

HISTORICAL AND ARCHAEOLOGICAL INVESTIGATIONS
DUNHAM'S MILL SITE
WOODBIDGE TOWNSHIP
MIDDLESEX COUNTY, NEW JERSEY

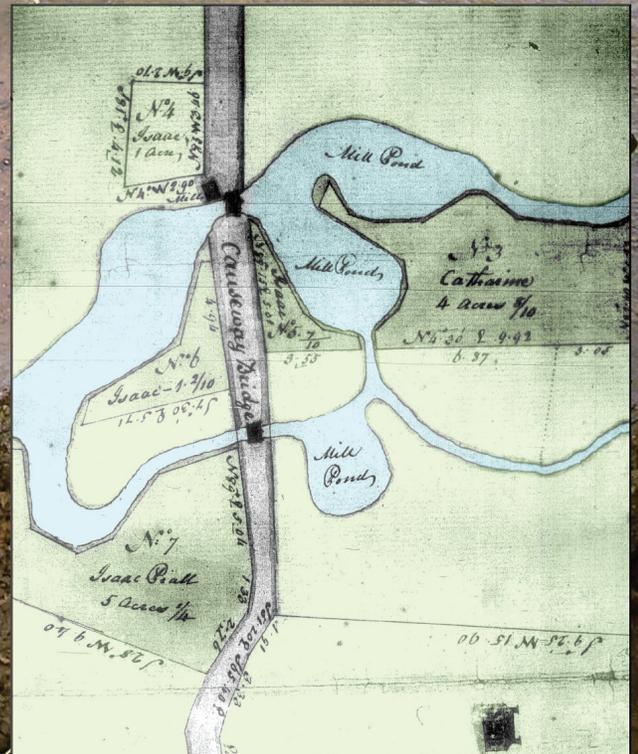
WOODBIDGE CREEK MITIGATION SITE
NEW YORK AND NEW JERSEY HARBOR
NAVIGATION PROJECT

CONTRACT NO. DACW51-01-D-0015

Prepared for:
U.S. Army Corps of Engineers, New York District

Submitted to:
Matrix Environmental and Geotechnical Services, Inc.

Prepared by:
Hunter Research, Inc.



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Prepared by:

Damon Tvaryanas, Principal Architectural Historian/Historian
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Richard W. Hunter, Ph.D., RPA

**JUNE 2006
(REVISED NOVEMBER 2006)**

MANAGEMENT SUMMARY

Historical and archaeological investigations were performed in connection with proposed U.S. Army Corps of Engineers (New York District) wetland replacement/restoration activities along Woodbridge Creek and public access improvements in the vicinity of the Port Reading Avenue crossing of this drainage. These Corps of Engineers actions are being conducted in partial mitigation of the New York and New Jersey Harbor Navigation Project, a scheme that entails the deepening and widening of navigation channels in New York area waterways. Historical and archaeological work, carried out in compliance with Section 106 of the National Historic Preservation Act of 1966 and related federal and state legislation and regulations, was focused specifically on the site of Dunham's Mill, a key component in the early settlement of the Town of Woodbridge in the late 17th century. This site is reputed to have been located close to the modern Port Reading Avenue crossing of Woodbridge Creek.

Work tasks comprised background and archival research, field inspection and limited manual archaeological excavation (undertaken on several different occasions at times of low tide), data analysis, report preparation and coordination with the local historical community. Background and archival research conclusively documented the former existence of a late 18th-century gristmill on the west bank of Woodbridge Creek at the present-day Port Reading Avenue crossing. This facility was owned by William Stone from at least the mid-1760s until 1786 and by Isaac Prall from 1786 until his death in 1789. The mill continued in Prall family ownership but was abandoned and pulled down by 1804. Although a chain of ownership title could not be established back into the late 17th/early 18th centuries linking William Stone to the Dunham family, other archival evidence suggests that the Stone/Prall Mill occupied the same site as Dunham's Mill, founded in 1670-71 by Jonathan Dunham/Singletary.

Archaeological fieldwork found timber remains of a mill dam/causeway (and possible sluice gate/bridge) in the banks and bed of Woodbridge Creek immediately upstream of the modern Port Reading Avenue crossing. Through correlation with historical data (notably a map of 1790 that divided the estate of Isaac Prall) and limited assistance from dendrochronological analysis, these remains are interpreted as remnants of the hydropower system of the late 18th-century Stone/Prall Mill. They may also be associated with the earlier Dunham's Mill. The core of the mill site, which would likely include remains of a mill building, is projected to lie on the west bank of Woodbridge Creek beneath and just to the south of the Port Reading Avenue crossing, although the archaeological integrity of this area has been compromised by several reconstructions of the bridge and roadway and by installation of numerous utilities. Additional remains of the mill dam/causeway and an eastern sluice gate/bridge may survive in the wetland to the east of the creek. Evidence of wharfage, bulkheading and other mill-related buildings may survive on the west bank immediately downstream of the core of the mill site. Topographic, hydrologic and archaeological evidence all point to the Dunham/Stone/Prall Mill being a tide mill. The timber remains observed in the banks and bed of Woodbridge Creek and other suspected mill-related archaeological evidence buried beneath the surrounding wetland are judged eligible for inclusion in the National Register of Historic Places under Criterion D, and probably also under Criterion B on the basis of the site's likely connection to Jonathan Dunham/Singletary.

MANAGEMENT SUMMARY (CONTINUED)

The proposed wetland replacement/restoration activities on the east bank of Woodbridge Creek to the north of Port Reading Avenue may encounter further remains of the mill dam/causeway and eastern sluice gate/bridge. The proposed public access improvements on the west bank to the south of Port Reading Avenue may encounter archaeological remains within and immediately downstream of the core of the mill site. In both of these areas, recommendations are made for archaeological monitoring of project-related ground disturbance within certain depth limits. If mill-related timber remains are encountered during construction, it is also recommended that wood samples be taken for dendrochronological analysis in an effort to obtain more accurate dating of this archaeological resource.

TABLE OF CONTENTS

	<i>page</i>
Management Summary	i
Table of Contents	iii
List of Figures.....	v
List of Plates and Tables.....	vii
Acknowledgments.....	ix
1. Introduction	
A. Project Background.....	1-1
B. Scope of Work and Methodology	1-4
C. Evaluation Criteria.....	1-5
D. Definition of Terms.....	1-6
E. Assessment of Effects and Adverse Effects	1-6
F. Previous Research and Principal Sources of Information	1-7
2. Geographical Setting and Current Land Use	2-1
3. Historical Background	
A. Dunham’s Mill	3-1
B. William Stone’s Mill.....	3-6
C. Isaac Prall’s Mill and His Estate.....	3-10
D. The Dismantling of Prall’s Mill and Subsequent History	3-11
4. Archaeological Investigations	
A. Fieldwork Calendar.....	4-1
B. General Description of Project Site.....	4-1
C. Archaeological Remains in the Creek	4-2
D. Other Surface Features	4-14
E. Synthesis	4-17
5. Conclusions	
A. Evaluation of Significance.....	5-1
B. Assessment of Effect	5-2
C. Recommendations.....	5-2
REFERENCES	R-1

TABLE OF CONTENTS (CONTINUED)

APPENDICES

A. Site Safety and Health Plan	A-1
B. New Jersey State Museum Site Registration Form	B-1
C. Resumes	C-1
D. New Jersey Historic Preservation Office Bibliographic Abstract	D-1
E. Project Administrative Data	E-1

LIST OF FIGURES

	<i>page</i>
1.1. Location of Project Site.....	1-2
1.2. Detailed Location of Project Site	1-3
1.3. Detailed Location of Project Site	opposite 1- 4
1.4. Public Access and Port Reading Avenue - Conceptual Design.....	opposite 1- 4
2.1. Physiographic Location of Project Site.....	2-2
3.1. Map of <i>Amboy to Elizabethtown</i> in <i>circa</i> 1778.....	opposite 3-6
3.2. Andre’s Revolutionary Map of Middlesex County in <i>circa</i> 1778	3-7
3.3. Hills’ <i>A Map Middlesex County</i> in 1781	3-8
3.4. Hills’ <i>A Map of Part of the Province of Jersey</i> in 1781.....	3-9
3.5. Division of Lands of Isaac Prall in 1790	3-12
3.6. Gordon’s <i>Map of New Jersey</i> in 1833.....	3-14
3.7. U.S. Coast Survey Map <i>From Perth Amboy to Elizabethtown, New Jersey</i> in 1836.....	3-15
3.8. Otley and Keily’s <i>Map of Middlesex County</i> in 1851.....	3-16
3.9. Walling’s <i>Map of Middlesex County, New Jersey</i> in 1861.....	3-17
3.10. Everts and Stewart’s <i>Map of Woodbridge Township</i> in 1876	3-18
3.11. Plan of Proposed Concrete Bridge 1-B-17 and Predecessor Bridge in 1938	3-19
3.12. Plan and Sections of Bridge 1-B-17 in 1978	opposite 3-20
4.1. Overall Site Plan.....	opposite 4-2
4.2. Detailed Plan View of Timber Remains.....	opposite 4-2
4.3. “A Safe and Economical Dam”	4-21
4.4. Overall Site Plan with Conjectured Location of Mill Site and Dam.....	opposite 4-22
5.1. Detailed Location of Project Site Showing Probable Site of Dunham’s Mill and Mill Dam/Causeway	opposite 5-4
5.2. Conceptual Design of Proposed Public Access Area in Relation to Probable Site of Dunham’s Mill and Mill Dam/Causeway	opposite 5-4

LIST OF PLATES AND TABLES

	<i>page</i>
PLATES	
1.1. Detailed location of project site	opposite 1-4
3.1. Aerial photograph of Woodbridge in 1940	3-21
4.1. Modern aerial view of Port Reading Avenue Crossing of Woodbridge Creek	opposite 4-2
4.2. View up Woodbridge Creek at the Port Reading Avenue bridge	4- 3
4.3. View up Woodbridge Creek from the Port Reading Avenue bridge	4-4
4.4. View down Woodbridge Creek from the Port Reading Avenue bridge	4-5
4.5. Port Reading Avenue from Watson Avenue	4-6
4.6. Watson Avenue from Port Reading Avenue	4-7
4.7. Right bank of Woodbridge Creek upstream from bridge	4-8
4.8. Left bank of Woodbridge Creek upstream from bridge	4-9
4.9. Timber remains in Woodbridge Creek upstream from bridge	4-10
4.10. Wood beams and planking on right bank of Woodbridge Creek upstream of bridge	4-11
4.11. Wood beams and planking on right bank of Woodbridge Creek upstream of bridge	4-12
4.12. Timbers being exposed on left bank of Woodbridge Creek upstream of bridge	4-13
4.13. Wood beam being removed for dendrochronological analysis	4-15
4.14. Pilings under the Port Reading Avenue Bridge	4-16
4.15. Concrete foundation on right bank of Woodbridge Creek	4-18
4.16. Large timber on right bank of Woodbridge Creek	4-19
4.17. Early 20th-century view of the Gerritsen Tide Mill	4-23
4.18. Early 20th-century view of the Gerritsen Tide Mill	4-24
TABLE	
3.1. Sequence of Ownership, Dunham’s Mill Site	3-2

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Thank are due to the staffs of the New Jersey Historic Preservation Office, the New Jersey State Archives, the New Jersey State Library, the New Jersey State Museum, the New Jersey Historical Society, the Middlesex County Courthouse, the Middlesex County Engineering Department and the Middlesex County Cultural and Heritage Commission, who periodically assisted in providing relevant archival materials for this work. In particular, Mark Nonestied of the Middlesex County Cultural and Heritage Commission was especially helpful in tracking down construction plans for earlier bridge replacement projects at the Port Reading Avenue crossing of Woodbridge Creek. We also wish to acknowledge the assistance of Dr. Richard Veit of Monmouth University for his help in obtaining dendrochronological analysis of the one timber beam removed from the creek. Dr. Veit handled all coordination with the Lamont-Doherty Earth Observatory Tree-Ring Laboratory. Finally, last, but by no means least, we have greatly appreciated the considerable interest of the local historical community in this work and acknowledge the help and information supplied by Ernie Oros, Ray Schneider, Robert McEwen and Richard Crowley.

Overall direction for this project was provided by Richard Hunter. Background research for this survey was performed by Nadine Sergejeff under the direction of Damon Tvaryanas. The site safety and health plan was prepared by Ian Burrow. The archaeological field investigations were carried out by Joshua Butchko, Frank Dunsmore and Benjamin Harris under the supervision of George Cress and overall direction of Richard Hunter. The report graphics were drafted by Frank Dunsmore and Michael Murphy. Final report coordination and assembly were undertaken by Michael Murphy and James Lee. This report was authored by Damon Tvaryanas, Nadine Sergejeff and Richard Hunter. Final editing was carried out by Richard Hunter with assistance from James Lee.

Richard W. Hunter, Ph.D.
Principal

Chapter 1

INTRODUCTION

A. PROJECT BACKGROUND

This report describes the results of historical research and limited archaeological field investigations carried out by Hunter Research in connection with the U.S. Army Corps of Engineers' (New York District) plans for the Woodbridge River Mitigation Site in Woodbridge Township, Middlesex County, New Jersey (Figures 1.1 and 1.2). These plans form part of the New York and New Jersey Harbor Navigation Project, a broad-based scheme aimed at deepening and widening navigation channels in New York area waterways to accommodate larger vessels. In this instance, Hunter Research was contracted to Matrix Environmental and Geotechnical Services, Inc., prime contractor to the New York District of the U.S. Army Corps of Engineers (Contract No. DACW51-01-D-0015).

In the process of making the above-referenced navigation improvements, mudflats, beaches and salt marsh adjacent to the larger navigation channels will be compromised. The loss of these environmentally significant habitats will require mitigation and one of the sites selected for wetland replacement/restoration is the Woodbridge River Mitigation Site, which extends upstream and downstream of the Port Reading Avenue crossing of the Woodbridge Creek* floodplain and tidal marshland (Figures 1.2 and 1.3; Plate 1.1). A primary component of this ecosystem restoration plan, and an important focus of this study, is the proposed removal of phragmites, which may result in the excavation and removal of one to two feet of soil. In

these excavated areas, the Army Corps plans to plant peat pots of the marsh grass *Spartina alterniflora*. A related component of the wetland replacement/restoration project involves the provision of public access to Woodbridge Creek and its tidal marshland at the Port Reading Avenue crossing of the river. Proposed public access improvements include a boat launch, parking facilities, walkways and bikeways, plantings, and environmental and historic interpretive displays (Figure 1.4).

The historical and archaeological investigations discussed in this report have focused primarily on the area immediately surrounding the Port Reading Avenue crossing of Woodbridge Creek and have specifically considered this location as the probable site of a late 17th-century gristmill known as Dunham's Mill. This early colonial agricultural processing facility is known to have been constructed in 1670 by Jonathan Dunham on the watercourse then known as Papiack Creek. Papiack Creek is the 17th- and early 18th-century name for the waterway known today as Woodbridge Creek.

These investigations were conducted in accordance with the instructions and intents of applicable federal legislation and guidelines governing the evaluation of project impacts on archaeological resources, notably: Section 101(b)(4) of the National Environmental Policy Act of 1969; Section 1(3) and 2(b) of Executive Order 11593; Section 106 of the National Historic Preservation Act; 23 CFR 77.1, as amended October 30, 1980; the guidelines developed by the Advisory

* Although the Army Corps refers to the project location as the Woodbridge River Mitigation Site (a term retained here when describing the project), this report otherwise uses the more common form of Woodbridge Creek.

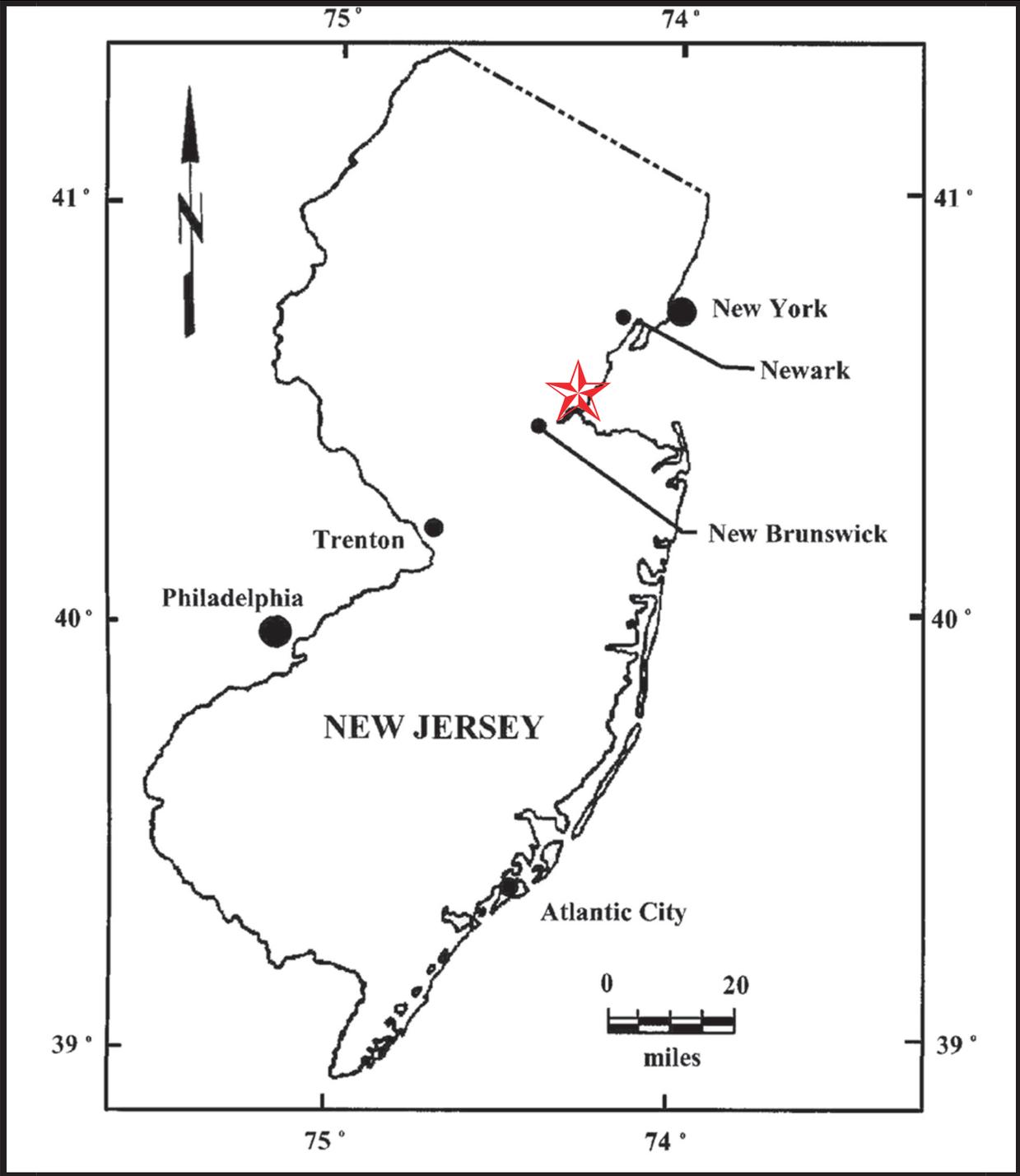


Figure 1.1. General Location of Project Area (starred).

