Cultural Resources Assessment for the Fort Lowell-Adkins Steel Property within Historic Fort Lowell, Tucson Pima County, Arizona

J. Homer Thiel
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Technical Report No. 2008-08
Desert Archaeology, Inc.

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Submitted to

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Desert Archaeology, Inc.
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ABSTRACT

DATE: 14 March 2008

AGENCY: Pima County

REPORT TITLE: Cultural Resources Assessment for the Fort Lowell-Adkins Steel Property within Historic Fort Lowell, Tucson, Pima County, Arizona

PIMA COUNTY PROJECT NAME: Adkins Steel Property Inventory and Mapping

PIMA COUNTY CONTRACT NUMBER: 25-73-D-139578-0507/PO#070536

FUNDING LEVEL: County Bonds

PROJECT DESCRIPTION: Survey and mapping of a newly acquired portion of Historic Fort Lowell

PERMIT NUMBER: Arizona Antiquities Act Blanket Permit No. 2007-0139ps, Arizona State Accession No. 2007-0361

LOCATION:

County: Pima

Description: Section 35, Township 13 South, Range 14 East on the USGS 7.5-minute topographic quad Tucson North, Arizona (AZ BB:9 [SW]).

NUMBER OF SURVEYED ACRES: 5.47

NUMBER OF SITES: 2

LIST OF REGISTER-ELIGIBLE PROPERTIES: Historic Fort Lowell, AZ BB:9:40 (ASM), and the Hardy site, AZ BB:9:14 (ASM)

LIST OF INELIGIBLE SITES: 0

RECOMMENDATIONS: A cultural resources survey of the former Adkins Steel property indicates the visible presence of six or possibly seven historic buildings associated with Fort Lowell (1873-1891). Another building is represented by subsurface foundations. It is very likely that additional subsurface archaeological features are present associated with the fort occupation, the subsequent use of the property as a tuberculosis sanatorium, and by the Adkins family. In addition, the Hardy site, a prehistoric Hohokam village, extends into this area, and associated subsurface cultural resources are likely to be present. All ground-disturbing activities should be either monitored or mitigated through archaeological fieldwork.

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CULTURAL RESOURCES ASSESSMENT FOR THE FORT LOWELL-ADKINS STEEL PROPERTY WITHIN HISTORIC FORT LOWELL, TUCSON, PIMA COUNTY, ARIZONA

The results of a Class 1 and Class 3 cultural resources survey of a portion of historic Fort Lowell located at the southwestern corner of Fort Lowell and Craycroft roads are presented in this report. This parcel is known as the Fort Lowell-Adkins Steel property, and it was recently acquired by the City of Tucson. In addition to the survey, a second task involved detailed mapping of the parcel and the adjacent portions of Fort Lowell. A third task is to monitor ground-disturbing activities within the Adkins Steel property. A monitoring and discovery plan is presented in Appendix A.

The City of Tucson recently acquired the property from its former owner, the Adkins Steel and Tank Manufacturing Company, in cooperation with Pima County through an Intergovernmental Agreement (IGA). The IGA provides the means by which the Pima County Bond funding will be used to implement a preservation project. Following this work, the property will be incorporated into the Fort Lowell Historic Park, and owned and operated by the City of Tucson, as stipulated in the IGA with Pima County. The county will continue to be a major stakeholder through a Conservation Easement on the property, to insure the property is managed and interpreted as a part of the park in perpetuity.

William H. Doelle, Ph.D., of Desert Archaeology, Inc., is the Principal Investigator for the project. J. Homer Thiel and Tyler Theriot of Desert Archaeology conducted the field survey on 6 August 2007, working under the authority of Arizona Antiquities Act Project Specific Permit No. 2007-0139ps (Arizona State Museum Accession No. 2007-0361). Michael Brack and Tyler Theriot conducted the mapping program for this project.

The surveyed project area consists of the southwestern corner of historic Fort Lowell. This area contains archaeological remains dating to the prehistoric Hohokam occupation of the area and later historic use related to Fort Lowell (1873-1891), followed by squatters, a tuberculosis sanatorium run by the Cate family, a rest home, and a steel tank manufacturing location operated by the Adkins family. Additional project records are curated at the Arizona State Museum (ASM).

PROJECT AREA LOCATION AND DESCRIPTION

The project area is located in Pima County in the SE ¼ of the NE ¼ of Section 35, Township 14 South, Range 13 East on the USGS 7.5-minute topographic quad Tucson North, Ariz. (AZ BB:9 [SW]) (Figure 1). Specifically, the project area is at the southwestern corner of East Fort Lowell Road and North Craycroft Road, immediately west of Fort Lowell Historic Park (Pima County Assessor's Parcel Nos. 110-09-032A, 110-09-032B, 110-09-330, 110-09-0340, and 110-09-0350). The total area of the parcel is approximately 5.47 acres. The project area currently contains structures associated with Fort Lowell and with the subsequent use by members of the Adkins family.

The Area of Potential Effects (APE) refers to the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[d]). For the purposes of this assessment, the APE for this project includes the entire Adkins property.

ENVIRONMENTAL SETTING OF THE PROJECT AREA

The project area is located south of the Rillito River (Figure 2). Much of the surrounding area is fully developed, but it once supported vegetation typical of the Arizona Uplands subdivision of the Sonoran Desert Scrub series (Hansen 1996). Spicer (2004) recently prepared a list of plants and wildlife present in the Fort Lowell area during historic and modern times. The elevation of the project area averages approximately 2,390 ft above sea level.

The vegetation present within the project area is a combination of plantings and natural growth. Landscaping elements present around the Adkins house include pomegranate bushes. A pair of saguaros is planted within a stone circle between officer's quarters no. 2 and no. 3, and a citrus tree is located behind officer's quarters no. 3. The natural

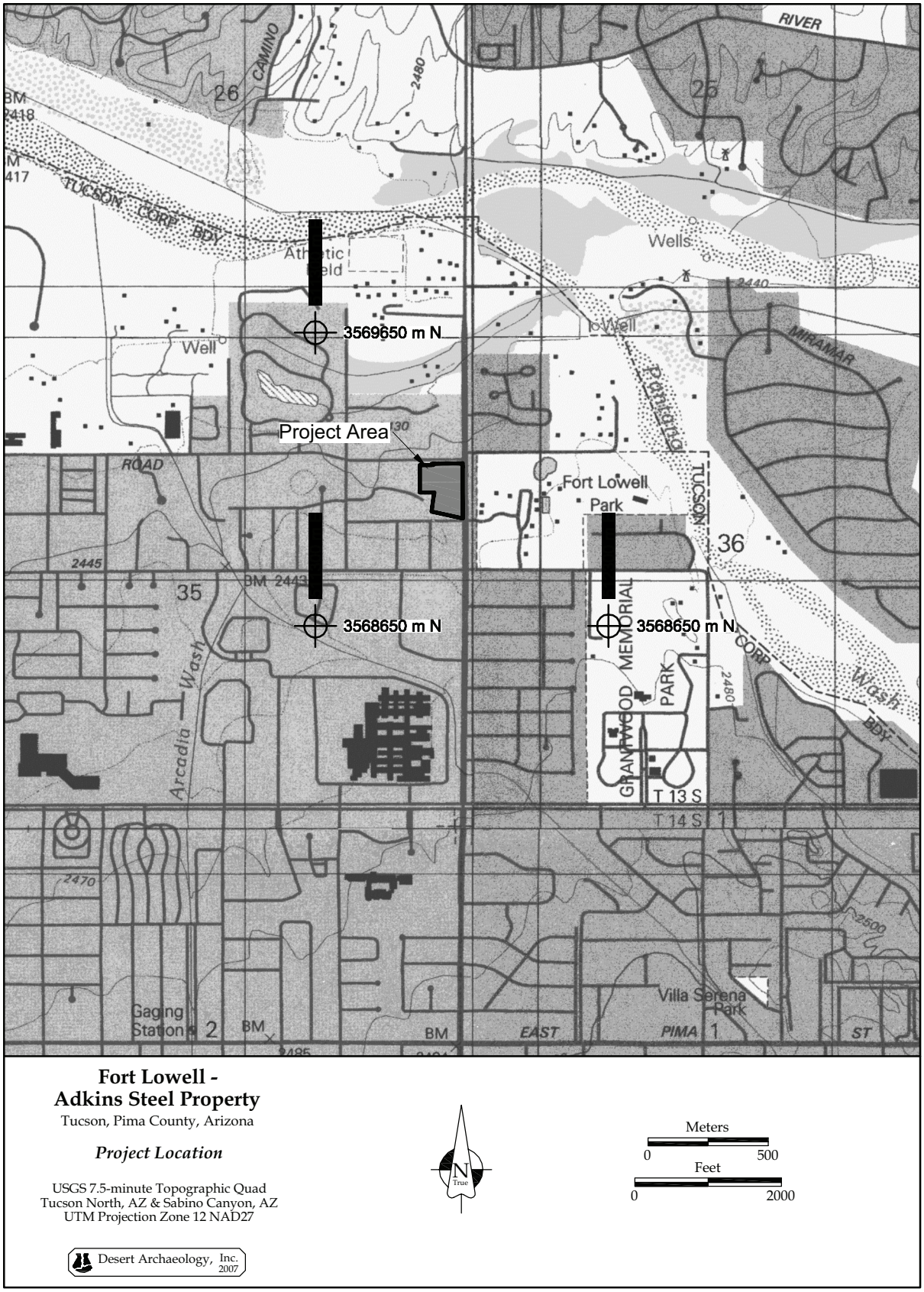

Figure 1. Reproduction of USGS 7.5-minute topographic quad Tucson North, Ariz. (AZ BB:9 [SW]), showing location of project area.

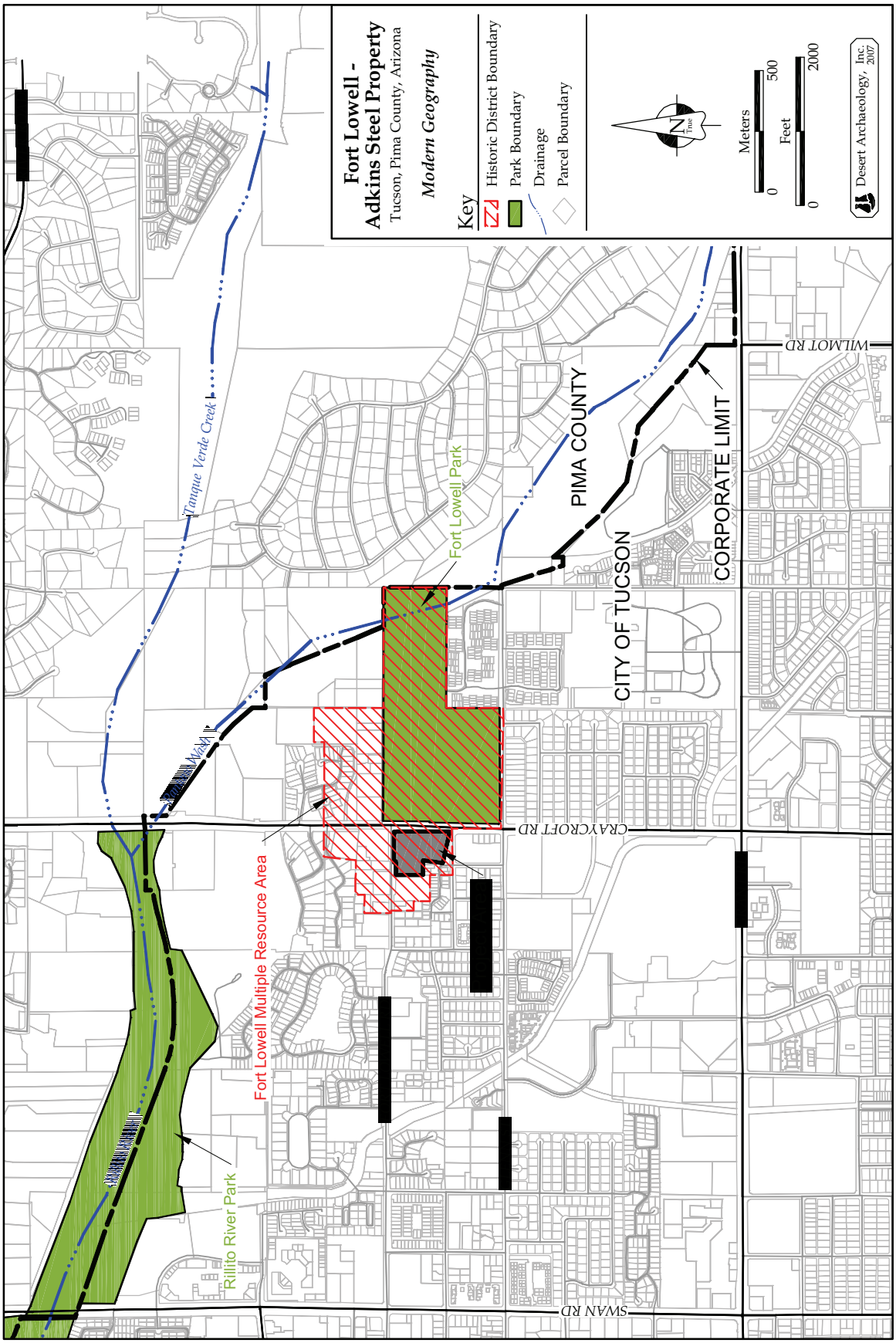

Figure 2. Modern geography of Fort Lowell and the Fort Lowell-Atkins Steel property.

vegetation includes mesquite trees, barrel cactus, and creosotebush. The locations of some of the larger vegetation within the parcel are pinpointed in Figure 3.

The dense vegetation and the adobe ruins at the back and on the western side of the lot serve as habitat for a variety of animals. Cottontail rabbits, ground squirrels, a king snake, whiptails, several other small lizards, geckos, Gambel's quail, mourning doves, vultures, and Africanized bees were all seen on the property during fieldwork.

CULTURAL BACKGROUND OF THE PROJECT AREA

The history of the Southwest and of the Tucson Basin is marked by a close relationship between people and the natural environment. Environmental conditions have strongly influenced subsistence practices and social organization, and social and cultural changes have, in turn, made it possible to more efficiently exploit environmental resources. Through time, specialized adaptations to the arid region distinguished people living in the Southwest from those in other areas. Development of cultural and social conventions also became more regionally specific, and by A.D. 650, groups living in the Tucson Basin can be readily differ-entiated from those living in other areas of the Southwest. Today, the harsh desert climate no longer isolates Tucson and its inhabitants, but life remains closely tied to the unique resources of the Southwest. The chronology of the Tucson Basin is summarized in Table 1.

Paleoindian Period (11,500?-7500 B.C.)

Archaeological investigations suggest the Tucson Basin was initially occupied some 13,000 years ago, a time much wetter and cooler than today. The Paleoindian period is characterized by small, mobile groups of hunter-gatherers who briefly occupied temporary campsites as they moved across the countryside in search of food and other resources (Cordell 1997:67). The hunting of large mammals, such as mammoth and bison, was a particular focus of the subsistence economy. A Clovis point characteristic of the Paleoindian period (circa 9500 B.C.) was collected from the Valencia site, AZ BB:13:74 (ASM), located along the Santa Cruz River in the southern Tucson Basin (Doelle 1985:183). Another Paleoindian point was found in Rattlesnake Pass, in the northern Tucson Basin (Huckell 1982). These rare finds suggest prehistoric use of the Tucson area probably began at this time. Paleoindian use of the Tucson Basin is supported by archaeological investigations in the nearby San Pedro Valley and elsewhere in southern Arizona, where Clovis points have been discovered in association with extinct mammoth and bison remains (Huckell 1993, 1995). However, because Paleoindian sites have yet to be found in the Tucson Basin, the extent and intensity of this occupation are unknown.

Archaic Period (7500-2100 B.C.)

The transition from the Paleoindian period to the Archaic period was accompanied by marked climatic changes. During this time, the environment came to look much like it does today. Archaic period groups pursued a mixed subsistence strategy, characterized by intensive wild plant gathering and the hunting of small animals. The only early Archaic period (7500-6500 B.C.) site known from the Tucson Basin is found in Ruelas Canyon, south of the Tortolita Mountains (Swartz 1998:24). However, middle Archaic period sites dating between 3500 and 2100 B.C. are known from the bajada zone surrounding Tucson, and, to a lesser extent, from floodplain and mountain areas. Investigations conducted at middle Archaic period sites include excavations along the Santa Cruz River (Gregory 1999), in the northern Tucson Basin (Roth 1989), at the La Paloma development (Dart 1986), and along Ventana Canyon Wash and Sabino Creek (Dart 1984; Douglas and Craig 1986). Archaic period sites in the Santa Cruz floodplain were found to be deeply buried by alluvial sediments, suggesting more of these sites are present, but undiscovered, due to the lack of surface evidence.

Early Agricultural Period (2100 B.C.-A.D. 50)

The Early Agricultural period (previously identified as the Late Archaic period) was the period when domesticated plant species were first cultivated in the Greater Southwest. The precise timing of the introduction of cultigens from Mexico is not known, although direct radiocarbon dates on maize indicate it was being cultivated in the Tucson Basin and several other parts of the Southwest by 2100 B.C. (Mabry 2007). By at least 400 B.C., groups were living in substantial agricultural settlements in the floodplain of the Santa Cruz River. Recent archaeological investigations suggest canal irrigation also began sometime during this period.

Several Early Agricultural period sites are known from the Tucson Basin and its vicinity (Diehl 1997; Ezzo and Deaver 1998; Freeman 1998; Gregory 2001; Huckell and Huckell 1984; Huckell et al. 1995; Mabry 1998, 2007; Roth 1989). While there is variability

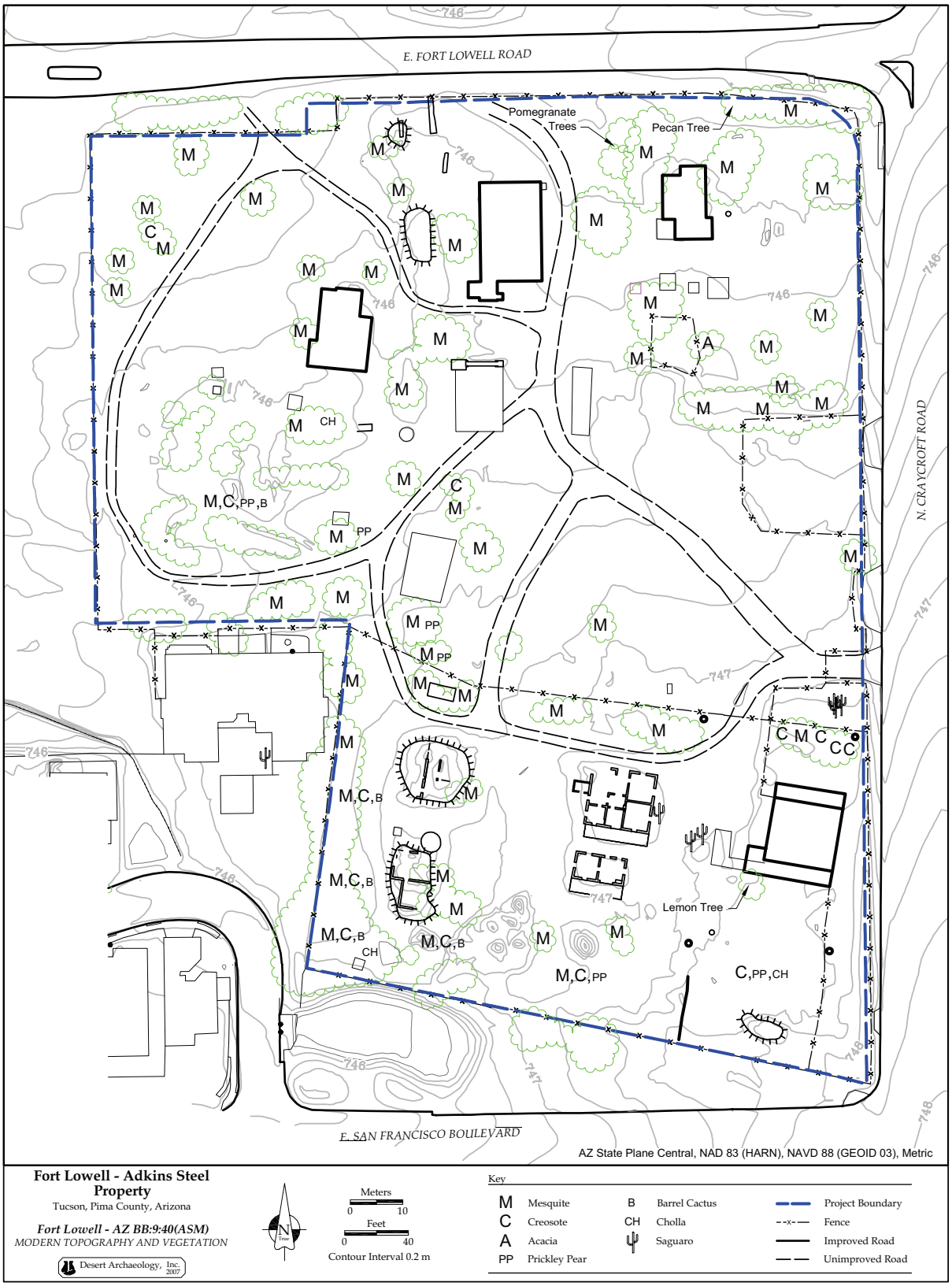

Figure 3. Topography and vegetation on the Fort Lowell-Adkins Steel property.

Table 1. Periodization and chronology of the Santa Cruz Valley-Tucson Basin prehistory.

Era/Period	Phase	Date Range
Historic		
American Statehood	–	A.D. 1912-present
American Territorial	–	A.D. 1856-1912
Mexican	–	A.D. 1821-1856
Spanish	–	A.D. 1694-1821
Protohistoric	–	A.D. 1450-1694
Prehistoric		
Hohokam Classic	Tucson	A.D. 1300-1450
	Tanque Verde	A.D. 1150-1300
Hohokam Sedentary	Late Rincon	A.D. 1100-1150
	Middle Rincon	A.D. 1000-1100
	Early Rincon	A.D. 950-1000
Hohokam Colonial	Rillito	A.D. 850-950
	Cañada del Oro	A.D. 750-850
Hohokam Pioneer	Snaketown	A.D. 700-750
	Tortolita	A.D. 500-700
Early Ceramic	Late Agua Caliente	A.D. 350-500
	Early Agua Caliente	A.D. 50-350
Early Agricultural	Late Cienega	400 B.C.-A.D. 50
	Early Cienega	800-400 B.C.
	San Pedro	1200-800 B.C.
	(Unnamed)	2100-1200 B.C.
Archaic	Chiricahua	3500-2100 B.C.
	(Occupation gap?)	6500-3500 B.C.
	Sulphur Springs-Ventana	7500-6500 B.C.
Paleoindian		11,500?-7500 B.C.

among these sites—probably due to the 2,150 years included in the period—all excavated sites to date contain small, round, or oval semisubterranean pithouses, many with large internal storage pits. At some sites, a larger round structure is also present, which is thought to be for communal or ritual purposes.

Stylistically distinctive Cienega, Cortaro, and San Pedro type projectile points are common at Early Agricultural sites, as are a range of ground stone and flaked stone tools, ornaments, and shell jewelry (Diehl 1997; Mabry 1998). The fact that shell and some of the material used for stone tools and ornaments were not locally available in the Tucson area suggests trade networks were operating. Agriculture, particularly the cultivation of corn, was important in the diet and increased in importance through time. However, gathered wild plants–such as tansy mustard and amaranth seeds, mesquite seeds and pods, and agave hearts–were also frequently used resources. As in the preceding Archaic period, the hunting of animals such as deer, cottontail rabbits, and jackrabbits, continued to provide an important source of protein.

Early Ceramic Period (A.D. 50-500)

Although ceramic artifacts, including figurines and crude pottery, were first produced in the Tucson Basin during the Early Agricultural period (Heidke and Ferg 2001; Heidke et al. 1998), the widespread use of ceramic containers marks the transition to the Early Ceramic period (Huckell 1993). Undecorated plain ware pottery was widely used in the Tucson Basin by about A.D. 50, marking the start of the Early Agua Caliente phase (A.D. 50-350).

Architectural features became more formalized and substantial during the Early Ceramic period, representing a greater investment of effort in construction, and perhaps more permanent settlement. A number of pithouse styles are present, including small, round, and basin-shaped houses, as well as slightly larger subrectangular structures. As during the Early Agricultural period, a class of significantly larger structures may have functioned in a communal or ritual manner.

Reliance on agricultural crops continued to increase, and a wide variety of cultigens–including maize, beans, squash, cotton, and agave–were an

integral part of the subsistence economy. Populations grew as farmers expanded their crop production to floodplain land near permanently flowing streams, and it is assumed that canal irrigation systems also expanded. Evidence from archaeological excavations indicates trade in shell, turquoise, obsidian, and other materials intensified and that new trade networks developed.

Hohokam Sequence (A.D. 500-1450)

The Hohokam tradition developed in the deserts of central and southern Arizona sometime around A.D. 500, and is characterized by the introduction of red ware and decorated ceramics: red-on-buff wares in the Phoenix Basin and red-on-brown wares in the Tucson Basin (Doyel 1991; Wallace et al. 1995). Red ware pottery was introduced to the ceramic assemblage during the Tortolita phase (A.D. 500-700). The addition of a number of new vessel forms suggests that, by this time, ceramics were utilized for a multitude of purposes.

Through time, Hohokam artisans embellished this pottery with highly distinctive geometric figures and life forms such as birds, humans, and reptiles. The Hohokam diverged from the preceding periods in a number of other important ways: (1) pithouses were clustered into formalized courtyard groups, which, in turn, were organized into larger village segments, each with their own roasting area and cemetery; (2) new burial practices appeared (cremation instead of inhumation), in conjunction with special artifacts associated with death rituals; (3) canal irrigation systems were expanded and, particularly in the Phoenix Basin, represented huge investments of organized labor and time; and (4) large communal or ritual features, such as ballcourts and platform mounds, were constructed at many village sites.

The Hohokam sequence is divided into the pre-Classic (A.D. 500-1150) and Classic (A.D. 1150-1450) period. At the start of the pre-Classic, small pithouse hamlets and villages were clustered around the Santa Cruz River. However, beginning about A.D. 750, large, nucleated villages were established along the river or its major tributaries, with smaller settlements in outlying areas serving as seasonal camps for functionally specific tasks such as hunting, gathering, or limited agriculture (Doelle and Wallace 1991). At this time, large, basin-shaped features with earthen embankments, called ballcourts, were constructed at a number of the riverine villages. Although the exact function of these features is unknown, they probably served as arenas for playing a type of ball game, as well as places for holding religious ceremonies and for bringing different groups together for trade and other communal purposes (Wilcox 1991; Wilcox and Sternberg 1983).

