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An Archeological Reconnaissance of the Four Proposed Twelfth Street Extension Routes, Lexington County, South Carolina

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AN ARCHEOLOGICAL RECONNAISSANCE OF THE FOUR PROPOSED TWELFTH STREET EXTENSION ROUTES, LEXINGTON COUNTY, SOUTH CAROLINA

by

Ronald W. Woganan, John H. House
and Albert C. Goodyear
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Prepared by the
INSTITUTE OF ARCHEOLOGY AND ANTHROPOLOGY
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December, 1976
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We wish to collectively thank the staff of the Institute of Archeology and Anthropology for many and varied contributions to the Twelfth Street Extension research. Two other individuals have also made important contributions to this research effort. Mr. James L. Michie, of Columbia, has for years carried out archeological reconnaissance and excavations at sites in the Twelfth Street project area and was, indeed, one of the first to realize the major importance of this locality to South Carolina prehistory. In addition, during the present research Jim discussed the project with the writers and offered many useful comments and criticisms based on his prolonged, perceptive and in-depth investigations in this locality and elsewhere in South Carolina. Mr. David G. Anderson, formerly an Institute Research Assistant and currently a graduate student in anthropology at the University of Arkansas, also carried out research in the project area in connection with the proposed Southeastern Beltway. The present research builds in many ways on David's careful observation and recording of site data at many locations in the Twelfth Street project area. The Otarre Development Company which owns most of the land through which the Twelfth Street Extension routes pass is acknowledged for its cooperation and permission to conduct this study on their property. Mr. Glen Hall of this same company has been especially helpful. We would also like to thank the South Carolina Highway Department for their friendly cooperation and sponsorship of the highway archeology program under which this archeological analysis was conducted.
In the Fall of 1976, the Institute of Archeology and Anthropology, University of South Carolina, performed a field reconnaissance of an area of Lexington County, South Carolina, which would be impacted by the proposed Twelfth Street Extension, a four-lane highway which will link Knox Abbot Drive in Cayce with the proposed Southeastern Beltway (I-326). The reconnaissance concentrated on four alternate routes for the proposed highway and was designed to yield estimates of the relative impact of each alternate upon the archeological resources of the locality. This research was carried out under contract with the South Carolina Highway Department in compliance with the National Environmental Policy Act of 1969 (NEPA) and Executive Order 11593 and was funded by the normal highway archeology budget for 1976.

The project area lies primarily within the floodplain of the Congaree River and Six Mile and Congaree Creeks, immediately below the Fall Line marking the boundary between two of the major physiographic provinces of North America, the Piedmont and Atlantic Coastal Plain. Though located within a few miles of downtown Columbia, South Carolina, the project area is predominantly rural, comprised chiefly of cultivated fields and woodlands.

Previous archeological research in this locality has demonstrated it to be unusually rich in prehistoric and historic archeological resources. There is evidence of relatively intensive prehistoric Indian occupation beginning as much as 12,000 years ago and continuing until the arrival of the Europeans. An English garrison and trading factory known as the "Congaree Fort" was established in this immediate vicinity in 1718 to guard the trading paths to the Cherokee and Catawba Nations. The site of the mid-eighteenth century town of Saxe Gotha is located only a short distance to the east of the project area. The previous archeological research in this locality includes surveys of three alternate routes of the projected Southeastern Beltway.

The present reconnaissance relied upon surface investigation of exposed ground in and near the locations of the four proposed alternate routes of the Twelfth Street Extension. Some limited subsurface investigation was carried out, but it was not sufficient to reliably locate potential archeological sites in wooded areas.

Nineteen previously unrecorded archeological sites were located by the present survey in addition to the nine sites previously recorded in the project impact area. These primarily represent prehistoric Indian occupation, though a number of Colonial and nineteenth century components, as well, have been recognized. The prehistoric sites in the corridor are quite variable in topographic position, period of occupation, inferred function in prehistoric settlement patterns, and in degree of preservation. Two of the sites in the project area are of particular interest. The Taylor site, 38LX1, a major Early Archaic component located about 300 meters east of the easternmost alternate, has been placed on the National Register of Historic Places. The Manning site, 38LX50, a high, terrace remnant with evidence of intensive occupation throughout much of prehistory, is located in the path of two of the proposed alternatives. The Manning site is in the process.
of being nominated to the National Register. The other sites in the locality have received comparatively less investigation, but available evidence suggests that many of these represent fairly intensive occupation and are sufficiently well preserved to yield abundant and versatile archeological data.

Fall Line floodplain environments, such as the one in which the Twelfth Street Project is located, have been demonstrated to be of key importance in prehistoric and historic settlement in this portion of North America. The archeological resources in the project area, then, should be considered an especially valuable part of South Carolina's archeological heritage and great care should be given to their study and conservation. Though no exhaustive attempt has been made at this time to assess the significance, on a site-by-site basis, of the known archeological resources in the project area, four research problem domains appropriate to assessing the significance of these resources have been outlined. They are: (1) human ecology in a Fall Line floodplain environment, (2) prehistoric cultural identification and chronology, (3) variability in prehistoric site function, and (4) prehistoric lithic resource procurement.

In the final section of this report, the known archeological sites in the path of each of the four alternate routes are listed, and the four alternates are ranked according to their estimated relative impact on archeological resources. This ranking, from least impact to greatest impact, is:

1. Alternate 2A
2. Alternate 1A
3. Alternate 2
4. Alternate 1

It is emphasized that each of the four alternates would affect significant archeological sites and that any other potential route would almost certainly do so as well.

Whichever of the four routes is ultimately selected, we recommend that an intensive survey of this corridor be carried out. This would serve not only to discover any yet unrecorded sites in that corridor but also provide additional information pertinent to evaluation of the research potential and significance of each of the sites to be impacted. This final survey would form a basis for the planning and budgeting of further research to mitigate the impact of construction of the Twelfth Street Extension.
INTRODUCTION

In its continuing effort to protect and conserve the archeological resources of the State of South Carolina, the Institute of Archeology and Anthropology of the University of South Carolina undertook an archeological survey of a portion of eastern Lexington County, South Carolina. Field research was conducted during September and November of 1976. The area, immediately to the south of and including sections of the city of Cayce, is slated to be impacted by the proposed Twelfth Street Extension, a four-lane highway which will link Knox Abbott Drive on the north with the proposed Southeastern Beltway (I-326) on the south.

This highway connector is expected to greatly increase urban and industrial development and growth in this relatively undisturbed area. It would provide ready access from Cayce and the West Columbia area to the Beltway and to Interstates 26 and 77. Much of the land encompassed by this survey is owned by the Otarre Development Company, which has plans for the future development of the property. The construction of the highway through the Otarre property would greatly improve the accessibility of this land, now largely woods and cultivated fields, for residential and industrial use.

Following the guidelines for highway archeological research set forth by Goodyear (1975a), the Institute conducted a preliminary investigation of this area under contract with the South Carolina Highway Department, in compliance with the National Environmental Policy Act of 1969 and with Executive Order 11593. The research was funded by the normal highway archeology budget for 1976.

The purpose of this investigation has been to gather information concerning the archeological resources within the area to be impacted by the proposed Twelfth Street Extension. With this information, the South Carolina Highway Department will be able to select a route which will minimally damage those resources in light of recommendations resulting from the archeological research. It must be stressed that this initial reconnaissance is only a preliminary stage in determining the significance of sites in the area. In a framework of cultural resource management archeological reconnaissance must be viewed as the "minimum necessity for predicting impacts of all alternatives" (McGimsey and Davis 1976: 209A). The large area involved in the survey and the early stage of planning for the 4 highway alternates compelled us to make only cursory examination of the area, from which recommendations for subsequent planning and secondary and tertiary stage research can be drawn.

The research goals of this survey can be viewed as threefold—reconnaissance, evaluation of significance, and recommendations. The reconnaissance stage was accomplished through examination of the ground surface within each of the 4 alternate routes and the immediately adjacent areas. Prefaced by a check of existing archeological records and conferences with archeologists familiar with the area, the reconnaissance stage produced several sites previously unrecorded in the site files of the Office of the State Archeologist. Small collections were made which, although somewhat
limited in quantity and reliability, will be used to aid in the formulation of recommendations.

The evaluation and determination of significance for archeological resources can only be accomplished through problem-oriented research (Lipe 1974; Schiffer and House 1975; Goodyear 1975a; Klinger and Raab 1976). Various approaches and criteria for deriving significance include scientific or anthropological values, the occurrence of noteworthy historic events, and psychological and national heritage values (Scovill, Gordon and Anderson 1972; House and Schiffer 1975; Klinger and Raab 1976).

At this stage in our analysis and understanding of the cultural resources which lie in the paths of the 4 alternative corridors of the Twelfth Street Extension, we have collected and analyzed very little data in terms of previously formulated hypotheses or models. Many of the sites encountered are of obvious scientific and anthropological importance, as similar sites have been located and studied in this locality and similar environs. Because we have a priori knowledge of the general age and cultural affiliation of these sites, and the kinds of information that can be derived from their intensive study, nearly all of the remains have critical scientific value. In order that the scientific significance of these sites be at least initially introduced in this early stage of research and so that relevant recommendations can be explicitly made for eventual placement of the Twelfth Street Extension corridor, the significance of the sites vis-à-vis certain obvious problem domains will be provided.

Due to the above mentioned limitations in data collection and analysis, this reconnaissance report cannot stand as a final statement on the significance and appropriate mitigation of these resources. In order that mitigation recommendations be formulated with the best possible fit between site information potential and current archeological theory and method, the final route selected will require an intensive Environmental Impact Statement that will generate appropriate mitigation procedures and costs. The main purpose of this reconnaissance and report is to gather enough information to allow the determination of the best alternate route in light of its greater and lesser impact on cultural resources.

Four alternate routes have been proposed to cross the roughly two and three-quarters miles between Knox Abbott Drive and the proposed site of the Southeastern Beltway (see Fig. 1). All 4 alternates follow the route of the existing Twelfth Street from Knox Abbott to Holland Avenue and continue along existing Pear Street. South of Highway 2 (Frink Street), Alternates 1 and 2 diverge.

Alternate 1 veers to the southeast across undeveloped territory, skirting the eastern edge of a residential area. The route crosses the Seaboard Coastline Railroad at its intersection with Godley Road and continues southeast to Taylor Road. Just south of Taylor Road, Alternate 1 splits into Alternate 1 on the west and the roughly parallel Alternate 1A to the east. These cross Six Mile and Congaree Creeks to converge with Alternate 2 at a point just north of the proposed Southeastern Beltway.

Alternate 2 continues along Pear Street and swings to the southeast along Taylor Road. Shortly after crossing the Seaboard Coastline Railroad
FIGURE 1. Proposed Twelfth Street Extension Alternates.
on Taylor Road, this route cuts south across open land. South of Six Mile and Congaree Creeks, Alternate 2A splits off to the southwest and meets the Beltway approximately 100 meters west of the point at which the other three alternates end.
ENVIRONMENTAL SETTING

The area included within the survey lies primarily within the floodplains of the Congaree River and Six Mile and Congaree Creeks, immediately south of the Fall Line border. The Fall Line, where the Piedmont meets the Atlantic Coastal Plain, represents a merging of the two major physiographic regions and accordingly, has the biotic qualities of an ecotone. The environment of this immediate area has been generally discussed in previous archeological research reports in the area (Anderson 1974; Anderson, Michie and Trinkley 1974; Goodyear 1975b; Ackerly 1976).

Immediately to the west of the Congaree River are the modern floodplain and broad, nearly level terraces. Both the floodplain and the terraces are composed of deep alluvial deposits of the Congaree-Toccoa-Brogdon soil association. These are poorly-drained to well-drained soils (Lawrence 1976).

Reaching out onto these alluvial deposits from the west, are fingers of Coastal Plain sands, clay, and gravels (Overstreet and Bell 1965). These occur as higher sandhills with well-drained soils of the Lakeland-Blaney association (Lawrence 1976). Elevations range from 125 feet at Congaree Creek to slightly over 160 feet in the sandhills.