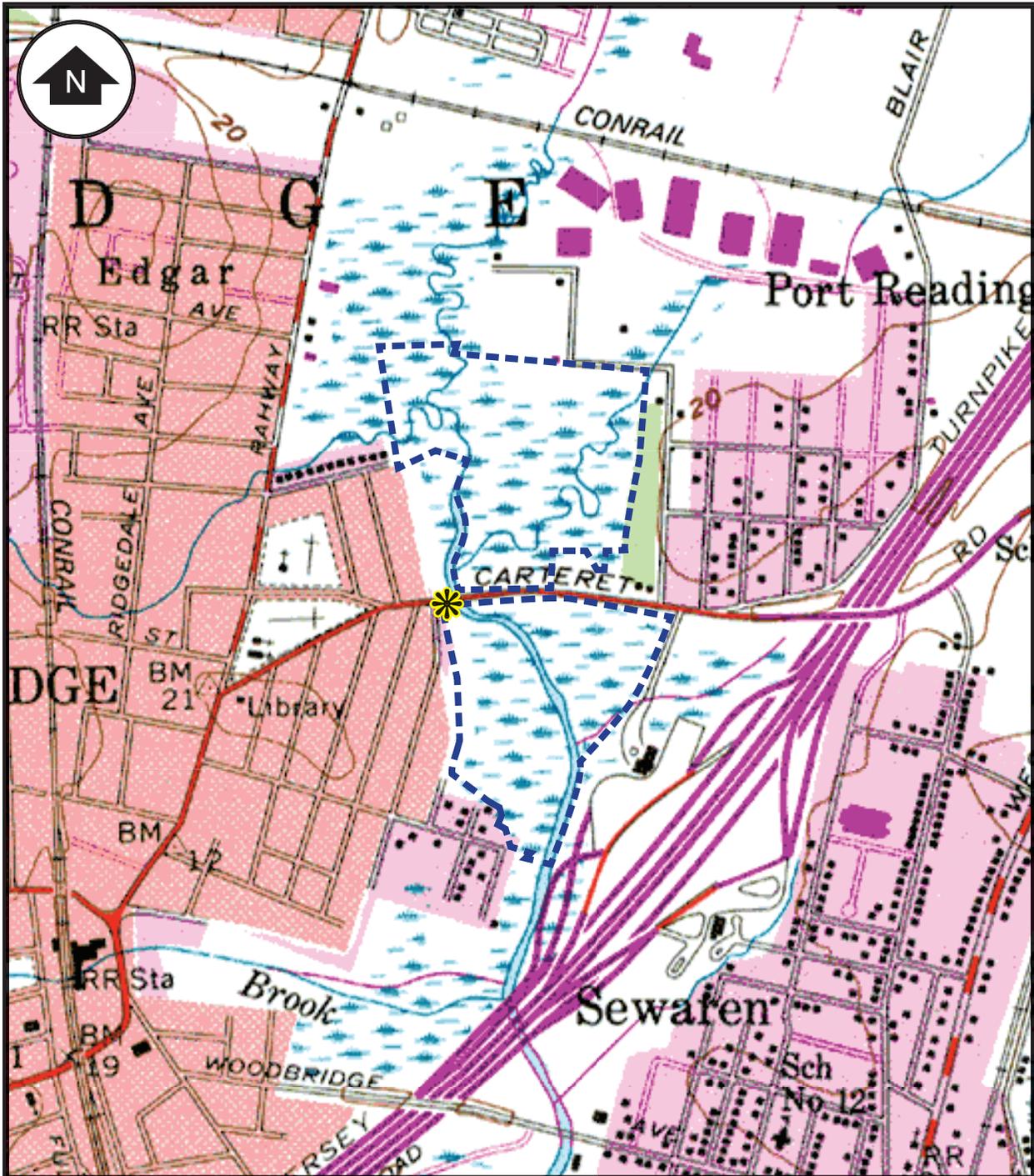


Figure 1. 2. Detailed Location of Project Site. Proposed areas of wetland restoration outlined in blue. Approximate location of Dunham's Mill indicated by asterisk. Source: USGS Perth Amboy, N.J.-N.Y. 7.5' Quadrangle (1956 [Photorevised 1981]). Scale: 1 inch= 1000 feet (approximately).

Council on Historic Preservation published November 26, 1980 and the amended Procedures for the Protection of Historic and Cultural Properties as set forth in 36 CFR Part 800 (revised August 5, 2004).

B. SCOPE OF WORK AND METHODOLOGY

These investigations were conducted in three stages. Initially, under a base contract arrangement, detailed historical research was undertaken followed by a site inspection and analysis of documentary and field data. As a deliverable under the base contract, a brief interim report was prepared which outlined the initial findings and made recommendations on the need and strategy for a further phase of archaeological fieldwork (Hunter Research, Inc. 2005). This work, largely carried out in August and September of 2005, aimed to identify the location of Dunham's Mill and preliminarily assess its archaeological potential within the context of the wetlands replacement/restoration and public access projects.

The initial stage of work concluded that the site of Dunham's Mill likely stood within the bounds of the Woodbridge River Mitigation Site on the right bank of Woodbridge Creek either beneath or just downstream of the Port Reading Avenue crossing. Timber remains observed in the bed of the creek just upstream of the Port Reading Avenue crossing were considered to mill-related remains, possibly dating from the colonial period. The mill site, although still imprecisely located and poorly understood at this point, was preliminarily judged to be at risk of being affected by ground disturbance from the proposed public access improvements (Figure 1.4).

A second stage of archaeological fieldwork was thus authorized in late November 2005, the main focus of which was to better understand the archaeological remains observed in the creek bed. This work,

referenced as Option 1 to the base contract, entailed the following tasks: preparation of a health and safety plan; supplementary archaeological field investigations involving limited manual subsurface testing in the creek bed; laboratory and data analysis (including dendrochronological study); and project management. Following approval of the health and safety plan in late December 2005 (Appednix A), archaeological fieldwork was carried out in early January and late March of 2006 to take advantage of low tide conditions. Further timber remains were exposed in the creek bed upstream of the Port Reading Avenue bridge and again judged to be mill-related, although probably represented parts of the dam and causeway as opposed to being remnants of an actual mill building. Finally, under Option 2 to the base contract, the results of all the investigative work have been described and interpreted in this report, prepared between April and June of 2006. Also under Option 2, Hunter Research conducted public outreach within the local historical community and made a public presentation on the findings of these studies on October 23, 2006.

In general terms, the research methodology adopted in these investigations has endeavored to take full and reasonable account of the historical data, interpretations and opinions developed by several historically knowledgeable members of the local community. The history of Dunham's Mill has long been a topic of interest and debate among local historians. The current studies have drawn extensively on the work of others and hopefully, through the pursuit of additional archival sources referenced here, our knowledge of one of the earliest mills in New Jersey has been usefully advanced. Likewise, numerous potential locations for the site of Dunham's Mill have also been the subject of considerable scrutiny. The limited archaeological work described here, carefully timed to coincide with low tide and integrated with archival study, strengthens the contention - and perhaps even

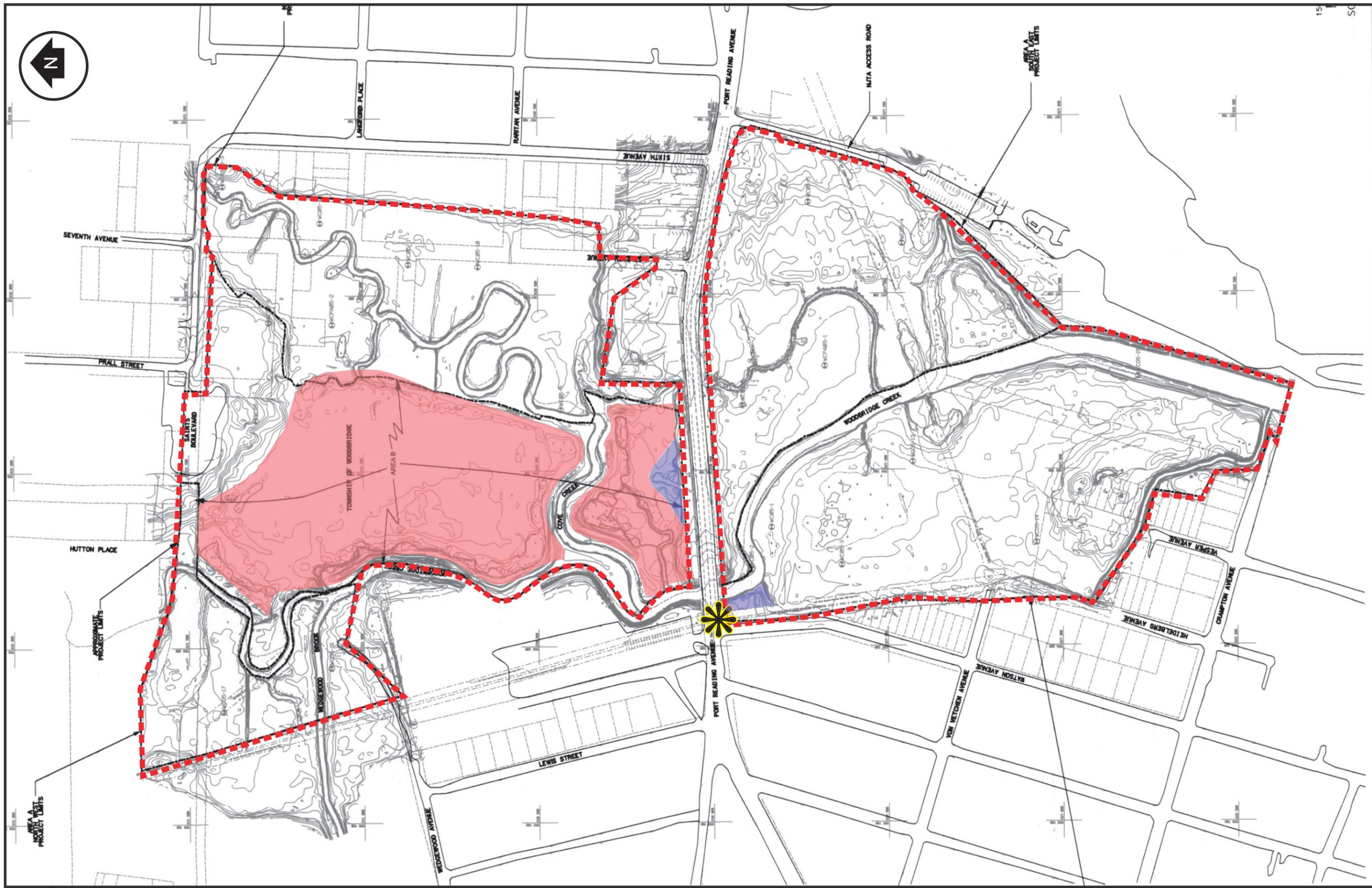


Figure 1.3. Detailed Location of Project Site. Overall U.S. Army Corps of Engineers Wetland Restoration Area Outlined in Red; National Oceanic & Atmospheric Administration/New Jersey Department of Environmental Protection Wetland Restoration Site Shaded in Red; Proposed Public Access Areas Shaded in Purple; Approximate Location of Dunham's Mill Site Indicated by Asterisk. Scale: 1 inch = 270 feet (approximately).

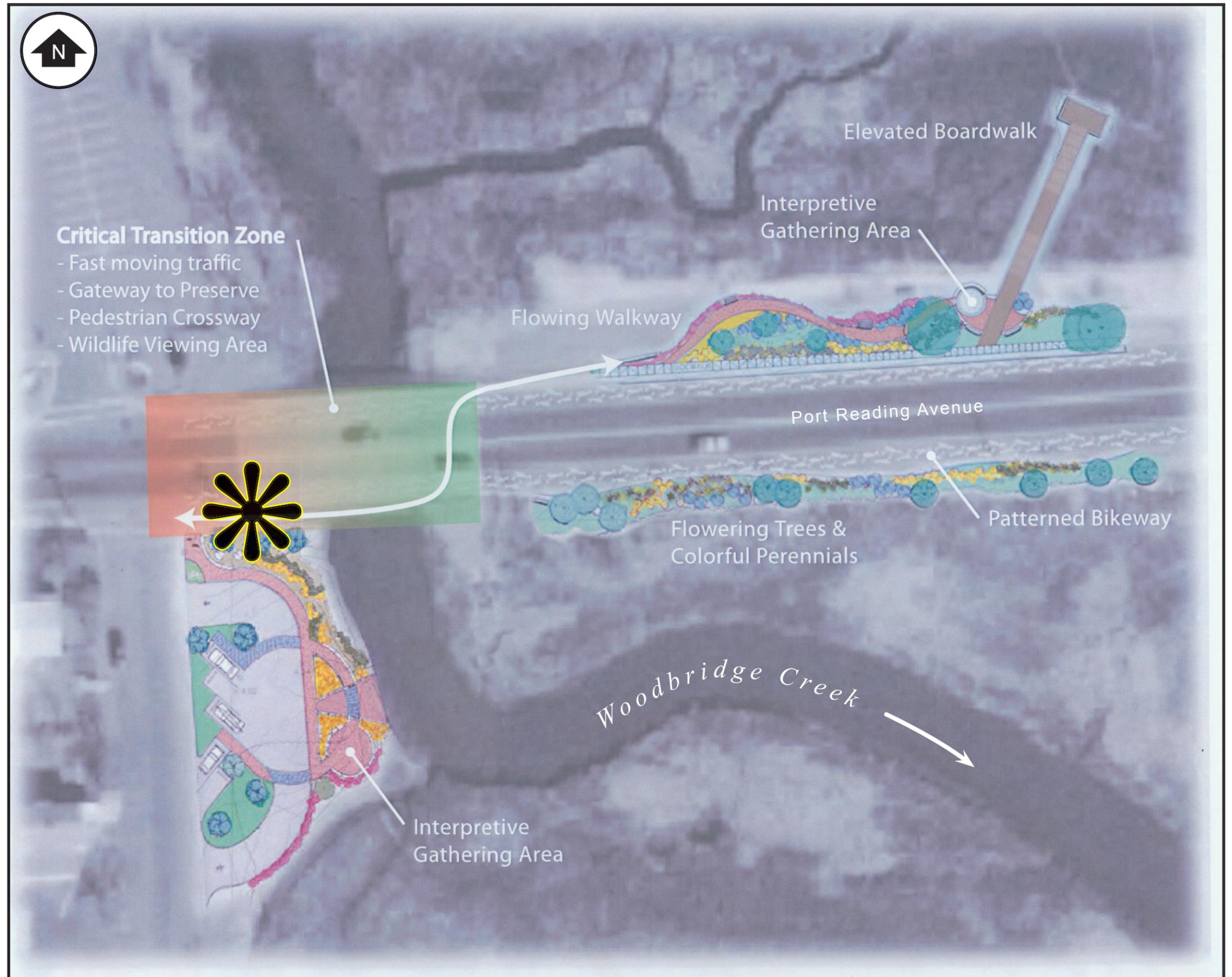


Figure 1.4. Public Access and Port Reading Avenue - Conceptual Design. Approximate Location of Dunham's Mill Site Indicated by Asterisk. Scale: 1 inch= 35 feet (approximately). (Source: Louis Berger and Associates, Inc. 2005).



Plate 1.1. Detailed Location of Project Site. Overall U.S. Army Corps of Engineers Wetland Restoration Area Outlined in Yellow; National Oceanic & Atmospheric Administration/New Jersey Department of Environmental Protection Wetland Restoration Site Shaded in Yellow-Green; Public Access Areas Shaded in Green; Approximate Location of Dunham's Mill Site Indicated by Asterisk. (Source: New Jersey Department of Environmental Protection, 2005).

conclusively indicates – that this mill was located at the Port Reading Avenue crossing of Woodbridge Creek.

C. EVALUATION CRITERIA

The information generated by this study was considered in terms of the criteria for evaluation outlined by the U.S. Department of the Interior, National Register Program. The criteria are found at 36 CFR 60.4 and are as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Criteria considerations.

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions ,or used for religious purposes, structures that have been moved from their original locations,

reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria of if they fall within the following categories:

- (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- (b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.
- (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- (f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- (g) A property achieving significance within the past 50 years if it is of exceptional importance.

D. DEFINITION OF TERMS

The following definitions are from the Department of the Interior, National Register of Historic Places (36 CFR 63):

1. A “district” is a geographically definable area, urban or rural, possessing a significant concentration, linkage or continuity of sites, buildings, structures, or objects which are united by past events or aesthetically by plan or physical development. A district may also be comprised of individual elements which are separated geographically but are linked by associations or history.
2. A “site” is the location of a significant event, or prehistoric or historic occupation or activity or a building or structure whether standing, ruined, or vanished where the location itself maintains historical or archaeological value regardless of the value of any existing structures.
3. A “building” is a structure created to shelter and form of human activity such as a house, barn, church, hotel or similar structure. “Buildings” may refer to a historically related complex, such as a courthouse and jail or a house and barn.
4. A “structure” is a work made up of interdependent and interrelated parts in a definite pattern or organization. Constructed by man, it is often an engineering project large in scale.
5. An “object” is a material thing of functional, aesthetic, cultural, historical, or scientific value that may be, by nature or design, movable yet related to a specific setting or environment.

