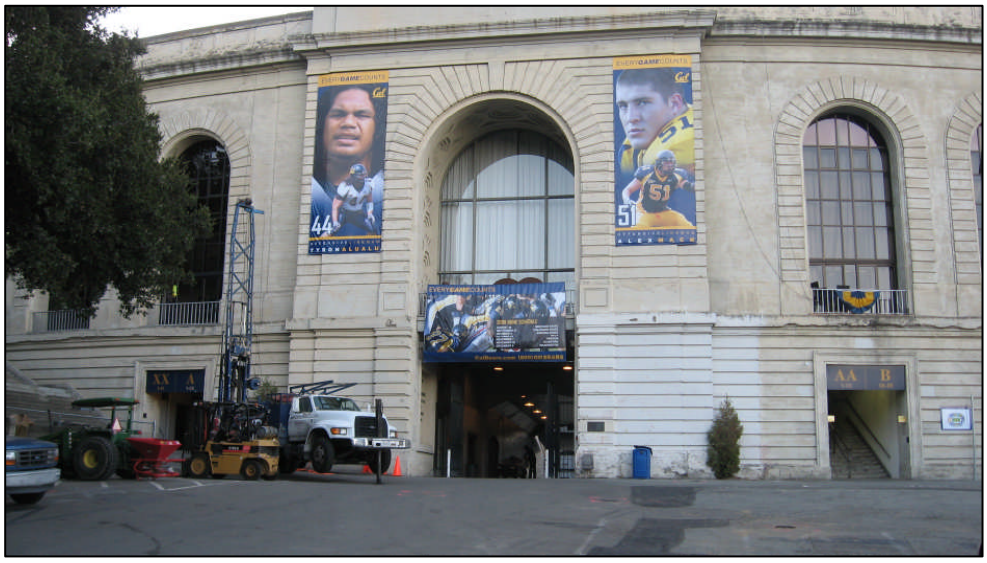
Geoarchaeological Testing Report
for the
University of California, Berkeley
Student Athlete High Performance Center,
Alameda County, California



Prepared for:

University of California, Berkeley
Capital Projects
1936 University Avenue
Berkeley, CA 94704

Prepared by:
William Self Associates, Inc.
P.O. Box 2192
Orinda, CA 94563
(925) 253-9070

December 2008

Geoarchaeological Testing Report for the University of California, Berkeley Student Athlete High Performance Center, Alameda County, California

Prepared By:
David Buckley, B.A., Angela Cook, B.A., Allen Estes, Ph.D.,
Paul Farnsworth, Ph.D., and Nazih Fino, M.A.,

Submitted By:
James M. Allan, Ph.D.
Principal Investigator

Project No. 2008-53
Report No. 2008-60

WSA

December 2008

Cover Photo: View of Memorial Stadium from parking lot, view southeast.

TABLE OF CONTENTS

List of Tables

List of Figures

Appendices

Management Summary

The University of California, Berkeley contracted William Self Associates, Inc. (WSA) to conduct subsurface geoarchaeological testing for the University of California, Berkeley, Student Athlete High Performance Center (SAHPC) in Berkeley, Alameda County, California, as part of the pre-construction cultural analysis and mitigation process. The proposed SAHPC will be located adjacent to California Memorial Stadium and will provide training and academic resources and facilities to University sports programs.

WSA conducted archival and records research, developed and implemented a subsurface testing plan, and analyzed core samples recovered during testing. The results of this effort are presented in this Geoarchaeological Testing Report

On behalf of WSA, staff at the California Historical Resources Information System, Northwestern Information Center (NWIC) at Sonoma State University conducted a records search to identify known cultural resources and previous cultural resources studies in or within ½-mile of the project area. The search revealed one site within the project area, and 10 within a ½-mile radius. No previous studies have been conducted within the project area, and 20 have been conducted within a ½-mile radius.

Consultation with the Native American Heritage Commission (NAHC) in Sacramento provided a list of Native American individuals and tribal representatives with potential information on cultural resources in the project area. The NAHC reported that their sacred lands file has no record of resources in the vicinity of the project. Ohlone tribal representative Ramona Garibay served as Native American monitor for the project and observed the subsurface testing process.

WSA developed and implemented a testing program, including both field observations and geoarchaeological lab analysis, based on a sampling strategy designed to recover data sufficient to verify the presence or absence of potentially significant cultural resources. The program was designed to determine the areal extent and to characterize the nature and integrity of such deposits, if present. The testing program consisted of drilling a total of 31 bore holes using a hollow-stem auger and recovering a series of 3¾ - in. diameter cores in 5-ft.-long segments. Of these, 20 bore holes were drilled the anticipated depth of project construction, 35 ft. An additional five bore holes were drilled to depths of 50 ft. in areas where excavation for drainage will reach that depth. Six additional bore holes were drilled to 15 ft. to evaluate the nature of the subsurface in the alignments of the proposed water lines.

No prehistoric cultural deposits or materials were observed in the 31 core samples. Historic-era materials including brick fragments, pieces of charcoal and coal, and ceramic fragments were observed in two of the cores. The majority of the 31 cores were characterized by fill material

associated with the construction of Memorial Stadium in 1923, and from later modifications of the stadium and alterations of the surrounding grounds.

The geoarchaeological analysis determined that buried former stable land surfaces were encountered at various depths in at least 11 core samples. These represent developed soils (Ab horizons) with organic matter from roots and decomposing plant material. Although the subsurface testing and analysis did not identify evidence of prehistoric cultural material, the entire project site should be considered an archaeologically sensitive area based on its proximity to Strawberry Creek and the fact that prehistoric archaeological deposits and features have been found along the creek within the vicinity of the project area. Consequently, archaeological monitoring is recommended during all construction and related excavations. WSA has prepared a Cultural Resources Monitoring Plan, which has been submitted under separate cover.

1.0 Introduction

This report presents the findings of the subsurface archaeological testing along the western perimeter of the University of California at Berkeley's Memorial Stadium in the footprint of the proposed Student Athlete High Performance Center (SAHPC). Thirty-one 3¾ inch-diameter cores were extracted from locations throughout the proposed footprint. The purpose of the subsurface investigation was to ascertain whether buried archaeological deposits are present beneath the proposed footprint of the SAHPC, to determine the extent of such deposits, to assess their integrity, and to recover data sufficient to provide recommendations about the potential significance of such deposits, if present. A geoarchaeological assessment of 15 cores was also conducted to ascertain the geomorphology of the site area and to assess the area's potential archaeological sensitivity.

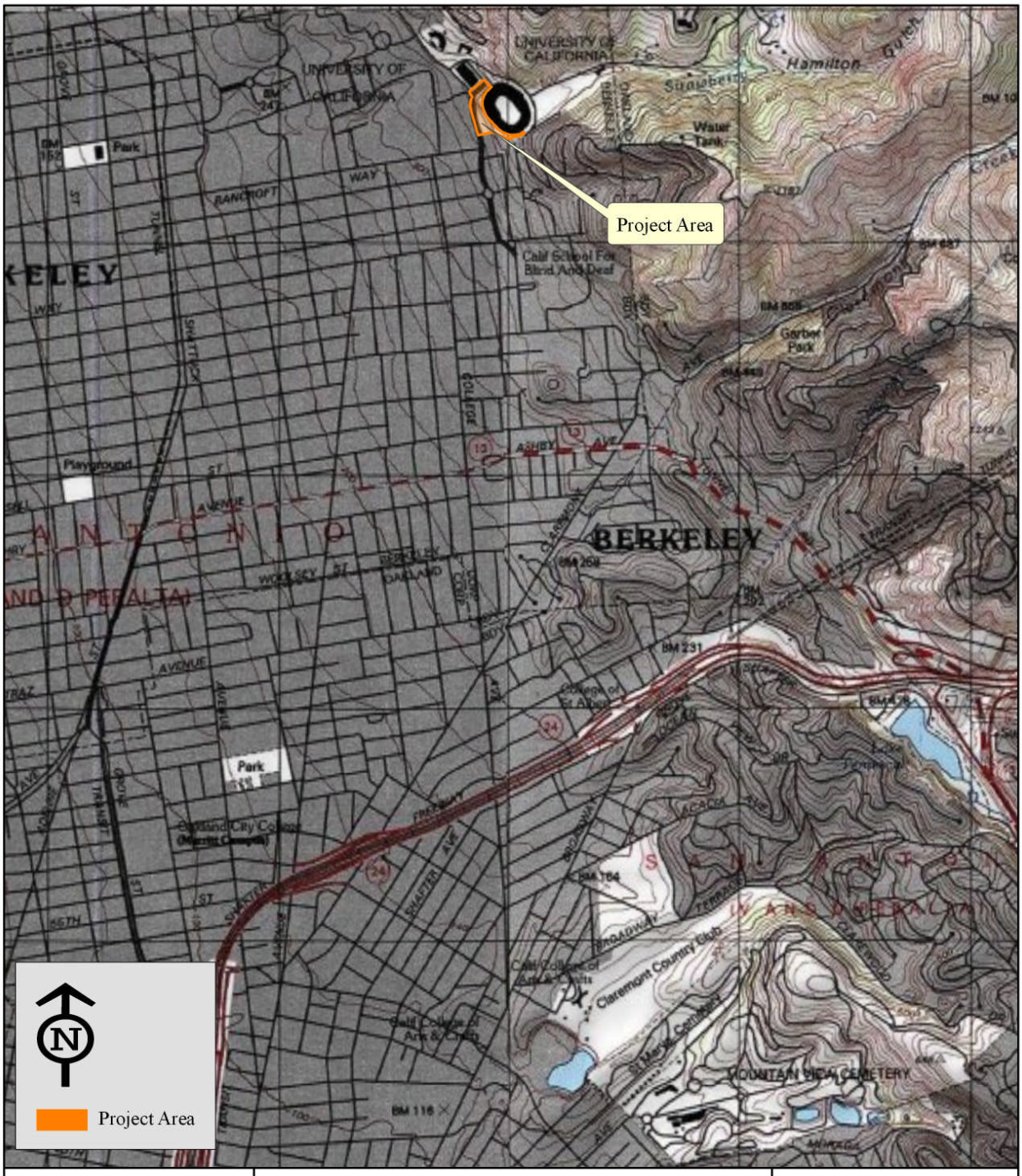
1.1 Project Description

The proposed UC Berkeley SAHPC involves excavation and construction outside the north, west and south perimeter of Memorial Stadium encompassing the current asphalted pedestrian walkway around the side of stadium, and the landscaped slope to the southwest towards Piedmont Avenue. The depth of excavation will range from 15 to 50 ft. The 142,000 sq.-ft. SAHPC will provide locker rooms, meeting rooms, and offices for football and 12 additional University Olympic-level sports. It will also house a state-of-the-art training facility and an applied sports science and medicine complex for year-round access by approximately 450 student-athletes. In addition, the SAHPC will feature an academic center where student-athletes will have access to educational resources (UC Berkeley 2008).

1.2 Project Location

The new SAHPC will be located adjacent to the UC Berkeley's Memorial Stadium and slightly to the northeast of Piedmont Avenue. It is within Township 1 South, Range 4 West, Section 1, as depicted on the Oakland West and Oakland East USGS 7.5-minute topographic quadrangles (Figures 1 and 2). The project area is bounded by International House to the southeast, Piedmont Avenue to the west, Kleeberger Field to the northwest, and Memorial Stadium to the east (Figure 3). The actual project area is larger than the footprint of the SAHPC, as it encompasses drainage, water, and utility lines that extend beyond the structure's footprint.

Figure 1
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

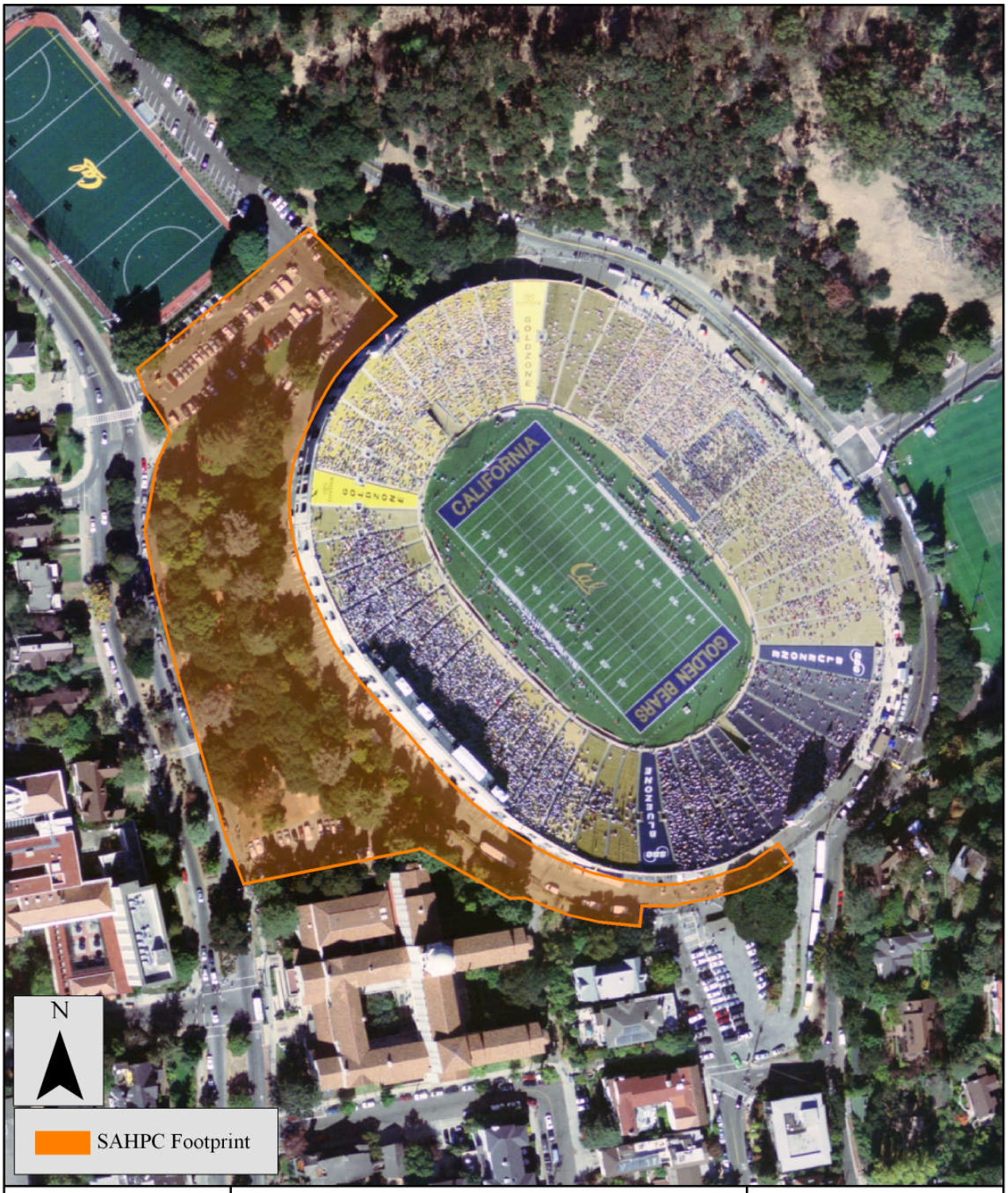


WSA

Oakland West and Oakland East USGS 7.5' Topo Quads

0 0.5 1 Miles

Figure 2
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA



WSA

Footprint of the SAHPC

0 200 400 Feet

Figure 3
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

2.0 Environmental and Cultural Setting

2.1 Natural Setting

2.1.1 Existing Environment

The SAHPC project area is situated east of the San Francisco Bay, the largest estuarine system in California. The project area, located adjacent to UC Berkeley's Memorial Stadium, sits at the base of the Berkeley hills at the mouth of Strawberry Canyon, and at the south fork of Strawberry Creek, which is now channelized. The creek runs underneath the northern section of Memorial Stadium in a southwest direction through the current project area.

At one time, several different habitats surrounded the project area. However, extensive urban settlement and industrial development in the San Francisco Bay Area has greatly impacted the natural environment. Beneath the historic fill associated with construction of Memorial Stadium, lie accumulations of colluvium and alluvium that were once plains replete with grassland vegetation that included perennial and annual grasses, such as small flowered melica (*Melica imperfecta*) and rye grass (*Elymus glaucus*), as well as coastal shrubs, such as coyote brush (*Baccaris pilularis*), and a range of bulb bearing plants like soap plant (*Chlorogalum pomeridianum*). Prior to modern development, extensive oak woodlands including species such as coast live oak (*Quercus agrifolia*), madrone (*Arbutus menziesii*), and California bay (*Umbellularia californica*) extended to the east.

These grasslands and oak woodlands attracted a variety of fauna including brush rabbits, jackrabbits, deer, elk, antelope, fox, coyote, grizzly bears, and black bears. Southwest of the project area, closer to the bay, a small freshwater marsh was created by Temescal Creek where it overflowed its banks before entering the bay. Here one could have seen broad-leafed cattail (*Typha latifolia*) and California bulrush (*Scirpus californicus*). Farther south was a large coastal salt marsh that sustained pacific cordgrass (*Spartina foliosa*) and perennial pickleweed (*Salicornia virginica*). The San Francisco Bay, west of the project area, sustained a large population of invertebrates including the California oyster (*Ostrea lurida*), bay mussel (*Mytilus edulis*), bent-nosed clam (*Macoma nasuta*), Dungeness crab (*Cancer magister*), and bay shrimp (*Crago* spp.) (Broughton 1994:22). The landscape of the San Francisco Bay shoreline has changed through time due to geologic events and industrial development. It is estimated that between 1850 and 1950 as much as one third of the bay was filled to accommodate urban development and expansion.

Today, annual precipitation in the bay region varies from 20 to 40 inches with precipitation concentrated in the fall, winter, and spring months. This climate is much like that found in the Mediterranean, with mild, rainy winters, and warm, dry summers. After the first rain at the end of October or early November, the vegetation becomes green, and remains green but not growing until late February, when the grasses that cover the surrounding Berkeley hills begin to grow rapidly. By early May, these have usually changed to a dry, golden-color and remain so until fall (Brown 1985).

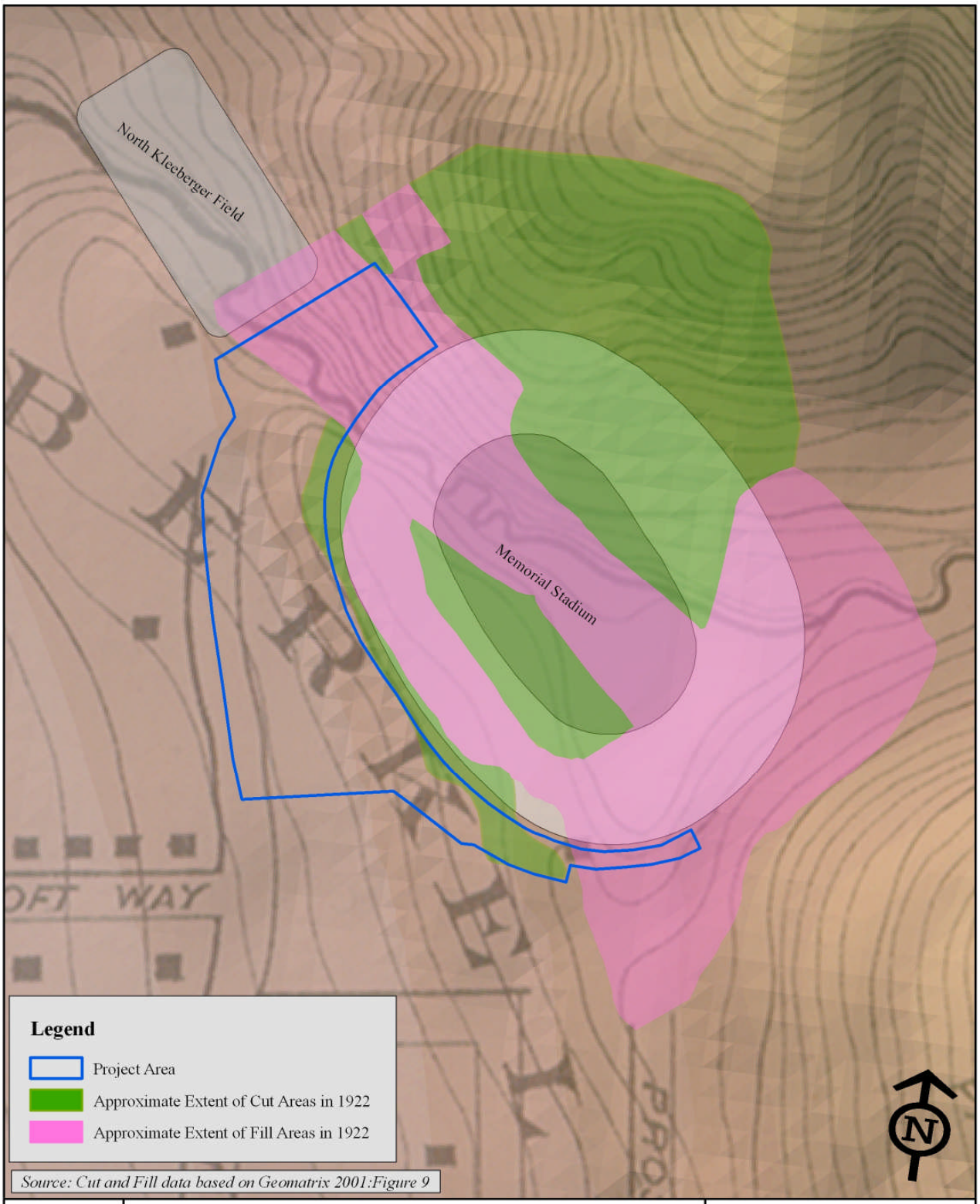
Due to the cooling effects of the local bay environment, temperatures in the project area are mild in the summer, usually averaging 55-65° F (Moratto 1984:223). The cold water of the bay also creates frequent fog, and relative humidity remains high most of the time (Schoenherr 1992:627).

2.1.2 Geology and Soils

The following information on geology and soils in the project area is partially based on the Fault-Rupture Hazard Investigation Report for the Student Athlete High Performance Center (SAHPC) for the University of California, Berkeley (Geomatrix 2006), subsurface exploration and recommendations about neighboring sites as presented in reports prepared by Treadwell and Rollo (1997), The City of Emeryville (1995), Sedway Cooke Associates and The Emeryville Redevelopment Agency (1985), the United States Department of Agriculture Soil Conservation Service in cooperation with the University of California Agriculture Experiment Station, and on observations made in the field by WSA during subsurface testing.

The project is situated within the San Francisco Bay Area, a structural depression between two mountain ranges. Franciscan Complex bedrock underlies the project area. Waterborne and windblown sediments derived from the local East Bay hills and sediments from the central California region transported by the Sacramento and San Joaquin River systems have accumulated above the bedrock. Some of these accumulated sediments include unconsolidated clays, silts, sands, and gravels that make up the Alameda and San Antonio Formations. However, the soil directly underneath the northeast and southeast ends of the SAHPC footprint (at the north and south ends of Memorial Stadium) is fill material consisting of sandstone and gravelly clays that was imported from Charter Hill during the construction of Memorial Stadium in 1923 (Figure 4, [based on Geomatrix 2001:Figure 9]).

The Hayward fault forms the major structural boundary along the eastern side of the UC Berkeley campus, bounding rock types of various ages, compositions and tectonic history. These bedrock units consist of late Cretaceous, 100 to 65 million years ago (Ma), marine siltstone, shale and sandstone, late Jurassic to early Cretaceous (159 to 99 Ma) Knoxville Formation (shale with thin sandstone), and late Jurassic volcanic rocks, including keratophyre, basalt, and diabase, all of the Great Valley Group (Geomatrix. 2006:7). Younger sediments situated further up in the Berkeley Hills include Miocene sedimentary (Orinda Formation, Claremont Chert, various types of sandstone) and volcanic rocks (Moraga Formation). The amalgamations of these weathered rocks and formations are the main materials exposed along the hillslopes east of the Hayward fault (Geomatrix 2006:7). West of the Hayward fault, the bedrock consists of Jurassic to Cretaceous (195 to 65 Ma) marine sedimentary rocks and various igneous and metamorphic rocks of the Franciscan Complex. The Franciscan Complex consists mostly of greywacke sandstone and inter-bedded shale, with lower amounts of submarine basalt (greenstone), chert, serpentine, and some high-pressure metamorphic rocks such as blueschist (Geomatrix. 2006:7). Semi-consolidated, older, Pleistocene alluvium and colluvial deposits overlie the bedrock forming the piedmont that underlies the central



WSA

1922 Cut and Fill Areas Shown on 1900 Geologic Map

0 200 400 Feet

Figure 4
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

Berkeley campus. Former stream valleys across the campus have been filled by younger, late Pleistocene and Holocene alluvium. In addition, colluvium, landslide debris, and proximal alluvial fan deposits of late Pleistocene and Holocene age create a depositional apron along the base of the Berkeley hills (Geomatrix 2006:8).

The soil directly associated with the hills to the east of the project area surrounding the Memorial Stadium grounds is of the Maymen series. It is a sandy loam that consists of shallow, somewhat excessively drained soils that formed in material weathered from sandstone, shale and conglomerate (Figure 5). Depth to bedrock along the hillslopes ranges from 10 to 20 in. Local vegetation consists of open stands of chaparral that include chamise, Manzanita, several species of ceanothus and scrub oak, bay, buckeye, and scatters of various other tree species (California Resource Lab 2008).

2.1.3 Prehistoric Shoreline, Marshlands, and Creeks

The locations of the shoreline, marshlands, and creeks within the project vicinity have changed over the past 6,000 years. In some cases, this was due to sea level change, but during the past century, the creeks in the urbanized area have been managed and, in some cases, rerouted with culverts, storm drains, and engineered channels.

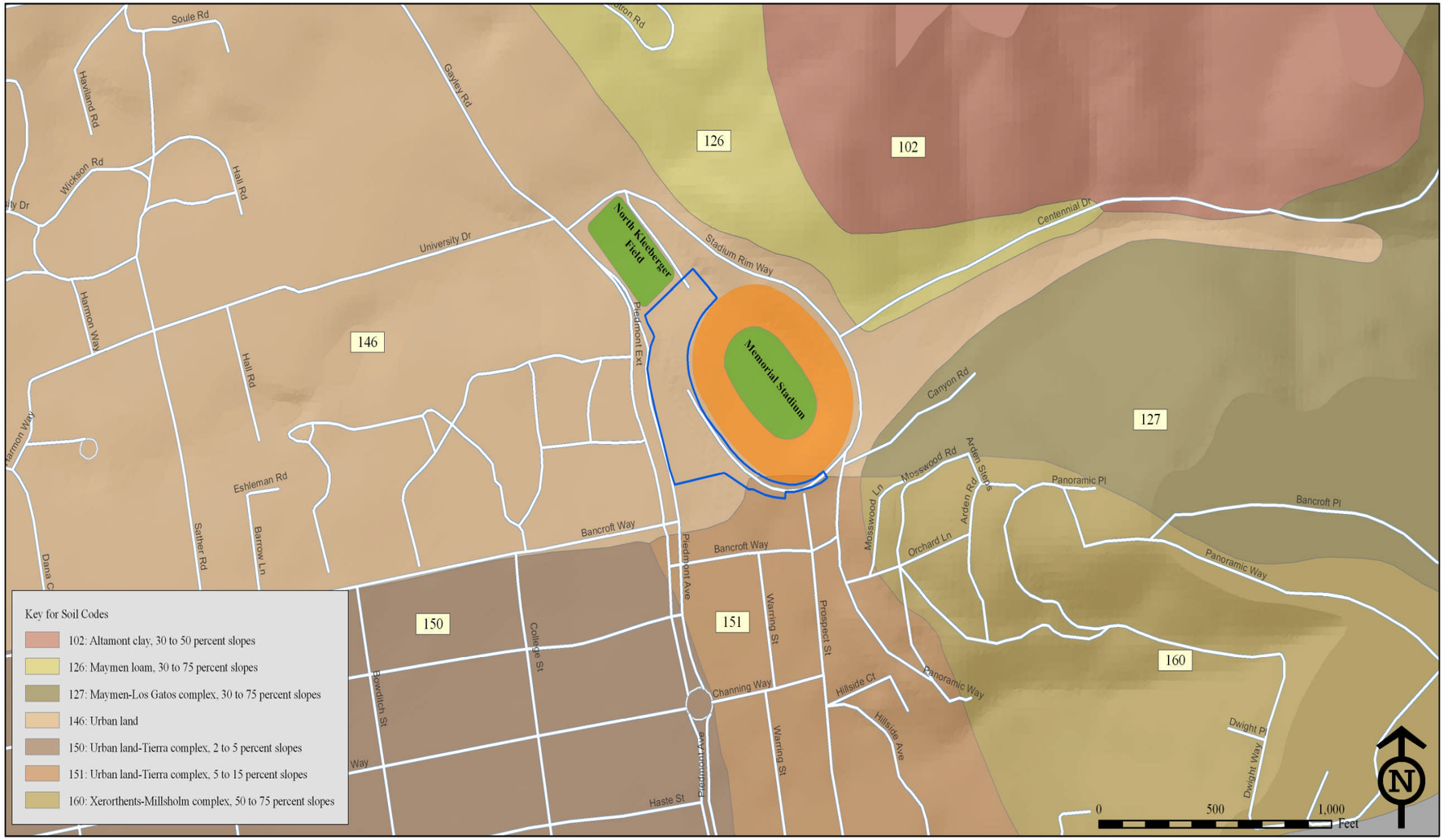
In general, the prehistoric archaeological sites of the Bay Area are located close to water (e.g., creeks, marshes, and the bay shoreline). This relationship has been modeled by Price et al. 2004a in a previous study of the East Bay by plotting the location of known prehistoric archaeological sites in the watershed and creating a buffer based on the mean distance of these sites to the nearest water source (e.g., creek, former marsh, or the bayshore). In the project vicinity this mean distance is 623 ft. There is a higher probability of finding prehistoric sites within the buffer than outside of it.

2.2 Cultural Setting

2.2.1 Prehistory

REGIONAL ARCHAEOLOGICAL BACKGROUND

Research into local prehistoric cultures began with the investigation of the Emeryville Shellmound, CA-ALA-309, by Dr. Max Uhle and Professor John C. Merriam of the University of California, Berkeley (Uhle 1907). At that time, the Emeryville Shellmound, located within 130 ft. of the bay's high-water line, was one of the largest and best-preserved mounds in the region. Shortly thereafter Merriam supervised the work of UC Berkeley archaeologists Nels C. Nelson and A.V. Wepfer who attempted to verify and supplement the findings of Uhle at the Emeryville Shellmound (Nelson 1906). Nelson subsequently conducted an intensive archaeological survey of the San Francisco Bay region from 1906 to 1908. Nelson documented 425 shellmounds along the bay shoreline and adjacent coast when the bay was still ringed by salt marshes up to 5 miles wide (Nelson 1909:322-



WSA	**Soils Map**	UC Berkeley Student Athlete High Performance Center Berkeley, CA	Figure 5

This page intentionally left blank

357). He maintained that the intensive use of shellfish, a subsistence strategy reflected in both coastal and bay shoreline middens, indicated a general economic unity in the region during prehistoric times, and he introduced the idea of a distinct San Francisco Bay archaeological region.

Nels C. Nelson, directed by John C. Merriam, and assisted by A. W. Wepfer, conducted a series of short-term investigations at the Ellis Landing shellmound in Richmond, over a period of three years, from 1906 to 1908 (Nelson 1910). This massive mound was of particular interest to Merriam and Nelson because it extended at least as far below the marshland as it did above it. The maximum thickness of the mound was estimated at 33 ft., with deposits extending 16 ft. below the early 1900s ground surface, and deposits extending 17 ft. above the same ground surface. The UC archaeologists were anxious to investigate what they reasoned were some of the oldest deposits in the bay area, assuming that the deposits began to accumulate on what was at one time dry land. Nelson assumed that the ground had somehow subsided over time, whereas we now understand that the sea level has gradually risen. Like the Emeryville Shellmound, Ellis Landing was both a burial ground and a habitation site. Although Nelson acknowledges evidence of change in material culture over time in this mound (e.g., increasingly elaborate stone tools), he concludes that the same general types of implements that are found near the top of the mound can also be found at the bottom, and concludes that the mound was inhabited over perhaps as much as 3,500 years, by the same general types of people, with essentially the same type of culture.

In 1911, Nelson supervised excavations at CA-SFR-7 (the Crocker Mound) near Hunter's Point in San Francisco County, a site later dated from 1050 B.C. to A.D. 450. Llewellyn L. Loud identified archaeological components from this same period in Santa Clara County in 1911 while excavating at CA-SCL-1 (the Ponce, Mayfield, or Castro Mound site). Robert J. Drake recognized them in San Mateo County in 1941–1942 at CA-SMA-23 (Mills Estate) in San Bruno (Moratto 1984:233).

The work of Nelson and Loud in the Bay Area provided the impetus for investigations into the prehistory of central California, which began in earnest in the 1920s. In the early 20th century, Stockton-area amateur archaeologists James A. Barr and Elmer J. Dawson conducted excavations at sites around Stockton and Lodi, and Dawson was responsible for making a substantial collection of cultural material. On the basis of artifact comparisons, Barr identified what he believed were two distinct cultural traditions, an early and a late. Dawson later refined his work and classified the Central Valley sites into three "age-groups" (Ragir 1972:2-3; Schenck and Dawson 1929:402).

In the 1930s Jeremiah Lillard and William Purves of Sacramento Junior College formed a field school and conducted excavations throughout the Sacramento Delta area. By seriating artifacts and mortuary traditions, they identified a three-phase sequence similar to Dawson's, including Early, Intermediate, and Recent cultures (Lillard and Purves 1936). This scheme went through several permutations, including Early, Transitional, and Late Periods (Lillard et al. 1939) and Early,

Middle, and Late Horizons (Heizer and Fenenga 1939). In 1948 and again in 1954, Richard Beardsley refined this system and extended it to include the region of San Francisco Bay (Beardsley 1948, 1954). The resulting scheme came to be known as the Central California Taxonomic System (CCTS) (Fredrickson 1973; Hughes 1994:1). Subsequently, the CCTS system of Early, Middle, and Late Horizons was applied widely to site dating and taxonomy throughout central California. This system focused on the archaeology of the Delta region, with its more established tradition of archaeological investigations of rich archaeological sites, to set the standard by which other regions were assessed. Resulting explanations of regional prehistory and culture change tended to place the Delta as the earlier center for interaction, change, and development, with the bay following on a separate, somewhat different path.

As more data were acquired through continued fieldwork, local exceptions to the CCTS were discovered. The accumulation of these exceptions, coupled with the development of radiocarbon dating in the 1950s and obsidian hydration in the 1970s, opened up the possibility of dating deposits more accurately. Much of the subsequent archaeological investigation in central California focused on the creation and refinement of local versions of the CCTS.

In the 1960s, citing limitations with the existing classificatory schemes, Ragir (1972:12) adopted a new set of terms for describing archaeological cultures based on their localities, such as type sites. Around this same time, a series of workshops was convened to discuss current concerns in California archaeology, including revisions to the CCTS (Fredrickson 1973:88-91). In his doctoral dissertation, Fredrickson (1973) reviewed the present state of archaeology in California and, adopting some of the revisions agreed upon at the workshops, as well as incorporating modifications employed by Ragir and Bennyhoff, suggested an alternative way of classifying the prehistory of California. Fredrickson (1973:113-114) proposed four "major chronological periods" in prehistoric California: the Early Lithic Period (described as hypothetical), a Paleoindian Period, an Archaic Period, and an Emergent Period. The Archaic and Emergent Periods were further divided into Upper and Lower periods. Subsequently, Fredrickson (1974, 1994) revised the findings and concepts discussed in his doctoral dissertation, and produced the following temporal divisions and associated cultural characteristics (Table 1).