One of the impressive aspects of the environment spanned by all 4 corridor alternates is its ecological diversity. Special biotic and abiotic resources of prime importance to aboriginal and colonial societies can be found densely located within a remarkably small area. Looked at in terms of regional geography within the eastern U.S. Coastal Plain, Fall Line river valleys and their adjacent upland zones are unusual and unique features, as they constitute only a very small percentage of the total land form categories by area. Although we are at present working with limited and incomplete information, previous surveys and reports have indicated functionally meaningful patterns and associations of certain kinds of archeological sites and special microenvironments (Goodyear 1975b; Ackerly 1976). Obviously, such environmental diversity and quality have implications for understanding the nature of human existence in the Congaree Valley locality with regard to human adaptation through time within a regional ecotone. The relevance of cultural resources within the 4 alternate corridors and other similar sites in the Congaree Valley to understanding long-term human responses to this environment will be treated in a following section which discusses the significance of these sites.

Various agents, both naturally and humanly induced, have been in operation modifying the land surface since the time of initial human occupation. These influences are of interest to the archeologist in terms of the manner in which they affect the archeological record. Of importance within the floodplain environments are flooding activity and the deposition of alluvium. Coe (1964) demonstrated that many prehistoric sites lie buried under thick deposits of alluvium resulting from centuries of flooding. This has also been found to be the case in the Tennessee Valley, where the work of Chapman (1975) has uncovered deeply buried sites which had been predicted on the basis of geomorphological criteria. The possibility of similarly buried sites exists on the Congaree floodplain. One such site
(38Lx12) has been discovered on the immediate margin of the Congaree River western bank by a backhoe trench (Ackerly 1976).

Historic land use, especially agriculture, has played a major role in changing the character of the land surface and subsurface within the Twelfth Street corridor. It can be assumed that most of the project area has been cultivated for substantial periods throughout the 200 years of historic occupation. Currently, nearly all of the area south of Congaree Creek, where the alternates pass, is cultivated. As a result of land clearing prior to planting, all forest examples within the area, with the possible exception of swamps and other wetland forests, represent secondary stages of growth. Sheet erosion, which has carried off much of the topsoil and has produced a truncated soil profile, particularly in the upland sandhills, also resulted from cultivation. In terms of the archeological record, erosion often uncovers once-buried sites, thereby destroying stratigraphic context and exposing artifacts to additional horizontal displacement and removal by untrained collectors. Evidence of erosion can be found in areas where underlying red clay deposits are exposed on the surface and where subsurface testing reveals a truncated soil profile.

During the twentieth century, large-scale land modification occurred in the form of clay mining from an area on the eastern edge of the Twelfth Street corridor. The mines, excavated by the Guignard Brick Works from 1915-20 to the 1940's (Sanders R. Guignard, Jr., personal communication), removed the upper 10 to 12 feet of soil, effectively destroying any archeological material which may have existed there.

Another environmental alteration of lesser impact is the network of high-voltage powerlines which transect the area. Erection of the series of power poles and tower structures would have damaged sites existing in these locations. Broad corridors were cut through the forest vegetation to facilitate the erection of the lines. Regrowth has resulted in grasses, weeds, and scrub growth, but erosion is apparent on slopes in these areas, and is intensified by the clearing of field roads.

Current land use is important to archeological survey as it relates to ground surface visibility of sites and to the condition of those sites. The northern section of the Twelfth Street impact zone is within residential neighborhoods and industrial parks. Surface visibility is poor to non-existent, and there is a high probability that any archeological sites in these locations have been destroyed by modern development.

To the south, the 4 alternates enter relatively undisturbed land covered by oak-hickory and planted pine forests. The sandhill regions are characterized by more xeric vegetation (Fig. 2) than the mesic bottomlands (Fig. 3). Natural forest floor cover, especially pine straw, renders visibility extremely poor. Several powerline right-of-way corridors have been cut through these wooded areas and are currently covered by grasses, weeds, and scrub growth, thus providing low visibility (Fig. 4). Both the wooded areas and powerline cuts are transected by numerous logging and field roads. The dirt roads and eroded areas offer high ground visibility and were given special inspection during the archeological surface reconnaissance (Fig. 5).
FIGURE 2. Xeric Vegetation in the Sandhills Region.

FIGURE 3. Mesic Bottomland Vegetation.
FIGURE 4. Vegetation within Powerline Right-of-way.

AN ARCHEOLOGICAL AND HISTORICAL OVERVIEW
OF THE TWELFTH STREET EXTENSION AREA

Previous Research

The locality of the proposed Twelfth Street Extension is, relatively speaking, one of the most intensively-studied archeological regions of South Carolina. The history of previous research in this locality reflects both its demonstrated richness in prehistoric and historic archeological resources and ongoing efforts to conserve these resources in the path of impending urbanization around South Carolina's capital city. The archeological study of this locality though, can be considered as being only in its beginning stages, having identified a number of significant research problem domains such as those discussed in the "significance" section of this report.

Paleo-Indian fluted points from the West Columbia area were reported by Robert Wauchope (1939), and the previously unknown Thom's Creek ceramic complex was defined by James B. Griffin (1945) on the basis of materials from the Thom's Creek site (38LX2), a few miles to the south of the presently proposed alternates. Extensive reconnaissance was carried out in this portion of the Congaree Valley in the 1960's by James L. Michie and other members of the Archeological Society of South Carolina, Inc. Michie and others subsequently performed intensive excavations at the Taylor (38LX1) (Michie 1971) and Thom's Creek sites (Michie 1969) and at the Manning site (38LX50). Further excavations were later carried out at Thom's Creek through a University of South Carolina archeological field school under the direction of Dr. Donald R. Sutherland (Trinkley 1974a). In 1974, recognition of the anthropological significance and further research potential of the Taylor site lead to its placement on the National Register of Historic Places.

Intensive involvement of the Institute of Archeology and Anthropology with this locality began in 1973 with the survey of a projected route for the proposed Southeastern Beltway (Anderson, Michie and Trinkley 1974). Recognition that construction of this original projected route (Alternate 1) would damage archeological sites of major importance led to subsequent surveys of the Alternate 2 (Anderson 1974) and Alternate 3 (Goodyear 1975b) routes. These surveys included intensive and spatially controlled surface collections and limited test excavations at several sites in the locality. The area of the projected Twelfth Street Extension route north of Congaree Creek, however, received no investigation during these surveys. Due to the extent and importance of the Manning site (38LX50), which lies in the path of the original Twelfth Street exit, the South Carolina Highway Department abandoned the Twelfth Street project.

In the fall of 1975 the Institute performed a survey of a transmission line corridor, proposed by South Carolina Electric and Gas Company, south of Cayce. This project involved both intensive controlled surface collection at site 38LX104 and stratigraphic testing of alluvial deposits at 38LX112 (Ackerly 1976).

During the winter of 1975-76, a program of extensive stratigraphic testing was initiated at the Manning site by students from the University
of South Carolina archeology class under the direction of Dr. William Ayres and Dr. Donald Sutherland of the USC Anthropology Department and John House of the Institute. In June 1976 this program of testing was continued and further controlled surface collections at Manning were carried out by an archeological field school directed by Dr. Leland Ferguson of the Institute. The 1976 USC Anthropology Department summer field school was conducted in part to determine the nature and extent of archeological resources at the Manning site. The results of this fieldwork are used in a later section of this report to assess the impact of the alternate routes which would intercept this site.

This locality also figures prominently in the Colonial history of South Carolina and, in addition to archeological fieldwork, extensive documentary research pertinent to this locality has been carried out in recent years. Documentary sources reveal that Fort Congaree, established in 1718 to guard the trading paths leading from Charles Towne to the Cherokee and Catawba Nations, was located in the immediate vicinity of the bridge over Congaree Creek on Old State Road (Trinkley 1974b; Gay 1974). The actual site of Fort Congaree has eluded archeological reconnaissance, but the probable area of its location has recently been placed on the National Register of Historic Places.

Prehistory in the Project Area

The prehistory of this portion of South Carolina has been adequately reviewed by Goodyear (1975b), Ackery (1976) and Ferguson (1976). In the present discussion we will attempt to identify some of the manifestations of occupation during various periods in prehistory at specific archeological sites in the locality of the proposed Twelfth Street Extension. This discussion will draw upon not only data from previous research in this locality but also upon the results of the present survey.

Paleo-Indian--Before 8500 B.C.

The term Paleo-Indian is applied to the earliest known human occupation of the New World. The beginnings of the Paleo-Indian period remain obscure, but it is considered to have lasted until the end of Ice Age or Pleistocene environmental conditions, ca. 8500 B.C. Present evidence from the Southeast is very sparse but suggests very low human population densities, a hunting and gathering lifeway, and occupation concentrated in major river valleys. Finds of fluted points indicate that the upper Congaree Valley was one of the major areas of Paleo-Indian occupation in South Carolina (Wauchope 1939; Michie 1974). No fluted points were found by the present survey, but they have been found in recent years at the Taylor and Manning sites.

Archaic--8500-2500 B.C.

The Archaic period is thought to represent a succession of hunting and gathering lifeways adapted to changing Holocene environmental conditions. A tripartite division of this long interval into Early, Middle and Late subperiods seems useful in most of eastern North America.

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Coincident with the warming trend and establishment of more or less modern biotic communities beginning about 8500 B.C., there seems to have been a major population increase throughout the Southeast. Dalton points may represent the earliest part of the Early Archaic while Palmer points seem to date slightly later (cf., Coe 1964).

Dalton occupation is present throughout most of South Carolina, and significant numbers of Dalton points have been found at Taylor (38LX1), Manning (38LX50) and 38LX19. Palmer points are abundant in the upper Congaree Valley area and have been found in at least small numbers at most of the Archaic sites in and adjacent to the floodplain. Dalton and Palmer occupation floors and hearths were discovered during the excavation of the Taylor site, not only revealing information about Early Archaic behavior, but demonstrating that Early Archaic occupational surfaces may remain intact even in presently cultivated sites in this locality. Similar Palmer features, though in less well-defined stratigraphic context, were observed by Michie (1969) in excavations at the Thom's Creek site. Palmer points and other Early Archaic tool forms have been found by the hundreds on some portions of the Manning site, suggesting that Early Archaic populations focused much of their time and interest on this terrace.

Well-made end-scrapers and other unifacial tools are strongly associated with many Paleo-Indian and Early Archaic occupations in the Southeast. Such unifaces have been found in large numbers at Manning and other major Early Archaic sites in this locality. Though no Dalton or Palmer points were found on the present survey, well-made unifaces were found at sites 38LX124, 38LX125, 38LX126, 38LX127, 38LX135, 38LX136, and 38LX138. These unifaces are particularly useful as an indicator of early occupation in this locality because the area is frequented by collectors who consistently pick up points but may leave unifaces. The presence of an additional Palmer component in the Twelfth Street impact area is suggested by a report (James L. Michie, personal communication) that during the 1950's Cecil Davis, a local collector, found large numbers of Palmer points in a presently wooded area east of 38LX129.

The Middle Archaic period, roughly 6000 to 3500 B.C., is represented in this portion of South Carolina by Morrow Mountain and Guilford points. Middle Archaic points have been found by the hundreds at the Manning site and in smaller numbers at many other sites in the locality. Morrow Mountain and Guilford hearths were found by Michie (1969) in the excavations at Thom's Creek. The Middle Archaic seems to have involved relatively high population densities and utilization of all environmental zones in the Piedmont and Fall Line areas of South Carolina. At present, however, very little is known of the Middle Archaic lifeway.

In most of the Southeast, the Late Archaic is a relatively long interval starting about 3500 B.C. and ending around 1000 B.C. with the appearance, in most areas, of the earliest prehistoric ceramics. The Late Archaic is better understood than preceding occupations and is characterized in many areas by evidence of more sedentary occupation and increasingly complex technology and social organization. The earliest known ceramics in North America, however, appear in the coastal South Atlantic area by about 2500 B.C. Savannah River points span the preceramic/ceramic transition at some stratified sites. Preceramic Late Archaic
occupations, then, are somewhat difficult to identify from surface data in this part of the Southeast, but some of the numerous sites in the upper Congaree Valley which yield Savannah River points may have been occupied during this interval.