Between A.D. 950 and 1150, Hohokam settlement in the Tucson area became even more dispersed, with people utilizing the extensive bajada zone as well as the valley floor (Doelle and Wallace 1986). An increase in population is apparent, and both functionally specific seasonal sites, as well as more permanent habitations, were now situated away from the river; however, the largest sites were still on the terraces just above the Santa Cruz. There is strong archaeological evidence for increasing specialization in ceramic manufacture at this time, with some village sites producing decorated red-on-brown ceramics for trade throughout the Tucson area (Harry 1995; Heidke 1988, 1996; Huntington 1986).

The Classic period is marked by dramatic changes in settlement patterns and possibly in social organization. Aboveground adobe compound architecture appeared for the first time, supplementing, but not replacing, the traditional semisubterranean pithouse architecture (Haury 1928; Wallace 1995). Although corn agriculture was still the primary subsistence focus, extremely large Classic period rock-pile field systems associated with the cultivation of agave have been found in both the northern and southern portions of the Tucson Basin (Doelle and Wallace 1991; Fish et al. 1992).

Platform mounds were also constructed at a number of Tucson Basin villages sometime around A.D. 1275-1300 (Gabel 1931). These features are found throughout southern and central Arizona, and consist of a central structure deliberately filled to support an elevated room upon a platform. The function of the elevated room is unclear; some were undoubtedly used for habitation, whereas others may have been primarily ceremonial. Building a platform mound took organized and directed labor, and the mounds are thought to be symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish et al. 1992; Gregory 1987). By the time platform mounds were constructed, most smaller sites had been abandoned, and Tucson Basin settlement was largely concentrated at only a half-dozen large, aggregated communities. Recent research suggests that aggregation and abandonment in the Tucson area may be related to an increase in conflict and possibly warfare (Wallace and Doelle 1998). By A.D. 1450, the Hohokam tradition, as presently known, disappeared from the archaeological record.

Protohistoric Period (A.D. 1450-1697)

Little is known of the period from A.D. 1450, when the Hohokam disappeared from view, to A.D.

1697, when Father Kino first traveled to the Tucson Basin (Doelle and Wallace 1990). By that time, the Tohono O'odham people were living in the arid desert regions west of the Santa Cruz River, and groups who lived in the San Pedro and Santa Cruz valleys were known as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). Both groups spoke the O'odham language and, according to historic accounts and archaeological investigations, lived in oval jacal surface dwellings rather than pithouses. One of the larger Sobaipuri communities was located at Bac, where the Spanish Jesuits, and later the Franciscans, constructed the mission of San Xavier del Bac (Huckell 1993; Ravesloot 1987). However, due to the paucity of historic documents and archaeological research, little can be said regarding this inadequately understood period.

Spanish and Mexican Periods (A.D. 1697-1856)

Spanish exploration of southern Arizona began at the end of the seventeenth century A.D. Early Spanish explorers in the Southwest noted the presence of Native Americans living in what is now the Tucson area. These groups comprised the largest concentration of pop-ulation in southern Arizona (Doelle and Wallace 1990). In 1757, Father Bernard Middendorf arrived in the Tucson area, establishing the first local Spanish presence. Fifteen years later, construction of the San Agustín Mission near a Native American village at the base of A-Mountain was initiated, and by 1773, a church was completed (Dobyns 1976:33).

In 1775, the site for the Tucson Presidio was selected on the eastern margin of the Santa Cruz River floodplain. In 1776, Spanish soldiers from the older presidio at Tubac moved north to Tucson, and construction of defensive and residential structures began. The Tucson Presidio was one of several forts built to counter the threat of Apache raiding groups who had entered the region at about the same time as the Spanish (Thiel et al. 1995; Wilcox 1981). Spanish colonists soon arrived to farm the relatively lush banks of the Santa Cruz River, to mine the surrounding hills, and to graze cattle. Many indigenous settlers were attracted to the area by the availability of Spanish products and the relative safety provided by the presidio. The Spanish and Native American farmers grew corn, wheat, and vegetables, and cultivated fruit orchards. The San Agustín Mission was known for its impressive gardens (Williams 1986).

In 1821, Mexico gained independence from Spain, and Mexican settlers continued farming, ranching, and mining activities in the Tucson Basin. By 1831, the San Agustín Mission had been abandoned (Elson and Doelle 1987; Hard and Doelle 1978), although settlers continued to seek the protection of the presidio walls.

American Period (1856-Present)

Through the 1848 settlement of the Mexican-American War and the 1853 Gadsden Purchase, Mexico ceded much of the Greater Southwest to the United States, establishing the international boundary at its present location. The U.S. Army established its first outpost in Tucson in 1856, and in 1873, founded Fort Lowell at the confluence of the Tanque Verde Creek and Pantano Wash, to guard against continued Apache raiding.

Railroads arrived in Tucson and the surrounding areas in the 1880s, opening the floodgates of Anglo-American settlement. With the surrender of Geronimo in 1886, Apache raiding ended, and the settlement in the region boomed. Local industries associated with mining and manufacturing continued to fuel growth, and the railroad supplied the Santa Cruz River valley with the commodities it could not produce locally. Meanwhile, homesteaders established numerous cattle ranches in outlying areas, bringing additional residents and income to the area (Mabry et al. 1994).

By the turn of the twentieth century, municipal improvements to water and sewer service, and the eventual introduction of electricity, made life in southern Arizona more hospitable. New residences and businesses continued to appear within an ever-widening perimeter around Tucson, and city limits stretched to accommodate the growing population. Tourism, the health industry, and activities centered around the University of Arizona and Davis-Monthan Air Force Base have contributed significantly to growth and development in the Tucson Basin in the twentieth century (Sonnichsen 1982).

HISTORIC RESEARCH

Archival research was conducted to provide a brief overview of Fort Lowell and a more detailed history of the Adkins Steel property. Research was completed at the Arizona Historical Society (Southern Arizona Division) (AHS), the Fort Lowell branch museum of the Arizona Historical Society, the Pima County Public Library, the Special Collections and Main Library at the University of Arizona, and through online resources available at Ancestry.com and other locations on the internet. Local resident Lannie Hartman provided additional data. Names are spelled as they appear in the respective documents, and spelling often differs (for example, Dolly vs. Dollie).

Fort Lowell

A military post was initially established by the U.S. Army in the downtown portion of Tucson in 1856, following the departure of the Mexican military in March of that year. The post was not permanent, and the soldiers occasionally left the community unprotected when, for example, they were stationed elsewhere or when the Confederate Army took control of the village for a few months in 1862 (Peterson 1976).

On 29 August 1866, the military post at Tucson was made permanent, with the post officially named Camp Lowell on 11 September 1866 (Peterson 1976; Post Returns, NARA microfilm 63, roll 942). The camp was located south of modern-day Broadway Boulevard, and remained at that location until 1873. It served as a supply depot for other camps in Arizona until 1871. Soldiers occasionally left the fort to patrol or to pursue Apaches (Peterson 1976).

For various reasons, such as the need for expansion, poor living conditions (soldiers bunked in tents), the prevalence of malaria in the Santa Cruz River environs, and civilian complaints about drunken soldiers, commanders recommended that the camp be relocated along the Rillito, at a point along the creek 6 miles northeast of Tucson. On 10 March 1873, the decision to move the camp reached Tucson, and near the end of March 1873, the troops were relocated, initially living in canvas tents (Peterson 1976).

Construction of permanent buildings soon began. Contracts for the production of adobe bricks were assigned to the lowest bidder. In October 1873, Lord & Williams won with a bid of $30.60 per 1,000 bricks "in the wall" (*Arizona Citizen* 1873a).

Work was well underway in September 1873, when it was reported that:

> We were out at Camp Lowell Wednesday and found about forty men, citizens and soldiers, employed putting a roof on the commanding officer's building and the guard-house. These buildings are well constructed as far as they have gone. Gen. Carr and Maj. Furey are much embarrassed in prosecuting the work, by not having any means to work with. They have not even transportation and of course until they are better supplied, but little progress can be hoped for. In exploring the country a few days since for the purpose of laying off a military reserve, they discovered a few miles north of the post a beautiful little lake of pure water, filled with fish (*Arizona Citizen* 1873b).

The project area was mapped by the Surveyor General's Office (later the Government Land Office), and a map was completed on 31 December 1873 (Figure 4). At that time, the northeast quarter of Section 35 had some trees, a house near the northwestern corner, and a small canal running off Rillito Creek (or perhaps a road; the map is not clear). The commanding officer's building at Camp Lowell is depicted on the map, suggesting it was completed at that time.

Work paused in 1874, when construction funds were withheld. Soldiers were also out following raiding Apaches. In December, the commander of the fort went to Prescott, and his complaints led to the provision of funding to complete the fort (Peterson 1976:8-9). Initial construction continued into 1875.

> Building Camp Lowell
>
> The building of this camp has been in slow progress for about two years. We learn that only about $19,000 have been expended so far in the work, and that it will require $10,000 more to complete the post in proper shape. We are pleased to learn by this dispatch of the present advancement of the work:
>
> CAMP LOWELL, June 22. - The construction of Camp Lowell is now nearly completed. In all, there are seven sets of officers quarters, two sets of quarters for infantry and one for cavalry companies, and one for regimental band, besides suitable and well built offices for the post adjutant and quartermaster, also guard house, store-houses, corrals, etc. Considering the limited means for its construction and the lack of their seasonable availability, the post has been well and cheaply built, and is now among the best of the Territory... (*Arizona Citizen* 1875a).

In August, it was reported that:

> Col. John N. Andrews, Eighth Infantry, showed us around during our short stay, and we were surprised to see the many good buildings, and the air of comfort on every hand...The quarters of the officers and men are substantially finished, although much is to be done in the way of putting the grounds around including the parade ground, in nice order... (*Arizona Citizen,* 7 August 1875b).

At completion, the fort was centered around a large parade ground with a flagstaff in its center south side. The seven officer's quarters were located along the southern edge with a double row of cottonwood trees along their front, known as Officer's Row. The commanding officer's quarters was in the center, with three officer's quarters on each side. Adobe walls enclosed the backyards of each of the houses, and a picket fence framed their front (Peterson 1976:13). A map drafted in 1876 shows the layout of the post (Figure 5). A clearer version was re-drawn for publication in 1976 (Figure 6), although some errors were introduced in this version.

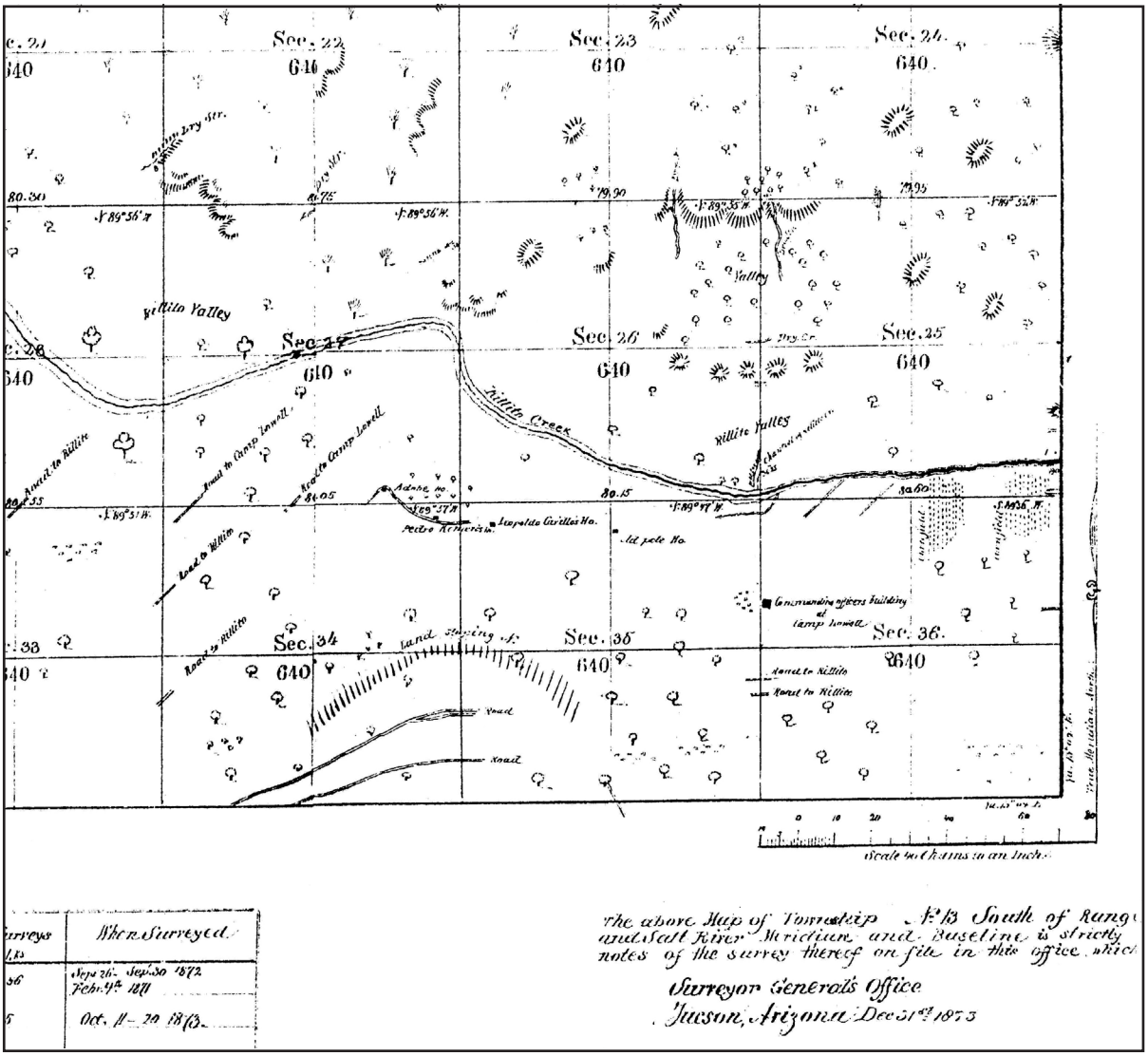

Figure 4. A portion of the Surveyor General's Office map completed in 1873, including the northeast quarter of Section 35 of Township 13 South, Range 14 East, which is the location of the Fort Lowell-Adkins Steel property.

On the western side of the parade ground were the adjutant's office, bake house, guardhouse, quartermaster and commissary offices, and the post trader's store. The quartermaster and commissary's warehouse, quartermaster corral, blacksmith shop, cavalry band headquarters, cavalry company quarters, infantry company quarters, three company kitchens, cavalry corral, and at least two privies were on the northern side of the parade ground. The infantry company quarters, a kitchen, and a privy, the hospital and its kitchen, and at least eight married non-commissioned officer's quarters were on the eastern side of the parade ground (Peterson 1976). A telegraph office was also present, but is not depicted on the 1876 map (AHS photo 12880). Additional wood structures—barracks, sheds, and equipment buildings—were constructed in the mid-1880s, when the fort was at full capacity (Peterson 1976:15). Two additional non-commissioned officer's quarters were built along the eastern side of Officer's Row in the late 1880s.

The fort initially continued to use the National Cemetery in downtown Tucson for the burials of soldiers. The last known military burial in this cemetery was in 1881 (O'Mack 2006:117). Seventy-four burials were removed from the National Cemetery and re-interred at a new cemetery that was established near Fort Lowell, also perhaps in 1881 (O'Mack 2006:21-26). This cemetery was located southeast of the fort, and was in use until the fort was abandoned in 1891. Eighty burials were disinterred and taken to the San Francisco National Cemetery (including west side burials 1275-1296, 1053-1055, 1059, 1063, and 1366-1387). Some burials,

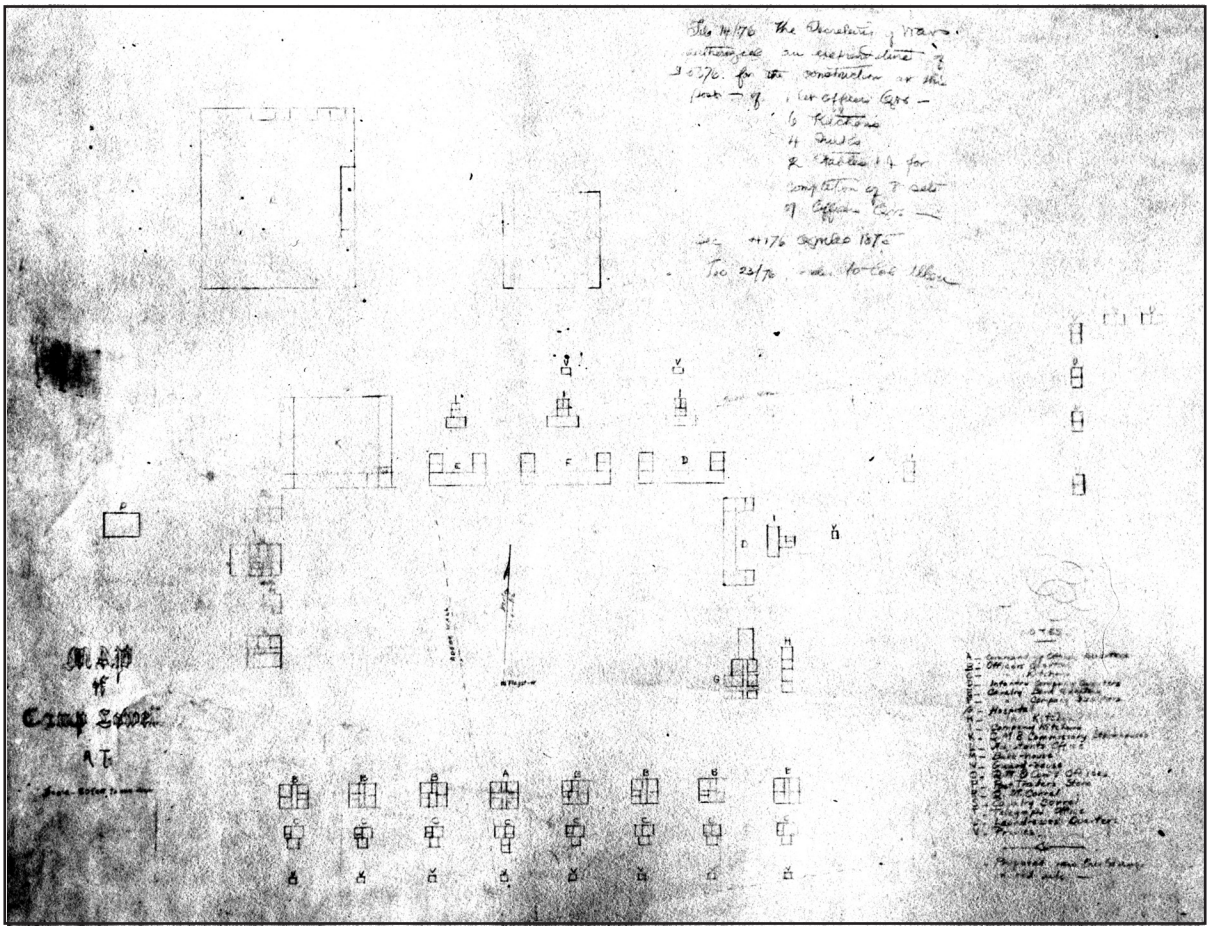

Figure 5. The 1876 map of Fort Lowell (AHS/SAD 12880).

including those of civilians, were left in place (Edith C. Tompkins collection, MS 790, AHS/SAD).

The exact location of the Fort Lowell Cemetery is not known. A map in the Edith Tompkins manuscript collection suggests it was located on the southern side of "Cienaga Road" southeast of the fort in the northeast quarter of Section 36 (MS 790, AHS/SAD) (Figure 7). The cemetery was relocated on private property in 1952, when members of the local Post 549 of the Veteran's of Foreign War received information from the U.S. Army Command. A photograph in a local newspaper clearly shows grave depressions and the base of a grave marker (*Arizona Daily Star* 1952).

The original buildings at the fort had adobe brick walls. Pine beams brought from the Santa Catalina Mountains were laid across the tops of the walls. Over these beams, saguaro ribs were positioned, and earth was packed on top. During the rainy seasons of 1876, 1877, and 1878, the roofs leaked, and earth and mud fell into the rooms (Weaver 1947:73). Tin roofs were not installed until sometime after mid-1879. Porches and screen doors were added in 1882; the milled lumber and other materials required were easier to transport after the 1880 railroad arrival in Tucson. Overall, little money was spent for maintenance, repair, and new construction at the fort (Peterson 1976:10).

An average of 10 officers and 140 enlisted men were stationed at Fort Lowell, with the number of men increasing in 1883, from one company to three companies, due to the increased military efforts against the Apache (Schuler 2000; Weaver 1947:76). The highest number of officers stationed at one time at the fort was 18. There was usually more than one officer living in each of the seven officer's quarters at the post. The number of rooms allotted varied by rank, with a lieutenant receiving one room, a captain two rooms, a major three rooms, and a colonel four rooms (David Faust, personal communication 2007). Enlisted men lived in barracks along the northern side of the parade ground. Despite the physical separation of Tucson and the post, soldiers and civilians frequently traveled between the two, often participating in social and sporting events.

During the 1870s and 1880s, the post was a supply depot for other camps and forts in Arizona. Soldiers at the post participated in sorties against hostile

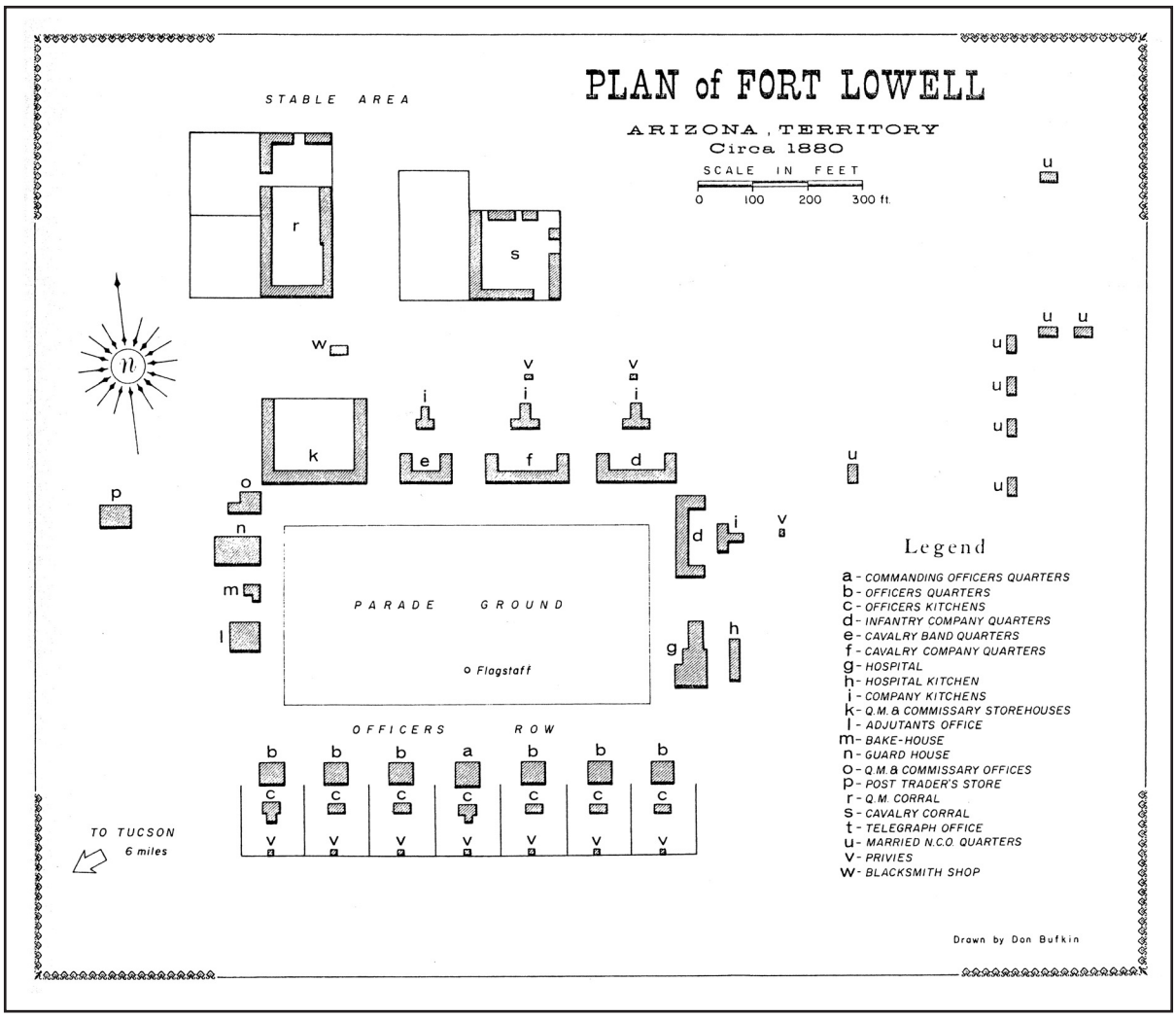

Figure 6. The 1876 map of Fort Lowell, redrawn by Don Bufkin (Peterson 1976).

Native Americans, most commonly, various groups of Apaches. Camp Lowell officially became Fort Lowell in 1879. The mid-1880s saw the final subjugation of the Apaches, with the surrender of Geronimo in 1886. As Apache issues decreased in the next few years, the U.S. Army began to focus its efforts along the U.S.-Mexico border. It became increasingly apparent that the number of military posts in Arizona could be reduced. The decision was made to abandon Fort Lowell, and, on 14 February 1891, the last soldiers left the fort. In April 1891, the fort was transferred to the Department of the Interior to be sold as surplus property (Peterson 1976:14-17). Some of the usable materials from the site were stripped and taken to Fort Yuma for reuse (David Faust, personal communication 2007).

Interest in obtaining the land of Fort Lowell arose in the mid-1890s. Henry Ransom, an African-American resident of Tucson, attempted to claim 160 acres of the fort in 1895 (apparently unsuccessfully) (*Arizona Daily Citizen* 1895).

In 1896, the *Arizona Daily Citizen* reported that the Department of the Interior, General Land Office, had authorized the sale of buildings and the land for the NE ¼ of NE ¼ and the SE ¼ of NE ¼ of Section 35. The buildings located on the NW ¼ of SW ¼ of Section 36 were also to be sold, but the land was to be kept for school purposes. The buildings on Section 36 were to be removed, or the land leased by the purchaser (*Arizona Daily Citizen* 1896).