Table 1 Characteristics of Cultural Periods in Central California

Period and Time Range	Technology, Subsistence	Exchange	Organization
Paleoindian 8000–6000 B.C. Wet and cool; lakeside habitation	Foraging: large projectile points imply hunting with dart and *atlatl*; groups change habitat to find resources	Ad hoc between individuals	Extended family; little emphasis on wealth
Lower Archaic 6000–3000 B.C. Drying of pluvial lakes, habitations move to rivers, streams	Foraging: milling stones indicate plant food; dart and *atlatl* imply hunting also important; use of local materials	Ad hoc between individuals	Extended family; little emphasis on wealth

Table 1 Characteristics of Cultural Periods in Central California

Period and Time Range	Technology, Subsistence	Exchange	Organization
Middle Archaic 3000–500 B.C. Climatic amelioration; local specialization of marine, upland, riverine environments	Foraging: mortars and pestles imply acorn economy; dart and *atlatl* persist; hunting remains important; tool kits diversify	If changes occurred, not observed in archaeological record; ad hoc continues	Extended family, sedentism begins; growth of population and expansion into diverse niches
Upper Archaic 500 B.C.–A.D. 800 Cooler climate	Foraging, but also some collecting; mortars, pestles; dart and *atlatl*	More complex: regular exchange between groups; ad hoc continues	Sociopolitical complexity; status distinctions imply wealth; group-oriented religious organizations; no firm territories
Lower Emergent A.D. 800–1500	Collecting dominates, some foraging; small projectile points imply use of bow and arrow; mortars and pestles persist	Regularized exchanges between groups; more materials in network; ad hoc continues	Status distinctions more pronounced; established territories
Upper Emergent A.D. 1500–1800	Collecting dominates, some foraging; bow and arrow; mortars, pestles; local specialization re: production	Clam disk beads as trade commodities; local specialization; exchange materials move greater distances; ad hoc continues	
Adapted from Fredrickson 1974, 1994			

A series of "patterns," emphasizing culture rather than temporal periods, can be identified throughout California prehistory. Fredrickson (1973:7-8) defines a pattern as:

> [An] adaptive mode(s) extending across one or more regions, characterized by particular technological skills and devices, particular economic modes, including participation in trade networks and practices surrounding wealth, and by particular mortuary and ceremonial practices.

In addition, following Ragir, Fredrickson (1973:123) proposed that the nomenclature for each pattern relate to the location at which it was first identified, such as the Windmiller, Berkeley and Augustine Patterns (see below for descriptions).

Fredrickson's work illustrates that the application of the CCTS over an extensive area that includes both central California and the Bay Area sites makes explanation of cultural change in the various locales difficult. Nonetheless, a modification of the CCTS (Bennyhoff and Hughes 1987; Fredrickson 1973, 1974; Milliken and Bennyhoff 1993) remains a useful way of organizing our understanding of regional prehistory in terms of time and space. The cultural patterns identified in the Bay Area that in a general way correspond to the CCTS scheme are the Berkeley (primarily Middle Horizon, overlapping some with the latest part of the Early Horizon) and Augustine (Late Horizon) patterns. Dating techniques such as obsidian hydration or radiometric measurements can further increase the accuracy of these assignments.

Of some relevance to the project is Scheme B1 of the central California archaeological sequence developed by Bennyhoff and Hughes (1987:149). In general, this scheme includes the following periods and chronology:

- Early Period, ca. 3000–500 B.C.
- Early/Middle Period Transition, ca. 500–200 B.C.
- Middle Period, ca. 200 B.C.–A.D. 700
- Middle/Late Period Transition, ca. A.D. 700–900
- Late Period, ca. A.D. 900–1800

This was later revised by Milliken and Bennyhoff (1993) to include the following periods:

- Early Period (beginning in the mid-Holocene until ca. 500 B.C.),
- Middle Period (500 B.C. to A.D. 700),
- Middle-Late Transition Period (A.D. 700 to 1100),
- Phase 1 of the Late Period (A.D. 1100 to 1500),
- Phase 2 of the Late Period (A.D. 1500 to 1800), and
- Historic Period (beginning A.D. 1800) (Hylkema 2002:237, Figure 13.4).

Milliken and Bennyhoff's Early Period corresponds to Fredrickson's Windmiller pattern and Gerow's Early Bay pattern (see below). The Middle Period, during which prehistoric peoples appear to have increased their resource base and formed semisedentary habitation communities, links to Fredrickson's Berkeley pattern and Bennyhoff's Meganos culture. The Middle-Late Transition Period, characterized by intensification of socioeconomic systems while retaining Middle Period artifact traits, and the Late Period, when social structures tended to develop into a form consistent with that recorded during early ethnographic studies, correspond with Fredrickson's Augustine Pattern (Hylkema 2002:237, 241-250).

It was initially thought that a well-developed Early Period prehistoric component was not represented within the San Francisco Bay Area. It had been assumed that San Francisco Bay was a "local marginal and impoverished manifestation of cultural succession or development in the Sacramento-San Joaquin Delta region," where a thriving Windmiller culture had been identified, which was "explainable in terms of local ecological adjustments over a period of three to four thousand years" (Gerow with Force 1968:10 summarizing Heizer 1964).

However, Bert Gerow of Stanford University, in his work at the University Village in the 1950s, established the idea that the Bay Area represented a separate center of cultural interaction, change, and development in its own right (e.g., Gerow with Force 1968). The work undertaken by Gerow and Force at the University Village site (CA-SMA-77) in San Mateo County indicated that a distinct Early Bay culture preceded the arrival of the Middle Horizon Berkeley pattern.

This conclusion was supported by radiocarbon dates derived from charcoal found in association with burials at the site. The burials were dated from 1500 to 1000 B.C., and were markedly older than any other published site in the Bay Area at that time. Obsidian hydration results accorded with this date range (Gerow with Force 1968:7-8).

Comparing characteristics of the Early Bay period to those of the Windmiller facies and Beardsley's Sacramento Valley Middle Horizon, Gerow and Force (1968:109-110) noted the following trends. In the Early Bay period, burials tend to be flexed, and there is a lack of extended burials common at Windmiller sites or patterned orientation or position. There is a high occurrence of red ochre in relation to ornamental artifacts manufactured of bone, marine shell, and stone. Whole *Olivella* shell is more common than drilled shell fractions. Quartz crystals, plummet-shaped charmstones and artifacts manufactured from mica or slate are either rare or absent. "Crude" flaked and core tools are more common than projectile points, which are relatively rare. Stone net-sinkers are found in this period, and composite fishhooks or fishspears are rare or absent. There is a relative abundance of bone awls, antler wedges or end-scrapers, scapula and rib side-scrapers, flat-ended pestles and unshaped cobblestone mortars.

Gerow and Force noted that there were similarities between the Early Bay period components and those of later periods, but observed that changing trends included more intensive exploitation of food resources, a decrease in the amount of powdered red ochre included in graves, more elaborate shell, stone and bone artifacts, an increase in the number of obsidian and projectile points and concomitant decrease in the number of "crude" flake and core tools, an increase in the amount of cylindrically shaped mortars and longer pestles, a decrease in the number of edge-notched stone sinkers, and an increase in stature and variations in cranial indices (Gerow with Force 1968:124).

According to Breschini (1983), Gerow and Force's hypotheses were largely ignored by the archaeological community throughout the next two decades. Alternative explanations have subsequently been suggested such as Moratto's (1984:279) hypothesis that the "University Village complex is an expression of the Sur Pattern strongly influenced by the Berkeley Pattern." The Berkeley Pattern has been dated from at least 3000 B.C. in the east San Francisco Bay (e.g. Alameda County, where the earliest Early Berkeley sites appear) (Bennyhoff 1994; Hughes 1994), with the number of sites increasing through A.D. 1 (Moratto 1984:282). Late Berkeley Pattern (500 B.C.–A.D. 1000) sites are much more common and well documented and, therefore, better understood than the Early Berkeley Pattern sites. Berkeley sites are scattered in more diverse environmental settings, but riverine settings are prevalent.

It is during this period that the Bay Area shellmounds were inhabited (Lightfoot and Luby 2002), and deeply stratified shellmound deposits that developed over generations of occupation are common to Berkeley Pattern sites. The typical body position for burials is tightly flexed, with no consistent orientation. Associated grave goods are much less frequent than is encountered in sites

of other periods. The sites contain numerous milling stones for food preparation. Projectile points in this pattern become progressively smaller and lighter over time, culminating in the introduction of the bow and arrow during the Late Period. Wiberg (1997:10) claims that large obsidian lanceolate projectile points or blades are unique to the Berkeley Pattern. *Olivella* shell beads include saddle and saucer types. *Haliotis* pendants and ornaments are occasionally found. Slate pendants, steatite beads, stone tubes, and ear ornaments are unique to Berkeley Pattern sites (Fredrickson 1973:125–126; Moratto 1984:278–279). Evidence of warfare or interpersonal violence is present, including cranial trauma, parry fractures, and embedded projectile points (Milliken et al. 2007:113-114).

The Augustine Pattern coincides with the Late Period, ranging from as early as A.D. 700 to about 1800. Intensive fishing, hunting, and gathering (especially of acorns) typify this period, as well as a large population increase, expanded trade and exchange networks, increased ceremonialism, and the practice of cremation in addition to flexed burials. Certain artifacts are also distinctive in this pattern: bone awls used in basketry, small notched and serrated projectile points that are indicative of bow-and-arrow usage, clay effigies, bone whistles, stone pipes, and occasional pottery. *Olivella* beads and *Haliotis* ornaments increase in number of types and frequency of occurrence, sometimes numbering in the hundreds in single burials. Beginning in the latter half of the 18th century, the Augustine Pattern was disrupted by the Spanish explorers and the mission system (Moratto 1984:283).

These patterns were at one time treated as useful chronological indicators, although the overlap in the Early Bay and Berkeley chronologies has reduced their usefulness in this respect, especially for earlier time periods. A chronology allows archaeologists to explore other kinds of evidence and research questions that focus on cultural responses to environmental change, settlement and subsistence strategies, trade and exchange routes, population movement, and related topics.

Most recently, Milliken et al. (2007:99-123) developed what they term a “hybrid system” for the San Francisco Bay Area, combining the Early-Middle-Late Period temporal sequence with the pattern-aspect-phase cultural sequence. Following Fredrickson, Milliken et al. (2007:103) define *patterns* as “units of culture marked by distinct underlying economic modes, technological adaptations, and ceremonial practices.” *Aspects* are defined as local variations in a major economic pattern, with a sequence of phases within a particular district representing an aspect. Following Willey and Phillips (1958), phases represent the smallest units of related site components “spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time” (Milliken et al. 2007:103).

Dating of the cultural patterns, aspects, and phases was based on Dating Scheme D, developed by Groza (2002). Groza directly dated over 100 *Olivella* shell beads, obtaining a series of AMS radiocarbon dates for individual samples of beads from various shell bead horizons. Groza found

that several shell bead horizons occurred as much as 200 years more recently than previously thought. Milliken et al. (2007:105) use the term *bead horizon* to represent "the short time periods marked by trade of particular bead types across wide areas of central California, in order to clearly separate units of time and units of culture."

Milliken et al.'s (2007) San Francisco Bay Area Cultural Sequence is divided into the Early Holocene (Lower Archaic[1]) from 8000 to 3500 B.C., the Early Period (Middle Archaic) from 3500 to 500 B.C., the Lower Middle Period (Initial Upper Archaic) from 500 B.C. to A.D. 430, the Upper Middle Period (Late Upper Archaic) from A.D. 430 to 1050, the Initial Late Period (Lower Emergent) from A.D. 1050 to 1550, and the Terminal Late Period, post-A.D. 1550. They do not include a discussion of pre-8000 B.C. as no archaeological evidence dating to this early time period has been located in the Bay Area. Milliken et al. posit that this dearth of archaeological material may be related to subsequent environmental changes, submerging sites or burying them beneath alluvial deposits, or destruction through stream erosion. A summary of Milliken et al.'s findings follows.

A "generalized mobile forager" pattern marked by the use of milling slabs and handstones and the manufacture of large, wide-stemmed and leaf-shaped projectile points emerged around the periphery of the Bay Area during the Early Holocene Period (8000 to 3500 B.C.). No occupation sites dating to this early period have been found in the East Bay.

Beginning around 3500 B.C., evidence of sedentism, interpreted to signify a regional symbolic integration, of peoples, and increased regional trade emerges in the form of new ground stone technology and the introduction of cut shell beads into burial contexts (Milliken et al. 2007:114). This Early Period lasted until ca. 500 B.C. The earliest mortar and pestles found so far date to post-4000 B.C., with wooden mortars dating to 3800 B.C. found in the vicinity of the Los Vaqueros reservoir. By 1500 B.C., mortars and pestles replaced milling slabs and handstones at some East Bay sites. Sedentism or semisedentism is in evidence in the East Bay during this period in the form of burial complexes with associated ornamental grave goods, such as were found at West Berkeley, Ellis Landing, and Pacheco shellmounds, and house floors with postholes, such as has been found at the Rossmoor site near Walnut Creek (Milliken et al. 2007:115; Price et al. 2006).

Milliken et al. (2007:115) identify "a major disruption in symbolic integration systems" circa 500 B.C., marking the beginning of the Lower Middle Period (500 B.C. to A.D. 430). Changes included the disappearance of rectangular shell beads and introduction of split-beveled and small saucer *Olivella* beads, inferred to represent some of the earliest religious artifacts, appear around the Early/Middle Transition bead horizon. However, spire-lopped *Olivella* beads continued to be

[1] The corresponding periods based on Fredrickson's Paleoindian, Archaic and Emergent classification system are provided in parentheses.

the most common bead type in mortuary contexts. Bead Horizon M1, dating from 200 B.C. to A.D. 430, is described by Milliken et al. (2007:115) as marking a 'cultural climax' within the San Francisco Bay Area. New developments included the introduction of circular *Haliotis* ornaments and the proliferation of *Olivella* saucer beads. New bone tools and ornaments are also manufactured in this period, such as tubes and whistles, barbless fish spears, and elk femur spatulae. In the Central and North Bay areas, awls of bone with shouldered tips indicate basketry manufacture. Within the Central Bay, mortars and pestles continued to be used exclusively, while both milling slabs and mortars were used around the margins. Net sinkers ceased to be used at most sites around the Bay (Milliken et al. 2007:115).

The Upper Middle Period (A.D. 430 to 1050) is marked by the collapse of the *Olivella* saucer bead trade in central California, abandonment of many Bead Horizon M1 sites, an increase in the occurrence of sea otter bones in those sites that were not abandoned, and the spread of the extended burial mortuary pattern characteristic of the Meganos complex into the interior East Bay. Bead Horizons M2, M3, and M4 were identified within this period (Milliken et al. 2007:116). Bead Horizon M2a is marked by the replacement of *Olivella* saucer beads in burial contexts with "rough-edged full saddle *Olivella* beads with remarkably small perforations" (Milliken et al. 2007:116). Bead Horizon M2b is characterized by mixed *Olivella* saddle beads dating from A.D. 430 to 600. The Meganos burial pattern continued to spread westward, although did not extend as far as the West or North Bay. Within the Central Bay, artifacts such as extremely well-crafted "show" blades, mica ornaments, fishtail charmstones and a variety of *Haliotis* ornament forms appear during Bead Horizons M2a and M2b. During Bead Horizon M3, dating from A.D. 600 to 800, small square saddle *Olivella* beads appear in mortuary contexts, occasionally with roughly formed *Olivella* saucer beads, and often in single component cemeteries located away from the village. Large mortars, ear spools and single-barbed bone fish spears also initially occur during Bead Horizon M3. Wohlgemuth (2004, quoted in Milliken et al. 2007:116) also observed an increase in seeds present in midden sites dating to this time. Bead Horizon M4 occurred from A.D. 800 to 1050 and was marked by stylistic changes to *Olivella* shell beads with various wide and tall bisymmetrical bead forms appearing. *Haliotis* ornaments also develop a distinctive style, described by Milliken et al. (2007:116) as unperforated rectangles and horizontally perforated half ovals. Few burial sites have been located dating to this period, with Bead Horizon M4 burials excavated at SCL-131 in the South Bay yielding no associated grave goods.

The Initial Late Period, dating from A.D. 1050 to 1550, is characterized by increased manufacture of status objects. In lowland central California during this period, Fredrickson (1973 and 1994, quoted in Milliken et al. 2007:116) noted evidence for increased sedentism, the development of ceremonial integration, and status ascription. The beginning of the Late Period, ca. A.D. 1000, is marked by the Middle/Late Transition bead horizon. Well fashioned "show" mortars, new *Olivella* bead forms, and a variety of *Haliotis* ornaments with multiperforated and bar-scored forms appear during this period. These new artifact forms are reflective of the

beginning of the Augustine Pattern, while those features of the classic Augustine Pattern, such as the arrow, banjo effigy ornaments, the flanged pipe, and callus cup *Olivella* beads, appear during Bead Horizon L1 (post-A.D. 1250). Coincident with the introduction of the bow and arrow, Napa Valley obsidian manufacturing debitage increased markedly in the interior East Bay, while there was a striking decrease in biface and debitage manufacture at Napa Valley Glass Mountain quarries. In addition, the variety of status goods included in interments and in association with cremations of high-status individuals increased (Milliken et al. 2007:117).

Sequin and cup *Olivella* beads, characteristic of the L1 Bead Horizon, disappear circa A.D. 1500 to 1550, marking the beginning of the Terminal Late Period. Clamshell disk beads, indicative of the L2 Bead Horizon, were traded across the North Bay during this period, although there is no evidence that they spread south of the Carquinez Strait at this time. The earliest clamshell disks south of the Carquinez Strait date to A.D. 1670 in Contra Costa County. Sometime between A.D. 1500 and 1650, fewer beads appear as grave goods, and only lipped and spire-lopped *Olivella* beads appear in South Bay and Central Bay interments. Milliken et al. (2007:117) note that material of the L2 Bead Horizon tends to occur as a thin lens atop rich midden material of the L1 Bead Horizon. Other changes occurred around the San Francisco Bay Area during this period. Clamshell disk beads, magnetite tube beads, the toggle harpoon, hopper mortars, plain corner-notched arrow-sized projectile points, and secondary cremation initially appear in the North Bay during the Terminal Late Period. The hopper mortar did not extend into the Central or South Bay, although the plain corner-notched projectile points did begin appearing in the Central Bay.

SHELLMOUND RESEARCH AND INTERPRETATION

Recent research in coastal and bay shoreline archaeology highlights the advantages of marine environments for prehistoric human adaptation. Coastal and bay shoreline shell midden sites are, or were once, highly visible and, because they occur throughout the world in varying coastal environments, provide comparative data for studies focusing on the influence of marine resources on site use, as well as larger cultural processes. The project area falls within the zone between the shoreline and the foothills of the San Francisco Bay Area in which Nelson systematically identified hundreds of shellmounds in the first decade of the 20th century. As Nelson approached the foothills from the shoreline, he noted that shell mounds located away from the shoreline were most frequently situated adjacent to streams (Nelson 1909). The project area, located adjacent to Memorial Stadium, was situated by Strawberry Creek, prior to the construction of Memorial Stadium and related channelization of the creek. There is a potential for buried cultural remains from the prehistoric period within the project area due to its proximity to Strawberry Creek, and also a potential that any buried remains may include a shell midden. Discovery of intact deposits from this site, which is located away from the bayshore, would offer the potential for investigating the relationship of site location to site function.

The function of shellmounds in the greater San Francisco Bay has always been a topic of interest to archaeologists, but has never been satisfactorily explained. In recent years, shellmound function has once again become a topic of focused academic discussion (e.g., Lightfoot 1997; Lightfoot and Luby 2002). Lightfoot observed that despite considerable research, archaeologists have not reached consensus on why hunter-gatherer populations constructed the shellmounds. The role of shellmounds in the subsistence-settlement system most likely changed over time, as evidenced by the variation in location, characteristics, and interrelationships of the shellmounds. The shellmounds have been alternatively interpreted as residential bases, garbage dumps, or specialized ceremonial sites. Because many of the mounds contain abundant and intermixed evidence of food remains, hearths, house floors, and burials, it is difficult to devise a simple, comprehensive and satisfying explanation for their function. Lightfoot and Luby argue for the ceremonial significance of the mounds, partly because the mounds they examined once rose above the landscape – some as high as three-story buildings – providing impressive visual markers that they argue must have had symbolic value (Lightfoot and Luby 2002).

Due to the intensive industrialization and urban development of the greater San Francisco Bay Area, most of the 425 mounds that Nelson documented in 1906 have been either completely destroyed or severely compromised and are no longer visible on the landscape. The Ellis Landing Shellmound was leveled in 1907 as Nelson worked on it, and the Emeryville Shellmound was dismantled by steam shovel in 1924. Other shellmounds suffered similar fates. Archaeological methods have become more sophisticated, and our understanding of the construction and chronology of shellmounds, as well as the culture history of the surrounding landscape, has grown considerably since the mass excavations and destruction of shellmounds in the first half of the 20th century.

Today most analysis and interpretation of the function of shellmounds relies upon data that were excavated from the shellmounds with outdated techniques and incomplete understanding of the complexities of chronology and structure. Research questions that drive data collection have changed over time. Recent construction projects have encountered intact portions of some shellmounds once thought to be completely destroyed. Examples include the Emeryville Shellmound (CA-ALA-309) and its neighbor, CA-ALA-310, which were exposed during the development of a large tract in Emeryville (Price et al. 2004b), and CA-ALA-17, which was first identified in 1876 and more recently rediscovered in West Oakland (Hylkema 1997; Van Bueren et al. 2002). New discoveries are possible, as evidenced by the discovery of a diminutive shell-rich cultural deposit buried beneath the streets of West Oakland, CA-ALA-604 (Pastron and Gottsfield 2003). This relatively small find (less than 20 m in diameter) is of particular significance, as the deposit lies approximately 1 m below modern ground surface and is limited to several species of shell, charcoal, some broken and burned faunal remains, and some fire-affected rock. A few thousand years ago, this concentration of shell and debris from cooking must have appeared as a very small mound or bump on the landscape. With no evidence of burials and such a relatively small profile, this site reminds us of the variations in shellmound

size, form, and function and, with further discoveries, offers the promise of a more nuanced and sophisticated understanding of shellmound function in prehistory.

Observable patterns in the current Bay Area archaeological data indicate that people settled near marshes adjacent to the bay shoreline and, at the very least, fished and collected shellfish and other resources such as reeds and grasses. Local occupants had access to imported materials and shared various regional cultural traits. The level of involvement in exchange of goods and ideas, however, has not been determined. In order to achieve a more sophisticated and satisfying explanation for variation in shellmounds, Bay Area archaeologists must conduct more comprehensive evaluations of existing shellmound finds, incorporate new data from investigations at sites other than shellmounds, and take full advantage of any newly discovered intact shellmound deposits, whether from previously known shellmounds, or from new discoveries.

2.2.2 Ethnographic Background

This section provides a brief summary of the ethnography of the project area within the San Francisco Bay Area and is intended to provide a general background only. More extensive reviews of Ohlone ethnography are presented in Bocek (1986), Cambra et al. (1996), Kroeber (1925), Levy (1978), Milliken (1995), and Shoup et al. (1995).

The project area lies within the region occupied by the Ohlone or Costanoan group of Native Americans at the time of historic contact with Europeans (Kroeber 1925:462-473). Although the term *Costanoan* is derived from the Spanish word *Costaños*, or "coast people," its application as a means of identifying this population is based in linguistics. The Costanoans spoke a language now considered one of the major subdivisions of the Miwok-Costanoan, which belonged to the Utian family within the Penutian language stock (Shipley 1978:82-84). Costanoan actually designates a family of eight languages.

Tribal groups occupying the area from the Pacific Coast to the Diablo Range and from San Francisco to Point Sur spoke the other seven languages of the Costanoan family. Modern descendants of the Costanoan prefer to be known as Ohlone. The name *Ohlone* is derived from the Oljon group, which occupied the San Gregorio watershed in San Mateo County (Bocek 1986:8). The two terms (*Costanoan* and *Ohlone*) are used interchangeably in much of the ethnographic literature.

On the basis of linguistic evidence, it has been suggested that the ancestors of the Ohlone arrived in the San Francisco Bay Area about A.D. 500, having moved south and west from the Sacramento-San Joaquin Delta. The ancestral Ohlone displaced speakers of a Hokan language and were probably the producers of the artifact assemblages that constitute the Augustine Pattern previously described (Levy 1978:486).

Although linguistically linked as a family, the eight Costanoan languages comprised a continuum in which neighboring groups could probably understand each other. However, beyond neighborhood boundaries, each group's language was reportedly unrecognizable to the other. Each of the eight language groups was subdivided into smaller village complexes or tribal groups. These groups were independent political entities, each occupying specific territories defined by physiographic features. Each group controlled access to the natural resources of its territory, which also included one or more permanent villages and numerous smaller campsites used as needed during a seasonal round of resource exploitation. Chochenyo or East Bay Costanoan was the language spoken by the estimated 2,000 people who occupied the "east shore of San Francisco Bay between Richmond and Mission San Jose, and probably also in the Livermore Valley" (Levy 1978:485). Chochenyo-speaking tribal groups in the project area on the east side of the bay included the Tuibun and the Alson (Milliken 1995:235,258). Costanoan was the language spoken by people who occupied the San Francisco Peninsula.

Leadership was provided by a chief, who inherited the position patrilineally and could be either a man or a woman. The chief and a council of elders served mainly as community advisers. Specific responsibility for feeding visitors, providing for the impoverished and directing group activities such as ceremonies, hunting, fishing, and gathering fell to the chief. Only during warfare was the chief's role as absolute leader recognized by group members (Levy 1978:487).

Extended families lived in domed structures thatched with tule, grass, wild alfalfa, or ferns (Levy 1978:492). Semisubterranean sweathouses were built into pits excavated in stream banks and covered with a structure against the bank. The tule raft, propelled by double-bladed paddles, was used to navigate across San Francisco Bay (Kroeber 1925:468).

Shellfish were an important staple in the Ohlone diet, as were acorns of the coast live oak, valley oak, tanbark oak, and California black oak. Seeds and berries, roots and grasses, and the meat of deer, elk, grizzly, rabbit, and squirrel formed the Ohlone diet. Careful management of the land through controlled burning served to ensure a plentiful, reliable source of all these foods (Levy 1978:491).

As observed by early European visitors, the Ohlone usually cremated a corpse immediately upon death but, if there were no relatives to gather wood for the funeral pyre, interment occurred. Mortuary goods comprised most of the personal belongings of the deceased (Levy 1978:490).

The arrival of the Spanish in 1775 led to a rapid and major reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to largely eradicate the aboriginal life ways. Brought into the missions, the surviving Ohlone, along with the Esselen, Yokuts, and Miwok, were transformed from hunters and gatherers into agricultural laborers (Levy 1978; Shoup et al. 1995). With the abandonment of the mission

system in the 1830s, numerous ranchos were established. Generally, the few Indians who remained were then forced by necessity to work on the ranchos.

In the 1990s, some Ohlone groups (e.g., the Muwekma, Amah, and Esselen further south) submitted petitions for federal recognition (Esselen Nation 2007; Muwekma Ohlone Tribe 2007). Many Ohlone are active in preserving and reviving elements of their traditional culture and are active participants in the monitoring and excavation of archaeological sites.

2.2.3 Local Archaeological Setting

CA-ALA-23, recorded within the current project area, consists of the partial remains of one individual discovered during construction of Memorial Stadium in 1923. The burial was uncovered ". . . at the west end of the stadium site. . . about 50 feet from Strawberry Creek," approximately 2 ft. below ground surface "close to a huge tree" (*Courier* 1925). A coin from the second half of the 19th century from Sonora, Mexico was also recovered in proximity. It is unknown, however, if the coin was associated with the burial. The San Francisco Examiner reported on June 21, 1925, "Third Skeleton Found in Grove on U.C. Campus." The article explained that three burials were encountered adjacent to Strawberry Creek during construction in the area of the UC Berkeley Faculty Club. The construction reportedly destroyed the burial site. This article did not provide information on the horizontal extent, thickness, or depth of the deposit associated with the burials. According to an interview conducted in 1925 with University of Washington Associate Professor of Anthropology Leslie Spier, approximately a dozen burials were found between Memorial Stadium and the Faculty Club. Spier states that these burials were all found within a 1½ to 2 block area just south of the south fork of Strawberry Creek.

Outside of the immediate SAHPC project area, but within ¼ mile, several prehistoric archaeological sites have been recorded. CA-ALA-308, a burial and habitation site, was discovered in 1907 by workmen digging a trench on the south bank of Strawberry Creek at the current location of the Faculty Club on the UC Berkeley campus. The site lies approximately 1,600 ft. west of the SAHPC project area. While digging the trench, the workmen encountered gray to black clay mixed with shells, bone and charcoal. The deposit was one to two ft. thick and extended for 200 ft. along the bank of the creek. Shells from oysters, mussels and clams were reported. A single flexed adult burial was found. Further work recovered a child burial roughly 100 ft. west of the first burial. Artifacts associated with the deposit included mortars, a projectile point, a charmstone, and a pestle. The work was reported by Merriam in 1907 and later recorded on an Archaeological Site Survey Record on an unrecorded date by Adolf R. Pilling. Nelson recorded shellmound #308 in 1907 in the general vicinity of the Faculty Club (Nelson 1909). Investigations at this site are more fully discussed in section 4.3.

In 1959, approximately seven blocks west of the SAHPC project area, a single burial was exposed and recovered during construction at 2138 Kittredge Street. This find has been designated CA-ALA-NL-18.

A prehistoric shellmound located on the north bank of Strawberry Creek, roughly 300 ft. inland from the bayshore of the early 1900s, has been designated CA-ALA-307, and is known as the West Berkeley Shellmound. The shellmound reportedly stood about 18 ft. high and covered a city block (between 2nd and 3rd streets and University and Hearst Avenues in Berkeley). The earliest depiction of the site is on the 1852 United States Coast Survey Map. Finds from the site are first noted in a newspaper clipping from 1884 (Schwartz 2002). Ten burials and a quantity of petrified wood and shell were recovered during digging at the back of the Franklin House, possibly to connect the house to a new sewer system. The Franklin House was located on the northwest corner of University Avenue between 3rd and 4th streets. The main body of the site was between 2nd and 4th Street and between Hearst and University Avenue, with the mound feature approximately one block in extent (CA-ALA-307 Site Card).

The West Berkeley Shellmound site was first excavated by University of California, Berkeley archaeologists in 1902. A wide range of materials including faunal and human remains, stone tools and debitage, and textiles were recovered and accessioned in the Phoebe A. Hearst Museum of Anthropology at UC Berkeley. A letter dated February 21, 1938 from E.L. Furlong, addressed to Mr. Alex D. Krieger, Department of Anthropology, University of Oregon, briefly recounts a few hazy details about work he had done at an unspecified earlier date on the property. He described it as "a relatively small mound as to height" with many burials in the part that he worked. He could not recall artifacts other than ornamental shell and some bone needles (Furlong 1938).

Two site records submitted by Adolf R. Pilling (1949, 1952) are sparse in their information. Pilling reports that the site was destroyed in 1950 and that a single pestle was accessioned to the Hearst Museum of Anthropology. Pilling notes that the West Berkeley Shellmound is crossed by the Southern Pacific Railroad and that many houses also sit on the site. Wallace and Lathrap (1975) report on excavations of 1950 and 1954 that uncovered hearth, pit and structural features, but provide very little detailed information.

Dore conducted a subsurface boring program in 2001 for the City of Berkeley limited to streets in the vicinity of CA-ALA-307 (Dore 2002). The results of the boring program indicate that intact deposits, some over 3 ft. thick, extend from just west of 2nd Street to east of 4th Street, almost to 5th Street in Berkeley, and from University Avenue to just north of Hearst Avenue. Radiocarbon tests yielded a range of dates from ca. 3030 BC to AD 780. The site record does not identify the materials that were dated or their proveniences. The entire above-ground mound was leveled in the 1950s and it is for this reason that Pilling reported that the site was destroyed. However, Dore has found with his drilling program that pockets of intact buried deposits remain. Dore describes the site as a

substantial habitation site with a mound centered between 2nd and 3rd streets, and a much larger extended site radius based on a sketch map by Nelson produced in 1910.

2.2.4 History

The historic period in the eastern San Francisco Bay region begins with the Fages-Crespi expedition of 1770. The Fages party explored the eastern shore of San Francisco Bay, eventually reaching the location of modern Fremont, where they traded with the local Costanoans. Members of the expedition eventually sighted the entrance to San Francisco Bay from the Oakland hills. In 1772, a second Fages expedition traveled from Monterey through what are now Milpitas, San Lorenzo, Oakland, and Berkeley, finally reaching the area of modern-day Pinole on March 28, 1772 (Cook 1957:131). From there they traveled through what is now Rodeo and Crockett to Martinez, made a brief foray into the delta region of the Central Valley, and then camped somewhere near modern-day Pittsburg or Antioch. On March 31, the Fages party began the return journey to Monterey. They traveled to the area of Walnut Creek, turned south, and then made their way to today's Danville, where they spent the night. On the first of April they passed through the area of San Ramon, Dublin, and Pleasanton, finally arriving back in the area of Milpitas on the following day.

In 1776, the Anza-Font expedition traveled through the same area and also traded with residents of native villages encountered along the way. The significant impact of the European presence on the local California natives, however, was not felt until the Spanish missions were established in the region.

In 1775, Captain Juan Manuel Ayala's expedition studied the San Francisco Bay and ventured up the Sacramento and San Joaquin Rivers in search of a suitable mission site. The first mission in the region was established the following year with the completion of Mission San Francisco de Asis (Mission Dolores) in San Francisco. Mission Santa Clara de Asis followed in 1777, and Mission San Jose in 1797. The ensuing Mission era proved to be the downfall of the native inhabitants of the region, who were brought to the missions as conscripts for labor under the pretense of Christianization. The missions became the loci of native missionization, which brought disease, subjugation, and ultimately decimation, to the native Californian groups. It is reported that by 1810, the traditional Costanoan lifestyle ceased to exist (Levy 1978:486). Diseases introduced by the early expeditions and missionaries, and the contagions associated with the forced communal life at the missions, killed a large number of local peoples, exemplified by a mass burial of 18 individuals adjacent to the Hotchkiss Mound site near Oakley (Heizer 1954). On an expedition through the Central Valley in 1832-1833, Ewing Young observed:

> In the Fall of 1832...the banks of the Sacramento River, in its whole course through the valley, were studded with Indian villages... On our return, late in the summer of 1833, we found the valleys depopulated. From the head of the Sacramento to the great bend and slough of the San Joaquin, we did not see more than six or eight Indians; while large numbers of their skulls and dead bodies were to be seen under

> almost every shade-tree near water, where the uninhabited and deserted villages had been converted into graveyards... (Cook 1957:318).

Cook (1943) estimates that by 1832, the Costanoan population had been reduced from a high of over 10,000 in 1770 to less than 2,000.

In 1817, Mission Dolores began using what would become the City of Berkeley to graze sheep (Schwartz 2000:1). In 1820, Sergeant Luis Maria Peralta received a grant of 10 square leagues of land in the East Bay in recognition of his long, faithful military service in California. Peralta named his grant Rancho San Antonio. It comprised the land that lay from the water's edge to the crest of the Oakland hills between San Leandro Creek in the south and El Cerrito Creek in the north (Hendry and Bowman 1940:585), completely encompassing modern-day Oakland, Berkeley, Emeryville, Piedmont, Albany, Alameda, and a portion of San Leandro (Sher 1994:6).

By 1822, Mexico had become free of Spanish rule, but did not give much attention to its frontier lands, therefore allowing the Alta California culture to develop independently and become distinctive. Residents began using the barter system to trade cattle hides and tallow for manufactured goods with foreign trading vessels (Schwartz 2000:1).

In 1842, Peralta formally divided his holdings among his four sons. Vicente Peralta received the area between Lake Merritt and the southern border of Berkeley. On the north bank of Temescal Creek, in the vicinity of the intersection of Telegraph Avenue, 55th Street, and Highway 24, he built his home, a chapel, corrals, storerooms, and other buildings (Bowman 1951: 225-226; Hendry and Bowman 1940: 589-591; Judd 1984:2). Corrals were also situated along the lower course of Temescal Creek and two structures stood at its mouth. Hides and tallow from the Peralta cattle herds were processed at the mouth of the creek and then shipped to San Francisco. Domingo Peralta, the second oldest son of Luis Peralta, received the northernmost section of his father's land that encompassed Berkeley. He grazed cattle on these lands (Schwartz 2000:2).