**Transitional--2500-1000 B.C.**

Fiber tempered or Stalling's Ware Group (South 1973) ceramics have been dated as early as 2500 B.C. at sites along the lower Savannah River and South Atlantic coast. Thom's Creek ceramics have a more northerly distribution (Anderson 1975) and are roughly contemporaneous or slightly later. The Thom's Creek site (Griffin 1945; Michie 1969; Trinkley 1974a) is only a few miles south of the project area. A number of sites in this locality which have high densities of fire-cracked rock, Savannah River points and occasional Thom's Creek sherds or sherds of steatite probably represent Transitional Period base camps or settlements. The Godley site (38LX141) and a concentrated midden area on the south tip of the Manning site are examples of this site type. Steatite sherds were also found by the present survey at 38LX124. In addition to Savannah River points, a small contracting stemmed point, not readily distinguishable from some Morrow Mountain points, seems to be associated with some Transitional Period occupations (Bullen and Green 1970). Similar points were found at 38LX126 and 38LX129 on the present survey and have been found previously at numerous other sites in the locality.

**Woodland--1000 B.C.-A.D. 1000**

The Woodland period is characterized by the earliest widespread ceramics in eastern North America. Though evidence of cultivated plants is beginning to be apparent in some Archaic sites, the Woodland period probably also saw the first widespread horticulture in the East.

Linear check-stamped sherds, Deptford-like ceramics representing the earlier part of this interval, have been found in quantity at the Thom's Creek site (Griffin 1945; Michie 1969; Trinkley 1974a) and at 38LX5 on the edge of the sand hills west of this locality (Goodyear 1975b: 18). Within the project area, linear check-stamped ceramics have been found at 38LX19, 38LX54 and in a small area at the center of the Manning site. Plain sand-tempered sherds, probably representing occupation sometime during the Woodland period, have been found in small numbers at numerous other sites in the locality. Such sherds and a small broad-stemmed point were excavated from test pits at 38LX130 during the present survey. There is yet very little known about human behavior during this time period in inland portions of the South Atlantic area.

**South Appalachian Mississippian--A.D. 1000-1700**

Cultural patterns based on intensive agriculture are widespread in eastern North America after A.D. 1000; in this portion of the Southeast, these occupations are known as South Appalachian Mississippian (Griffin 1967; Ferguson 1971). Chicora Ware Group (South 1973) sherds and small triangular
arrowpoints are useful indicators of Mississippian occupation in this region. Another attribute of many Mississippian components in the Piedmont and Fall Line areas is the presence of tools and debitage of translucent black or grey flint, thought to have originated in the Ridge and Valley Province beyond the Blue Ridge. Palmer points found along the Fall Line, however, are occasionally made of a black flint.

Numerous South Appalachian Mississippian village sites are present in and adjacent to floodplain areas in the Congaree Valley. Site 38LX68 on the banks of Congaree Creek below Old State Road may represent such a village, and a small area on the northern tip of Manning which yielded Chicora Ware Group sherds and probable Ridge and Valley Province flintdebitage may also represent late prehistoric or protohistoric habitation. In the present survey, triangular arrow points were found at 38LX125, 38LX131, 38LX134, and 38LX137. Small flakes of probable Ridge and Valley flint were found at 38LX126, 38LX132, and 38LX141. Many of the plain, coarse-sand or grit-tempered sherds found at sites in the locality may also represent some kind of Mississippian occupation.

Mississippian village sites in this region are usually associated with areas of alluvial, sandy loam suited to aboriginal agricultural techniques and crops (cf., Anderson 1975). The frequent finds of arrow points and low-density scatters of Chicora Ware Group sherds in a diversity of environments, however, suggests a diversified over-all subsistence strategy. Probably most of the Mississippian components found in the project area, accordingly, represent some kind of extractive activity peripheral to a village at 38LX68 or elsewhere in the floodplain.

History and Historical Archeology in the Project Area

The history of the upper Congaree Valley has been briefly summarized by Anderson (1974). Much historical and archeological research in the locality has been undertaken in an attempt to locate the site of Fort Congaree, known to have been constructed in this immediate vicinity (Gay 1974; Trinkley 1974b). Though these attempts to locate the site of Fort Congaree so far have been unsuccessful, the documentary and archeological information generated by these attempts provides a useful base on which to begin investigating Colonial period settlement in the region.

In 1718, an English garrison and trading factory was established at the area known as the "Congarees"—after an Indian group inhabiting the locality prior to the Yemasee War. The original Fort Congaree was abandoned in 1722 (Trinkley 1974b: 4), but a second trading company was established in the immediate vicinity about 1733 and persisted for 20 years as a major focus of the Indian trade on the Carolina frontier (Central Midlands Regional Planning Council 1974: 132). Intensive settlement in this portion of South Carolina began in the 1730's with the establishment of Saxe Gotha Township. Reconnaissance by Leland Ferguson (personal communication) in the summer of 1976 revealed abundant Colonial artifacts in cultivated fields east of Old State Road in the location indicated by the 1757 DeBrahm map (DeBrahm 1757) as the location of the town of Saxe Gotha. Colonial materials found on many sites in this locality (Anderson, Michie and Trinkley 1974; Anderson 1974) presumably represent settlement in and around eighteenth

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In the Twelfth Street Extension project impact area, Colonial artifacts have previously been found in two areas at the Manning site and at 38LX54. No Colonial artifacts were recognized, however, in any of the additional areas investigated during the present survey.

The project area saw more or less intensive settlement through the nineteenth century and into the twentieth century. Nineteenth century materials were occasionally found on the present survey, but no old house places or other nineteenth century features were recognized. In February 1865, during the Civil War, a skirmish was fought at the bridge over Congaree Creek on Old State Road; site 38LX83, a heavily wooded area of earthworks on the north side of Congaree Creek just west of Old State Road, has been identified by Anderson (1974) with the Confederate fortifications erected at this time.
Reconnaissance of the Twelfth Street extension area was undertaken by the examination of the ground surface within all 4 alternates and adjacent areas for cultural debris indicative of prehistoric or early colonial activity. Reliance on dirt roads, trails, eroded slopes and other areas of scant vegetation was necessary due to the ground cover which limited visibility. Residential and industrial areas in the northern portion of the impact zone were not as intensively examined as the less developed and disturbed areas to the south. The probability is high that archeological sites in these developed areas have been obscured or destroyed. Cultivated fields south of Congaree Creek were only superficially surveyed, as several intensive reconnaissance projects (Anderson, Michie and Trinkley 1974; Anderson 1974; Goodyear 1975b; Ackerly 1976) have been previously conducted in these areas, recording 11 sites which could potentially be impacted by Twelfth Street construction. Swamp areas in the vicinity of Congaree Creek were not investigated.

The surface collecting method employed at each site was straightforward. All visible artifacts were picked up, a strategy which is referred to here and elsewhere (House and Ballenger 1976) as "intensive controlled." Such a method at least allows preliminary analysis and comments on basic site information including the type and relative age of cultural occupations present, activities conducted at the site which may have required special artifacts, and rough notions about spatial dimensions and artifact density of the site. In an effort to offset what are undoubtedly strong sampling limitations in using such a method, an effort was made to collect all or as many artifacts as possible under the assumption that as sample size increases, so does the representativeness of the sample. The controlled aspect of this method refers only to the procedure of picking up all visible artifacts regardless of form or size. In that there were no spatial controls imposed, there is an obvious limitation to this sampling strategy. Area of surface collection, however, was noted. In addition to these stipulations, it should be pointed out that some of the sites in the corridors, which are now under vegetation, had been cleared in the past and have been frequently visited by scientifically untrained relic hunters (James L. Michie, personal communication). This tends to diminish the presence of certain kinds of artifacts such as finished and exotic tools. While impact from such uncontrolled collections certainly damages the data base, numerous classes of artifacts are still present and unharmed at least by collectors, since these materials are rarely of interest to them.

The statistical limitations in the way these sites were found and sampled should be obvious. No claims are made that either intersite or intrasite parameters regarding site content and functional variability have been made. It should be pointed out that several sites in the corridors have already been recorded by other means, and much of the proposed impact area was at least superficially observable. Thus, for a reconnaissance stage archeological analysis we feel that the methods and findings are adequate to formulate an evaluation of the cultural resources in the 4 alternate corridors.

-METHODS-
Limited subsurface testing was done to determine the presence of artifact-bearing strata at 38LX130, 38LX134, and 38LX141. Unscreened collections of visible artifacts were taken from these testpits and profile cuts.

Analysis of all Twelfth Street collections was undertaken using the typology outlined on the artifact analysis sheet developed for previous highway projects (see House and Ballenger 1976). The same typology was used for previous small projects in the Congaree floodplain regions, enabling the combination of data into a broader regional approach toward an increased archaeological understanding of this area. Domains of interest in such an approach include activity reconstruction, subsystem reconstruction, and ecological analysis (Goodyear 1975a).
SITE INFORMATION

Site descriptions and generalized discussions of archeological content are presented in this section, arranged according to the alternates in which each site is located. The research potential and significance of these sites are outlined later. For more precise information concerning site locations, see Figure 6; detailed artifact counts are contained in Appendix A.

Alternate 1

Alternate 1 passes through the sandhills for roughly the northern third of its length, and then moves down onto terraces of the Congaree floodplain as it continues southeast to the Southeastern Beltway. Much of its extent in the sandhills is covered by urban and industrial developments which have obscured or, more probably, destroyed archeological sites there. The floodplain section of Alternate 1, however, is relatively undisturbed. One site (38LX141) was discovered in the sandhills, and 4 sites (38LX124, 38LX132, 38LX133, and 38LX136) were found on the terraces. The Alternate 1 corridor may also affect 4 previously recorded sites (38LX1, 38LX19, 38LX50, 38LX81), which will be discussed here.

38LX141, the Godley site. The Godley site extends for an estimated 160 meters along Godley Road west of its intersection with the Seaboard Coastline railroad. The road intersects the site and construction no doubt resulted in considerable damage to it. The portion of the site south of the road is currently undisturbed in a pine-oak forest, but the northern section is presently being disturbed by earth-moving operations. Intensively controlled surface collections of visible cultural material were made from the roadcuts south (locus 1) and north (locus 2) of Godley Road and 2 6-foot long profiles (tc-A and tc-B) were cut into the bank along the southern side of the road (Fig. 7). Collections were made (unscreened) from these 2 profile cuts. All artifacts collected are recorded in Appendix A.

Analysis of these collections from the Godley site indicates this was an area of intensive prehistoric activity. Quantities of fire-cracked rock were recovered, as was debitage representing all phases of biface manufacture. Utilized flakes and endscrapers were recovered from locus 1, and a small-stemmed Savannah River-like biface was found in profile cut A. Pottery sherds, including a Thom's Creek sherd, were found on the surface, as were recent historic ceramics and glass.

The occurrence of prehistoric ceramics and the high diversity of tool types and lithic material (quartz, argillite, Coastal Plain chert, Carolina slate, and quartzite) indicate that the Godley site was probably a type of habitation site, and was the scene of various maintenance activities. The 2 profiles cut into the roadbank suggest the possible existence of a midden deposit, an organic stained stratum containing cultural debris resulting from intensive occupation. Diagnostic material from the Godley site indicates occupation during the Transitional period between the Archaic and the Woodland, as well as early historic activity.
FIGURE 6. Locational Map of Twelfth Street Sites.
FIGURE 7. Profile Cut Into Bank at the Godley Site, 38LX141.
Information which can be gained from investigations at the Godley site will be extremely important to our understanding of prehistoric activities as they transpired in the Congaree floodplain during the Archaic, Transitional, and Early Woodland periods, making it eligible for nomination to the National Register of Historic Places. Should Alternate 1 be chosen as the route of the Twelfth Street Extension, we can say at this time that mitigation through intensive excavations would definitely be warranted.

38LX133. 38LX133 is situated along a field road on the second terrace of the Congaree floodplain. The east-west dimensions could not be determined due to the grass, weed, and scrub growth vegetation, but the north-south extent (based on surface material found along the road) is approximately 40 meters. An intensively controlled surface collection was made, which resulted in only a small quantity of fire-cracked quartz chunks, flakes, and a utilized chert flake. A square-cut nail was also recovered.

From this information it is not possible to assign a prehistoric cultural designation to the site. The nail indicates early historic activity in the area. Although the field road has probably damaged a portion of the site, intact areas probably remain on either side of the road. Should this site be endangered by highway construction, further research would be necessary to determine its significance and to more precisely outline a program of mitigation.

38LX132. This site, located several hundred meters south along the field road from 38LX133, is very much like its neighbor. It extends for approximately 40 meters north-south along the road and appears on the surface as a low-density lithic scatter. Extensive surface collection produced only 23 nondiagnostic flakes of quartz, Carolina slate, Coastal Plain chert, and black Ridge and Valley chert.