An auction was held on 18 November 1896, and the portable portions of buildings sold. Windows, doors, and their frames, beams, tin roofing, and wood flooring were sold and removed. Many items were reportedly purchased by Lyman Wakefield, who later incorporated the materials into homes he was building in downtown Tucson (Fort Lowell ephemeral file, AHS). The cottonwood trees lining

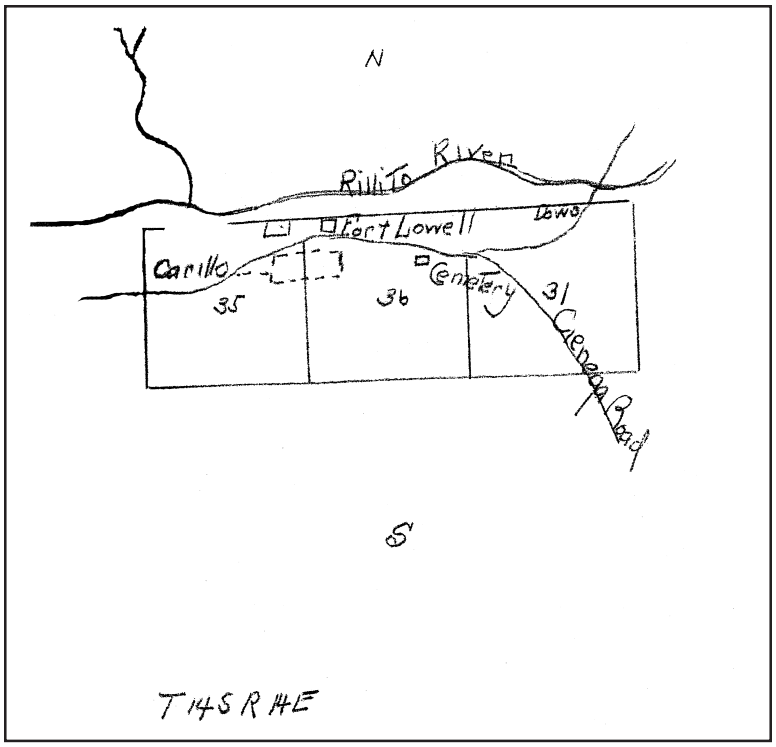

Figure 7. A hand-drawn copy of the United States Army map, showing the location of the Fort Lowell Cemetery (Edith Tompkins manuscript collection, MS 790, Arizona Historical Society, Tucson).

Officer's Row were cut down (Peterson 1976:17). Afterwards, some buildings became the residences of local Mexican-American families. Others decayed due to neglect and vandalism. Portions of the Fort Lowell Reservation were sold to private citizens, and another large piece was given to the University of Arizona.

The first preservation efforts occurred in the late 1920s. Tucson residents held a dance to raise money to purchase the lease on the fort, valued at $750 (Fort Lowell ephemeral file, 1920s, AHS). Mr. and Mrs. W. C. Harrington, who owned the portion of the fort east of Craycroft Road, were asked not to damage the standing adobe walls on their property in June 1929 (*Tucson Citizen* 1929). Additional money was raised later in the year (*Arizona Daily Star* 1929). Dr. Byron Cummings of ASM used the money to obtain a lease of 40 acres of Fort Lowell. The Harringtons were subsequently paid a total of $1,500 for improvements they had made on the property, with the University of Arizona contributing $750, and moneys collected by Mrs. George Kitt and the Tucson Chamber of Commerce providing another $750. The Harringtons were also paid a yearly lease fee. The Arizona Archaeological and Historical Society then organized an effort to fill in potholes at the site (Bieg et al. 1976:73).

The 1930s saw an attempt to create a national monument through the National Park Service (*Arizona Daily Star* 1936). In 1932, a Fort Lowell Bill came before the United States Congress but failed to pass (Bieg et al. 1976:74). In 1933, adobe walls were built along the eastern side of Craycroft Avenue and on the northern side of the main portion of Fort Lowell by the Civil Works Administration (C.W.A.). Two years later, the C.W.A. from Camp SP-11, under the direction of Charles Maguire, created diversion ditches, constructed checkdams, and filled in gullies along the portion of the fort east of Craycroft Road (Fort Lowell ephemeral file, AHS). Work at the site ended in 1936, when funding of the program was cut (Bieg et al. 1976:74). Maguire continued to interview local residents in 1937 and 1938, collecting information about life at the fort, the appearance of structures, the location of the fort flagpole, and architectural elements from buildings. He also prepared a master plan for the proposed park (Fort Lowell ephemeral file, AHS). Unfortunately, this effort failed. Historic American Building Survey forms, plan view, cross-section, exterior façade drawings, photographs, and data sheets were prepared by Maguire and other government personnel for the second officer's quarter's kitchen, the third officer's quarters, and the post hospital (online at the Library of Congress website, <http://memory.loc.gov/>).

Maguire completed a map in June 1937 for a proposed Fort Lowell State Park (Figure 8). This map indicates that, for the Fort Lowell-Adkins Steel property, the adjutant's office, bake house, and guardhouse were in ruins. The first and second officer's quarters and the third officer's quarter's privy were standing. The third officer's quarters and the second officer's quarters were occupied. The first and third kitchens and the first and second privies were in ruins. All three of the latrines were marked as having fallen walls. The adobe walls demarking individual yards for the officer's quarters were partially intact.

Another map was drafted by Philip Contzen in the same general time period (Figure 9). Contzen's map varies quite dramatically from Maguire's map in some details. It does include the Fort Lowell-Adkins Steel property.

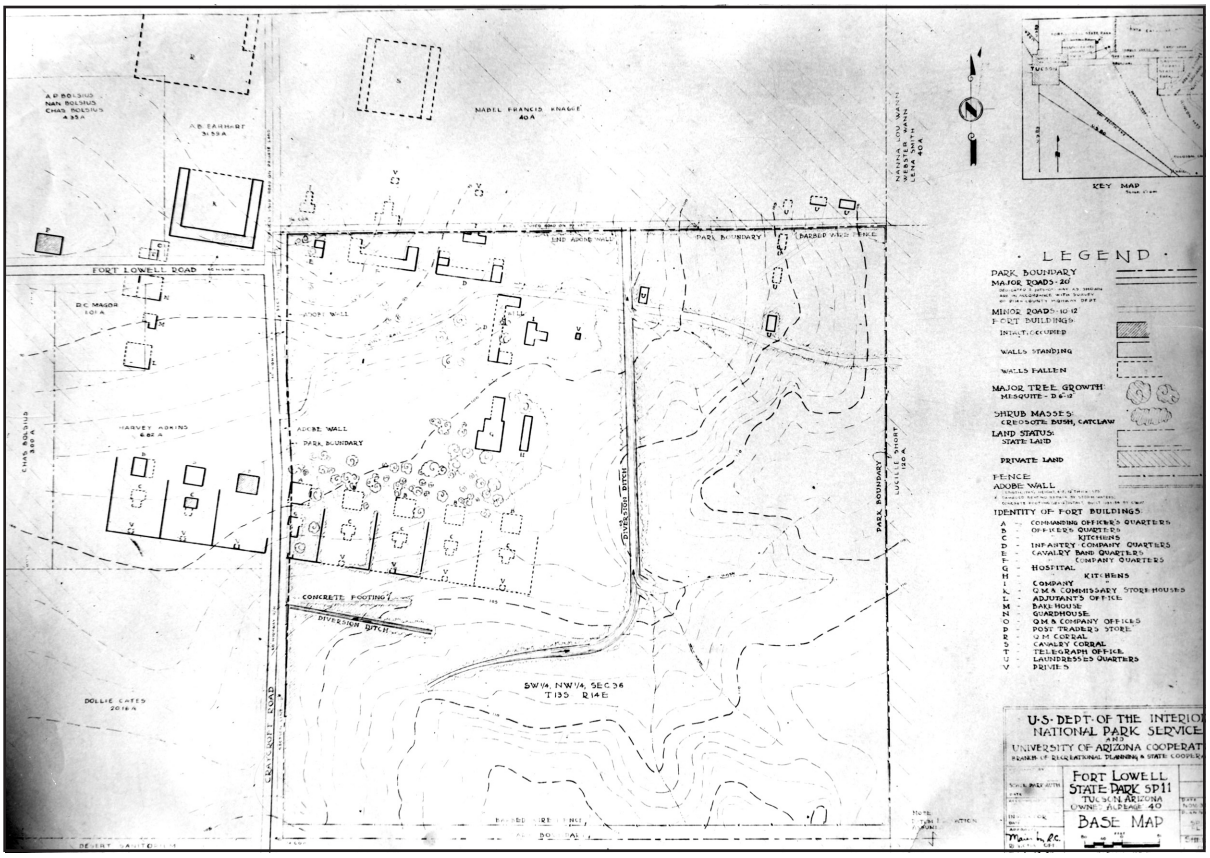

Figure 8. A 1937 map of Fort Lowell, drafted by Charles Maguire (AHS/SAD 12887).

In 1941, the president of the University of Arizona instructed Dr. Emil Haury of ASM to turn the fort over to another agency. Subsequently, in 1944, the property was auctioned, and it was purchased by the postmaster of Flagstaff, George Babbitt. He bought it for $9,000, presumably to help save the ruins (Bieg et al. 1976:74).

Babbitt, in turn, sold the land for $220 to a local Boy Scout troop in 1945. The scouts planned to reconstruct several of the buildings, but lacked the necessary funding. They were able to erect a shelter over the ruins of the hospital building (Bieg et al. 1976:74; Fort Lowell ephemeral file, 1940s, AHS). In 1952, members of the Veterans of Foreign Wars located the post's cemetery, although unfortunately, this location was later lost again (Bieg et al. 1976:74).

Pima County acquired the property in 1957, paying the Boy Scouts $50,000 for 37 acres. The county then established the Fort Lowell Historical and Recreational Area (Fort Lowell ephemeral file, 1950s, AHS).

Pima County soon prepared plans to develop the park for recreation. These plans included destruction of much of the fort area for athletic fields. Concerned citizens organized and presented an alternate plan to the county. A committee was established in 1960 to plan reconstruction of the commanding officer's quarters and its kitchen. Archaeologist Al Johnson spent 16 days excavating these structures, privies, and a trash dump (*Arizona Daily Star* 1960; MS 265, AHS). The Junior League donated $10,000, and an architect prepared plans for the new buildings. Construction began in 1962, and the dedication ceremony was held in November 1963 (*Tucson Citizen* 1963).

In 1971, publication of *Tucson's Historic Districts* noted that Fort Lowell was one of five remaining historic areas the city should consider as possible historic districts. Three years later, local residents and property owners petitioned the Pima County Planning and Zoning Commission to make Fort Lowell a historic zone. The spring of 1976 saw planning students from the University of Arizona canvassing the neighborhood to determine which buildings and structures might be considered historic (Bieg et al. 1976:3-4). The Fort Lowell Multiple Resource Area was nominated to the National Register of Historic Places in 1977, and was listed on the National Register on 10 April 1978 (National Register form). Inventory forms created during this process are housed at AHS (MS 265, binder in file).

Additional properties have been added to the park or entered into public ownership. The Hardy

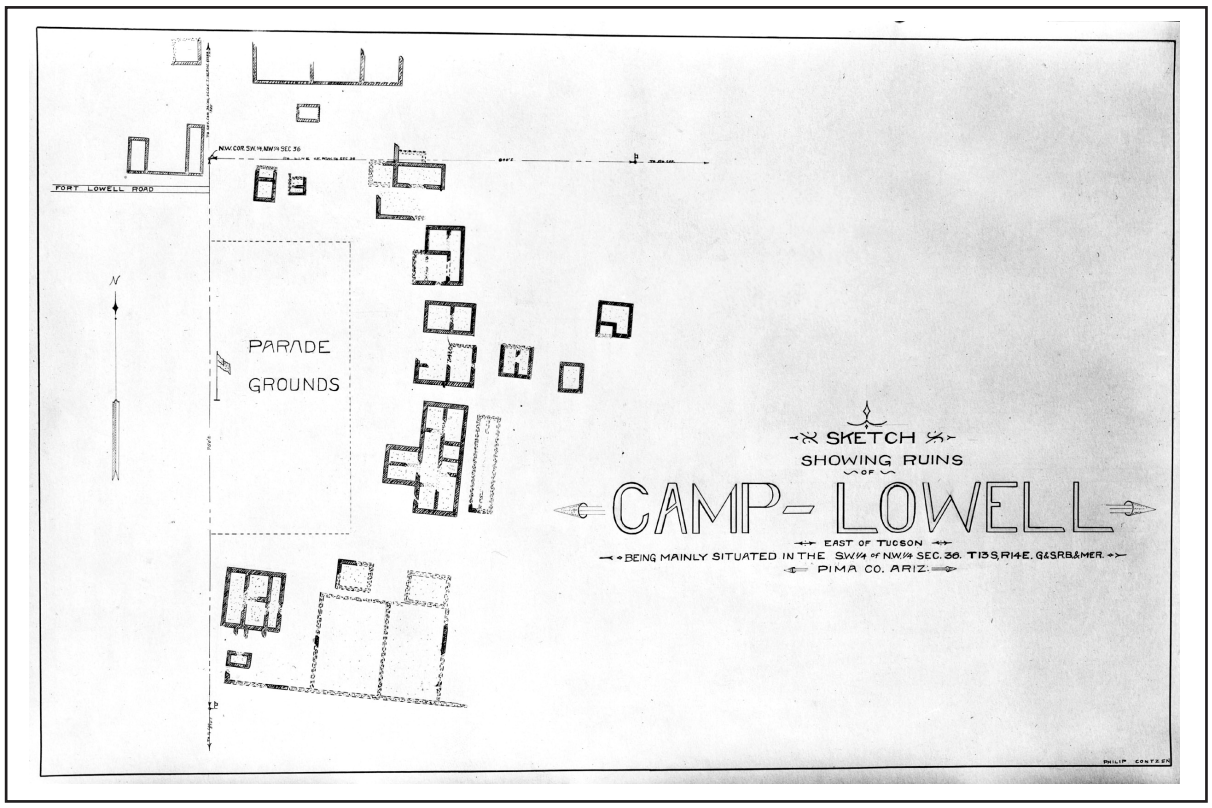

Figure 9. An undated map of Fort Lowell, drafted by Philip Contzen (AHS/SAD BN 207929).

property, north of the main portion of the park, was acquired in 1985. This was the location of the kitchens and privies of the cavalry company and the infantry company, along with the cavalry stables (Thiel 1994). The City of Tucson also acquired the northwestern portion of Fort Lowell in the 1990s. This area contained the quartermaster and commissary storehouses, the blacksmith shop, and the quartermaster stables (Thiel 1997). The acquisition of the Fort Lowell-Adkins Steel property completes public ownership of the core of historic Fort Lowell.

Post-Fort Lowell Use of the Fort Lowell-Adkins Steel Property

Fort Lowell was occupied by civilians after its 1891 abandonment, although little is known about these individuals. Period photographs show families living in some of the buildings, including the quartermaster commissary. Strings of dried chili peppers, *ristras*, suggest these were Mexican-Americans, because this form of food preservation is typically associated with this ethnic group in Tucson.

Identification of the residents is made difficult by their invisibility in contemporary records. Tucson City Directories did not include this area. The residents did not purchase the properties so there are no deeds at the Pima County Recorder's Office. The 1900 U.S. census population schedules provide the best chance to identify the individuals who lived at the fort. Research by Lannie Hartman indicates the people listed on Sheets 14A though 17B of Enumeration District 46 lived in the Fort Lowell area, although it is not known which (if any) lived in the fort buildings. Examination of the census records further reveals that the area was home to Euro-Americans, Chinese immigrants, and Mexican-Americans. The Chinese were working as gardeners, and many of their neighbors were farmers and day laborers. The post-fort occupation both within and adjacent to Fort Lowell has been referred to as "El Fuerte." This appears to be a modern name assigned to the area and has become popular since the 1980s (Turner et al. 1982). It does not appear in historic documents and an every-word search of the *Tucson Citizen* for 1899 to 1921, available on a subscription genealogy website, did not locate a single instance of the term in use.

The 18 November 1896 auction resulted in the stripping of usable materials from most of the remaining buildings, accelerating their destruction through erosion. Photographs taken in the early 1900s clearly show the lack of wooden structural elements, such as window frames and roofs, and the concurrent enlargement of door and window openings and the

melting of adobes along the parapets of buildings (Fort Lowell photographs, AHS).

Lyman W. Wakefield purchased the SE ¼ of the NE ¼ of Section 35, totaling 40 acres, from the U.S. government on 19 April 1897 (BLM Serial No. AZ AZAA 011023, online at <www.glorecords.blm.gov /PatentSearch>). The owners of the Fort Lowell-Adkins Steel property are summarized in Table 2.

Lyman Wakefield was born on 5 October 1853, in New York, son of James M. Wakefield and Clarinda Brown. He was married on 11 May 1881, in Pima County, to Anna R. Patrick, with both residents of Pantano at the time (Negley and Lindley 1994:80). Anna was born in May 1866, in Missouri. Wakefield was the Sheriff of Pima County on 4 June 1900, when the census was taken (he served in that office from 1899-1900). Wakefield lived at 205 East 3rd Street in Tucson with his wife, their five living children (Walter, William, Edith, Clarence, and Margaret), a boarder, and a servant (Lyman Wakefield household, 1900 U.S. census, Pima County, Arizona Territory, ED 47, SD 11, sheet 4A). Wakefield likely viewed ownership of the property as an investment, as there is nothing to suggest he or his family lived on the property. Lyman Wakefield died in Tucson on 30 September 1919, from prostrate hypertrophy and infection and is buried in Evergreen Cemetery (see <http://genealogy.az.gov/azdeath/020/10202839.pdf>).

On 28 December 1899, Lyman and Anna Wakefield sold their 40 acres for $1.00 to Thomas Grindell (Pima County DRE 30:256-257). Grindell was born circa 1870, in Platteville, Wisconsin, son of William Grindell and Margaret McCurry. He grew up in Platteville, where his father was a cabinetmaker (Western Historical Company 1881:906). Thomas moved to Arizona and was a resident of Nogales in November 1896 (Pima County DRE 27:635). Thomas Grindell sold the land to his younger brother, Edward Page Grindell, on 20 March 1902, also for $1.00 (Pima County DRE 32:640).

Edward Grindell was born on 3 July 1873, in Platteville, Wisconsin. On 25 June 1900, Edward lived in Precinct 1 of Tucson and was working as a newspaper editor (Edward P. Grindell household, 1900 U.S. census, Pima County, Arizona Territory, ED 46, sheet 16A). Edward lived in Douglas at the Gadsden Hotel on 26 April 1910, where he was the secretary for the Chamber of Commerce (Nathaniel Grant household, 1910 U.S. census, Cochise County, Arizona Territory, ED 19, sheet 8A). He was described on his World War I draft registration card, created in September 1918, as being tall and slender with gray eyes and black hair. At that time, he was working as a railway agent for the El Paso and Southwestern Railway and living at McNeal, Cochise County, Arizona (WW I draft registration card, online at <www.ancestry.com>).

Given his white collar status, it seems unlikely that Edward lived on or farmed the property. He may have rented it out instead. On 5 November 1904, Edward Grindell sold the land for $10.00 to Irvin Douglas (Pima County DRE 45:476). Efforts to locate information about the Douglas family were unsuccessful. They apparently did not remain in Pima County for long, and were not counted on the U.S. census here.

On 22 May 1908, Irvin and Maude Douglas sold the land to Robert D. Cole (Pima County mortgages 23:689). Robert Cole was born in September 1862, in Missouri, and was married circa 1884, to Mary L. (—?—). In June 1900, the couple, their three living children (Rena, James, and Robert), and Robert's father Frank S. Cole lived in Tucson, with Robert working as a farmer (Robert D. Cole household, 1900 U.S. census, Pima County, ED 46, sheet 15B). Robert Cole and his brother William farmed in the area and had already purchased a three-sevenths stake in an irrigation ditch from Bernardino Diaz for $150 on 23 May 1899. The ditch ran south from the southern side of the Rillito, and their interest allowed unrestricted use of water in the ditch on Mondays, Tues-

Table 2. Fort Lowell property owners.

Grantor	Grantee	Date	Reference
United States	Lyman W. Wakefield	19 April 1897	BLM Serial No. AZ AZ A
Lyman and Anna Wakefield	Thomas Grindell	28 December 1899	Pima County DRE 30:256-2
Thomas Grindell	Edward Page Grindell	20 March 1902	Pima County DRE 32:640
Edward Grindell	Irvin Douglas	5 November 1904	Pima County DRE 45:476
Irvin and Maude Douglas	Robert D. Cole	22 May 1908	Pima County Mortgages 23
Rober and Mary Cole	Dixie L. Cate	29 June 1908	Pima County DRE 45:558-5
Dixie L. Cate estate	Dolly Cate		Pima County DRE 47:471
Dolly Cate	Harvey and Fronia Adkins	3 February 1928	Pima County DRE 155:4
Adkins family	OT Gila, LLC	13 March 2006	Pima County Docket 12759
OT Gila, LLC	City of Tucson	9 March 2006	Pima County Docket 12759

days, and Wednesdays (Pima County DRE 30:82). Robert's other land purchases in the Fort Lowell area included 50 acres on the southern side of Section 26 (north of the Adkins Steel parcel), the 80 acres immediately north and west of the Adkins Steel parcel, and land in Section 31 (Pima County DRE 28:710, 30:540, 35:268, 42:298, 45:466, 45:550, 46:155, 46:166). The earliest transaction indicates Cole was in Tucson by 19 September 1898 (Pima County DRE 28:710).

Several irrigation canals (also called *acequias*, or ditches) were run from Rillito Creek to fields on the south and north (Figure 10). The Corbett or Douglas Ditch runs to the north of the Fort Lowell-Adkins Steel property, and was apparently once owned by Irvin Douglas. Some of these canals are still visible north of Fort Lowell Park.

Mr. Dixie L. Cate purchased the property from the Coles on 29 June 1908, paying them $10.00 and agreeing to pay off the mortgage the Coles had from the Douglases (Pima County DRE 45:558-559). Richard Longstreet "Dixie" Cate was born on 23 September 1864, in James County, Tennessee, the son of George Oliver Cate and Mary D. Allison. He was married on 27 March 1895, in Hamilton County, Tennessee, to Dolly (often also spelled Dollie) Monger (International Genealogical Index, online at <www.familysearch.org>). Dolly was born in October 1871, in Tennessee. The identity of her parents has not been confirmed, and a child by that name has not been located on the 1880 U.S. census. It is unclear if Dolly was her given name, or if it was a nickname (Dolly is often a shortened form of Dorothy).

On 9 June 1900, Dixie and Dollie Cate lived in James County, Tennessee, with Dixie working as a farmer (Dixie Cate household, 1900 U.S. census, James County, TN, ED 7, SD 3, sheet 5A). The couple had moved to Arizona by 13 December 1907, when Dixie purchased a lot in the Feldman Addition of Tucson (Pima County DRE 43:707). Over the next year, several additional lots were purchased in that area (Pima County DRE 44:181, 44:183, 44:726). The 1908 Tucson City Directory (probably created in 1907) lists D. L. Cate as a chicken rancher living at 5th Avenue and Drachman Street in Tucson (Kimball 1908:80).

Dixie's sister, Nellie Davis Cate, had married Charles F. Gulden circa 1887. He was a railroad conductor, and the couple lived at 54 Council Street in June 1900 (Charles Gulden household, 1900 U.S. census, Pima County, ED 49, sheet 18A). Dixie and Dolly Cate almost certainly came to Tucson at the invitation of Dixie's sister.

Dixie died from pulmonary tuberculosis on 18 December 1908, while living near Fort Lowell: "He was 44 years of age and was a brother of Mrs. Charles Golden. He came to this country for his health, but he failed steadily. He was a native of Tennessee and was quite well known in that state." Dixie was buried in Evergreen Cemetery (Dixie L. Cate, Return of a Death, online at < http://genealogy.az.gov/azdeath/005/10052798.pdf >; *Tucson Citizen* 1908). Dolly Cate was subsequently assigned ownership of the couple's property (Pima County DRE 47:471). On 24 February 1909, Dolly paid off the Irwin mortgage on the property (Pima County DRE 46:189, 46:325).

In May 1910, Dolly (last name incorrectly listed as Cole) was living near Fort Lowell with two young girls, listed as "Mollie Cole" (Lottie) and "Ruth Cole." The U.S. census states that these are her daughters, but this is incorrect (Dolly Cole household, 1910 U.S. census, Pima County, Arizona, ED

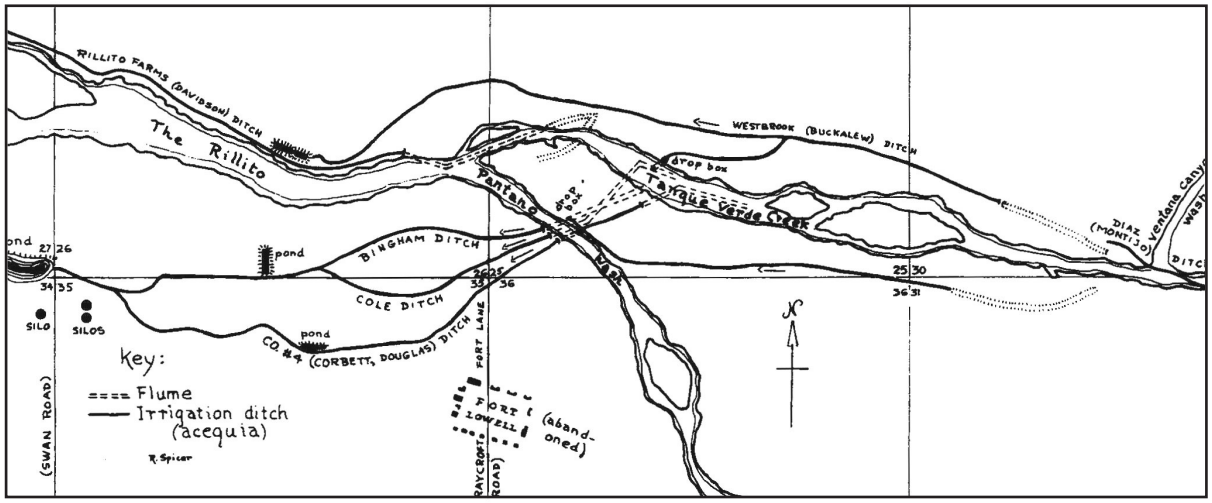

Figure 10. Irrigation ditches located in the Fort Lowell area (Turner et al.).

95, SD 1, sheet 10B). The two girls were probably orphaned and Dolly was raising them. They do not appear to be related to the former Cole owners.

Dolly Cate opened "Mrs. Cate's Tuberculosis Sanatorium" in the officer's quarters in the current project area. In 1918, "Mrs. Dollie Cate" was listed in the Tucson City Directory as living in the "Rural Free Delivery 2" area (Tucson Directory Company 1918). In January 1920, Dolly Cate was running a "rest ranch" with two nieces, Ruth Monger (age 21) and an 18-year-old girl whose given name was not recorded, but who must be Lottie Monger. Thirteen invalid males lived at the rest home, all white men between the ages of 21 and 48 (D. Cate household, 1920 U.S. census, Pima County, Arizona, Ed 80, SD 2, sheet 5A).