Following the U.S. seizure of Alta California from Mexico in 1846, rancho lands were divided up and generally overrun by the Anglo immigration to the area coincident with the land boom following the Gold Rush of 1849. By the beginning of 1850, Vicente Peralta had lost nearly $100,000 in rustled cattle, and squatters were usurping his land (Davis 1967:252). By 1852, Domingo Peralta's land was also being grabbed up by squatters, and his herds were dwindling due to poachers (Schwartz 2000:2). Rancho San Antonio suffered the fate of most Mexican land grants in northern California, with squatters taking quasi-legal title to lands, and the courts denying title to the original grantees (Hendry and Bowman 1940:585).

In 1853, Domingo Peralta was forced to sell the majority of his estate to several groups of investors. These investors split the property into lots and quickly resold them. Some of the land Peralta sold to developers eventually became sites of the state college, numerous farms, and Berkeley's first freight

wharf at the foot of Delaware Street. The previous year in 1852, William Hillegass, James Leonard, Francis Kittredge Shattuck, and Shattuck's brother-in-law, George Blake, filed claims to a square mile of land in the central section of what is now Berkeley (Cerny 1994).

THE COLLEGE OF CALIFORNIA

In 1855, the College of California was created and began searching for a new campus location. In 1857, Captain Orrin Simmons purchased the land now occupied by the Greek Theater and California Memorial Stadium from John Bonneron. Simmons offered up his lands for possible consideration of the new location of the college, and soon after, in 1860, the trustees of the college decided to locate the campus in the hills surrounding Strawberry Creek (Page and Turnbull, Inc. 2006). By 1864, the College of California had purchased an area of land from Simmons that encompassed part of the northern section of what is now Piedmont Avenue and part of the area that became the Berkeley Property Tract. This tract area was highly useful and sought after because water rights were built into the stipulations of purchase (Ranney 1990:572).

THE UNIVERSITY OF CALIFORNIA

In the mid-1860's, California Governor F. F. Low chose Berkeley as the new site for an Agriculture, Mining and Mechanical Arts College, under the 1862 Morrill Land Grant Act. The University was to be built next to the College of California site (Ferrier 1933:101). In 1867, during the College of California commencement, Governor Low proposed to merge the college with the new proposed University. As a result, the college dissolved on October 7, 1867. The assets of the College of California were given to the State for the new University with the stipulation that the new school include a College of Letters for the study of liberal arts and the humanities. Upon agreement with the State, the University of California was formed on March 23, 1868 by the signing of the Organic Act by California Governor Henry H. Haight (Page and Turnbull, Inc. 2006).

By 1872, University President Daniel G. Gilman announced that the University was to construct buildings on the Berkeley campus. Through the summer of 1873, campus buildings were constructed (Figure 6) and the University of California officially moved from Oakland to Berkeley in September 1873 (Page and Turnbull, Inc. 2006).

Because of the lack of transportation, the Berkeley campus was slow to grow. By 1872, only the slow-moving horse-drawn streetcar had been extended to Berkeley from Oakland. However, in 1876, the railroad arrived in Berkeley with a station at the intersection of Shattuck Avenue and Center Street (Page and Turnbull, Inc. 2006). By 1877, trains became connected to San Francisco via ferry, and, in 1878, cross country trains were connected to the Berkeley station. Due to the arrival of the transcontinental railroad, the small epicenter of Berkley moved from Telegraph

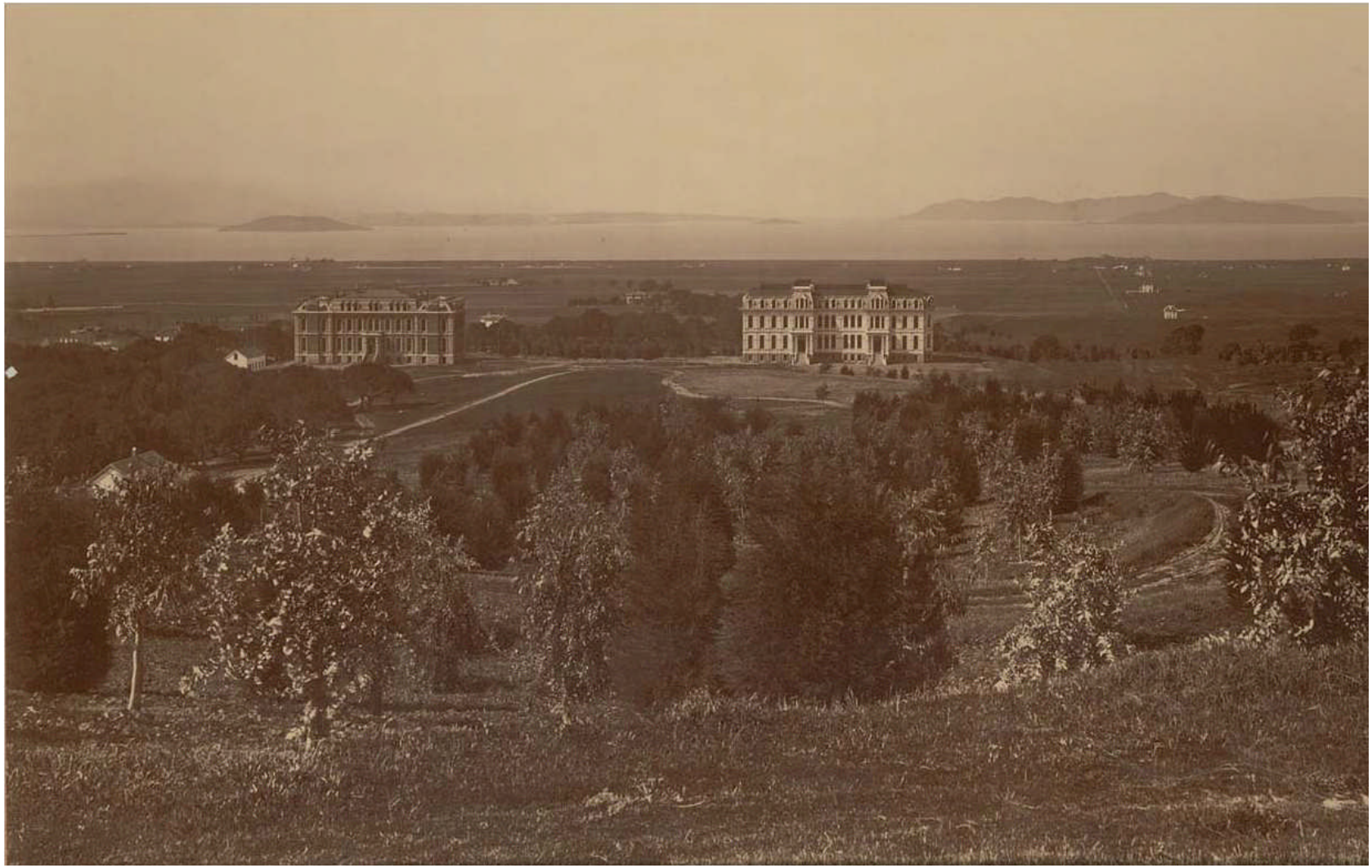


Figure 6 - View of the early UC Berkeley campus from the hills, showing natural landscape, circa 1874 (Carleton E. Watkins - OAC)

Figure 7 - Painting of UC Berkeley from the hills, with today's West Berkeley in background, circa 1890 (J.D. Robertson - Berkeley Public Library - OAC).

Avenue closer to Shattuck Avenue (Ferrier 1933:118). On April 1, 1878, the Town of Berkeley was officially incorporated, combining the bayside manufacturing settlement of Ocean View, which is now West Berkeley, with the small academic area of the University (Page and Turnbull, Inc. 2006) (Figure 7). The influx of supplies and commodities increased, and more people began inhabiting the town. By 1900, houses began replacing farms, and approximately 15,000 people lived in Berkeley, a marked increase from the 12 individuals who were recorded in the census during the time of Domingo Peralta (Schwartz 2000:2).

The 1870s also saw the development of the 2200 block of Piedmont Way and College Avenue in Berkeley. This block was located in close proximity to the University and was situated next to Strawberry Canyon and Strawberry Creek. Many of the residents along this block were associated with the University, such as Professor Fredrick Slate, future University Appointments Secretary Lucretia May Cheney, Dean of Mining Samuel Christy, and Professor Joseph Le Conte. The Slate's house was situated in the vicinity of today's Calvin Laboratory, immediately north of the Cheney house at 2241 College Avenue. Dean Christy's house was located on Piedmont Way, and the Le Conte house was slightly west of Piedmont Way on Bancroft Way. The Zeta Psi Fraternity, which was the first Greek letter collegiate organization formed at a college west of the Mississippi, was located where 2251 College Avenue stands today (Architectural Resources Group 2002:2). Other residents not affiliated with the University also occupied homes within the block. Between 1894 and 1896, a house at 2245 College Avenue was built by Mrs. Harriet J. Lee, who at various times rented space to students (Page and Turnbull, Inc. 2006).

HISTORY OF THE PROJECT AREA

Along the 2200 block of Piedmont Way, several houses existed in the late 19th century within what is now the footprint of the proposed SAHPC. These large, single-family homes were set far back on their lots, allowing for optimal viewing of the surrounding San Francisco Bay and the town below (Page and Turnbull, Inc. 2006). Two such residences included the Palmer Houses (Figure 8).

These homes were separate mansions for two wealthy brothers – H. A. Palmer and C. T. H. Palmer, and were designed by the architect Clinton Day. Day also designed several of the early University campus buildings. The Palmer and the Day families were closely connected, as each of the Palmer brothers had married sisters of Clinton Day (Pettitt 1973:68). The "Palmer Houses" stood on the slope of the east side of the 2200 block of Piedmont Way adjacent to where Memorial Stadium now stands. By 1911, neither of these houses remained in these locations. The residence of Clinton Day was also located close to the current project area at the northeast corner of Bancroft Way and Piedmont Avenue (Figure 9).

Several historic maps depict the location of Strawberry Creek, and give a sense of the historic landscape of the area. They illustrate the proximity of the structures within and surrounding the current project area and Memorial Stadium. When overlaid with a map of Memorial Stadium and

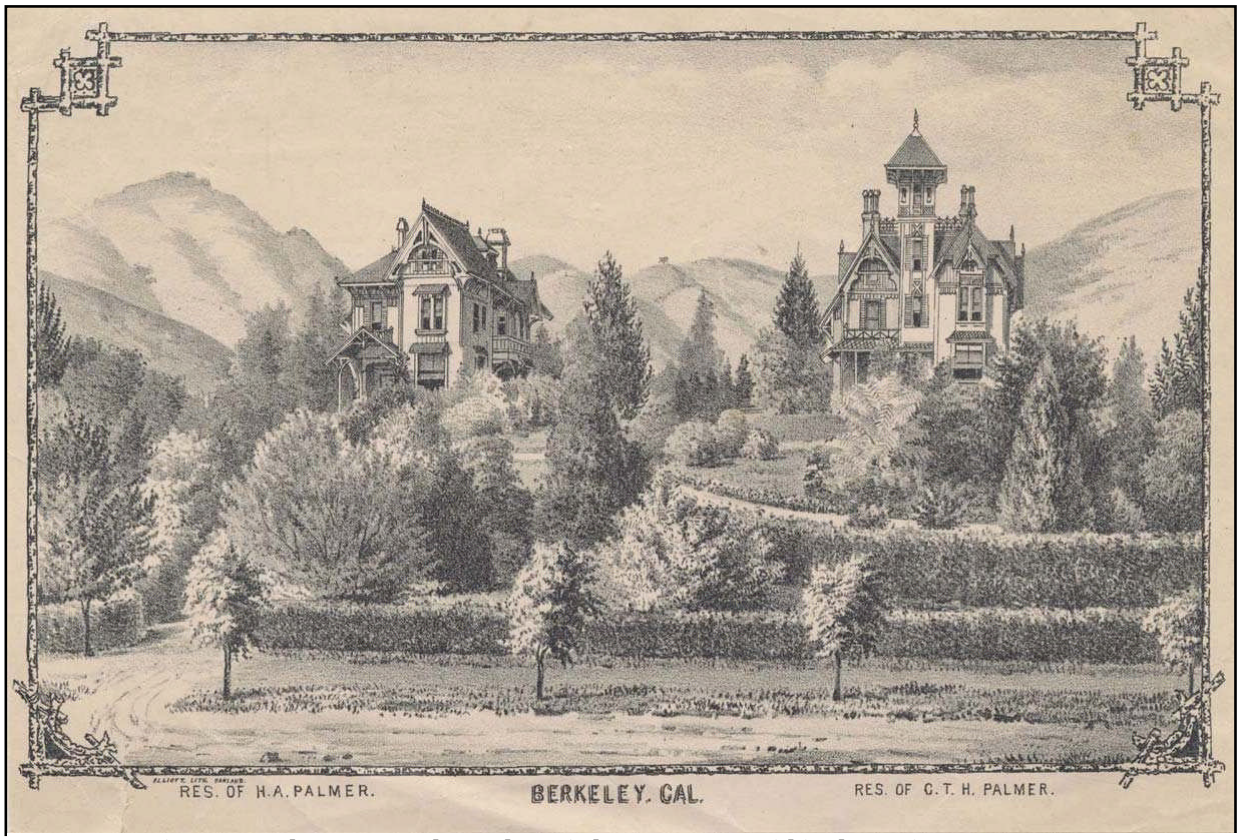


Figure 8 - Palmer Houses located on Piedmont Avenue within the project area, ca. 1882 (Bancroft Library, UARC PIC 14Q:5).

Figure 9- Clinton Day House at Bancroft Way and Piedmont Avenue, showing the Palmer Houses in the background, ca. 1885 (Clinton Day Collection, BAHA).

the current SAHPC project area, a 1900 geologic map of a portion of the Berkeley hills by Andrew C. Lawson and Charles Palache clearly shows the locations of several structures within and surrounding the project area, as well as the original location of Strawberry Creek, showing that it runs in a general east-west direction through the northern half of the stadium (Figure 10).

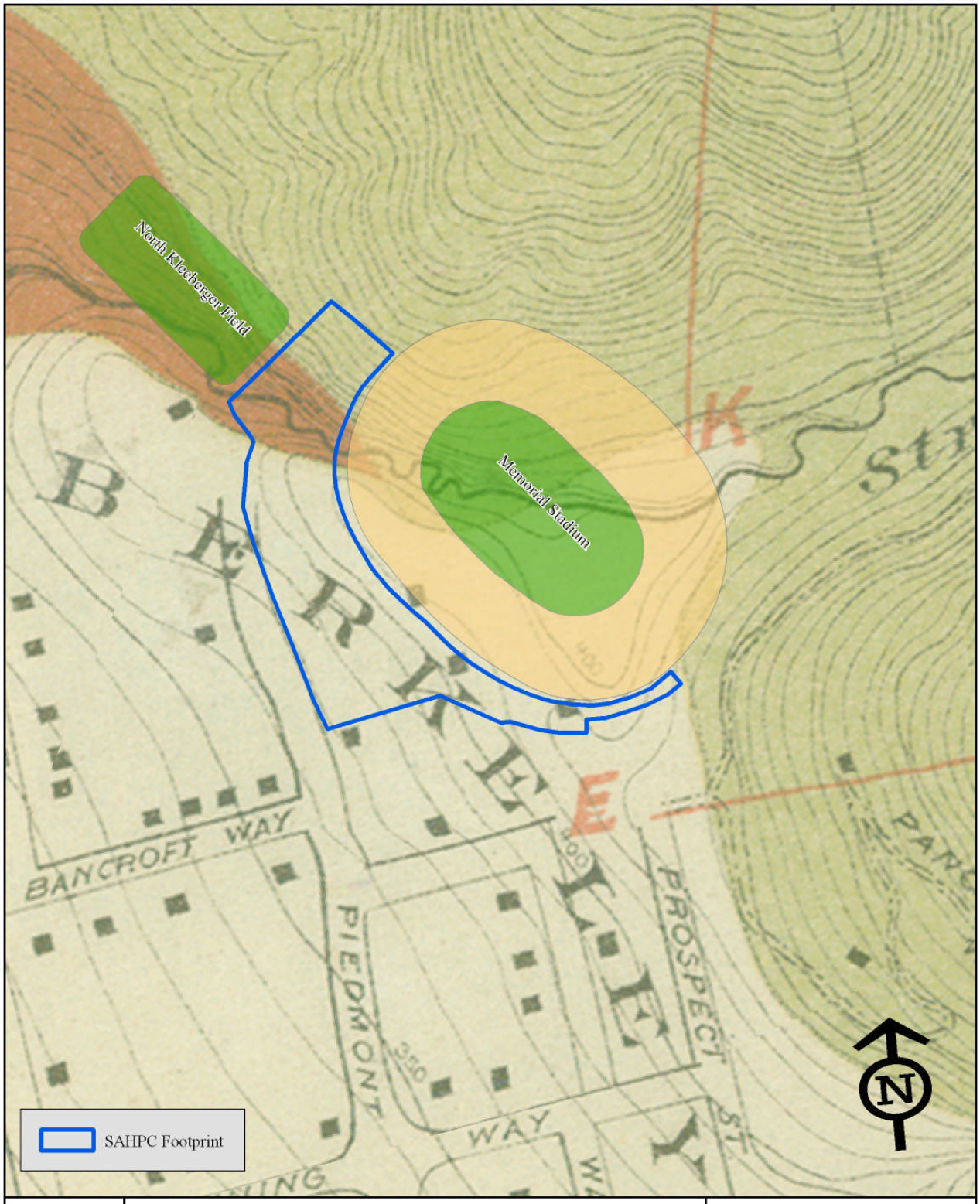
Analysis of Sanborn Fire Insurance Company maps of Berkeley provide a better sense of what structures were within and surrounding the project area. The 1911 Sanborn map of Berkeley shows approximately six structures within the project area. Several other structures are depicted underneath the footprint of Memorial Stadium (Figure 11). Examination of the Federal Census from 1910 and 1920 provides the identification of the residents of the structures located within and surrounding the project area. Martha Stringham and her family lived at 2250 Prospect Street, located at the southern edge of the project area. H. Suzuki, a cook, is listed at the head of the household for 2245 Piedmont Avenue. 2241 Piedmont and the adjoining building, 2243 Piedmont, were occupied by Harriet Palmer[2] and her family and Aug. Bayley and his family, respectively.

B. F. Brooks and his family lived at 2237 Piedmont, while slightly to the north, C.T. Blake and his family resided at 2235 Piedmont. Anson S. Blake and his family lived at 2231 Piedmont Avenue. Edwin T. Blake and his wife Harriet W. Blake are listed as living at 2233 Piedmont. A separate structure for 2233 Piedmont is not evident on the 1911 Sanborn map, however 2235 and 2233 Piedmont may have been adjoining residences, or it is possible that modifications were made to the structure after 1910 that show up on the 1911 Sanborn map. The residence of Anson Blake, a construction contractor at 2231 Piedmont, is the only household that appears in the previous 1900 Federal Census within the project area. All other recorded residences from the 1900 Federal Census on Piedmont Avenue are on the west side of the street, outside of the project area.

The residence of Charles Rieber, a University professor, located at 15 Canyon Road along the east end of the stadium and slightly outside the project area, is depicted in a 1914 photograph showing the project area and future location of Memorial Stadium (Figure 12). Rieber and his family are also present in the 1920 Federal Census. His residence provides a good landmark in photographs from the pre-stadium era, as his house sat on top of a ridge above the low lying topography of the area surrounding Strawberry Creek. Later, during construction of the stadium, the hillside was cut back and the area below Rieber's house was filled in. Most of the residents on the eastern side of the 2200 block of Piedmont Way appeared to have been well established with white collar or skilled labor jobs in engineering, insurance, medicine, education, manager and real estate.

The 1920 United States Federal Census provides a good indicator of the development of the area, as all of the homes listed in the 1910 Federal Census were still present, along with a few other residences that were not listed previously. One example is 2227 Piedmont Avenue, where the 1920

[2] Harriet Palmer's relationship to the Palmer brothers, if any, is not known. Her house is not one of the two Palmer houses depicted in Figure 8.

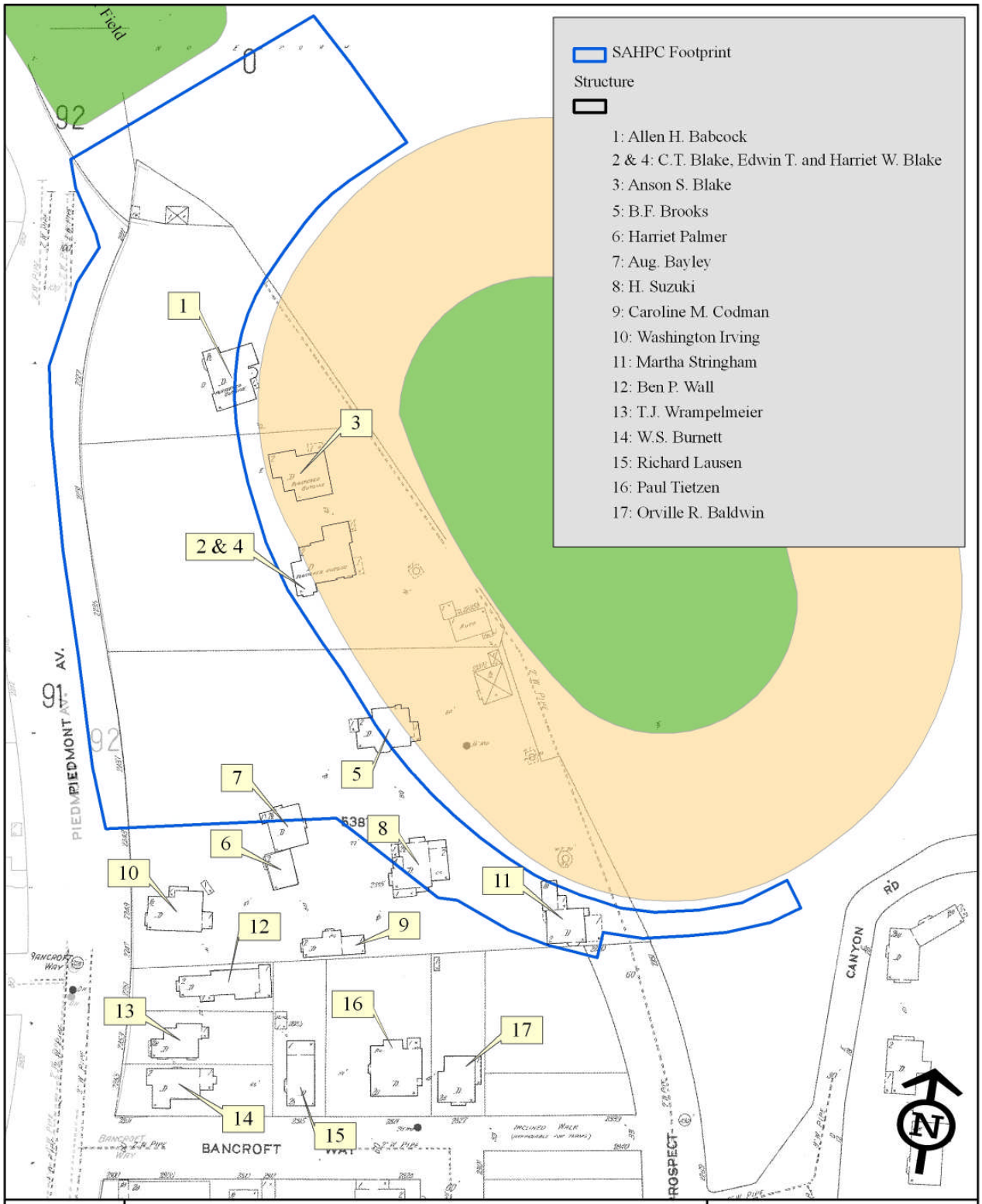


WSA

1900 Geologic Map

0 250 500 Feet

Figure 10
UC Berkeley
Student Athlete
High Performance Center
Berkley, CA



WSA

1911 Sanborn Map with Ownership Data

Figure 11
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

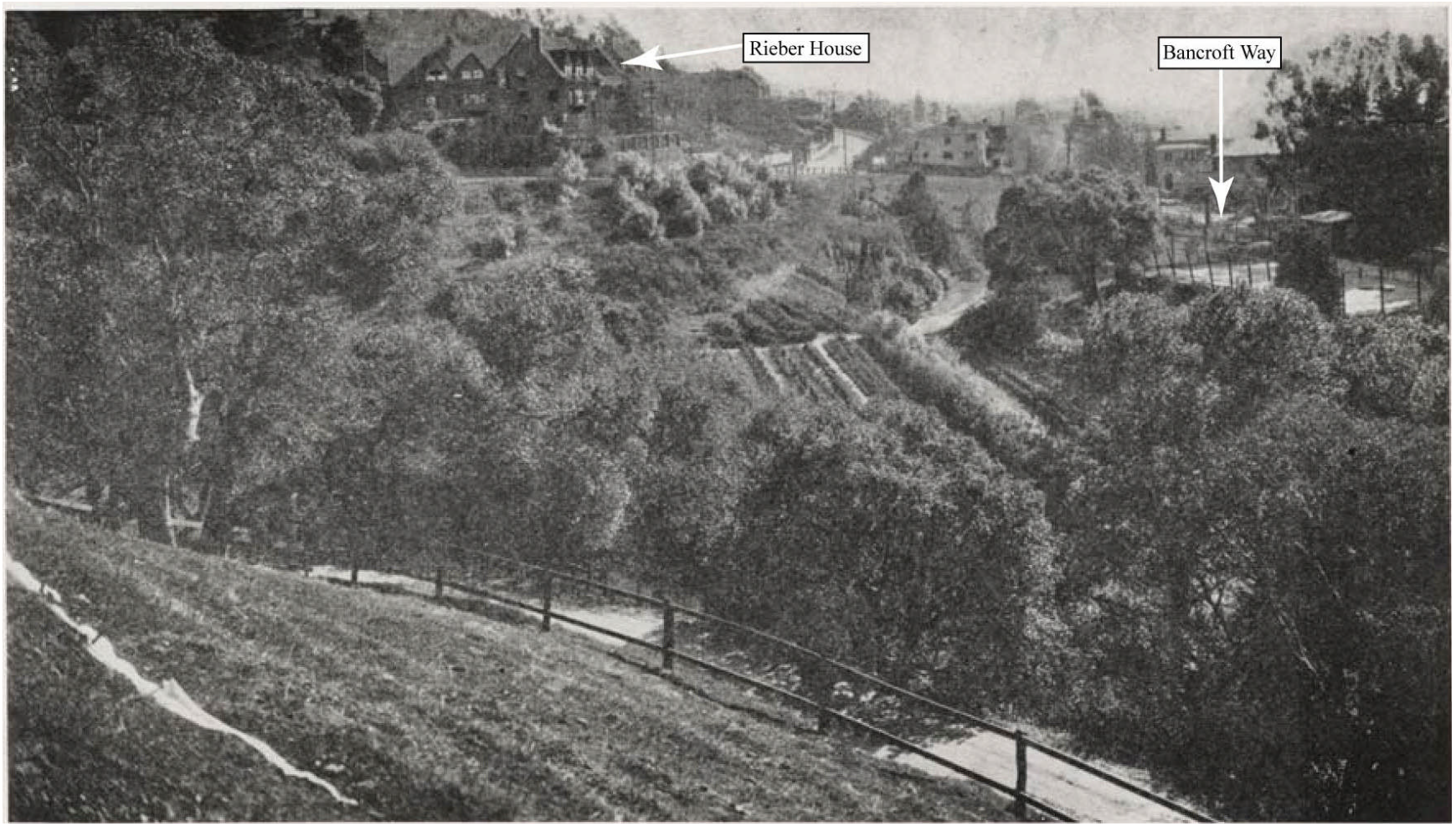


Figure 12 - View of Strawberry Canyon landscape, showing Rieber house on the top left and houses along Bancroft Way to the right. The central portion is the current location of Memorial Stadium, circa 1914 (UC Berkeley).

Federal Census lists Allen H. Babcock and his family, whereas the 1910 Federal Census did not have a listing for that address.

As evident from the United States Federal Census by 1930, most of the residents along the eastern side of the 2200 block of Piedmont Avenue had either relocated their residence across the street or in the near vicinity, or moved out of the area and Berkeley altogether.

Because the project area changed so much from the late 19th to the early 20th centuries, a comparative map showing the location of structures within the project area from different years (1873, 1874, 1882, 1885, 1897, 1911 and 1914) helps illustrate the historic landscape while at the same time showing the potential for encountering historical materials during project construction (Figure 13). During the construction, relocation or demolition of these houses there is no mention in contemporary newspapers or reports of any archaeological deposits being encountered. This is noteworthy in light of the media coverage given to discoveries of human remains during the construction of and around the Faculty Club, and the interest that such finds would have generated in those who lived in the neighborhood, many of whom were associated with the University

The topography also illustrates the natural meander of Strawberry Creek before it was channelized, and that the stadium was constructed in a natural depression. The development of the area and the modifications to the natural environment expanded when the decision to build the football stadium was made. Piedmont Way, as it existed at the end of the 1800s and the beginning of the 1900s was extended to the north and expanded and became Piedmont Avenue. The environments surrounding the project area were slowly transformed into the UC Berkeley campus we know today.

After the decision was made that a football stadium would be built on campus, several different locations were considered for the future Memorial Stadium. Eventually, the Board of Regents chose a site on the southeast side of campus at the mouth of Strawberry Canyon, because the other proposed locations (the southwest corner of campus where Edwards Stadium stands today, and south of University Avenue between California and Sacramento Streets), would have required the purchase and demolition of private property.

The proposed Strawberry Canyon site location was already partially owned by the Board of Regents and the University (Figure 14) (Siegel and Strain 1999:13). The stadium grounds consisted of approximately 22 acres, 16 of which were already owned by the University (Siegel and Strain 1999:25). Before the construction of Memorial Stadium, Strawberry Canyon was primarily a natural preserve and was also used for horticulture. The area was described as a "place with paths and benches placed to enjoy the view of Strawberry Creek, native vegetation including bracken, wild current, oaks, and bay trees, and wildlife such as quail and rabbits" (Smyth 1923:33).

Construction and excavation for Memorial Stadium began in mid-January 1923 (Siegel and Strain 1999:15). The houses and most of the trees on the site were removed (Figure 15), and a large

Figure 13 - Map showing topography and historic structures surrounding the project area

This page intentionally left blank

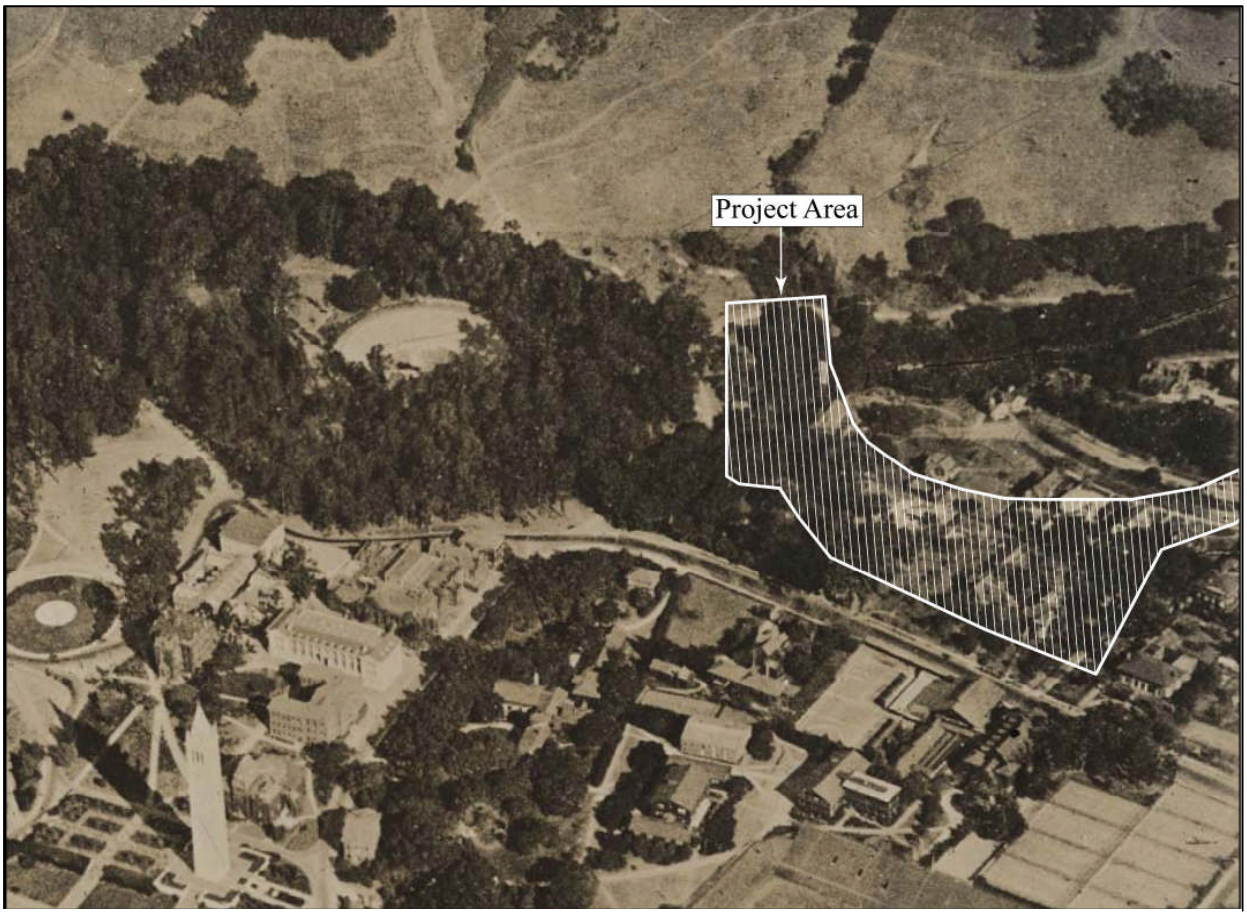


Figure 14 - UC Berkeley campus, showing the future location of Memorial Stadium, ca. 1920 (Bancroft Library, UARC PIC 03:067)

Figure 15 – Early stage of Memorial Stadium under construction, looking north. Note the draw horses and mules and Strawberry Creek (Bancroft Library, UAPC)

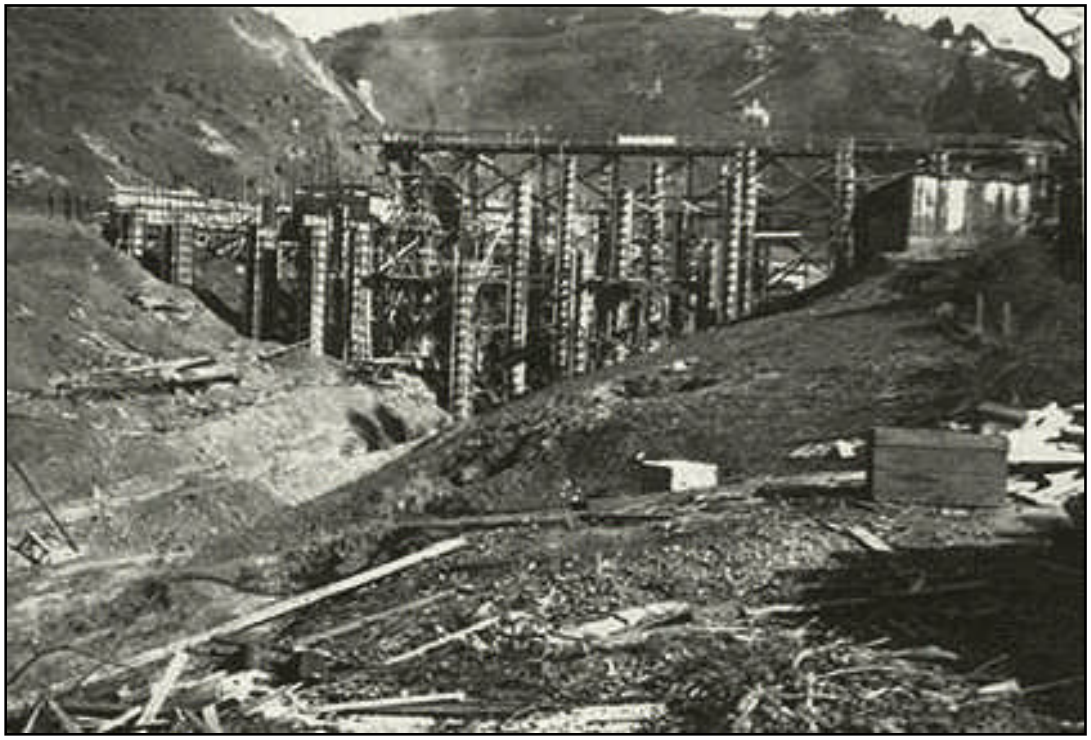


Figure 16 – UC Berkeley Memorial Stadium under construction, 1923
Note concrete culvert. (BAHA archives, courtesy of R. Wesell)

concrete culvert approximately 4 feet wide running north-south across the center of the site was constructed to divert Strawberry Creek (Siegel and Strain 1999: 27) (Figure 16). Approximately six structures were moved to the 2200 block of College Avenue, or across the street to lots on Piedmont Avenue (Page and Turnbull, Inc. 2006).

