie *Wings*, at which time "extensive trench works were buil[t] and stormed by soldier-extras in French, American and German uniforms" (Manguso 1990:57). While Manguso did not specifically identify the locations of these 1926 trenches, he did note that combat scenes were shot "near the old target ranges not far from Schasse Ranch" (1990:57), a description that would place the movie features in the general area of site 41BX1163/1189 and the 1917–1918 trenches. According to the *San Antonio Express* (September 22, 1926:n.p.) and the *Infantry Journal* (Chastaine 1926:637–640), reconstruction of the battlefield of St. Mihiel prior to the filming of *Wings* occurred on the bombing range at Camp Stanley; presumably, the battlefield was the location of the trench features depicted in movie stills.

In 1933, control of approximately 15,000 acres of the Camp Stanley portion of the Reservation, including the area with the World War I–era trenches, passed to Camp Bullis. At the same time, a proportionately smaller Camp Stanley was transferred to the Chief of Ordnance and served thereafter as an ammunition area of the San Antonio Arsenal (Bruns

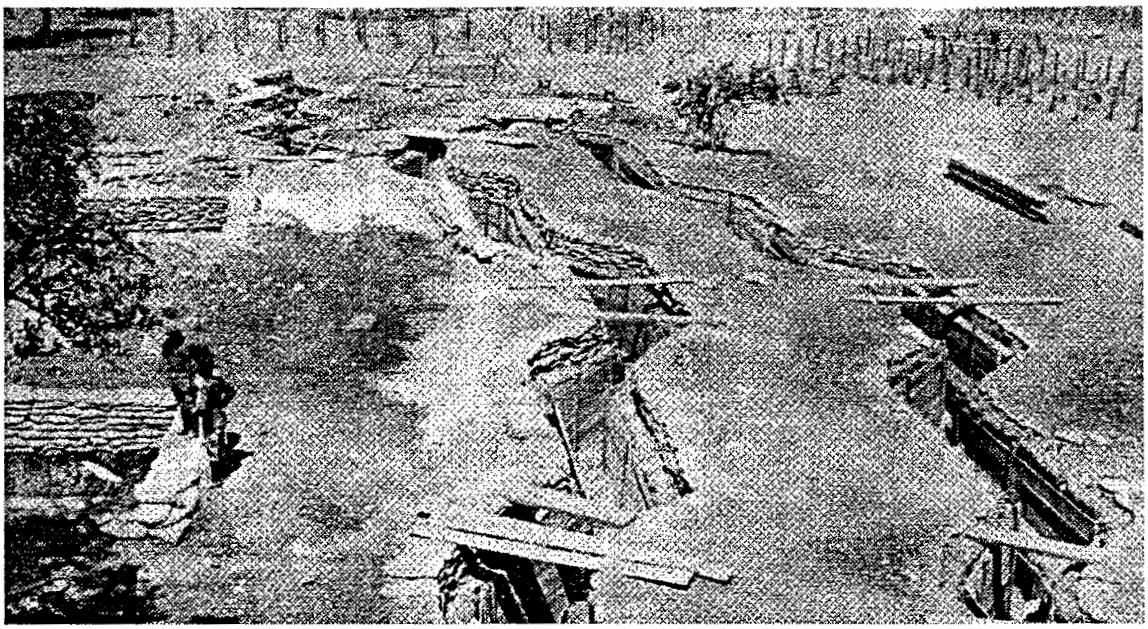


Figure 24. Photograph of timber and plank revetments in trenches at Camp Stanley in 1917.

1989:4). Use of the trench site area continued throughout the 1930s and 1940s under the auspices of Camp Bullis, although use of the trenches themselves during this time has not been recorded. Final disposition of site 41BX1163/1189 occurred in 1953, when 2,040 acres were reassigned to Camp Stanley (Manguso 1990:101).

MILITARY TRAINING DEVICES: WORLD WAR I–ERA TRENCHES

Acquisition, construction, and use of military training facilities was intense during the late nineteenth and early twentieth centuries. As numerous small frontier posts were abandoned, troops were consolidated into larger garrisons and a series of international crises created a need for large numbers of trained military personnel.