Dolly Cate sold the property to Harvey and Fronia Adkins on 3 February 1928. She received $10.00 and "other valuable considerations." In turn, the Adkins received 6.5 acres "together with certain household furniture and furnishings" (Pima County DRE 155:4). Dolly was still in Tucson on 9 April 1930, when she and her niece Ruth O. Monger lived at 720 East Speedway Boulevard. She owned the house, which was valued at $6,000, but did not have a radio. She was reported to be the proprietor of a boarding house (Dollie Cate household, 1930 U.S. census, Pima County, Arizona, ED 34, sheet 8B). City directories reveal that Dolly lived at that address until 1944. From 1946 through 1962, she lived at 1115 North 9th Avenue. She died on 8 October 1964, and is buried in Block 30, Section B, Lot 159 of Evergreen Cemetery in Tucson.

> Mrs. Cate's Funeral Set for Tuesday. Funeral services for Mrs. Dolly Cate, 93, a longtime Tucson resident who formerly operated a convalescent rest home at Ft. Lowell, will be held at 10 a.m. tomorrow at Bring's Funeral Home. She died Thursday at a local rest home. Mrs. Cate, who lived at 1115 N. 9th Ave., was born near Chattanooga, Tenn. She came to Tucson in 1907 with her late husband Richard Cate. From about 1909 until the 1920s, she operated a convalescent home in the fort buildings. She is survived by two nieces, Miss Ruth Monger of Tucson, and Mrs. C. N. Cooke of Hydesville, California. Burial will be in Evergreen Cemetery (*Tucson Daily Citizen* 1964).

Dolly's nieces, who were apparently sisters, were traced further. Ruth O. Monger was born on 9 January 1899, in Georgia, never married, and died on 16 August 1977, in Humboldt County, California (California Death Index, online at <www.ancestry.com>). She is likely the Ruth Monger, born in January 1899, living with her parents William C. Monger and Laura (—?—) in Flomaton, Escambia County, Florida. Her father worked as a telegraph operator (William C. Monger household, 1900 U.S. census, Escambia County, FL, ED 18, sheet 14B). William C. Monger was, in turn, the son of Byrd Monger and Sarah Hess. In 1880, he lived with his parents and siblings Myra (age 7), Rufus, and Gus in the 5th Civil District of James County, Tennessee (Byrd Monger household, 1880 U.S. census, James County, Tennessee, ED 61, page 31). The Myra listed in this census may be Dolly (Monger) Cate; however, Dolly would have been 8 years old in 1880, instead of 7 years old. Census records are often incorrect, however.

Lottie Allen Monger was born on 7 June 1901, in Alabama, was married on 30 September 1922, in Pima County to Cecil Norman Cooke, and died on 8 June 1993, in Humboldt County, California. Her mother's maiden name was Roy (California Death Index; Negley and Lindley 1997:67). Cecil Cooke was born in East Preston, Sussex, England, on 12 January 1901, and died in Humboldt County on 16 February 1978 (California Death Index; see also <http://freebmd.rootsweb.com/>). The couple were the parents of a son, Cecil Norman Cooke, Jr., born circa 1924, in Arizona. They lived in Santa Cruz County, Arizona, on 9 April 1930, with Cecil working as the chief engineer of a utility plant (Cecil Norman Cooke household, 1930 U.S. census, Santa Cruz County, Arizona, ED 10, sheet 4A). In the future, it may be possible to contact the descendants of Cecil and Lottie Cooke for family photographs and other information about Dolly Monger Cate.

Harvey Adkins was born on 18 September 1872, in Jasper County, Illinois, the son of Thomas Jefferson Adkins and Dicy Ann Brooks (see <http://james.thenamecenter.com/sheets/ f3666.html> for family group sheets on the Adkins family). He was married on 17 May 1898, to Sophronia "Fronia" Bragg. Fronia was born on 15 September 1872, in Clay County, Illinois, the daughter of John Wesley Bragg and Hannah Dyson (*Arizona Daily Star* 1955). The couple were the parents of five children: Vinda Adkins Ortega (1900-1944), Virginia Alice Adkins Beam (1903-1985), Dicey Minerva Adkins (1905-1927), Marion Heber Adkins (1908-1986), and Belva Naomi Adkins (1911-1999). The family lived in Newton, Jasper County, Illinois, in 1910 and 1920, with Harvey working as a dairy farmer (1910 U.S. census, Jasper County, Illinois, ED 87, SD 14, sheet 6B; 1920 U.S. census, Jasper County, Illinois, ED 110, SD 15, sheet 1B). Harvey registered for the draft on 12 September 1918, and reported he had a medium build, was of medium height, and had blue eyes and black hair (WW I draft registration, online at <www.ancestry.com>).

The Adkinses had moved to Tucson around August 1926, to bring their daughter Dicey to a tuber-

culosis sanatorium (Old Fort Lowell Neighborhood Association 2005:33). The family was living on Fort Lowell Road, at the Cate's rest home, on 15 June 1927, when Dicey died from pulmonary tuberculosis at age 21. She was subsequently buried in Evergreen Cemetery: "Miss Adkins had lived here only six months, coming from Newton, Illinois. She is survived by her parents, three sisters and a brother all of whom are in Tucson" (Dicy Minerva Adkins, Original Certificate of Death, online at <http://genealogy.az.gov/azdeath/035/10350392.pdf>; Old Fort Lowell Neighborhood Association 2005:33; *Tucson Citizen* 1927). According to a family member, Dicey's body was later moved to East Lawn Cemetery (Lannie Hartman, personal communication 2007).

According to a Fort Lowell Inventory form, the Adkins family constructed an adobe house on the property in 1927. They constructed a second adobe house around 1935 (MS 265, black binder in file, AHS).

On 9 April 1930, Harvey and Fronia operated the "Adkins Rest Ranch" at Fort Lowell. Their daughter Belva was living with them. There were 13 residents of the ranch, 10 men and three women. All 13 residents were white, ranged in age from 23 to 51, and with one exception, had been born in the United States. The facility was valued at $8,000; the family did not own a radio at that time (1930 U.S. census, Pima County, Arizona, ED 10, SD 3, sheet 4B). In 1938 and 1940, Harvey and Fronia were reported to be running the Adkins Rest Home (Tucson City Directories 1938 and 1940). The Adkins family operated the rest home until at least 1950 at 5615 East Fort Lowell Road (Old Fort Lowell Neighborhood Association 2005:33; Tucson City Directory 1950).

Fronia Adkins was a member of the Valley Christian Church in Tucson (*Arizona Daily Star* 1955). She died on 9 September 1955, at her home at 2951 North Craycroft Road from pneumonia, complicated by the effects of a stroke she had suffered seven months earlier (Fronia Adkins, Certificate of Death, online at <http://genealogy.az.gov/azdeath/0220/02201696.pdf>). Harvey Adkins died on 11 January 1958, at the family home in Tucson. He and Fronia are buried in the Grantwood Memorial Park (later East Lawn Cemetery) (*Tucson Daily Citizen* 1958).

Marion Adkins, born on 12 December 1908, and a son of Harvey and Fronia Adkins, started the Adkins Trucking and Steel Manufacturing business on the property in 1934. Marion's son Harry Adkins recalled: "In the '40s we were doing steel buildings and tanks and in the '50s pretty much tanks, for everybody and the City of Tucson" (Old Fort Lowell Neighborhood Association 2005:35). Marion was married to Lovetta Nova Merchant, who was born on 20 May 1913. The 1938 and 1940 Tucson City Directories list Marion H. Adkins as living on Fort Lowell Road with his wife Loretta, and working as a trucker. In 1950, they lived at 5603 East Fort Lowell Road, with Marion listed as a welder and operating the Adkins Steel Manufacturing Company (Tucson City Directory 1950).

Residential Property Record Cards were filled out for the Adkins family home (10-110-09-032A) and the historic Fort Lowell Officer's Quarters (10-110-09-350) on 2 June 1965. At that time, the Adkins family home was described as a solid masonry structure with Spanish tile roofing. The assessor reported that the home was constructed in 1935, based on information provided by Marion Adkins. Other buildings and structures built by members of the Adkins family include a water tower and a windmill adjacent to their home, a large steel shed (built circa 1935), a nearby adobe house, several concrete slabs, a chicken coop, and a large concrete tank next to a well.

Marion Adkins lived at 5460 East Ft Lowell Road in 1970, with his business address at 5450 East Fort Lowell (Tucson City Directory 1970). He died in January 1986, in Tucson (Social Security Death Index). Lovetta N. Adkins died on 4 July 2002, in Colorado, where she had moved to live with her daughter (Social Security Death Index; Lannie Hartman, personal communication 2007). The couple's son Harry Adkins took over the family business, which operated within the project area until the spring of 2007.

There had been several attempts over the years by the City of Tucson to purchase the property from the Adkins family. These attempts were not successful. In the early 2000s, Pima County became interested in the acquisition of properties with significant cultural resources and the Fort Lowell-Adkins Steel Property was identified as a property of interest. A local developer Oasis Tucson, Inc. (later OT Gila, LLC), made a deal to purchase the property. Concerns over the sale led to the creation of "An Intergovenmental Agreement between Pima County and the City of Tucson for the Rehabilitation, Restoration and Management of the "Adkins Steel" parcel at Historic Fort Lowell," which was approved by the Pima County Board of Supervisors on 6 March 2007. Pima County provided money from the May 2004 Bond election (2004 Bond Project 4.4, Fort Lowell Acquisition and San Pedro Chapel) to purchase the property. A complex land exchange and sale subsequently occurred, with the developer receiving another parcel along Speedway Boulevard in exchange for the Fort Lowell-Adkins Steel Property. The Adkins family formally sold the parcel to OT Gila, LLC in March 2006 (Pima County Docket

12759:5128). On 9 March 2006, OT Gila, LLC, sold the property for $1.00 to the City of Tucson (Pima County Docket 12759:5132).

Fort Lowell Buildings and Structures on the Fort Lowell-Adkins Steel Property

More in-depth research was conducted for the Fort Lowell-era buildings and structures located on the Fort Lowell-Adkins Steel property. Research was directed toward creating a more comprehensive understanding of the materials used in these buildings, how they were repaired and maintained, their internal layout, and what happened to these features after the fort was abandoned. At least 12 buildings, the southwestern portion of the parade ground, and the adobe walls enclosing the backyards of the officer's quarters are located within the Fort Lowell-Adkins Steel property (Table 3).

The amount of documentary information available for each structure varies. A particularly important source of information is a set of typewritten transcripts of requests for repairs for the post, held at AHS as Manuscript 266.

Guardhouse

The guardhouse is located in the northern portion of the Fort Lowell-Adkins Steel parcel, immediately south of Fort Lowell Road and west of the Adkins steel barn. It was constructed in 1873 during the initial work at the new post. The 1876 map of Camp Lowell provides information about the layout of the structure (Figure 11). An 1875 report noted:

> The guard house, probably one of the best in the Territory is 52 feet square, external measurements, to which is attached a corral, or inclosed yard, 28 by 48 feet, interior measurement. This inclosure is for the use of the prisoners when not at labor. The building has two halls at right angles to each other, cutting it each way nearly through the center. It is divided into a general prisoners' room (with stone walls) 20-1/6 by 19-¾, a guard room 19-¾ by 18-½, room for garrison prisoners 18-½ by 11, room for officers of the guard 16 by 11, room for sergeant of the guard 8 by 11 feet, a wash room and a tool room. All of the rooms are ten feet high, lighted by windows with iron gratings, and are excellently ventilated at the eaves. There are in addition, four cells each 7-½ by 4-¼ feet, 10 feet in height, like the general prisoners' room, built of stone, all the rest of the buildings being constructed of adobes. Only the cells are used for prisoners, the balance of the building being used as adjutant's office, library, and quarters for the non-commissioned staff. Prisoners are kept in tents (Fort Lowell ephemeral file, AHS).

Table 3. Fort Lowell buildings and structures on the Fort Lowell-Adkins Steel property.

Structure designation on the 1876 map	Type
N	Guard house
M	Bake house
L	Adjutant's office
B	Officer's quarters [no. 1]
B	Officer's quarters [no. 2]
B	Officer's quarters [no 3]
C	Officer's kitchen [for no. 1]
C	Officer's kitchen [for no. 2]
C	Officer's kitchen [for no. 3]
V	Privy [for no. 1]
V	Privy [for no. 2]
V	Privy [for no. 3]
	Parade ground
	Backyard enclosing walls

An April 1882 report noted: "Roof of tin in good condition except needing painting. Walls in fair condition. Doors and windows and some repairs needed and painting, and a board floor required. It contains six rooms and five cells, with an aggregate capacity of two thousand, four hundred square feet floor surface." A request for wood floors for the building was turned down in 1882, but four new doors and six windows (each with 12 panes of glass) were approved (MS 266, file 2, AHS).

Estimates for the flooring (at $217.32) of the guardhouse, prepared on 31 March 1883, provide the dimensions of each room in the building (MS 266, file 2, AHS):

- guard room, 20 ft by 20 ft
- general prison room, 20.5 ft by 20 ft
- garrison prison room, 19 ft by 12 ft
- small room, 11 ft by 8 ft
- small room, 16 ft by 11 ft
- small room, 12 ft by 10 ft
- four cells, 8 ft by 4.5 ft
- one cell, 8 ft by 7 ft
- main hall, 50 ft by 7 ft
- cross hall, 37 ft by 4 ft

A request for the construction of *porticos* (porches) costing $160.91 was submitted to the Army on 31 March 1883 (MS 266, file 1, AHS).

An 1889 report on the buildings states:

> Building No 15.—One story part of adobe and part of stone, dirt roof covered with tin, height of building 14 feet, porch in front, has 6 rooms and 5 cells.

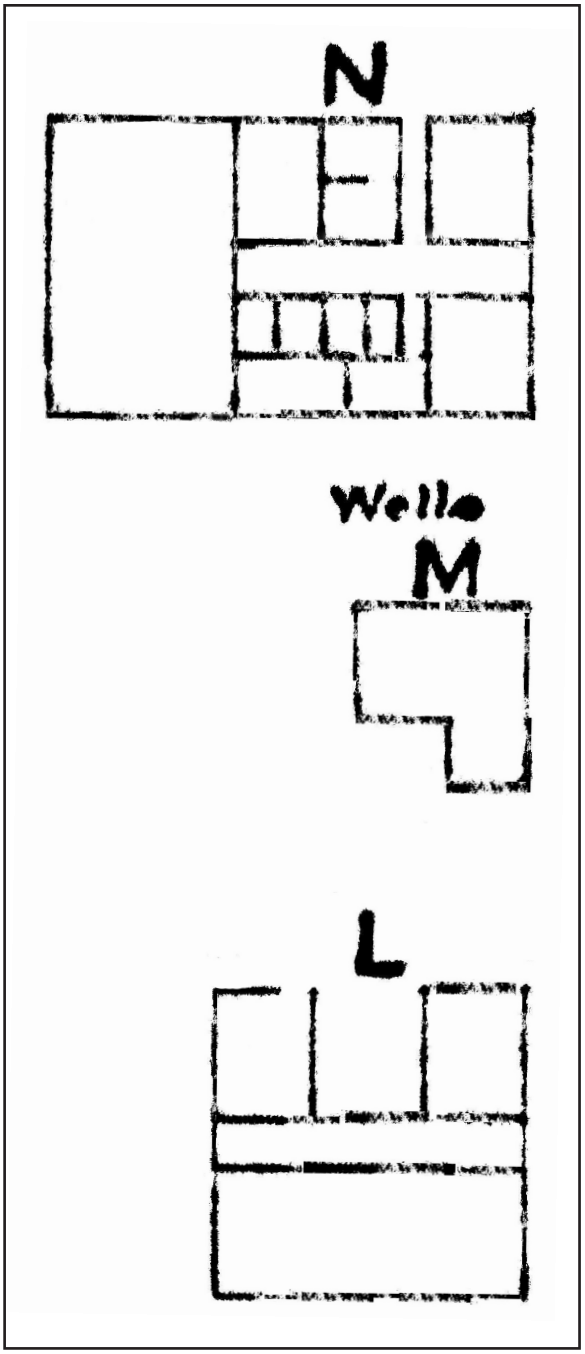

Figure 11. Close-up of the Fort Lowell guardhouse, bakery, and adjutant's office from the 1876 map.

> 1 room 19'8 x 10\9', and 4 cells 5' x 7' are of stone, the other rooms & cell are of adobe 1 room 19'8" x 14', 2 8' x 17', 1 11' x 18', 1 10' x 11' and one cell 7' x 8', there is also a yard enclosed with adobe walls 30' x 49' and 9 feet high. Building used as Post Guard House, cost not known, date of construction supposed to be 1875" (MS 266, file 4, AHS).

The building was in use until 1891. At the 18 November 1896 auction, the starting bid for the guardhouse was set at $10.00 (*Arizona Daily Citizen* 1896). The building was probably stripped of materials after the 1896 auction sale. A photograph taken in the early 1900s and on exhibit at the Fort Lowell Museum, shows that the door and the window frames had been removed, along with the roof.

In June 1937, the building was reported to be in ruins (AHS photograph 12887). In 1976, at least one portion of the stone walls was several feet tall (Fort Lowell Inventory Form, MS 265, black binder in box, AHS). Today, it is visible only as a set of rock and mortar foundations that protrude slightly from the ground surface.

As part of the mapping phase of this project, the foundations were lightly swept to expose their alignments, and the outlines of the visible walls were mapped (Figure 12). The rock alignments are probably well preserved below the modern ground surface.

Bake House

The bake house was located south of the guardhouse. This was an L-shaped structure where bread (and probably other baked goods) was prepared for the post's troops. A well was located a short distance north of this building (see Figure 11) (MS 266, file 1, AHS).

An 1875 report states:

> The post bakery measures 31-1/6 by 15-¼ feet, and has an addition for the ovens; this extension is 13-1/3 by 18-1/6 feet, external measurement. The building is divided into three rooms; one, the bake room is 12 by 15-7/12 feet, another is 11-5/12 by 4-7/12 feet, the third 11-5/12 by 6-7/12 feet is used as a sleeping room by the baker. The walls of this house are 10 feet high; the ventilation is at the eaves. Capacity of the ovens, two hundred rations (Fort Lowell ephemeral file, AHS).

A request for an additional room for the bake house "to mix and handle dough away from the heat of the ovens" along with repairs to the smoky chimney, were not approved after a request was submitted on 13 July 1876. The addition was proposed for the south side of the building and would have measured 18 ft long (east-west) by 15 ft wide (north-south) (Figure 13). A map drawn for the request reveals that the two ovens of the bake house were located on the west side of the building in a room measuring about 16 ft long (north-south) by 12 ft (east-west), while a flooring estimate from 31 March 1883 indicates the "old building" room measured 30 ft long by 12 ft wide (MS 266, files 1 and 2, AHS).

In April 1882, it was reported: "Roof of tin and good, but needs painting. Walls in good condition. Plastering in side needs some repairs. Doors and

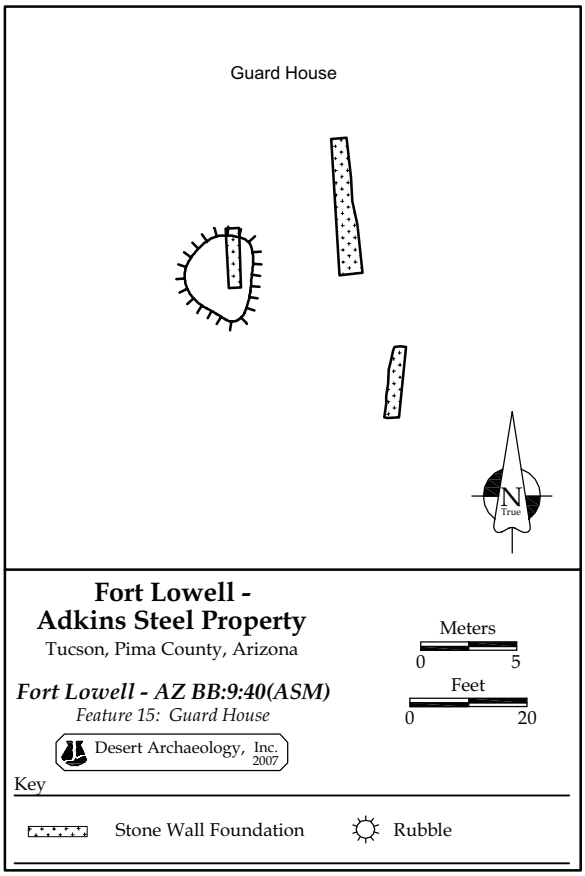

Figure 12. Visible wall alignments of the Fort Lowell guardhouse.

windows need slight repairs and painting, one room required flooring." A manta cloth ceiling was installed in the bake house in 1882, costing $14.50 and requiring 70 yards of cloth. Other repairs done in that year included the installation of a floor in one room (probably the oven room) and repairs to two doors and some windows (MS 266, file 2, AHS).

In March 1883, a request for *porticos* (porches) costing $154.16 for the bakery was submitted to the U.S. Army (MS 266, file 1, AHS).

The bakery was described in an 1889 report. "Building No 16.—One story adobe, porch in front, dirt roof covered with tin, has two (2) rooms 16′ x 18′ & 12′ x 27′6", also has a single bake oven, used as Post Bakery, cost not known, date of construction supposed to be 1875" (MS 266, file 4, AHS).

The building was appraised at $8.00 in 1896, prior to the post-fort auction (*Arizona Daily Citizen* 1896). In June 1937, the L-shaped building was in ruins. No surface indications for this structure are present today. During the removal of a large underground fuel storage tank in August 2007, a section of a fired brick and mortar foundation that likely formed part of this structure was located. These remains will be discussed in the separate monitoring report. The bakery was probably extensively disturbed by placement of the large underground fuel storage tank, although additional portions of the building are likely present below the modern ground surface.

Adjutant's Office

The adjutant's office was the location of administrative offices, court martial trials, and the post library (Peterson 1976:9-10). It was present on the south side of the bake house. The 1876 map of Camp Lowell indicates the structure had three equal-sized rooms on the northern side of a central (east-west) hallway and a single room on the south side (see Figure 11). Between 1884 and 1888, the post library was located within the building (Weaver 1947:85).

In April 1882, a report stated that the adjutant's office had: "Roof of tin in good order but needs painting. Doors and windows need slight repairs and some painting. Three rooms and hall should be floored…. This building contains four rooms and a hall, with an aggregate capacity of two thousand, five hundred square feet floor surface." A wood floor was approved for the building later that month. Other work done in the building included repairing windows, doors, and other woodwork (MS 266, file 2, AHS).

On 31 March 1883, a request for the installation of *porticos* (porches) for the adjutant's office, priced at $480.66, was submitted to the U.S. Army (MS 266, file 1, AHS).

An 1889 description of fort building states:

> Building No 17.—One story adobe, porch on 3 sides, dirt roof covered with tin, has 4 rooms & hall, 2 15′ x 18′, 1 18′ x 18′, 1 18′ x 50′, Hall 11′ x 50′. Building used as office by Comd'g Officer and First Adj't, Library & School Room, and Quarters for Sergt Major and Regt Qr Mr, Sergt 4th Cavalry, cost not known, date of construction supposed to be 1875 (MS 266, file 4, AHS).

The administrative building was appraised at $15.00 prior to the post-fort auction (*Arizona Daily Citizen* 1896). Following the abandonment of the post, the adjutant's office was stripped of wood elements. A photograph on display at the Fort Lowell Museum, dating to the early 1900s, shows the roofless structure already experiencing erosion around door and window openings. In June 1937, it was reported to be in ruins.

No evidence for the adjutant's office is currently visible on the ground surface. It is uncertain if subsurface remains of this adobe structure are present.

Parade Ground

The parade ground was a flat, cleared area in the center of the fort (see Figures 5 and 6). A row of cot-

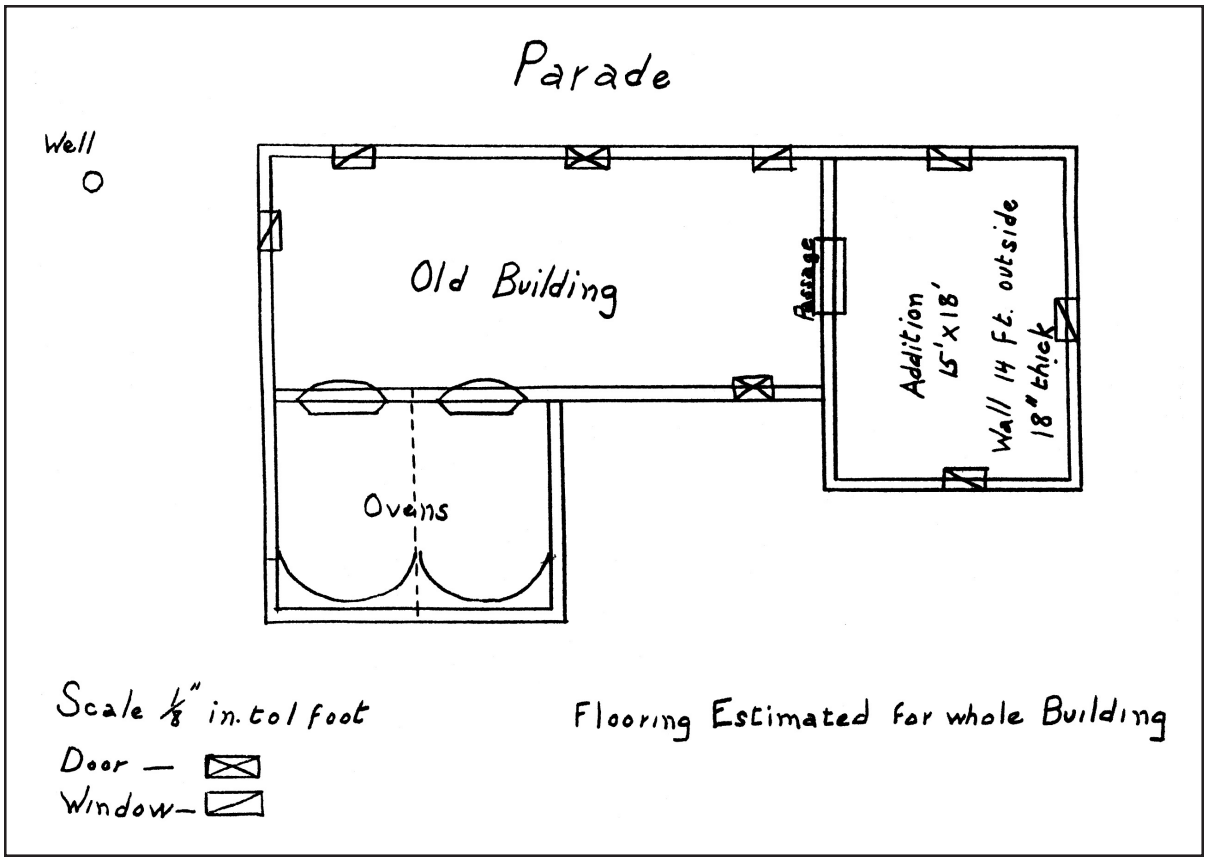

Figure 13. Map of the Fort Lowell bakery with a proposed addition, 1876.

tonwood trees and an *acequia* were present along its south side. The post flagpole was located in front of the commander's quarters, on the southern side of the parade ground, east of the Fort Lowell-Adkins Steel property. Mesquite trees were present along the west side of the ground. This area was the location of training exercises, typically conducted in the morning (Fort Lowell ephemeral file, AHS).