In order to create a level and large enough space for the stadium and its surrounding grounds, approximately 280,000 cubic yards of soil and rock were moved onto the site, mostly from the lower slopes of Charter Hill (Figure 17). To loosen the dirt and hillside, approximately 10,000 pounds of dynamite and 24,000 pounds of black powder were used (Siegel and Strain 1999:25). The rock was pulverized into silt and gravel and was moved around the stadium grounds using sluice boxes, which created a flat, raised surface ranging from 14 to 24 ft. above the old creek bed. In addition, an elliptical mound of dirt was created around the field (Siegel and Strain 1999:27). Memorial Stadium was completed in time for the Big Game between Stanford and California on November 24, 1923, and by December 1923, the landscaping of the stadium grounds was mostly complete (Page and Turnbull, Inc. 2006) (Figure 18).

The 1929 Sanborn Fire Insurance Company map of Berkeley shows the location of the completed stadium, and the locations of the surrounding structures within and near the current project area. Two structures, 2239 and 2241 Piedmont Avenue are represented as being partially within the southwest corner of the project area (Figure 19). By their absence, the 1930 Federal Census illustrates how the residences within the project area were affected by the construction of Memorial

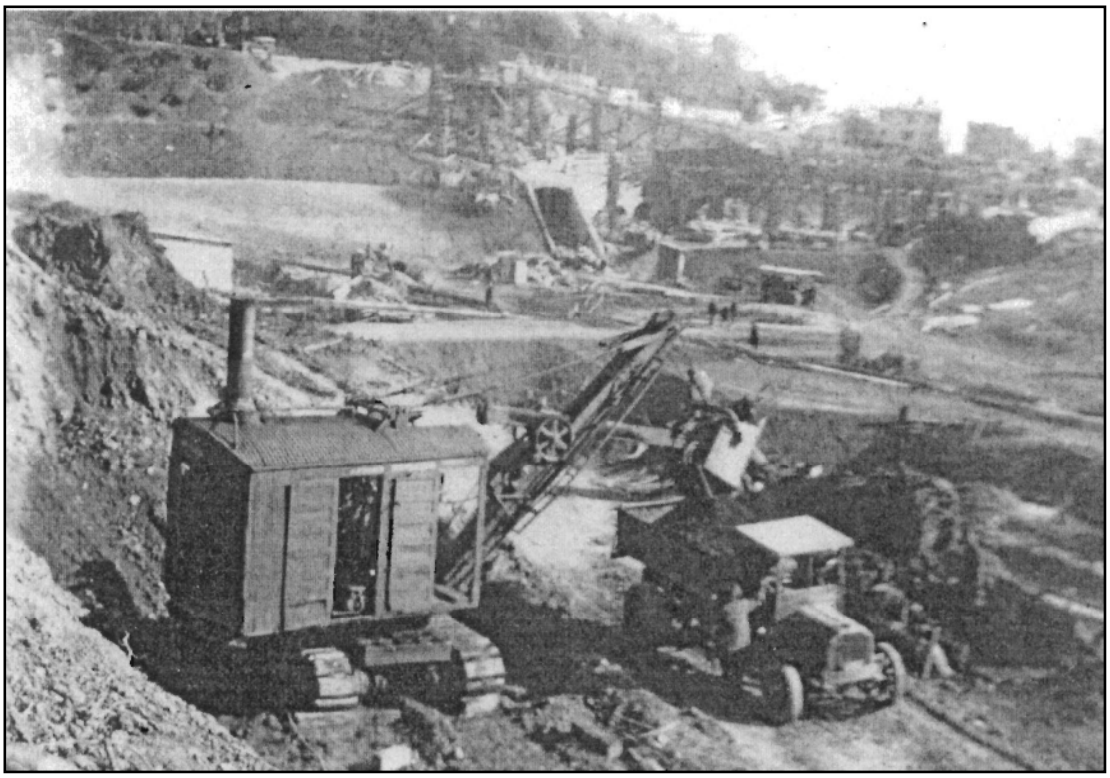


Figure 17 – Steam shovels removing dirt from side of Charter hill, showing construction of stadium in background, 1923 (BAHA archives)

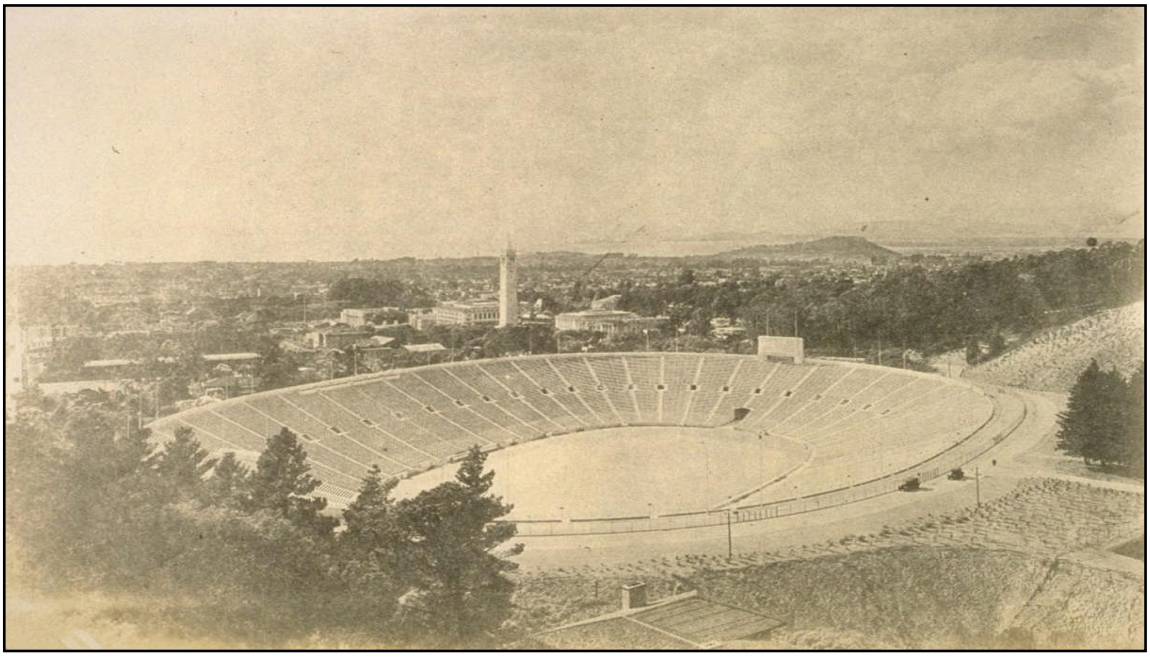
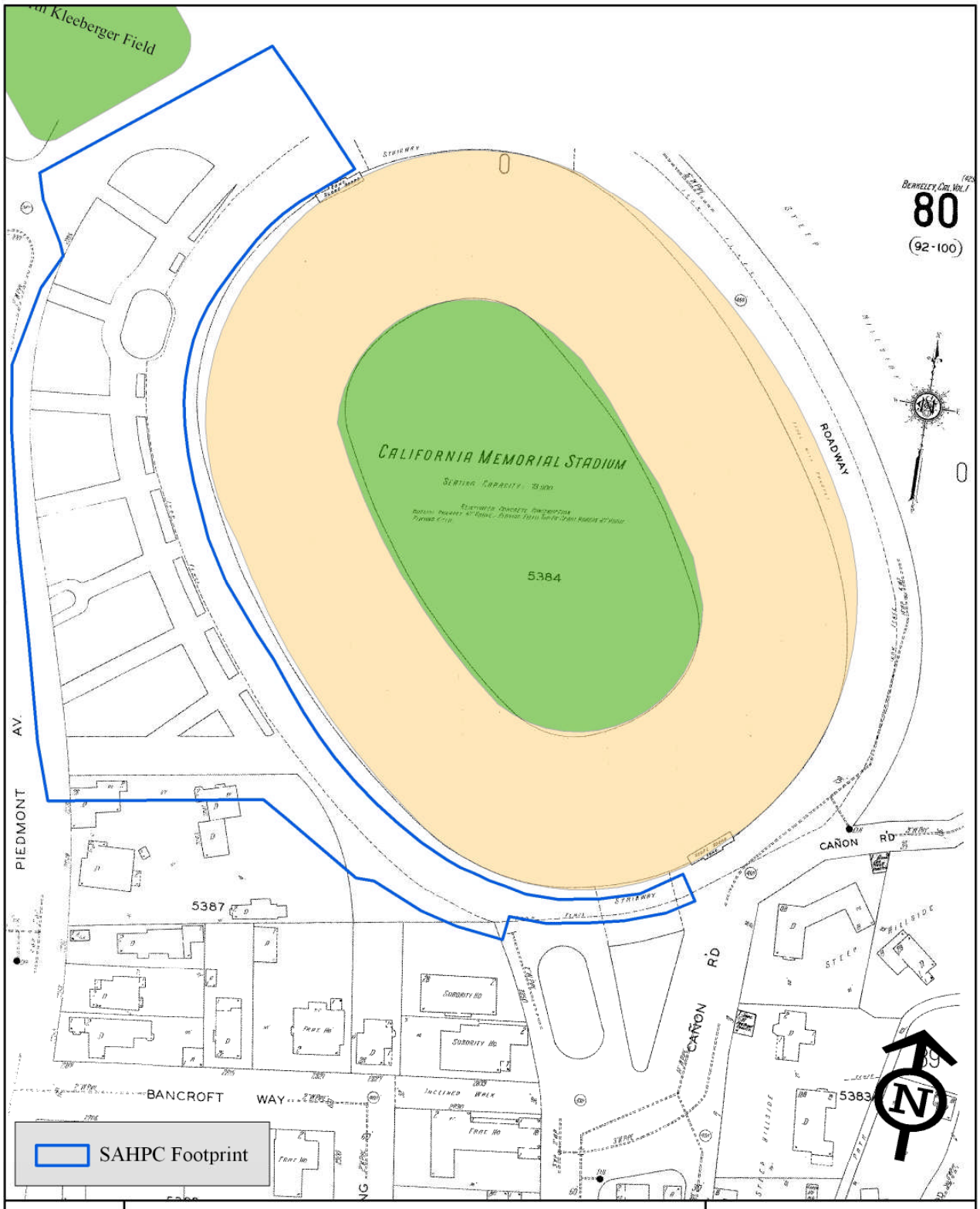


Figure 18 – Completed Memorial Stadium, facing west, 1923 (Online Archives of California)



1929 Sanborn Map

0 200 400 Feet

Figure 19
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

Stadium, the landscaping of its grounds, and with the construction of the International House in 1929. Many of the homes illustrated on the 1911 Sanborn Map are no longer present on the 1929 Sanborn Map, although the homes located at the site of the International House are still represented on the map. As stated previously, most of the homes within the project area were either moved to different locations (across the street on Piedmont Avenue, College Avenue, or several other areas) or were removed during development of the stadium and its grounds. Through the construction of Memorial Stadium, the International House, various University and non-University construction projects, and road upgrades and improvements, the area today little resembles the landscape that existed at the end of the 19th and the early 20th centuries.

3.0 Results of the Records Search

On June 21, 2007, WSA contacted the California Historical Resources Information System (CHRIS), Northwest Information Center (NWIC) at Sonoma State University to request a records search of the project area to identify known cultural resource sites and previous surveys in or near the project area. The search (File No. 06-2010) included the entire project area and a ½-mile radius surrounding it. All previous cultural resource surveys, known historic or prehistoric sites, and listed or eligible National Register of Historic Places or California Register of Historical Resources properties within the area of the records search were examined. State and local historic site inventories were also reviewed to identify the presence of any listed sites in the project vicinity.

One previously recorded site, CA-ALA-23, is located within the project area (Table 2), and an additional 10 sites have been previously recorded within ½-mile of the project area (Table 3).

TABLE 2 – Recorded Archaeological Sites within the Project Area

Site Number	Period	Description	Location	Condition	Other Info.
CA-ALA-23	Prehistoric	Burial removed during the building of the UC Stadium, site record based on SF Examiner article, June 21, 1925	Beneath the UC Berkeley stadium	Record states site destroyed by construction of stadium	

TABLE 3 – Recorded Archaeological Sites within ½-Mile of Project Area

Site Number	Period	Description	Location	Condition	Other Info.
CA-ALA-308	Prehistoric	Burial & habitation site, Nelson's 308, contains tightly flexed burials, shell, bones, charcoal, artifacts include mortars, a charmstone, pestle & projectile point, site record based on notes by J.C. Merriam, August 3, 1907	At the Faculty Club on the UC Berkeley campus	Considerable destruction by construction activities	Accession No. 12-3456, 1-24103, 1-24102
CA-ALA-552 P-01-000230	Modern	Stone tool making debris of University staff & students	Inside apex of the 'L' shaped Kroeber Hall, UC Berkeley	Extant in 2008	
P-01-005619	Historic (b. 1907)	Hotel Carlton, flat-roofed 4-story, brick masonry building	2328-2346 Telegraph Ave	Extant in 2004	

Site Number	Period	Description	Location	Condition	Other Info.
CA-ALA-606 P-01-010537	Prehistoric	Remains of an adult male, described as 'Mongoloid', site record based on Oakland Tribune article, June 20, 1925 & other published & unpublished documents; remains of an adult & infant burial within layer of shell, record based on Oakland Tribune article, August 4, 1907 & other published documents	Faculty Club, UC Berkeley	Burials removed	Site analysed by J.C. Merriam
P-01-010578	Unknown	Recorded as subsurface markings in a grid pattern, site record based on Berkeley Daily Gazette article, date not included, this may not be a legitimate site	Beneath the Doe Library, UC Berkeley		
P-01-010597	Prehistoric	Scatter of bone & shell fragments within a large flat area with dark soil, site record based on cursory visual inspection of area	Up Derby Canyon, east of top of Dwight Way, Berkeley	Unknown	
P-01-010659	Historic (b. 1914)	Cambridge Apartments, flat-roofed 5-story building of steel frame with brick veneer & cast stone detailing	2500 Durant Ave	Extant in 2004	
CA-ALA-615 P-01-010663	Prehistoric	Scatter of shell adjacent to creek bank, site record based on visual inspection of area	UC Berkeley campus, just west of Haviland Hall	Unknown	
P-01-010669	b. 1964	Wurster Hall, 4-story building with 10-story tower	Bancroft Way	Extant in 2003	
P-01-010685	Historic (b. 1944)	Building 50, Lawrence Berkeley Laboratory, 3-story L-shaped building	Lawrence Road at Seaborg Road	Extant in 2003	

Twenty cultural resource studies have been conducted within ½-mile of the project area. These are listed below in Table 4.

TABLE 4 – Previous Cultural Resource Studies within ½-Mile of Project Area

Reference	Year	Author	Title
S-000445	1977	Katherine Flynn	Preliminary Archaeological Reconnaissance of 5 Proposed Locations for the New Engineering Building, University of California, Berkeley-ARS 76-73.
S-005625	1982	William Roop	Archaeological Reconnaissance of the Proposed Biological Sciences Construction and Alterations Project, University of California at Berkeley (letter report).
S-007903	1985	David Chavez	Cultural Resources Evaluation for the East Bay Municipal Utility District Infiltration/Inflow Project (P.O. 951 1143 EA).

Reference	Year	Author	Title
S-008719	1986	William Roop	Archaeological Survey of Undeveloped Lands and Proposed Building Locations within the Lawrence Berkeley Laboratory, University of California, Berkeley (letter report).
S-009452	1987	Miley Paul Holman	Foothill Student Housing Project, Berkeley, California: Archaeological Field Inspection (letter report).
S-017501	1976	Thomas L. Jackson	A Preliminary Archaeological Reconnaissance of the Proposed Engineering Center Building, University of California campus, Berkeley (letter report).
S-018275	1996	Celia McCarthy	Berkeley: Rural Romance to Urban Ideal 1905-1946, Historic Context Statement for The Granada at Sather Gate.
S-020513	1998	Barry A. Price	Cultural Resources Assessment, Pacific Bell Mobile Services Facility PL-131-01, Berkeley, Alameda County, California (letter report).
S-021110	1998	Sunshine Psota	Review of the Historic Resources of the Built Environment for Site PL-131-02, Campus Store, 1810 Euclid Avenue, Berkeley, Alameda County, CA (50001 105/98) (letter report).
S-022814	2000	Sean Dexter, Daniel Shoup	Cultural Resource Reconnaissance for the Proposed East Bay Regional Park District Fire Mitigation Projects, Alameda and Contra Costa Counties, CA, HMGP# 919-515-24.
S-022828	2000a	Lorna Billat	California Office of Historic Preservation (OHP) Regarding Telecommunication Facilities, (Nextel CA-2215B-'SF-16') (letter report).
S-022829	2000b	Lorna Billat	California Office of Historic Preservation (OHP) Regarding Telecommunication Facilities, (Nextel CA-2200A-'SF-1') (letter report).
S-022830	2000c	Lorna Billat	Consultation with the California Office of Historic Preservation (OHP) Regarding a Proposed Cellular Facility (Nextel Site Number CA-2208A-'SF-9') in San Francisco, California (letter report).
S-026399	2002	Carolyn Losee	Cultural Resources Analysis for Cingular Site No. PL-059-02 City Parking Berkeley Site (letter report).
S-028039	2000	Carol Kielusiak	Archaeological Survey of 70 Acres of Land and Recordation and Evaluation of Four Historic Resources at the E.O. Lawrence Berkeley National Laboratory, Alameda County, California.
S-028215	2004	Diana J. Painter	Architectural Resource Evaluation for Cingular Wireless Installation PL-059-03, Durant and Telegraph (letter report).
S-029012	2003	Ric Windmiller	Historic Architectural Survey Report, AT&T Wireless Services Site ID# 960006358/ Lawrence Berkeley Lab (Bldg 50), Cyclotron Road, Berkeley, Alameda County, California.
S-029668	2005	Scott Billat	Collocation on a Building Roof Containing a Lease Area with Equipment Cabinets, Berkeley. SF-06930A, (Wurster Hall), 1936 University Ave., UC Berkeley, Berkeley, CA.
S-030739	2005	Dana E. Supernowicz, Lorna Billat	Collocation ('CO') Submission Packet FCC Form 621, Durant & Telegraph, BA-12059, 2500 Durant Avenue, Berkeley.

Reference	Year	Author	Title
S-031825	2005	Suzanne Baker	Positive Archaeological Survey Report for the Alameda-Contra Costa Transit District's East Bay Bus Rapid Transit Project in Berkeley, Oakland, and San Leandro.

4.0 Other Sources Consulted

A number of sources were consulted to obtain information about other historical archaeological research, about CA-ALA-23 beneath Memorial Stadium, and about nearby CA-ALA-308 at the site of the Faculty Club and Faculty Glade. Professor Laurie A. Wilkie of the UC Berkeley, Department of Anthropology provided information regarding archaeological research that has been conducted at four historic sites on the UC campus in conjunction with multiple campus development projects. The information obtained during consultation with Professor Wilkie is presented below in section 4.1.

Site cards for CA-ALA-23 and CA-ALA-308 were provided by the NWIC in the results of the site records search. WSA staff archaeologist Angela Cook visited the NWIC to determine if additional material relating to these two sites was available. This search included examination of all reports relating to cultural resource investigations within the current project area and within a ¼-mile radius. No additional information was located.

A search of the archives at the Phoebe A. Hearst Museum of Anthropology at UC Berkeley was also undertaken by Ms. Cook, with the kind assistance of Ms. Joan Knudsen, museum Registrar. Sources examined included site records, the card catalogs for skeletal material, artifacts, coins, accession records, and manuscript listings. No manuscripts relating to either CA-ALA-23 or CA-ALA-308 were located.

A search of historical newspapers provided on the website Ancestry.com was also conducted using the following search terms in various combinations: Memorial Stadium, Faculty Club, Faculty Glade, University of California, Berkeley, Strawberry Creek, Indian burial, Indian bones, Indian skeleton, skeleton, bones, Leslie Spier, stadium construction. The information obtained during these searches is summarized below in sections 4.1 through 4.3.

4.1 Recent Historical Archaeological Excavations

The first archaeological research project conducted by Dr. Wilkie on campus focused on the Zeta Psi fraternity located at what was formerly 2225 College Avenue. Excavations began in 2001 in association with the earthquake retrofit of the 1911 fraternity building. The archaeological excavations uncovered stratified deposits associated with the building and with the preceding fraternity house that was present at this location from 1876 to 1910 (Wilkie 2008). Portions of the 1876 foundation and associated pipe lines were located during the excavation. Artifacts recovered

from the site illustrated the ". . . changing notions of masculinity in American society during the late 19th and early 20th centuries" (Wilkie 2008, elec. comm.).

In 2003, archaeological testing was completed at the site of Student's Observatory which was built in 1870, as well as the agricultural Conservatory, operational between 1893 and 1924. Testing revealed that the subsurface remains associated with the observatory had been largely destroyed during the construction of McCone Hall (Wilkie and Kozakavich 2003). In contrast, testing results of the glass Conservatory building revealed well-preserved architectural features and significant deposits. Due to the future construction of the East Asian Library at this location, excavations of over 100 sq. m were carried out at the site, revealing features and artifacts related to soil science and various agricultural experiments that were conducted in the green houses during their use (Wilkie and Kozakavich 2003).

Archaeological testing in the SAHPC project vicinity was conducted at 2243 College Avenue from 2006 to 2007, at the site of the Cheney residence. The extant building was the residence of UC Berkeley alumni May and Warren Cheney from 1883 to 1939 (Wilkie 2008, elec. comm.). May Cheney was significant in campus history not only for her involvement in local women's rights movements of the early 20th century, but also her role in developing the University Placement Center. Archaeological excavations conducted within the site revealed garden features, and a range of domestic artifacts were recovered (Wilkie 2008, elec. comm.).

4.2 CA-ALA-23

The site record for CA-ALA-23 describes the site component located beneath the southwest edge of Memorial Stadium, as "Burials removed during the building of the UC stadium." A coin from Sonora, Mexico, dating to the second quarter of the 19th century was found a month later, though its association with the burial, if any, is not discussed (refer to site card for CA-ALA-23 and skeletal remains card catalog entry). The site was recorded as having been destroyed during construction of the stadium. According to the accession record for the remains, which represented one individual, Charles Donald Younger collected and donated the skeletal material to the Museum of Anthropology in 1923 (see below for discussion of the Museum of Anthropology). Attempts to locate the correspondence relating to this donation have not been successful.

Attached to the CA-ALA-23 site card located at the Hearst Museum is a copy of a newspaper article that appeared in the *Berkeley, Cal. Californian* on January 17, 1923. The article, entitled ". . . Unearth Bones of Indian Warrior in Strawberry Creek," states that workmen excavating during construction of Memorial Stadium had found skeletal remains the day prior, approximately 2 ft. below ground surface. The remains were found near the roots of a tree. The bones represented an almost complete skeleton, which Professor A. L. Kroeber and Professor R. H. Lowie identified as that of an adult male Native American who died sometime between the ages of 25 and 50 years. The article finishes by stating that "It is not likely that any large Indian burial ground will be unearthed,

as the excavation for the stadium progresses, but it is probable that a number of other skeletons will be discovered near where this first one was found." It must be noted that it is not specified if these are the opinions of Kroeber and/or Lowie or if they are those of the unidentified author.

While the site record for CA-ALA-23 states that burials were removed during construction of the stadium, the card catalog entry for skeletal remains for this site is for fragments of a single skeleton. In addition, the aforementioned *Berkeley, Cal. Californian* newspaper article states that the remains of only one individual were located beneath the stadium. The skeletal material is in storage in the basement of the Hearst Gym, and the location of the Mexican coin is unknown.

4.3 CA-ALA-308

CA-ALA-308 is described as a burial and habitation site, and was originally recorded as Nelson's shellmound 308. This site is located at the site of the Faculty Club, approximately 1,640 ft. west of CA-ALA-23. Attached to the site card for CA-ALA-308 is a newspaper article that appeared in the *San Francisco Examiner* on June 21, 1925, entitled "Third Skeleton Found in Grove on UC Campus." Information from this article was also used to prepare the site card for CA-ALA-23. It appears that the *Berkeley, Cal. Californian* article from January 17, 1923 was not available when the site card for CA-ALA-23 was originally prepared.

CA-ALA-308 contained shell within gray-black soil over an area measuring 50 ft. north-south by 200 ft. east-west. According to the site card, tightly flexed burials along with mortars, a projectile point, a charmstone and a pestle were removed from the site. The site card was prepared by Arnold Pilling based on J.C. Merriam's notes taken in August 1907. Merriam's notes are provided in full below.

> In digging a trench along the south side of Strawberry Creek near the Faculty Club on August 2, 1907, the University workmen cut through a deposit of clay mixed with sea shells, bones and charcoal, which evidently represented an old Indian campsite. The shell bed was from one to two feet in thickness and extended for a known distance of nearly two hundred feet along the bank of Strawberry Creek. The kind of shell present includes oysters, mussels, clams, all of which were used for food by some of the aboriginal tribes.
>
> In contact with the upper portion of the shell layer and about one foot below the surface, one of the workmen uncovered the complete skeleton of an adult lying on its side and with the knees drawn up toward the chest, as in manyknown [sic] shellmound burials.
>
> The thickness of the shelly deposit indicates the occupation of this site as a swelling [the 's' is replaced with a hand-written 'd'] place through a period amounting to many years. How long a time has elapsed since the site was occupied can only be

> conjectured, though some evidence is found in the fact that large tree roots passed through the skeleton.
>
> Since the discovery of the burial another of the workman [sic] has uncovered the skeleton of a young child, embedded in the shell layer, and one hundred or more feet west of the first discovery.
>
> J. C. Merriam
>
> Aug. 3, 1907.

This find was reported in the *Oakland Tribune* on the same day that Merriam produced his notes. The article states that the skeletal material was discovered during excavations of a water pipeline trench. The skeleton, which "reposed on top of a bed of shells in a crouching attitude" was found a foot from the existing ground surface. Dr. J. C. Merriam was to "make an exhaustive study of the bones" and produce a bulletin on his findings (no evidence of this bulletin has been located during archival searches). The finding appears to have prompted much discussion among members of the Faculty Club, and the article observed that the discovery of the shell deposit "…inspired the announcement of the theory at the Faculty club that in other ages the present site of the University touched the shore of the sea, and that on those shores prehistoric man walked, ate and slept, and there buried his dead."

The following day, the *Oakland Tribune* announced the discovery of the remains of a Native American infant "within a few yards" west of the aforementioned adult remains, as noted by Merriam. The article appears to have been based on the notes provided by Merriam and transcribed above.

No field notes or documents produced by the Department of Anthropology staff have been located for the site after this time. Information regarding the subsequent discovery of human remains at the site has been obtained from newspaper articles appearing primarily in the *Oakland Tribune*, but also the *Courier* and the *San Francisco Chronicle*. Relevant newspaper articles are summarized in Table 5.

TABLE 5 – Newspaper Articles Relating to Burials Located within the Vicinity of the Faculty Club, Faculty Glade, and Memorial Stadium

Newspaper	Date	Title of Article	Description	Source:
Oakland Tribune	August 3, 1907	Prehistoric Indian Skeleton Dug up on University Campus	Native American skeletal remains representing one individual found during excavation of a water pipeline trench near the Faculty Club. Dr. J. C. Merriam to study the remains. Remains found overlying a shell deposit.	Ancestry.com
Oakland Tribune	August 4, 1907	Second Prehistoric Aborigine Skeleton Uncovered on Campus	Skeletal remains of a Native American infant found near the Faculty Club close to those remains found the previous day. Remains found within the shell deposit.	Ancestry.com

Newspaper	Date	Title of Article	Description	Source:
Oakland Tribune	August 7, 1907	More Bones Spur Efforts of Searchers	A leg bone of a Native American individual was unearthed during excavations for the installation of a telegraph pole. At this time there was a call for archaeological excavations to be conducted within the surrounding area (J. C. Merriam).	Ancestry.com
Oakland Tribune	June 6, 1914	Campus Skeleton: Find Evidence of Early Race at the University of California	Remains of four Native American individuals including one woman found along Strawberry Creek, found during excavations for a new kitchen annex to be built onto the Faculty Club. Artifacts found in association with the burials including a mortar and an illegible item made of glass.	Ancestry.com
Oakland Tribune	October 5, 1914	Shell Mounds in 'Faculty Glade'	Records that there is a shell deposit across the entire Faculty Club glade to a depth of several feet. Professor A. L. Kroeber states that the site was an occupation site as evidenced by the burials previously found there.	Ancestry.com
Oakland Tribune	July 21, 1915	War Whoop Dad of College Yell	Professor T. T. Waterman is quoted as saying that the Faculty Club glade was the site of an 'Indian camping ground.'	Ancestry.com
Berkeley, Cal. Californian	January 17, 1923	Unearth Bones of Indian Warrior in Strawberry Creek	A skeleton of an adult male Native American found during excavation for the Memorial Stadium.	Hearst Museum of Anthropology
Courier	June 20, 1925	Indian Skeleton Under Club House	A Native American skeleton found during excavation for a new extension for the Men's Faculty Club. Leslie Spier, associate profession or anthropology at the University of Washington, excavated the remains.	Copy provided by Richard Schwartz
Oakland Tribune	June 20, 1925	Mongoloid Skeleton Is Dug Up at Berkeley	This article provides the same basic information as the Courier, June 20, 1925 article.	Ancestry.com
San Francisco Examiner	June 21, 1925	Third Skeleton Found in Grove on UC Campus	A third Native American skeleton was found during excavations for the Men's Faculty Club.	Transcribed on attachment to CA-ALA-308 site card
Oakland Tribune	August 5, 1927	20 Years Ago in Oakland Tribune	This article merely references the discovery made on this date in 1907 and does not provide any new information.	Ancestry.com

Within a week of the initial finds, the *Oakland Tribune* was again announcing the discovery of more remains. On August 7, 1907, the Tribune reported the unearthing of a leg bone of a Native American individual during excavations for the installation of a telegraph pole. Dr Merriam reportedly identified the “flat along Strawberry Creek, near the Faculty club” as “once an Indian burying ground.” The article reported that further investigation of the site was proposed: “A movement is on foot to have the lawn in front of the club dug up in the hope of gaining valuable scientific data.” No information has been located concerning any excavations conducted by the anthropology department within this area.

The next mention of the discovery of human remains within this portion of the University campus occurs in 1914, when the headline 'Skeletons of Indians Are Found on Berkeley Campus' was

emblazoned across the front page of the *Oakland Tribune*. On June 5 and 6, 1914, the remains of four individuals were located during excavation work for the construction of a new kitchen annex to be built onto the Faculty Club. Artifacts were found in association with the graves. A mortar weighing approximately 100 pounds was located covering the head of a female who had been buried in a tightly flexed position: "The knees were doubled up against the chin, the arms being secured about the legs." An item measuring three and a half inches in length and manufactured of glass was reportedly found with one of the individuals but the form of this item is illegible within the article. The remains were deposited at the anthropological museum at the affiliated colleges at San Francisco and excavations at the site were to be "carefully conducted in the hope of discovering further prehistoric ruins." Again, no information has been located concerning any excavations conducted by the anthropology department within this area.

By October 1914, it appears that Professor A. L. Kroeber had become more involved with the site. The *Oakland Tribune* (October 5, 1914) quoted Professor Kroeber's comments as they appeared in the student newspaper *Brass Tacks*. In this, Kroeber stated that

> There is some shell scattered through all the soil of the Faculty Club glade to a depth of several feet…That this comfortable little hollow, with its growth of live oaks, was inhabited pretty regularly is shown by the burial of several individuals. The aborigines would hardly have interred their dead at an overnight camp. The convenient combination of acorns, firewood and water in Strawberry creek, which in former times probably had some flow throughout the year, no doubt determined the selection of this site, which could not have been more appropriately chosen…

Based on typological analyses of artifacts found at the shell midden, Kroeber determined that the site was likely inhabited between 500 and 1,000 years ago.

The following year, Professor T.T. Waterman of the Department of Anthropology concurred with Professor Kroeber's determination that the Faculty Club glade was once a Native American occupation site. In an article published in the *Oakland Tribune* on July 21, 1915, Waterman describes the glade as 'once an Indian camping ground' and that the Faculty Club 'has been built over an ancient Indian cemetery'. He also observes that until 30 years prior, Strawberry Creek was a permanent watercourse filled with trout.

An article appearing in the *Courier*, dated June 20, 1925, as well as an article in the *Oakland Tribune* of the same date, recorded that the remains of a single Native American individual were unearthed during excavations for a new extension to the Men's Faculty Club. The skeletal material was excavated by Leslie Spier, associate professor of anthropology at the University of Washington, who was working at the University of California, Berkeley at that time. The article records that the remains ". . . were found partly beneath the north wall of the north dining room, at a depth of two or three feet below the original surface, lying partially in an undisturbed pocket of shells. The body was flexed, and lay with head to the north" (*Courier* 1925). Dr. Spier identified the fragmentary

remains as being of an elderly male of "Mongoloid" (Native American) descent. In addition, Dr. Spier was quoted as saying that many skeletons had been unearthed within the vicinity of Strawberry Creek, and the article observed that similar finds had also been made during the construction of the stadium.

The *San Francisco Examiner* of June 21, 1925, reported the discovery of a third skeleton found within Faculty Glade, which Dr. Spier identified as that of an elderly male Native American. The article states that "Faculty Glade…was once an Indian burial ground. This suspicion was confirmed yesterday by anthropologists when workmen excavating for the new Men's Faculty Club uncovered an Indian skeleton – the third found on the site."

According to the *Courier*, by June 1925 the remains of approximately one dozen individuals had been unearthed within the area of the Faculty Club glade, along Strawberry Creek and beneath Memorial Stadium. It must be noted that based on the newspaper articles, only one burial had been found beneath Memorial Stadium and eight had been found within the Faculty Club and Faculty Glade area (at least one additional individual, and possibly a second, were found subsequently [see June 21, 1925 article in the *San Francisco Examiner*, discussed above]). At the time the article was published, the newly discovered remains were held in the Anthropology Building on the campus, awaiting removal to the University Museum of Anthropology in San Francisco (see below).

Information contained in the artifact card catalogs, and accession records stored at the Phoebe A. Hearst Museum of Anthropology indicate that the remains of eight individuals were located within the Faculty Club and Faculty Glade areas, and an additional one individual beneath Memorial Stadium. The information from the card catalogs and accession records regarding CA-ALA-308 is presented in Table 6.