Training of troops involved maintenance of specialized skills and learning of combat techniques. By the turn of the century, such training occurred at remote locations since increased troop numbers and the introduction of rifled weapons made training activities at urban posts infeasible. In 1901, Congress passed "An act to increase the efficiency of the permanent military establishment of the United States" and authorized the Secretary of War to carry out preliminary examinations and surveys for the purpose of "selecting four sites with a view to the establishment of permanent camp grounds for the instruction of troops of the Regular Army and National Guard." A board of officers convened and identified five areas in the United States that seemed to fit

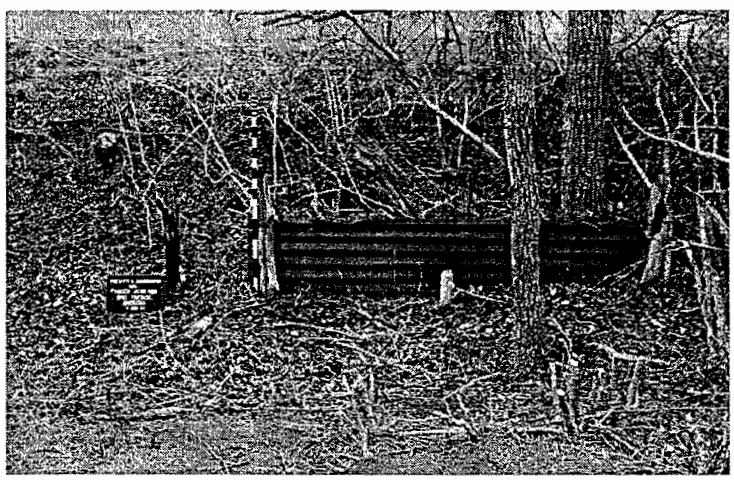


Figure 25. Photograph showing in situ example of post and corrugated metal revetment at 41BX1163/1189.

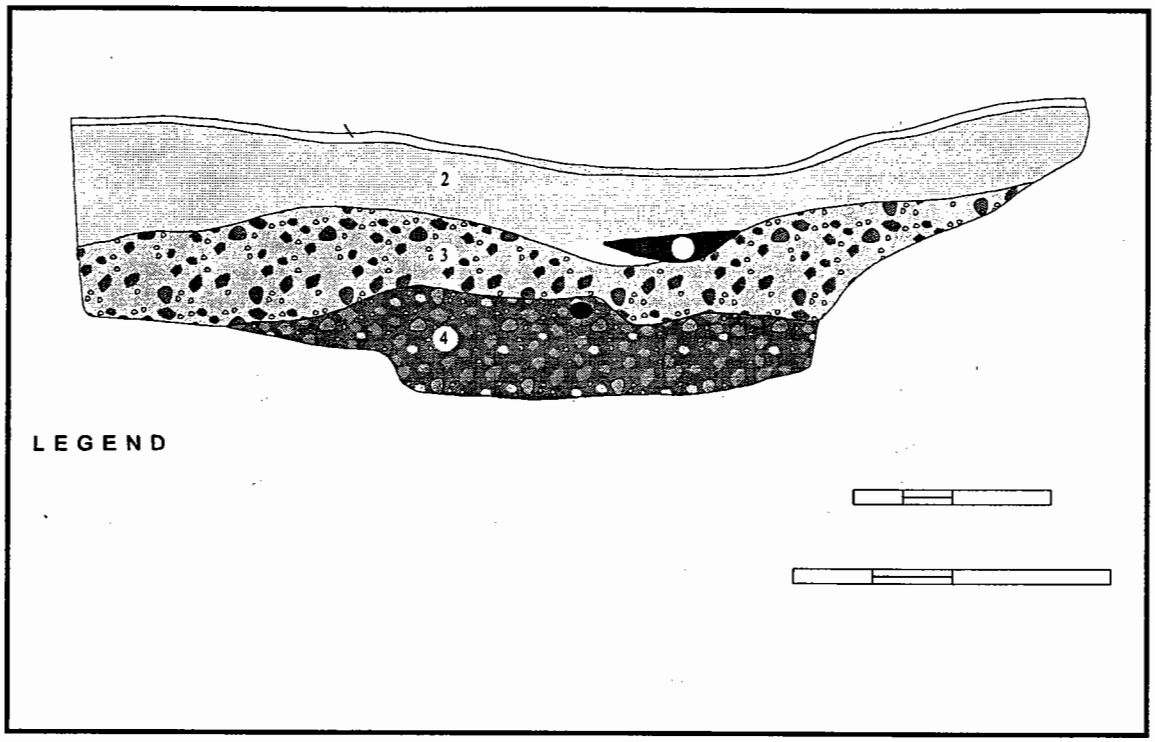


Figure 27.

Congress's requirements. One of these areas was located in the vicinity of Fort Sam Houston, Texas, where 10 properties were examined before the board recommended the Oppenheimer tract as the most suitable(U.S. Secretary of War 1902:3–4).