Like 38LX133, this may have intact areas along the road. Should highway construction be planned which would affect this area, further research would be required to more accurately determine its significance and to outline mitigation.

38LX1, the Taylor site. The Taylor site is an area of prehistoric cultural material about one-half mile long on a low-lying ridge on a high terrace in the Congaree River floodplain. The site has long been under cultivation, and surface collections over the years have yielded Paleo-Indian fluted points of both Clovis-like and Suwanee varieties and numbers of Early Archaic Dalton, Quad-like, Palmer and Taylor points.

Excavations at the Taylor site in 1970 by Michie (1970) and others revealed as much as 12-14 inches of recent sediments overlying Early Archaic occupational features. These features include both Dalton and Palmer hearths and concentrated areas of chipping debris, hammerstones, and anvils closely associated with hearths. In spite of the extensive 1970 excavations, most of the Taylor site remains to be excavated.

Research at Taylor has demonstrated the site to be of major importance in the early prehistory of South Carolina. This importance has been recognized by the placement of the site on the National Register of Historic Places.
38LX50, the Manning site. The Manning site occupies an elevated terrace remnant, approximately 650 meters in length, lying along the south edge of the Congaree Creek swamp. The site is underlain by gravely red clays, but the surface stratum is coarse alluvial sand. The elevation of the site averages about 150 feet above sea level, probably rendering the location immune to all floods within geologically modern times. Anderson, Michie and Trinkley (1974: Figure 2) have divided the site into 6 subareas, designated "A" through "F."

The Manning site was reported to the Institute in 1970 by James L. Michie, who immediately recognized the almost unique importance of the site in upper Congaree Valley prehistory. The site is especially outstanding for having yielded, over the years, a number of Paleo-Indian fluted points—including both Clovis-like and Suwanee forms—several Dalton points, and very large numbers of Palmer points and other Early Archaic tools.

Accordingly, the Manning site has during recent years received more protracted and diversified archeological investigation than any other prehistoric site in South Carolina. Abundant data have been collected which have only begun to be analyzed. A large collection of points and other tools from the site, comprising thousands of pieces, has been loaned to the Institute by Mr. Tommy Charles of Columbia. In 1974, the Archeological Society of South Carolina, Inc. performed excavations in the wooded area on the northern fringe of the site (adjacent to Area B) and on the sloping south central portion of the site (Area C). Extensive artifact bearing deposits were encountered in the wooded area, but only the bottom of a few features were found below the plowzone at Area C.

In the summer of 1975, during the survey of the Alternate 3 route of the Southeastern Beltway, Goodyear and House made an intensive statistical surface collection on the southern half of the site using the SYMAP computer program to map the values of specific artifactual variables on the site. These analyses revealed complex variability in the distribution of tool, debitage, and lithic raw material categories across the area sampled. The 1976 summer field school directed by Ferguson completed this intensive surface sampling program by collecting the northern half of the site.

In the winter of 1975-1976, House prepared a research design involving test excavations to evaluate the surface samples and to elucidate the over-all stratigraphy and condition of the Manning site (House 1976). This program of testing was begun that winter and continued during the summer field school. Though this testing program is not yet complete, results so far indicate that artifact-bearing strata extend 1 foot or more below the plowzone over much of the site. Clusters of fire-cracked rock found in some excavation units seem to represent hearths or earth ovens and suggest that materials in the subplowzone may in many cases still be very close to their original depositional context. The discouraging stratigraphy encountered on the slope at Area C, then, seems to be a result of localized sheet erosion and not typical of cultivated portions of the site as a whole. Of particular interest are Early Archaic materials recovered from the lower subplowzone strata at Area B. These data suggest that Early Archaic horizons may be stratigraphically below later deposits and well preserved in this portion of the Manning site.
The horizontal spatial structure of prehistoric occupations at 38LX50 is only now becoming known. A very concentrated Transitional period midden area, presumably representing a base camp or settlement, is present at Area A on the south tip of the site. Middle and Late Archaic occupations seem to be present throughout the site; but fire-cracked rock concentrations, suggestive of habitation, seem to be greatest in portions of Area B. Early Archaic materials have been found in greatest abundance at Area C, but this may only reflect their exposure by sheet erosion. Scattered, sand-tempered ceramics are found in portions of Area B, and a small concentration of linear check-stamped sherds is present at Area C. Preliminary analysis of the surface collection data from the 1976 field school indicates that the concentration of Early Archaic material continues north and east of Areas B and C. A concentration of Mississippian sherds and probable Ridge and Valley flint debitage was recognized at Area E on the north part of the site. Colonial artifacts have been found in small quantities at Area B and at Area F on the northeastern tip of the site.

The past several years of research have amply documented the major importance of the Manning site in Paleo-Indian and Early Archaic settlement in the upper Congaree Valley and its yet barely-tapped research potential. The Institute of Archeology and Anthropology is currently completing the process of nominating the Manning site for placement on the National Register of Historic Places. Such a site should be preserved by nomination to the Register for purposes of study by future generations. It is obvious from our studies thus far, that owing to its unusual locational setting, (i.e., on an elevated terrace overlooking rich and diverse microenvironments) and its correspondingly complex occupational history throughout its 10,000 years of cultural utilization, the Manning site is central to our understanding of prehistoric and historic lifeways in the Upper Congaree Valley.

38LX19. 38LX19 was discovered and recorded during the archeological reconnaissance for the Southeastern Beltway (Anderson, Michie and Trinkley 1974). It is located on a small ridge at the point where Alternates 1, 1A, and 2 converge, making it a highly endangered site. Covering approximately 8 acres, 38LX19 contains dense surface debris representing activity from Early Archaic through Early Woodland, and historic times. Anderson, Michie and Trinkley (1974) suggest the possibility of deposits containing stratified cultural material.

Due to the limited nature of this preliminary reconnaissance, the precise research potential cannot be determined at this time. Further investigation is necessary before its significance can be fully assessed and a plan of mitigation can be outlined.

Alternate 1A

Proceeding from north to south, the route of Alternate 1A coincides with that of Alternate 1 through the sandhills and southeast across the terraces of the Congaree floodplain. It diverges south of Taylor Road and continues through the area of the Guignard clay pits, across Six Mile and Congaree Creeks, to a point where it rejoins Alternates 1 and 2 north of the Southeastern Beltway.
Three new sites were recorded along the northern portion of the route which coincides with Alternate 1 (38LX141, 38LX133, and 38LX132). Nine previously unrecorded sites were discovered along the central part of Alternate 1A (38LX127, 38LX128, 38LX135, 38LX124, 38LX125, 38LX134, 38LX126, 38LX140, and 38LX139). Four sites within the vicinity of the southern end of the alternate were recorded by previous reconnaissance for the Southeastern Beltway (38LX1, 38LX63, 38LX19, and 38LX81).

38LX141, the Godley site. The Godley site lies squarely in the path of the combined 1-1A corridor. A discussion of its archeological content is included in the section on Alternate 1 sites.

38LX133. 38LX133 also is within the combined 1-1A alternate corridor and is included with the Alternate 1 sites.

38LX132. 38LX132 lies just to the east of the combined 1-1A route where it splits into two separate routes. Information concerning the site is given with the Alternate 1 sites.

38LX1, the Taylor site. This important site lies to the east of all Twelfth Street alternates. See the section on Alternate 1 sites for a further discussion.

38LX127. Located approximately 100 meters south of Taylor Road, this site is on the edge of a rise situated on the second terrace of the Congaree floodplain. Ground surface visibility along the field road which passes through 38LX127 is good, but there is little visibility in the grass and weeds off the roadbed. The areal extent of the site could not be determined due to the limited visibility. Sections of the site along the road are badly eroded to the underlying red clay.

An intensive surface collection was made from this area, producing a small amount of general biface reduction debitage, 2 utilized quartz flakes, 1 quartz endscraper, and 5 nondiagnostic biface fragments. Quartz was the only lithic material recovered. Material was collected from both the top and the slopes of the rise; the greatest concentration occurred on the eastern slope. The only diagnostic artifact recovered is the endscraper, which is probably indicative of Early Archaic occupation.

38LX127 lies on the western edge of the Alternate 1A corridor. Due to the limited nature of this preliminary reconnaissance, precise research potential cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX128. 38LX128 is located on the edge of the second terrace of the Congaree floodplain. The site extends for approximately 40 meters along a field road within a grass, weed, and scrub covered powerline corridor. It probably also extends into the immediately adjacent oak-pine-gum forest. Although some damage has no doubt been inflicted by the presence of the road, erosion is slight and the area appears to be relatively stable.
Controlled surface collection of the site resulted in 1 piece of fire-cracked rock, 3 quartz chunks, and a small number of biface thinning flakes of quartz, Carolina slate, and Coastal Plain chert. Also recovered were 2 biface blanks and 2 broken biface fragments. None of this material was found to be culturally or chronologically diagnostic.

38LX128 is in the center of Alternate 1A. Due to the limited nature of this preliminary reconnaissance, the precise research potential of 38LX128 cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX135. 38LX135 was designated on the basis of a surface scatter of prehistoric cultural material extending for roughly 50 meters along a field road. Surface visibility along the road was good, but grass obscured visibility away from the road.

During the course of the controlled surface collection, the following cultural materials were collected: a small amount of fire-cracked rock; biface reduction debitage of quartz, Carolina slate, Coastal Plain chert, and argillite; 1 quartz utilized flake; 1 quartz endscraper; and 1 quartz flake core. One biface of heat-treated Coastal Plain chert was recovered, as were 3 biface blanks and numerous biface fragments. The endscraper indicates an Early Archaic occupation of the site, although this locus is likely to have been occupied at other times as well.

38LX135 is in the corridor of Alternate 1A. Due to the limited nature of this preliminary reconnaissance, the precise research potential of 38LX135 cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX124, the Tower site. The Tower site is situated at the edge of a high point on the second terrace of the Congaree floodplain (Fig. 6). Visibility is fair to good throughout much of the area due to the field roads which converge there and to considerable erosion which is exposing underlying red clay deposits. Because of this erosion, it is uncertain whether subsurface artifact-bearing deposits exist.

Both the top and the slopes of this knoll produced a high density of diversifiedartifact material. Fire-cracked quartz, quartz chunks, and bifacial thinning flakes of banded argillite, quartz, Carolina slate, banded chert, Coastal Plain chert, black Ridge and Valley chert, and an unidentified schistose occur. Tools recovered consist of 3 utilized flakes, 4 endscrapers, a flake core, 1 "Gary-like" stemmed point, 2 biface blanks, and several biface fragments. Two steatite sherds, 1 plain ceramic sherd, and 1 historic stoneware sherd were collected. A Guilford point and an unidentified biface were collected during subsequent visits to the site. Elements in this artifact assemblage indicate multicomponent occupancy throughout the Archaic and into the Transitional and Woodland periods. The historic stoneware fragment represents some degree of early historic activity in this area. The high diversity of tools and lithic raw materials and the occurrence of pottery and maintenance tools suggest the hypothesis that this was the site.
of intensive prehistoric habitation. The Tower site is situated between the corridors of Alternates 1 and 1A.

38LX125. 38LX125 is located along a field road within a powerline cut on the second terrace of the Congaree floodplain. It is approximately 30 meters southeast of the Tower site and may represent a continuation of it. Grass and weeds obscure much of the site, making determination of its extent impossible. Erosion is apparent here, as at other sites in this area, and has removed the topsoil in some sections of the site, revealing red clay.

Quartz chunks and bifacial thinning flakes of quartz, Carolina slate, Coastal Plain chert and argillite were recovered during the controlled surface collection of this site. Also collected were a broken chert biface tip and a quartz triangular point diagnostic of the Mississippian period. One possibly punctated steatite sherd was found, as was a single undecorated, coarse, sand-tempered sherd. A piece of "black glass" wine bottle was also collected. Cultural time periods represented by this collection are the Early and Late Archaic, the Transitional, the Woodland and the Mississippian periods, and the Early Historic period.

38LX125 lies west of the Alternate 1A corridor, between it and Alternate 1. Due to the limited nature of this preliminary reconnaissance, the precise research potential cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX134. A knoll in a wooded area of the second terrace was tested as a potential site location. As the forest litter obscured ground visibility, making surface collection impossible, 2 2-meter x 4-meter testpits were excavated. These pits produced both historic and prehistoric cultural material. A truncated soil profile with 2 to 4 inches of humic zone overlying red clay was found, possibly the result of sheet erosion accompanying cultivation. The areal extent of the site could not be determined.