Table 6 – Skeletal Material Held at the Phoebe A. Hearst Museum of Anthropology

No. of individuals	Skeletal Material	Location	Date Collected	Associated Material
1	Skull, jaw and fragments of skeleton of adult	South side of Strawberry Creek in Co-ed Canyon, near Faculty Club, 1 ft. deep in upper portion of shell layer	August 2, 1907	
1	Fragment of infant's skeleton	South side of Strawberry Creek in Co-ed Canyon, Faculty Club, 100 ft. or more to west and 2 1/2 ft. deep, in shell layer	August 2, 1907	Shells found with bone
1	Fragments of skull and bones	Faculty Club grounds, 3 ft. deep in filled ground, about 1 1/2 ft. originally	May 22, 1914	Heavy oval mortar found bottom up over the skull; slender serpentine implement with hole at broad end, tapering, broken 8' long, found in or under skull; small stone for pounding
3	Fragments of three skeletons	Site of new wing of Faculty Club	June 15, 1914	Terminal fragment of stone pestle; distal fragment of bone blade

No. of individuals	Skeletal Material	Location	Date Collected	Associated Material
2	Fragmentary skeleton of adult, & single bone from infant	Faculty Club, partly beneath north wall of dining room, 2-3 ft. deep, lying partially in undisturbed pocket of shells (burial flexed, head to north)	June 9, 1925	

Other artifacts that were collected from CA-ALA-308 apparently not associated with human remains include an obsidian knife or spear head, a beach pebble with one side hollowed (possibly associated with CA-ALA-308), an obsidian arrow point or knife, a small obsidian projectile point, a basalt concave edge scraper, a mano fragment (possibly associated with CA-ALA-308), and a Royal Ironstone China sherd. These artifacts were collected between 1907 and 1957. The artifacts and skeletal remains are stored in the basement of the Hearst Gym at the University of California, Berkeley.

In 2006, Richard Schwartz prepared site records for burials found beneath the Faculty Club based on the aforementioned *Oakland Tribune* articles dated August 4, 1907 and June 20, 1925, and a very brief mention of cultural material found beneath the club in an out-of-print book called *Berkeley, The Town and Gown of It* by George Pettitt. The primary number P-01-010537 and trinomial CA-ALA-606 were allocated to this site. Based on the site description and location information contained in the site records, CA-ALA-606 is clearly the same site as CA-ALA-308.

4.4 Museum of Anthropology and Storage of Materials from CA-ALA-23 and CA-ALA-308

In 1901, the Department of Anthropology was established at the University of California, Berkeley, through funding provided by Mrs. Phoebe A. Hearst. A fireproof storage building, referred to as the "Tin Shack," was erected on campus to house the department and the collected anthropological and archaeological materials. Within a couple of years the department had outgrown the building, and, in 1903, the anthropology collection and department headquarters were relocated to an unused building at the Affiliated Colleges in San Francisco. The building was originally intended to house a different department and it was thought that the use of this building by the Department of Anthropology and Museum of Anthropology would be temporary only. At this time, the collections were available solely to researchers and students, and it was not until 1911 that the Museum of Anthropology was opened to the public. It was to this building in San Francisco that the various skeletal remains and artifacts from the Faculty Club and the stadium were taken. The California Collections were housed in room no. 18, referred to as the California hall, which was the largest room in the building. However, space once again became an issue. By 1931, expansion of the University of California San Francisco's medical school forced the closure of the Museum of Anthropology. The collections were subsequently returned to the Berkeley campus in 1931 and at that time were housed in the Old Civil Engineering Building. In 1960, the Anthropology Department and the Museum were moved into Kroeber Hall, the first time they were housed in a specially designed, permanent building. Today, the collections are housed in three locations

including the basement of Kroeber Hall, the Hearst Gym basement, and a University storage facility (a former factory) a few miles away from the campus (Kell 1997; Phoebe A. Hearst Museum of Anthropology and the Regents of the University of California 2006; Bancroft Library 2006). The artifacts and skeletal remains recovered from CA-ALA-23 and CA-ALA-308 are currently stored in the basement of the Hearst Gym.

5.0 Native American Heritage Commission Consultation

On June 21, 2007, Dr. James Allan of WSA contacted the Native American Heritage Commission (NAHC) by letter to request information on known Native American traditional or cultural properties within the project area, and to request a listing of individuals or groups with cultural affiliation to the project area. NAHC staff member Ms. Debbie Pilas-Treadway replied to the WSA letter on June 29, 2007, stating that "a record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area." Included in the NAHC response was a list of interested Native American contacts, which is appended to this report. Ohlone tribal member Ramona Garibay on that list served as Native American monitor for the project. See attached Native American Heritage Commission Consultation and List of Native American Contacts (Appendix A).

6.0 Research Design

The following research design serves a regulatory purpose under CEQA. Should any cultural resources be discovered as a result of the project, their significance would have to be determined in relation to the criteria for eligibility to the California Register of Historical Resources (CRHR). Should any such discovered resource be determined to be significant, any impacts of the project on the resource would have to be reduced to a less-than-significant level, if feasible. There are four criteria for determining eligibility for listing on the CRHR. Under the fourth criterion, a cultural resource must have the potential to contribute information important to prehistory or history (often expressed as scientific research potential) to be considered for listing on the CRHR. The following research design presents a series of research questions and related data requirements that constitute a framework for assessing the potential significance of a cultural resource under Criterion 4 of the CRHR.

WSA conducted the archaeological subsurface testing program in an effort to recover data sufficient to indicate the presence or absence of potentially significant cultural material in the SAHPC project area, as well as to characterize the nature of that cultural material. The testing method is described in further detail in section 7.0 below. Given the coring technique, retrievable data might range from prehistoric artifactual materials such as flaked stone artifacts, groundstone implements, shell beads, modified bone, evidence of midden formation, compacted soil layers, concentrations of fire-cracked rock, charcoal, shell or fragmentary skeletal remains; or a wide range of historic artifacts, such as those made from glass, ceramic, metal, and wood (or fragments thereof), to evidence of

buried landscape features that could have supported human activity. In the absence of artifacts, evidence of buried landscape features (for example, terraces above Strawberry Creek) typically used by humans in the area could be an indicator that buried archaeological deposits are potentially present.

Core samples offer a limited view of buried deposits. However, it is possible for the deposits that are captured in a core sample to contain important information about the overall buried archaeological deposits they might encounter. If sufficient evidence were recovered indicating that an intact cultural resource is present within the project area, the sampling strategy and method would be modified in order to gather additional information to establish the potential significance of the find.

6.1 Site Formation

Identifying the processes of site formation is a fundamental objective of archaeological research. An analysis of data related to site formation processes can help address the potential integrity of archaeological deposits and features, as well as help characterize the context of those deposits as to their research potential. A variety of post-depositional processes that can disturb and alter the original character of archaeological sites, such as erosion or bioturbation, could be observed in core samples.

Potential research questions:

- What formation processes have been active on the archaeological deposits?
- Is there evidence of long-term site use, e.g., midden formation, dense concentrations of habitation debris?
- Have recent (i.e., construction of California Memorial Stadium) land use activities affected site integrity?
- Has alluviation, colluviation, erosion or sheet wash affected site integrity?
- Is bioturbation a factor in artifact distribution or site integrity?

Required data:

- Cultural materials indicative of long-term occupation or short-term usage. For example, dense concentrations of fire-cracked rock and charcoal, compacted layers of shell and organic material, or evidence of features (e.g., burials), could indicate long-term usage, possibly, habitation. Flaked stone debris on otherwise native surface soils might be an indicator of short-term usage.
- Evidence for midden development, such as stratified layers of sediment with high concentrations of shell and organic debris.

- Evidence of trampling, such as highly compressed soils containing cultural materials.
- Cultural materials found in a context of eroded or bioturbated soils or sediments.

6.2 Chronology

Chronologically relevant data can reasonably be expected to be encountered in core samples. Establishing a firm temporal range for archaeological deposits is one of the foundations of archaeological investigation and research. Many of the subsequent research topics in prehistory, such as culture change and adaptation, focus on questions that rely on chronological information. Absolute dating (through radiocarbon or obsidian hydration) of sites would provide valuable information on settlement along Strawberry Creek. This technique relies on retrieving appropriate quantities of charcoal, shell or bone. Obsidian hydration may also prove useful, although the development of accurate results is dependent upon sourcing the material, collection of appropriate quantities of non-biased samples, and application of an acceptable hydration rate, which is fairly well developed for the Bay Area.

Potential research questions:

- What is the temporal range of archaeological deposits?
- Is there a single period component, or were there discrete periods of site use?
- How does the site relate to others in the region in terms of age? Does it support the existing regional chronology?

Required data:

- Appropriate materials for absolute dating techniques available in sufficient quantities for radiometric and/or AMS radiocarbon dating. For the latter, charcoal, shell or bone in quantities of 50 mg, 100 mg and 30 gm respectively.
- Diagnostic artifact types that have established temporal associations (e.g., shell beads, projectile points, and charmstones for prehistoric sites; makers' marks on ceramics, glass bottles and their manufacturing process for historic-era sites).
- Diagnostic artifacts in stratified sediments or soils.
- Bone, charcoal, shell in primary context and in association with intact features, may be difficult to ascertain from core samples.
- Obsidian artifacts for hydration dating.
- X-ray diffraction to identify individual obsidian sources, allowing for each obsidian hydration result to be calibrated.

6.3 Subsistence and Settlement—Prehistoric Period

Settlement and subsistence are intertwined concepts that have to do with how people used natural resources and the landscape. Use of different locales according to the seasonal availability of various resources is a common occurrence in California prehistory, but there is also evidence of the long-term occupation of sites along water courses and the bay shoreline. Because the focus of this research is a single locale within Strawberry Canyon and Creek, the study of subsistence and settlement is necessarily limited.

Preserved floral and faunal remains offer the opportunity to examine subsistence strategies and how they may have changed over time at the site. The analysis of artifacts used for procurement (e.g., spear points or harpoons), for manufacture (e.g., obsidian drill or antler pressure flaking tool), or for preparation (e.g., mortars and pestles) provides clues as to which resources were gathered or hunted and which were prepared and used on-site. Determining the seasonal availability of various resources provides clues to both subsistence and settlement pattern. Identifying various activities that were carried out more or less contemporaneously also serves to develop a picture of the kind of settlement pattern, and how it may have changed over time. If core samples contain evidence useful in answering such questions, then the research potential of the archaeological deposits sampled would be considered potentially significant.

Potential research questions:

- What floral and faunal species were exploited? Do they change over time? How do subsistence data compare with other sites in the region?
- Is there a shift in the relative degree of exploitation of various plant or animal species over time? Are mortars and pestles or other grinding implements present? Were acorns or other plant seeds being transported to the site from outside the area or procured locally?
- What types of bone tools and shell artifacts are present (differentiated by species and artifact type)?
- What raw materials are present at the site? Are they available locally or were they transported to the site (and from where)? Do raw material preferences change over time?
- What lithic manufacturing processes are in evidence? Do they change over time?
- Is there any evidence of unique lithic specialization in tool type or manufacturing technique? How do the data pertaining to lithic technology compare with other sites in the region?

Required data:

- Floral and faunal remains in stratified sediments or soils; such recovery may require flotation of column samples and identification of macrobotanical and faunal remains in quantities that would not be collected by the core testing alone. Although this was not part of the scope of WSA's testing program; it could factor into any data recovery plans.

- Artifacts related to subsistence activities or seasonality (e.g., vegetal processing, hunting, fishing, etc.)
- Identifiable stone, bone and shell artifacts in stratified sediments and soils.
- Flaked-stone tools and associated debitage that can be characterized by material, size, and flake type.
- Data from X-ray fluorescence technology for sourcing obsidian artifacts.
- Raw materials with identifiable sources.
- Flaked stone tools with evidence of tool reuse or reworking

6.4 Trade and Exchange—Prehistoric Period

Observable patterns of culture contact occurring through processes such as trade and exchange have been documented for much of the Bay Area, especially between the coastal and inland regions. Inland inhabitants with access to resources such as high quality obsidian exchanged goods with inhabitants of the San Francisco Bay and coastline who fished, collected shellfish, and hunted sea mammals. Interpretation of archaeological evidence show that local Bay Area occupants had access to imported materials and shared various regional cultural traits. The level of involvement in exchanging goods and ideas, however, changed over time. Distinguishing trade from seasonal movement in the archaeological record is difficult.

Potential research questions:

- What are the sources of the various materials used on site (e.g., Napa Valley and Anadel obsidian)?
- Did preferences for specific sources vary over time?
- Is there evidence of participation in local, regional, or even broader trade networks?
- How does evidence of trade compare with other sites in the region?

Data required:

- Sourceable raw material (e.g., X-ray fluorescence sourcing of obsidian).
- Nonlocal and local material in stratified sediments and soils.
- Evidence for manufacture of artifacts on site (e.g., different stages of manufacture present from raw material to finished product) or evidence of recycling of raw materials.

6.5 Consumer Behavior—Historic Period

Any historic period deposits encountered in the core samples would be potentially valuable as indicators of consumer behavior. The land use during the historic period of the project area is fairly well documented as being residential. Discarded items may serve to illustrate the fashion and utility of various items found within the residential neighborhood that occupied the project area.

Comparison with the historic cultural materials found in other 19th century deposits in the area would be of value in illustrating consumptive patterns among early residents. The association of the residences with the early days of the University of California may yield deposits associated with educated and wealthier residents that could be compared with deposits from contemporary, working class neighborhoods of Berkeley.

Potential research questions:

- Does the historic-era deposit contribute to our knowledge of the various classes or types of consumer goods used at this location?
- Is there evidence of hand-made materials, mass production, or other types of manufacturing processes? Are they intermixed in the deposit?
- Are there imported objects?

Data required:

- Identifiable artifacts of various types and material.
- Artifacts with makers' marks, embossing, or other indications of manufacturer identity.

6.6 Social Status and Ethnicity—Historic Period

A succession of people coming from different geographic and national origins and various ethnic and cultural backgrounds (e.g., Spanish, Mexican, European, Native American, Chinese, and African American) settled in the Bay Area in the latter half of the 19th century. Some were wealthy landowners; others were landless laborers just passing through. Determining the social identity and social status of people from artifactual remains is not a straightforward task. Nonetheless, a careful consideration of social identity and status indicated by various artifacts found in context could potentially complement information derived from historical sources, and could ultimately reveal more about the people who lived in the project area at the turn of the century. Core samples might contain artifactual data related to social status and ethnicity that could be compared with documentary evidence of the residents of the project neighborhood.

Potential research questions:

- Can the class, gender, ethnicity or age of people who lived in the project area be determined?
- Is there evidence of differential wealth or status in the deposit?

Data required:

- Identifiable artifacts that might be associated with a specific ethnicity, gender, age, or social class.
- Identifiable objects of wealth versus common everyday items.

7.0 Methodology

In the archaeological testing program, 31 3¾-inch core samples were recovered from bore holes drilled to depths of 15, 35 or 50 ft. (Figure 21 below) The locations and depths of the bore holes were determined on the basis of projected depths of excavation within particular areas of the SAHPC project footprint, the results of the archival and records search, an analysis of topographic maps, and WSA's past experience with identifying and excavating prehistoric archaeological sites in the San Francisco Bay Area.

The initial drilling attempts employed a drill rig that used a direct push method of core sampling. With this approach, samples were collected in 2-in. diameter transparent plastic tubes housed within a steel casing that was pushed into the subsurface in 4-ft. increments. Due to the nature of the subsurface, however, this method quickly proved to be unworkable, as the usable core recovered for analysis within each 4-ft. increment was less than 10 percent.

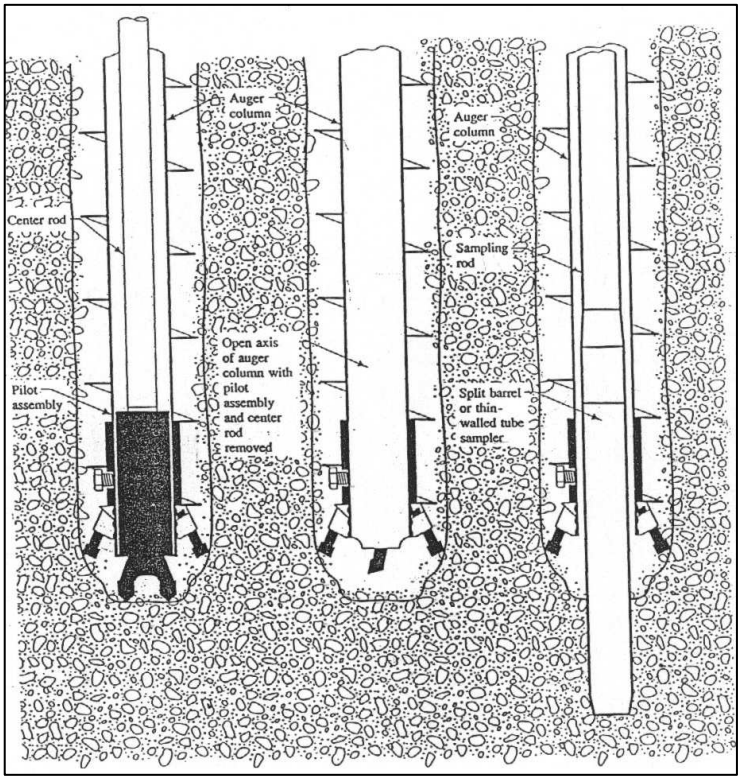
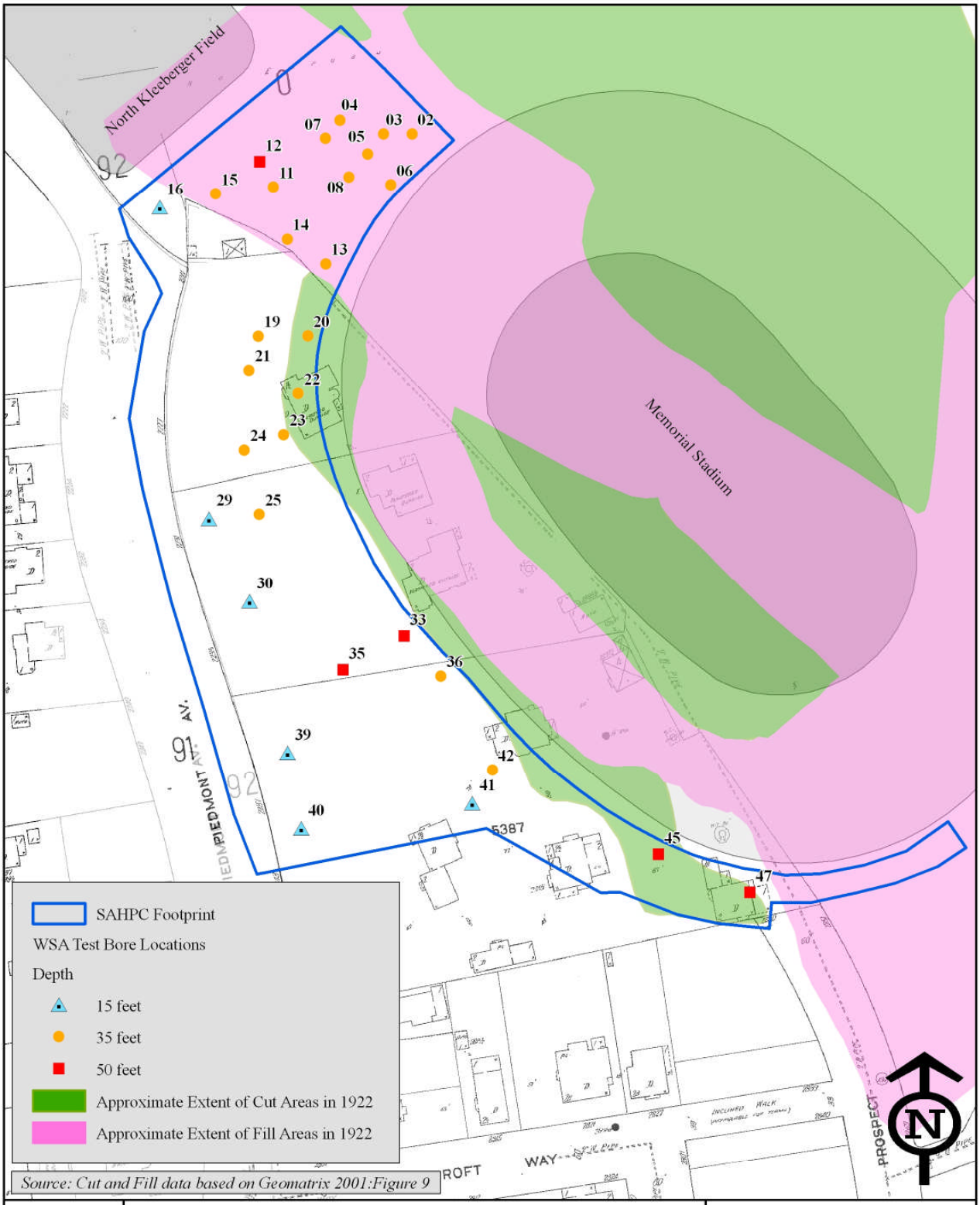


Figure 20 - Auger drilling process

The testing approach was immediately modified and a larger drill rig fitted with a 6-in. diameter hollow-stem open-flight auger was used to conduct the remaining drilling operations. In this approach, a 5-ft.-long, 3¾-in. diameter, two-piece metal casing is inserted into the hollow stem of the auger. As the drill rig turns the auger, the helical or spiral cutting edge on the auger's exterior drives the auger and the inserted metal casing into the soil, forcing the subsurface matrix into the hollow steel casing, providing an undisturbed, 5-ft.-long soil sample (Figure 20). Once the drill has reached 5 ft., the metal casing is removed from the hollow auger column, which remains in place, and a new, empty casing is inserted to capture the next 5-ft. increment. This process continues in 5-ft. intervals until the desired depth is reached.



1922 Cut and Fill Areas Shown on 1911 Sanborn Map

Figure 21
UC Berkeley
Student Athlete
High Performance Center
Berkeley, CA

In WSA's testing program, once the casing was removed from the auger, the bottom attachment holding the two piece casing together was removed and the metal casing opened to expose the collected soil core sample. Each core was visually inspected for any evidence of cultural material or changes in stratification or geomorphology. Each 5-ft.-long soil core was then placed into a cardboard core box, which was labeled and stored at the end of each day in a designated room on the UC campus. Fifteen cores (48.4 percent of the total number of boreholes) were then analyzed by Mesa Technical, Inc., to obtain any embedded geoarchaeological information and to help reconstruct and identify the soil stratification present in each bore location. A letter from Mesa Technical, Inc. summarizing the results of their analysis states that:

> …[we examined] fifteen soil cores of the thirty-one obtained by WSA, Inc. from locations within the footprint of the proposed Student Athlete High Performance Center, adjacent to the west side of Memorial Stadium. We selected the fifteen cores to provide data from all parts of the footprint.
>
> We were looking in detail at the cores for any evidence of surface or subsurface archaeological sites. Archaeological evidence would include both direct evidence such as artifacts or midden, or indirect evidence such as compacted layers, fire scarred rocks, or concentrations of charcoal. Soil and sediment attributes helpful in developing a perspective upon indirect evidence include texture, structure, color, coarse fragments, mottles and gley, HCl reaction, etc. The soil cores were examined off site, using accepted field methods. No laboratory analyses were performed (Dave De Vries 2008, pers. comm.).

These results have been incorporated into the subsurface testing conclusions section below. Mesa Technical's full report may be found in Appendix C.

The purpose of the subsurface testing was to determine if intact archaeological cultural deposits exist beneath the proposed footprint of the SAHPC; to assess their integrity and potential significance; and to determine whether significant impacts to those deposits may occur as a result of the project's construction. As discussed above, the level of disturbance caused by the construction of California Memorial Stadium, and the areas of fill can generally be distinguished from areas where hillsides were cut and leveled (refer to Figures 4 and 21). The fill areas may potentially cover undisturbed ground surfaces (Ab horizons) that existed in the project area prior to 1923 and may also contain subsurface historic features, even in areas cut and leveled during stadium construction, depending on the depths of those disturbances. The analysis of the cores conducted by Mesa Technical, Inc. was designed to help reconstruct the geomorphology of the site area, to assess the potential archaeological sensitivity of the area and the possibility that pedogenic A horizons are buried in the site area. Ohlone Native American monitor Romana Garibay was on-site and observed all testing operations.

8.0 Subsurface Testing Results

8.1 Field Observations

From September 21, 2008 to October 10, 2008, WSA Project Director Allen Estes and WSA staff archaeologists Thomas Young and David Buckley conducted subsurface auger testing within the proposed footprint of the SAHPC. UC Berkeley employed RSI Drilling to conduct the drilling and core recovery. A total of 31 bore holes were drilled throughout the proposed footprint, collecting incremental core samples that created a continuous core accurately depicting the subsurface soil stratification. Six of the bore holes were drilled to a depth of 15 ft., 20 bore holes were drilled to a depth of 35 ft., and five bore holes were drilled to a depth of 50 ft. below the surface (refer to Figure 21). Table 7 provides the field observations for each bore location.

Table 7. Summary of Field Crew Observations of Each Bore Location

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
10/10/08	2	0-5	7.5 YR 4/1	Coarse sand and gravel with clay	35-50	No	Rocky and gravelly throughout
		5-10	2.5 Y 7/4	Yellowish rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					No recovery
		30-35					
10/10/08	3	0-5	7.5 YR 4/1	Coarse sand and gravel with clay	45-65	No	Rocky and gravelly
		5-10	2.5 Y 7/4	Yellowish rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					
		30-35					
10/9/08	4	0-5	7.5 YR 4/1	Coarse sand and gravel with clay	75-85	No	Rocky and gravelly
		5-10	2.5 Y 7/4	Yellowish rocky clay			
		10-15					
		15-20					
		20-25					
		25-30	Gley 2 4/5B	Grayish blue rocky clay			
		30-35	2.5 Y 7/4	Yellowish rocky clay			
9/30/08	5	0-5	2.5 Y 4/3	Coarse sand and gravel with clay	40-50	No	

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		5-10	2.5 Y 5/3	Coarse gravelly clay with sand			
		10-15					
		15-20					
		20-25					Rock layer encountered
		25-30	2.5 Y 2.5/1	Dark gravelly silty clay			Organics with roots at 29 ft.
		30-35	7.5 YR 5/4	Brown silty clay			
9/30/08	6	0-5	7.5 YR 4/1	Coarse sand and gravel with clay	50-60	No	
		5-10	2.5 Y 7/4	Yellowish rocky clay			
		10-15					
		15-20					
		20-25					
		25-30	2.5 Y 2.5/1	Dark gravelly silty clay			Organics present at approximately 30 ft.
		30-35	7.5 YR 5/4	Brown silty clay			
10/10/08	7	0-5	2.5 Y 4/3	Coarse gravelly clay with sand	45-60	No	Rocky and gravelly;
		5-10	2.5 Y 5/3				
		10-15					
		15-20	7.5 YR 5/4	Brown silty clay with greenish gray mottling			
		20-25	No Recovery				
		25-30	7.5 YR 5/4	Brown silty clay with greenish gray mottling	45-60	45-60	Rocky and gravelly;
		30-35	2.5 Y 2.5/1	Dark gravelly silty clay			Hard rock at 30 ft.; Creek deposit at approximately 30 ft.
10/8/08	8	0-5	7.5 YR 4/1	Coarse sand and gravel with clay	85	No	
		5-10	2.5 Y 7/4	Yellowish rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					
		30-35	2.5 Y 2.5/1	Dark gravelly silty clay			Creek deposit observed at 30 ft.
10/2/08	11	0-5	10 YR 5/3	Coarse gravelly clay with sand	50	No	
		5-10					

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		10-15			50-60		
		15-20					
		20-25					
		25-30		Clay with gravels			Very wet; Gravelly
		30-35	2.5 Y 2.5/1	Dark gray to black silty clay with greenish gray mottling			
10/1/08	12	0-5	10 YR 5/3	Coarse gravelly clay with sand	40-50	No	
		5-10					
		10-15					
		15-20					
		20-25					
		25-30					Water encountered; very wet
		30-35	10 YR 6/2	Gravelly clay with sand; very wet			
		35-40					
		40-45					
		45-50					
9/30/08	13	0-5	10 YR 5/3	Coarse gravelly clay with sand	50	No	Very rocky
		5-10	7.5 YR 5/4	Brown silty clay with greenish gray mottling			
		10-15					
		15-20					
		20-25			60-75		
		25-30					
		30-35					
9/25/08	14	0-5	10 YR 5/3	Coarse gravelly clay with sand	60-65	Yes	
		5-10					
		10-15					
		15-20	2.5 Y 2.5/1	Dark gray to black silty clay with gravel	75-85		Historic brick debris, blue ceramic whiteware sherd at 19-20 ft.; bits of coal present in backdirt
		20-25	7.5 YR 5/4	Brown silty clay with greenish gray mottling			
		25-30					
		30-35					
10/1/08	15	0-5	10 YR 5/3	Coarse gravelly clay with sand	85-100	No	
		5-10	10 YR 5/2	Gravelly clay with sand			
		10-15					

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		15-20					Hard rock encountered at 17-18 ft.
		20-25			40-50		
		25-30					
		30-35					
10/1/08	16	0-5	2.5 Y 5/3	Coarse gravelly clay with sand	85-100	No	
		5-10					Red sandstone material from 7 to 8 ft.; Piece of lead pipe observed in backdirt
		10-15	2.5 Y 7/4	Yellowish rocky clay			
9/24/08	19	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-100	Yes	
		5-10					
		10-15	10 YR 3/3	Brown gravelly clay			
		15-20	10 YR 6/4	Yellowish-brown gravelly clay			
		20-25					Brick rubble and charcoal debris from 22 to 25 ft.
		25-30					
		30-35	2.5 Y 5/3	Coarse gravelly clay with sand			Gray-green rocky material at 33 ft.
10/6/08	20	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-95	No	
		5-10					
		10-15	10 YR 3/3	Brown gravelly clay			
		15-20	10 YR 6/4	Yellowish-brown gravelly clay			
		20-25					
		25-30					
		30-35	2.5 Y 5/3	Coarse gravelly clay with sand			
9/24/08	21	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-100	No	
		5-10					
		10-15					
		15-20					
		20-25					
		25-30					

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		30-35	2.5 Y 5/4	Dark yellowish brown very rocky clay			Water encountered at 32 ft. below surface; Sandstone encountered at 34 ft.
10/6/08	22	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-95	No	
		5-10					
		10-15	10 YR 3/3	Brown gravelly clay			
		15-20	10 YR 6/4	Yellowish-brown gravelly clay			
		20-25					
		25-30					
		30-35	2.5 Y 5/3	Coarse gravelly clay with sand			
10/6/08	23	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-95	No	
		5-10					
10/7/08		10-15	10 YR 3/3	Brown gravelly clay			
		15-20	10 YR 6/4	Yellowish-brown gravelly clay			
		20-25					
		25-30					
		30-35	2.5 Y 5/3	Coarse gravelly clay with sand			
9/25/08	24	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-100	No	
		5-10					
		10-15					
		15-20					
		20-25					Hard rock layer at 22 ½ ft.
		25-30	10 YR 5/1	Grayish-brown with large gravels			Gray rock
		30-35					
9/25/08	25	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-100	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					Hard rock encountered at 14 to 15 ft.
		15-20					
		20-25					
		25-30					
		30-35	2.5 Y 2.5/1	Dark gray clay with greenish gley			
10/3/08	29	0-5	2.5 Y 5/4	Dark yellowish	80-85	No	

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		5-10		brown rocky clay			
		10-15					
10/3/08	30	0-5	2.5 Y 5/4	Dark yellowish brown rocky clay	80-85	No	
		5-10					
		10-15					
10/7/08	33	0-5	10 YR 5/4	Yellowish-brown gravelly clay	85-95	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					
		30-35					
		35-40					
		40-45					
		45-50					
9/26/08	35	0-5	10 YR 5/4	Yellowish-brown gravelly clay	95-100	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					
		30-35					Hard rock
		35-40					
		40-45			75-80		Hard rock
		45-50					Water encountered at 49 ft.; darker rock
10/2/08	36	0-5	10 YR 5/4	Yellowish-brown gravelly clay	80-85	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					Yellow sandstone at 13 ft.
		15-20					Reddish sandstone at 17-18 ft.
		20-25					
		25-30					
		30-35					Hard Rock at 30 ft.
10/3/08	39	0-5	2.5 Y 5/4	Dark yellowish brown rocky clay	80-85	No	
		5-10					

Date	Bore (BL)	Depth (ft.)	Munsell	Soil Description	Percent Recovery	Cultural Material	Comments
		10-15					
10/3/08	40	0-5	10 YR 5/4	Yellowish-brown gravelly clay	80-90	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					
9/26/08	41	0-5	2.5 Y 5/4	Dark yellowish brown rocky clay	85-90	No	
		5-10					
		10-15					
9/26/08	42	0-5	2.5 Y 5/4	Dark yellowish brown rocky clay	85-100	No	
		5-10					
		10-15					
		15-20	2.5 YR 4/6	Compact clayey sand			Reddish rocky soil
		20-25	2.5 Y 5/4	Dark yellowish brown rocky clay			Hard rocky layer at 22 ft.
		25-30					
		30-35					
10/8/08	45	0-5	10 YR 5/4	Yellowish-brown gravelly clay	75-80	No	
		5-10	2.5 Y 5/4	Dark yellowish brown rocky clay			
		10-15					
		15-20					
		20-25					
		25-30					
		30-35					Hard rock at 35 ft.
		35-40					Hard rock at 39 ft.; No soil recovery from 39-40 ft.
		40-45					
		45-50					
10/9/08	47	0-5	10 YR 5/3	Dark yellowish brown rocky clay	50	No	
		5-10					
		10-15					
		15-20					
		20-25					
		25-30			50-60		
		30-35					
		35-40					
		40-45					
		45-50					

The initial drilling process began on September 21, 2008, using a drill rig that carried out a direct push method of core sampling. With this drill rig, the samples were collected in 4-ft.-long, 2-in. diameter transparent plastic tubes. Bore Location (BL) 13 was the first location selected for drilling.

It is located outside the north end of Memorial Stadium along the asphalted access area that surrounds the stadium. The planned final depth of BL 13 was 35 ft. below the surface. Throughout the drilling process, soil recovery was very low (0-20 percent). With the soil that was recovered in the plastic tubes, the sediments had been compacted and heated by the drill rig. From a depth of 16 to 24 ft. there was no recovery, and the hole was abandoned after reaching 28 ft. The drilling process moved onto location BL 17, followed by BL 20, 22, 23, 23a[3], and finally BL 28. All bore holes were planned to a proposed depth of 35 ft., however none of the above bores reached the anticipated depth. This was due to the process of the direct push method of drilling. Because of the high gravel and rock content in the soil, the drill rig was not able to push through the subsurface matrix effectively. Because of the poor quality of the core samples collected using the direct push method, the testing strategy was changed and a hollow-stem auger drill rig with a removable internal metal casing was employed to collect all subsequent core samples. The six bore holes drilled with the direct-push method were subsequently re-drilled using the hollow-stem auger, and it is the data collected in those cores that are discussed below.[4]

The drilling process resumed on September 24, 2008, using this new approach. Drilling operations began with BL 21 to a depth of 35 ft. The original location of the bore hole was moved approximately 20 ft. to the south off of a dirt mound onto the connecting road in order for the drill rig to access the location. The water table was encountered in BL 21 at a depth of 32 ft. and a hard sandstone rock layer at 34 ft. Fill was noted throughout the recovered cores to a depth of approximately 30 to 31 ft. BL 19 was drilled the same day to 35 ft. It is located approximately 35 ft. to the north of BL 21. Brick rubble was identified between 22 and 25 ft. below the surface, and a grayish-green rocky material (Gley 1 4/5GY) noted at approximately 33 ft. followed by yellowish-brown gravelly clay fill.

Bore holes drilled the following day on September 25, 2008, included BL 24, 14 and 25, each of which recovered cores to 35 ft. below the surface. Soil from BL 24 was mostly yellowish-brown gravelly and rocky clay (10 YR 5/4) with varying gray rock inclusions. At approximately 25 ft. the soil was slightly darker brown (10 YR 5/1) in color.

Recovery from BL 14 was slightly less than in previous bore holes (approximately 60 to 65 percent from 0 to 15 ft.). Between 19 and 20 ft. below the surface the soil transitioned into a dark gray to black color (2.5 Y 2.5/1) with small historic ceramic sherds and brick fragments visible. Because of these observations, the backdirt from this depth was examined and bits of coal and more brick fragments were noted. No prehistoric material was observed or noted. The location of BL 14 may coincide with the area surrounding or within the previous location of previous residences or relates to the construction of Memorial Stadium. BL 14 is approximately 33 ft. east of an out-building and

[3] The original location of bore hole 23 was impenetrable so the bore was moved approximately 10 feet southeast and labeled 23a.