The parade ground is invisible on the modern ground surface of the Adkins Steel property. It may be possible to see the tamped surface of the parade ground, the adjacent *acequia*, or the planting holes of the cottonwood trees through careful archaeological fieldwork.

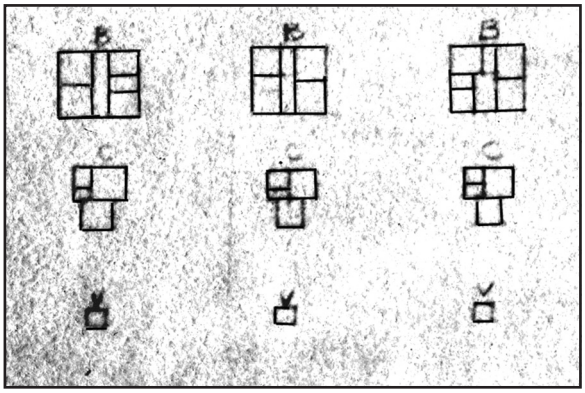

Figure 14. Close-up of Fort Lowell officer's quarters no. 1, no. 2, and no. 3, their kitchens, and their privies.

Officer's Quarters

The three officer's quarters on the Fort Lowell-Adkins Steel property are arranged in a row, running northwest to southeast (Figure 14). The commanding officer's quarters and four additional officer's quarters were immediately to the east. The officer's quarters (and presumably their kitchens and privies) were constructed in 1874-1875 (Peterson 1976:10). Military documents suggest they were numbered from 1 on the west to 3 on the east.

The 1876 map suggests the western three differed slightly in their floor plans. In April 1882, a report stated:

> There are seven buildings or sets of Officers Quarters. Roofs of tin in good condition with the exception of needing a good coat of paint. Walls in good condition with few exceptions. Doors, windows, and other woodwork are generally more or

> less warped and imperfect from climate effect, and need considerable minor repairs and painting. These can be put in fair condition at a comparatively small cost…About thirty six screen doors are required for summer use. Each set of Quarters should have a floored porch built all around as a protection against the intense heat which prevails for a good part of the year. The area between the mail building and the kitchens (without side walls) are covered with dirt roofs, are very leaky, and many of the *Vegas* (rafters) are warped and weakened by the weight of the dirt so that there is danger of the roofs falling ion. I would recommend that these roofs be repaired and covered with tin. Quarters No. 1 contains nine rooms counting kitchen and store rooms, with an aggregate capacity of one thousand nine hundred and thirty square feet of floor surface… (MS 266, file 2, AHS).

On 7 March 1879, a report by James Biddle on the condition of the officer's quarters stated: "In the rainy season the water leaks through the mud roofs and makes them almost uninhabitable and certainly unhealthy." He recommended that tin rather than shingle roofs be placed over the dirt roofs because the tin was "better in every way, and would last longer, besides they would cost less" (MS 266, file 1, AHS).

A report prepared on 1 July 1879 states that:

> There are seven buildings or sets of Officer's quarters. The roofs of all leak more or less during rainy weather. These are made of small sticks of a kind of cactus called sahuaro laid transversely and close together upon the *vegas*, or rafters, and covered with earth the depth of six or more inches in the style mostly used in this part of the country and generally known as dirt roofs. It is evident that the dirt was not of the proper kind, nor properly put on when built as the leakage is far greater than with ordinary private houses in this vicinity. There is as much dirt now on the roofs as it is advisable to put with regard to the safety of the occupants—and this remark will apply to all the buildings at the Post. Some of the *Vegas* are decayed and cracked and it would perhaps take about thirty new ones at an aggregate cost of about three hundred and fifty ($350.00) dollars, counting cost of labor and materials to replace the unserviceable ones.
>
> The adobe walls are in good condition, with a few exceptions, where they have been slightly damaged by leakage—and if roofs were repaired or renewed soon—the walls might be repaired at a nominal cost say, not to exceed one hundred (100) dollars and last for an indefinite time.
>
> The doors and windows are some of them warped and rickety owing to the effect of dryness of this climate upon wooden fabrics made up in California. This can, however, be repaired at slight cost of labor and materials—not exceeding, say seventy five (75) dollars….
>
> No. 1 contains nine rooms counting kitchen and closets or storerooms, with an aggregate capacity of two thousand, one hundred and fifty (2,150) sq. ft. floor surface.
>
> No. 2, 3, 5, 6 and 7 each contains seven rooms, counting kitchen and hall with an aggregate capacity of nineteen hundred and thirty (1930) sq. ft. floor surface to each set… No additions, alterations or repairs have been made during last year, excepting a few rooms have been floored, one in quarters No. 1 since my arrival at the Post, (April 1st, 1879) and some minor, but necessary repairs of doors and windows—these at no estimable cost in money (MS 266, file 1, AHS).

The new roofs were subsequently approved on 29 July 1879 (MS 266, file 1, AHS).

Work conducted on the quarters in 1882 included the repair and painting of doors, windows, and other woodwork, replastering of exterior walls (18 days work for a skilled mason and a helper for the six quarters), and installation of a manta ceiling in the kitchen and another room of an unspecified quarters (MS 266, file 2, AHS). On 31 March 1883, a request for construction of *porticos* (porches) for each of the three quarters was submitted to the U.S. Army. They were priced at $515.85 each (MS 266, file 2, AHS). Another request was for flooring and "hand brick" chimneys and hearths to be installed in three rooms of quarters no. 1 (kitchen and dining room) and two rooms in quarters no. 2 and no. 3 (including the kitchen) for between $82.27 and $86.37. Another report stated that doors and window frames needed resetting. At that time, the post surgeon was living in quarters no. 3 (MS 266, file 2, AHS).

According to the recollections of Mrs. Ben Heney in 1936 (she lived at the fort as a child), one of the residents of officer's quarter no. 3 was Colonel Cornelius C. Smith (Maguire 1938). In 1882, seven married officers (two with children) and six single officers lived in the six quarters assigned to officers (Schuler n.d.). In the mid 1880s: "there are now four officers (some of whom are married) living in two sets of quarters, necessitating the use of common halls, yards, etc., a very objectionable arrangement…" (MS 266, file 3, AHS).

In an 1889 buildings report prepared by the Quartermaster General, descriptions of the quarters were provided. Unfortunately, it is uncertain which quarters are referred to, because they are not numbered the same as other documents, which number them from left to right as 1 through 7. In this document, Building No. 1 is the commanding officer's house, which is usually designated No. 4.

> Building No. 2.—One story adobe, Porch in front and both sides, height of building 14 feet, has dirt roof covered with tin, has six (6) living rooms, 2 14′6″ x 18′, 1 15′ x 15′, 1 12′ x 12′, 1 10′ x 21′, 1 7′ x 15′6″, and bath room 10′6″ x 11′, also Hall 7′ x 15′6″ has one story adobe kitchen separated from main building with two (2) rooms Kitchen 15′ x 15′ Servants Room 15′ x 15′. Building now used as Quarters by Capt. I. A. Mason, 4th Cavalry, cost of building not known date of construction supposed to be 1875.
>
> Building No 3.—Same as building No. 2, excepting that it is used as quarters by 1st Lt. C. H. Murray, 4th Cavalry.
>
> Building No 4.—Same as building No. 2, excepting that there are two (2) bathrooms, not occupied, recently used as quarters by Lt. W. E. Wilder, 4th Cavalry (MS 266, file 4, AHS).

The three officer's quarters "5 rooms hall and buildings" were each appraised at $50.00 prior to the November 1896 auction (*Arizona Daily Citizen* 1896). Photographs taken in 1901 show that officer's quarters no. 1 had been stripped of its roof, door frames, and window frames (Figures 15 and 16). Portions of the adobe walls, especially above the window openings, were starting to fall. Officer's quarters no. 2 appears to have been intact, with only a section of the western parapet missing. Officer's quarters no. 3 was intact and had a wood addition at the southwestern corner of the building (AHS photographs 61561 and 270989).

In 1936, the western two officer's quarters had walls standing and the third quarters was occupied. The third officer's quarters was documented by the Historic American Building Survey in 1940, with a plan view map, cross sections, and exterior façade and detail drawings (Figure 17). These reveal that the original house had seven rooms (two bedrooms, a dining room, *zaguan* [hallway], living room, pantry, and kitchen), with a bath added to the southwestern corner of the house, and porches on the north and south facades. Corner fireplaces were present in each bedroom and in the living room. The house has remained largely intact since the 1940 HABS documentation.

A. E. (Gene) Magee (1907-1999) was an electrical engineer and pilot who photographed many locations in Tucson from the air. His photographs of Fort Lowell, taken in the 1940s and 1950s, show the general area was mostly undeveloped, with a series of fields along the south side of the fort. Several photographs of the east side of Fort Lowell show ruins of the eastern three officer's quarters, the hospital, and the infantry company quarters. A third photograph, looking south, provides a detailed look at the Fort Lowell-Adkins Steel property (Figure 18). The second and third officer's quarters are apparently

Figure 15. Photograph of Fort Lowell Officer's Row, with officer's quarters no. 1 on the far right (AHS/SAD 27089).

Figure 16. Photograph of Fort Lowell Officer's Row, with officer's quarters no. 3 and its wooden addition (AHS/SAD 61561).

roofed, as is the second kitchen. The first officer's quarters has been reduced to perhaps a single roofed room. A concrete water tank is present directly behind it. West of the first quarters is a standing portion of the wall that once enclosed the backyard. Two homes are visible toward the front of the lot.

A photograph taken on 25 October 1960 (AHS 24,888) shows the east side of the third quarters. The house appears to be in good condition and was occupied. An evaporative cooler is visible in a window, and a back porch is attached to the southern side of the building.

In contrast, the second officer's quarters and its adjoining kitchen were heavily damaged in April 1970 in a fire, according to a property card from the Pima County Assessor's office. It has remained a ruin since that time. Officer's quarters no. 1, which was partially roofed in the 1930s to 1940s, has since become a ruin, with a few sections of interior walls still standing.

Pima County Assessor's cards, updated in 1976, note that the third officer's quarters was "unoccupied—house in state of decay—historical value only." The second officer's quarters was described as "2nd house on lot #039 abandoned—in state of decay walls and roof crumbling… was burned 4-11-1970 per owner." However, a survey of Fort Lowell buildings in 1976 indicates the third officer's quarters was occupied at that time (Bieg et al. 1976:33). Two University of Arizona archaeology students, Michael Faught and Ken Matesich, lived in the quarters in the mid-1970s. Matesich states that the house had been vacant for several years and that he and Faught made minor repairs in an attempt to make the building more livable (Ken Matesich, personal communication to Arthur Stables 2007). One of the Adkins granddaughters subsequently lived in the house in the 1990s and 2000s.

The first and second quarters and their kitchens were mapped in September 2007 as part of the present project (Figure 19). These buildings are in ruins, lacking roofs and with portions of their walls collapsed. These buildings are also being stabilized as part of the preliminary work conducted by Pima County. The third officer's quarters is in much better condition, but is starting to deteriorate due to its leaking roof. Pima County is also currently undertaking emergency stabilization of this building.

Officer's Kitchens

Each of the officer's quarters had a summer kitchen located a few feet south of the main house. These kitchens were made from adobe brick with

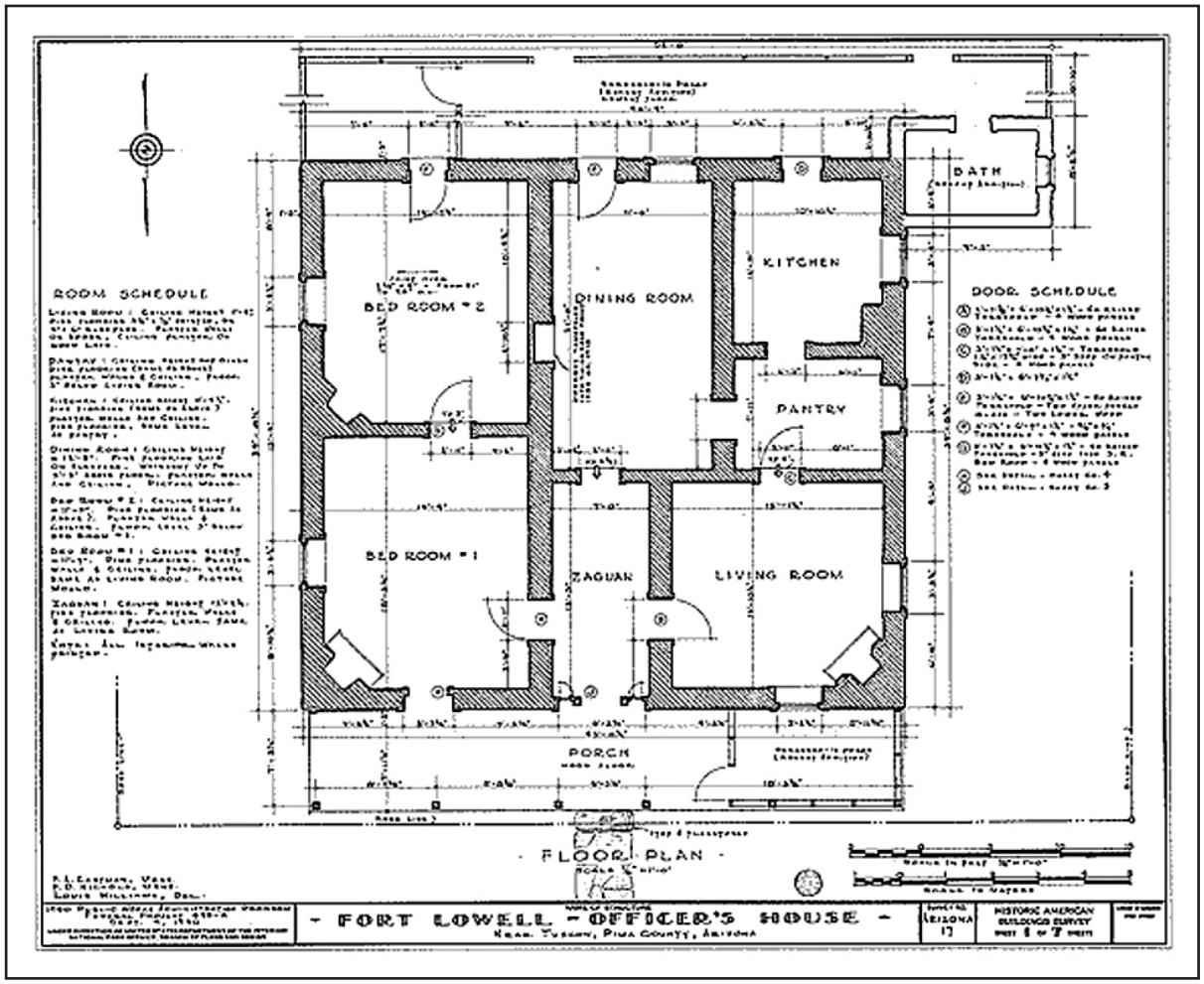

Figure 17. Historic American Building Survey drawings of Fort Lowell officer's quarters no. 3. (Courtesy, Library of Congress.)

flat roofs and originally had dirt floors. The 1876 map indicates each kitchen was divided into two rooms with a probable porch present on the southern side of each kitchen (see Figure 14). One of the two rooms was used as servant quarters, and the other was a kitchen where cooking took place during the hot summer months (Schuler n.d.).

On 1 July 1879, it was reported: "All the kitchens need flooring… Painting: All the doors, windows, blinds, washboards &c, and at least one good coat of paint at a cost of about two hundred and twenty-five (225) dollars counting labor and material" (MS 266, file 1, AHS). The floors appear to have been installed sometime after 1882, when the initial request for flooring was denied (Weaver 1947:75). A partially burned wooden floor is present in the kitchen for officer's quarters no. 2.

There was a question about if the third kitchen was ever built. However, it is present on the 1876 map, although it does not appear on the 1930s Maguire map. The most likely explanation is that the kitchen for the third officer's quarters was demolished, and no visible traces were present by the 1930s.

In June 1937, the westernmost kitchen was in ruins, and the second kitchen was occupied. The Historic American Building Survey prepared documentation of the second kitchen in 1940. Plan view and profile drawings were prepared by Louis Williams. Fireplaces or stoves were present in the southeastern and northwestern corners of the building. On 6 July 1940, photographer Donald W. Dickensheets documented this structure with a photograph looking to the west. A poured-in-form concrete foundation had been retrofitted around the exterior of the lower foundation. Concrete capping blocks (which probably date to 1920, based on newspapers adhering to their undersides) were present along the roofline. According to the Pima County Assessor's card, the structure burned in 1970.

The first and second kitchens were mapped in September 2007 (see Figure 19). Both buildings are in ruins and are being stabilized by replacing adobe

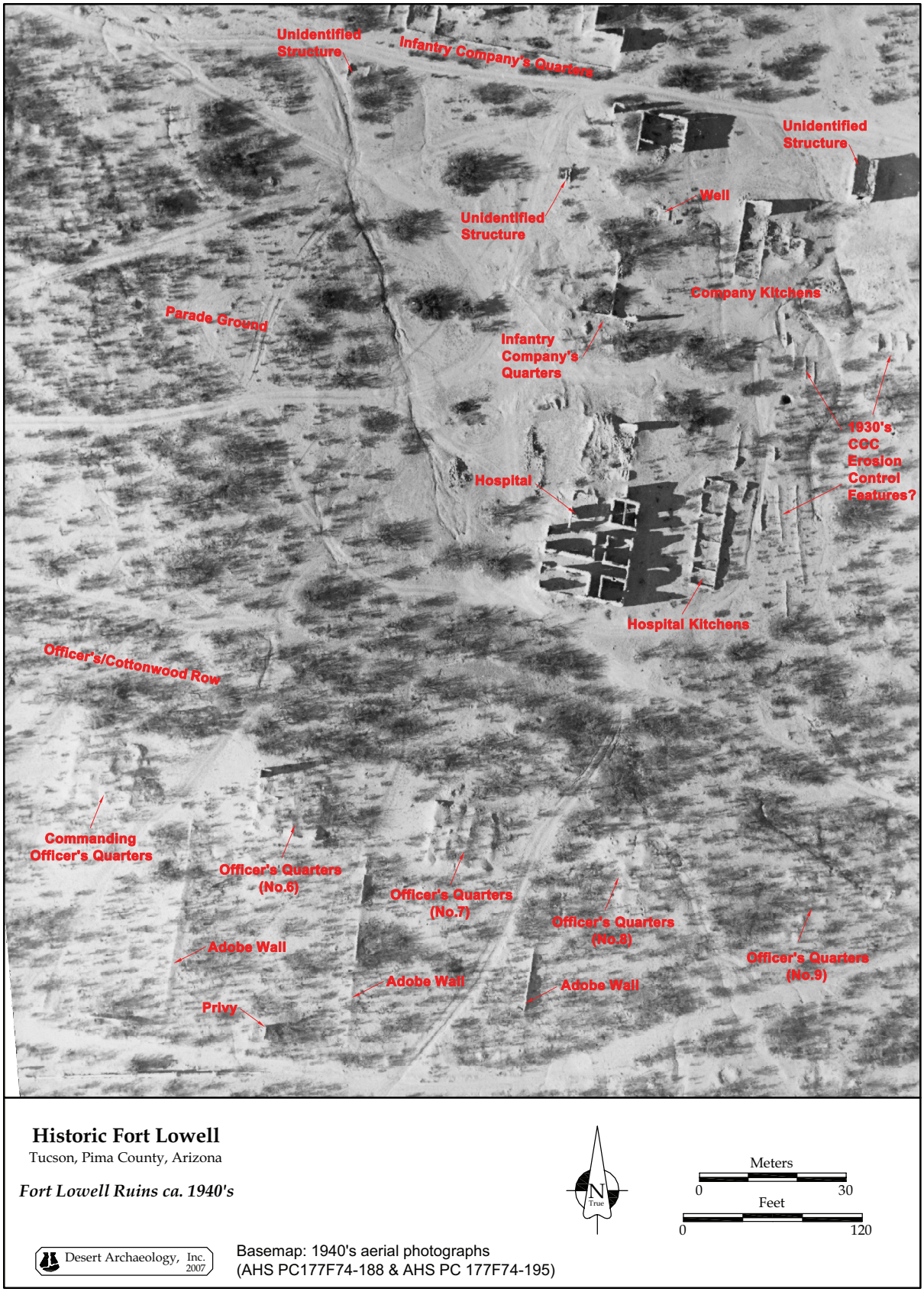

Figure 18. Aerial photograph of Fort Lowell from the 1940s, looking to the southwest (AHS/SAD PC 177, File 74, #188 and #195).

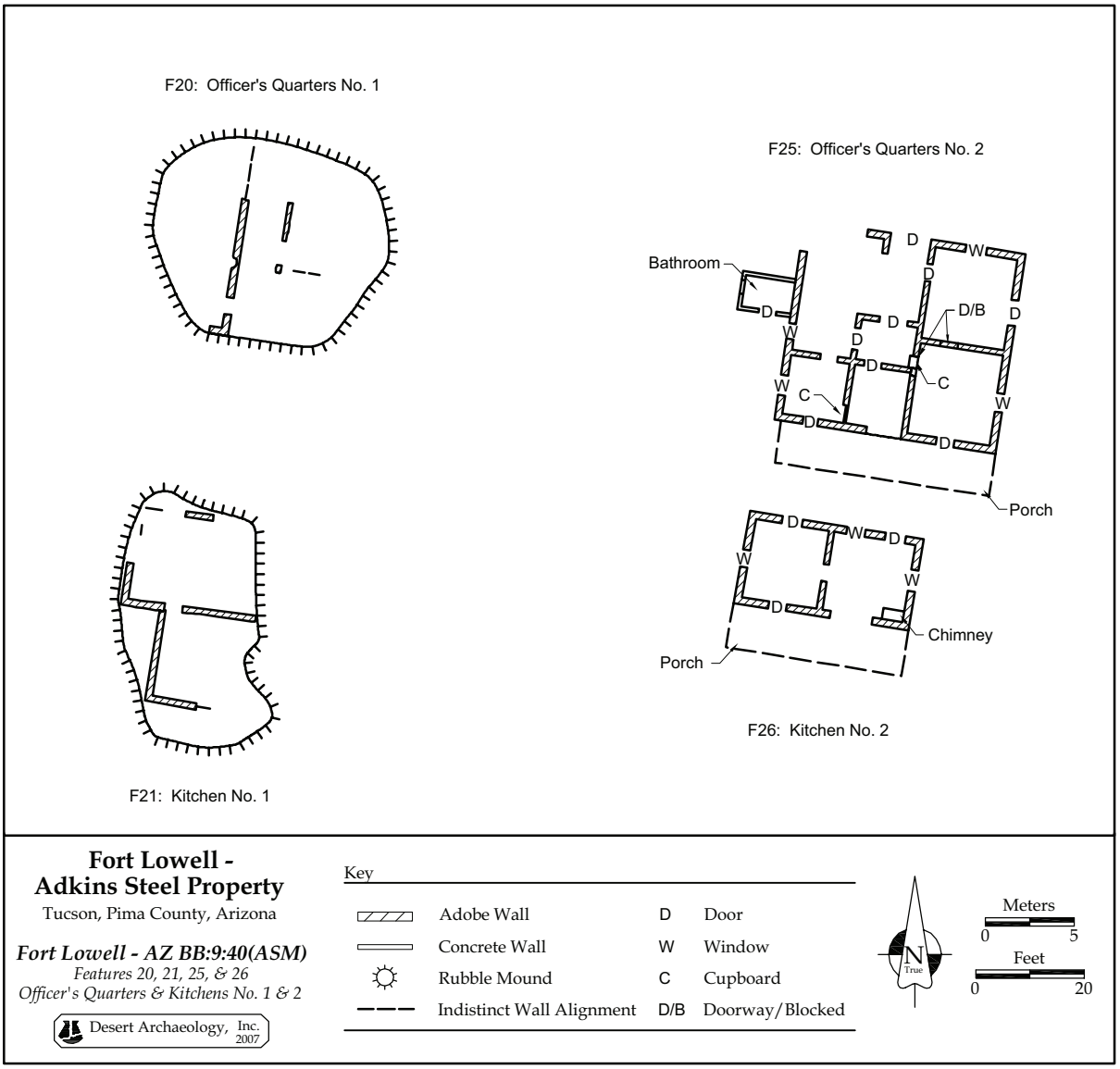

Figure 19. Archaeological remains of Fort Lowell officer's quarters no. 1 and no. 2 and their kitchens in 2007.

bricks where necessary and by capping the top of the existing walls.

Officer's Privies

The officer's privies were built from adobe brick and were located along the adobe wall at the back of the officer's quarters' backyards (see Figure 13). The privy pits for officer's quarters nos. 4-7 were excavated by Alfred Johnson in 1960. Privy no. 4 had a pit measuring 1.65 m long, 1.25 m wide, and 1.20 m deep. The dimensions of the structure were not reported. The back patio wall was also the back wall of this privy. The adobe foundation of privy no. 5 was 2.45 m long and 2.00 m wide. The actual privy pit was 1.95 m long, 1.30 m wide, and 1.30 m deep. The privies for quarters no. 6 and no. 7 were nearly identical to privy no. 5. Privy no. 6 had two coats of plaster on the interior (Figure 20).

The privies for quarters nos. 1-3 were located behind (south of) the kitchens, along the back wall of the walls enclosing the backyards. They had adobe walls and probably a wooden door. The type of roofing is unknown. No photographs of these privies have been located. In June 1937, the three were reported to have "walls fallen" (AHS photograph 12887). The privies were reportedly dug twice each by artifact collectors in the 1960s. Ken Matesich reports that the walls of the third privy were visible in the 1970s (personal communication to Arthur Stables 2007).

A depression for the privy for officer's quarters no. 1 is visible on the ground surface in August 2007. No evidence for the other two privies was visible.