Cultural material was retrieved only from the upper humic zone. A great quantity of fire-cracked rock was collected, along with a number of bifacial thinning flakes of quartz and Coastal Plain chert, and the base of a Mississippian triangular point. Two sherds of Historic period blue transfer earthenware were also found in these testpits.

This site is located in the central portion of Alternate 1A. Due to the limited nature of this preliminary reconnaissance, the precise research potential of 38LX134 cannot be determined at this time. Further investigation is necessary before significance can be assessed and a plan of mitigation can be outlined.

38LX126. This site is located to the southeast of 38LX125, on the same floodplain terrace. Surface material is visible for approximately 50 meters along a field road, extending from the cleared powerline corridor into the adjacent pine-oak-sweetgum forest. Damage has occurred both from construction of the road and from erosion (Fig. 8).

The controlled surface collection from this site contains a small amount of fire-cracked rock, quartz chunks, and a large number of biface
FIGURE 8. Dirt Access Road Intersecting 38LX126.
thinning flakes, primarily of tertiary stage production. Raw lithic materials present are quartz, Carolina slate, Coastal Plain chert, argillite, and 2 unidentified materials. Lithic tools include 4 utilized flakes, 4 endscrapers, and a core tool, as well as one Gary-like point, 2 biface blanks, and several small biface fragments. Plain pottery sherds with fine-sand temper and rose quartz inclusions were found. Early and Late Archaic and Woodland occupations are suggested from this assemblage.

38LX126 lies on the western border of the Alternate 1A corridor. Due to the limited nature of this preliminary reconnaissance, the research potential cannot be determined at this time. Further investigation is necessary before total significance can be assessed and a plan of mitigation can be outlined.

38LX140. 38LX140 is in a cultivated soybean field on a sloping area of a terrace of the Congaree floodplain, south of Congaree Creek. Damage has probably been caused by continuous cultivation and possible sheet erosion. The soil here is a reddish-tan clay loam with fine gravel.

A large amount of fire-cracked rock was collected during the intensive surface collection of this area, along with flakes of quartz, Coastal Plain chert, and argillite representing various stages of biface reduction, and 1 quartz endscraper. Two plain pottery sherds with coarse sand inclusions were also located. The endscraper suggests Early Archaic occupation of 38LX140, while the pottery is diagnostic of the Woodland period.

The site is situated on the western edge of the Alternate 1A corridor. Due to the limited nature of this preliminary reconnaissance, the research potential cannot be determined at this time. Further investigation is necessary before significance can be accurately assessed and a plan of mitigation can be outlined.

38LX139. This site is on a natural levee 30 meters west of Congaree Creek, on a terrace of the Congaree floodplain. Located primarily in a cultivated soybean field and extending into the adjacent treeline, it has probably suffered damage from cultivation and sheet erosion. A 70 meter east-west dimension is estimated for the site.

A systematic surface collection of the area produced a large quantity of fire-cracked rock, several quartz chunks, a very small number of thinning flakes and 2 biface blank fragments. Lithic raw materials were limited to quartz and Coastal Plain chert.

The site lies east of all proposed alternates. Due to the limited nature of this preliminary reconnaissance, its full research potential cannot be determined at this time. Further investigation is necessary before its significance can be assessed and a plan of mitigation can be outlined.

38LX63. This site was previously recorded in the site files of the Institute of Archeology. Located on a knoll overlooking Congaree Creek, the area is currently under cultivation.
No collection was made from the area during this project, but prior collection has gathered Guilford and Savannah River points, representing the Middle and Late Archaic.

This area lies to the east of the Twelfth Street routes. Should it be endangered by any related land disturbance, it should be subjected to further testing in order to determine its significance and to plan necessary mitigation.

38LX19. This site is located at the point at which Alternates 1, 1A, and 2 converge to join the Southeastern Beltway. A discussion of its archeological content is found in the section concerning Alternate 1 sites.

38LX81. Located in the Southeast Beltway corridor, southwest of the point at which it is joined by 3 Twelfth Street alternates, this site is considered in the section on Alternate 1 sites.

Alternate 2

Alternate 2 leaves the sandhills north of Taylor Road and continues south across Congaree terraces to where it joins Alternates 1, 1A and 2 north of the Southeastern Beltway. Six sites would be impacted by construction of this alternate; 3 of these were located during this reconnaissance (38LX138, 38LX129, 38LX136) and 3 were recorded by previous reconnaissance for the Southeastern Beltway (38LX50, 38LX19, 38LX81).

38LX138. This is a large area of low density surface material extending along a dirt access road. The site no doubt extends eastward into the neighboring oak-pine forest for an undetermined distance, but land modification for the railroad which parallels this area to the west has certainly obscured archeological deposits there.

Only a small "grab" sample was taken here since the area appears to be clear of highway construction. This sample, containing chunks and thinning flakes of quartz and Coastal Plain chert, and a quartz endscraper, cannot be viewed as being representative of the total artifact assemblage. The endscraper is probably indicative of Early Archaic occupation, but nothing more can be said about 38LX138 at this time.

Located west of all corridors, this site should not be affected by highway construction. If, for some reason, it would become threatened, further investigation would be necessary to precisely determine its significance and to outline necessary mitigation.

38LX129. 38LX129 is a very large site area stretching for about 400 meters through pine-oak and planted pine forest on a floodplain terrace north of Six Mile Creek. This appears along a dirt access road as a series of continuous low-density surface scatters possibly representing different occupations. The area has no doubt been cultivated in the past, resulting in possible damage to archeological resources here; otherwise, only slight erosion along the road currently poses any threat of damage.
The controlled surface collection produced bifacial thinning flakes of quartz, argillite, Carolina slate and Coastal Plain chert; several broken fragments of bifaces; and a single fine-sand tempered pottery sherd. From this evidence only a Woodland occupation can be ascertained. However, it is reported by James L. Michie that when this area was under cultivation a number of Palmer points representing Early Archaic were found east of the road toward the terrace edge.

38LX129 is located within the impact zone of Alternate 2. Due to the limited nature of this preliminary reconnaissance, the precise research potential cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX136. This site is situated in pine-mesic oak forest on the edge of a terrace overlooking the swamp area at the confluence of Six Mile and Congaree Creeks. The north-south extent of the site, estimated by examination of surface debris along a dirt access road transecting it, is roughly 80 meters. Serious erosion is occurring along this road in the central portion of the site. Each substantial rain washes out additional cultural material.

Materials collected here include fire-cracked rock; quartz chunks; and flakes of quartz, Carolina slate and Coastal Plain chert. Tools in the assemblage consist of 2 quartz endscrapers and a sidescraper of Carolina slate, a quartz biface blank, and a possible Morrow Mountain point reworked into an endscraper. The flake endscrapers are diagnostic of the Early Archaic, while a Morrow Mountain point would have been made during the Middle Archaic.

This site is midway between Alternates 1 and 2. Due to the limited nature of this preliminary reconnaissance, the precise research potential cannot be determined at this time. Further investigation is necessary before significance can be fully assessed and a plan of mitigation can be outlined.

38LX50. The Manning site is threatened by Alternate 2, as well as by Alternates 1 and 1A. A discussion of the archeological content of this site is found in the section on Alternate 1 sites.

38LX19. This site is transected by Alternates 2, 1 and 1A. A discussion of 38LX19 can be found in the section on Alternate 1 sites.

38LX81. 38LX81 is located southwest of the point where 3 of the alternates join the Southeastern Beltway, and is threatened by construction of the Beltway. A discussion of the site can be found in the section on Alternate 1 sites and in the report on the Alternate 2 route of the Southeastern Beltway (Anderson 1974).

Alternate 2A

Eleven sites occur within the impact corridor of Alternate 2A. Five of these were located by the Twelfth Street reconnaissance (38LX138, 38LX129, 38LX130, 38LX137, and 38LX131), while 6 were previously recorded (38LX50, 38LX54, 38LX62, 38LX82, 38LX97, and 38LX96).
38LX138. The northernmost site in the 2A corridor is 38LX138. This site lies to the west of the combined 2-2A route and is discussed with the Alternate 2 sites.

38LX129. 38LX129 lies within the impact zone of both Alternates 2A and 2. A discussion of the archeological resources found here is included in the section on Alternate 2 sites.

38LX130, the Dead Refrigerator site. The Dead Refrigerator site is located on a terrace north of and overlooking Six Mile Creek. A moderately dense concentration of cultural debris was noted for a distance of about 60 meters along a dirt access road. Areas of the site located in the roadway are experiencing slight erosion, while the adjacent forest of pines, sweetgum, and mesic oaks is stable.

Extensive surface collection of this area produced lithic debitage of quartz, Carolina slate, argillite, and Coastal Plain chert. One plain, fine-sand tempered sherd was collected from the surface. Two 4 meter x 2 meter test pits were excavated in the wooded area approximately 15 yards and 20 yards north of the road. These pits revealed an uppermost zone of fine dark sand (7"-8" thick) overlying fine light brown sand. This upper dark zone may be plowzone resulting from cultivation. Artifactual material was found concentrated in the light brown sandy strata. Test pit 1 produced a large quantity of fire-cracked quartz; several thinning flakes of quartz, argillite, and Coastal Plain chert; a utilized flake tool; and a fragment of a flake core. Also from this pit were a square-stemmed point, and a fragment of a ferruginous concretion. From test pit 2 came a large amount of fire-cracked quartz; quartz chunks; thinning flakes of quartz, argillite, and quartzite; a broken sandstone cobble; a fragment of unidentified igneous rock; and a single plain coarse-sand inclusion pottery sherd. The only diagnostic piece in this collection is the projectile point, which suggests Woodland occupation.

The existence of subsurface stratified deposits indicated by the test pits makes the Dead Refrigerator site significant to our understanding of the culture-historical sequence in the Congaree Valley. This site is eligible for nomination to the National Register of Historic Places.

38LX137. This site is located south of Six Mile Creek within a cleared area between an oak-pine-gum forest on the east and the Seaboard Coastline Railroad on the west. Material was found for about 60 meters along a north-south axis on an eastern-facing slope near the base of the artificial railroad embankment. Portions of the site may have been disturbed or buried by railroad construction. Heavy erosion on the slope is exposing artifacts.

Only a small amount of material was recovered from this low-density area, including quartz chunks and debitage and 1 Carolina slate thinning flake. A basally indented triangular point of Carolina slate is indicative of a Mississippian occupation.

Located at the base of the sandhills, this site has ready access to the supply of quartz cobbles which are eroding out from beds under the sandhills. A high percentage of early-stage core reduction debitage from biface manufacture suggests that this site may have been the scene of quartz
38LX137 lies to the west of all highway alternates. However, should any construction or land modification endanger this site, further investigation would be necessary before its significance could be more fully assessed and a plan of mitigation could be outlined.

38LX131. This site lies atop an embankment overlooking the SCL railroad approximately 1000 meters north of Congaree Creek. Slope erosion has been active here, resulting in fair to good ground visibility. The site is estimated to be approximately 30 meters in diameter.

A systematic collection from this low-density site includes a single piece of fire-cracked rock, 2 quartz chunks, 64 thinning flakes of quartz and Coastal Plain chert, and a biface fragment of quartz. No cultural affiliation could be determined from this material, however, a Morrow Mountain point and a Thom's Creek sherd, observed during subsequent visits to the site, indicate Middle Archaic and Transitional periods.

Located at the foot of the sandhills, 38LX131 is easily accessible to quartz cobbles which are washing out from deposits under the sandhills. The site may have been created here from the extraction of these quartz resources.

The site is west of all highway alternates. However, if any construction or land modification endangers it, further investigation would be necessary before its significance can be fully understood and a plan of mitigation outlined.

38LX50. The Manning site is threatened by 3 of the 4 alternates, including 2A. A discussion of its archeological content can be found in the section on Alternate 1 sites.

38LX54. Site 38LX54 is an area of prehistoric cultural material, about 2 acres in extent, located on a level, low-lying area of the Congaree River floodplain southwest of the Manning site. Surface collections from the site include numerous Early through Late Archaic tools and a quantity of temporally-undiagnostic prehistoric sherds. In 1974 a test pit was excavated at the site by David G. Anderson of the Institute. Anderson recovered ceramics only from the plowzone but found abundant debitage and fire-cracked rock, presumably attributable to Archaic occupation, extending below the plowzone to a depth of 58 cm below surface.