[4] When these locations were re-drilled with the hollow-stem auger, only bore 23a was re-drilled.

approximately 125 ft. north of the residence of Allen H. Babcock at 2227 Piedmont, depicted on the 1911 Sanborn Fire Insurance map. BL 25 contained a hard rock layer from 14 to 15 ft. below the surface.

On September 26, 2008, BL 35 was drilled to a depth of 50 ft., BL 42 to 35 ft. and BL 41 to 15 ft. below the surface. Hard rocky layers were encountered at depths of 30 and 40 to 45 ft. during drilling of BL 35. A water layer and harder rock were also encountered at 49 ft. Recovery was very high (almost 100 percent) down to 40 ft., where it dropped off slightly to 75 to 80 percent thereafter. In BL 42, a very red brick (Munsell: 2.5 YR 4/4) colored sandstone from 15 to down below 20 ft. was encountered. A harder rock layer was hit at 22 ft. BL 41 was drilled to 15 ft. with primarily fill noted during recovery.

Bore holes drilled on September 30, 2008, include BL 13 to 35 ft. (re-drilled from direct push method drill on September 21, 2008), BL 6 to 35 ft., and BL 5 to 35 ft. Recovery from BL 13 was approximately 50 percent for the first 20 ft., and the soil was very gravelly and rocky. BL 6 had similar recovery percentages (50-60 percent) down to 30 ft., where recovery increased and dark gray-to-black gravelly clay soil (2.5 Y 2.5/1) with organics (rootlets, etc.) was encountered. Due to the close proximity of the diverted Strawberry Creek running beneath the project area, it is believed this soil is the old creek bed deposit. The result of the drilling of BL 5 closely mirrored that of BL 6, with dark gray/black gravelly clay (2.5 Y 2.5/1) with organics. The creek bed soil was encountered at 29 ft. below the surface. The soil was also moister at this depth than the fill material recovered from shallower depths. No cultural material was observed or noted within these creek bed soils.

On October 1, 2008, BL 16 was drilled to a depth of 15 ft., BL 15 to a depth of 35 ft. and BL 12 to a depth 50 ft. below the surface. Brick colored (Munsell: 2.5 YR 4/4) sandstone fragments were observed at approximately 7-8 ft. for BL 16, and one piece of lead pipe was noted in the backdirt that wormed out of the hole while the auger was turning. In BL 15, hard rock was encountered at a depth of 17 to 18 ft. that required the drilling crew to add water to the hole to allow them to drill deeper. The resulting soil cores recovered were very wet because of the added water. BL 12 was mostly fill (10 YR 5/3) underlain by the same hard rock encountered in BL 15.

Two bore holes (BL 11 and BL 36) were drilled the following day, both to a depth of 35 ft. Recovery for BL 11 was approximately 50 percent from ground surface to a depth of 10 ft. and slightly greater thereafter. The soil was very wet after 28 ft. and consisted of high amounts of gravels. The drilling of BL 36 encountered several hard rock layers at 13 ft. with yellowish sandstone, at 17 to 18 ft. with reddish colored (Munsell: 2.5 YR 4/3) sandstone and again at 30 ft.

On October 3, 2008, four 15-ft. bore holes (BL 40, 29, 30 and 39) were drilled along the southwest edge of the project area. Most of the soils observed were yellowish-brown gravelly and rocky clays (10 YR 5/4 and 2.5 YR5/4). No cultural material was observed or noted.

On October 6, 2008 BL 20, 22 and part of BL 23 were drilled. All bore holes were to depths of 35 ft. The material recovered from these holes consisted mostly of yellowish-brown gravelly rocky clay fill (10 YR 6/4). The first 10 ft. of BL 23 was drilled on October 6th, with the final 15 ft. completed the following morning. BL 33 was also completed on October 7, 2008 to a depth of 50 ft.

BL 45 was drilled on October 8, 2008 to a depth of 50 ft. and BL 8 to a depth of 35 ft. Hard rock levels were encountered at 35 and 39 ft. in BL 45. Consequently, no soil was recovered from 39 to 40 ft. during drilling through the rock level. The soil consisted of mostly naturally deposited material and some fill material near the top of the hole from 0 to 5 ft. of the bore hole. In BL 8, a dark gray to black muddy/silty clay level (2.5 Y 2.5/1) was encountered at 30 ft. below the surface that is most likely associated with the creek.

On October 9, 2008 BL 47 was drilled to a depth of 50 ft. and BL 4 was drilled to 35 ft. below the surface. Poor recovery was noted during the first 25 ft. (approximately 50 percent) in BL 47 with recovery at that level and slightly higher for the remaining 25 ft. (50 to 60 percent). BL 4 had slightly higher recovery percentages (75-85 percent). Fill material was observed from BL 47 and BL 4 along with naturally deposited soils. A grayish-blue gravelly/rocky clay layer (Gley 2 4/5B) was observed at a depth of approximately 27 to 30 ft. for BL 4.

BL 2, 3 and 7, the final three bore holes, were completed on October 10, 2008. All were to a depth of 35 ft. Poor recovery was noted for all three of the bore locations. Recovery ranged from 25 to 75 percent. There was no recovery from 25 to 30 ft. for BL 2, and therefore a slight modification was made in the collection of the core sample. Once the auger had drilled down, the casing was pushed down past the auger column 5 ft. to recover the sample. Recovery improved slightly. It was determined that larger rock fragments had become caught in the auger bit, preventing soil from being carried into the casing. Creek deposits were encountered in BL 7 at approximately 30 ft. below the surface (2.5 Y 2.5/1).

8.2 Geoarchaeological Analysis

In additional to WSA's observations of the soil cores made in the field, David DeVries, geoarchaeologist and owner of Mesa Technical, Inc. analyzed 15 of the 31 soil cores between September 29, 2008, and October 31, 2008. In a letter dated November 5, 2008, Mr. DeVries stated that:

> We found no archaeological evidence within the cores, except only a ceramic fragment deep in one core, and some redwood pieces near the surface in another. Both are undoubtedly relics from the time when the stadium was built. We identified several soil layers which appear to be buried A horizons, now covered either with fill or by natural alluvial or colluvial deposits. Buried A horizons were once at the surface, for a long enough time that organic matter from roots and decomposing plant material accumulated in the soil. Buried A horizons usually have a darker color

> and a granular or prismatic structure, as compared to soil horizons above and below. The buried A horizons we examined showed no evidence of human occupation or use, and appear to be natural (Dave De Vries 2008, pers. comm.).

The complete results of De Vries' analysis are provided in Appendix C. They support the conclusion that the former creek alignment and associated former land surfaces, or buried Ab horizons, lie relatively undisturbed beneath the imported fill used in 1923 to create a flatter surface upon which to construct Memorial Stadium. The potential for buried archaeological deposits is directly related to the presence of these buried land surfaces.

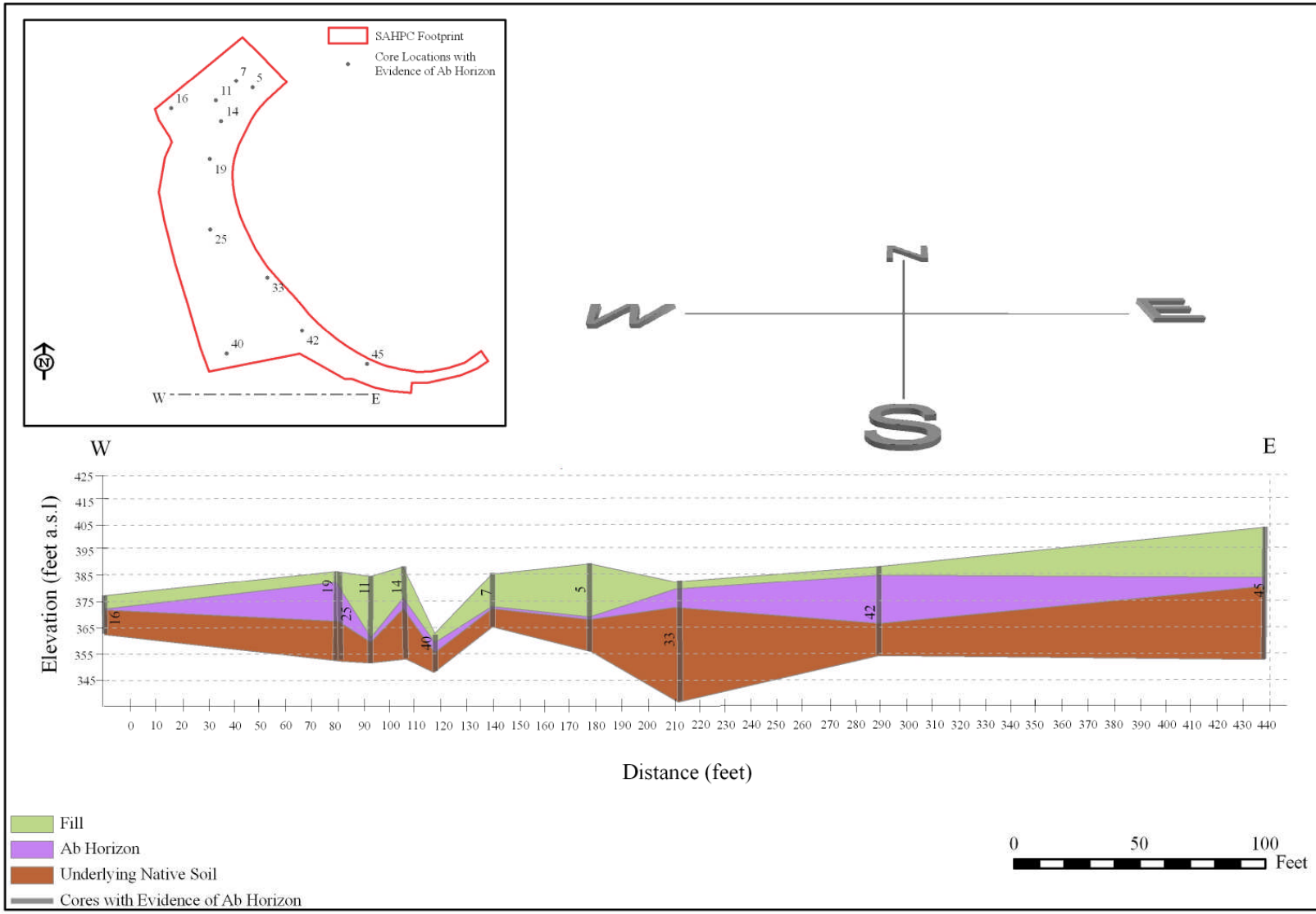
Buried land surfaces (Ab horizons) were encountered in 11 core samples. In four of these, several Ab horizons were encountered within a single core. The presence of multiple Ab horizons is due to the fact that extant land surfaces were buried during significant colluvial or alluvial depositional episodes and new surfaces were created that were then exposed for a sufficient amount of time for surface soil features to develop, including concentrations of organic materials.

8.3 Interpretation of Results

The original alignment of Strawberry Creek was observed during drilling and lab analysis. Bore Locations 5, 6, 7 and 8, revealed a dark gray-to-black gravelly clay with organics and trace silts, evidence of the former creek bed. Organic material included rootlets, bits of charcoal and other miscellaneous plant and organic inclusions. The depths at which the former creek alignment was encountered ranged from 29 to 30 ft. below the surface.

The Ab horizons were identified in 11 of the 15 cores that were subject to geoarchaeological analysis. The cores in which these horizons were identified were taken from across the project footprint. An extrapolation of the elevation of the Ab horizons that were identified in the cores suggests that buried land surfaces may lie relatively undisturbed in the vicinity of the former creek, and underneath construction-related fill from 1923 (Figure 22). It is these surfaces that would have the greatest historic and prehistoric archaeological potential.

Based on background research on the project area, the historic debris observed in the field and noted during lab analysis is believed to have been associated either with the construction of Memorial Stadium in 1923 or with private residences that were, at one time or another, located within and around the project area. The historic debris observed in BL 19 may be associated with the residence of Allen H. Babcock at 2227 Piedmont, as the core was taken approximately 41 ft. northwest of where the building once stood. Likewise, as stated previously, BL 14 is located approximately 33 ft. east of an outbuilding and 125 ft. north of 2227 Piedmont, as depicted on the 1911 Sanborn Fire Insurance map. The presence of coal and charcoal within core samples is most likely associated with the operations of the coal-fired steam/hot water systems at the Stadium, and the charcoal is probably associated with fires and/or burnt coal from the steam-operated equipment that was used during the grading and construction of Memorial Stadium (Siegel and Strain 1996).



WSA	Extrapolation of Ab Horizon from Core Data	UC Berkeley Student Athlete High Performance Center Berkeley, CA	Figure 22

9.0 Summary and Conclusions

No evidence of prehistoric cultural material or prehistoric activity was identified in the 31 core samples taken throughout the footprint of the SAHPC. Subsequent geoarchaeological lab analysis of 15 of these core samples likewise did not identify any prehistoric cultural material or evidence of prehistoric activity. Historic debris and material were noted in the field in two cores (BL 14 and 19). These materials, including brick fragments, pieces of charcoal and coal, and ceramic sherds, were also identified in the geoarchaeological analysis conducted by Mesa Technical.

The majority of the 31 core samples (27 out of 31) consisted of fill material that appears to be associated with the construction of Memorial Stadium in 1923 and from later modifications to the stadium and the surrounding grounds. Based on field observations and subsequent geoarchaeological analysis, the fill appears to range from 8 to 35 ft. in depth.

Given the proposed depth of construction, and the depths at which the former creek bed and the Ab horizons were identified, there is a potential for encountering prehistoric archaeological resources during project construction. Project plans call for construction-related disturbances to go 15 to 50 ft. below ground surface, with foundation excavations reaching 35 ft. below ground surface. Buried land surfaces (Ab horizons) were encountered in 11 core samples at various depths reaching to 35 ft. (BL 5, 7, 11, 14, 16, 19, 25, 33, 40, 42, and 45). Buried Ab horizons form when a land surface is stable long enough to accumulate organic matter from roots and decomposing plant material and to undergo soil development. If prehistoric cultural deposits are present within the project area, they would most likely be found in proximity to the buried Ab horizons, as those represent past living surfaces. Because large areas on both sides of the creek were covered with fill, the buried land surfaces are likely to be found in proximity to the former creek alignment and may be relatively undisturbed. Based on the geoarchaeological analysis of 15 core samples extracted during WSA's testing program, the depths of prehistoric archaeological deposits and features, if present, could be found as deep as 35 ft. below ground surface (refer to Figure 22). Prehistoric deposits could include such material as charcoal, obsidian or chert debitage and flaked stone tools, grinding bowls and pestles, shell fragments, bone, and pockets of dark, friable soils. Prehistoric features could include concentrations of fire-cracked rock, hearths or other fire pits, pithouse depressions, storage pits and burials. Any intact prehistoric archaeological deposits or features would most likely constitute a significant cultural resource under CEQA.

As stated previously, buildings and structures were removed from the site at the time of the construction of the stadium. Any subsurface features, such as privies or trash pits once associated with occupation of these buildings would have potential historical significance. The potential for encountering such historic-era features is considered to be moderate.

The entire project site should be considered an archaeologically sensitive area based on this potential, and on the site's proximity to Strawberry Creek and the fact that prehistoric

archaeological deposits and features have been found along the creek within the vicinity of the project area. An archaeologically sensitive area is considered to have a high research potential (significance) and a low likelihood of having been disturbed (integrity). Research potential refers to an archaeological deposit's potential to yield information important to history or prehistory.

Although the construction of Memorial Stadium involved significant grading and re-contouring of the original land surface, which likely would have destroyed any buried historic or prehistoric deposits or features in the areas subject to that activity, tons of fill were also imported to bring the project area to grade In these areas, it is also possible that any historic or prehistoric deposits or features that were present would have been buried and preserved, and would likely retain their integrity. Consequently, WSA recommends that construction activities within the project area should be monitored by a qualified archaeologist and a Native American experienced in archaeological monitoring. An archaeological monitoring plan addressing this recommendation has been prepared and provided under separate cover.

10.0 References

Architectural Resources Group

2002 Historic Structure Report: 2251 College Avenue, Berkeley, California. Architectural Resources Group, San Francisco, CA

Baker, Suzanne

2005 Positive Archaeological Survey Report for the Alameda-Contra Costa Transit District's East Bay Bus Rapid Transit Project in Berkeley, Oakland, and San Leandro. S-031825. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Bancroft Library

2006 Foundations of Anthropology at the University of California. Online exhibit at The Bancroft Library. http://bancroft.berkeley,edu/Exhibits/anthro/2history1.html, Accessed 6/27/2007.

Beardsley, Richard K.

1948 Cultural Sequences in Central California Archaeology. *American Antiquity* 14(1):1–29.

1954 *Temporal and Arial Relationships in Central California Archaeology*. Reports of the University of California Archaeological Survey, Dept. of Anthropology, University of California, Berkeley.

Bennyhoff, James A.

1994 Central California Augustine: Implications for Northern California Archaeology. In *Toward a New Taxonomic Framework for Central California Archaeology. Essays by James A Bennyhoff and David A. Fredrickson*, Richard E. Hughes, editor, pp. 65–74. Contributions of the University of California Archaeological Research Facility 52, University of California, Berkeley.

Bennyhoff, James A. and Richard E. Hughes

1987 Shell Bead and Ornament Exchange between California and the Western Great Basin. *Anthropological Papers of the American Museum of Natural History,* 64(2). New York, NY.

Berkeley, Cal. Californian

1923 Unearth Bones of Indian Warrior in Strawberry Creek. *Berkeley, Cal. Californian.* January 17, 1923. Berkeley, CA

Bickel, Polly

1981 *San Francisco Bay Archaeology: Sites Ala-328, Ala-13 and Ala-12.* Contributions of the University of California Archaeological Research Facility, No. 43. University of California, Berkeley.

Billat, Lorna

2000a California Office of Historic Preservation (OHP) Regarding Telecommunication Facilities, (Nextel CA-2215B-'SF-16') (letter report). S-022828. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

2000b California Office of Historic Preservation (OHP) Regarding Telecommunication Facilities, (Nextel CA-2200A-'SF-1') (letter report). S-022829. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

2000c Consultation with the California Office of Historic Preservation (OHP) Regarding a Proposed Cellular Facility (Nextel Site Number CA-2208A-'SF-9') in San Francisco, California (letter report). S-022830. On file, Northwest Information Center, California Resources Information Center, Sonoma State University, Rohnert Park, CA.

Billat, Scott

2005 Collocation on a Building Roof Containing a Lease Area with Equipment Cabinets, Berkeley. SF-06930A, (Wurster Hall), 1936 University Ave., UC Berkeley, Berkeley, CA. S-029668. On file, Northwest Information Center, California Resources Information Center, Sonoma State University, Rohnert Park, CA.

Bocek, Barbara

1986 Hunter-Gatherer Ecology and Settlement Mobility along San Francisquito Creek. Doctoral dissertation, Department of Anthropology, Stanford University, Stanford, CA.

Bowman, Jacob N.

1951 The Peraltas and their Houses. *California Historical Society Quarterly*. 30(3).

Breschini, Gary S.

1983 Models of Population Movements in Central California Prehistory. Doctoral dissertation, Department of Anthropology, Washington State University, Pullman.

Broughton, Jack M.
1994 Resource Depression and Intensification During the Late Holocene, San Francisco Bay: Evidence from the Emeryville Shellmound Vertebrate Fauna. *University of California Anthropological Records* 32. University of California, Berkeley.

Brown, Lauren, editor
1985 The Audubon Society Nature Guides. *Grasslands*. Alfred A. Knopf. New York, NY.

California Resource Lab
2008 UC Davis Soil Resource Laboratory. Electronic document, http://casoilresource.lawr.ucdavis.edu/drupal, accessed October 15.

Cambra, Rose Mary, Alan Leventhal, Laura Jones, Julia Hammett, Les Field, Norma Sanchez, and Robert Jurmain
1996 Archaeological Investigations at Kaphan Umux (Three Wolves) Site, CA-SCL-732: A Middle Period Prehistoric Cemetery on Coyote Creek in Southern San Jose, Santa Clara County, California. Report on file at Caltrans District 4 Offices, Oakland, CA.

Cerny, Susan Dinkenspiel
1994 *Berkeley Landmarks*. Berkeley Architectural Heritage Association, Berkeley, CA.

Chavez, David
1985 Cultural Resources Evaluation for the East Bay Municipal Utility District Infiltration/Inflow Project (P.O. 951 1143 EA). S-007903. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

City of Emeryville
1995 Chiron Development Plan EIR. City of Emeryville, CA.

Cook, Sherburne F.
1943 The Conflict Between the California Indian and White Civilization. *Ibero-Americana*, 22. Berkeley, CA.
1957 The Aboriginal Populations of Alameda and Contra Costa Counties, California, *University of California Anthropological Records*, 16(4). Berkeley, CA.

Courier
1925 Indian Skeleton Under Club House. *Courier* June 20, 1925. Berkeley, CA

Davis, William Heath
1967 *Seventy-five Years in California.* John Howell Books. San Francisco, CA.

Dexter, Sean and Daniel Shoup
2000 Cultural Resource Reconnaissance for the Proposed East Bay Regional Park District Fire Mitigation Projects, Alameda and Contra Costa Counties, CA, HMGP# 919-515-24. S-022814. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Dore, Christopher D.
2002 Archaeological Site Record for CA-ALA-307. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Dore, Christopher D., Stephen Byrne and James W. Jenks
2003 Archaeological Survey Report (positive) Public Improvement Projects and Maintenance in the West Berkeley Redevelopment Area, City of Berkeley, Alameda County, California. EA 04-923579. On file, California Department of Transportation District 4, Oakland, CA and [City of Berkeley] Planning and Development Department – Redevelopment Division, and Basin Research Associates, San Leandro.

Esselen Nation
2007 The Ohlone/Costanoan Esselen Nation Today. Electronic document, www.esselennation.com/OCENToday.html, accessed November 29.

Ferrier, William Warren
1933 *Berkeley, California: The Story Of The Evolution Of A Hamlet Into A City of Culture and Commerce*. William W. Ferrier, Berkeley, CA.

Flynn, Katherine
1977 Preliminary Archaeological Reconnaissance of 5 Proposed Locations for the New Engineering Building, University of California, Berkeley-ARS 76-73. S-000445. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Fredrickson, David A.
1973 Early Cultures of the North Coast Ranges, California. Doctoral dissertation, Department of Anthropology, University of California, Davis.
1974 Cultural Diversity in Early Central California: A View from the North Coast Ranges. *The Journal of California Anthropology* 1(1):41-53.
1994 Archaeological Taxonomy in Central California Reconsidered. In *Toward a New Taxonomic Framework for Central California Archaeology. Essays by James A Bennyhoff and David A. Fredrickson*, Richard E. Hughes, editor, pp. 93-104.

Contributions of the University of California Archaeology Research Facility 52. University of California, Berkeley.

Geomatix Consultants, Inc. (Geomatrix)

2006 Geotechnical Investigation, Student Athlete High Performance Center, University of California, Berkeley. Draft report to Capitol Projects, University of California, Berkeley, and URS Consultants, San Francisco. Geomatrix Consultants, Inc., Oakland, CA.

Gerow, Bert A., with Roland W. Force

1968 *An Analysis of the University Village Complex with a Reappraisal of Central California Archaeology*. The Board of Trustees of the Leland Stanford Junior University, Stanford, CA.

Groza, Randy G.

2002 An AMS chronology for central California *Olivella* shell beads. Master's thesis. Department of Anthropology, San Francisco State University, San Francisco, CA.

Heizer, Robert F.

1954 The Archaeology of Central California I: The Early Horizon. *University of California Anthropological Records*, 12(1):1-84. Berkeley.

1964 The Western Coast of North America. In *Prehistoric Man in the New World*, Jesse D. Jennings and E. Norbeck, editors, pp.117-48. University of Chicago Press, Chicago, IL.

Heizer, Robert F., and Franklin Fenenga

1939 Archaeological Horizons in Central California. *American Anthropologist* 41:378–399.

Hendry, George W. and Jacob N. Bowman

1940 The Spanish and Mexican adobe and other buildings in the nine San Francisco Bay Counties, 1776 to about 1850. Ms. on file at the Bancroft Library, University of California, Berkeley.

Holman, Miley Paul

1987 Foothill Student Housing Project, Berkeley, California: Archaeological Field Inspection (letter report). S-009452. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Hughes, Richard E., (editor)

1994 *Toward a New Taxonomic Framework for Central California Archaeology. Essays by James A. Bennyhoff and David A. Fredrickson*. Contributions of the University of California Archaeology Research Facility 52. University of California, Berkeley

Hylkema, Mark G.

1997 Archaeological Report of a Prehistoric Burial Find at CA-ALA-17 in the City of Oakland, Alameda County, California. 4-ALA-880 Cypress Reconstruction Project. Report prepared by the California Department of Transportation, Office of Environmental Planning, South. District 4, Oakland. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

2002 Tidal Marsh, Oak Woodlands, and Cultural Florescence in the Southern San Francisco Bay Region. In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, Jon M. Erlandson and Terry L. Jones, editors, pp. 233-262. Perspectives in California Archaeology, Vol. 6. Cotsen Institute of Archaeology, University of California, Los Angeles.

Jackson, Thomas L.

1976 A Preliminary Archaeological Reconnaissance of the Proposed Engineering Center Building, University of California campus, Berkeley (letter report). S-017501. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Judd, D.R.

1984 Early Days in Temescal. *Oakland Heritage Alliance Newsletter*. 4(1):1-6.

Kell, Gretchen

1997 Hidden Treasures. *Berkeley Magazine*, 2(3). Electronic document, http://www.berkeley.edu/news/magazine/may_97/, accessed June 26, 2007.

Kielusiak, Carol

2000 Archaeological Survey of 70 Acres of Land and Recordation and Evaluation of Four Historic Resources at the E.O. Lawrence Berkeley National Laboratory, Alameda County, California. S-028039. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Kroeber, Alfred L.

1925 *Handbook of the Indians of California*. Bureau of American Ethnology of the Smithsonian Institution. Bulletin 78, Washington, D.C.

Levy, Richard

1978 Costanoan. In *Handbook of North American Indians*, Vol. 8, *California*, Robert F. Heizer, editor, pp. 485-495. Smithsonian Institution, Washington, D.C.

Lightfoot, Kent G.

1997 Cultural Construction of Coastal Landscapes: A Middle Holocene Perspective from San Francisco Bay. In *Archaeology of the California Coast during the Middle Holocene*, Jon M. Erlandson and Michael A. Glassow, editors, pp. 129-141. Perspectives in California Archaeology, Vol. 4. Cotsen Institute of Archaeology, University of California, Los Angeles.

Lightfoot, Kent G., and Edward M. Luby

2002 Late Holocene in the San Francisco Bay Area: Temporal Trends in the Use and Abandonment of Shell Mounds in the East Bay. In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, Jon M. Erlandson and Terry L. Jones, editors, pp. 263-281. Perspectives in California Archaeology, Vol. 6. Cotsen Institute of Archaeology, University of California, Los Angeles.

Lillard, Jeremiah B., Robert F. Heizer and Franklin Fenenga

1939 An Introduction to the Archaeology of Central California. *Sacramento Junior College Department of Anthropology Bulletin* 2. The Sacramento Unified School District, Sacramento, CA.

Lillard, Jeremiah B., and William K. Purves

1936 The Archaeology of the Deer Creek-Cosumnes area, Sacramento Co., California. S*acramento Junior College Department of Anthropology Bulletin* 1, The Sacramento Unified School District, Sacramento, CA.

Losee, Carolyn

2002 Cultural Resources Analysis for Cingular Site No. PL-059-02 City Parking Berkeley Site (letter report). S-026399. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

McCarthy, Celia

1996 Berkeley: Rural Romance to Urban Ideal 1905-1946, Historic Context Statement for The Granada at Sather Gate. S-018275. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Milliken, Randall

1995 *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810*. Ballena Press Anthropological Papers No. 43, Menlo Park, CA.

Milliken, Randall, and James A. Bennyhoff

1993 Temporal Changes in Beads as Prehistoric Grave Goods. In *There Grows a Green Tree: Papers in Honor of David A. Fredrickson*, Greg White, Pat Mikkelsen, William R. Hildebrandt, and Mark E. Basgall, editors, pp. 381-395. Center for Archaeological Research at Davis, Publication 11. University of California, Davis.

Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellifemine, Eric Strother, Robert Cartier and David A. Fredrickson

2007 Punctuated Culture Change in the San Francisco Bay Area. In *California Prehistory: Colonization, Culture, and Complexity*, Terry L. Jones and Kathryn A. Klar, editors, pp. 99-123. Altamira Press, Lanham, MD.

Moratto, Michael J.

1984 *California Archaeology*. Academic Press, Orlando, FL.

Muwekma Ohlone Tribe

2007 The Muwekma Ohlone Tribe: A Brief History and the Recognition Process. Electronic document, www.muwekma.org/news/index.html, accessed November 29.

Nelson, Nels C.

1909 Shellmounds of the San Francisco Bay Region. *University of California Publications in American Archaeology and Ethnology* 7(4):310-357. University of California, Berkeley.

1910 The Ellis Landing Shellmound. *University of California Publications in American Archaeology and Ethnology* 7(5):357-426.

Oakland Tribune

1907 Prehistoric Indian Skeleton Dug up on University Campus. *Oakland Tribune* August 3, 1907. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1907 Second Prehistoric Aborigine Skeleton Uncovered on Campus. *Oakland Tribune* August 4, 1907. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1907 More Bones Spur Efforts of Searchers. *Oakland Tribune* August 7, 1907. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1914 Campus Skeleton: Find Evidence of Early Race at the University of California. *Oakland Tribune* June 6, 1914. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1914 Shell Mounds in 'Faculty Glade'. *Oakland Tribune* October 5, 1914. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1915 War Whoop Dad of College Yell. *Oakland Tribune* July 21, 1915. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1925 Mongoloid Skeleton Is Dug Up at Berkeley. *Oakland Tribune* June 20, 1925. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

1927 20 Years Ago in Oakland Tribune. *Oakland Tribune* August 5, 1927. Oakland, CA. Downloaded from Ancestry.com. Accessed 6/27/2007.

Page and Turnbull, Inc.

2006 Historic Landscape Report: California Memorial Stadium, Berkeley, CA. Prepared for the University of California, Berkeley. Page and Turnbull, Inc., San Francisco, CA.

Painter, Diana J.

2004 Architectural Resource Evaluation for Cingular Wireless Installation PL-059-03, Durant and Telegraph (letter report). S-028215. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Pastron, Allen G., and Andrew Gottsfield

2003 Final Archaeological Report: East Block of the Mandela Gateway Project, City of Oakland, Alameda County, California. Archeo-Tec Consulting Archaeologists. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Pettitt, George Albert

1973 *Berkeley: the Town and Gown of It*. Howell-North Books, Berkeley, CA.

Phoebe A. Hearst Museum of Anthropology and the Regents of the University of California

2006 Phoebe A. Hearst Museum of Anthropology website. Electronic document, http://hearstmuseum.berkeley.edu/, accessed 6/27/2007.

Pilling, Arnold R.

n.d.b. Archaeological Site Survey Record for CA-ALA-308. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

1949 Archaeological Site Survey Record for CA-ALA-307. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

1952 Archaeological Site Survey Record for CA-ALA-307. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Price, Barry A.

1998 Cultural Resources Assessment, Pacific Bell Mobile Services Facility PL-131-01, Berkeley, Alameda County, California (letter report). S-020513. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Price, Heather, Kyle Kearney, and Aimee Arrigoni

2004a Archaeological Survey Report, Bart Seismic Retrofit Project, Berkeley Hills Tunnel to Montgomery Station. Caltrans District 4, Alameda and San Francisco Counties, CA.

Price, Heather, Eric Strother, Jennifer Price, Aimee Arrigoni, Marin Pilloud, Lisa Valkenier, James Allan, and William Self

2004b Report on the Madison Marquette Bay Street Project, Burial Removal and Construction Monitoring, CA-ALA-309 and CA-ALA-310, Emeryville, Alameda County, California. William Self Associates, Inc., Orinda, CA.

Price, Heather, Aimee Arrigoni, Jennifer Price, Eric Strother, and James Allan

2006 Rossmoor Basin Archaeological Report: Site CA-CCO-309, Contra Costa County, California. With contributions by Kenneth Gobalet, Jack Meyer, and Eric Wohlgemuth. William Self Associates, Inc., Orinda, CA.

Psota, Sunshine

1998 Review of the Historic Resources of the Built Environment for Site PL-131-02, Campus Store, 1810 Euclid Avenue, Berkeley, Alameda County, CA (50001 105/98) (letter report). S-021110. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Ragir, Sonia

1972 *The Early Horizon in Central California Prehistory*. Contributions of the University of California Archaeological Research Facility 15. University of California, Berkeley.

Ranney, Victoria Post (editor)

1990 *The Papers of Frederick Law Olmsted: Volume V. The California Frontier, 1863-1865*. Johns Hopkins University Press, Baltimore, MD.

Roop, William

1982 Archaeological Reconnaissance of the Proposed Biological Sciences Construction and Alterations Project, University of California at Berkeley (letter report). S-005625.On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

1986 Archaeological Survey of Undeveloped Lands and Proposed Building Locations within the Lawrence Berkeley Laboratory, University of California, Berkeley (letter report). S-008719. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

San Francisco Examiner

1925 Third Skeleton Found in Grove on UC Campus. *San Francisco Examiner* June 21, 1925. San Francisco, CA

Schenck, W. Egbert, and Elmer J. Dawson

1929 Archaeology of the Northern San Joaquin Valley. *University of California Publications in American Archaeology and Ethnology* 25(4):289-413. University of California, Berkeley.

Schoenherr, Allan A.

1992 *A Natural History of California*. University of California Press, Berkeley.

Schwartz, Richard

2000 *Berkeley 1900: Daily Life at the Turn of the Century*. RSB Books, Berkeley, CA.

2002 Archaeological Site Record for CA-ALA-307. On file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, Rohnert Park, California.

Sedway Cooke Associates and Emeryville Redevelopment Agency

1985 Emeryville Bayfront Specific Plan EIR. Sedway Cooke Associates, San Francisco, CA.

Sher, Sandra
1994 The Native Legacy of Emeryville. *The Journal of the Emeryville Historical Society* 5(2): 6

Shipley, William F.
1978 Native Languages of California. In *Handbook of North American Indians*, Vol. 8, *California*, Robert F. Heizer, editor, pp. 80-90. Smithsonian Institution, Washington, D.C.

Shoup, Laurence, Randall T. Milliken and Alan K. Brown
1995 Inigo of Rancho Posolmi: The Life and Times of a Mission Indian and His Land. Report on file at Woodward Clyde, 500 12th Street, Oakland, CA.

Siegel & Strain
1999 Historic Structure Report: University of California Berkeley, California Memorial Stadium. Report to the University of California Office of Planning, Design, and Construction. From Siegel & Strain, Architects, Emeryville, CA.

Smyth, William Henry
1923 *The Story of the Stadium*, reprinted from the *Berkeley Gazette* (articles appeared September 16, 1922; February 3, 10 and 24, March 24, May 5, July 7, August 4, October 6 and 27, 1923).

Supernowicz, Dana E. and Loma Billat
2005 Collocation ('CO') Submission Packet FCC Form 621, Durant & Telegraph, BA-12059, 2500 Durant Avenue, Berkeley. S-030739. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Treadwell and Rollo
1997 Summary and Preliminary Recommendations, City View Hotel. Treadwell and Rollo, Oakland, CA.

UC Berkeley
2008 The Campaign for Student-Athletes: California Memorial Stadium. Electronic document, http://stadiumcampaign.berkeley.edu/phase-1/index.cfm, accessed October 15.

Uhle, Max

1907 The Emeryville Shellmound. *University of California Publications. American Archaeology and Ethnology*, Vol. 7, No. 1. Berkeley: The University Press.

Van Bueren, Thad, Jack Meyer, and Brian Ramos

2002 Report on Archaeological Testing for the Broadway-Jackson Interchange Improvement Project in the City of Oakland, California. Report to the Office of Environmental Planning South, District 4, California Department of Transportation, Oakland, CA.

Wallace, William J., and Donald W. Lathrap

1975 West Berkeley (CA-ALA-307): A Culturally Stratified Shellmound on the East Shore of San Francisco Bay. *Contributions of the University of California Archaeological Research Facility* 29. Berkeley.