Acquisition of the Oppenheimer Ranch was accelerated by concern about revolutionary activities in Mexico. By 1906–1907, the government had acquired the large tract near Leon Springs, Texas, and had named it the Leon Springs Military Reservation. Augmentation of this property by lease occurred after the outbreak of World War I, when the Southern Department acquired an additional 15,427 acres to the south of the Reservation. It was on this extensive tract and on Camp Stanley to the north that all or some of the troops for 25 percent of all divisions that served overseas during World War I were trained. They used facilities in the vicinity of the present-day Camp Bullis cantonment, trained at the pistol ranges located on the north side of Salado Creek, learned maneuvers and tactics at various bombproofs, and dug trenches while learning warfare "as it is being fought on the French front" (*San Antonio Express*, February 7, 1918:7).

Construction and Use of Specific Training Devices: Field Fortifications

The following discussion is derived wholly from Chief of Engineers, U.S. Army (1909, 1918) and War Office (1918:115–117).

Fortification is the use of engineering devices to increase the fighting power of troops who are occupying a position by increasing the fire action and mobility of those troops while reducing the fire action and mobility of the enemy (Table 6). Field fortifications are fortifications constructed in response to specific field conditions and events that occur during a campaign; they often lose their value during or by the end of that campaign.

Field fortifications consist of:

1. shields or shelters such as trenches, galleries, redoubts, and blockhouses that protect the defender from the assailant's fire,
2. clearings, demolitions, or grading that produce an unobstructed field of fire, such as plantations, embankments, and screens that conceal the defender from the assailant's view,
3. obstacles such as abattis, slashings, and entanglements that retard the advance of an assailant,
4. communication devices such as roads, bridges, and telegraphs, and
5. obstructions to the assailant's ability to communicate (i.e., the destruction of communication devices).

Field fortifications of the first type (shields or shelters) may consist of several different kinds of entrenchments and other works such as:

1. hasty entrenchments, devices constructed on the battlefield in haste and in the presence of the enemy,
2. deliberate entrenchments, more carefully designed works that have greater defensive strength and that are constructed by troops outside of the line of battle to protect depots and lines of communication, supply, or retreat, and
3. siege works, devices that enable troops to advance under continuous cover in the attack or defense of strong fortifications.

In 1918, engineers identified large numbers of trench types, the purposes of which were to provide concealment, cover, protection against rifle and artillery fire, resistance to assault, lateral communication, and passage within the entrenched zone between front and

Table 6. Types of Field Fortifications, 1918

Type	Examples	Purpose
Shields/shelters	Trenches Galleries Redoubts Blockhouses	
Masks	Plantations Embankments Screens	view
Obstacles	Abattis Slashings Entanglements	To retard the advance of an assailant
Communication Devices	Roads Bridges Telegraphs	

rear. Typical trenches (Table 7) consisted of three major elements (Figure 28a)—the trench itself, an excavated area of varying complexity and depth; a parapet in front of the trench, which might include a berm, banquette slope, banquette or banquette tread, elbow rest, interior crest, superior slope, exterior crest, exterior slope, toe of the exterior slope, and berm; and a ditch in front of the parapet, which consisted of a scarp, relief, and counterscarp. Precise design of a trench depended largely on the angle of the fall of projectiles and shrapnel and the effect of explosive shells.

Specific trench types included the following:

1. skirmisher's trench (Figure 28b), which gave cover to a man lying down,
2. kneeling trench (Figure 28c), which gave cover for troops in the main line of resistance,
3. standing trench (Figure 29a–c), which provided more protection than the skirmisher's trench, and
4. complete trench (Figure 29d–h), which consisted of a standing trench with a passageway dug at the rear at least 6 feet below the interior crest.

Engineers' designs of the World War I period also called for trenches to be used as elements within an entrenched zone (Table 8). Such a zone might include:

1. firing trenches, which were designated primarily for delivering rifle fire against an infantry attack. They usually were not continuous and often not even in the same line. They were traversed and relatively narrow, and they sometimes included overhead cover, head cover, and ammunition recesses. They were constructed to fulfill six essential conditions: (1) the parapet had to be bulletproof; (2) every man had to be able to fire over the parapet and hit the bottom of his own wire entanglement; (3) traverses had to be adequate; (4) a parados had to be present to give protection against a back blast from a high explosive shell; (5) the trace of the trench had to be irregular to provide flanking fire; and (6) the sides of trenches had to be revetted and the bottom floored and drained if they were to be held for any length of time,
2. cover trenches, that were located 10 to 100 yards behind firing trenches to protect men on the firing line and were provided with cave shelters, bombproofs, firing banquettes, overhead cover, and loopholes or head cover,
3. approach trenches, that connected cover trenches with communicating trenches and, where communicating trenches were in advance of cover trenches, connected communicating with firing trenches. They were deep, comparatively wide, and winding, traversed, or zigzagged,
4. communicating trenches, that were deep, often short trenches located in front or rear of the line of cover trenches and provided lateral communication,
5. local trenches, that extended from firing, cover, communicating, or other trenches to observation stations, command posts, latrines, machine gun emplacements, and other specialized posts,
6. support trenches, which were similar in construction to cover trenches but were located towards the rear. At the front they might merge into cover trenches. They sometimes were provided with firing banquettes, and machine-gun emplacements might be located among them, and
7. reserve trenches, which were located to the rear of support trenches and often merged into them. They were designed to shelter local reserves and usually were not subjected to prolonged and severe artillery fire so long as the firing trenches held.

The combination of trench types, together with a cleared, obstructed foreground, constituted a defensive position. Specific organization of that defensive position depended on issues such as the mission of the command; numbers and quality of the troops; strength, position, and probable intent of the enemy; nature of the terrain;

Table 7. Types of Trenches, 1918

Type	Purpose	Description
Skirmisher's trench (Figure 28b)	Give cover to a man lying down when under fire	6 ft wide 9 inches deep at rear; 3 inches deep at front 1 ft high, 2.5 ft deep parapet
	of resistance	2.5 ft wide at the bottom (minimum) 3 ft relief
	trench	2.5 ft maximum bottom width 4.5 ft relief
	standing trench	A standing trench with an additional passageway at the rear excavated sufficiently deep to provide a minimum the parapet

Table 8. Descriptions of Firing, Communicating, and Approach Trenches

Type	Description
Firing trench "b"	Bulletproof parados
	Irregular trace
	planks, sod, brush, or wire
	6–7 ft below the crest of the parapet
	observation and manning of parapets
	Slightly deeper than firing trench "b"
	3 ft wide

weapons available to the combatants; time available for construction of the defensive position; whether reinforcements were expected; and ease of support, maneuver, and retreat. Regardless of these factors, however, all entrenched zones consisted of an obstacle in front of the firing, support, intermediate, and reserve trenches. The obstacle also was located between strong and supporting points and approaches and was continuous, except for narrow passages for patrols. Behind the obstacle was the front line (firing trench and cover and communicating trenches). To the rear of the front line were support and more communicating, reserve, and local trenches.

Construction of an entrenched zone involved training of infantry and cavalry in the tasks of construction, repair, and maintenance using specialized tools. Execution of the work involved the operations of tracing (marking lines on the ground to determine the horizontal limits of cutting and embankment) and profiling (indicating the positions of lines and slopes necessary to determine the proper sectional dimensions of trench, ditch, and parapet). Works executed deliberately involved nine steps: establishing and marking the trace, placing men and their arms and tools according to tactical conditions, placing packs and rifles on the rear side, marking out the tasks and traverses on the ground with a pick, stripping the grass from the width of the excavation and using the pieces of earth and grass to make a mask or small parapet, digging as nearly vertical as possible, concealing the trench, arranging communications, and constructing individual and collective arrangements such as firing banquettes, notches and loopholes, drainage, overhead cover, revetment, steps, ladders, and obstacles. Portable tools used included pick mattocks, wire cutters, hand axes, bolos, shovels, and sledge hammers. Heavy entrenching tools included axes, crowbars, pick mattocks, sandbags, hand and two-man saws, and shovels.

In light of activities in the European theater during World War I, engineers in December 1917 (Chief of Engineers, U.S. Army 1918:328) noted that permanent fortifications with their concrete parapets, magazines, and prepared gun emplacements had given way to "line upon line of entrenchments and earthwork inconspicuous as possible, manned by an ample number of mobile troops thoroughly trained in trench warfare, with artillery of all calibers, but mobile and easily concealed." The engineers remarked that the principles of field fortification and entrenchment had not changed during the war. But there had been a number of adaptations and new applications of existing principles because of improvements in artillery and methods of observation and communication, the use of new devices and methods of attack, the presence of continuous entrenched positions located in areas of great diversity and having unassailable flanks, the close proximity of the opposing lines of trenches, and the tendency to occupy field works for long periods of time during all

ments, increased use of mines and counter-mines, development of special measures to prevent surprise attack, development of auxiliary equipment such as guideposts to prevent troops becoming confused in the maze of trenches, and initiation of more routine maintenance in response to the longer-term occupation of the trenches.