The limited data presently available suggest that the site is well preserved, probably stratified and containing intact Archaic features, and should be considered to have a significant research potential. Based on our current information, 38LX54 is considered eligible for the National Register of Historic Places.

38LX62, the Swails site. This previously recorded site is located on a sandy clay knoll which rises 10 to 15 feet above the swamp floor south of Congaree Creek. It is estimated to cover 2 acres. Ceramics and projectile points collected from this area in 1974 indicate Late Archaic and Woodland occupations. Further investigation, however, is required before we can precisely determine the significance of this site and outline a plan for necessary mitigation.
38LX82. This site was discovered in 1974 during reconnaissance for the Southeastern Beltway (Anderson 1974). It was recorded as a small, tight cluster of artifacts approximately 800 feet south of Congaree Creek. An intensive collection made at that time included quartz flakes, fire-cracked rock, utilized quartz flakes, a Savannah River point, and 1 small pottery sherd fragment. These materials suggest a Late Archaic-Early Woodland occupation. Further information is necessary before the significance of 38LX82 can be determined and a mitigation plan can be formulated.

38LX97. This site was recorded by the Institute survey conducted in 1975 (Goodyear 1975b). It is situated on the edge of a swampy area. The site is plowed in part and the edge is protected in a hardwood forest. 38LX97 forms the extreme eastern end of what appears to be a continuous artifact deposit, the western end of which is referred to as 38LX96. A statistically based surface collection was conducted on this site, the artifactual results of which were later computer mapped. These mapping studies revealed numerous spatially discrete clusters or debris concentrations indicating a complex occupational history for the edge of the swamp in this area. Artifactual materials observed from this site include fire-cracked rock, plain grit tempered pottery, and biface reduction debitage of Coastal Plain chert, Carolina slate and locally available quartz. Of particular interest from the standpoint of cultural identification, were several unifacial tools indicative of the Early Archaic period (Goodyear 1975b: 23). Points which resemble the stemmed Middle Archaic Morrow Mountain points were found, as well as a triangular Woodland point. This site has substantial research potential from the standpoint of site function studies, particularly as it is associated with the swamp microenvironment; and since more than one cultural phase is indicated here, there is the opportunity to study swamp exploitation activities through time. The fact that probable unplowed remains lie preserved in the hardwood forest on the swamp edge and the great possibility that paleoenvironmental and paleosubsistence remains also lie preserved in the aquatic environments of the adjacent swamps, greatly increases the scientific importance of this site as well as 38LX96. Both 38LX97 and 38LX96 which designate 2 halves of the same site, are to be impacted by the Southeast Columbia Beltway project (Goodyear 1975b: 22-28). As such, these sites will be mitigated under a plan of excavation at that time. Alternate 2A of the present Twelfth Street project will also contribute to the destruction of 38LX97 and 38LX96, since the off ramp will destroy areas beyond that of the Beltway itself. Precise mitigation procedures and associated costs were not formulated in the Environmental Impact Study for the Southeastern Columbia Beltway project (Goodyear 1975b). Such procedures were to be detailed at a later data. Similar to the Beltway project, these 2 sites (38LX97 and 38LX96) will need to have mitigation plans developed with associated costs. If Alternate 2A is chosen for the construction of the Twelfth Street corridor, these sites will then be considered for mitigation.

39LX96. This site is nearly identical to 38LX97 discussed above. The same recommendations apply to this site (see Goodyear 1975b: 22-28).
SIGNIFICANCE OF THE ARCHEOLOGICAL RESOURCES IN THE TWELFTH STREET EXTENSION IMPACT AREA

Defining Significance

Under relevant Federal legislation and guidelines (Scovill, Gordon and Anderson 1972), the significance of cultural resources in project impact areas is to be evaluated from several different standpoints including historical, educational, psychological and scientific. In many cases, only the scientific significance is relevant to the evaluation of specific archeological resources, especially in the case of prehistoric sites.

In recent years, a framework for assessing scientific significance has evolved in which resources acquire significance as they relate to specific research questions in substantive, technical, and methodological contexts (cf., Scovill, Gordon and Anderson 1972; House and Schiffer 1975; Schiffer and House n.d.). Within this framework, assessment of the scientific significance of archeological resources requires (1) compilation of a list of significant research problem domains for the region under consideration, and (2) determination of the degree to which the resources could yield data relevant to these problems. Both information needs, it will be noted, usually require that archeological research be carried out during the inventory and evaluation process. Furthermore, the necessity of arriving at management recommendations requires that relative priorities be assigned to research questions and that an evaluation be made of the relative significance of sites--both within the impact zone and within the surrounding region.

In the following pages, the known archeological resources in the Twelfth Street impact area will be considered in relation to a number of research problem domains in the historical and social sciences. It will be noted that the formulation of these problem domains is very broad and that, given the nature of the present reconnaissance, our estimates of the research potential of specific sites are only preliminary.

Human Ecology in a Fall Line Floodplain Environment

The Twelfth Street Extension Project is located on the boundary between 2 of the major physiographic regions of North America, the Piedmont and the Atlantic Coastal Plain. Ecologists have long noted that ecotonal habitats are optimal for many animal species because of the high diversity of biotic and abiotic resources within a very small area (cf., Odum 1971). Though this "edge effect" cannot be assumed for all species at all ecotones, the importance in prehistory of Fall Line floodplains from Virginia to Georgia seems obvious. Indeed, a very high proportion of all of the previous archeological research in this part of the Southeast has taken place in these zones (cf., Ferguson 1975). The ecological significance of the Fall Line zone continues into the Historic period. Many of the earliest Colonial forts, trading posts and settlements in the interior were located along major rivers at the Fall Line. Today, several of the major cities of the South--in many cases state capitals--are located in these zones.
In this context, the importance of archeological resources in Fall Line floodplains and the need for especially careful management and conservation of these resources comes into sharper focus: Fall Line floodplains, for all their importance to past human lifeways, constitute a particularly rare type of environment—comprising only a tiny percentage of the total land area of South Carolina. Therefore, the archeological resources in these zones constitute a particularly rare type of resource. Furthermore, as the social, economic, and ecological importance of these zones continues into the present day, it is no coincidence that these rare Fall Line floodplain archeological resources are the resources most threatened by urban expansion.

Though the importance of Fall Line floodplains in past human ecology seems quite obvious empirically, the actual workings of human adaptation in these past ecosystems remain poorly understood. This is a problem domain of major interest not only to South Carolina and Southeastern U.S. prehistory and historical archeology, but also to the social and ecological sciences as a whole.

In the study area alone there are numerous discrete microenvironments which occur in varying combinations. The result is tremendous biological diversity and greater linear amounts of edges or small ecotones important to many animal species. The Piedmont Uplands and Atlantic Coastal Plain in this part of South Carolina are interfaced by the sandhills, a comparatively xeric environment. The sandhills in some places merge with the alluvial bottomlands and certain drainages such as Congaree Creek and Six Mile Creek form arteries from the uplands to the bottomlands. The floodplain of the Upper Congaree Valley is itself interrupted by several economically relevant microenvironments. For example, there is the main channel of the Congaree River and its immediate margins. Alluvially deposited sandy loam soils which can be readily exploited by primitive agricultural techniques are often found adjacent to the channel. Congaree Creek and Six Mile Creek traverse the floodplain where they join and then run as a single channel, Congaree Creek, until merging with the Congaree River. These creeks provide rich riparian habitats plus a sizeable associated swamp. There are also what appear to be old cutoff branches of streams, perhaps like Congaree Creek, which now exist as swamps. The environmental potential for these environments and their bewildering combinations within the valley floodplain all suggest a tremendous research potential for this region in terms of studies in prehistoric human ecology.

The immediate vicinity of the proposed Twelfth Street routes contains at least 2 major prehistoric sites (Taylor, 38LX1, and Manning, 38LX50) which were undoubtedly central to Paleo-Indian and Archaic settlement in the upper Congaree Valley. This locality also contains a number of other prehistoric sites which, though they might have been peripheral to major settlements, must also receive investigation if the total picture of prehistoric adaptation to this major ecotone is to emerge. This is true because although large sites such as Manning and Taylor contain complex patterns and enormous analytical value, they cannot be considered completely representative of the entire settlement system in the valley. This is the case since activities were also obviously conducted elsewhere in the same zone which may represent a subsistence subsystem not present at Taylor and Manning.
The major centers of Colonial settlement in this Fall Line floodplain seem to lie outside the potential Twelfth Street impact area (though we do not yet actually know the precise location of the Congaree Fort). Evidence of Colonial occupation has, however, been observed at a number of locations within the potential impact area and an attempt should be made to determine the nature of these occupations and their relationship to the Congaree Fort or Saxe Gotha Town.

Prehistoric Cultural Identification and Chronology

One of the prerequisites for analyzing the changing ecology of past human societies is reliable archeological identification of those societies and their placement in time. Our present chronology of prehistoric occupation in the upper Congaree Valley, however, is largely based on correlation between the morphology of artifacts found in this region with those found in stratified and absolute dated contexts elsewhere in this part of the Southeast.

In spite of the limitations of this approach to chronology, we are fairly confident that we understand the broad outlines of temporal-stylistic artifact variability in this locality. Nonetheless, a more precise understanding of artifact variation through time and of any synchronic continuities of artifact style with adjacent regions, would be extremely useful for archeologically approximating past societies and delineating the total culture-history of this region. For instance, considerable variation in probable Late Archaic/Transitional broad-bladed (Savannah River-like) point forms is evident in this locality, but we do not know to what extent this variation represents "stylistic" change through time within one functional category of cutting tool. Our understanding of the Woodland period in this locality is also very vague; linear check-stamped ceramics evidently represent the earlier part of the Woodland, but we do not know what occupations were present in Late Woodland or Early Mississippian times. Three major categories of data would be relevant to this problem domain: (1) stratified sequences of artifact-bearing deposits, (2) horizontal spatial patterning by the consistent association of various artifact classes on an intrasite level, and (3) dating of past occupations with the use of radiocarbon or other absolute dating techniques.

Alluvially-buried deposits have been recognized at Taylor (Michie 1971) and at 38LX112 (Ackerly 1976), but there is little evidence that any sites in this locality contain well-stratified, vertically separated cultural deposits similar to those at, for instance, the Doerschuk and Gaston sites in North Carolina (Coe 1964). Nonetheless, general stratigraphic trends have been discerned in excavations at Thom's Creek (Michie 1969). Limited tests suggest the probability that similar stratigraphic trends within a foot or two of subplowzone deposits may exist at Manning, 38LX54, and 38LX130 and perhaps elsewhere in this locality. The potential for reconstructing culture history from stratigraphic data at sites in the Twelfth Street project area seems, on the whole, however, rather limited.

In the absence of well-stratified sites, patterning in the intrasite horizontal association of artifacts of known age with those of undetermined age may prove useful for a synchronic look at the total lithic and/or ceramic
artifact variability within a past society (at least within the context of a single site). Extensive exposure of subplowzone deposits at Thom's Creek (Michie 1969) and Taylor (Michie 1971) indicate that very subtle intrasite patterning in artifact distribution remains intact in at least some sites in the upper Congaree Valley. Horizontal patterning may be present within the plowzone, as well. Computer mapping (SYMAP) analysis of statistical samples from the surface of Manning and several other sites investigated during the 1975 survey of the Beltway Alternate 3 route seemed to reveal spatially discrete episodes of occupation restricted to very small portions of sites. Such data are relatively easy and inexpensive to gather and can be recovered from even very shallow and eroded cultivated sites.

Charcoal from preserved hearth features have been recorded in excavations of the Taylor site in large enough quantities to permit radiocarbon analysis (Michie 1971). Charcoal from Dalton hearths were assayed from this site but with disappointing results. Apparently the carbon was contaminated from later materials yielding dates which were obviously too young (James Michie, personal communication). Subsurface features containing at least some charcoal have been observed at other sites in this locality as well (see Goodyear 1975b:24, Fig. 7). The possibility of archeomagnetic dating of hearths has not been empirically examined for archeological sites in the impact area but seems probable, given the numerous observations of apparent hearths in clayish soils at sites in this locality.