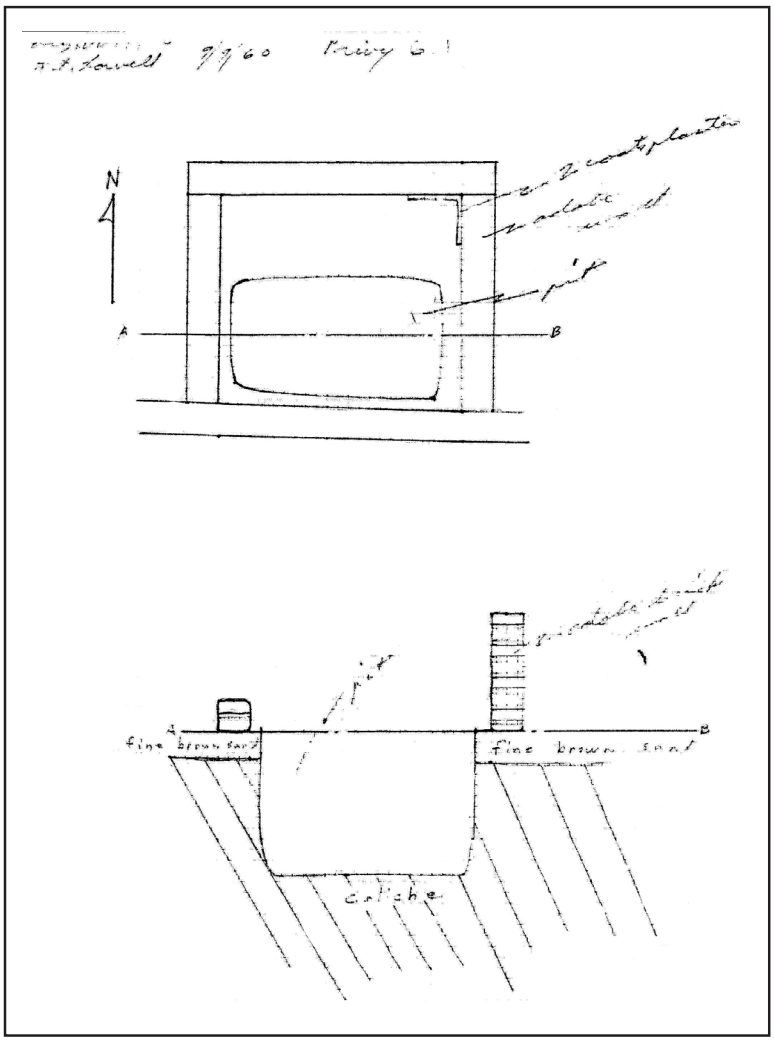

Figure 20. Plan view and cross section drawing of the privy at Fort Lowell officer's quarters no. 6, excavated in 1960 (AHS/SAD MS 265).

Backyard Enclosing Walls

Adobe walls were constructed to enclose the backyard of each of the officer's quarters. These adobe walls are depicted on the 1876 map, and are noted on the 1937 map of the fort as still standing. These adobe walls were likely built directly on the existing ground surface.

A small portion of the wall separating the backyard of officer's quarters no. 2 and officer's quarters no. 3 was located in September 2007. The upper surface of the wall is flush with the ground and is barely visible. Its location should be marked to prevent people from driving over it.

PREVIOUS ARCHAEOLOGICAL RESEARCH

A records check was conducted at ASM and on the Internet at AZSITE. Cultural resource survey and site information reported in this section reflects records available in September 2007. Archaeological investigations have been conducted in the Fort Lowell area since 1935, when the Arizona Archaeological and Historical Society and the University of Arizona Anthropology Department went to Fort Lowell and filled treasure-hunters holes around many buildings (*The Kiva* 1935:4).

Archaeological sites identified within 1 mile of the project area are listed in Table 4 and shown in Figure 21. Similarly, archaeological projects that have been conducted within 1 mile of the project area between 1979 and 2003, are listed in Table 5 and shown in Figure 22. [redacted] have been identified within 1 mile of the project area. Of these, two are of primary importance: the Hardy Site, AZ BB:9:14 (ASM), and historic Fort Lowell, AZ BB:9:40 (ASM).

Prehistoric Archaeology

[redacted]

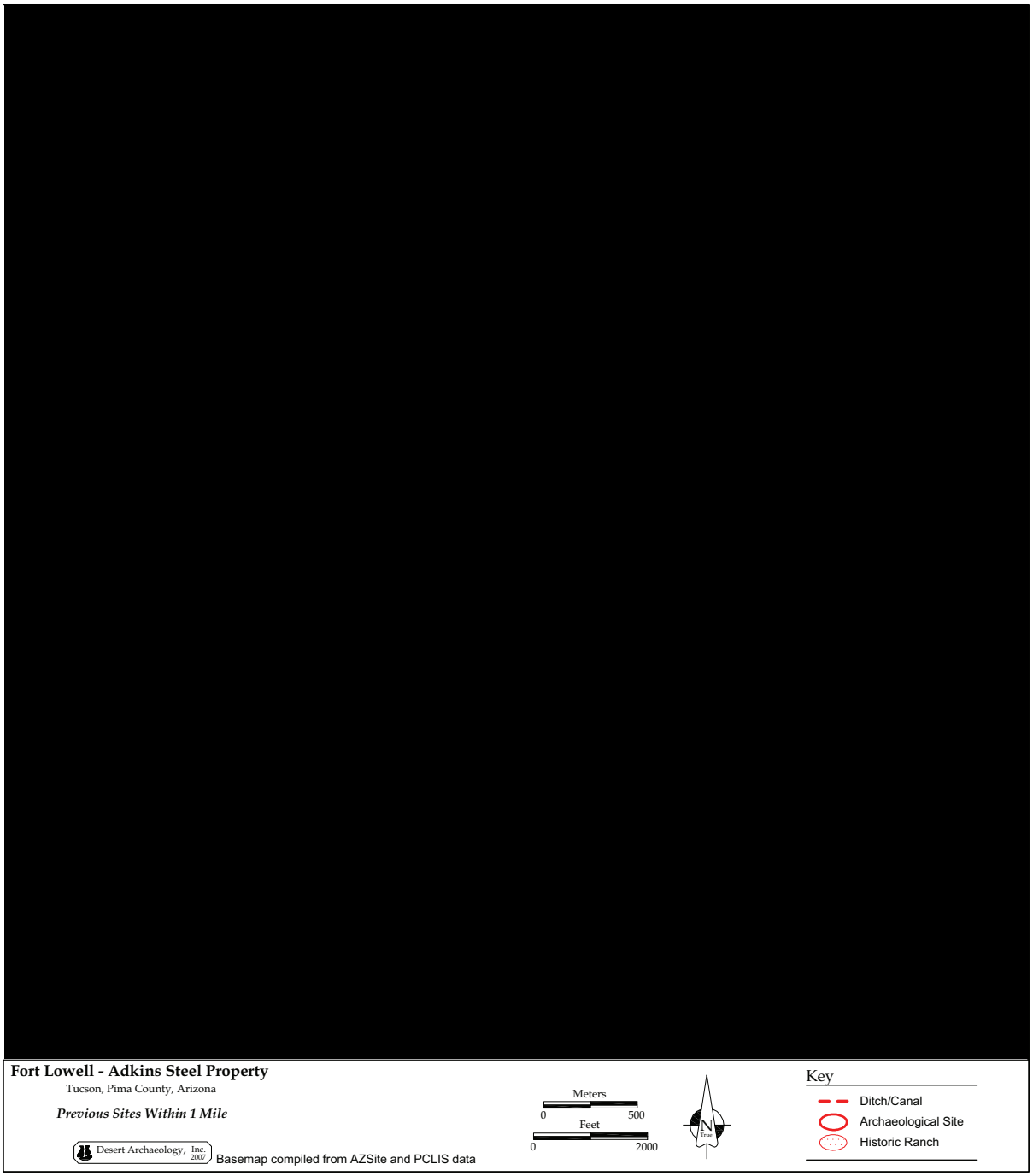

Figure 21. Previously recorded archaeological sites within 1 mile of the project area.

phase (A.D. 750-850). Only small portions of these

Table 4. Previously recorded archaeological sites within 1 mile of the project area.

[redacted]

[a]All sites are AZ # (ASM).

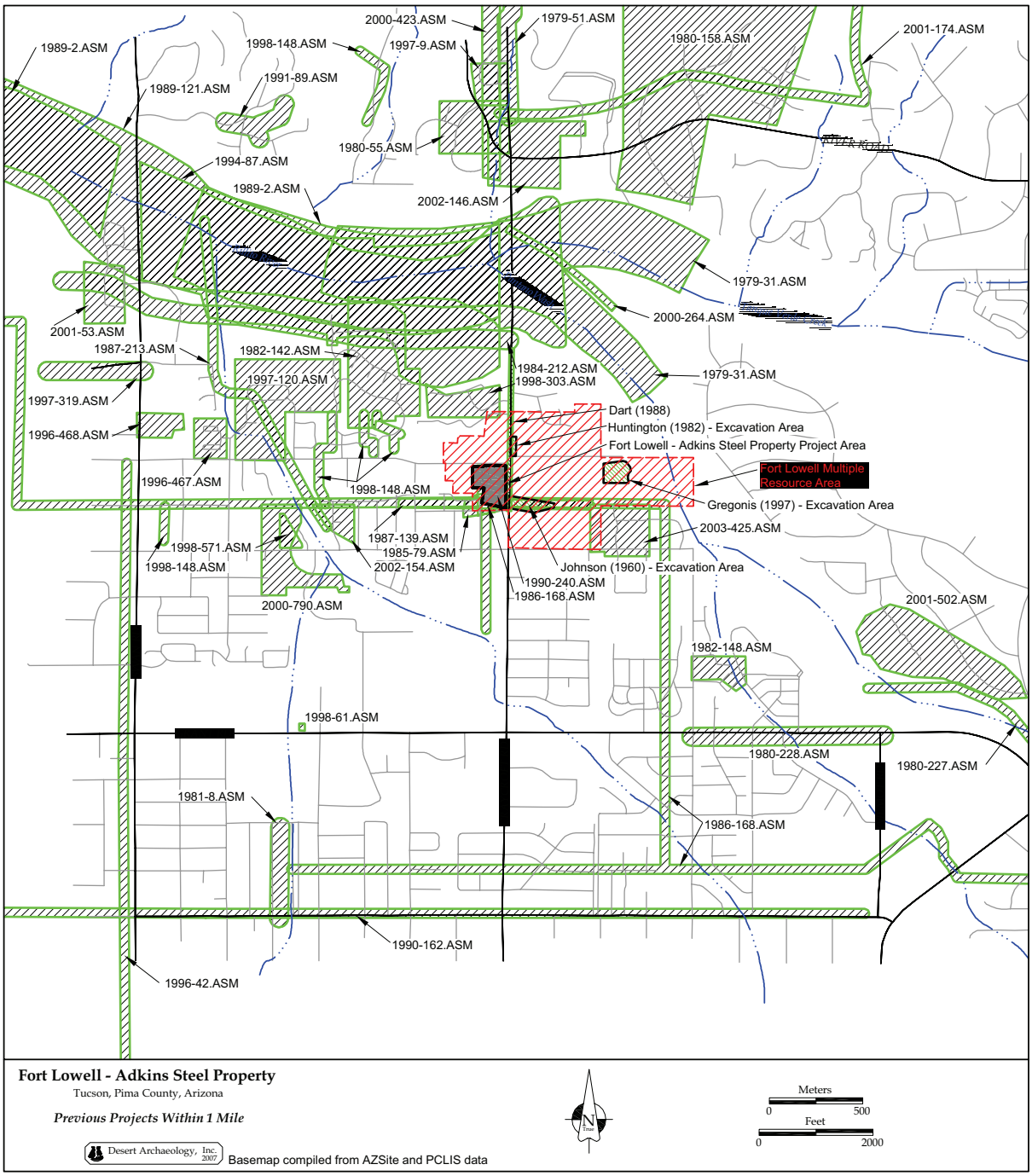

Figure 22. Previous cultural resources surveys conducted within 1 mile of the project area.

Historic Archaeology

Fort Lowell was assigned site number AZ BB:9:40 (ASM) by William Wasley in August 1960 (ASM site card). Additional site numbers have been assigned to the fort by other archaeologists—AZ BB:9:72 (ASM) for the band quarters and kitchen and AZ BB:9:324 (ASM) for the quartermaster's dump—but both should be considered part of BB:9:40.

Alfred Johnson excavated a portion of Fort Lowell in 1960, prior to construction of a parking lot (Johnson 1960). During Johnson's project, one of the officer's quarters was completely excavated, the commanding officer's quarters were partially excavated, three other officer's quarters were tested, and several outhouses were excavated, as was a trash-filled pit. Johnson (1960) noted that buildings were constructed from unfired adobe bricks measuring

Table 5. Previous cultural resources surveys conducted within 1 mile of the project area.

ASM Project No.	Project Name	Organization	Sponsor
1979-31	Pima County Bridge Survey	Arizona State Museum	Pima County
1979-51	TEP 138 kV Survey, NE Substation to E Loop Substation through Snyder Substation	Arizona State Museum	Tucson Electric Power
1980-158	Rio Verde Vista II, East of Craycroft, N and S of River Road	Arizona State Museum	Broadway Realty & Trust
1980-227	ROW Along Grant/Kolb Road	Arizona State Museum	Arizona Department of Transportation
1980-228	Reconstruction/Widening of Grant Road, Sahuara to Wilmot Road	Arizona State Museum	Arizona Department of Transportation
1980-55	Primavera, SW Corner of Craycroft and River Road	Arizona State Museum	Continental Homes
1981-8	Cloverleaf Townhouses	Arizona State Museum	
1982-142	Hill Farms II, Ft. Lowell and Craycroft	Arizona State Museum	Cienega, Ltd.
1982-148	Sahuaro Village, Grant and Sahuaro	Arizona State Museum	Sun Country Development
1984-212	OPW South Rillito Sanitary Interceptor Survey	Arizona State Museum	Osborn, Petterson, Walbert and Associates
1985-79	Archaeological Clearance Survey of La Sonrisa Development Area, Pima County	Arizona State Museum	Lovstrom and Associates
1986-168	Clearance Survey for a Reclaimed Water Pipeline, North-Central Tucson	Arizona State Museum	Brown and Caldwell, Consulting Engineers
1987-139	Archaeological Monitoring during Construction of the Ft. Lowell Park Reclaimed Water Main	Arizona State Museum	R. E. Miller Paving and Construction
1987-213	Alamo Wash: Glenn Street to Rillito River, W.O. 4FAWFL	Institute for American Research	Pima County Transportation and Flood Control District
1989-121	Phase I Archaeological Reconnaissance of the Proposed Rillito Creek Recharge Site	Louis Berger and Associates	Camp Dresser & McKee
1989-2	Rillito Testing Project	Statistical Research	US Army Corps of Engineers, LA District
1990-162	Archaeological Survey of Speedway/Pima Widening Project	Desert Archaeology	City of Tucson
1990-240	Fort Lowell Park Expansion	Desert Archaeology	City of Tucson
1991-89	Calle Chueca Main Replacement Survey	Desert Archaeology	City of Tucson
1994-87	Rillito Creek Recharge Feasibility Study	Bureau of Reclamation	Bureau of Reclamation
1996-42	Swan Road	Desert Archaeology	City of Tucson
1996-467	Parcel C, Fort Lowell at Swan Road	Arizona State Museum	University of Arizona
1996-468	Parcel B, Fort Lowell at Swan Road	Arizona State Museum	University of Arizona
1997-120	Ft Lowell/Orlando	Professional Archaeology Services & Technologies	The DeGrazia Company
1997-319	Archaeological Survey of the Fort Lowell Alignment Extension between Vista del Forte and Swan Road	Desert Archaeology	City of Tucson
1997-9	Archaeological Assessment of 5.6 Acre Parcel Near River and Craycroft Roads	Tierra Archaeology	Rogers Civil Engineering
1998-148	Swan/Sunrise Main Survey	Desert Archaeology	City of Tucson
1998-303	Presidio/Craycroft Rd. NWC	Professional Archaeology Services & Technologies	Planners Ink Corporated
1998-571	Canciones Survey	Tierra Archaeology	Rob Paulus Architect
1998-61	Traffic Signal Survey: Grant/Rosemont	Desert Archaeology	City of Tucson
2000-264	Pantano Wash Bank Protection Project	Statistical Research	Pima County
2000-423	Craycroft Road Survey	SWCA	Engineering and Environmental Consultants

Table 5. Continued.

ASM Project No.	Project Name	Organization	Sponsor
2000-790	TMC - Acadia Wash (Lots 13 & 14)	Professional Archaeology Services & Technologies	TMC Healthcare - Plant Services
2001-174	River Road-Tanuri Drive-Calle Vista Ciudad Buried Cable Survey	Old Pueblo Archaeology Center	Comcast Cable Communications
2001-502	Tanque Verde Wash Survey	Aztlan	American Pacific Engineering LLC
2001-53	Camp Lowell and Swan Survey	SWCA	Park West Development
2002-146	River-Craycroft Survey	Tierra Archaeology	Broadway Realty & Trust
2002-154	TMC Site Archaeological Survey	SWCA	Planning Resources
2003-425	East Lawn Survey	Tierra Archaeology	KB Home Tucson

20 inches by 12 inches by 4 inches (50 cm by 30 cm by 10 cm). Interior walls of these structures were plastered, whereas exterior walls were left unplastered.

Artifacts from this excavation are housed at ASM and are contained within 22 boxes (6 glass, 2 ceramic, 2 glass/ceramic, 9 mixed, 1 glass/plaster/ceramic, 1 metal, and 1 glass/wood/ceramic). These items have never been formally analyzed. A brief examination of the artifacts indicates that many are from the post-fort period and represent items discarded by Mexican families living in the abandoned structures, as shown by items with maker's marks that postdate 1891. The AHS in Tucson has a manuscript file containing information about the project (MS 265, AHS). This material includes the original maps drawn by Johnson, drawings of architectural elements found in other buildings and reported to be from Fort Lowell, and a variety of black-on-white photographs.

Excavations in 1982 documented the band-quarter's kitchen, where members of the regimental band had a mess hall, kitchen, and storage room during the fort's occupation (Huntington 1982). This structure is located northeast of the current project area, on the east side of Craycroft Road. Widening of Craycroft Road necessitated the project, which documented the structure and recovered associated artifacts. At about the same time, excavations were conducted at the cavalry stables and corral, resulting in the documentation of standing portions of the wall, as well as recovering a small number of artifacts (Huntington 1982).

In 1988, the Institute for American Research (now Desert Archaeology, Inc.) conducted monitoring of waterline trenches dug along the eastern side of North Craycroft Road, between Glenn Street and St. Gregory's High School (Dart 1988). Eight archaeological features were documented. Three of these features, two pithouses and a roasting pit, were prehistoric. One pithouse yielded Middle Rincon phase (A.D. 1000-1100) ceramics. Five other features dated to the Historic era. Four were associated with Fort Lowell and consisted of the area of the commanding officer's quarters, two pits, and a midden area. Another feature was a possible irrigation ditch from the Fort Lowell occupation or later.

On 3 October 1990, Jonathan Mabry of Desert Archaeology surveyed the Adkins Steel property for the City of Tucson. He noted the presence of prehistoric and historic artifacts scattered about the property, as well as the three officer's quarters and the guardhouse of Fort Lowell (Mabry 1990).

Architectural evaluations conducted in 1994 and 1997 at the Hardy homesite, located at the northeastern corner of Craycroft and Fort Lowell roads, and at the quartermaster warehouse at the northwestern corner of these streets, indicate that features associated with Fort Lowell and the Hardy sites are also likely to be found in these areas (Thiel 1994, 1997).

Monitoring of the emergency stabilization work for the second officer's quarters and kitchen was conducted in August 2007. Portions of the wooden floor in the southeastern room of this quarters were removed so that wall bracing elements could be installed. A whiteware cup and a stoneware Dundee Marmalade jar were found beneath the floor, suggesting additional fort-era refuse may be present in this and other rooms. Newspapers from the 1930s were present beneath the deteriorated linoleum on the south side of the quarters, in the area of a former porch. Other newspapers from 1920 were present beneath the cement capping elements that once lined the parapet of the quarters and its adjacent kitchen.

Removal of a large underground storage tank in 2007 on the western side of the Adkins steel barn located a fragmentary brick foundation or floor support pier and ash deposit associated with the post bakery. The uncovered portion was six bricks long, two bricks wide, and several courses tall. Only a

small portion was uncovered, and the full extent of the feature is not known. It is unclear how much of the bakery was destroyed by placement of the tank.

Removal of a fuel line running from the large underground storage tank uncovered portions of the rock foundation of the guardhouse. The guardhouse foundations are partially visible on the ground surface, and additional rock alignments were visible in the trench for the fuel line.

Artifact-collecting activities have also taken place on the property, focused especially on the latrine features associated with the officer's quarters. The Fort Lowell Museum contains displays with a number of artifacts purchased from an artifact collector. Some items have also been discovered on the surface within the park, or during excavation of trenches for utility lines. Despite these disturbances, it is very likely that many subsurface features associated with the prehistoric and historic occupation of the site remain undisturbed, hidden beneath the modern ground surface.

Previous archaeological work suggests the prehistoric occupation of the site occurred between A.D. 650-750 and A.D. 1000-1300. However, it would not be surprising if evidence for occupation during the intervening years were eventually located. The presence of pit structures along Craycroft Road and at the eastern edge of the modern Fort Lowell Park, as well as the location of artifacts over a much larger area, indicates this was a significant and large site. Many areas almost certainly remain undisturbed, despite the development of portions of the site.

Fort Lowell-era (1873-1891) archaeological features are located within the park, the Fort Lowell-Adkins Steel property, the City of Tucson-owned portion of the fort in the quartermaster warehouse area, and privately owned parcels north of the warehouse area. While artifact collecting activities have undoubtedly destroyed important features and artifact assemblages, the likelihood is high that other features have survived.

Post-Fort Lowell features (1891-onward) relating to occupation of the site by post-fort residents, and the subsequent use by the Cate, Adkins, and Hardy families, are also likely to be present. These should include irrigation ditches or *acequias*, trash-filled pits, adobe mining pits, privies, and wells.

SURVEY METHODS AND RESULTS

Field survey of the project area was conducted on 6 August 2007, by Homer Thiel and Tyler Theriot (Figure 23). The Fort Lowell-Adkins Steel property was surveyed in transects spaced approximately 5 m apart. Overall visibility of the ground surface was excellent, with little vegetation except at the southwestern corner of the parcel. However, historic and modern ground-disturbing activities throughout the entire property have likely obscured the presence of prehistoric and historic artifacts and features. The property was visited several times in August, and no additional significant features or artifacts were located during subsequent visual inspection.

A light scatter of historic artifacts is present, mostly along the southern third of the parcel in close proximity to the officer's quarters. These items included a bisque porcelain doll limb, turned-purple bottle glass, whiteware and porcelain ceramics, and hand-wrought nails. None of the artifacts appeared to be in concentrations indicative of subsurface features or a trash dump except in the area south of the third officer's quarters. Unfortunately, this area is also the location of piles of modern dirt and asphalt, and it is unclear if the artifacts present originated at the site, or if they arrived with the fill material that was brought into the area and dumped with permission of Mr. Adkins.

All visible buildings and structures were mapped and assigned feature numbers. Features present are summarized in Table 6. Of the 12 Fort Lowell era buildings known to be present on the parcel, eight are visible on the ground surface. A ninth was subsequently located during monitoring and will be discussed in a separate monitoring report. The Fort Lowell era buildings are discussed in greater detail in the previous section.

Also present are a variety of buildings and structures associated with the Cate and Adkins families' use of the property (most are probably associated

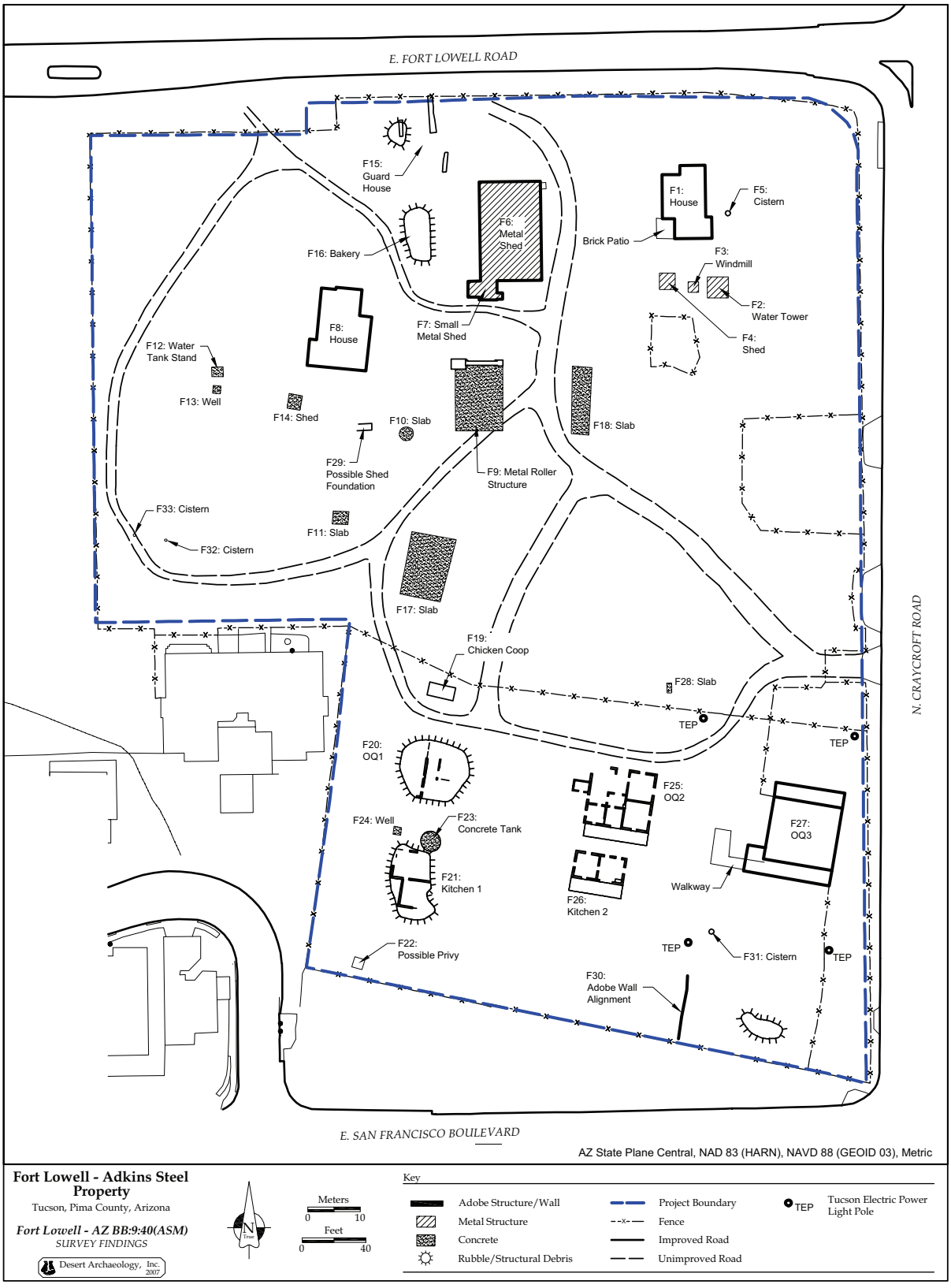

Figure 23. Survey map of the Fort Lowell-Adkins Steel property.