E. ASSESSMENT OF EFFECTS AND ADVERSE EFFECTS

Effects are discussed at the conclusion of this report. In that discussion, assessments of effects and adverse effects are based upon the following criteria contained in 36 CFR 800.5 (a)(1) and (2), as follows:

(a)(1) *Criteria of adverse effect.* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:

- (i) Physical destruction of or damage to all or part of the property;
- (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary’s standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;
- (iii) Removal of the property from its historic location;
- (iv) Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

F. PREVIOUS RESEARCH AND PRINCIPAL SOURCES OF INFORMATION

Dunham's Mill has been the subject of periodic inquiry by local historians and has occasionally been discussed in published local histories of the Woodbridge area (e.g., Clayton 1882; Dally 1873; Monnette 1930; Breckenridge 1946). The mill is also referenced in standard sources on the history of New Jersey mills (e.g., Weiss and Sim 1956). However, these texts provide little evidence of systematic research into primary archival sources. Several currently active local historians, notably Ernie Oros, Ray Schneider, Robert McEwen and Richard Crowley, have shown great interest in pinning down the site of Dunham's Mill and have lent their assistance and considerable knowledge to the investigations undertaken here. No detailed archaeological study of Dunham's Mill had been conducted prior to the current investigations.

Research into state agency files was undertaken at the New Jersey State Museum and the New Jersey Historic Preservation Office in Trenton, New Jersey, in order to determine the proximity of the Woodbridge River Mitigation Site to known prehistoric and historic resources. Research in primary archival

and published secondary sources was undertaken at the New Jersey State Library, the New Jersey State Archives, the New Jersey Historical Society, the New Jersey Bureau of Tidelands Management, the New-York Historical Society, the New York Public Library, Special Collections at the Alexander Library at Rutgers University, the Middlesex County Clerk's Office, the Middlesex County Cultural and Heritage Commission and the Middlesex County Engineering Department. On-line sources and in-house research materials were also consulted. Particular research emphasis was placed on determining the location and history of Dunham's Mill, tracing the post-abandonment history of the mill site, gaining an understanding of the history of the local infrastructure (especially roads, bridges and utilities) and gathering biographical information on Jonathan Dunham.

The research involved consultation with the local historians noted above and detailed examination of certain classes of primary and secondary source materials, notably deeds, cartographic materials, aerial photographs, tax ratables and genealogies. During this process, a number of key sources proved particularly useful, including: the Woodbridge Township Freeholders' Books; Joseph Dally's *History of Woodbridge and Vicinity* (1873); Amy E. Breckenridge's *Disappearing Landmarks of Woodbridge* (1946); Orra Eugen Monnette's *First Settlers of Ye Plantations of Piscataway and Woodbridge* (1930); R. McEwen and V. Troeger's *Woodbridge: New Jersey's Oldest Township* (2002); various Revolutionary War era maps (reproduced below in Chapter 3); the Middlesex County Divisions of Lands Books; and the General Board of Proprietors of the Eastern Division of New Jersey, Road Book (1740-1902).

Chapter 2

GEOGRAPHICAL SETTING

The Woodbridge River Wetland Mitigation Site is located in the Inner Coastal Plain physiographic province roughly a mile southeast of its border with the Piedmont (Figures 1.2 and 2.1). The Woodbridge Creek drainage, less than five miles in length along its principal channel, rises in the Piedmont approximately a mile and a half southeast of Rahway. The project site is situated roughly halfway along the course of the drainage about two-and-a-half miles from its mouth on the Arthur Kill. In the central section of the drainage between the New Jersey Turnpike and the Conrail rail corridor (formerly the Port Reading Railroad), where the project site is located, several tributaries flow into the main channel, creating an extensive area of tidal wetland. Except for their uppermost headwaters, the creek and its various tributaries are tidal with a typical fluctuation of three to five feet occurring in the project vicinity.

The bedrock geology underlying the downstream portion of Woodbridge Creek (including the bulk of the project site) consists of clayey silt of the Raritan Formation of Late Cretaceous age. Extending northward and upstream, these deposits overlie siltstone and shale of the Passaic Formation of Late Triassic age, which belong to the Newark basin sequence of sedimentary deposits. Just south and downstream of the project site, between the mouth of Woodbridge Creek and Perth Amboy, the topography becomes hilly as a result of the clays of the Raritan Formation being overlain by the terminal moraine laid down by the Wisconsinan ice advance between 80,000 and 18,000 years ago (Wolfe 1977:76-80, 96-100, 144, 263; Drake *et al.* 1996).

Upstream and downstream of Port Reading Avenue, Woodbridge Creek winds through lowlying tidal wetland where the dominant vegetation cover today

is phragmites. The creek itself and its tributaries are bordered by tidal mud and muck. Some mid-to late 20th-century residential and light industrial development has occurred on the wetland fringes, buildings in some cases being erected on fill placed over what was formerly marshland and meadow (cf. Plates 1.1 and 3.1). North and west of the Port Reading Avenue crossing of Woodbridge Creek is the parking lot and clubhouse of the Woodbridge Hungarian Club. Numerous utilities, mostly buried, run parallel to Woodbridge Creek along its right bank and along the north and south margins of Port Reading Avenue. These include petroleum and gas pipelines, sanitary sewers, water lines and storm drains.

Today's Port Reading Avenue roughly follows the course of the historic roadway that led east out of Woodbridge to two ferry locations (the Old Blazing Star and New Blazing Star ferries) where travelers and livestock could cross over the Arthur Kill to Staten Island (see below, Figures 3.1-3.3). The modern roadway crosses Woodbridge Creek on a concrete bridge constructed in the late 1980s, the latest in a succession of bridges at this site. The road is laid atop a causeway, roughly 600 feet in length, which traverses the wetland adjoining the creek. This causeway, probably rebuilt and enlarged numerous times over the years, is believed to roughly follow the alignment of a historic causeway that was apparently put in place in the late 17th century (see below, Chapter 3A). Port Reading Avenue today, also designated as County Route 604, is a heavily traveled route that links Woodbridge with the small residential community and railroad terminus of Port Reading and the Borough of Carteret, both of which lie between the New Jersey Turnpike and the Arthur Kill in northeastern Middlesex County.

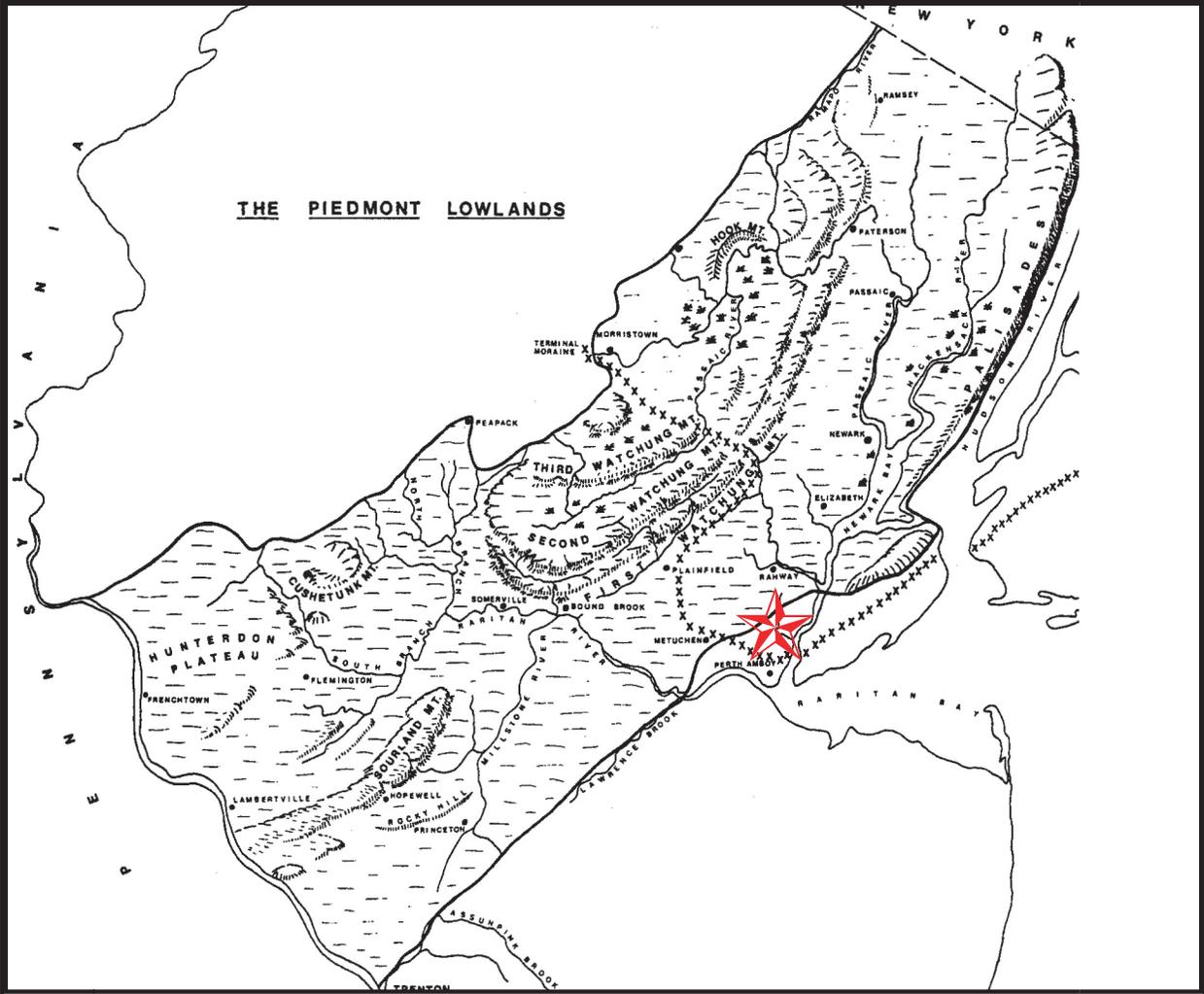


Figure 2.1. Location of the Project Site Within the Piedmont Physiographic Province (Starred). (Source: Wolfe 1977:254).

Chapter 3

HISTORICAL BACKGROUND

A. DUNHAM'S MILL

On June 8, 1670, the following entry was entered into the Woodbridge Township Freeholders' Records:

Witness that I Jonathan Dunham alias Singeltary doth hereby promise and Ingage to come to Woodbridge abovesaid and bring with me a good pair of millstones of five feet over at least and ironwork and other things fitting for a mill at or before micklemaist next ensuing the date hereof and then or before or at least between this and the last of June next, which will be in the year one thousand six hundred and seventy one build and finish a good sufficient gristmill for service to supply the Towne abovesaid with good meale, takeing for toule one sixteenth part of all grain that shall come to the mill to be ground and no more and to keep and maintain the said Mill in good repair, and the Inhabitants of the Towne shall be supplied before strangers [Woodbridge Township Freeholders' Books Liber A].

According to Joseph Dally's *Woodbridge and Vicinity* of 1873, Dunham soon acquired the reputation of "turning out the most beautiful meal...his till was so light that a man who brought a bag of grain to him took back two bags of flour" (Dally 1873:17). Nearly all accounts by later historians hold that Dunham's Mill was situated on the south side of the bridge on the road that linked present-day Carteret with Woodbridge. At various times in the past this road, today's Port Reading Avenue and County Route 604, has been known as the road to Blazing Star Ferry, the road to Union Landing, the Port Reading Road and Carteret Avenue. Dally (1873:17) noted that old

timbers that once supported the mill were discernible on the western side of Papiack Creek at the time of his writing. According to Amy E. Breckenridge's manuscript entitled "Disappearing Landmarks of Woodbridge" (1946:4), several wooden posts related to the mill still could be seen in the meadows by the edge of the waterway in the mid-20th century.

In return for agreeing to become the town's miller in the summer of 1670, Jonathan Dunham was granted 12 acres of upland between the meadow of Papiack Creek and the meeting house green (Woodbridge Township Freeholders' Books Liber A). The meeting house green was located approximately 500 feet to the west of the present Port Reading Avenue bridge over Woodbridge Creek. Furthermore, the town contributed £30 toward the endeavor and provided Dunham with sod for use in embanking the mill dam (McEwen and Troeger 2002:28). Also in 1670 Jonathan Dunham received an additional 120 acres of upland and 40 acres near the parsonage (Woodbridge Township Freeholders' Books Liber A).

Jonathan Dunham, or Jonathan Singletary as he was first known, was born in Newbury, Massachusetts *circa* 1639 and was the son of Richard and Hannah (Susannah) Cooke Singletary (Hancock 2004). Many of the details of his early and later life remain unclear, as over the course of this research numerous inconsistencies and discrepancies were found in the works of others who have written about the Dunham/Singletary genealogy and the early history of Woodbridge, New Jersey. It is clear, however, that sometime between 1657 and 1662, Jonathan Dunham married Mary Bloomfield, daughter of Thomas and

Table 3.1. Sequence of Ownership, Dunham's Mill Site, Woodbridge Township, Middlesex County, New Jersey.				
Ownership Tenure	Name	Reference	Consideration	Description
1670-1704	Jonathan Dunham	Est Jersey Deed I/128; Wood-bridge Township Freeholders' Books Liber A		various tracts
1704-1705	Jonathan Dunham Jr.	(West Jersey Deed AAA/216)		various tracts
1705-1706	Benjamin Dunham	West Jersey Deed AAA/216		various tracts
1706-?	John Fitzrandolph	West Jersey Deed AAA/217		various tracts
c.1766-1786	William Stone	Dunham 1766		
1786-1789	Isaac Prall	Middlesex County Deed 6/563	£2,100	various tracts including the gristmills
1790-1850	Isaac Prall Jr.	Middlesex County Division of Estates, Book 6		several tracts including one acre with a mill, pond, dam and stream
1850-1887	Cornelius D. Prall*			
1887-	James Prall*			

* Although deeds for the specific property could not be located after Isaac Prall Jr. acquired the mill site, deeds were traced for the properties directly to the east and to the north, suggesting that Isaac Prall Jr.'s lands may have been passed on to his son Cornelius after his death in 1850 (Middlesex County Will #1254). In 1860, Cornelius D. Prall sold the 4.72-acre property on the east side of the creek and south of modern Port Reading Avenue to William Brown (Middlesex County Deed 83/543). Two residences owned by Cornelius Prall appear on the north side and south side of modern Port Reading Avenue east of Cove Creek on late 19th-century maps (Figures 3.8-3.10). The remainder of the estate was devised to James P. Prall, who in 1910 conveyed approximately 121 acres on the north side of Port Reading Avenue flanking both sides of Cove Creek and "Stone's Mill Creek" to Adolph Greenbaum (Middlesex County Deed 452/89). The mill site property was ultimately acquired by the Township of Woodbridge in the 20th century.

Mary Bloomfield. The couple had several children - Esther, Mary, Ruth, Eunice, Jonathan, David, Nathaniel and Benjamin (Hancock 2004).

Secondary sources indicate that Dunham was something of a controversial figure during his lifetime (Monnette 1930:195; Hancock 2004). Dunham was identified as a "Ranter" in Plymouth Colony Records. True "Ranters" were members of a controversial group of Protestant Dissenters. The group gained prominence between 1649 and 1654 and embraced a set of extremist religious views referred to as Antinomianism. Ranters believed in the notion of the "indwelling spirit," a form of religious perfection, and that a person was "free of Sin and the Law" (ExLibris 2003). Still more offensive to the less than tolerant Puritanical Calvinists of Massachusetts was the Ranters' practice of frequently preaching and appearing in public in the nude and their belief that sexual promiscuity was permitted to "true possessors of the Holy Spirit" (Levy 1988:82).

However, many individuals who were not actually Ranters were labeled as such by unknowing outside observers and by those who, for various reasons, chose not to make distinctions between the numerous dissenting Protestant groups that had sprung up in the English borderlands and Wales during the mid-17th century. Included among these other groups, for example, were the Quakers, whose core belief in the "inner light" was not all that much different from the Ranter concept of the "indwelling spirit."

Jonathan Singletary may have been a Ranter, or he may have been a member of any one of a number of dissenting English sects, or he simply may have not been in complete agreement with the teachings of Massachusetts' Puritan ministers and was thus branded a "Ranter" simply because it was the popular synonym for a heretic at that place and time.

Many accounts note that Jonathan Singletary had frequent issues with the authorities in Massachusetts and gained some measure of notoriety. His religious beliefs may have been the root of much of this. One noteworthy example of Singletary's difficulties with the law occurred in 1662, when he was accused of slander and defamation by another Massachusetts societal outsider, John Godfrey. Singletary, then in his early 20s, had accused Godfrey of being a witch, stating that while Singletary had been incarcerated in the local jail, Godfrey had appeared to him in a supernatural manner and offered to arrange his freedom in return for a payment of corn. After a deposition, Singletary was found guilty of slandering Godfrey and ordered to publicly apologize and to pay a fine. The case is known as an important predecessor to the Salem witch trials (Hancock 2004).

In 1670, Jonathan Singletary and his wife Mary relocated to Woodbridge, New Jersey from Hauesall (Haverhill), Massachusetts. Jonathan abandoned the name of Singletary at the time of the move, taking on instead the Dunham name. The motivation behind Jonathan Singletary's decision to change his name remains unclear, but it has been suggested that the probable cause was a desire to disassociate himself from his past in Massachusetts (Hancock 2004).

Assuming Jonathan Dunham held true to the terms of his agreement with the town, Dunham's Mill was to have been completed and in operation before July 1, 1671. Secondary sources state that the mill was up and running by the fall of 1670 (Dally 1873:17). In 1672, Dunham received an official warrant granting him a nine-acre house lot in the Town of Woodbridge bounded westerly by the meeting house green and easterly by the meadow of Papiack Creek. The meeting house green mentioned in the foregoing deeds was also known as the Kirk ("Church") Green. It was situated in the Town of Woodbridge and eventually encompassed the present-day sites of the Trinity Church and the First Presbyterian Church

along Rahway Avenue (Dietrich 2002). The green was bounded by William Smith's house lot (formerly owned by Samuel Smith, Jonathan Dunham's son-in-law) on the south, Jonathan Dunham's house lot on the east and by Samuel Barron's property to the north (Monnette 1930:195; Dietrich 2002). Breckenridge (1946:4) observed that so many of Dunham's descendants eventually lived to the north of the Kirk Green that "the neighborhood was known for many years as Dunhamtown."