At the present stage of investigation, we have only preliminary estimates of the research potential of sites in the Twelfth Street Project area relevant to this problem domain. The articulation of all 3 of the categories of data discussed above, however, would doubtlessly result in a greatly improved understanding of culture-history and temporal-stylistic artifact variability in this region. Such studies leading to greater chronological controls are absolutely critical to research in other problem domains.

Variability in Prehistoric Site Function

The archeological record produced by a given society at a single time in the past can be expected to exhibit considerable variability within and between sites occupied. This variability can be attributed to a complex set of behavioral factors such as seasonality of occupation, performance of different tasks at different locations, and division of labor by sex (cf., Goodyear 1975a). One specially useful--though undoubtedly oversimplified--general model for site-use variability is the "maintenance/extraction" model (Binford and Binford 1966) which postulates a distinction between "maintenance tasks," performed at settlements for base camps, and "extractive tasks," performed at specialized "work camps" or "extractive loci" located in close proximity to the resource being extracted. In any event, it is impossible to assume that data from a single site, or even a few sites, can form a basis for typifying the behavior of a past society.

The prehistoric sites in the Twelfth Street Project area exhibit considerable variability in topographic location, artifact content, and overall density and structure. Though part of this variability is obviously related to differences in the time period in which sites were occupied,
these archeological differences undoubtedly also reflect differences in the activities carried out at various locations about the landscape by single past societies. Understanding of prehistoric lifeways in this locality will require investigation of not only the few large, conspicuous, artifactually-"rich" sites but also investigation of a proportion of the smaller, less conspicuous sites which may contain the record of functionally distinct portions of the behavioral repertoire of past societies in this region.

Early Archaic base camps are probably represented at Taylor and Manning. The Early Archaic occupations at 38LX19, 38LX124, 38LX125, and 38LX126, however, appear rather similar to Taylor and Manning in the presence of some of the more frequent Early Archaic tool classes. These components then, may represent (1) base camps that were simply reoccupied fewer times than were 38LX1 and 38LX50, or (2) very temporary habitation or extraction loci at which some maintenance activities took place. Only intensive investigation at both kinds of sites will provide a basis for answering this question and elucidating Early Archaic site variability in this locality.

Variability in the content, function and geographic distribution of Middle and Late Archaic sites in the project area is very poorly understood at present. Intensive Middle and Late Archaic habitation seems to be reflected at the central portion of the Manning site and intensive Late Archaic to Transitional Period habitational loci seem to be present at the south tip of Manning and at Godley (38LX141). A number of apparent Archaic sites are present, however, in extremely lowlying, flood-prone natural levee areas beside swamps in this locality. Sites 38LX64, 38LX96 and 38LX97 in the Alternate 3 route of the Beltway and sites 38LX54 and 38LX63 in the vicinity of projected Twelfth Street alternative routes are examples of this site type (Goodyear 1975b). Sites 38LX139 and 38LX140 near the Alternate 1A Twelfth Street route south of the Manning site, seems to be similar to the above sites in artifact content and location, though temporally-diagnostic artifacts have not yet been recovered from them. The location of these sites along swamp edges seems explainable; swamps are very rich in a variety of useful biotic resources (see Goodyear 1975b: 26). Of particular interest, however, are the quantities of fire-cracked rock at these sites usually considered an output of the habitation activity of cooking. Intensive investigation at a proportion of these sites would be crucial to our understanding of Archaic and Transitional period site variability in the region. It would be useful to know, for instance, whether or not these sites represent a type of seasonal base camp occupied only at drier times of the year.

Woodland and Mississippian settlement patterns are similarly very poorly understood. Only one of the sites in the Twelfth Street impact area, 38LX130, exhibits marked evidence of Woodland habitation, though a small concentration of linear check-stamped sherds at the center of the Manning site may represent a single brief episode of Early Woodland habitation. Late prehistoric or protohistoric Mississippian habitation may be represented by Chicora Ware Group sherds and probable Ridge and Valley Province flint debitage at Area E at the Manning site. Small numbers of Woodland or Mississippian sherds and triangular arrowpoints have been found at several sites in this locality, possibly representing extractive loci such as hunting conducted on the periphery of major settlements. Testing this hypothesis will require further investigation at a number of these small
low-density Woodland and Mississippian sites as well as at larger probable settlement sites.

A few of the collections from sites recorded by the present survey exhibit outputs of early stages in the chipping and decortication of quartz cobbles, suggesting that these loci functioned, at least in part, as workshops for the manufacture of stone tool blanks and preforms. These sites will be discussed below under the problem domain, "lithic resource procurement."

Prehistoric Lithic Resource Procurement

Since the lithic technology of a nonmetal using society is articulated, directly or indirectly, with all other aspects of the past cultural system, lithic analysis is not an end in itself but a means toward reconstruction of these other aspects of culture. In this regard, knowledge of lithic resources and strategies of lithic resource procurement becomes basic to a variety of research problem domains.

The lithic artifacts collected by the Twelfth Street survey and previous investigations in this locality exhibit a remarkable variety of raw material categories. As the Columbia area is today the crossroads of South Carolina, so the prehistoric Indians of the upper Congaree Valley seem to have had access, at one time or another, to all of the kinds of lithic raw materials used in any portion of South Carolina. The more common chipped stone raw materials found in archeological assemblages in this locality include vein quartz originating in the Piedmont or in local stream gravels; cherts originating in the Flint River formation of the Coastal Plain; grey banded "Carolina Slate" originating in the Carolina Slate Belt in the Piedmont in south-central North Carolina or adjacent portions of North Carolina; a brown orthoquartzite thought to have originated in the South Carolina Coastal Plain; and translucent black and grey flints thought to have originated in the Ridge and Valley Province in Tennessee or Alabama (see House and Ballenger n.d.; Stoltman 1974). In addition to chipped stone materials, sherds from vessels of steatite originating in the Appalachians or upper Piedmont are associated with Transitional period occupations in this locality. In addition, a variety of igneous and metamorphic rocks were used in the manufacture of ground-stone artifacts.

During the present survey, it was noted that different sites yielded markedly different proportions of various lithic raw material categories. Identification of these raw materials and elucidation of their procurement and use is relevant to 2 major problem domains.

First, the presence of the majority of these raw materials categories undoubtedly represents some kind of interregional exchange in prehistoric times. Investigation of the mechanisms of this exchange and their change through time is one of the most promising approaches to reconstruction of the over-all social and economic organization of various prehistoric societies in the region. Furthermore, the geographical aspect of these exchange networks is relevant to reconstruction of broad patterns of communication and economic interaction.
Second, analysis of tools and debitage in samples can be a source of information about functional variability among sites. This approach, however, requires reconstruction of the technology involved in the utilization of different raw materials. For instance, Gould (1974) cites ethnographic data from Australia suggesting that manufacture of tools of exotic vs. locally available raw materials usually takes place at habitation sites while the manufacture of tools from materials widely available in the environment frequently takes place on an ad hoc basis at extraction sites. Another example: 1 small area at the Manning site has yielded, over the years, as many as 2 dozen large, thick flakes of Coastal Plain chert suitable for use as tool blanks. It seems highly likely that these flakes represent a plowed-out cache of raw material associated with a prehistoric settlement.

One of the more important research results of the present survey is the recognition of quarry and workshop activity associated with quartz cobbles and gravels available in the bed of Six Mile Creek where it leaves the sandhills and enters the Congaree Alluvial Valley. Tested cobbles and primary and secondary decortication flakes are conspicuous in samples collected from the nearby sites 38LX130, 38LX137, and 38LX138. Blank flakes and biface blanks of this material were presumably exported from these loci to other sites in this locality. Analysis of workshop debris from these components would be basic to an understanding of the reduction processes associated with the manufacture of tools of this material during various periods in the prehistory of the upper Congaree Valley.
SUMMARY AND RECOMMENDATIONS

Estimated Impacts of the Proposed Twelfth Street Extension

The proposed Twelfth Street Extension and Southeastern Beltway project lies primarily within the Congaree floodplain immediately below the Fall Line. Fall Line floodplains have been demonstrated to be of key importance in prehistoric and historic settlement in this part of North America. The present reconnaissance and previous archeological research in the locality of the proposed Twelfth Street Extension has revealed the presence of many significant prehistoric and early historic archeological sites. These sites should be considered an especially valuable portion of South Carolina's archeological heritage and great care should be given to their study and conservation in the face of projected land modification in this locality.

The present study relies upon evaluation of data from previous investigations in part of the Twelfth Street area, plus surface reconnaissance of hitherto uninvestigated portions of the area. It should be borne in mind that, for the most part, only sites visible on the surface have been recorded and only very limited data have been collected at any of the sites recorded.

The known impacts of each of the 4 alternate routes are as follows:

Alternate 1. Known archeological sites in the immediate vicinity of Alternate 1 are:

- 38LX141
- 38LX124
- 38LX132
- 38LX133
- 38LX136
- 38LX50
- 38LX19
- 38LX81

The Manning site, 38LX50, is presently being nominated to the National Register of Historic Places. The Godley site, 38LX141, can also be considered on the basis of artifactual and stratigraphic data already gathered, to be eligible for nomination to the National Register, although we have not done so at this time. In addition, the Taylor site, 38LX1, which has already been placed on the National Register, is located about 300 yards to the east of this alternate route.

Alternate 1A. Known archeological sites in the immediate vicinity of Alternate 1A are:

- 38LX141
- 38LX133
- 38LX132
- 38LX127
- 38LX128
- 38LX135
- 38LX124
- 38LX81

-40-
Again, site 38LX14l can be considered eligible for nomination to the National Register. In the area on the north, where Alternates 1 and 1A coincide, Alternate 1A would also pass about 300 yards west of the Taylor site.

Alternate 2. Known archeological sites in the immediate vicinity of Alternate 2 are:

- 38LX138
- 38LX129
- 38LX136
- 38LX50
- 38LX19
- 38LX81

As noted above, site 38LX50, the Manning site, is currently being nominated for placement on the National Register of Historic Places.

Alternate 2A. Known archeological sites in the immediate vicinity of Alternate 2A are:

- 38LX138
- 38LX129
- 38LX130
- 38LX137
- 38LX131
- 38LX54
- 38LX62
- 38LX82
- 38LX96
- 38LX97

The Alternate 2A route, as indicated on the project maps provided by the South Carolina Highway Department, would intercept the concentrated Transitional period midden area on the southwest tip of the Manning site. It is our understanding, however, that the Alternate 2A route was specifically designed to completely avoid the Manning site, and we assume that it is actually intended to pass slightly further west than indicated on the project maps. In any event, Alternate 2A would intercept site 38LX54 which is known to have deep subplowzone deposits and should be considered of sufficient scientific importance to be considered eligible for the National Register of Historic Places.

### Ranking of the Alternate Routes by Estimated Potential Impacts

Our estimates of the relative magnitude of adverse impacts of the 4 alternates are based not only on the number of known sites potentially intercepted by each alternate, but also on our preliminary estimates of the research potential and significance of each site. It will be noted that each of the routes would affect significant archeological sites; any other potential route in this locality would almost certainly do so as well, since this is an extremely rich and significant area for archeological and historic sites in South Carolina. Therefore, another survey in order to find an archeologically clear corridor would not be advisable.

Our ranking of the 4 alternates, from least to greatest relative impacts, is:

1. Alternate 2A
2. Alternate 1A
3. Alternate 2
4. Alternate 1
Alternates 1 and 2 are approximately equal in estimated impact; both would intercept the Manning site and a potentially significant Early Archaic component at 38LX19. Alternate 1 would, in addition, intercept the Godley site, 38LX141.

Alternate 1A would miss Manning but would intercept 38LX19, the Godley site, and the perhaps significant Early Archaic components at 38LX124, 38LX125, and 38LX126.

Our present knowledge suggests that Alternate 2A (if it would indeed completely miss Manning) would have the least impact on the total archeological resource base in this Fall Line floodplain. Sites 38LX82, 38LX96 and 38LX97 would be intercepted in any event by the projected Southeast Beltway Alternate 3 route (Goodyear 1975b). This route could, however, intercept 38LX54 and a potentially significant, if yet poorly understood, Woodland component at 38LX130 and 1 additional site, 38LX129.

**Recommendations**

Our recommendation, based purely on archeological criteria, is that the Twelfth Street Extension Alternate 2A route be selected.