Table 6. Buildings and structures visible on the Fort Lowell-Adkins Steel property in August 2007.

Feature	Type	Length (m)	Width (m)	Comments
1	Adkins house	13.9	9.4	Circa 1935
2	Elevated water tank	3.6	3.6	–
3	Windmill and well	2.5	2.5	–
4	Metal shed	3.1	3.0	Slab is inscribed "Wanda L. Kelley 7-29-72"
5	Cistern	1.1	1.1	Iron tank in ground
6	Metal shed	18.9	11.6	–
7	Small metal shed	5.5	3.6	–
8	Adkins house	15.3	11.3	Circa 1927
9	Concrete slab	13.2	9.1	–
10	Circular concrete slab	2.7	2.7	Circular disk blades lie around perimeter of slab, beneath concrete
11	Concrete slab	3.1	2.5	–
12	Water tank stand	2.3	2.3	Slab only
13	Windmill and well	1.5	1.5	Concrete box only
14	Shed foundation	3.1	2.9	Wood, clothes line posts nearby
15	Guardhouse	–	–	Stone foundations
16	Bakery	–	–	Brick foundation found during large tank removal
17	Concrete slab	12.2	8.2	–
18	Concrete slab	12.9	3.5	–
19	Chicken coop	5.1	2.5	Block foundation
20	Officer's quarters no. 1	–	–	–
21	Kitchen, officer's quarters no. 1	–	–	–
22	Privy, officer's quarters no. 1	2.0	2.0	–
23	Concrete tank	3.9	3.9	–
24	Well shaft	1.7	1.7	Concrete box
25	Officer's quarters no. 2	13.4	12.0	–
26	Kitchen, officer's quarters no. 2	9.8	5.0	–
27	Officer's quarters no. 3	17.8	13.2	–
28	Concrete slab	1.9	0.9	–
29	Possible shed foundation	–	–	Next to 1927 house
30	Adobe wall	–	–	Separating officer's quarters no. 2 from officer's quarters no. 3
31	Cistern	–	–	–
32	Cistern	–	–	–
33	Cistern	–	–	–

with the Adkins family). Among the 25 Cate-/Adkins-era buildings or structures are two homes constructed by the Adkins family, a steel shed used for their tank manufacturing business, several large concrete slabs, a windmill and tank, several wells, cisterns/septic tanks, and a chicken coop foundation.

Subsurface cultural features are likely present on the Adkins parcel. For the Prehistoric era, these could include pit structures, various types of pits, and burial features (inhumations, cremations, and/or crematoria) similar to those previously reported for the Hardy site (Gregonis 1997). For the Historic era, the foundations of historic structures (such as the bake house or adjutant's office), the adobe walls enclosing the backyards and sideyards of the officer's quarters, the second and third officer's quarter's privy pits, adobe mining pits, and other trash-filled pits are likely to be present. According to David Faust, curator for the Fort Lowell Museum since 1976, both adobe mining pits (that were subsequently filled with trash) and trash-filled pits have been located within the area bounded by the historic fort buildings. He also suggests that trash-filled features are likely to be present behind the buildings, south of the officer's quarters or west of the buildings located on the western side of the parade ground.

FORT LOWELL PARK MAPPING PROGRAM

Mapping Methods

Two objectives guided cartographic work at Fort Lowell: (1) documentation of modern and historic features located on the Fort Lowell-Adkins Steel property; and (2) development of new mapping data and assimilation of existing public and archival resources for the entire historic fort. A holistic approach utilized remote sensing, local instrument mapping, scaled hand-drawings, existing geographic databases, and historic maps and photographs. The resulting product is a cartographic record of the Fort Lowell-Adkins Steel property, and an inclusive geographic information system (GIS) compiled for Fort Lowell and the surrounding area.

The mapping base data were derived from photogrametry. Cooper Aerial Surveys Co. produced rectified aerial imagery, high-resolution topography, and general physiographic mapping for an area of 45 ha (113 acres). Darling Environmental and Surveying, Ltd., established control points for the aerial photography, and the final digital data and image were ground checked by Desert Archaeology, Inc. Additional archaeological field mapping supplements the airphoto data. GIS- and survey-grade GPS instruments were used for spatial and attribute data collection. Geodetics are based on the Pima County control network. Sub-centimeter, real-time kinematic L1/L2 data collection established local instrument control relative to Pima County control point T13SR14EV21 located about 500 m north of the Fort Lowell-Adkins Steel property. Positioning was cross-referenced against additional Pima County monuments and photographic points measured by Darling Environmental. Desert Archaeology set temporary and semipermanent monuments on the Fort Lowell-Adkins Steel property. The semipermanent marker is a nail set flush into the Feature 17 concrete foundation. This monument is located at 140218.919 m N, 311386.333 m E, 746.614 m orthometric (AZ State Plane Central, NAD83 [HARN]/NAVD 88[Geoid 03], metric).

Survey and recording focused intensively on the Fort Lowell-Adkins Steel property. For this archaeological mapping, sub-meter precision GPS receivers were used, and raw L1 GPS positions were differentially corrected with local L1/L2 static data. Complementing the mapping, GPS data collectors were used to record metric and attribute data about modern and historical features. The instrument data are supplement with scaled illustrations of some Fort Lowell ruins. These drawings are rectified to local mapping nails which were measured with sub-centimeter GPS. Instrument data were compiled into a Microsoft Access database and Autodesk Autocad drawing files for final digital cartography and GIS development.

The remote and instrument mapping are components of a larger GIS for Fort Lowell. The modern and historical geography frames this historic resource within its wider context. The Pima County Land Information System (PCLIS) provided considerable mapping and information for the Fort Lowell GIS. The Pima County data model the current geographic, political, and physical setting of Fort Lowell. AZSITE, Arizona's online archaeological database, was queried. These data help illustrate the archaeological context of Fort Lowell, which is one of many resources in the immediate area. The historic context for Fort Lowell is derived from many sources. Multiple maps, illustrations, oblique and aerial photographs, and descriptions were obtained from AHS and Historic American Building Survey archives. The GIS was supplemented with additional data from various public and professional publications. Compiled as an integrated system, these multiple streams of spatial and attribute data are the foundation for the project's maps. However, these maps are a static representation of a more dynamic GIS model for historic Fort Lowell.

Mapping Results

The mapping program at Fort Lowell produced a detailed cartographic record of the historic property and developed an integrated GIS dataset to assist with future management and planning. The Fort Lowell-Adkins Steel property was subject to intensive field mapping, which documented historic remains associated with Fort Lowell and post-military use of the property. As a whole, this mapping project constitutes the first modern, precision cartography generated for the Fort Lowell historic site. In addition to the generation of new mapping data, other existing sources were compiled into an integrated GIS.

Complementing their documentary nature, maps produced as a part of this project illustrate modern and historical relationships on the property and provide a wider geographic framework for historic Fort Lowell. Many illustrations throughout this report graphically present the history and archaeology of Fort Lowell and the Fort Lowell-Adkins Steel parcel. Additional maps illustrate the context of this resource and the relationship of historic Fort Lowell to modern Tucson. These maps are graphical data which can be used as a planning and management tool. Many of these maps are analytical in that they summarize the quantitative data and their spatial distribution.

The relationship of historic Fort Lowell and the modern park and historic district are illustrated in

Figures 24 and 25. The base data were derived from photogrametric mapping, while the Fort Lowell features were compiled from and cross-checked against multiple historic sources and illustrations. The many historical maps of Fort Lowell vary in accuracy and detail, but most are clearly redrawn from a single source, the 1876 map of Camp Lowell (AHS 12880). The two synthetic figures convey the importance of the Fort Lowell-Adkins Steel property relative to the preservation of historic Fort Lowell. Clearly, portions of the historic fort have been damaged or destroyed by modern development and improvements to Fort Lowell Park.

The natural context of the Fort Lowell Historic District is shown in Figure 26. [redacted] The historic district is optimally located at the head of the Rillito River at the confluence of Pantano Wash and Tanque Verde Creek. The area is characterized by rich alluvial soils of the Qt3 terrace, and is protected by its relatively high elevation above the flood-prone Qt1 landform. Soils south of the Rillito-Tanque Verde drainage are typical of overbank alluvium, while north of the drainages, deposits are derived from the bajada of the Santa Catalina Mountains.

Patterns of modern land use are illustrated in Figure 27. This map shows current land ownership and zoning for the area around the Fort Lowell Historic District. Fort Lowell is located on the margin of urban Tucson and more suburban Pima County. The district and adjacent parcels fall under various historic zoning designations, while the vast majority of land around the district is privately owned, residential property. City of Tucson holdings include much of the Fort Lowell Historic District, with limited properties along drainage easements. Similarly, Pima County has relatively limited holdings, which consists primarily of properties along the Rillito River Park. Public lands also include parcels adjoining the major water courses that are maintained for public use and flood protection.

Reflecting its location on the margin of Tucson, modern land use is variable around the Fort Lowell Historic District. Relatively dense commercial, office, and residential properties are intermixed west and south of the district. To the north and east, properties are zoned for dispersed residential and suburban ranch development. Assessed property values reflect a similar pattern (Figure 28). Parcels west and south of the historic district maintain relatively high property valuations typical of office and commercial properties. Lands north and east reflect notably lower property valuations, consistent with larger land parcels and limited residential construction.

Assessment of the Historic Cartography

Fort Lowell has been mapped on numerous occasions. These maps, which date to occupation of the fort and afterwards, are useful in developing the modern cartography for this cultural resource. The archival sources vary considerably in quality, utility, and accuracy, but together, they offer multiple lines of evidence for understanding the organization, arrangement, and function of this historic military facility. The historic Fort Lowell cartography consists of instruments maps, schematic or sketch maps, and oblique aerial photography. None of the data sources are georeferenced and, at best, minimally reference the public land survey system. Translating historic planar survey into coordinated geodetic cartography presented some challenges.

Because so little of the overall fort remains today, very few co-occurring points tie the historic data to the modern ground surface. Only three locations are suitable for defining a basis of control, bearing, and scale factor for the historical cartography. Although its configuration has been altered since initial construction, the quartermaster and commissary storehouse retains sufficient spatial integrity to function as a control location. Officer's quarters no. 3 remains in sound condition, as do remnants of officer's quarters no. 1 and no. 2, and their kitchens provide a second location for geodetic control. Preserved ruins of the hospital facility theoretically provide a third control location, but in practice, it was found that the earliest map of the fort depicted a hospital location that was slightly in error. This error has perpetuated through the historic chain of mapping, and the hospital is unsuitable as a horizontal control.

In testing multiple geodetic hypotheses, an important *a priori* fact became obvious. The parade ground is, in fact, the seed by which the entire fort was arranged and organized. The parade ground was laid out 750 ft (east-west) by 500 ft (north-south), as defined by the southwestern corner of the quartermaster and commissary storehouse, the northwestern corner of officer's quarters no. 1, the northeastern corner of officer's quarters no. 7, and the southeastern corner of the infantry company quarters. Identifying the parade ground as the pertinent dimension and unifying element defines a knowable scale factor for historic cartography, identifies testable angular measurements for the basis of bearing, and provides points to define a basis of horizontal control. Despite a lack of preserved Fort Lowell buildings, a sufficient number of linear and angular relationships within and between existing historic features could be measured to accurately georeference the parade ground and, in turn, the fort.

The earliest depiction of the post is an 1876 military "Map of Camp Lowell" (AHS photograph

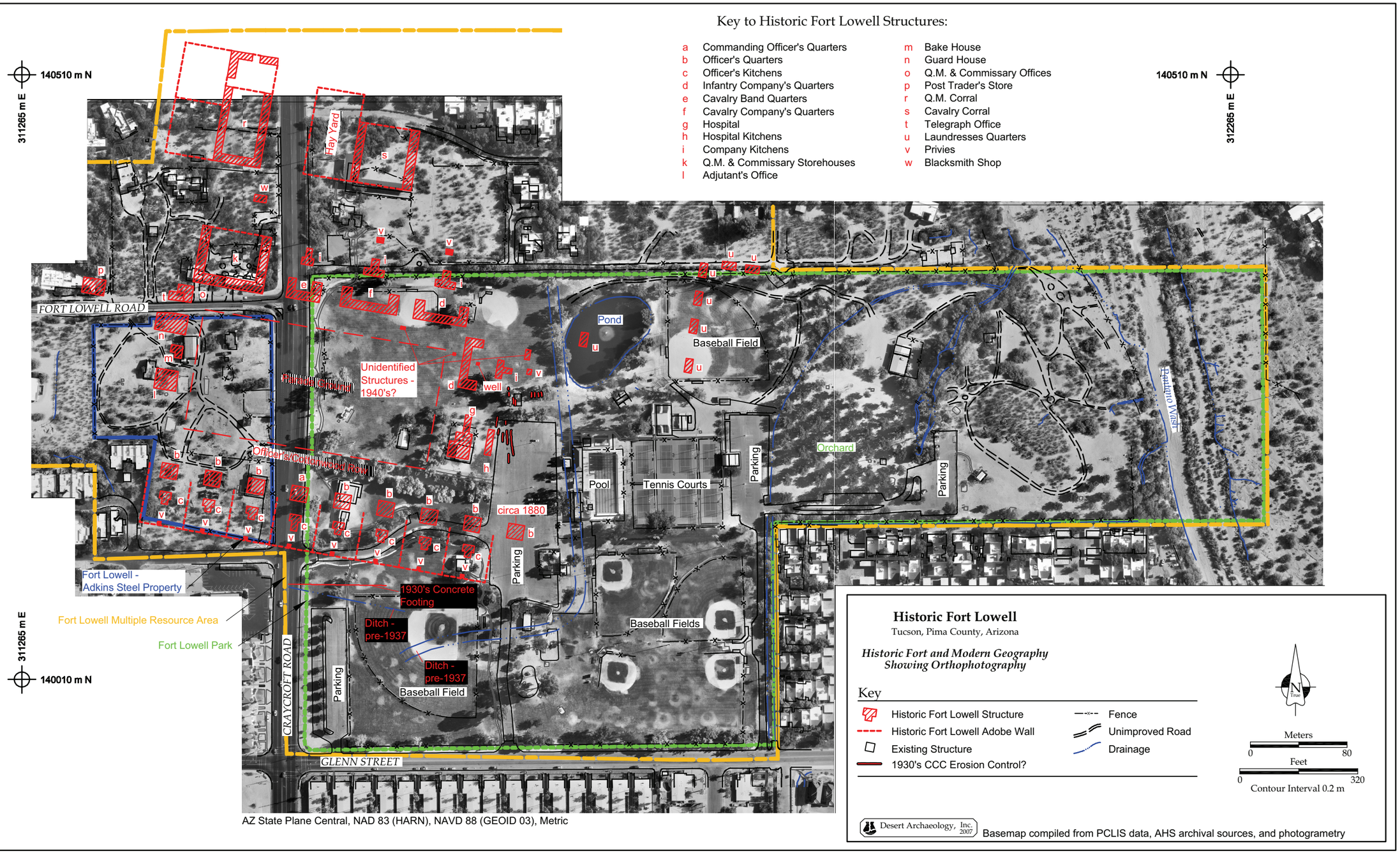

Figure 24. Map illustrating the relationship of modern features and historic Fort Lowell on aerial photograph background.

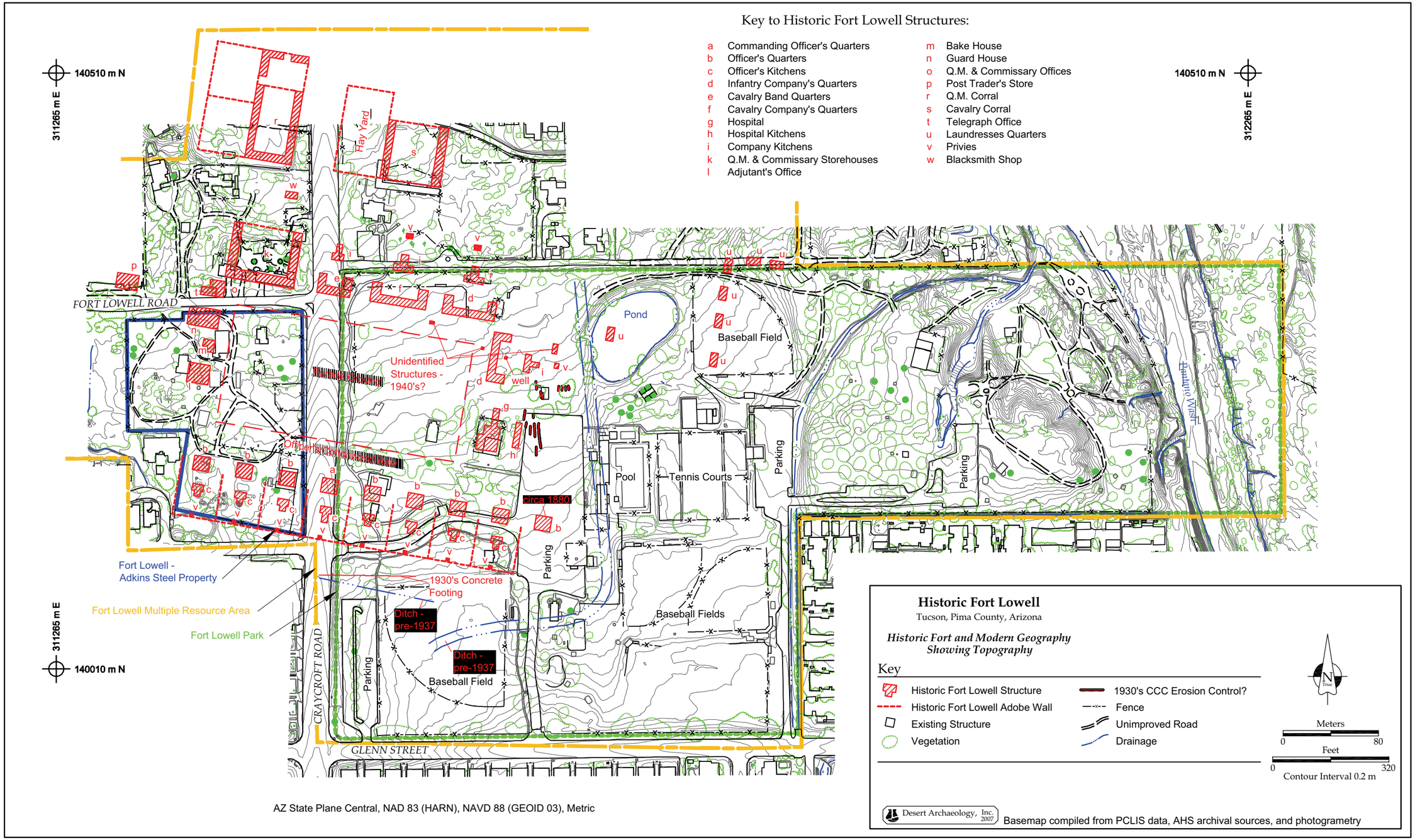

Figure 25. Map illustrating the relationship of modern features and historic Fort Lowell, showing existing topography.

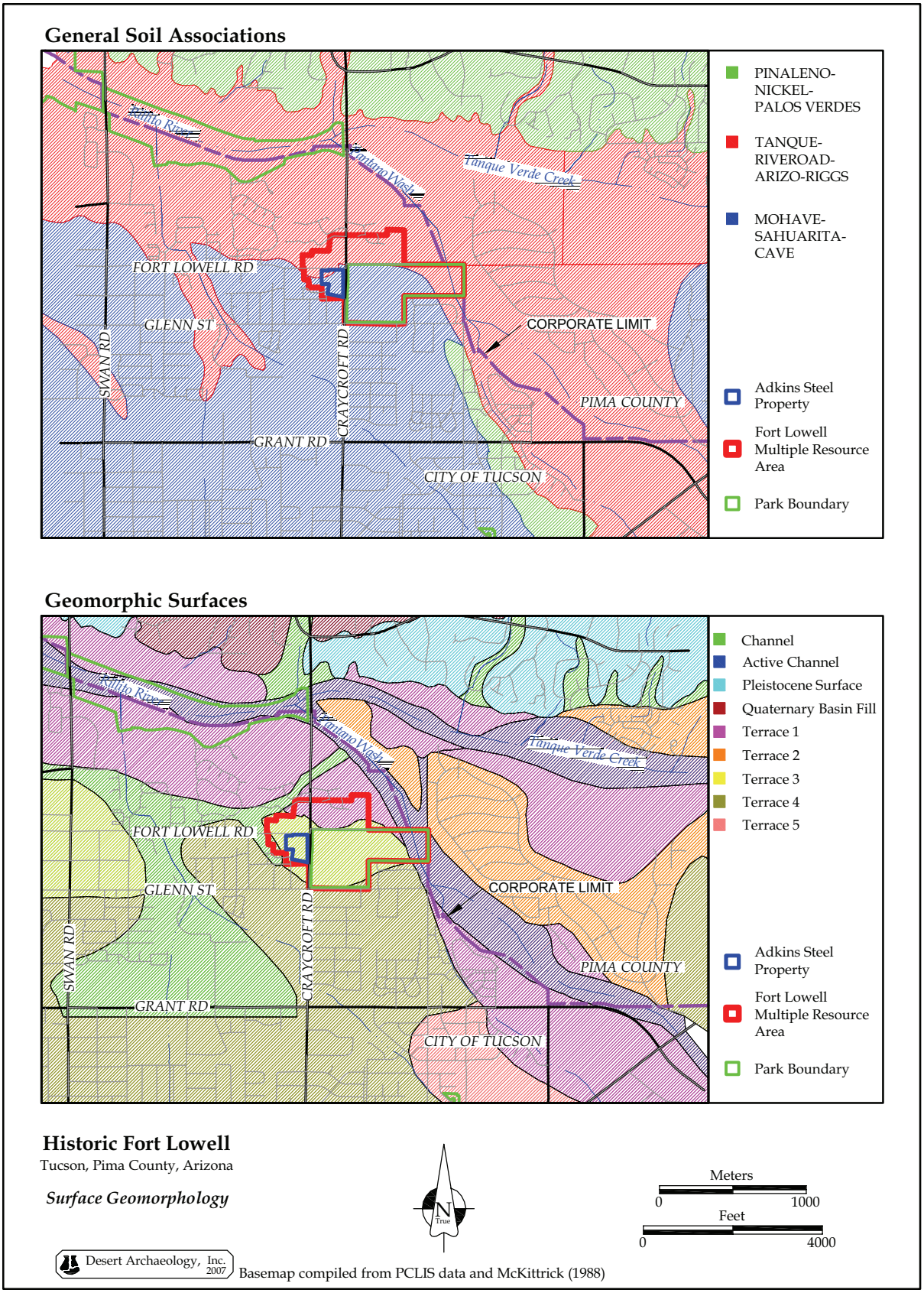

Figure 26. Surface geomorphology of the Fort Lowell area.

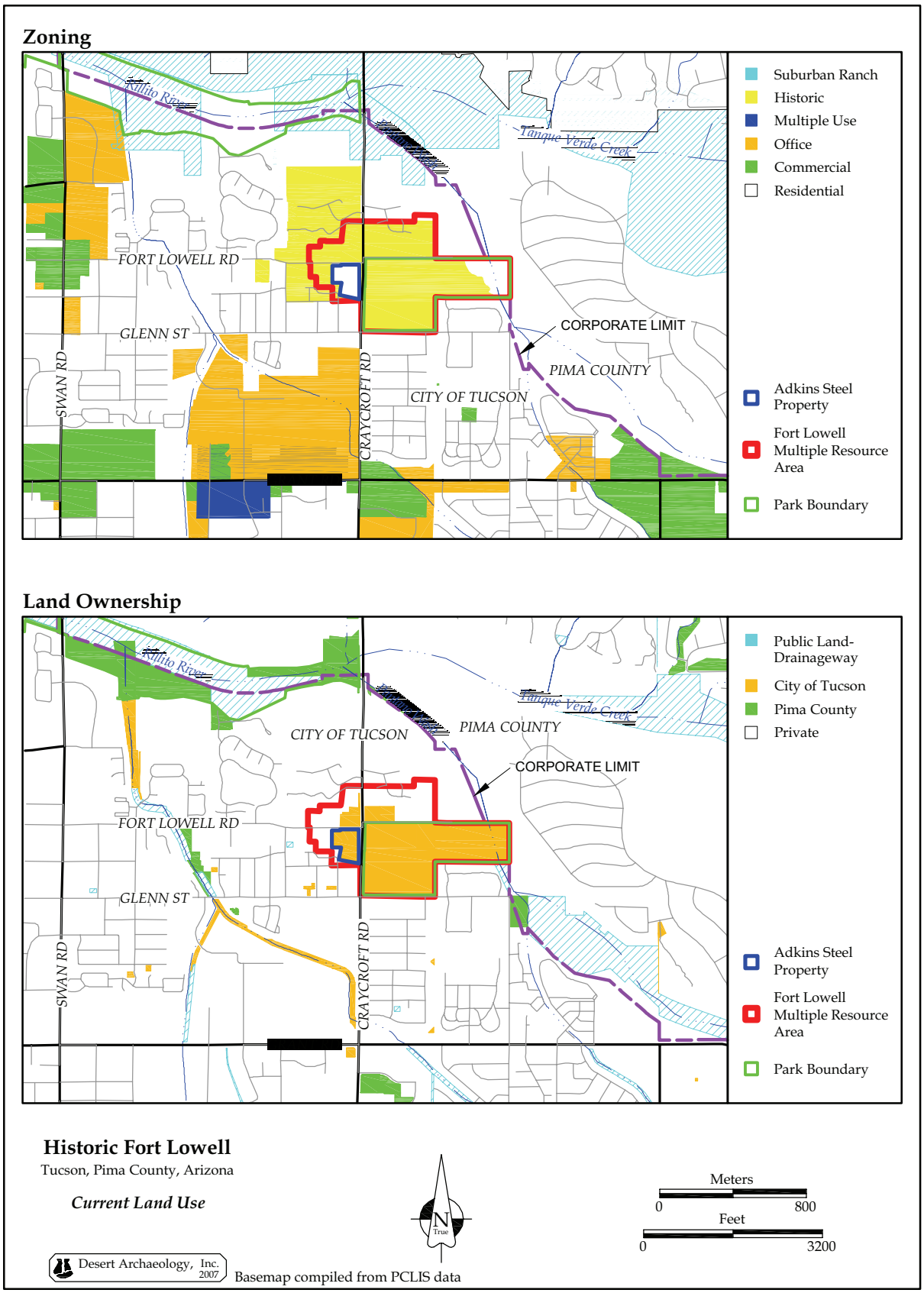

Figure 27. Current land use of the Fort Lowell area.