Wiberg, Randy S.

1997 *Archaeological Investigations at Site CA-ALA-42, Alameda County, California: Final Report.* Coyote Press, Salinas, CA.

Wilkie, Laurie A. and Stacy Kozakavich

2003 2003 Archaeological Field Research at the Conservatory and Observatory Hill Sites. Report on file, Capital Projects, University of California, Berkeley.

Wilkie, Laurie A.

2008 The Lost Boys of Zeta Psi: A Historical Archaeology of Masculinity at a College Fraternity. University of California Press, Berkeley, in press (2009).

Willey, Gordon R., and Phillip Phillips

1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago, IL.

Windmiller, Ric

2003 Historic Architectural Survey Report, AT&T Wireless Services Site ID# 960006358/ Lawrence Berkeley Lab (Bldg 50), Cyclotron Road, Berkeley, Alameda County, California. S-029012. On file, Northwest Information Center, California Historical Resources Information Center, Sonoma State University, Rohnert Park, CA.

Wohlgemuth, Eric

2004 The Course of Plant Food Intensification in Native Central California. Doctoral dissertation, Department of Anthropology, University of California, Davis, CA.

Appendix A
NAHC Consultation

June 21, 2007

Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
(916) 653-4082; Fax (916) 657-5390

RE: MEMORIAL STADIUM, UC BERKELEY, BERKELEY, CA

Dear Native American Heritage Commission:

William Self Associates, Inc. (WSA) has been contracted to assess potential impacts to cultural resources as part of the project that will construct the Student-Athlete High Potential Center at UC Berkeley. The Center will be built underground and will wrap around the northwest and west side of Memorial Stadium in Berkeley, Alameda County, CA. The project area is located within Township 1 South, Range 4 West in Section 12 and Section 1 as depicted on the Richmond, Briones Valley, Oakland West, and Oakland East 7.5' USGS Topographic Quads (refer to attached map).

We bring this project to the attention of the Native American Heritage Commission with the desire to obtain, from your office, pertinent information regarding prehistoric, historic and/or ethnographic land use and sites of Native American traditional or cultural value that might be known to exist within the project vicinity, as depicted in the Sacred Lands database or other files. We would also appreciate obtaining a list of interested Native American tribal entities or individuals for the project area. We have contacted the Northwest Information Center at Sonoma State University, Rohnert Park to review their files as part of the background research on the project and will be reviewing files in the archives of the Phoebe Hearst Museum of Anthropology at UC Berkeley.

We would appreciate a response, at your earliest convenience, should you have information relative to this request.

Thanks again for your assistance.

Sincerely,

WILLIAM SELF ASSOCIATES

James M. Allan, Ph.D., RPA
Vice-President

Attachment

William Self Associates, Inc.
E-mail: wself@williamself.com

CORPORATE OFFICE: San Francisco Bay Area
PO Box 2192, 61 Avenida de Orinda
Orinda CA 94563
Phone: 925-253-9070/ 925-254-3553 fax

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

June 29, 2007

James M. Allan, Ph.D., RPA
Vice-President
WILLIAM SELF ASSOCIATES
P.O. Box 2192
Orinda, CA 94563

Sent by Fax: 925-254-3553

Number of Pages: 2

Re: Proposed Memorial Stadium, UC Berkeley, Alameda County.

Dear Dr. Allan:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
Alameda County
June 29, 2007

Jakki Kehl
720 North 2nd Street
Patterson , CA 95363
jakki@bigvalley.net
(209) 892-2436
(209) 892-2435 - Fax
Ohlone/Costanoan

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
831-637-4238
Ohlone/Costanoan

Katherine Erolinda Perez
PO Box 717
Linden , CA 95236
canutes@verzion.net
(209) 474-2602
Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
PO Box 360791
Milpitas , CA 95036
muwekma@muwekma.org
408-434-1668
408-434-1673
Ohlone / Costanoan

Amah/Mutsun Tribal Band
Michelle Zimmer, Cultural Resource Coordinator
P O Box 3892
Clear Lake , CA 94422
408-375-4281
Ohlone/Costanoan

The Ohlone Indian Tribe
Andrew Galvan
PO Box 3152
Mission San Jose , CA 94539
chochenyo@AOL.com
(510) 656-0787 - Voice
(510) 882-0527 - Cell
(510) 687-9393 - Fax
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Amah/MutsunTribal Band
Irene Zwierlein, Chairperson
789 Canada Road
Woodside , CA 94062
amah_mutsun@yahoo.com
(650) 851-7747 - Home
(650) 851-7489 - Fax
Ohlone/Costanoan

Trina Marine Ruano Family
Ramona Garibay, Representative
16010 Halmar Lane
Lathrop , CA 95330
510-300-5971 - cell
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

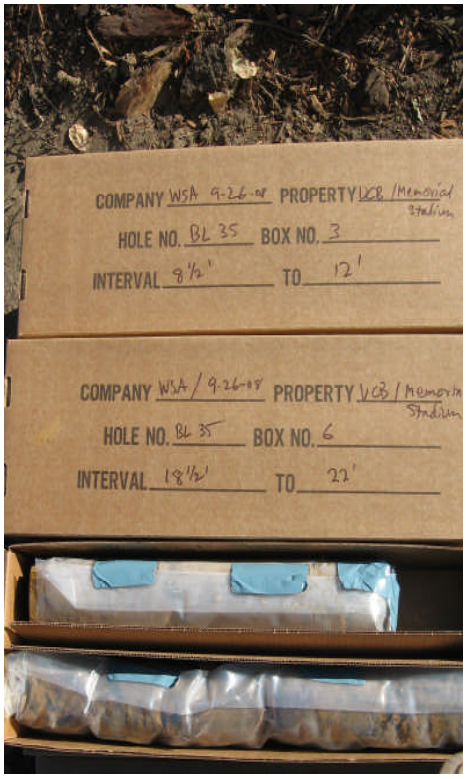
This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Memorial Stadium, UC Berkeley, Alameda County

Appendix B
Photographs

Photograph 1: View of auger drilling BL 35, facing west



Photograph 2: View of recovered and stored core from BL 35

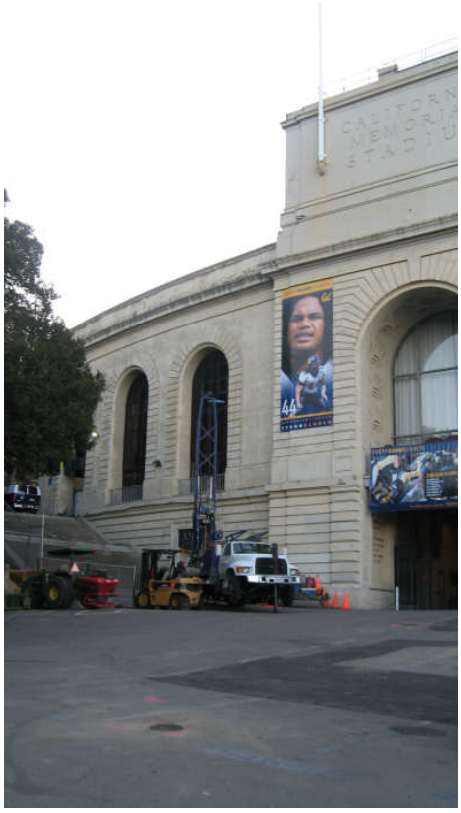
Photos 1 and 2	**UC Berkeley Student Athlete High Performance Center Berkeley, Alameda County, CA**

Photograph 3: View of crew members removing casing containing sample from BL 35, facing west

Photograph 4: View of core sample on side of drill rig after removal of casing, facing west

Photos 3 and 4	**UC Berkeley Student Athlete High Performance Center Berkeley, Alameda County, CA**

Photograph 5: View of exposed soil core sample after removal from casing, facing east



Photograph 6: View of drill rig at northwest entrance of stadium, facing east

Photos 5 and 6	**UC Berkeley Student Athlete High Performance Center Berkeley, Alameda County, CA**

Photograph 7: View of drill rig set up at BL 2 in front of northwest entrance, facing northeast

Photograph 8: View from stairs near northwest entrance showing drilling of BL 2, facing southwest

Photos 7 and 8	**UC Berkeley Student Athlete High Performance Center Berkeley, Alameda County, CA**

Photograph 9: View showing beginning of drilling for BL 7, facing east

Photograph 10: View of auger drilling BL 7, facing northwest

Photos 9 and 10	**UC Berkeley Student Athlete High Performance Center Berkeley, Alameda County, CA**

Appendix C
Mesa Technical Geoarchaeological Findings

MESA TECHNICAL
2630 HILGARD AVENUE
BERKELEY, CALIFORNIA 94709-1002 TEL: 510.845.7830

member, American Cultural Resources Association

GEOARCHAEOLOGICAL OBSERVATIONS, AT THE SITE PROPOSED FOR THE STUDENT ATHLETE HIGH PERFORMANCE CENTER, ADJACENT TO MEMORIAL STADIUM, UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA

Introduction.

This report presents data obtained from examination of soil and sediment cores drilled at the site of the proposed UC Berkeley student athlete high performance center, adjacent to the west side of Memorial Stadium on the campus. David De Vries, principal and soil scientist, Mesa Technical, examined fifteen cores selected from locations offering good geographic coverage over the site, looking in detail at the cores for any evidence of surface or subsurface archaeological sites. Archaeological evidence would include both positive evidence such as artifacts or midden, and potential evidence such as compacted layers, fire cracked rock, or concentrations of charcoal. Soil and sediment attributes helpful in developing a perspective upon potential evidence include texture, structure, color, consistence, coarse fragments, mottles and gley, HCl reaction, and the type of lower horizon boundary.

The purpose of the soil examinations was to supplement WSA's testing program with information about the soils and sediments in which archaeological evidence might be found. We were interested to know whether deeply buried paleosols might be present here, possibly containing cultural material. Also, if any cultural remains were to be found, the soils might reveal much about site formation processes and landscape history.

Methodology:

The core locations were selected by WSA archaeologists. Each core was drilled, cut into 2.5 foot lengths to fit the core storage boxes, wrapped in plastic, and delivered to a campus location for examination. We used standard USDA-NRCS field techniques and terminology to describe the horizons within the cores, as detailed below. It is important to note that no soils or engineering laboratory testing was performed. Thus quantitative characteristics such as texture, percent coarse fragments, and percent gley reported below are estimates rather than precise measurements. Likewise, the naming of soil and sediment horizons depends upon a consideration and summation of multiple characteristics that can be quite subjective. Horizon names reflect the observer's interpretation of pedogenic relationships, and that is a difficult thing to know, given the very small sample size available from a core.

Soil color was obtained from comparison of a soil sample to the Munsell charts, and is expressed both as a Munsell name (e.g. “dark grayish brown”) and as a more precise reference to the hue-value/chroma Munsell color chips, for example, “10YR 4/2.” Soil color was observed both dry and wet, where possible, as the difference in Munsell value and chroma between dry and wet is a useful indicator of organic matter content, and thus in distinguishing A and B horizons. “Moist” color is noted when the soil is neither dry nor wet, as when a clay has not yet dried. Texture, plasticity, and stickiness were determined by hand, by rolling or pressing a small soil sample between thumb and forefinger. Stickiness and plasticity are good field indicators of clay content. Texture refers to the overall mix of sand, silt, and clay sized soil particles. The size and proportional volume of the soil particles imparts many important physical and chemical properties to the soil. “Sandy loam” and “clay” are examples of two formally defined soil texture classes having vastly different physical and hydrological properties. Coarse fragments occurring in soil horizons having gravel content were estimated by eye, in the case of clay rich horizons, or by the use of a 2mm screen, in the case of dry, sandy or loamy horizons.

We also have used USDA-NRCS horizon naming conventions, such as “Ab, B, Cg,” etc. in this report. The “A” and “B” designations indicate genetically related surface and subsurface horizons showing evidence of the effects of soil forming factors over time. Primarily in these cores that would be the accumulation of decomposed organic matter and a black or dark gray color in the “A” horizon, and a higher chroma color, with similar or heavier texture in the “B” horizon. The notation “Ab” indicates a former surface horizon that was buried, but is still evident beneath a younger deposit. Master horizon “C” indicates soil parent material, such as raw sediment, not yet showing discernable evidence of soil formation. The raw alluvium or colluvium from successive, unrelated depositional events is identified by horizon names such as “2C”, “3C”, etc., while sucessively deeper buried A horizons are noted as “2Ab”, “3Ab”, etc. The suffix “g” as in “Cg” indicates gley, a bluish or greenish cast of the soil matrix caused by sustained, anaerobic, reducing electrochemical conditions. Surface horizons named “F,” “F2,” etc. are fill horizons of exotic or off site material, usually high in angular gravel and somewhat alkaline in pH because of crushed concrete powder. The words “light” and “heavy” modifying the texture class, as for example, “light clay loam,” indicate less or more clay present than the typical amount upon which the texture class is defined, and thus a transitional value to the adjacent coarser or finer textural class.

Augered core samples such as these are subject to mechanical torque that distorts natural soil structure, and can destroy delicate indicators such as thin lamellae, or weak platy peds. We observed many instances of gross spiral fracturing within these core samples, that result solely from the augering process, bearing no relationship to natural soil forming processes. Structure is an important

characteristic for interpreting buried surfaces. Nevertheless, we feel that the distortions of soil structure present in these cores are not so great as to be unable to use structure as an indicator. This is because of the cores' relatively large diameter, as compared to a hand auger.

Also, the coring process is fraught with mechanical difficulties, including encountering large buried rocks and perched groundwater lenses. These difficulties affect our ability to obtain true measurements of horizon upper and lower boundaries. There are many "unconformities" in these core samples, reflecting compression of the record, and sometimes apparent gaps in the record, because of having to change drill bits or add a new core sleeve. The end result is that the horizon depths we measured in the lab for this report bear only a rather loose conformity to the measurements that might have been obtained from an undistorted sample such as a trench wall, on site. Nevertheless, though horizons may have been compressed to a large degree, and small sections may be missing, we believe we have obtained at least a qualitatively accurate indication of the soils and sediments present.

Core Sample #BL2, examined on 10/14/08.

Location Data: Core #BL2 is in the northwest part of the site. See the detailed core location map in the primary report.

Profile Data:

F1 0-27 cm. Dark gray (7.5YR 4/1 dry) coarse sand, very dark gray (7.5YR 3/1) wet; structure single grain; consistence: loose, non-sticky, non-plastic; slightly effervescent; coarse fragments: 65% total, 60%< 1 cm sharply angular, 40% 3-6 cm angular; lower boundary clear.

F2 27-129 cm. Brown (7.5YR 4/3 moist) light sandy clay loam, wet color not taken; structure strong, fine, subangular blocky; consistence: firm, sticky, plastic; noneffervescent; coarse fragments: 40% total, 1-6 cm sharply angular gravel; mottles: few distinct yellowish red (5YR 5/8) and few distinct pale yellow (2.5Y 7/4); lower boundary clear.

C 129-151 cm. Dark brown (7.5YR 3/2 moist) heavy clay, wet color not taken; structure massive; consistence: very firm, sticky, very plastic; noneffervescent; coarse fragments: 1% total, 2-3 mm subangular gravel; mottles: few distinct pale yellow (2.5Y 7/4) and common distinct dark red (2.5YR 4/6); lower boundary abrupt.

2C1 151-187 cm. Dark brown (7.5YR 3/2 moist) clay, wet color not

taken; structure weak, very coarse, subangular blocky; consistence: firm, sticky, very plastic; noneffervescent; coarse fragments: none; lower boundary gradual.

2C2 187-242 cm. Brown (7.5YR 4/2 moist) clay, wet color not taken; structure weak, coarse, angular blocky; consistence: very firm, sticky, very plastic; noneffervescent; coarse fragments: <1%, subrounded; mottles: few distinct pale yellow (2.5Y 7/4); lower boundary gradual.

2C3 242-337 cm. Brown (7.5YR 4/3 moist) heavy clay, wet color not taken; structure massive; consistence: extremely firm, sticky, very plastic; noneffervescent; coarse fragments: none; mottles: few distinct pale yellow (2.5Y 7/4); lower boundary not observed.

NOTE: 5 foot gap above horizon 3C, reported on core box.

3C 487-542 cm. Brown (7.5YR 4/3 moist) light sandy clay, wet color not taken; structure strong, medium, platy; consistence: firm, sticky, plastic; noneffervescent; coarse fragments: <1%; mottles: few faint pale yellow (2.5Y 7/4); lower boundary gradual.

4C 542-622 cm. Brown (7.5YR 4/2 moist) sandy clay, wet color not taken; structure massive; consistence: extremely firm, sticky, very plastic; noneffervescent; coarse fragments: 15% total, 2-4 mm subangular gravel; mottles: many distinct pale yellow (2.5Y 7/4) and yellowish red (5YR 5/8); lower boundary not observed.

Profile comment: Core #BL2 shows two fill horizons with a high percentage of fresh looking angular gravel and a high sand content, lying atop a series of four sediment horizons. Fill horizons often effervesce with 1N HCl, because of crushed concrete content, or from calcareous gravel or sand within the aggregate. The west side of the Berkeley hills receives enough leaching precipitation that it would be unlikely for any natural nonagricultural soil to contain carbonate near the surface. The clay horizons, by contrast, are heavy textured, mottled, with almost no gravel, and that fine and subrounded. The lack of gravel and fine texture suggest overbank deposits of Strawberry Creek. No cultural material was observed in this profile.

Core Sample #BL5 examined on 10/03/08.

Location Data: Core #BL5 is in the northwest part of the site. See the

detailed core location map in the primary report.

Profile Data:

F1 0-18 cm. Olive brown (2.5Y 4/3 dry) sand, wet color not taken; structure not taken; consistence: not taken; Note: Horizon consists of asphalt pieces and angular subbase gravel about 3 cm diameter.

F2 18-60 cm. Very dark grayish brown (10YR 3/2 dry) sandy clay loam, Very dark grayish brown (2.5Y 3/2) wet; structure not taken; consistence: sticky, plastic; slightly effervescent in places. Note: buried nail at 42 cm.

B 60-125 cm. Dark yellowish brown (10YR 4/4 dry) sandy clay loam, Brown (10YR 4/3) wet; structure weak, medium, granular near the top, strong, medium, subangular near the bottom; consistence: sticky, slightly plastic; noneffervescent; coarse fragments: 50% total, 2-4 cm subrounded gravel; lower boundary clear. Note: redwood bark found at 80 cm.

C 125-650 cm. Olive brown (2.5YR 4/4 wet) sandy clay loam, structure weak, coarse, blocky; consistence: sticky, plastic; noneffervescent; coarse fragments: 70% total, 2-4 cm sharply angular fragments of decomposing sandstone; lower boundary clear.

Ab 650-682 cm. Black (2.5Y 2.5/1 moist) silty clay loam, also black (2.5Y 2.5/1) wet; structure weak, medium, blocky; consistence: slightly sticky, plastic; noneffervescent; coarse fragments: none; mottles: rare distinct light yellowish brown (2.5Y 6/4) not larger than 2 mm; lower boundary irregular. Horizon is relatively rich in organic matter.

2C1 682-802 cm. Very dark grayish brown (2.5Y 3/2 moist) sandy clay loam, also very dark grayish brown (2.5Y 3/2) wet; structure weak, medium, prismatic; consistence: very firm, sticky, plastic; noneffervescent; coarse fragments: 20% total, 3 mm rounded gravel; mottles: rare distinct light yellowish brown (2.5Y 6/4) not larger than 2 mm; gleyed matrix is about 50% by volume, dark greenish gray (10GY 4/1); lower boundary gradual.

2C2 802-872+ cm. Brown (7.5Y 4/3 moist) heavy clay, wet color not taken; structure massive; consistence: very firm, very sticky, very plastic; noneffervescent; coarse fragments: 20% total, 3 mm rounded gravel; mottles: rare distinct light yellowish brown (2.5Y 6/4) not larger than 2 mm and few distinct olive yellow (2.5Y 6/6); lower boundary not observed.

Profile comment: Core #BL5 shows two fill horizons lying atop what appears to be the B and C horizons of a truncated natural soil. Below lies a silty buried A horizon, black and still showing some evidence of plant material. This horizon had no greasy consistence, no smell, no abrupt internal changes in structure or texture that might indicate midden. Below the A horizon are two alluvial horizons containing rounded fine gravel, a good indicator of stream laid origins. No cultural material was observed in this profile.

Core Sample #BL7 examined on 10/14/08.

Location Data: Core #BL7 is in the northwest part of the site. See the detailed core location map in the primary report.

Profile Data:

F1 0-16 cm. Brown (10YR 4/3 dry) loamy sand, wet color not taken; structure single grain; consistence: non sticky, non plastic; slightly effervescent; coarse fragments: 65% total, sharply angular gravel, 50% 2-5 mm size, 50% 1-3 cm size; boundary abrupt.

F2 16-395 cm. Dark yellowish brown (10YR 4/4 moist) sandy clay loam, wet color not taken; structure moderate, coarse, blocky; consistence: firm, sticky, plastic; non effervescent; coarse fragments: <20%, 2-5 cm angular gravel; mottles: few distinct light yellowish brown (2.5Y 6/4); boundary abrupt.

Ab 395-420 cm. Bluish black (5PB 2.5/1 moist) clay loam; color in uppermost part of horizon is dark greenish gray (10BG 4/1); structure weak, medium, blocky; consistence: friable, slightly sticky, very plastic; non effervescent; coarse fragments: 1% rounded 3 mm gravel; mottles: few distinct reddish brown (5YR 4/4); boundary abrupt. Consistence not greasy; no abrupt texture or structure changes.

Cg 420-480+ cm. Dark greenish gray (5GY 3/1 moist) light sandy clay loam, wet color not taken; structure weak, medium, blocky; consistence: friable, sticky, plastic; non effervescent; coarse fragments: 20% total, subrounded gravel 1-3 cm in size; mottles: common distinct light yellowish brown (2.5Y 6/4) and few faint reddish brown (5YR 4/4); boundary not observed.

Profile comment: Core #BL7 shows two fill horizons lying atop a buried A horizon, as indicated by the very dark color, friable

consistence, and rounded gravel content. Below the A horizon is a C horizon of parent material, gleyed. No cultural material was observed in this profile.

Core Sample #BL11 examined on 10/14/08.

Location Data: Core #BL11 is in the northwest part of the site. See the detailed core location map in the primary report.

Profile Data:

F1 0-26 cm. Brown (10YR 4/3 dry) loamy sand, brown (10YR 4/3) wet; structure single grain; consistence: loose, non sticky, non plastic; slightly effervescent; coarse fragments: 65% total, 40% asphalt pieces 1-4 cm; boundary abrupt.

F2 26-92 cm. Gray (10YR 5/1 dry) sandy clay loam; very dark gray 10YR 3/1) wet; structure strong, medium, blocky; consistence: moderately hard, slightly sticky, slightly plastic; strongly effervescent; coarse fragments: 65% total, sharply angular 2-3 cm; boundary abrupt.

F3 92-157 cm. Brown (10YR 4/3 dry) sandy clay loam; dark gray 10YR 4/1) wet; structure weak, fine, blocky; consistence: firm, sticky, plastic; non effervescent; coarse fragments: 30% total, 1 cm angular gravel; mottles: few distinct yellowish red (5YR 5/6); boundary abrupt.

F4 157-200 cm. Brown (10YR 4/3 moist at top of horizon) sandy clay loam; dark gray (10YR 4/1) moist at bottom of horizon; structure strong, medium, blocky; consistence: firm, sticky, plastic; slightly effervescent; coarse fragments: 80% total, sharply angular 5-8 cm in size; mottles: common distinct reddish yellow (5YR 6/8) and olive yellow (2.5Y 6/6); boundary abrupt.

F5 200-701 cm. Dark grayish brown (10YR 4/2 moist) sandy clay loam; wet color not taken; structure weak, fine, subangular, blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 40% total, sharply angular 3-5 cm in size, also some subrounded fragments in lower part; mottles: common weak light yellowish brown (2.5Y 6/4) and rare dark red (2.5YR 4/6); boundary not observed. Note: Wire fragment at 260 cm. At 606 cm coarse fragments increase to 65% and ground water appears.

F6 701-751 cm. Light olive brown (2.5Y 5/3 dry) clay; dark grayish brown (2.5Y 4/2) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: 20%

total, sharply angular 1-8 cm in size; mottles: few distinct light yellowish brown (2.5Y 6/4); boundary clear.

Abg 751-801+ cm. Greenish black (10Y 2.5/1 moist, matrix) heavy sandy loam; greenish gray gley (10BG 5/1) moist; structure weak, coarse, blocky; consistence: very firm, slightly sticky, slightly plastic; non effervescent; coarse fragments: 20% total, 10% < 2 cm subrounded and 90% sharply angular at extreme lower part of horizon; mottles: few distinct light yellowish brown (2.5Y 6/4) and rare distinct dark red (2.5YR 4/6); 50% gleyed by volume; boundary not observed.

Profile comment: Core #BL11 was drilled in an area of deep fill. There are six horizons of fill, 7.5 or more meters deep, lying atop a dark, gleyed, buried A horizon. The A horizon is lighter in texture and much darker in value than horizons above. Also, the angular rock fragments at 8 meters are natural fractured sandstone rather than aggregate gravel. No cultural material was observed in this profile.

Core Sample #BL14 examined on 10/02/08.

Location Data: Core #BL14 is in the northwest part of the site. See the detailed core location map in the primary report.

Profile Data:

F1 0-50 cm. Brown (10YR 4/3 dry) clay loam, dark grayish brown (10YR 4/2) wet; structure strong, coarse, granular; consistence: slightly hard, non sticky, plastic; non effervescent; coarse fragments: 40% total, sharply angular >2 cm in size; boundary gradual.

F2 50-100 cm. Brown (10YR 4/3 dry) silty clay loam, also (10YR 4/3) wet; structure massive breaking to weak, coarse, blocky; consistence: very hard, sticky, slightly plastic; slightly effervescent; coarse fragments: 10% total, sharply angular averaging 4 cm in size; boundary clear. Note: Horizon contains subbase aggregate throughout, also with small pieces of brick.

F3g 100-138 cm. Brown (10YR 4/3 dry, matrix, 20%), dark greenish gray (10BG 3/1 dry, gley, 80%) heavy clay loam, dark greenish gray (10GY 4/1) gley wet; structure massive breaking to weak, coarse, blocky; consistence: hard, slightly sticky, plastic; slightly effervescent; coarse fragments: 10% total, sharply angular 4 cm in size; boundary clear.

F4 138-198 cm. Brown (10YR 4/3 dry) light sandy clay loam, dark

grayish brown (10YR 4/2) wet; structure strong, coarse, granular in top 20 cm, massive below; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 10% total, sharply angular 4 cm in size; boundary not observed.

F5 198-248 cm. Dark grayish brown (10YR 4/2 dry) sandy clay loam, also dark grayish brown (10YR 4/2) wet; structure strong, medium granular, and coarse granular; consistence: friable, sticky, plastic; non effervescent; coarse fragments: 25% total, not greater than 3-4 cm in size; boundary not observed.

F6 248-346 cm. Brown (10YR 4/3 moist) heavy sandy loam, also brown (10YR 4/3) wet; structure weak, coarse, blocky; consistence: hard, slightly sticky, slightly plastic; non effervescent; coarse fragments: 70% total, 4-6 cm encased in clay; boundary not observed.

F7 346-378 cm. Yellowish brown (10YR 5/4 moist) light sandy clay, dark yellowish brown (10YR 4/4) wet; structure massive; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 20% total, 4-6 cm in size encased in clay; boundary abrupt. Note: charcoal at top of horizon and fragment of glazed blue and white patterned potsherd at 378 cm.

Abg 378-510 cm. Dark greenish gray (5G 3/1 moist, top 5 cm, bluish black 5B 2.5/1, below) clay, black (N 2.5/-) wet; structure massive; consistence: sticky, plastic; non effervescent; coarse fragments: <5% increasing with depth to 20%; roots present; mottles: few distinct dusky red (2.5YR 3/3) and few distinct light olive brown (2.5Y 5/4); boundary abrupt.

C1g 510-654 cm. Brown (10YR 5/3 moist) heavy clay, wet color of matrix not taken; gley color: dark bluish gray (10B 4/1); structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: <1%; roots present; mottles: few distinct dusky red (2.5YR 3/3); boundary clear. Note: There is a concentration of charcoal 35 cm below top of horizon.

C2g 654-764 cm. Yellowish brown (10YR 5/4 dry) sandy clay, dark grayish brown (10YR 4/2) wet; gleyed soil 20% by volume dark greenish gray (10GY 4/1); structure weak, coarse, subangular blocky; consistence: friable, slightly sticky, plastic; non effervescent; coarse fragments: 25% total, rounded gravel; mottles: few distinct dusky red (2.5YR 3/3); boundary gradual.

C3 764-796+ cm. Light yellowish brown (2.5Y 6/4 dry) sandy clay,

brown (10YR 4/3) wet; structure weak, medium, blocky; consistence: hard, non sticky, plastic; HCl not taken; coarse fragments: 25% total, sharply angular 3 cm in size; boundary not observed.

Profile comment: Core #BL14 also was drilled in an area of deep fill, similar to #BL11. There are seven horizons of fill, lying atop a dark, gleyed, buried A horizon. The A horizon lies abruptly atop an almost 3 meter thick C horizon which contains charcoal near the top. The presence of charcoal is common in natural soils, and is not by itself a cultural indicator. There is also charcoal in the fill horizon above, as well as a fragment of glazed dinnerware. No cultural material was observed in this profile, except the historic dinnerware.

Core Sample #BL16 examined on 11/05/08.

Location Data: Core #BL16 is in the northwest part of the site, along a proposed water line lineament. See the detailed core location map in the primary report.

Profile Data:

F1 0-10 cm. Brown (10YR 4/3 dry) light sandy loam, olive brown (2.5Y 4/4) wet; structure single grain; consistence: non sticky, slightly plastic; non effervescent; coarse fragments: 80% total, subbase aggregate and cinder 1-3 cm; boundary abrupt.

F2 10-97 cm. Dark grayish brown (2.5Y 4/2 moist, matrix, top) brown (10YR 4/3 moist, matrix, bottom) sandy clay loam, dark grayish brown (10YR 4/2) wet; structure moderate, medium, blocky; consistence: extremely firm, sticky, plastic; non effervescent; coarse fragments: 50% total, <1 cm in size with small chips of brick at 25 cm depth; mottles: few distinct strong brown (7.5YR 5/8) and few distinct very pale brown (10YR 7/4); boundary abrupt. Note: cinder at 35 cm depth.

Bt 97-122 cm. Dark yellowish brown (10YR 4/4 moist) clay, also dark yellowish brown (10YR 4/4) wet; structure massive; consistence: slightly sticky, very plastic; non effervescent; coarse fragments: 5% total, subrounded 5-8 mm gravel; boundary clear.

C 122-165 cm. Olive brown (2.5Y 4/4 moist) clay, brown (10YR 4/3) wet; structure moderate, medium, subangular blocky; consistence: extremely firm, sticky, very plastic; non effervescent; coarse fragments: >5% mixed rounded and

angular; mottles: common distinct yellow (2.5Y 7/6) near lower boundary; boundary abrupt.

Ab 165-177 cm. Very dark grayish brown (10YR 3/2 moist) clay, brown (10YR 4/3) wet; structure weak, fine, subangular blocky consistence: extremely firm, sticky, plastic; non effervescent; coarse fragments: 10% total; boundary clear.

2C 177-211 cm. Light olive brown (2.5Y 5/4 moist) sandy clay loam, also light olive brown (2.5Y 5/3) wet; structure massive, showing strong rock fabric; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 50% total, angular sandstone fragments; boundary clear.

3C1 211-279 cm. Dark brown (7.5YR 3/4 moist) clay, brown (7.5YR 4/4) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: 1% total, fine gravel; mottles: rare diffuse dark red (2.5YR 4/8) and rare distinct brownish yellow (10YR 6/8); boundary gradual.

3C2 279-410 cm. Brown (7.5YR 4/4 moist) heavy clay loam, also brown (7.5YR 4/4) wet; structure moderate, fine, subangular blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 5% total, white angular fragments 2-4 mm(non effervescent); mottles: common white(gypsum?) and few diffuse yellowish red (5YR 5/6); boundary clear.

4C 410-493+ cm. Yellowish brown (10YR 5/4 dry) heavy sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure weak, medium, blocky; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 15% total, 3 mm angular gravel, 50% white non effervescent minerals and 50% other minerals; mottles: common white gypsum and few distinct reddish yellow (7.5YR 6/8); boundary not observed.

Profile comment: Core #BL16 shows only about a meter of fill atop natural horizons. The second fill horizon has chips of brick as well as some aggregate. The naturally occurring horizons are a clay enhanced Bt immediately beneath the fill, now missing its associated A horizon(s) from above, followed by an associated C horizon. Then comes a buried A horizon immediately beneath an abrupt boundary, distinguished only by its darker color and fine structure. The A horizon rests upon a series of sedimentary horizons having differences in color and texture, especially the rock rich horizon immediately below, but with no evidence of organic matter accumulation or pedogenesis. No cultural material was observed in this profile.

Core Sample #BL19 examined on 10/30/08.

Location Data: Core #BL19 is in the western part of the site, approximately halfway between the existing stadium wall and the outer edge of the footprint for the proposed development. See the detailed core location map in the primary report.

Profile Data:

F 0-14 cm. Light gray (10YR 7/2 dry) sand, wet color not taken; structure single grain; consistence: loose; slightly effervescent; coarse fragments: 80% total, angular subbase gravel 1-3 cm mixed with pieces of asphalt; boundary clear.

A 14-33 cm. Brown (10YR 4/3 dry) silty clay loam, very dark grayish brown (10YR 3/2) wet; structure strong, fine, granular; consistence: slightly hard, slightly sticky, plastic; non effervescent; coarse fragments: 10% total, rounded gravel 10-15 mm; boundary clear.

B 33-133 cm. Yellowish brown (10YR 5/4 dry) silty clay loam, brown (7.5YR 5/4) wet; structure massive, breaking to coarse, angular blocky; consistence: very hard, slightly sticky, plastic; non effervescent; coarse fragments: 2% total, 3 mm size angular and subrounded gravel; mottles: many diffuse brownish yellow (10YR 6/6) and common diffuse yellowish red (5YR 5/6); boundary clear.

Ab 133-163 cm. Brown (10YR 4/3 dry) light clay, dark yellowish brown (10YR 4/4) wet; structure strong, fine, prismatic; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: none; mottles: none; boundary clear.

C1 163-338 cm. Brown (7.5YR 4/4 dry) light clay, also brown (7.5YR 4/4) wet; structure moderate, medium, blocky; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 50% total, angular sandstone 2-4 cm in size; boundary gradual.

C2 338-583 cm. Strong brown (7.5YR 4/6 dry) sandy clay loam, brown (7.5YR 4/4) wet; structure weak, coarse, angular blocky; consistence: moderately hard, slightly sticky, plastic; non effervescent; coarse fragments: 75% total, unsorted mixture 4 mm-4 cm gravel; mottles: common distinct dark red (2.5YR 4/6) and common yellow (10YR 7/6) also rare black manganese stains; boundary not observed.

C3 583-790 cm. Brown (7.5YR 4/4 moist) sandy clay, dark brown (7.5YR 3/4) wet; structure strong, coarse, and very coarse

granular; consistence: friable, very sticky, plastic; non effervescent; coarse fragments: 60% total, sharply angular 3-7 cm rock fragments also with common 4 mm rounded and subrounded fine gravel; mottles: few distinct red (2.5YR 5/6) and few distinct very pale brown (10YR 7/4); boundary abrupt.(gap!) Note: horizon is wet with ground water.

C4 790-968 cm. Yellowish brown (10YR 5/4 dry) sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure strong, medium, blocky; consistence: very hard, slightly sticky, plastic; non effervescent; coarse fragments: 80% total, angular rock breaking to 3-5 cm in size; mottles: common distinct brownish yellow (10YR 6/6) and reddish yellow (7.5YR 6/8) also common black manganese staining; boundary gradual.