Dunham's warrant of 1672 also included 40 additional acres (subsequently corrected to 48) to the west of the meeting house green, 120 acres of upland and swamp near William Cotter's lands and 36 acres of meadow that had not yet been laid out (East Jersey Proprietors Deed Book I:128-129). The description of Dunham's house lot noted that a road leading to Dunham's Mill traversed the parcel. An examination of 18th-century maps shows that there were at that time two primary roads in the vicinity. The first ran east/west between the Town of Woodbridge and the modern site of Carteret, crossing Papiack Creek. The other generally followed the north/south alignment of today's Rahway Avenue and ran over Wedgewood Creek, a tributary of Papiack Creek. A deed dated 1697 between Stephen Kent and Jonathan Dunham for adjacent properties provides the information that the "highway that goeth through the sayd [Dunham's] house lott to his mill" ran on a generally east/west alignment (East Jersey Deed F/215).

As the predecessor of modern Port Reading Avenue is the only roadway known to have extended east from the late 17th/18th-century nucleus of the Town of Woodbridge, and since this passed near or through Dunham's house lot, it is deduced that Dunham's Mill stood near the point at which this early highway crossed Papiack (now Woodbridge) Creek. The first mention of this highway being extended past the mill and across Woodbridge Creek occurs in a record of the Woodbridge Township freeholders dated 1680, which

noted that a "good cart bridge and causeway" were to be constructed over Papiack Creek" (Woodbridge Township Freeholders' Books Liber A). In 1694 a committee comprised of four persons was organized to inspect Papiack Creek in the vicinity of Dunham's Mill in order to determine how to construct a cart bridge over the waterway. Dally (1873:115) hypothesized that the need for a bridge must have occurred because the old structure had either washed away or had been damaged or deteriorated, although it seems just as likely that the first bridge and causeway were in fact not built until after 1694.

"Jonathan Dunham," Woodbridge's new miller, went on to become a prominent local resident and a wealthy and respected figure. In 1673 one "John Singletary," presumably Jonathan Singletary/Dunham, was involved in an incident related to the brief recapture of New Netherlands by the Dutch. The new Dutch government appointed John Ogden to serve as Sheriff of the East Jersey towns of Newark, Elizabethtown, Woodbridge, Piscataway, Middletown, and Shrewsbury. Ogden was directed to inventory the estate and property of the former English Governor Philip Carteret. In advance of their efforts a certain Robert Lapriere apparently removed "divers goods from the house of Philip Carteret," probably to protect Carteret's personal property and to keep official records of the colony out of Dutch hands. Lapriere and Jonathan Singletary were arrested for these actions, sent to New York for trial and convicted. Singletary, who had been charged with disobeying commands, was fined £5 and put on good behavior. Lapriere was convicted of sedition and banished. The incident provides some evidence that despite his brushes with colonial authority, Singletary was in his heart loyal to England or at least to Carteret (Hancock 2004).

In 1674, following the reconquest of New Netherland by the English, Jonathan Dunham served as Woodbridge Township tax assessor and in 1675, along with Samuel Dennis, he was elected a

representative for Woodbridge in the East Jersey assembly (Hancock 2004). Recent research suggests that Jonathan Dunham returned to Massachusetts for a brief period beginning around 1682. Leaving his wife behind in Woodbridge, he apparently carried on a suspicious rapport with a woman of a questionable reputation named Mary Rosse (Junkin 2004). It may have been in connection with this absence that Orra Eugen Monnette (1930:194) wrote that Dunham had assigned custody of his landholdings in "Canoo Hill" in Woodbridge Township to James Seaton for a period of time while he was "traveling."

Dunham's return to Massachusetts disconcerted the local authorities. His reappearance raised more than a few eyebrows and made him a subject of constant scrutiny. As a result of his questionable behavior (his relationship with Mary Rosse and his involvement in an alleged arson incident at the home of a John Irish), Jonathan Dunham was publicly whipped and subsequently expelled from the colony. Following this embarrassment, Dunham once again returned to Woodbridge Township where his reputation remained largely unsullied (Hancock 2004). Evidence that the taint of scandal did not follow Dunham back to his adopted home can be found in the fact that, in 1701, he was elected Deputy to the General Assembly of New Jersey as a representative for the Woodbridge District (Monnette 1930:194).

Dunham's Massachusetts and New Jersey lives seem to have been diametrically opposed. In Massachusetts, Jonathan Singletary/Dunham lived on the outer edges of society and was frequently in trouble with the authorities. While he was branded a Ranter in Massachusetts, he appears by all evidence to have been a regular and respected member of Woodbridge's church community. He was paid six shillings for caretaking the Woodbridge meeting house in 1698 (Woodbridge Township Freeholders' Books Liber A). In 1702, when the Woodbridge Anglicans formally organized themselves into a parish, Jonathan Dunham

and his son Benjamin reportedly played a large role in establishing this institution by recruiting new church members (McEwen and Troeger 2002:25). Dunham had evidently created a new and more socially respectable life for himself and his family in New Jersey.

Jonathan Singletary/Dunham did not live long into the new century. In 1704, the Woodbridge Freeholders' Records note that Jonathan Dunham was deceased. This historical record contradicts claims later made by Dunham family genealogies which suggest a death date of 1723 for the progenitor of the New Jersey branch of the family (Woodbridge Township Freeholders' Books Liber A; Monnette 1930:196; Hancock 2004). Although the possibility that the 1704 date actually represents that of the death of Jonathan Dunham's son, Jonathan Dunham, Jr. was briefly considered, Jonathan Dunham, Jr. is known to have not expired until September of 1706 as confirmed by his will (West Jersey Recorded Will Liber I/160).

In April of 1705, a little over a year prior to his own death, Jonathan Dunham, Jr. conveyed to his brother Benjamin Dunham several of the tracts left to him by his recently departed father. These included the nine-acre house lot, property that his father purchased from Stephen Kent lying south of the "ould mill" and other tracts. The indenture also indicates that when the highway was laid out through Jonathan Dunham, Sr.'s property, the Township allowed the miller to acquire a tract of upland as compensation. Additionally, Jonathan Dunham, Jr. references one of the boundaries in the deed as a piece of land that he granted to his brother David Dunham (West Jersey Deed AAA/216).

In July of 1706 Benjamin Dunham and his wife Mary conveyed several tracts in Woodbridge to a carpenter by the name of John Fitzrandolph. The conveyance included the nine-acre house lot, the Stephen Kent property, 40 acres of upland, and a

“fourth part of the freehold and right of commonage in said Woodbridge which belonged to my father Jonathan Dunham lately deceased” (West Jersey Deed AAA/217). This information further supports the *circa* 1704 date for the death of Jonathan Dunham, Sr. suggested in the Woodbridge Township Freeholders’ Records. Although the indenture mentions the “ould mill” as a reference point, the remainder of the document lacks any detail concerning the building and does not state unequivocally that the mill stood on any of the properties conveyed by the document. Jonathan Dunham, Sr. had been required by his agreement with Woodbridge to erect his mill before he was recorded as having purchased or having been granted the rights to any lands in Woodbridge. Thus it may be, (1) that the plot of land upon which the mill stood was never fully legally ceded to Dunham by means of warrant, patent or deed, or (2) that it was so granted but that the document by which this was accomplished was never formally recorded and has not survived, or (3) that it was situated on one of the several tracts granted to Dunham after it had already been constructed. If the second scenario was the case, then it remains to be explained why no later Dunham family deeds record the passage of this additional parcel of land from one family member to another, or to any other purchaser. If the third scenario occurred, then it remains unclear why the extant mill was not noted in the descriptions of any of the various properties as having stood upon them at the time of their conveyance to Dunham.

It is quite likely that since the construction of the mill was publicly financed, its ownership may have been, at first, communal and thus the first enumerated scenario may have been the correct one. Under the terms of the covenant of 1670 between Jonathan Dunham/Singletary and the Town of Woodbridge, Dunham was unquestionably responsible for the task of constructing the mill, for its maintenance and for its general upkeep. In return, he clearly had been granted the right to operate the mill and he probably also retained ownership of the millstones that he had

brought with him to Woodbridge. Land rights and, perhaps even the ownership of the mill building itself, could well have remained vested with the Town of Woodbridge or the East Jersey Proprietors throughout the entire 30+ years of Dunham’s tenure. Because of the question of mill ownership and the ambiguous parcel descriptions in the various deeds examined during the course of this research, it remains unclear whether ownership of the mill passed to Fitzrandolph along with the bulk of Jonathan Dunham, Sr.’s real estate, remained with his heirs, or whether it had always been the property of the Township of Woodbridge or the East Jersey Proprietors. Thus, at the present time, the early 18th-century history of Dunham’s Mill remains vague.

B. WILLIAM STONE’S MILL

On the *Plan of Middlesex County in the Province of East Jersey*, prepared by Azariah Dunham in 1766 and later copied by John Hills in 1781 (see below, Figures 3.3 and 3.4), a mill is shown at the point where the road from Woodbridge to the Blazing Star ferry (the predecessor to Port Reading Avenue) crosses the stream today known as Woodbridge Creek. This map identifies “Stone’s” mill just south and downstream of the crossing. If the current interpretation of primary archival materials and suggestions by secondary sources regarding the location of Jonathan Dunham’s gristmill are accurate, Stone’s Mill stood in approximately the same location as the mill previously operated by Jonathan Dunham. It may have been the same building erected by Dunham in 1670-71 or a new edifice erected in approximately the same spot.

A map showing the route from Amboy to Elizabethtown, sketched *circa* 1778 (Figure 3.1), indicates that by the Revolutionary War era Papiack Creek was being referred to as Woodbridge Creek. Unfortunately, this map does not depict Stone’s Mill, although it does show the course of the road from Woodbridge



Figure 3.1. Amboy to Elizabethtown. Circa 1778. Scale 1 inch=2000 feet (approximately). Location of project site circled.

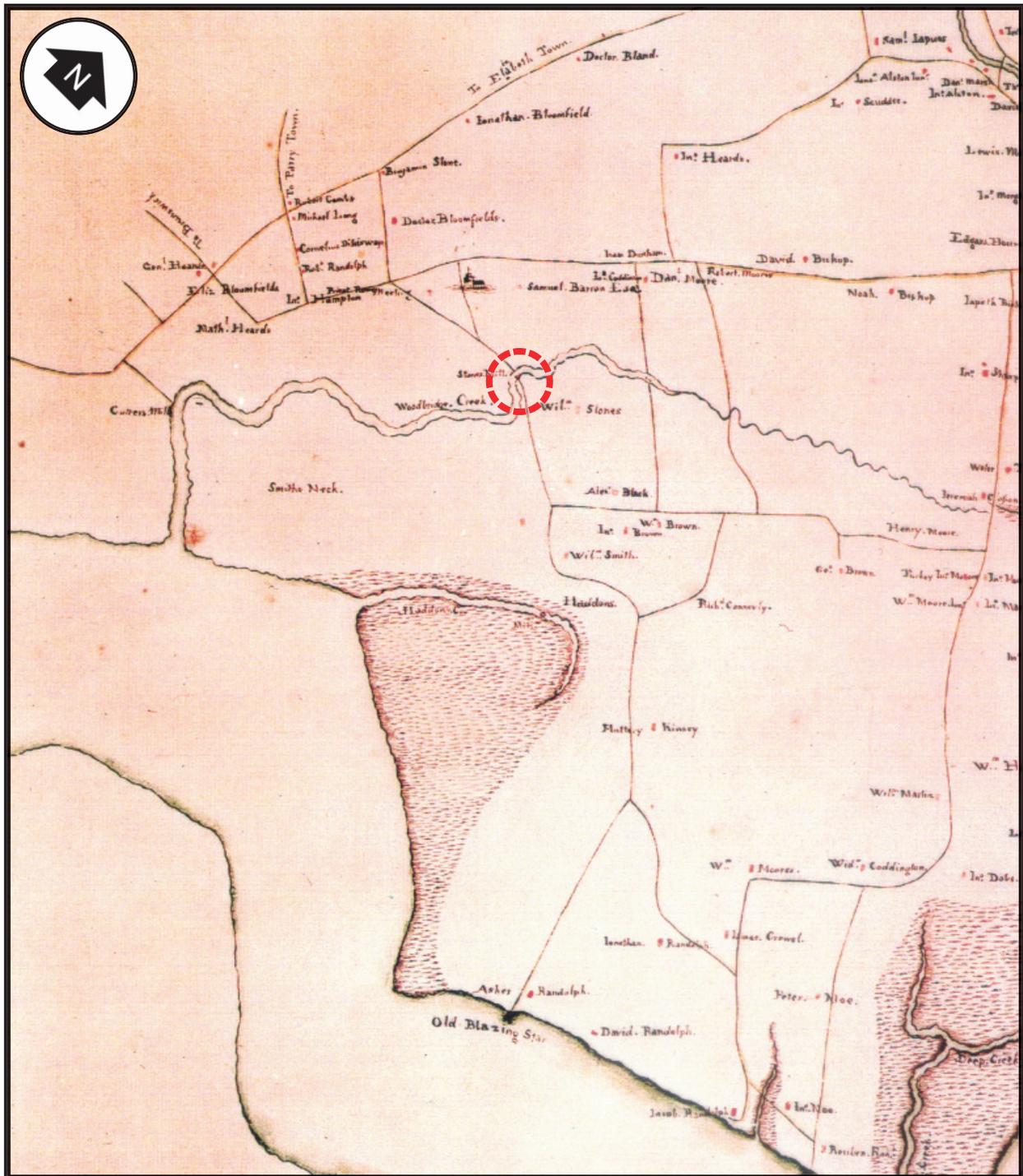


Figure 3.2. Andre, J. Revolutionary Map of Middlesex County. Circa 1778. (Source: Clinton Collection, University of Michigan). Scale: 1 inch= 1600 feet (approximately). Location of project site circled.



Figure 3.3. Hills, J. *A Map Middlesex County Reduced from the Original Survey.* 1781. Scale 1 inch= 1.1 miles (approximately). Location of project site circled.

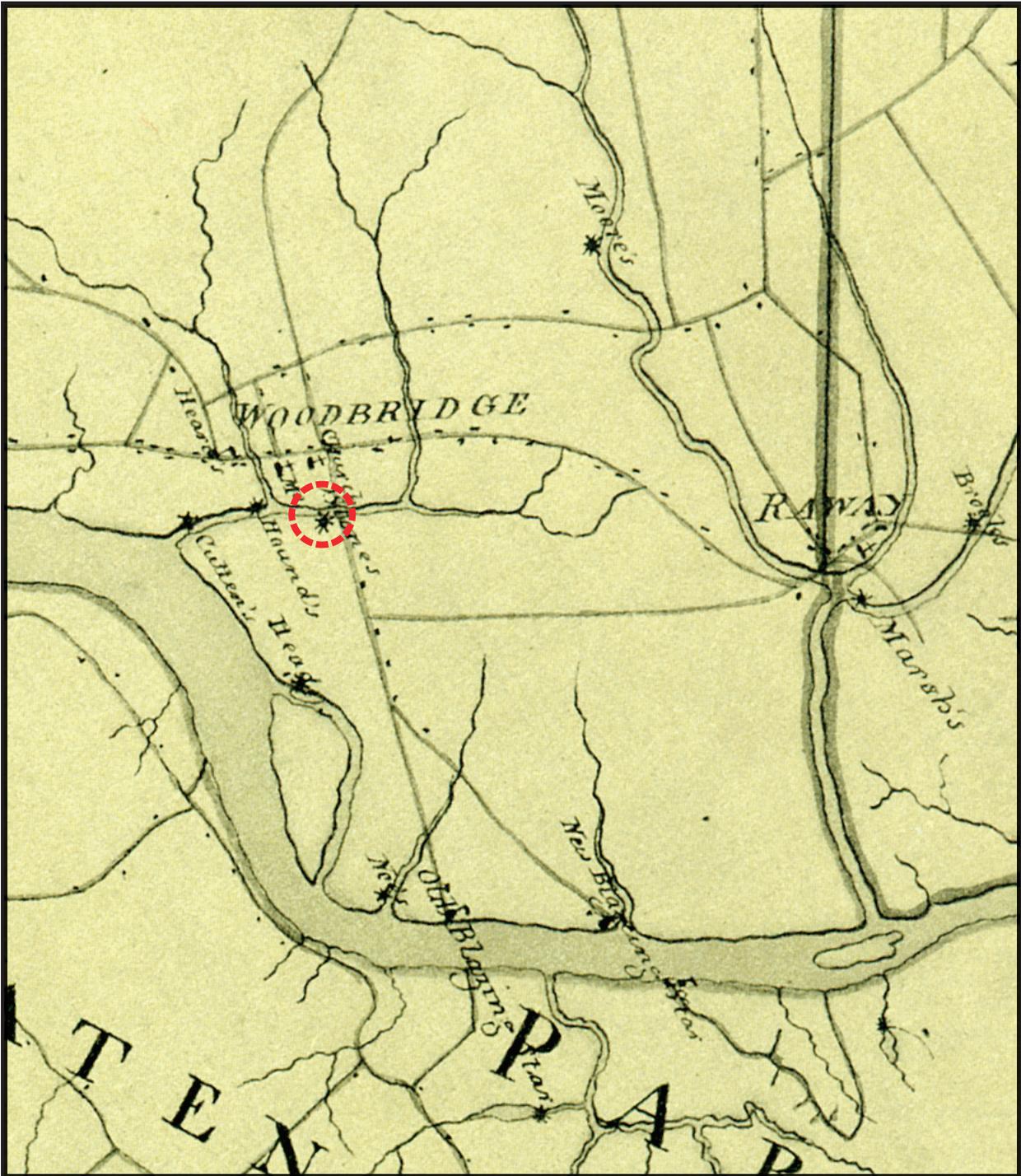


Figure 3.4. Hills, J. *A Map of Part of the Province of Jersey Compiled from the Original Surveys*. 1781. Scale 1 inch= 1.1 miles (approximately). Location of project site circled.

to “Old Blazing Star” and the location of the bridge over the creek. To the east of the creek the map identifies “Smith’s Farm.” Another Revolutionary War period map, rendered by John Andre *circa* 1778 and held in the Sir Henry Clinton Collection at the William L. Clements Library (Figure 3.2), echoes the Dunham map, identifying “Stones Mill” on Woodbridge Creek south and downstream of the causeway and bridge. This map also shows William Stone’s property extending north of the road and east of Woodbridge Creek.