We emphasize again, that our knowledge of the archeological resources in this locality is based on a surface reconnaissance rather than on a comprehensive survey. In addition, we have yet gathered only very limited data from most of the sites recorded. This reconnaissance has been sufficient for roughly estimating the relative magnitude of adverse impacts of each of the 4 alternate routes but is not sufficient for precisely estimating the impact of any one of these routes or planning and budgeting any needed mitigation.

Future archeological research in this locality can, nonetheless, build on the results of this reconnaissance (cf., Goodyear 1975a: 13). We recommend that, following the final selection of a route for the Twelfth Street Extension, an intensive survey of this project impact corridor be carried out. This survey should involve not only intensive surface investigation but also systematic subsurface investigation in areas that are heavily vegetated or potentially contain buried artifact-bearing deposits. In addition to an attempt to discover any yet unrecorded sites in the final corridor, the survey should gather much additional information pertinent to evaluation of the research potential and significance of each of the sites in the corridor. The results of this final survey would form the basis for planning and budgeting of mitigation-stage archeological research to mitigate the impact of construction of the Twelfth Street Extension.
### APPENDIX A. TYPOLOGICAL ANALYSIS OF PREHISTORIC CULTURAL MATERIAL COLLECTED DURING THE TWELFTH STREET EXTENSION SURVEY.

<table>
<thead>
<tr>
<th>Site no. &amp; method</th>
<th>Fire-cracked rock (gms)</th>
<th>Other Thinning flakes</th>
<th>Flakes</th>
<th>Flakes tools</th>
<th>Unif. cores</th>
<th>Flakes Preforms</th>
<th>Other bifaces</th>
<th>Grnd lith.</th>
<th>Other lith.</th>
<th>Cer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX124,c</td>
<td>190</td>
<td>7</td>
<td>72</td>
<td>79</td>
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<td>4</td>
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<td>1(1)</td>
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<td>13</td>
<td>12</td>
<td>2/3*</td>
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</table>

**Method Key:**
- c-controlled surface collection
- g-grab surface collection
- l-surface locus
- tp-testpit
- tc-testcut

*number of tools/number of edges

( )- fragment

X\(^1\)-1 chipped cobble of unidentified material
2 steatite sherds
X\(^2\)-1 steatite sherd (punctated?)
1 unmodified rock
X\(^3\)-2 fragments of unidentified rock
X\(^4\)-3 unclassified lithic fragments
X\(^5\)-1 unmodified fire-cracked(?) rock
1 ferruginous concretion fragment
X\(^6\)-1 large piece of unidentified igneous rock
### TYPOLOGICAL ANALYSIS OF PREHISTORIC CULTURAL MATERIAL COLLECTED DURING THE TWELFTH STREET EXTENSION SURVEY

<table>
<thead>
<tr>
<th>Site no. &amp; method</th>
<th>Fire-site no.</th>
<th>cracked rock(gms)</th>
<th>Chunks</th>
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<th>flakes</th>
<th>flakes tools</th>
<th>Unif. cores</th>
<th>Pts.</th>
<th>Preforms</th>
<th>bifaces</th>
<th>Grnd Other stne lith.</th>
<th>Cer.</th>
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<td>x2</td>
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</tr>
</tbody>
</table>

**Method Key:**
- c-controlled surface collection
- g-grab surface collection
- l-surface locus
- tp-testpit
- tc-testcut

*number of tools/number of edges

( )- fragment

$X^1$-1 unmodified unidentified rock

$X^2$-1 piece of concrete
### APPENDIX B. COLLECTED DATA FROM THE TWELFTH STREET SITES.

<table>
<thead>
<tr>
<th>Site</th>
<th>Elevation</th>
<th>Topographic Position</th>
<th>Extent of Site</th>
<th>Current Land Use</th>
<th>Relation to Highway Alternates</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX1</td>
<td>140'</td>
<td>Second terrace</td>
<td>ca. 35 acres</td>
<td>Cult. field</td>
<td>East of all alternates</td>
</tr>
<tr>
<td>38LX19</td>
<td>130'</td>
<td>Second terrace over tributary of Congaree Creek</td>
<td>I</td>
<td>Cult. field</td>
<td>At junct. of Alternates 1, 1A, and 2 with Southeastern Beltway</td>
</tr>
<tr>
<td>38LX50</td>
<td>150'</td>
<td>Ridge on second terrace overlooking Congaree Creek</td>
<td>ca. 600m nw-se</td>
<td>Cult. field</td>
<td>Intersected by Alternates 1, 2, and 2A</td>
</tr>
<tr>
<td>38LX54</td>
<td>135'</td>
<td>Second terrace above Congaree swamp</td>
<td>ca. 2 acres</td>
<td>Cult. field</td>
<td>Intersected by Alternate 2A</td>
</tr>
<tr>
<td>38LX62</td>
<td>130'</td>
<td>Second terrace above Congaree swamp</td>
<td>ca. 2 acres</td>
<td>Cult. field</td>
<td>West of all alternates</td>
</tr>
<tr>
<td>38LX63</td>
<td>130'</td>
<td>Second terrace</td>
<td>ca. 75'x150'</td>
<td>Cult. field</td>
<td>East of all alternates</td>
</tr>
<tr>
<td>38LX81</td>
<td>130'</td>
<td>Second terrace</td>
<td>2-3 acres</td>
<td>Cult. field</td>
<td>Intersected by Southeastern Beltway</td>
</tr>
</tbody>
</table>

I- Indeterminate
## COLLECTED DATA FROM THE TWELFTH STREET SITES (Continued)

<table>
<thead>
<tr>
<th>Site</th>
<th>Elevation</th>
<th>Topographic Position</th>
<th>Extent of Site</th>
<th>Current Land Use</th>
<th>Relation to Highway Alternates</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX82</td>
<td>130'</td>
<td>Second terrace</td>
<td>60-100m?</td>
<td>Cult. field</td>
<td>South of Twelfth Street Alts. on edge of SE Beltway</td>
</tr>
<tr>
<td>38LX96</td>
<td>130'</td>
<td>Second terrace above Congaree swamp</td>
<td>I</td>
<td>Cult. field</td>
<td>South of alternates and SE Beltway</td>
</tr>
<tr>
<td>38LX97</td>
<td>130'</td>
<td>Second terrace above Congaree swamp</td>
<td>ca. 1 acre</td>
<td>Cult. field</td>
<td>South of alternates and SE Beltway</td>
</tr>
<tr>
<td>38LX124</td>
<td>145'</td>
<td>High area of second terrace</td>
<td>ca. 150 m. dia.?</td>
<td>Powerline rt-of-way</td>
<td>Between Alternates 1 and 1A</td>
</tr>
<tr>
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<td>140'</td>
<td>High area of second terrace</td>
<td>I</td>
<td>Powerline rt-of-way</td>
<td>Western edge of Alternate 1A</td>
</tr>
<tr>
<td>38LX126</td>
<td>140'</td>
<td>High area of second terrace</td>
<td>ca. 50 m. dia.?</td>
<td>Powerline rt-of-way and ext. into adjacent woods</td>
<td>Western edge of Alt. 1A</td>
</tr>
<tr>
<td>38LX127</td>
<td>140'</td>
<td>Second terrace</td>
<td>I</td>
<td>Powerline rt-of-way</td>
<td>Western edge of Alt. 1A</td>
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</tbody>
</table>

I- Indeterminate
COLLECTED DATA FROM THE TWELFTH STREET SITES (Continued)

<table>
<thead>
<tr>
<th>Site</th>
<th>Elevation</th>
<th>Topographic Position</th>
<th>Extent of Site</th>
<th>Current Land Use</th>
<th>Relation to Highway Alternates</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX128</td>
<td>135'</td>
<td>Edge of second terrace</td>
<td>ca. 40 m. along field road</td>
<td>Powerline rt-of-way and ext. into adj. woods</td>
<td>Alternate 1A</td>
</tr>
<tr>
<td>38LX129</td>
<td>155' - 160'</td>
<td>Second terrace</td>
<td>ca. 400 m. along logging road</td>
<td>Cult. pine forest</td>
<td>Alternate 2</td>
</tr>
<tr>
<td>38LX130</td>
<td>135' - 140'</td>
<td>Edge of second terrace</td>
<td>ca. 60 m. along logging road</td>
<td>Cult. pine forest</td>
<td>Western edge of Alt. 2A</td>
</tr>
<tr>
<td>38LX131</td>
<td>150'</td>
<td>Sandhills</td>
<td>ca. 50 m. dia.?</td>
<td>Powerline rt-of-way and adjacent woods</td>
<td>West of all alternates</td>
</tr>
<tr>
<td>38LX132</td>
<td>145'</td>
<td>Second terrace</td>
<td>ca. 40 m. along field road</td>
<td>Powerline rt-of-way</td>
<td>Eastern edge of Alt. 1</td>
</tr>
<tr>
<td>38LX133</td>
<td>145'</td>
<td>Second terrace</td>
<td>ca. 40 m. along field road</td>
<td>Powerline rt-of-way</td>
<td>Alternate 1</td>
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</table>

I- Indeterminate
### COLLECTED DATA FROM THE TWELFTH STREET SITES (Continued)

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<thead>
<tr>
<th>Site</th>
<th>Elevation</th>
<th>Topographic Position</th>
<th>Extent of Site</th>
<th>Current Land Use</th>
<th>Relation to Highway Alternates</th>
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</thead>
<tbody>
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<td>140'</td>
<td>Edge of second terrace</td>
<td>I</td>
<td>Wooded</td>
<td>Alternate 1A</td>
</tr>
<tr>
<td>38LX135</td>
<td>135'</td>
<td>Second terrace</td>
<td>ca. 50 m. along field road</td>
<td>Powerline rt-of-way</td>
<td>Western edge of Alt. 1A</td>
</tr>
<tr>
<td>38LX136</td>
<td>135'-140'</td>
<td>Second terrace edge over Six Mile Creek</td>
<td>ca. 80 m. along logging road</td>
<td>Wooded</td>
<td>Between Alternates 1 and 2</td>
</tr>
<tr>
<td>38LX137</td>
<td>130'</td>
<td>Sandhills</td>
<td>ca. 60 m. along logging road</td>
<td>Wooded area adj. to SCLRR</td>
<td>West of all alternates</td>
</tr>
<tr>
<td>38LX138</td>
<td>140'-150'</td>
<td>Second terrace</td>
<td>ca. 100 m. along logging road</td>
<td>Cult. pine forest</td>
<td>West of all alternates</td>
</tr>
<tr>
<td>38LX139</td>
<td>130'</td>
<td>Edge of second terrace over Congaree Creek</td>
<td>ca. 70 m.? Cult. field and adjacent woods</td>
<td>East of all alternates</td>
<td></td>
</tr>
</tbody>
</table>

I- Indeterminate
<table>
<thead>
<tr>
<th>Site</th>
<th>Elevation</th>
<th>Topographic Position</th>
<th>Extent of Site</th>
<th>Current Land Use</th>
<th>Relation to Highway Alternates</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX140</td>
<td>130'</td>
<td>Edge of second terrace over Congaree Creek</td>
<td>I</td>
<td>Cult. field and adjacent woods</td>
<td>Western edge of Alt. 1A</td>
</tr>
<tr>
<td>38LX141</td>
<td>170'</td>
<td>Sandhills</td>
<td>I</td>
<td>Wooded area crossed by Godley Road</td>
<td>Alternate 1</td>
</tr>
<tr>
<td>38LX142</td>
<td>135'</td>
<td>Second terrace</td>
<td>I</td>
<td>Powerline rt-of-way</td>
<td>East of all alternates</td>
</tr>
</tbody>
</table>

I- Indeterminate
### APPENDIX C. ANALYSIS OF CERAMICS FROM THE TWELFTH STREET EXTENSION SURVEY.

<table>
<thead>
<tr>
<th>Site number and method</th>
<th>fine-sand temperless</th>
<th>coarse sand inclusions</th>
<th>rose quartz inclusions</th>
<th>COMP</th>
<th>STMP (coarse)</th>
<th>LNR CHK STMP (coarse)</th>
<th>THM CK (fine)</th>
<th>BRSHD (coarse)</th>
<th>CORD (coarse)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LX124,c</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>38LX125,c</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>38LX126,c</td>
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<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38LX130,tp-2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38LX140,c</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38LX141,c</td>
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<td>8</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1?</td>
<td>1?</td>
<td>1?</td>
</tr>
<tr>
<td>38LX141,tc-B</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Method Key:**
- c-controlled surface collection
- tp-testpit
- tc-testcut
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