2C 968-993 cm. Light olive brown (2.5Y 5/4 dry) clay, also light olive brown (2.5Y 5/4) wet; structure weak, coarse, subangular blocky; consistence: very hard, slightly sticky, very plastic; non effervescent; coarse fragments: 5% total, subrounded gravel 4-10 mm in size; boundary gradual.

2Ab 993-1039 cm. Very dark grayish brown (2.5Y 3/2 dry) silty clay loam, also (2.5Y 3/2) wet; structure weak, coarse, subangular blocky, breaking to fine, subangular blocky; consistence: moderately hard, sticky, plastic; non effervescent; coarse fragments: <2% subrounded gravel; mottles: few distinct white (non effervescent, gypsum?) and common diffuse light red (2.5YR 7/6) and yellowish brown (10YR 5/6); boundary clear.

2B 1039-1069 cm. Light olive brown(2.5Y 5/3 dry) sandy clay loam, olive brown (2.5Y 4/3) wet; structure weak, coarse, subangular blocky; consistence: moderately hard, non sticky, plastic; non effervescent; coarse fragments: <2%; boundary not observed.

Profile comment: Core #BL19 appears to show a natural series of horizons, with only a thin covering of fill at the top. There are two buried A horizons at depth, the first (at 133 cm) with dark color and strong prismatic structure, the second (at 993 cm) with a lighter texture and darker color than the horizon above. Both buried A horizons have a low content of coarse fragments; neither show any archaeological evidence.

Core Sample #BL25 examined on 10/03/08.

Location Data: Core #BL25 is in the western part of the site, approximately halfway between the existing stadium wall and Piedmont Avenue. See the detailed core location map in the primary report.

Profile Data:

F 0-36 cm. Brown (10YR 4/3 dry) light clay loam, dark brown (10YR 3/3) wet; structure single grain; consistence: slightly sticky, slightly plastic; non effervescent; coarse fragments: 40% total, sharply angular 2 cm mixed with rounded 3 mm gravel; boundary clear.

A 36-72 cm. Dark grayish brown (10YR 4/2 dry) sandy loam, very dark grayish brown (10YR 3/2) wet; structure strong, fine, granular; consistence: slightly hard, non sticky, slightly plastic; non effervescent; coarse fragments: 15% total, both angular and rounded, rounded gravel coated with organic matter; roots present; boundary gradual.

Bt 72-153 cm. Brown (10YR 4/3 dry) light silty clay loam, also brown (10YR 4/3) wet; structure strong, medium, angular blocky; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 1% total; boundary abrupt.

C1 153-196 cm. Dark yellowish brown (10YR 4/4 dry) clay, wet color not taken; structure massive; consistence: very hard, very sticky, very plastic; non effervescent; coarse fragments: 2% total, rounded gravel 3-5 mm coated with organic matter; mottles: few distinct black manganese mottles, also common fine roots; boundary gradual.

C2 196-321 cm. Dark yellowish brown (10YR 4/4 dry) sandy clay, also dark yellowish brown (10YR 4/4) wet; structure weak, medium, blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: few rounded pebbles; mottles: few distinct yellowish red (5YR 5/6); boundary clear. Note: at 281 cm charcoal and rounded pebbles.

Ab 321-365 cm. Brown (7.5YR 4/3 moist) heavy clay loam, also brown (7.5YR 4/3) wet; structure moderate, medium, prismatic, breaking to strong, medium, blocky; consistence: very firm, sticky, plastic; non effervescent; coarse fragments: none; mottles: common manganese staining, common root casts and possible charcoal; boundary clear.

2Bt 365-445 cm. Dark yellowish brown (10YR 4/4 moist) clay, yellowish brown (10YR 5/4) wet, crushed; structure moderate, medium, prismatic, breaking to medium, blocky; consistence: firm, slightly sticky, very plastic; non effervescent; coarse fragments: none; mottles: common distinct yellow (10YR 7/6) about 30% by volume, also few distinct yellowish red (5YR 5/6) about 5% by volume, also greenish gray gley (10Y 6/1) about 10% by volume; boundary gradual.

2C 445-510 cm. Yellowish brown (10YR 5/6 dry) sandy loam, no wet color taken; structure not taken; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 40% sandstone fragments; boundary gradual.

R 510-845 cm. Yellowish brown (10YR 5/6 dry) weathered sandstone; non effervescent; boundary gradual.

2Ab 845-990+ cm. Greenish black (10BG 2.5/1 moist) clay, also greenish black (10Y 2.5/-) wet; structure massive; consistence: extremely firm, slightly sticky, very plastic; slightly effervescent; coarse fragments: 10% total, 1-4 cm mixed angular and subrounded gravel; mottles: diffuse light olive brown (2.5Y 5/6); boundary not observed.

Profile comment: Like core #BL19, Core #BL25 appears to show a natural series of horizons, with only a thin covering of fill at the top. There are two complete A-B-C soils beneath the fill, and the buried A horizon of a third soil just beneath a rock layer which may represent a landslide deposit. The topmost A horizon contains roots and has a typical granular structure; the second A horizon has a prismatic structure and a lighter texture than horizons above and below; while the lower A horizon has a black color and contains some subrounded gravel. This lowest A horizon, a massive black clay, is reminiscent of basin rim black soils such as the Clear Lake series or the Pescadero series. No cultural material was observed in this profile.

Core Sample #BL30 examined on 11/03/08.

Location Data: Core #BL30 is in the western part of the site, on a proposed water line location near Piedmont Avenue. See the detailed core location map in the primary report.

Profile Data:

A 0-15 cm. Dark grayish brown (10YR 4/2 dry) loam, very dark brown (10YR 2/2) wet; structure moderate, very fine, and medium granular; consistence: slightly hard, non sticky, slightly plastic; non effervescent; coarse fragments: 30% total, 3-10 mm subrounded and rounded gravel, also with glass, leaves and woodchips; boundary clear.

AB 15-60 cm. Brown (10YR 4/3 dry) light clay loam, dark brown (10YR 3/3) wet; structure moderate, medium, subangular blocky; consistence: moderately hard, slightly sticky, plastic; non effervescent; coarse fragments: 10% total, 3-5 mm subrounded gravel; boundary gradual.

Bt1 60-117 cm. Brown (10YR 4/3 dry) clay, also brown (10YR 5/3) wet; structure weak, medium, blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: 15% total, sharply angular 3-5 cm in size; mottles: few diffuse red (2.5YR 5/6) and common diffuse very pale brown (10YR 7/4); boundary clear.

Bt2 117-175 cm. Brown (7.5YR 4/4 wet, matrix) clay, with brown (7.5YR 4/3, dry) clay films coating ped faces; structure massive and weak, medium, prismatic; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 20% total, 3 mm to 2 cm angular gravel; mottles: common black manganese stains in pores and on ped faces, also common thick reddish clay films on ped faces, also few distinct red (2.5YR 5/6) and few distinct very pale brown (10YR 7/4); boundary abrupt.

BC 175-223 cm. Light yellowish brown (10YR 6/4 dry) sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure strong, fine, blocky; consistence: hard, very sticky, plastic; non effervescent; coarse fragments: 80% total, yellowish sandstone 2-7 cm angular fragments; mottles: common diffuse very pale brown (10YR 7/4); boundary clear.

C1 223-393 cm. Brown (7.5YR 4/4 dry) sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure strong, fine, subangular blocky; consistence: moderately hard, sticky, plastic; non effervescent; coarse fragments: 50% total, sharply angular sandstone, 4 mm–7 cm, unsorted; mottles: few yellow (10YR 7/8) near bottom of horizon, also no clay films; boundary clear. Note: horizon contains a thin (7 cm) lens of gravel.

C2 393-431 cm. Light yellowish brown (10YR 6/4 dry) light sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure weak, coarse, granular; consistence: moderately hard, sticky, plastic; non effervescent; coarse fragments: 70% total, well sorted, rounded, 3-5 mm gravel; mottles: few distinct red (2.5YR 5/6); boundary clear.

2C 431-471+ cm. Brown (10YR 5/3 dry) light clay, yellowish brown (10YR 5/4) wet; structure weak, medium, prismatic; consistence: hard and very hard, very sticky, plastic; non effervescent; coarse fragments: 10% total, sharply angular sandstone 3 cm in size; mottles: few distinct red (2.5YR 5/6) and few distinct reddish yellow (7.5YR 7/8) and 50% greenish gray gley (10Y 6/1) by volume; clay films thick brown (7.5YR 5/4) coating ped faces near top of horizon; boundary clear.

Profile comment: Core #BL30 shows a natural series of horizons, with no evidence of fill at the top. This is consistent with the

cut and fill map for the stadium plans. There is a dark surface horizon with granular structure and loamy texture, transitioning into a deep, clay rich textural B horizon. Two C horizons containing a high percentage of angular sandstone fragments lie beneath, then an alluvial lens of rounded fine gravel, and finally a gleyed reddish clay. No cultural material was observed in this profile.

Core Sample #BL33 examined on 10/28/08.

Location Data: Core #BL33 was obtained from the western part of the site, close to the southwest wall of Memorial Stadium, at a storm drainage line. See the detailed core location map in the primary report.

Profile Data:

F1 0-10 cm. Dark gray (N 4/1 dry) texture not taken, wet color not taken; structure single grain; very slightly effervescent; coarse fragments: 95% total, asphalt; boundary abrupt.

F2 10-90 cm. Yellowish brown (10YR 5/4 dry) sandy clay loam, brown (10YR 4/3) wet; structure strong, medium, blocky to massive at bottom of horizon; consistence: very hard, slightly sticky, plastic; slightly effervescent; coarse fragments: 50% total, angular sandstone 1-3 cm in size; mottles: rare distinct dark red (2.5YR 4/6) and rare distinct white masses of calcium carbonate 3-5 mm; boundary clear.

Ab 90-120 cm. Brown (10YR 4/3 dry) silt loam, dark brown (10YR 3/3) wet; structure massive; consistence: very hard, slightly sticky, plastic; non effervescent; coarse fragments: <1% total, rounded, fine gravel; mottles: none; boundary clear.

C 120-248 cm. Brown (7.5YR 5/4 dry) clay, also brown (7.5YR 5/4) wet; structure weak, fine, blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: <1% total, rounded, fine gravel; mottles: none; boundary clear.

2Ab 248-308 cm. Brown (10YR 4/3 dry) light sandy clay, yellowish brown (10YR 5/4) wet; structure moderate, medium, prismatic; consistence: hard, sticky, plastic; non effervescent; coarse fragments: ~2% total, rounded, sandstone gravel; mottles: few distinct olive yellow (2.5Y 6/6) and prominent linear black manganese deposits along pores and few prominent white (gypsum?) masses; boundary gradual.

B 308-378 cm. Yellowish brown (10YR 5/4 dry) clay, dark yellowish brown (10YR 4/4) wet; structure moderate, fine,

subangular blocky; consistence: hard, slightly sticky, very plastic; non effervescent; coarse fragments: 10% total, rounded 3-5 mm gravel; mottles: common distinct olive yellow (2.5Y 6/6) and red (2.5YR 5/6); boundary gradual.

2C 378-543 cm. Yellowish red (5YR 4/6 dry) sandy clay loam, brown (7.5YR 4/4) wet; structure strong, medium, blocky; consistence: hard, sticky, plastic; very slightly effervescent at top of horizon, non effervescent at bottom; coarse fragments: 35% total, sharply angular (effervescent, limestone?); mottles: few distinct black manganese; boundary clear.

3C1 543-738 cm. Brown (7.5YR 4/4 dry) heavy clay loam, also brown (7.5YR 4/4) wet; structure massive, and weak, medium, subangular blocky; consistence: firm, sticky, plastic; non effervescent; coarse fragments: 10% total, rounded gravel 3 mm in size; mottles: common distinct red (2.5YR 5/6) and common distinct pale yellow (2.5Y 7/4); boundary clear.

3C2g 738-952 cm. Strong brown (7.5YR 4/6 moist) sandy clay loam, brown (7.5YR 4/4) wet; structure strong, medium, blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 50% total, sharply angular sandstone; gley: greenish gray (10Y 5/1; boundary abrupt.

R 952-980 cm. sharply angular sandstone fragments and the joints in the rock are coated with manganese stains; boundary not observed.

3Ab 980-1045 cm. Brown (10YR 4/3 moist) heavy sandy loam, also brown (10YR 4/3) wet; structure strong, medium, and coarse granular; consistence: friable, slightly sticky, plastic; non effervescent; coarse fragments: 65% total, mixed sharply angular fragments from above and rounded pebbles 1 cm in size; mottles: few distinct dusky red (2.5YR 4/4), and rock edges coated with manganese; boundary not observed.

4C 1045-1240 cm. Yellowish brown (10YR 5/6 moist) sandy clay, also yellowish brown (10YR 5/4) wet; structure strong, fine, angular; consistence: firm, slightly sticky, very plastic; non effervescent; coarse fragments: 20%, excluding rock lens; mottles: none; rock lens begins at 1065 cm, 60 cm thick, joints in the rock coated with black manganese; boundary not observed.

5C 1245-1349 cm. Light olive brown (2.5Y 5/4 moist) heavy clay, also light olive brown (2.5Y 5/4) wet; structure massive; consistence: very sticky, very plastic; non effervescent; coarse fragments: 10% total, mixed, rounded and angular gravel 1-2 cm in size; mottles: many distinct pale yellow

(2.5Y 7/4) and few distinct red (2.5YR 5/6), also gleyed areas 10% of volume greenish gray (10Y 5/1); boundary abrupt.

6C 1349-1429 cm. Yellowish brown (10YR 5/6 moist) clay, dark yellowish brown (10YR 4/4) wet; structure weak, coarse, subangular blocky; consistence: extremely firm, slightly sticky, very plastic; non effervescent; coarse fragments: 10% total, subangular and subrounded gravel 1-4 cm in size; mottles: few diffuse red (2.5YR 5/6) and black manganese stains on rock faces; boundary clear.

7C 1429-1443+ cm. Yellowish brown (10YR 5/4 moist) sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure weak, coarse, subangular blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 50% total, 3-10 mm mixed, rounded and angular gravel; manganese stains on rock faces; boundary not observed.

Profile comment: Core #BL33 is a deep sample, and shows many alluvial horizons beneath a meter of fill. There are three buried A horizons in the profile: The topmost Ab has a silt loam texture with rounded fine gravel and a typical brown color. The C horizon beneath appears to be an unrelated deposit, a reddish clay. Another Ab lies under this clay, with prismatic structure, rounded gravel, a lighter texture, and again the brown color. Beneath a gradual lower boundary lie B and C horizons of similar color, with increasing coarse fragment content. Then an unrelated sedimentary deposit, gleyed in the lower part, then a horizon of sharp sandstone fragments (colluvium or landslide origin), then another brown Ab with granular structure and loamy texture, atop four separate alluvial clay deposits, varying mainly in color and gley percent. No cultural material was observed in this profile.

Core Sample #BL35 examined on 10/29/08.

Location Data: Core #BL35 is another deep core obtained from the western part of the site, near the storm drainage line adjacent to core #BL33. See the detailed core location map in the primary report.

Profile Data:

F 0-35 cm. Dark yellowish brown (10YR 4/4 dry) clay loam, very dark grayish brown (10YR 3/2) wet; structure strong, medium, subangular blocky; consistence: moderately hard, sticky, plastic; non effervescent; coarse fragments: 15% total, asphalt ~2 cm and angular gravel 4 mm; mottles: few distinct red (2.5YR 6/6) and few distinct pale yellow (2.5Y 7/4); boundary abrupt.

A 35-92 cm. Brown (10YR 4/3 dry) light silty clay loam, very dark grayish brown (10YR 3/2) wet; structure moderate, fine, prismatic; consistence: moderately hard, slightly sticky, plastic; non effervescent; coarse fragments: <1% total; mottles: common distinct dark red (2.5YR 4/6); few fine and medium roots; boundary clear.

B 92-140 cm. Brown (10YR 4/3 dry) light silty clay loam, dark brown (10YR 3/3) wet; structure moderate, medium, prismatic; consistence: slightly hard, slightly sticky, plastic; non effervescent; coarse fragments: <1%; mottles: none; roots: few, fine and medium, less than above; boundary gradual.

C1 140-207 cm. Brown (7.5YR 4/3 moist) clay, dark yellowish brown (10YR 4/4) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: <2% total, 10 mm subangular gravel; common black manganese stains in pores, also gley about 5% by volume greenish gray (10BG 6/1); few coarse roots less than above; boundary clear.

C2 207-307 cm. Yellowish brown (10YR 5/4 dry) clay loam, also yellowish brown (10YR 5/4) wet; structure weak, coarse, blocky; consistence: very hard, slightly sticky, plastic; non effervescent; coarse fragments: <1%; mottles: few distinct manganese stains along ped faces and pores, 10% gley by volume greenish gray (10Y 6/1); boundary clear.

2C1 307-442 cm. Brown (10YR 4/3 dry) sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure weak, fine, prismatic; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 40% total, angular gravel 1-3 cm; mottles: few diffuse red (2.5YR 5/6) and few pale yellow (2.5Y 7/4), also common black manganese stains on ped faces and pores; boundary gradual.

2C2g 442-750 cm. Dark yellowish brown (10YR 4/4 dry) sandy clay loam, also dark yellowish brown (10YR 4/4) wet; structure weak, medium, blocky to massive; consistence: extremely firm, very sticky, plastic; non effervescent; coarse fragments: 15% total, angular, 4 mm-10 mm in size; clay films prominent, brown (7.5YR 5/2), not present above; mottles: many diffuse yellowish brown (10YR 5/8), and many distinct black manganese stains on ped faces and pores, also 40% gley by volume; boundary gradual.

2C3 750-961 cm. Yellowish brown (10YR 5/4 moist) sandy clay, also yellowish brown (10YR 5/4) wet; structure moderate, medium, subangular blocky and moderate, medium, platy; consistence: firm, sticky, plastic; non effervescent; coarse fragments: 20% total, angular 3-10 mm gravel; mottles: few distinct red (2.5YR 5/6), also 5% gley by volume greenish gray (10Y 6/1),

also 5% by volume black manganese stains on ped faces and pores; boundary gradual.

3C1 961-1200 cm. Yellowish brown (10YR 5/6 moist) sandy clay loam, also yellowish brown (10YR 5/6) wet; structure weak, coarse, angular blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 60% total, angular 3-5 cm rock fragments; mottles: none, rock fragments are stained with manganese; boundary clear.

3C2 1200-1490 cm. Dark yellowish brown (10YR 4/4 moist) sandy loam, yellowish brown (10YR 5/4) wet; structure strong, medium, angular blocky; consistence: firm(bottom) and very firm(top), non sticky, slightly plastic; non effervescent; coarse fragments: 30% total, mixed, angular and subrounded 3 mm-6 cm, unsorted gravel; mottles: many diffuse reddish yellow (7.5YR 7/6), only in lower 50 cm of horizon, 2% by volume manganese stains on rock faces; boundary abrupt.

R 1490-1515+ cm. Very dusky red (2.5YR 2.5/2 moist) light sandy loam, reddish black (2.5YR 2.5/1) wet; structure strong, fine, granular; consistence: friable, non sticky, non plastic; non effervescent; coarse fragments: 90% total, angular sandstone fragments coated with manganese; boundary not observed.

Profile comment: Core #BL35, also a deep sample like #BL33, shows a similar pattern of a silty A horizon immediately beneath fill, atop related B and C horizons, with two unrelated alluvial horizons below, and then a layer of colluvial rock. Unlike core #BL33, however, there do not appear to be any buried A horizons within this core. No cultural material was observed in this profile.

Core Sample #BL40 examined on 10/27/08.

Location Data: Core #BL35 was obtained from the southwestern part of the site, from the parking lot north of International House. See the detailed core location map in the primary report.

Profile Data:

F1 0-27 cm. Dark olive brown (2.5Y 3/3 dry) coarse loamy sand, wet color not taken; structure single grain and strong, medium, granular; consistence: moderately hard, non sticky, non plastic; non effervescent; coarse fragments: 65% total, angular subbase gravel and asphalt 3-30 mm in size; boundary clear.

F2 27-59 cm. Light yellowish brown (10YR 6/3 dry) sandy clay,

dark yellowish brown (10YR 4/4) wet; structure weak, coarse, blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: 10% total, angular sandstone 10 mm in size; mottles: common distinct strong brown (7.5YR 5/6) and black (7.5 2.5/1); boundary abrupt.

C1 59-95 cm. Dark brown (7.5Y 3/2 wet, upper part) clay, yellowish brown (10YR 5/4 wet, lower part); structure massive; consistence: not taken; non effervescent; coarse fragments: <2% total; mottles: common distinct linear dark red (2.5YR 4/8); boundary clear.

C2g 95-136 cm. Dark yellowish brown (10YR 4/4 moist) light clay, brown (10YR 4/3) wet; structure moderate, medium, platy; consistence: firm, sticky, very plastic; non effervescent; coarse fragments: <2% total; gleyed matrix 10% by volume greenish gray (5G 5/1); boundary clear.

Ab 136-172 cm. Dark yellowish brown (10YR 4/4 moist) light clay, also dark yellowish brown (10YR 4/4) wet; structure strong, medium, prismatic; consistence: extremely firm, very sticky, plastic; non effervescent; coarse fragments: 5% total, 3-10 mm subrounded gravel; mottles: common black (10YR 2/1) manganese stains; boundary gradual.

B 172-220 cm. Reddish yellow (7.5YR 7/6 moist) heavy sandy clay loam, strong brown (7.5YR 4/6) wet; structure strong, medium, and coarse granular; consistence: firm, sticky, plastic; non effervescent; coarse fragments: none; no mottles, no gley; boundary not observed.

2C 220- 274+ cm. Light yellowish brown (10YR 6/4 dry) sandy clay, brown (7.5YR 4/3) wet; structure massive; consistence: very sticky, very plastic; non effervescent; coarse fragments: 5% total, 3 mm size subrounded gravel and angular sandstone pieces; mottles: many distinct pale red (2.5YR 7/4) and dark red (2.5YR 4/6) and brownish yellow (10YR 6/8); boundary not observed.

Profile comment: Core #BL40 shows two horizons of fill material over a truncated natural soil, only the C horizon now present. Beneath the C2g is a buried A horizon with strong prismatic structure and subrounded gravel present. No cultural material was observed in this profile.

Core Sample #BL42 examined on 10/01/08.

Location Data: Core #BL42 was obtained from the southwestern part of the site, approximately 30 meters north of International House’s north wing. See the detailed core location map in the primary report.

Profile Data:

F 0-18 cm. Dark yellowish brown (10YR 4/4 dry) light clay loam, dark grayish brown (10YR 4/2) wet; structure weak, fine, granular; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 65% total, subangular aggregate base gravel, also flower pot fragments; boundary clear.

Bt1 18-82 cm. Dark brown (10YR 3/3 dry) clay loam, very dark grayish brown (10YR 3/2) wet; structure moderate, medium, prismatic; consistence: hard, sticky, plastic; non effervescent; coarse fragments: 5% total, sandstone fragments; mottles: none; boundary clear.

Bt2 82-103 cm. Yellowish brown (10YR 5/6 dry, sandy coating on peds), dark yellowish brown (10YR 4/4 dry, ped interiors), clay, brown (10YR 4/3) wet, crushed; structure weak, coarse, angular blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: none; mottles: reddish yellow (7.5YR 6/8 dry, mineral rind); boundary abrupt.

Ab 103-163 cm. Dark brown (10YR 3/3 dry) clay loam, very dark brown (10YR 2/2) wet; structure weak, coarse, angular blocky; consistence: very hard, slightly sticky, plastic; non effervescent; coarse fragments: none; mottles: none; boundary gradual.

C 163-285 cm. Yellowish brown (10YR 5/4 dry) heavy clay, dark yellowish brown (10YR 4/4) wet; structure massive; consistence: not taken; non effervescent; coarse fragments: 1% total, 2-4 mm rounded; mottles: none; gley: 10% by volume greenish gray (5G 6/1) dry; boundary abrupt.

2C 285-390 cm. Yellowish brown (10YR 5/4 dry) light clay, also yellowish brown (10YR 5/4) wet; structure moderate, medium, subangular blocky; consistence: hard, slightly sticky, plastic; non effervescent; coarse fragments: 1% total, 2-3 mm rounded gravel; mottles: none; gley: 2% by volume greenish gray (10Y 5/1) dry; boundary gradual.

3C1 390-425 cm. Dusky red (2.5YR 4/4 dry) clay, also dusky red (2.5YR 3/4) wet and reddish brown (5YR 4/4) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: none; mottles: common brownish yellow (10YR 6/6) and few dark red (2.5YR 4/8); boundary clear.

3C2 425-595 cm. Dusky red (2.5YR 4/4 dry) sandy clay loam, also dusky red (2.5YR 3/4) wet; structure strong, moderate, prismatic, breaking to strong, coarse, angular blocky;

consistence: hard, sticky, plastic; effervescent not taken; coarse fragments: 10% total, 2-5 mm angular white gravel; mottles: few distinct black manganese masses 1 mm diameter; boundary clear.

2Ab 595-692 cm. Dark yellowish brown (10YR 4/4 dry) extremely gravelly heavy sandy loam, very dark grayish brown (10YR 3/2) wet; structure strong, medium, blocky; consistence: friable, slightly sticky, plastic; non effervescent; coarse fragments: 60% total, sharply angular 1-5 cm sandstone; mottles: few distinct black manganese masses 1-2 mm size; boundary gradual.

C 692-760 cm. Dark yellowish brown (10YR 4/4 dry) loamy sand, also dark yellowish brown (10YR 4/4) wet; structure single grain; consistence: non sticky, non plastic; non effervescent; coarse fragments: 20% total, sharply angular 5-10 mm; mottles: rare black manganese masses; boundary abrupt.

3Ab 760-885 cm. Strong brown (7.5YR 4/6 dry) extremely gravelly heavy sandy loam. Note: other properties very similar to horizon 2Ab above.

3Bt 885-970 cm. Yellowish brown (10YR 5/6 dry) clay loam, dark yellowish brown (10YR 4/4) wet; structure massive; consistence: slightly sticky, plastic; non effervescent; coarse fragments: <2% total; mottles: none; boundary clear.

4Abg 970-1055+ cm. Brown (7.5YR 5/4 dry) loam (near top) and very gravelly loam (near bottom), wet color not taken; structure weak, medium, prismatic, grading to moderate, medium, blocky; consistence: not taken; effervescence not taken; coarse fragments: increase from 10% to 50% with depth, coated with clay films and manganese; mottles: common black manganese stains on coarse fragment surfaces; gleyed matrix dark greenish gray (10Y 4/1) in last 25 cm depth; boundary not observed.

Profile comment: Core #BL42 shows a thin horizon of fill over a truncated natural soil, only the Bt horizon now present. Buried beneath the Bt2 is a dark colored A horizon with a gradual boundary into its related parent material. Then follows an abrupt transition to a yellowish brown clay with moderate structure, then a transition to a red clay. We intrepret the brown clay and the red clay as two separate alluvial deposits. Beneath are two buried A horizons, or perhaps one thick horizon which includes a 70cm sand lens. However, the lower 3Ab has a more reddish color than the 2Ab, so it is probably older or has developed in parent material of slightly redder hue. A Bt of heavier texture lies beneath the lower member, and finally, a buried A showing prismatic

structure and a lighter texture. No cultural material was observed in this profile.

Core Sample #BL45 examined on 11/04/08.

Location Data: Core #BL45 was obtained from the southwestern part of the site, close to the stadium wall. See the detailed core location map in the primary report.

Profile Data:

F1 0-11 cm. Olive brown (2.5Y 4/3 dry) texture not taken, wet color not taken; structure single grain and strong, fine, granular; consistence: slightly hard; non effervescent; coarse fragments: 80% total, subbase aggregate 2-4 cm; boundary clear.

F2 11-52 cm. Olive brown (2.5Y 4/3 dry) sandy clay, light olive brown (2.5Y 5/3) wet; structure massive; consistence: very sticky, plastic; non effervescent; coarse fragments: 50% total, angular sybbase gravel 4-10 mm size; mottles: none; boundary abrupt.

C 52-396 cm. Light olive brown (2.5Y 5/4 dry) clay, also light olive brown (2.5Y 5/4) wet; structure moderate, medium, subangular blocky; consistence: very hard, sticky, very plastic; non effervescent; coarse fragments: 5% total, angular gravel 3-10 mm; mottles: rare distinct yellowish red (5YR 4/6) and common diffuse pale yellow (2.5Y 7/4); boundary gradual.

2C 396-603 cm. Brown (7.5YR 4/3 dry) light clay, wet color not taken; structure weak, medium, subangular blocky; consistence: hard, sticky, plastic; non effervescent; coarse fragments: 2% total, angular gravel 3-10 mm; mottles: rare distinct yellowish red (5YR 4/6); boundary gradual.

Abg 603-715 cm. Dark yellowish brown (10YR 4/4 moist) sandy clay loam, brown (10YR 4/3) wet; structure strong, coarse, subangular blocky, breaking to fine, subangular blocky; consistence: friable, sticky, plastic; non effervescent; coarse fragments: 20% total, rounded gravel 5-15 mm; mottles: few diffuse weak red (2.5YR 5/4); gley: greenish gray (10GY 5/1); boundary clear.

3C 715-910 cm. Strong brown (7.5YR 5/6 dry) heavy sandy clay loam, brown (7.5YR 4/4) wet; structure weak, medium, blocky; consistence: very hard, sticky, plastic; non effervescent; coarse fragments: 40% total, angular gravel 10 mm size; mottles: common distinct yellow (10YR 7/6) and common diffuse

red (2.5YR 5/6); gley: none; boundary clear.

4C 910-1122 cm. Yellowish brown (10YR 5/4 moist) heavy sandy loam, also yellowish brown (10YR 5/4) wet; structure weak, medium, blocky; consistence: extremely firm, non sticky, slightly plastic; non effervescent; coarse fragments: 30% total, angular sandstone pieces 9-10 cm; mottles: none; gley: none; boundary clear.

5C 1122-1237 cm. Dark reddish brown (5YR 3/3 moist) clay, brown (7.5YR 4/4) wet; structure strong, fine, angular blocky; consistence: extremely firm, sticky, very plastic; non effervescent; coarse fragments: 10% total, angular 4-10 mm; mottles: common diffuse red (2.5YR 5/6) and black manganes stain on faces of coarse fragments; gley: 10% by volume dark greenish gray (10Y 4/1); boundary clear.

6C 1237-1252+ cm. Dark yellowish brown (10YR 4/4 moist) clay, yellowish brown (10YR 5/4) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: 5% total, subrounded; mottles: none; gley: none; boundary not observed.

Profile comment: Core #BL45 again shows a thin veneer of fill over a truncated natural soil, abruptly covering the topmost C horizon. Buried beneath the olive brown clay C is a more reddish 2C of lighter texture. Just below is a gleyed Abg with strong structure, friable consistence, lighter texture, and rounded gravel, unlike horizons above and below. Below the Abg are four sedimentary horizons with mostly angular coarse fragments, still unrounded by stream transport, and varying degrees of high value and chroma, indicating no accumulation of surface organic matter. The 5C horizon comes close to approximating another buried A horizon, but we interpret it as having too heavy a texture and too firm a moist consistence to be a buried A. No cultural material was observed in this profile.

Core Sample #BL47 examined on 10/16/08.

Location Data: Core #BL47 was obtained from the southwestern part of the site, again fairly close to the stadium wall. See the detailed core location map in the primary report.

Profile Data:

F 0-15 cm. Very dark grayish brown (10YR 3/2 moist) coarse sand, wet color not taken; structure single grain; consistence: non sticky, non plastic; slightly effervescent; coarse fragments: 85% total, angular gravel 4 cm, also 30%

cinder; boundary clear.

Bt 15-85 cm. Dark yellowish brown (10YR 4/4 dry) sandy clay, brown (10YR 4/3) wet; structure massive; consistence: sticky, very plastic; non effervescent; coarse fragments: 10% total, 3-5 mm subrounded fine gravel; mottles: few distinct dark red (2.5YR 4/6) and few distinct reddish yellow (5YR 6/8); gley: in top 12 cm of horizon, no gley in rest; boundary gradual.

C1 85-190 cm. Yellowish brown (10YR 5/4 dry) heavy sandy clay loam, dark yellowish brown (10YR 4/4) wet; structure weak, medium, blocky; consistence: sticky, plastic; non effervescent; coarse fragments: 10% total, 3-5 mm subrounded gravel; mottles: common weak olive yellow (2.5Y 6/6) and rare distinct yellowish red (5YR 4/6); gley: none; boundary clear.

C2g 190-245 cm. Yellowish brown (10YR 5/4 dry) texture not taken, light olive brown (2.5Y 5/4) wet; structure moderate, medium, prismatic; consistence: moderately hard, very sticky, plastic; non effervescent; coarse fragments: none; mottles: none; gley: 40% by volume, dark greenish gray (10Y 4/1); boundary clear.

C3 245-417 cm. Yellowish brown (10YR 5/4 dry) clay, dark yellowish brown (10YR 4/4) wet; structure weak, coarse, blocky; consistence: hard, sticky, plastic; non effervescent; coarse fragments: 2% total, 4 mm mixed subrounded and angular gravel; mottles: few distinct olive yellow (2.5Y 6/6); gley: none; boundary clear.

2C 417-492 cm. Dark yellowish brown (10YR 4/4 moist) silty clay loam, also dark yellowish brown (10YR 4/4) wet; structure moderate, medium, blocky; consistence: firm, slightly sticky, plastic; non effervescent; coarse fragments: 60% total, mixed, rounded and sharply angular, greater than 9 cm size; mottles: few distinct olive yellow (2.5Y 6/6) and rare distinct yellowish red (5YR 4/6); gley: none; boundary clear.

3C 492-550 cm. Dark yellowish brown (10YR 4/4 moist) clay, also dark yellowish brown (10YR 4/4) wet; structure massive; consistence: very sticky, plastic; non effervescent; coarse fragments: 1% total, angular 1 cm maximum size; mottles: rare distinct brown (7.5YR 4/3) and rare distinct strong brown (7.5YR 5/8); gley: none; boundary clear.

4C 550-670 cm. Dark yellowish brown (10YR 4/4 moist) sandy clay loam, also dark yellowish brown (10YR 4/4) wet; structure moderate, medium, subangular blocky; consistence: firm, sticky, plastic; non effervescent; coarse fragments: 50% total, mixed, rounded and angular 7 cm maximum size; mottles: few distinct pale yellow (2.5Y 8/3); boundary clear. Note:

horizon contains a 22 cm thick clay lens at 48 cm depth; clay color is strong brown (7.5YR 5/6) moist; lens coarse fragments: 15%; lens mottles: many distinct light yellowish brown (2.5Y 6/4) and yellowish red (5YR 4/6).

5C 670-807 cm. Strong brown (7.5YR 4/6 moist) sandy loam, also strong brown (7.5YR 4/6) wet; structure strong, medium, subangular blocky; consistence: friable, slightly sticky, plastic; non effervescent; coarse fragments: 10% total, 5 mm-3 cm subrounded gravel; mottles: none; gley: none; boundary abrupt.

6C1 807-842 cm. Yellowish brown (10YR 5/6 dry) sandy clay loam, also yellowish brown (10YR 5/4) wet; structure strong, fine, blocky; consistence: slightly sticky, plastic; non effervescent; coarse fragments: 90% total, angular sandstone pieces as large as 8 cm diameter; mottles: rare distinct reddish brown (5YR 4/4); gley: none; boundary clear.

6C2 842-907+ cm. Dark yellowish brown (10YR 4/4 moist) sandy clay loam, yellowish brown (10YR 5/4) wet; structure strong, fine, subangular blocky, and strong, coarse, granular; consistence: sticky, plastic; non effervescent; coarse fragments: 50% total, angular sandstone pieces 2-5 cm; mottles: few distinct dark reddish gray (5YR 4/2); boundary not observed.

Profile comment: Core #BL47, like #BL45, was drilled on the location of the Piedmont Plaza cut, and shows a thin veneer of sandy fill over a truncated clayey natural soil. Buried beneath the sandy clay Bt is a thick C horizon subdivided into three parts, the middle one (C2g) gleyed because of groundwater perching for long periods atop the more heavy textured C3. Below are alternating horizons with more or less gravel content, but none showing evidence of organic matter enrichment that might indicate an Ab. No cultural material was observed in this profile.