As noted above, the Dunham *Plan of Middlesex County* prepared in 1766, along with other maps held by the East Jersey proprietors, formed the basis for several maps produced by British military cartographer John Hills in the early 1780s. Hills, an assistant engineer to British General Sir Henry Clinton, produced his maps in the relative comfort of New York City and does not appear to have carried out any field checks or instrument survey in support of his work. Indeed, many of these maps repeat ownership and place name information that was current in the mid-1760s even though many owners had died and place names had changed in the meantime (Snyder 1977:75).

Two Hills maps, both drawn in 1781, are reproduced here. *A Map Middlesex County Reduced from the Original Survey* (Figure 3.3) shows an asterisk (the symbol used to indicate a mill site) downstream from the point where the road from Woodbridge to the ferries at “Old Blazing Star” and “New Blazing Star” crosses Woodbridge Creek. The annotation “Stone’s” accompanies the asterisk. *A Map of Part of the Province of Jersey Compiled from the Original Surveys* (Figure 3.4) gives much the same information, although it is notable that the asterisk marking the mill site is shown on the left (or east) bank of the creek. All other cartographic and documentary evidence suggests that the mill was on the right bank, on the

Woodbridge side of the creek, which is the more logical spot for this facility. Probably this discrepancy is due to Hills’ inaccurately copying the earlier map.

The year 1779 is the earliest date for which tax ratables are available for Woodbridge Township. In February of 1779 William Stone was taxed for 147 acres, livestock, one slave and two gristmills (“two gristmills” here refers to the number of sets of millstones; only a single mill site is involved). The same data are provided in September of the same year with the exception of one additional item that Stone acquired—a riding chair. By 1784, William Stone’s landholdings in Woodbridge Township were reduced to 50 acres. That year, he continued to operate two gristmills and was levied for a riding chair and two slaves. William Stone was not listed in Woodbridge Township tax ratables for 1785 and 1786 and it is possible that the mill was not in operation at the time (Woodbridge Township Tax Ratables).

As yet, no evidence has been developed to suggest how William Stone came to be in possession of his mill site, but it is clear from tax records that he was the legal owner of the mill during much of the Revolutionary War period. A review of all recorded deeds documenting the purchase or sale of property by William Stone in Woodbridge Township did not produce any clues specifying how Stone came to be in possession of the gristmill property.

C. ISAAC PRALL’S MILL AND HIS ESTATE

In 1786, William Stone conveyed several tracts of land and meadow in Woodbridge to Isaac Prall (Prall) of Richmond County, New York for £2,100. The indenture references several parcels: 39 acres that included a messuage; 29 acres of upland and salt meadow on the west branch of Papiack Creek; 26 acres; a five-acre piece of salt meadow including a small island on the east side of Papiack Creek;

four acres of salt marsh; meadow on either side of the causeway; one acre of upland; and “the whole of my grist mills and bolting house situate standing and being in Woodbridge on Pepaiack Creek where the bridge and causeway crosseth the same together with all the ground waters watercourses streams dams ponds millstones bolting mills...” The deed also suggests that the millpond was located to the north, i.e., upstream, of the causeway (Middlesex County Deed 6/563).

In 1787 Woodbridge Township tax ratables indicate that Isaac Prall (Prall) owned 100 acres and a gristmill. Prall was levied for a gristmill and 140 acres the following year, the final time that the tax lists identify him as a mill owner (Woodbridge Township Tax Ratables). Two years later, in 1790, a portion of the road to Blazing Star Ferry was vacated and realigned from the Presbyterian Church through William Smith’s field to the Episcopal Church (Woodbridge Township Freeholders’ Books Liber A). As Breckenridge (1946:16) clarifies, the earlier road alignment had proceeded past the back of the Kirk Green and not, as it currently runs, on the south side of the church. From this point (roughly 400 feet west of the mill site), it met with the present-day road and ran easterly across the causeway, past the mill and through the uplands to the Blazing Star landing. The source notes that much of the old road has been altered.

Isaac Prall died intestate on December 30, 1789, four years after he purchased the mill property (Monnette 1930:376). The Orphan’s Court appointed Lewis Prall, John Thorp and Robert Ross, Jr. as the legal guardians of Isaac Prall’s children, Cornelius, Catherine, Isaac and Lewis, all of whom were under 14 years of age. An inventory of Prall’s estate lists bonds, household sundries, agricultural implements, livestock and “roap at the Mill” (Middlesex County Will Packet 7687L). A division of Isaac Prall’s estate subsequently took place. From close examination of the documentation for this division, it is evident that in addition to the

mill being studied here, Prall also owned a mill to the north in Rahway (Middlesex County Division of Estates, Book 6).

D. THE DISMANTLING OF PRALL’S MILL AND SUBSEQUENT HISTORY

A portion of the division of Isaac Prall’s estate reads: “Unto the said Isaac Prall [Isaac Prall, Jr.], we have assigned and devised the lots marked 4, 5, 6, 7, 8, 12. The first of which lots No. 4 is an acre of land including the gristmill, pond, dam and stream situate lying in Woodbridge aforesaid on Woodbridge Creek...” (Middlesex County Division of Estates, Book 6). Fortunately, a detailed and revealing map accompanies the division document (Figure 3.5). This rendering clearly shows the location of the mill on the west bank of Woodbridge Creek on the southern edge of the causeway. The causeway itself is roughly 500 feet long with bridges (and perhaps also sluice gates [see Chapter 4D for further discussion of the mill’s hydropower system]) at either end. The somewhat amorphous configuration of the mill pond is depicted north and upstream of the bridge. In 1796, Jonathan Freeman was appointed as guardian of 14-year-old Isaac Prall, Jr. (Middlesex County Will Packet 88991), indicating that Isaac Prall, Jr. was approximately eight years old at the time of his father’s death.

By 1802, an analysis of tax lists reveals that eight gristmills were in operation in Woodbridge Township (Woodbridge Township Tax Ratables). Since a gristmill was not listed under Prall ownership, it is likely that the mill was not in use. Two years later the course of Woodbridge Creek was formally surveyed for the East Jersey Proprietors and the accompanying document provides the necessary evidence that buttresses this theory. In February of 1804 Ichabod Potter walked atop the frozen Woodbridge Creek and surveyed its route. He commenced in the vicinity of modern Port Reading Avenue and proceeded downstream,

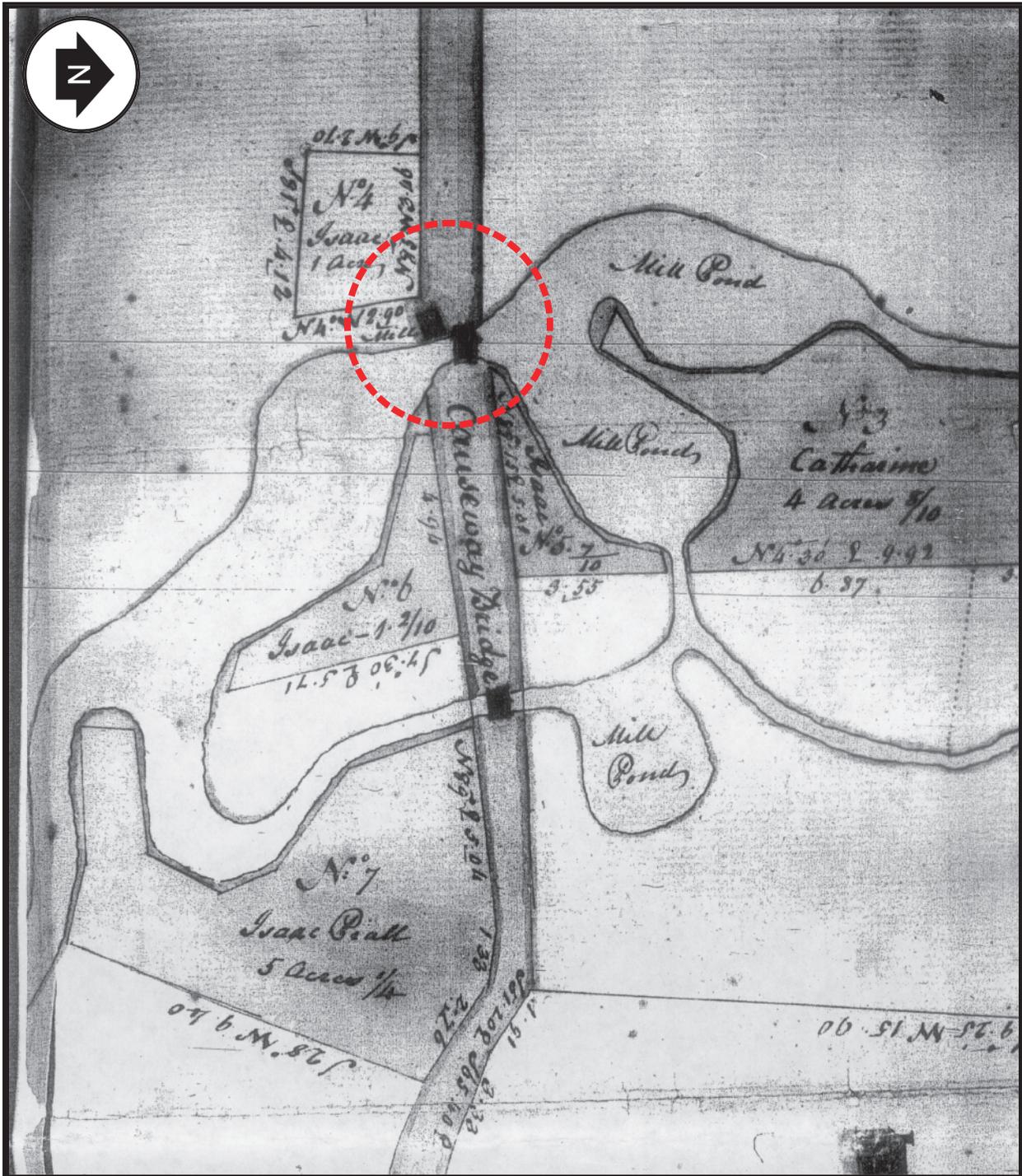


Figure 3.5. Division of Lands of Isaac Prall, Deceased. 1790. Scale: 1 inch= 280 feet (approximately). (Source: Middlesex County Division of Estates, Book 6). Location of project site circled.

southeast and then southwest, following the course of the waterway. This survey is particularly significant since it begins “at Pralls mill or a little to the eastward in the middle of the creek at the dam” at which point the width of the creek measured 1 chain and 85 links. Potter indicates that the survey begins adjacent to the “Blazing Star Road” and, most importantly, he makes the following observation, that: “the mill [was] pulled down” (General Board of Proprietors of the Eastern Division of New Jersey, Road Book 1740-1902).

A review of Prall family deeds has located various parcels that were sold by Prall family members. However, these tracts appear to be situated east of Papiack Creek, and property on the west side of the waterway could not be located. The bulk of the estate remained under Prall family ownership throughout the 19th century and a portion of the property, partially bounded by “Stone’s Mill Creek or Pond” was eventually acquired by the Metuchen Realty and Improvement Company in the early 20th century (Middlesex County Deed 451/312).

The area is shown without specific detail on the Gordon map of New Jersey in 1833 (Figure 3.6). Since the mill was taken down *circa* 1804, no water powered facility is identified at the location, although two other mills are shown in operation further to the south along the creek. The locale is also depicted on a U.S. Coast Survey map of 1836 (Figure 3.7). Curiously, this map does not depict Woodbridge Creek north of the old road to the Blazing Star, but it is helpful in showing the causeway over the tidal wetland and two channels that appear to correspond to the bridges shown on the division map of 1790 (cf. Figure 3.5). The site formerly occupied by the mill appears undeveloped.

Several years later, the Otley and Keily map of Middlesex County in 1850 provides a depiction of the course of both Woodbridge Creek and Cove Creek (Figure 3.8). Two residences owned by Cornelius

Prall, son of Isaac Prall, are shown on either side of the road to Blazing Star (modern Port Reading Avenue) to the east of Woodbridge Creek. Again, the map shows no mills along the northerly segment of the creek. To the south, a grist and sawmill belonging to “S.W. Phillips” was in operation and was located adjacent to modern Woodbridge Avenue on Woodbridge Creek. Nearly the same information is portrayed on the Walling map of Middlesex County in 1861 (Figure 3.9) and on the Everts & Stewart map of Woodbridge Township included in the Atlas of Middlesex County published in 1876 (Figure 3.10).

It is a reasonable assumption that the causeway, but more especially the bridges, carrying the predecessor of modern Port Reading Avenue across Woodbridge Creek were rebuilt on several occasions and perhaps also enlarged and realigned. Such rebuilding episodes most likely will have occurred in response to flood damage or to the need to carry new and heavier types of traffic. Clear evidence of an impending bridge replacement is given in Middlesex County’s plans for a new concrete bridge which were drawn up in 1938 (Figure 3.11). These plans show the pre-existing bridge at that time as a 24-foot-wide, 50-foot-long structure, but unfortunately they do not indicate whether this span was constructed in wood or metal. The new 50-foot-wide, 50-foot-long concrete bridge, identified as Middlesex County Bridge 1-B-17, was erected *circa* 1938-39 and is visible in an aerial photograph taken in 1940 (Plate 3.1). This aerial view is also valuable in that it shows the layout of meadows along the creek and the early stages of Woodbridge’s suburban expansion.

The concrete bridge erected in the late 1930s was soon in need of replacement as increasingly heavy traffic along Port Reading Avenue took its toll. This structure was recorded in detail in 1978 as part of a conditions assessment carried out for the County by Edwards and Kelcey, Inc. (Figure 3.12). By this time the upstream wing walls were in poor shape as a

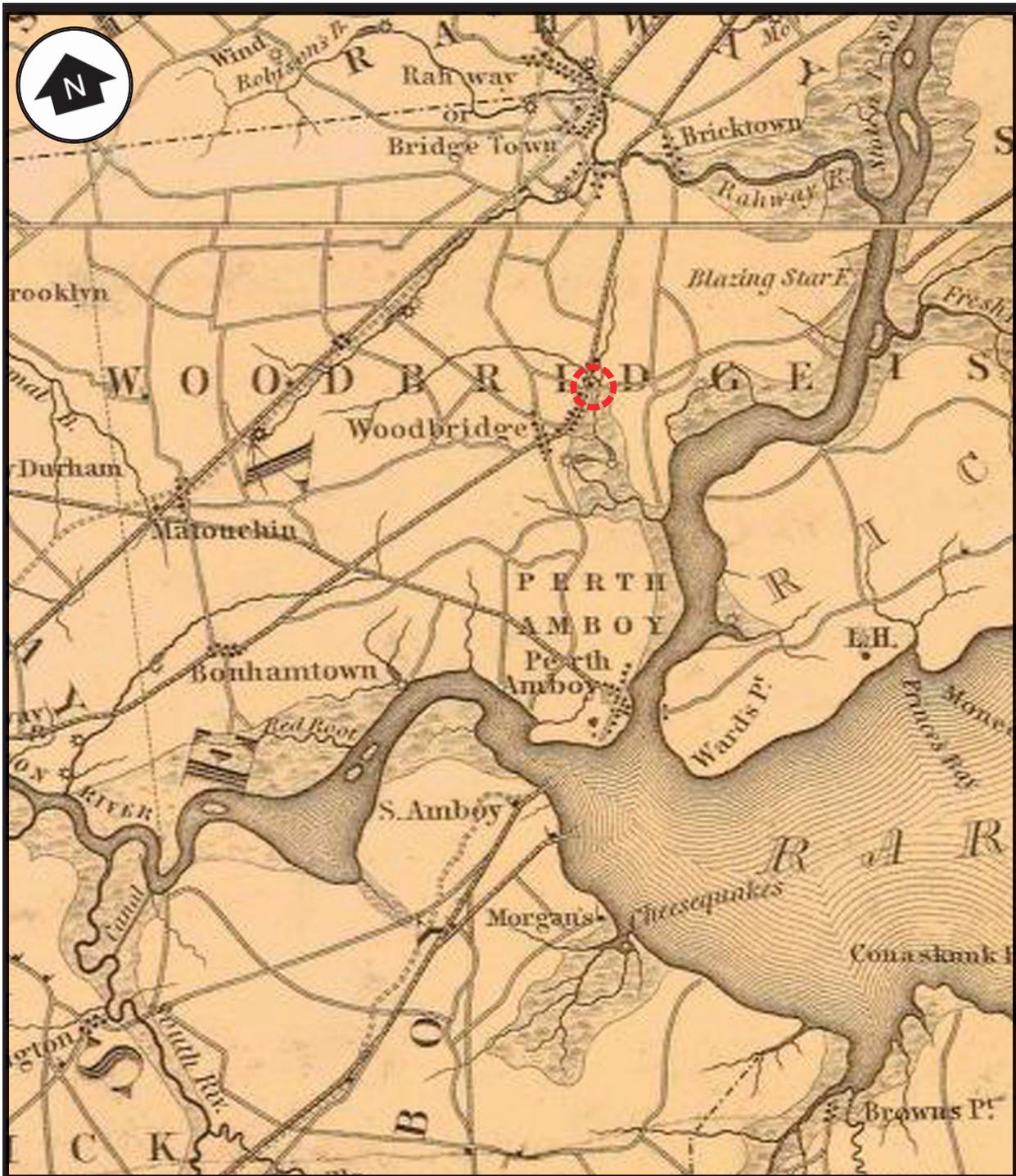


Figure 3.6. Gordon, T. *Map of New Jersey*. 1833. Scale: 1 inch= 1.8 miles (approximately). Location of project site circled.