Significance

Cultural properties associated with military training during World War I may be eligible for listing in the National Register of Historic Places under Criterion A because they "are associated with events that have made a significant contribution to the broad patterns of our history"; Criterion B because they "are associated with the lives of persons significant in our past"; Criterion C because they "embody the distinctive characteristics of a type, period, or method of construction . . . or represent a significant and distinguishable entity whose components may lack individual distinction"; or Criterion D because they "have yielded, or may be likely to yield, information important in . . . history" (National Park Service 1982:1).

Figure 28. Trench elements and profiles. (a) Diagram of major elements of a typical trench; (b) profile of skirmisher's, or lying trench; (c) profile of kneeling trench. Reproduced from Chief of Engineers, U.S. Army (1909:359).

seasons of the year. The most conspicuous adaptations and changes in field fortifications resulting from these improvements included a less extensive field of fire, greater difficulty in attaining concealment, deeper and narrower trenches, greater use of traverses and parados in firing trenches, the use of more support and cover trenches located generally parallel to the firing trench, and the development of a more complex first entrenched zone. Other changes that the engineers noted during World War I included an increased use of deep cover, especially back of the firing zone, extensive use of strong and supporting points in the first entrenched zone, provision for defense of communicating and approach trenches against flank attack, development of a second entrenched zone approximately 2 to 3 miles in rear of the first zone as well as entrenched zones even farther to the rear in case of defeat or retirement, increased use of obstacles such as barbed-wire entangle-

Construction of World War I–era military training facilities such as field fortifications occurred as part of a broad national program to train troops at remote installations that had been acquired specifically for that purpose. In Texas, use of those installations and training devices peaked during World War I when Fort Sam Houston became a concentration center for officers and men who were sent to Europe after they received their training at the Leon Springs Military Reservation. Aware by 1917 of changes in warfare that had occurred as a result of greater fire power, and of the increasing emphasis on trenches in preference to fixed fortifications, army personnel focused on training soldiers to construct and utilize specific types of field fortifications (Criterion A). At Camp Funston, a part of the Military Reservation at Leon Springs, members of the First Officers Training Camp such as Leslie J. McNair practiced trench warfare in July and early August. In July 1917, the 57th Infantry

Figure 29.

moved to Camp Funston for training as well. Its staff included Lieutenants Dwight D. Eisenhower and Walton Walker (Manguso 1990: 23, 33). They, together with the thousands of men who comprised a large proportion of the troops who served in Europe, participated in tactical drills and field training during 1917 and 1918, including the construction and use of trenches such as those that had become ubiquitous on the western front (Criterion B).

Training devices such as World War I trenches appear to have followed carefully delineated design principles that were firmly rooted in military tradition but also responded to new factors that came into play during the war. Training manuals were specific in their directions concerning the layout of entrenched zones, dimensions of the different kinds of trenches, tools used in their construction, and changes that had occurred in response to numerous improvements in fire power, observation, and new devices and methods of attack. Trenches used as training devices during the later years of the war, therefore, reflected both basic principles of layout and construction developed prior to World War I and also improvements in trench construction and zone design that resulted from experience on the western front (Criterion C).

Because the history of trench design, construction, and use has been thoroughly recorded in numerous military manuals, it seems unlikely that archeological investigations of trenches dating to the World War I period would yield new information important in history. Specific data exist in the forms of illustrations, specifications, technical reports, and historic photographs. As a result, World War I trenches used either as training devices or in actual combat probably are not eligible for nomination to the National Register of Historic Places under Criterion D.

Registration Requirements

To qualify for eligibility, trenches must have been constructed during the World War I period and used to train and prepare troops for combat in the European theater. Trenches should retain their subterranean configuration (see Figure 27), and the trench type—whether skirmisher's, kneeling, standing, or complete (see Table 7)—should be readily identifiable. Two of the three elements of the feature (trench, parapet, and/or ditch) should be clearly distinguishable, either in their original forms or after archeological excavation. Where revetment materials

(Halliwell 1981:1410), *Wings* showcased all arms of type.

1981:1410; Slate 1996:998).

THE FILM INDUSTRY AND SAN ANTONIO AREA MILITARY INSTALLATIONS

Significance

(National Park Service 1982:2).

1996:998).

the filming of *Heart of the Sunset* in San Antonio by Samuel Goldwyn and *The Warrens of Virginia* in the

The Big Parade (1925), *West Point of the Air* (1934), *I Wanted Wings* (1940), and *Air Cadet* (1951) (Slate

Wings lent

Rough Riders

B).

Juan Hill (Bruns 1989:3–4).

In 1926, the Camp Stanley portion of the

Registration Requirements

Wings.

actors.