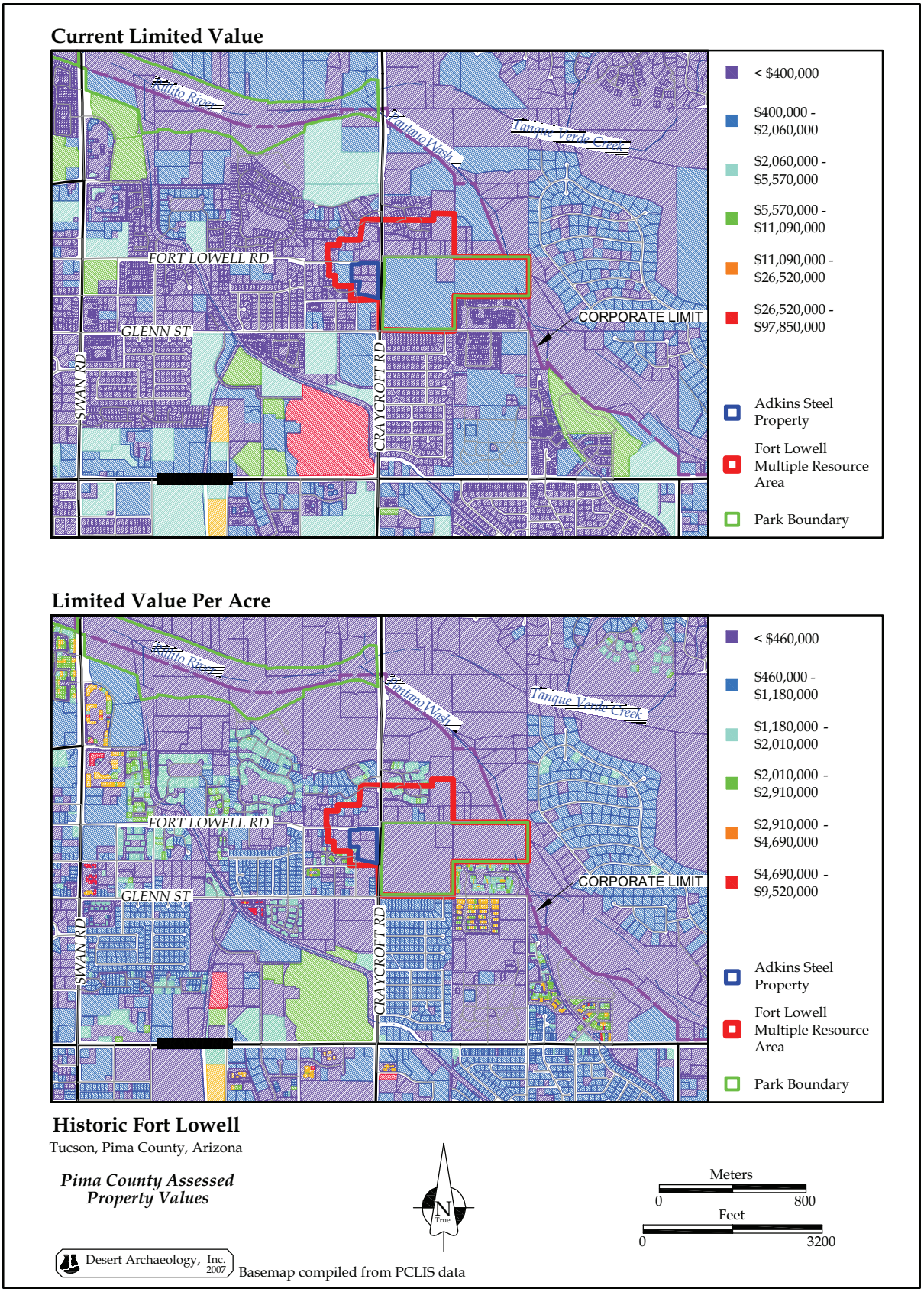

Figure 28. Current assessed property values around Fort Lowell.

12880). The derivation of this map is unknown, but it was likely produced using combined ground instrument measurements and measured sketching. Reproduced using a diazo process, the blueprint is a negative facsimile of the original hand-drawn illustration. Reflecting the technology of the times, the quality of this blueprint reproduction is marginal. This early map is one of the most accurate and complete representations of Fort Lowell, and is the only historical depiction that shows the arrangement of interior walls within the primary structures. Estimated error translating this map to the project area geodetics is less than 1 degree of angle, 0.5-1.0 m of horizontal error, and 0.5 percent scale factor error. This falls within the tolerance expected from the late nineteenth century mapping approach. When compared with the modern mapping of extant Fort Lowell features, there is a obvious schematic nature to this early map. Identifiable errors include the location of the hospital facilities and idealized relationships between sets of related structures. Within the officers "compounds," the domestic quarters are depicted correctly, while kitchens, privies, and the enclosing southern wall are not shown in their actual locations, but rather, are approximate relationships. However, these factors have little effect on the utility of the documentation.

The 1876 map is one of only two maps that can be considered as primary source documents, with the other being a 1937 base map of "Fort Lowell State Park" drafted for the National Park Service (AHS photograph 12887). Likely produced with similar tolerances as the 1876 map, the majority of the 1937 linework was copied directly from the earlier "Camp Lowell" map. The 1937 version is consistent with the early map, but includes additional military features apparently not mapped in 1876. Further, the 1937 illustration adds to the original fort map with the inclusion of "modern" geophysical features such as topography, roads, vegetation, and cadastral boundaries. Regarding the mapping of the military installation, the main difference between the two versions is that the adobe walls enclosing the officer's quarters into individual compounds are only shown on the 1937 Park Service map. There are very minor discrepancies as to the sizes and locations of a few individual buildings, but both maps fall within an acceptable tolerance for hand-illustrated maps of this scale.

All other historical maps for Fort Lowell are either derived from the 1876/1937 maps and/or are of questionable quality. The undated Philip Contzen sketch, probably from around the turn of the century, is one such example. Compared with multiple sources of data (maps, photographs, and existing building remains), the Contzen "map" has almost no basis in reality other than being titled "Ruins of Camp Lowell." This map has no utility beyond its historic association with the Fort Lowell military post and Arizona cartographer Philip Contzen. The Historic American Buildings Survey (HABS) study at Fort Lowell produced several illustrations of the post. Like the Contzen map, however, the precision of the 1940 HABS ground plan of Fort Lowell is questionable. This map is a reasonable schematic of the fort but lacks the detail and accuracy of the 1876 and 1937 illustrations. The focus of the HABS study was architectural rather than cartographic, so it is not surprising that the overview map was representative in nature while the architectural plans and elevations of officer's quarters no. 3 are exceptional illustrations.

The final pertinent map of Fort Lowell is a compilation produced by Don Bufkin (Peterson 1976). Although this map seems to have been derived from the 1876 and/or 1937 maps of Fort Lowell, there are notable discrepancies. First, the layout of buildings within the quartermaster and cavalry corrals at the northern end of the post vary considerably between Bufkin and the earlier maps. As the primary cartographic sources, one has to err toward the reliability of the 1876/1937 maps; however, lacking Bufkin's chain of evidence, the issue cannot be resolved with current data. Similarly, Bufkin identifies a series of small outbuildings northeast of the parade ground as "married non-commissioned offices quarters," while the 1876/1937 maps show these structures as "laundresses quarters." These structures are laid out with the orientation and spacing of the overall fort plan, which argues circumstantially that these could have been NCO quarters. It seems unlikely that the "support camp" would be laid out with the same rigor as the main post, but there is not sufficient data available to confidentially identify these ancillary structures. Further, Bufkin depicts a blacksmiths shop located between the storehouse and the quartermasters corral. The source of this feature is unknown, as neither the 1876 nor the 1937 map show a structure in this location. Another unexplained variation is that Bufkin's "circa 1880" map depicts only seven quarters along Officers Row, while by 1876, eight of the nine structures had been constructed. It is unknown if this was an oversight, or if Bufkin was attempting to depict the initial construction of the post.

The final element contributing to the historic cartography of Fort Lowell are a series of oblique aerial photographs probably dating to the 1940s. One photograph is a very oblique overview of the entire Fort Lowell installation (AHS PC177, F74-192), and two are overlapping, only slightly oblique images showing the eastern margin of the parade grounds and its encircling structures (AHS PC177, F74-188 and 195). Due to the highly oblique perspective, the over-

view has little utility as a mapping tool, but the other two images are suited to photogrametry. Lacking the lens parameters from the camera and adequate horizontal ground control, rectification represents a best fit with the 1876/1937 mapping data and a few remaining Fort Lowell ruins preserved at the east end of the parade ground. These rectified images provide a cross-check against the historic maps and provides a unique perspective on the "ruins" of Fort Lowell.

Several observations stem from the georeferenced aerial photographs. First, several small structures appear on the photographs that are not shown on the historic maps. These could have been constructed after the abandonment of the fort, but their appearance is consistent with the ruins of other Fort Lowell buildings. Perhaps the "best" historical maps of Fort Lowell are, in fact, incomplete regarding many small details. Second, the aerial photographs confirm an observation made during the rectification of the 1876 and 1937 maps; that is, the hospital and its kitchen are misplotted by 5-10 m south of their actual locations, and similarly, mapping represents the infantry company kitchen about 10 m west of its real location. Although not entirely conclusive due to its location along the extreme margin of the photographs, the north-south drainage ditch shown on the 1937 map actually runs slightly west of north. These discrepancies are minor, however, considering the original fort map is over 130 years old, and a "record of survey" was never the intent. The aerial photographs generally confirm the accuracy of the 1876 map, but serve as a reminder that the cartographic depiction is somewhat idealized and incomplete.

The third element contributed by the aerial imagery concerns officer's quarters nos. 8-9. Both were built sequentially late in the history of the fort. Quarters no. 8 is often shown on historic maps, while no. 9 is not depicted on any of the illustrations. The aerial photograph can only weakly support the presence and inferred location of no. 9. Perhaps as a reflection of construction methods or materials, nos. 8 and 9 reflect accelerated structural decay compared with the other quarters. Quarters 5-7 appear as both standing walls and adobe wall melt, no. 8 is mainly as intact wall melt defining exterior and interior wall alignments, while no. 9 is the most ephemeral, and walls appear almost entirely deflated to a small topographic rise.

The fourth piece of information provided by the photogrametry consists of parallel, linear features east of the hospital and infantry barracks. These undefined features have much the same appearance as melted adobe walls, but are not associated with any of the known fort buildings. The unconfirmed explanation is that these features are erosion-control features constructed by the Civilian Conservation Corps during the 1930s, as a part of stabilizing the ruins. The final inference stemming from the photogrametry relates to vandalism and/or bottle hunting. When these images were captured during the 1940s, there were clearly some potholes and small-scale diggings into the ruins of abandoned structures.

SIGNIFICANCE ASSESSMENT

National Register of Historic Places

The National Register of Historic Places (National Register) is the nation's inventory of historic sites. It was established after the passage of the National Historic Preservation Act of 1966 to promote preservation and study of historic resources. Most projects involving federal agencies, federal land, or federal funds require evaluation and mitigation of their impacts on properties eligible for the National Register. In addition, many state and local laws, ordinances, and regulations require similar evaluations.

For a property to be listed in the National Register, it must meet integrity requirements and at least one of four significance criteria. These criteria are summarized in Table 7. An important aspect of significance is a property's historic context (cultural affiliation and dates of use). If a historic context cannot be established, or if the property cannot be shown to be significant within its historic context, it does not meet eligibility requirements for inclusion in the National Register. Further, except in special circumstances, properties must be at least 50 years old to be considered for inclusion in the National Register.

Significance of the Fort Lowell-Adkins Steel Property

As noted, the Fort Lowell Multiple Resource Area was nominated to the National Register of Historic Places in 1977, and was listed on the National Register on 10 April 1978. At that time, the Fort Lowell-Adkins Steel property was included within the Fort Lowell Multiple Resource Area, with the Adkins-related buildings considered an intrusive element. It is now recognized that several of the Adkins buildings and structures are likely to be contributing elements to the Multiple Resource Area, due to their design characteristics and date of construction.

The Fort Lowell-Adkins Steel property meets eligibility requirements for inclusion in the National Register under Criterion A for the events associated

Table 7. National Register eligibility criteria (Code of Federal Regulations, Title 36, Part 60).

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
A. That are associated with events that have made a significant contribution to the broad pattern of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

with Fort Lowell that have taken place on the property, under Criterion C for the distinctive architectural elements of the best-preserved officer's quarters and possibly for the 1932 Adkins family home, and under Criterion D for its potential to yield significant information about prehistoric life and the history of Tucson. The property is potentially eligible under Criterion B, due to its association with Fort Lowell officers (including Gilbert Smith), but additional research to identify other residents of officer's quarters nos. 1-3 is necessary before making this determination.

Criterion A

Fort Lowell (Camp Lowell until 1879) was in operation from 1873 through 1891, at its location just south of the Rillito River. During this time, it served as supply depot for other military posts in southern and central Arizona. Soldiers from the fort participated in numerous raids against hostile Apache Indians, leading to their pacification in the 1880s. Miners, ranchers, farmers, and new communities developed throughout southern Arizona as a result of these military activities.

Criterion C

Officer's quarters no. 3 is the best preserved of the original Fort Lowell buildings. It was constructed in 1873-1875, and was occupied by officers until 1891. Afterward, it was occupied by squatters, the Cate and Adkins families, and by residents of the tuberculosis "rest home." One aspect of this continuous occupation has been the preservation of many of its original details, including saguaro rib ceilings, windows, doors, and woodwork.

The 1932 Adkins family house, located on the northeastern portion of the property, along with the adjacent steel barn, the windmill stand, and the elevated water tank, may also be eligible as examples of vernacular architecture. The home, barn, and water tank were all constructed by members of the Adkins family. As a unit, they provide a sense of how the property was used during the post-American Statehood era.

Criterion D

Previous archaeological work within Fort Lowell Park, east of Craycroft Road, has shown that significant subsurface cultural resources are present dating to the prehistoric, fort era (1873-1891), and post-fort era times. These include prehistoric pit structures, pits, and human burials, as well as structures, borrow pits, trash-filled pits, and other fort remains. Excavation of privy pits in 1960 located artifacts discarded by Mexican-American residents living in the fort after its abandonment. Similar features are likely located on the Fort Lowell-Adkins Steel property. These features would have the potential to provide significant information about the prehistoric and historic occupation of the area. Several research questions could be addressed through the study of prehistoric archaeological resources, including creating a better understanding of the overall chronology of the Hardy site, examining changes in the structure of the Hardy site through time, and an examination of the role of the site within the greater Tucson Basin. Historic research issues include examining how closely the construction techniques used at the fort compare with those reported in official military documents, what types of material culture and food were consumed by residents of the officer's quarters, and what life was like for residents of the Cate/Adkins rest home.

PROJECT EFFECT

Following the acquisition of the Fort Lowell-Adkins Steel property, Pima County coordinated the

cleanup and removal of debris from the project area. Pima County is also planning emergency measures to halt the decay of the Fort Lowell-era structures and ruins. Pima County and the City of Tucson have not yet finalized plans for future use of the property.

RECOMMENDATIONS

There is a high likelihood that subsurface archaeological resources dating to the Prehistoric era, the Fort Lowell-era (1873-1891), and the post-fort era (1891-1957) are present on the property. Desert Archaeology, Inc., recommends that any ground-disturbing activities be preceded by archaeological testing, or if limited impacts are perceived, by archaeological monitoring.

Condition of the Resources and Recommendations for Their Protection, Preservation, and Management

Ground-disturbing activities have likely disturbed some of the prehistoric and historic cultural resources on the property, including construction of the various buildings and concrete slabs present along the northern two-thirds of the Fort Lowell-Adkins Steel property. Surface indications of major disturbances are not visible, and it appears that the Adkins family did not undertake significant work that damaged subsurface cultural resources. Desert Archaeology recommends that any minor ground-disturbing activities be monitored and that any major ground disturbances be preceded by archaeological testing. This will insure the preservation and documentation of any subsurface resources.

A variety of buildings and structures are present on the Fort Lowell-Adkins Steel property. Fort Lowell-era resources include the eight visible buildings or structures (officer's quarters nos. 1-3, kitchens for no. 1 and no. 2, the privy for officer's quarters no. 3, the adobe wall between no. 2 and no. 3, and the guardhouse). Only officer's quarters no. 3 is well preserved; the remaining buildings are in various stages of decay. Pima County is currently stabilizing and capping the standing adobe walls, and this will prevent their further erosion until a management plan has been developed for the park. Building Condition Assessments have been completed for buildings within the Fort Lowell-Adkins Steel property by Arthur Stables of Burns-Wald Hopkins Architects.

Pima County should consider a more aggressive approach to the stabilization of the adobe walls within the greater Fort Lowell Park. This would include the preparation of baseline documentation for each structure, an assessment of stabilization needs, stabilization, and regular (perhaps annual) re-evaluation and maintenance.

Buildings and structures from the Cate/Adkins occupation of the property are present, mostly along the northern two-thirds of the property. These resources are in varying states of preservation. The western adobe house is in poor condition, with collapsed walls and a leaking roof. The Adkins family home, the steel barn, and the nearby water tank are among those in excellent condition. Pima County should maintain the Cate-/Adkins-period structures in their current condition until the Fort Lowell Park master plan is developed and decisions regarding the maintenance or demolition of these structures is finalized.

Archaeological Research

Previous archaeological projects and the activities of artifact collectors have resulted in the recovery of large numbers of prehistoric and historic artifacts from within Fort Lowell Park. Many of these are now housed in Tucson-area museums. It is recommended that an inventory be prepared for the artifacts housed at AHS, the Fort Lowell Museum, and ASM.

The following information would be collected for each accession:

- accession numbers;
- date of accession;
- name of collector(s);
- where collected;
- material types, quantity, functional categories, and date of artifacts;
- whether analyzed and, if analyzed, bibliographic references;
- potential of unanalyzed collections to provide data; and
- identification of exhibit quality artifacts.

The artifact information would be included in a report summarizing all previously published and unpublished archaeological excavations. Particularly pertinent are the 1960 efforts of Alfred Johnson, which has never been formally published. Dave Faust of the Fort Lowell Museum may also be able to identify areas where artifact collecting has occurred within the park.

MONITORING AND DISCOVERY PLAN FOR THE FORT LOWELL-ADKINS STEEL PROPERTY WITHIN HISTORIC FORT LOWELL, TUCSON, PIMA COUNTY, ARIZONA

PLAN OBJECTIVES

This plan has three primary objectives:

(1) to ensure the proper treatment of any human remains that might be impacted by the project;
(2) to document any cultural materials and features exposed during the excavations; and
(3) to assess the effect of modern disturbance in the project area.

PROJECT AREA

The monitoring project area is the Fort Lowell–Adkins Steel property, located at the southwestern corner of Craycroft Road and Fort Lowell Road. Previous archaeological and historical research, described in this report indicates that subsurface cultural resources dating to the prehistoric Hohokam and American Territorial period are likely to be present on the property.

RESEARCH QUESTIONS

Deposits on the Fort Lowell-Adkins Steel property have the potential to provide information about the prehistoric occupation of the Hardy site, AZ BB:9:14 (ASM), the lifestyles of military officers and other fort personnel between 1873-1891, and the activities that took place during the Cate and Adkins family use of the property as a sanatorium.

For the Prehistoric era, basic questions about the Hardy site remained unanswered. When was the site occupied? Was it continuously occupied, or were there times when the site was vacant? What kinds of activities took place at the site? Is there evidence for organization of the community?

Fort-era features and artifacts have the potential to provide information about everyday life at historic Fort Lowell, AZ BB:9:40 (ASM). What kinds of material culture did the officers have? What sorts of rations were provided to the prisoners in the guard house? Did the diet of the officers and the prisoners differ dramatically? The extensive documentary record available for Fort Lowell at the National Archives and elsewhere provide answers to some of these topics. Archaeological finds could provide an opportunity to examine these issues from a different perspective.

Finally, artifact-filled features may be present from the use of the property as a tuberculosis rest home by the Cate and Adkins families. These items could provide information about medical treatments, sanitation, and other aspects of the care of sick individuals at the sanatorium.

PREPARATION

Because the project area lies inside a recorded archaeological site, a monitoring permit will be acquired prior to planned ground-disturbing activities. At least 1 week will be required to obtain an Accession Number once a notice to proceed has been issued and submitted to ASM.

Human remains may be discovered during the course of the construction project. In 1990, the State of Arizona passed two laws to provide protection for human remains and associated artifacts located on private or state lands. These were the *Discovery of Human Remains, Sacred Ceremonial Object, Object of National and Tribal Patrimony* (Arizona Rev. Stat. 41:844) and *Disturbing Human Remains or Funerary Objects on Lands Other Than State Lands* (Arizona Rev. Stat. 41-865).

The laws provide guidelines to follow should human remains be discovered during the course of ground disturbing activities. ASM coordinates consultations under the state laws relating to the discovery of human remains.

Prior to initiating the monitoring phase of the project, Desert Archaeology, Inc., will notify ASM of the proposed work and handle any burial discoveries on a case-by-case basis.

NOTIFICATION

Contractors should notify Desert Archaeology, Inc., at least one day prior to any excavation associated with the project. Excavation is defined as ground disturbance of any sort, and to any depth. Desert Archaeology will provide a qualified archaeologist to oversee progress and to determine if an archaeologist must be present during or after excavations.

Once initiated, monitoring will proceed on an as-needed basis. It is extremely important that any contractors working on the project be notified about the need for an archaeological monitor during all ground-disturbance activities. As work progresses, it will be the responsibility of the City of Tucson, Pima County, and all contractors to keep the archaeological monitor informed of the work schedule and any changes therein.

EXCAVATION MONITORING

The goal of a monitoring project is to preserve useful information about archaeological materials that might otherwise be destroyed. Collection of artifacts observed during monitoring and the careful recording of archaeological features contribute to this

goal. The amount of effort proposed for the current project is consistent with the limited impacts of the proposed construction work. It is, however, designed to maximize the collection of information that can be used to address the research issues outlined above.

During excavation, the archaeological monitor will observe progress, visually inspect backdirt (where possible), and collect any significant artifacts. Additionally, notes will be taken on sediment types encountered. Once excavations are open and complete, the archaeological monitor will inspect the walls of the excavated area for signs of artifacts or features. To expose a clear cross section, the sidewalls will be scraped with a trowel. If features are located, the monitor may temporarily halt excavation to record features.

Desert Archaeology, Inc., will also collect and tag selected architectural elements from the ruins of several structures. These items will be stored in the steel barn at the property and will not be submitted to ASM. The items collected will include door, window, and trim elements, beams and other interior construction elements, and other items that will be used in the proposed reconstructions or that will provide information to allow certain elements to be replicated.

LIMITED FEATURE EXCAVATION

If significant subsurface remains are encountered, additional effort may need to be allocated to limited archaeological excavation. The decision to excavate a feature will be based on an assessment of the feature's integrity and how it relates to features previously excavated in the area.

To obtain a useful sample of materials from features and to determine feature form and function, rectangular excavation units may be placed over selected features that have been exposed during construction. The size of the excavation units will be determined by the type of feature and the depth of deposit. Typically, rectangular 1-m by 1-m or 1-m by 2-m units are used. Smaller features, such as trash pits, which are often smaller than the 1-m by 1-m or 1-m by 2-m units, may be bisected and one-half excavated. These units will be excavated in stratigraphic levels when possible and screened through l/4-inch mesh. When natural stratigraphic breaks cannot be discerned, features will be excavated in 6-inch levels. Flotation samples will be collected from each stratum within cultural fill, and artifacts will be collected for analysis. In most cases, it will not be necessary to suspend construction activities in other areas during these excavations, and additional archaeologists will be provided by Desert Archaeology, as needed.

DATA RECOVERY AND RECORDING

Any cultural features exposed will be drawn in profile to scale, and artifacts may be collected from the excavation walls. Detailed information about the locations of project exposures and the stratigraphy of each exposure will be recorded regardless of whether any cultural deposits are encountered. Any archaeological materials that are encountered, including prehistoric materials, will be assigned a new site number.

DISCOVERY SITUATIONS

Should any subsurface cultural materials be encountered within 15 ft of standing buildings, work should be temporarily halted in the applicable construction area so that an archaeological monitor can evaluate the materials and make proper records. If extensive or significant archaeological materials are encountered in a portion of the project area previously deemed to have low potential for cultural materials, Desert Archaeology may consult with ASM, the City of Tucson, Pima County and other involved parties to formulate a treatment plan that will allow construction work to resume as quickly as possible.

BURIAL TREATMENT

Any human remains encountered during fieldwork will be treated in accordance with the burial agreement developed for the project. If human remains are encountered during construction, or if they are suspected based on feature characteristics or artifacts, work must be discontinued in that area until appropriate measures can be taken. This may take up to several days, but work may continue elsewhere during the delay.

ARTIFACTS

Recovery of a limited quantity of diagnostic artifacts and specimens for special analysis is anticipated as a result of the monitoring efforts. Artifacts will be cleaned and otherwise processed in accor-

dance with ASM curation standards, then analyzed using established procedures. In keeping with currently accepted practice, cleaning will be minimized to avoid potential inadvertent loss of data.

Artifact types that may be collected during monitoring include ceramics, flaked stone, ground stone, animal bones, macrobotanical remains, shell, historic ceramics, glass, metal, and other historic items. These items will be analyzed by specialists in each of the respective artifact types. Minimally, this analysis will involve identification of all artifacts, classification to the level of accepted practice, and comparison with similar assemblages from other sites. When possible, the resulting data will be examined in relation to the research issues outlined above.

Except any materials that may be repatriated to affiliated groups, all project materials and documentation will be submitted to ASM following acceptance of the final report. Materials to be curated include artifacts, processed non-artifact samples, original field notes, maps, analysis records, photographs, negatives, and related materials.

REPORT PREPARATION

A monitoring/data recovery report that documents all findings will be prepared following completion of the field effort and analysis. Included in the report will be a description of the stratigraphy encountered across the project area, detailed descriptions, locations, and profiles of a representative sample of cultural features found, and descriptions of any artifacts recovered. The report will also include an updated ASM site card if any new materials are encountered. Copies of the report will be provided to Pima County and the City of Tucson. Copies of the monitoring/data recovery report will also be submitted, along with other project materials and collections, to ASM for permanent curation.

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