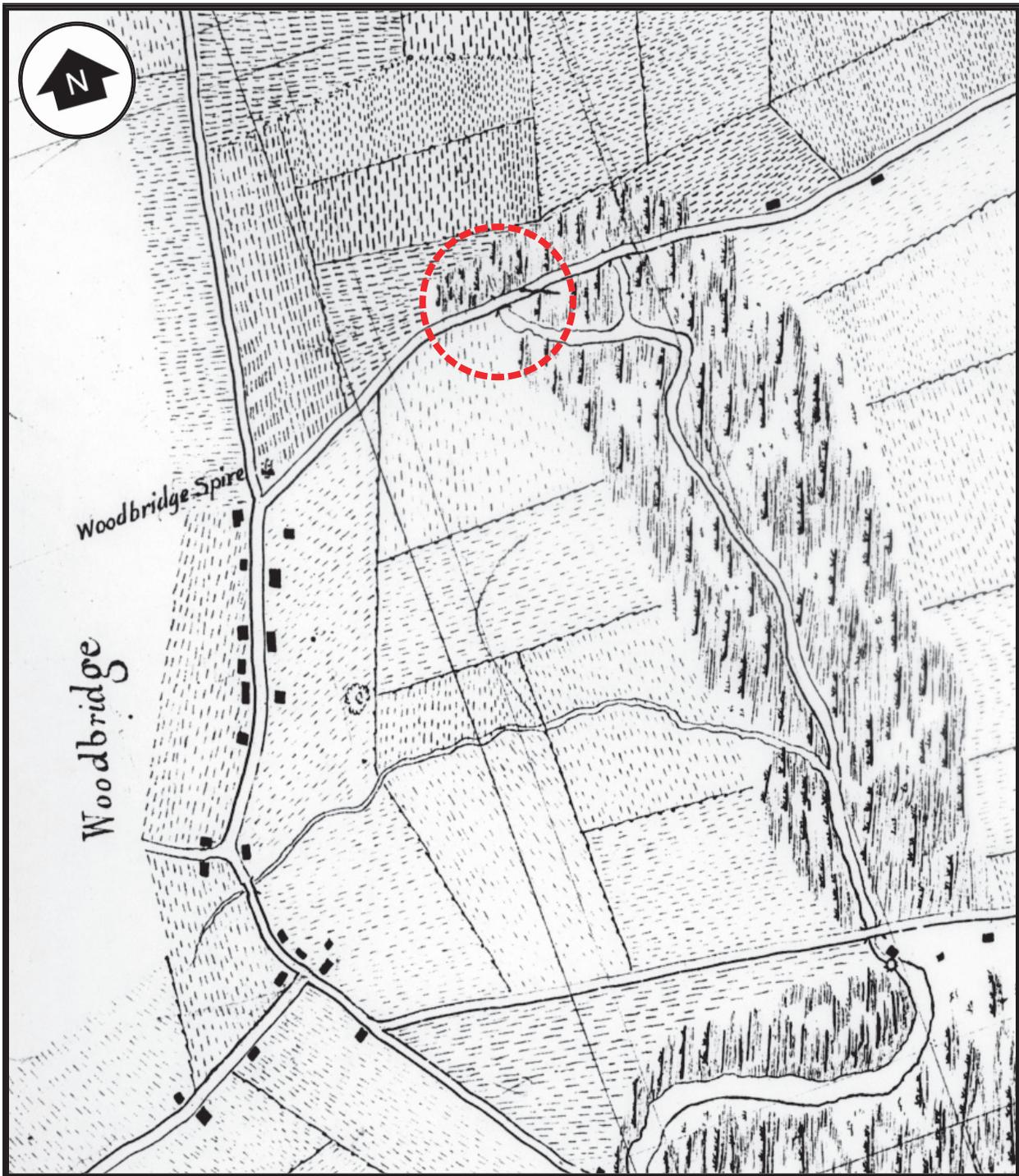


Figure 3.7. United States Coast Survey. *From Perth Amboy to Elizabethtown, New Jersey.* 1836. Scale: 1 inch= 745 feet (approximately). Location of project site circled.



Figure 3.9. Walling, H.F. Map of *Middlesex County, New Jersey*. 1861. Scale 1 inch= 1080 feet (approximately). Location of project site circled.

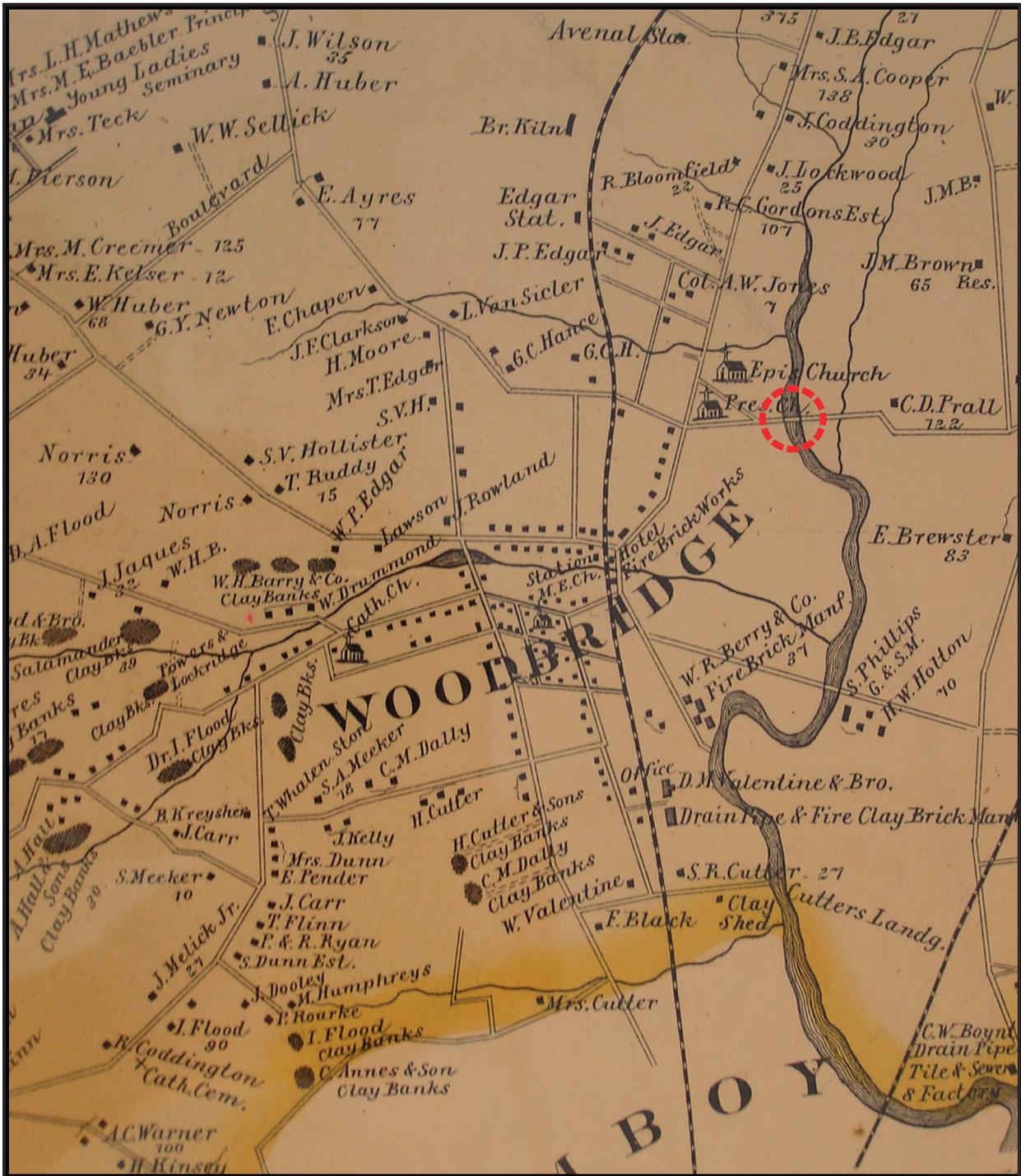


Figure 3.10. Everts & Stewart. Woodbridge Township. Combination Atlas of Middlesex County, New Jersey. 1876. Scale 1 inc= 1890 feet (approximately). Location of project site circled.

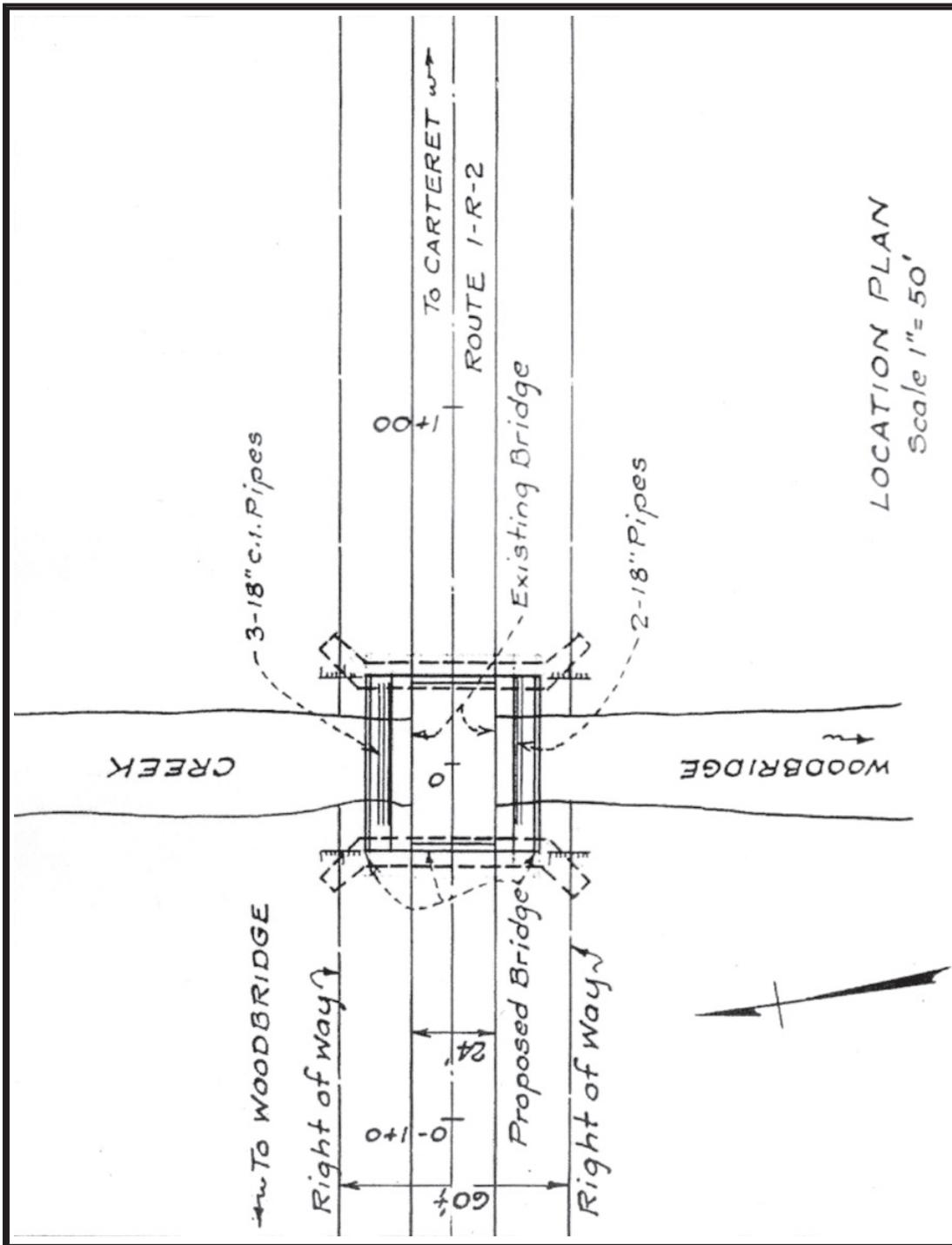


Figure 3.11. Plan of Proposed Concrete Bridge 1-B-17 and Predecessor Bridge in 1938. (Source: Middlesex County Engineer Department).

result of scouring by the creek during times of flood and extreme tidal fluctuation. The current concrete bridge, slightly wider and longer than the structure built in the late 1930s, was erected in 1988.

In addition to the periodic rebuilding of the bridge, several other infrastructure improvements have been implemented during the 20th century in the vicinity of the Port Reading Avenue crossing of Woodbridge Creek. Water lines were being carried over the creek on both sides of the bridge in the 1930s. The Sunoco Harbor line, a petroleum products pipeline, and a sanitary sewer interceptor were installed in the 1950s along the right bank of the creek. Another sanitary line feeding into the interceptor was installed across the creek upstream of the bridge. More recently, gas pipelines and replacement water lines have been built along the north and south margins of Port Reading Avenue and a storm drain has been inserted along the south side of the roadway with an outfall into the creek just downstream of the bridge on the right bank (Letter, John T. Amorosa, Louis Berger and Associates, Inc. to Lynn Rakos, U.S. Army Corps of Engineers, October 20, 2005). These utilities are discussed further in Chapter 4 and 5.

The general vicinity of the Dunham/Stone/Prall mill site is visible as vacant land in the aerial photograph of 1940 (Plate 3.1). This property was eventually acquired by the Township of Woodbridge and continues to be owned by the municipality. In 1969, a marker memorializing Jonathan Dunham was placed in front of the residence currently used as the Trinity Church rectory (Dietrich 2002). The rectory associated with the Trinity Church has been identified in various second sources as the home of Jonathan Dunham (Dally 1873:17; Wolk 1970:7; Dietrich 2002; McEwen and Troeger 2002:28). More recent observation, however, has determined that this house was constructed some time later in the first quarter of the 18th century north of the Kirk Green *circa* 1717 (Dietrich 2002). The two-story brick

dwelling, constructed atop a fieldstone foundation, was purchased by the Trinity Church in 1873 from a donor who had acquired it from the Barron family (Welles 1935:71). The house was heavily altered with Gothic elements to correspond with the style of the Trinity Church and it was enlarged to twice its size. A millstone reported to have come from Jonathan Dunham's mill is exhibited on the rectory's lawn (Dietrich 2002). Perhaps more likely, the stone displayed was utilized on the mill site during the Stone or Prall period of ownership.

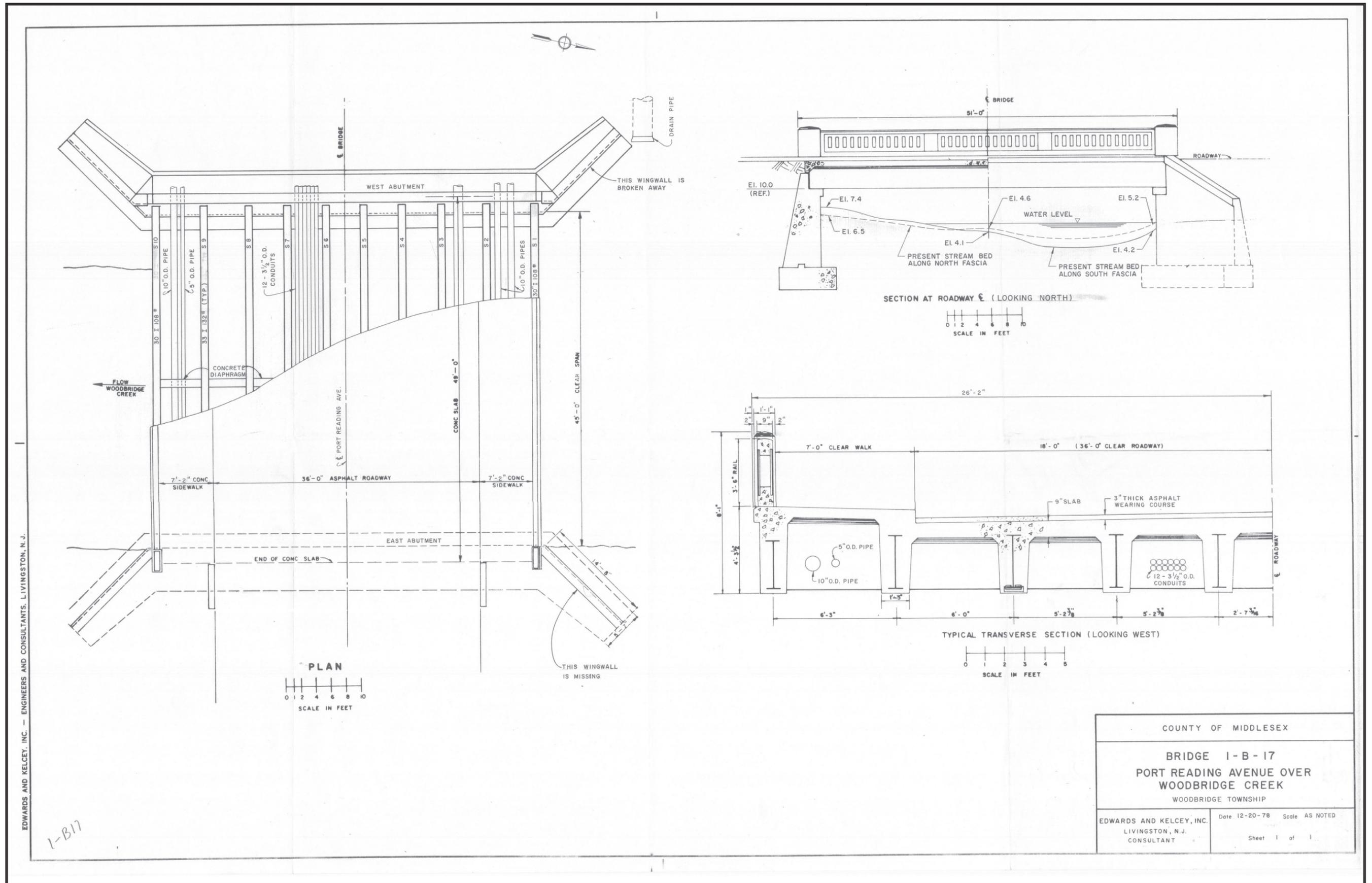


Figure 3.12. Plan and Sections of Bridge 1-B-17 (Port Reading Avenue over Woodbridge Creek), Woodbridge Township. (Source: Edwards and Kelcey, Inc. 1978).



Plate 3.1. Aerial Photograph of Woodbridge. 1940. (Source: New Jersey Bureau of Tidelands Management). Location of project site circled in red. Project area outlined in yellow.

Chapter 4

ARCHAEOLOGICAL FIELD INVESTIGATIONS

A. FIELDWORK CALENDAR

Archaeological fieldwork was undertaken on specific days over the course of several months between August 2005 and April 2006. These days were chosen to coincide with low tide conditions during daylight hours in the regular work week so that archaeological features in the creek bed could be examined at times of maximum visibility.

The first formal field visit was carried out on Thursday afternoon, August 18, 2005 at which time a meeting was held at the Woodbridge Hungarian Club at 95 Port Reading Avenue. The venue was chosen because of its close proximity to the project site on the right bank of Woodbridge Creek immediately upstream of the Port Reading Avenue crossing. In attendance were Lynn Rakos (U.S. Army Corps of Engineers, New York District), Richard W. Hunter, Damon Tvaryanas and Nadine Sergejeff (Hunter Research), Richard E. Crowley (local historian, Manville, New Jersey) and Robert McEwen and Ernie Oros (local historians, both of Woodbridge, New Jersey). The purpose of the meeting was to gather information from local informants who were knowledgeable about the history of Jonathan Dunham's mill, to share the information developed to date in connection with the current research project and to conduct a preliminary field inspection of the suspected mill site. Dead low tide occurred at 1:44 p.m. and was estimated to be -0.1 feet below mean sea level.

Additional field visits were made on Thursday, December 8 and Monday, December 12, 2005 and January 26 and March 28-20, 2006, again at times when dead low tide approached as much as one foot below mean sea level. Cold wet weather and frozen ground on January 26 resulted in postponement of the final phase of field investigation until late March

2006. At each successive field visit more of the archaeological remains in the creek were exposed and interpretation of what was being found was refined.

B. GENERAL DESCRIPTION OF PROJECT SITE

In the vicinity of the Port Reading Avenue crossing Woodbridge Creek pursues a winding course, flowing close to the western edge of the floodplain (Figures 1.3 and 4.1; Plate 4.1). Some 200 feet upstream of the bridge, one of the creek's larger tributaries, Cove Creek joins the main channel, meandering through the wetland in a generally southwesterly direction. Roughly 1,000 feet upstream of the bridge, another smaller, channelized tributary, Wedgwood Brook, flows in from the west. Downstream from the bridge the creek flows due south for approximately 120 feet before turning east and southeast and receiving additional flow from a side channel that draws water from Cove Creek, passes beneath the eastern end of the Port Reading Avenue causeway and joins the main channel roughly 1,000 feet south of the road.

In the immediate vicinity of the Port Reading Avenue bridge Woodbridge Creek is roughly 30 to 40 feet in width (Plates 4.2-4.4). The creek bed is composed of clay and siltstone and covered with mud, scattered stone, brick and concrete rubble and assorted debris. The land rises roughly five to six feet above the level of the creek bed on either bank. To the east of the creek, the terrain is mostly tidal wetland covered with phragmites and other tidal marsh grasses and weeds. To the west, the land is filled. Upstream (north) of the bridge, the fill on the right bank supports the parking lot of the Woodbridge Hungarian Club; downstream to the south, an informal gravel and grass-covered parking area is accessed from Watson Avenue adjacent to a storm water drain outfall (Plates 4.5 and 4.6).

C. ARCHAEOLOGICAL REMAINS IN THE CREEK

On those days when fieldwork was carried out visibility of the creek banks and the creek bed was reasonably good with only the deepest parts of the center of the creek bed being obscured from view by water. However, both the bed and sides of the creek were in many places masked by mud and eroding fill composed of rubble and mixed debris. Also, wading in the water tended to stir up the muddy creek bed, which made observation of submerged features difficult. Typically, as the tide receded, between three and four fieldworkers wielding picks, shovels and trowels, measuring tapes and cameras scrambled to expose and record timber remains during a brief window that lasted no more than two to three hours on any given day. In these same brief recording windows, elevation data were also gathered for key features using a total station referenced to a benchmark on the Port Reading Avenue bridge. The various remains identified in the banks and sides of the creek are described in the following paragraphs moving downstream from the confluence of Cove Creek and Woodbridge Creek to the bend in the river roughly 120 feet south of the Port Reading Avenue crossing (Figure 4.1).

Upstream of Port Reading Avenue features of particular archaeological interest were encountered within 20 feet of the upstream face of the bridge. A series of visits to the site over the fall and winter of 2005-06 allowed for the gradually unfolding exposure of substantial historic timber remains in this area on both banks of the creek and in the creek bed (Figure 4.2; Plates 4.7-4.9).

Initially, on the west side of the creek, one very long timber beam was found set into the creek bed in a matrix of hard-packed gravelly stone and clay (Plates 4.9 and 4.10). This beam, eight by nine inches in cross section and at least 16 feet long (its western extent was not established), projected out from the base of the bank and ran west-east to roughly the mid-point of the creek. On its downstream side it was abutted by at least one piece of horizontal planking, which appeared to have been set into the creek bed and was

presumably designed to hold the beam in place. While this beam may have been dislodged slightly (based on its relationship to other nearby timber components), it is essentially *in situ* and resisted all efforts to pry it loose by hand.

Set perpendicular to the downstream side of the large west-east beam, roughly 12 feet from the latter's eastern end, was a smaller beam, five feet long and five by seven inches in cross section (Plates 4.10 and 4.11). This beam was also set into the hard-packed gravelly stone and clay matrix and was again immovable. It was not attached to the larger beam, but butted up against it. Immediately to the west, separated by six to seven inches of the gravel/clay matrix, a slightly larger and longer north-south beam, 5.5 feet long and eight inches wide, was set into the creek bed.

Against the western edge of this beam was butted a series of five adjoining horizontal planks, each 8.5 inches wide and one inch thick (Plates 4.10 and 4.11). This floor-like area of planking, the surface of which was at 1.11 feet above sea level, extended west for at least four feet and disappeared beneath the base of the riverbank. The top surface of the smaller of the two north-south beams was at 1.18 feet above sea level, while the surface of the large east-west beam was at 1.14 feet above sea level. The creek bed adjacent to the latter beam was at an elevation of 0.61 feet above sea level. In part because of their all being tightly embedded in the same hard-packed gravelly stone and clay and partly because the various timbers display abutting relationships, this cluster of timber remains is judged to belong to a single constructional episode.

Directly across the creek on the opposite eastern bank, further timbers were observed that continued the alignment of the features found on the western bank and in the creek bed (Figure 4.2; Plate 4.12). Two small horizontally laid north-south beams, each five by seven inches in cross section and approximately 4.7 feet in length, were initially noted, spaced 3.5 feet apart. Both beams were set into a thick clay and secured in place on the western side by a single upright plank set on end and rammed into the creek bed. The top surface of the westernmost beam was

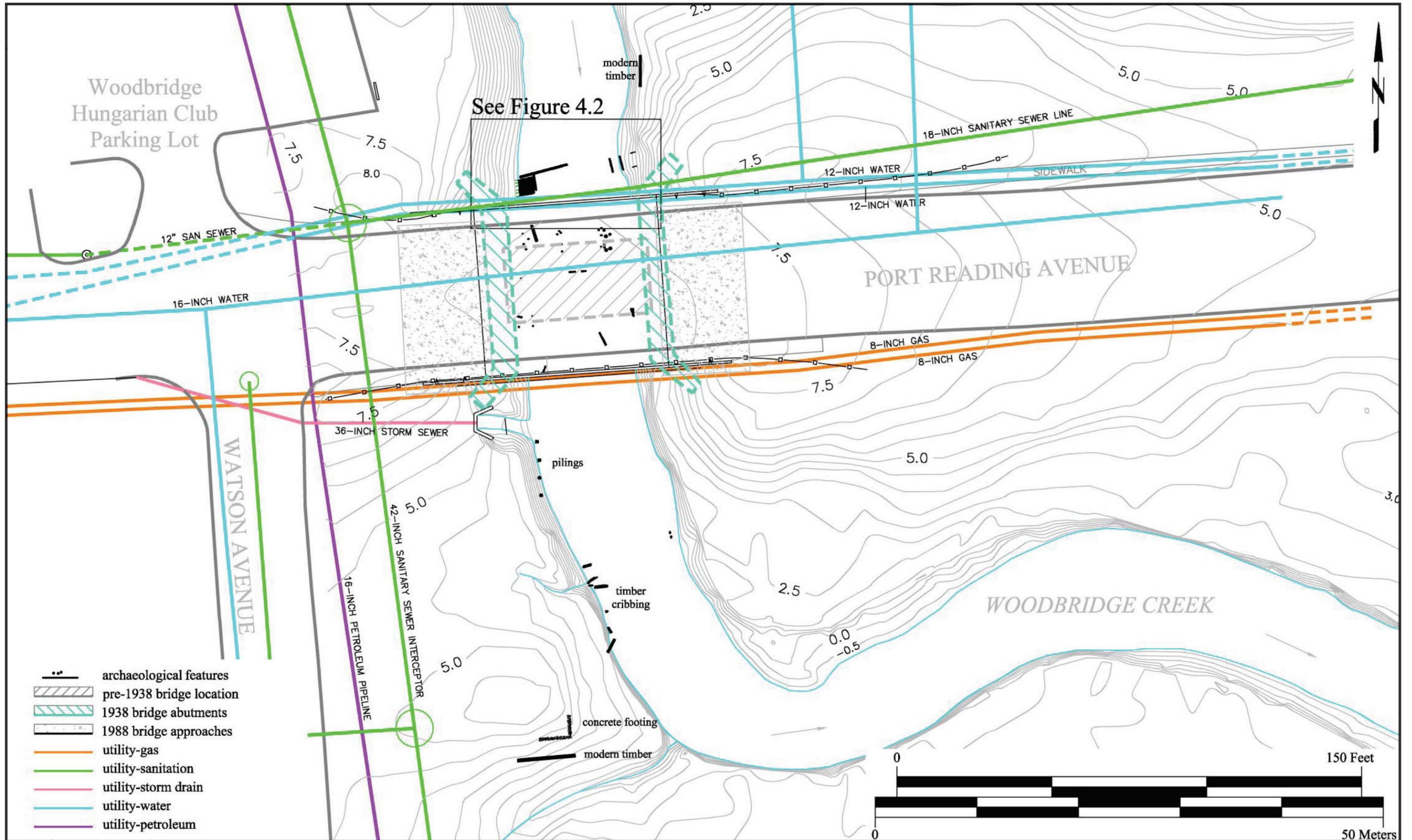
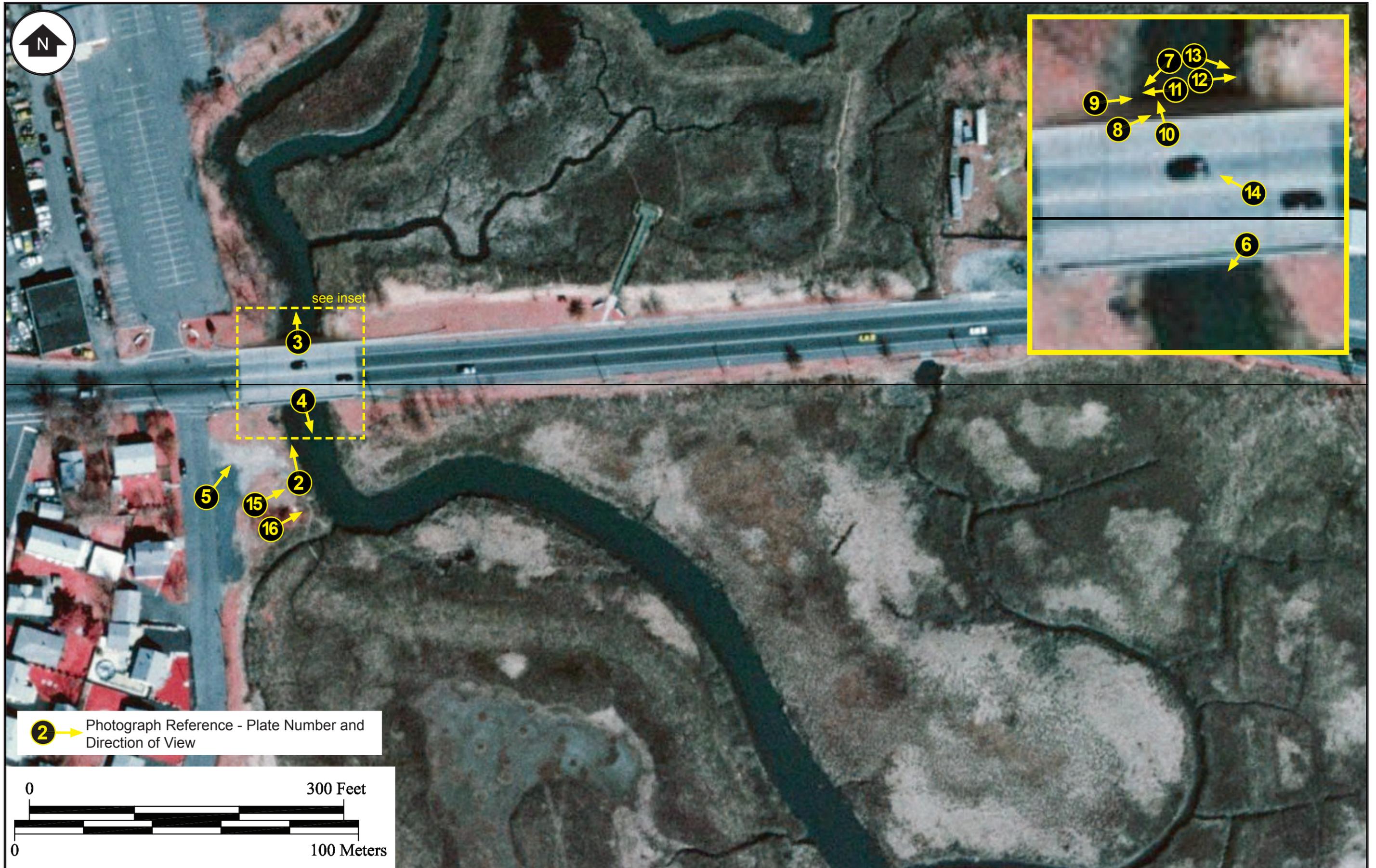


Figure 4.1. Overall Site Plan Showing Archaeological Features, Recent Bridges and Utility Lines.



2 → Photograph Reference - Plate Number and Direction of View

Plate 4.1. Modern Aerial View of Port Reading Avenue Crossing of Woodbridge Creek Showing Direction of View of Field Photographs. (Source: New Jersey Department of Environmental Protection, 2005).

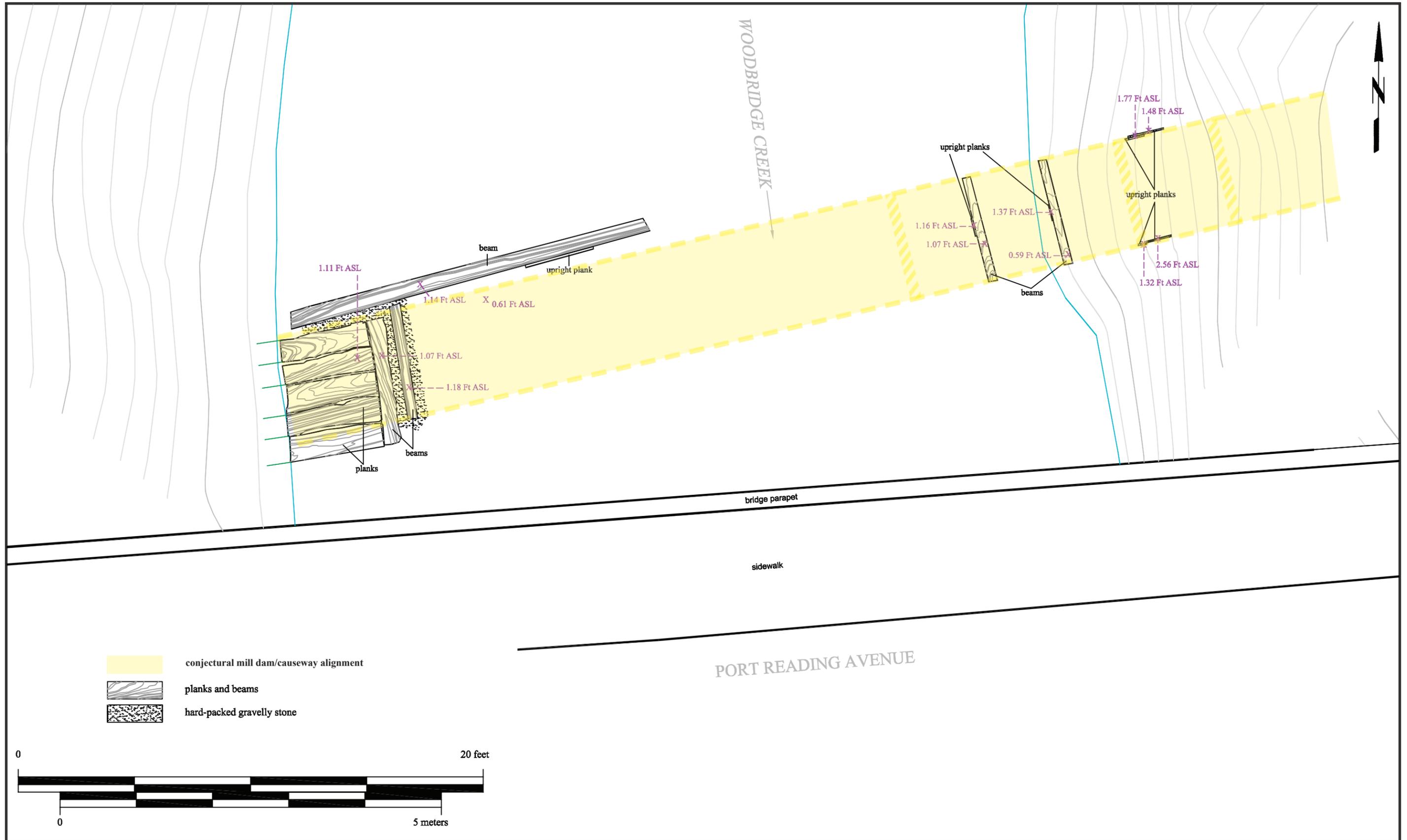


Figure 4.2. Detailed Plan View of Timber Remains.



Plate 4.2. View looking north up Woodbridge Creek at the Port Reading Avenue Bridge (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:37).



Plate 4.3. View looking north up Woodbridge Creek from the Port Reading Avenue Bridge (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:46).



Plate 4.4. View looking south down Woodbridge Creek from the Port Reading Avenue Bridge (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:32).



Plate 4.5. View looking northeast toward Port Reading Avenue from Watson Avenue showing the proposed public access area (boat launch, parking and interpretive area) and the suspected location of the Dunham, Stone and Prall Mills (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:44).



Plate 4.6. View looking southwest toward Watson Avenue from Port Reading Avenue showing the proposed public access area (boat launch, parking and interpretive area) and the suspected location of the Dunham, Stone and Prall Mills (Photographer: Lynn Rakos, April 2005) (HRI Neg.#05091/D3:01).



Plate 4.7. View looking southwest showing the right bank of Woodbridge Creek immediately upstream from the Port Reading Avenue bridge; archaeological fieldworkers are removing rubble and mud to expose timber remains (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:06).



Plate 4.8. View looking east showing the left bank of Woodbridge Creek immediately upstream from the Port Reading Avenue bridge; Port Reading Avenue at right; archaeological fieldworkers are removing rubble and mud to expose timber remains (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:12).



Plate 4.9. General view looking northeast showing showing timber remains in the bed of Woodbridge Creek immediately upstream from the Port Reading Avenue bridge; in left foreground are wood beams and planking; at top right, shovels indicate continuation of alignment of timber remains on the left bank (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:28).



Plate 4.10. View looking north showing wood beams and planking on the right bank of Woodbridge Creek immediately upstream of the Port Reading Avenue bridge; scales in feet (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:13).



Plate 4.11. View looking west showing wood beams and planking on the right bank of Woodbridge Creek immediately upstream of the Port Reading Avenue bridge; scales in feet (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:08).



Plate 4.12. View looking east showing timbers being exposed on the left bank of Woodbridge Creek immediately upstream of the Port Reading Avenue bridge; shovel in foreground marks the upstream end of a horizontal wood beam that continues the alignment of the remains found on the right bank of the creek; this beam was removed for dendrochronological analysis (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:20).

at elevation of 1.07 feet above sea level. To the east of the easternmost beam and continuing the same general east-west alignment and 3.5-foot spacing were two sets of upright planks were observed projecting from the muddy riverbank. The weathered top edges of these planks were at elevations ranging between 1.32 and 2.56 feet above sea level. It is a reasonable assumption that additional timbering survives beneath the river bank and would be encountered if one were to excavate eastward and upward, away from the creek bed.

Considerable effort was expended trying to extricate timbers from the creek bed that might be suitable for dendrochronological analysis. Despite working with crowbars and pick axes, none of the beams on the west side of the creek could be loosened, but eventually the easternmost of the two smaller beams on the east bank was pried up from its clayey surrounds (Plate 4.13). Probing of the bank immediately beneath the location of this beam established that other timbers lay more deeply buried directly under and adjacent to the timber that had been removed. A nine-inch-thick sample was sawn from the extricated beam and, with assistance from Dr. Richard Veit of Monmouth University, was submitted to the Lamont-Doherty Earth Observatory Tree-Ring Laboratory for analysis. The beam was identified as poplar, a wood species for which Mid-Atlantic tree-ring reference data has been developed extending back to 1750. The timber retrieved from Woodbridge Creek does not match the reference data and on this basis is tentatively thought to date from earlier than the mid-18th century (Richard Veit to Richard Hunter, e-mail correspondence, April 26, 2006).

Based on the identification of this one beam as being poplar, it is likely that the other two beams of similar dimensions, and perhaps the slightly larger beam that defines the eastern edge of the planking on the west side of the creek, are also poplar. The large east-west beam and planks are of uncertain wood type, but are perhaps less likely to be poplar (see below, Section E of this chapter, for further discussion). In examining all of the timber remains found just upstream of the Port Reading Avenue crossing of Woodbridge Creek,

no evidence was found for the use of timber joints, such as mortises or tenons, or iron hardware, in securing or attaching the various timber components.

Beyond this concentration of timber remains, further upstream, the creek banks display occasional modern timbers and concentrations of rubble fill, but no trace of earlier remains was noted. Immediately beneath the westbound lanes of the Port Reading Avenue bridge a cluster of wood pilings was observed in the bed of the creek (Figure 4.1; Plate 4.14). These pilings, which comprise logs and roughly shaped beams that have been driven into the creek bed, are interpreted as part of the superstructure which supported the bridge that was replaced in 1938-39 (see above, Chapter 3D).

Downstream of the Port Reading Avenue crossing a few additional timbers and posts were observed, mostly along the west side of the creek between approximately 15 and 90 feet south of the southern face of the bridge. The date and function of these timbers is unclear, although they most likely are the remains of 20th-century bulkheading along the creek edge. It is unlikely that they represent traces of 17th-century and/or 18th-century mill related structures.

D. OTHER SURFACE FEATURES

Surficial inspection of the more elevated areas bordering either side of Woodbridge Creek, upstream and downstream of the Port Reading Avenue crossing indicated that fill has been placed atop much of the property immediately adjoining the roadway. On the east side of the creek, the fill quickly gives way to tidal wetland vegetation as one moves 30 feet or so away from the top of the causeway. On the west side of the creek, thicker fill deposits, perhaps up to five feet in places, extend for at least 100 to 150 feet north and south of the Port Reading Avenue roadway. The area between Watson Avenue and the creek to the south of the road, and the ground underlying the Woodbridge Hungarian Club parking lot, are both predominantly fill (Figure 4.1).



Plate 4.13. View looking southeast showing wood beam being removed from the left bank of the creek for dendrochronological analysis (Photographer: George Cress, March 2006) (HRI Neg.#05091/D1:45).



Plate 4.14. View looking northwest showing pilings under the Port Reading Avenue bridge over Woodbridge Creek; these timbers are probably part of the superstructure which supported the bridge that was replaced in 1938-39 (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:10).

Richard E. Crowley pointed out the remains of two sides of a small rectangular concrete foundation situated approximately 120 feet south of Port Reading Avenue and approximately 20 feet from the western bank of Woodbridge Creek (Plate 4.15). Based on the land use history of the area along Watson Avenue and the fact that these remains are constructed of form poured concrete, they likely date from the early to mid-20th century and thus post-date the period during which the Dunham/Stone/Prall mill site was in use. They may represent the footings of a shed or garage on the riverbank. Mr. Crowley also pointed out a large wood timber approximately 10 inches square and 18.5 feet long lying on the ground surface approximately five feet to the south of the concrete foundation (Plate 4.16). This timber was considered to be *ex situ* and its origin is uncertain. It may be part of the structure that stood on the nearby concrete foundation. Again, this timber without question arrived at this location long after the Dunham/Stone/Prall mill site was abandoned.

E. SYNTHESIS

The modern crossing of Port Reading Avenue over Woodbridge Creek, achieved via a concrete bridge and an asphalt-capped earth and rubble causeway, is but the most recent version of an engineering work that archival study suggests has its origins in the late 17th century. Over more than three centuries there have been many bridges at this location – at least three successive spans in the 20th-century alone (pre-1938; *circa* 1938-1988; and the current structure erected in 1988-89). The causeway, which historically doubled as a mill dam, has undoubtedly also been rebuilt and enlarged multiple times during this 300-year period. Its alignment, as suggested by the archaeological evidence discussed below, may also have shifted. Over the past half century or so the land surrounding the crossing has been partially filled, especially on the west side of the creek, and numerous utilities (gas and petroleum pipelines, water and sanitary sewer lines, storm drains) have been installed in the area, running both across and parallel to the stream channel.

Archival evidence discussed above in Chapter 3 indicates clearly that the general vicinity of the Port Reading Avenue crossing of Woodbridge Creek is the site of the gristmill owned by William Stone and Isaac Prall in the late 18th century. Although less conclusive, the archival evidence also suggests strongly that the Stone/Prall mill occupied the same site as the gristmill established by Jonathan Dunham/Singletary in 1670-71. Potentially in operation for well over a century, the site went out of use around 1800 and saw no subsequent water-powered usage. If traces of the Dunham/Stone/Prall mill survive at this locale more than two centuries after its abandonment, it is reasonable to expect that these will be deeply buried and obscured by subsequent modification of the bridge, causeway and surrounding land. Such remains may also have been compromised by periodic flood damage and tidal fluctuations, by the various episodes of bridge and causeway construction and, most especially, by the installation of utilities.

The current program of archaeological fieldwork, carried out without the benefit of earthmoving and dewatering equipment, has been limited to visual inspection and removal of surface rubble and mud at low tide. This work has failed to find any clear evidence of archaeological remains related to the Dunham, Stone or Prall mill buildings, but tantalizing, probable mill-related remains have been identified in the sides and bed of the creek immediately upstream of the present bridge. Elsewhere along the creek and on the adjoining riverbank, various timbers and concrete remains have been noted, but in every instance these are thought to date no earlier than the late 19th century.

Upstream of the bridge, a 40-foot stretch of historic timber remains has been documented straddling the creek. These consist mostly of horizontally laid beams and upright planks set tightly into a hard-packed gravel and clay matrix, along with a section of horizontal planking that projects out from the base of the west bank of the creek. These remains show some regularity in their spacing and they clearly form part of a larger structural whole. Elevations taken on the various timbers indicate that these remains are mostly between 0.5 and 2.5 feet above mean sea



Plate 4.15. View of concrete foundation on the right bank of Woodbridge Creek downstream of the Port Reading Avenue bridge (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:41).



Plate 4.16. View of large timber on the right bank of Woodbridge Creek downstream of the Port Reading Avenue bridge (Photographer: Damon Tvaryanas, August 2005) (HRI Neg.#05048/D2:40).

level, essentially at the same level as the creek bed. The timber remains extend for an unknown distance both further west and east into and beneath the banks of the creek.

The timbers show no evidence of carpentering joints. No construction hardware (e.g., nails or spikes) was recovered. The structure appears to have been assembled through a series of mostly abutting relationships and was held in place by upright and horizontal planks set on edge. The structural system as a whole was driven and wedged into the creek bed and packed in gravel and clay. This mode of timber construction is relatively typical of how historic mill dams were built. There are similarities, for example, with the “safe and economical dam” for which simple specifications were drawn up by James Leffel in the late 19th century (James Leffel & Co. 1881:11-14) (Figure 4.3). Likewise, as Norman Smith notes in his *A History of Dams*, early dams “were unsophisticated pieces of work formed basically from a collection of logs or beams laid at right angles to each other so as to build up a stout wooden framework. All manner of configurations were popular, and a common feature was a filling, between the wooden bars, of earth, stones, gravel or brushwood, or some combinations of these materials. The fill was compacted as much as possible to give the whole structure weight, stability and watertightness” (1972:146).

What apparently have survived here are the very lowest portions of an early mill dam. The structure is aligned roughly west-east, but is set at a slight angle to the present-day road alignment (Figure 4.4). It is clearly representative of an entirely different and earlier crossing of Woodbridge Creek that predates the bridge replaced in 1938-39 (see above, Figure 3.11). Indeed, its alignment would seem to reflect the slightly angled causeway shown in the Prall division map of 1790 (see above, Figure 3.5). The somewhat inconclusive dendrochronological evidence noted earlier may place the dam even earlier, prior to 1750, which might suggest its association with Dunham’s Mill.

Unfortunately, there is no clear indication of exactly where within the dam/causeway structure these remains actually lie. It is uncertain, for example, whether they are within the body of the dam or, for that matter, whether the large east-west beam represents the upstream face of the structure. The downstream face most likely lay further downstream and was destroyed in this area by later bridge construction and installation of an 18-inch sanitary sewer line.

The regular spaced remains on the east bank are probably traces of dam cribbing – some of the compartments which were formed by building up the framework of the dam almost in the style of “Lincoln logs.” The remains on the west bank are less easily interpreted. The one very large beam may be one of the transverse foundation “logs” that Leffel describes being laid across the creek bed at the bottom of the “safe and economical” dam structure. The section of horizontal planking may represent deliberate infilling of the crib structure, a platform at the base of a compartment within the dam on to which was piled rubble fill, but an alternative explanation for this relatively elaborate timbering could be that it formed the floor of a sluice gate. If this latter interpretation is correct, these remains may be in the vicinity of the western end of the “causeway bridge” as shown on the Prall division map of 1790 (see above, Figure 3.5), where a sluice gate could have been situated immediately adjacent to the east end of the mill building on to which was likely affixed the mill’s waterwheel.

If one accepts that these dam remains can be linked to the mill and hydropower configuration shown in the Prall division map of 1790, this would place the site of the actual Prall mill to the west of the creek, probably beneath or immediately to the south of the western approaches to the Port Reading Avenue bridge, and beneath or just east of Watson Avenue (Figure 4.4). This may also be the approximate location of the predecessor mills of William Stone and Jonathan Dunham/Singletary. This area has been disturbed in part by successive bridge replacement projects and is crisscrossed by several utilities, the installation of some of which has entailed the open-cut excavation of trenches in excess of ten feet in depth. Archaeological

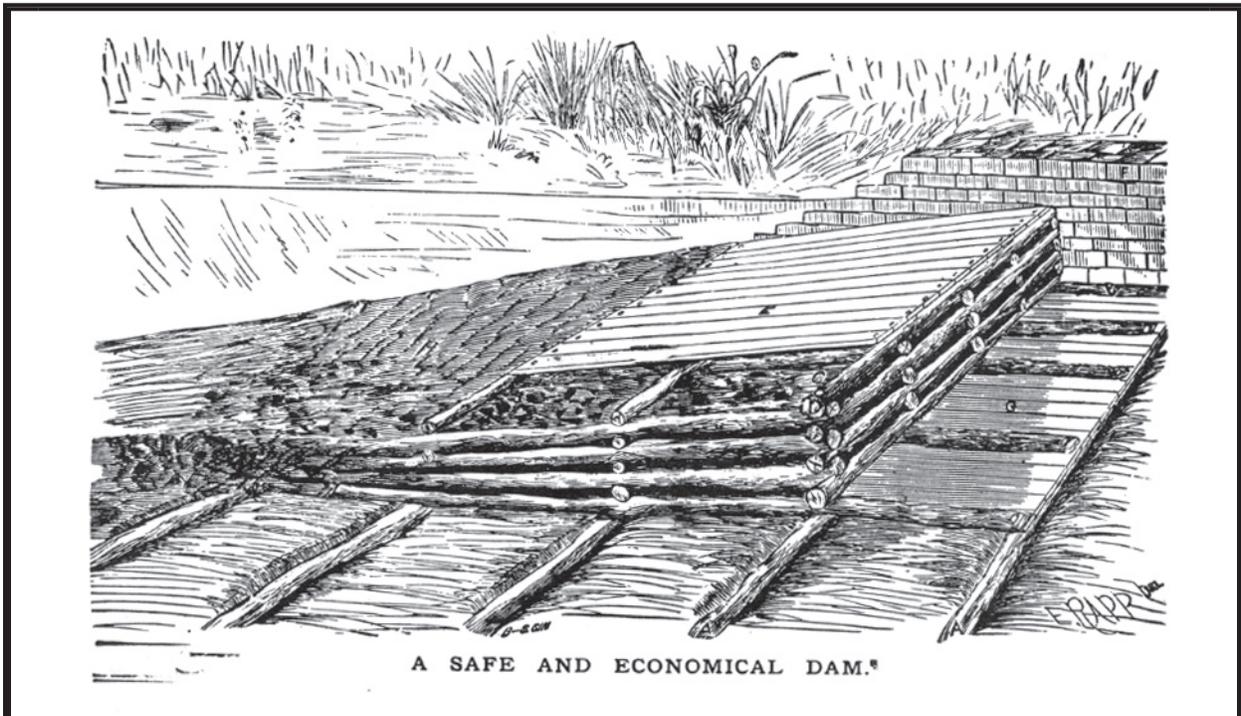


Figure 4.3. "A Safe and Economical Dam." (Source: James Leffel & Co. 1881:12 [reprinted 1972]).

remains of the mill building may extend slightly below the present-day level of the creek bed, but are unlikely to be more than ten feet below the level of Port Reading Avenue. While pockets of intact mill-related archaeological remains may survive in this area, the core of the mill site is probably somewhat compromised.

In all likelihood, the mill or mills situated at the Port Reading Avenue crossing of Woodbridge Creek were powered in large part by the tide. Tide mills are a long forgotten, but once quite common, type of water-powered agricultural processing facility found all along the Atlantic seaboard of North America. Their former abundance in areas with substantial tidal fluctuation like Nova Scotia and Maine (Wells 1869; Robertson 1986:15-19), the Boston area and Long Island is well known, but their existence also in less tidally dramatic settings like the Mid-Atlantic coast of New Jersey is underappreciated. In fact there were numerous tide mills in operation on tributaries draining into the Lower Raritan River and the Arthur Kill in the 18th century and the Dunham/Stone/Prall mill was almost certainly one of these.

The configuration of the mill site and its hydropower system as shown in the Prall division map of 1790 is typical of what one would expect of a tide mill. The causeway served as a dam and evidently had two bridges, one at either end. These bridges very likely also spanned sluice gates which controlled the water supply for the mill. On the incoming tide, these gates would have been left open so that the pond area upstream of the causeway filled with water. At high tide the gates were closed and, once a sufficient differential existed between the water level in the pond and the level of the receding tide downstream of the causeway, water could be released through the western sluice gate on to the mill wheel. The gate at the eastern end of the causeway was probably left closed, but could be used in the event surplus water needed to be released. By reversing the direction of the drive mechanism tide mills could also operate on the incoming tide, thereby providing additional milling capacity (although many tide mills only bothered to operate on the outgoing tide).

To gain a better sense of how the Dunham/Stone/Prall tidal gristmill might have looked in the landscape, one may look to well documented examples of very similar structures in nearby Long Island. One such mill, the Gerritsen Tide Mill on Gerritsen's Creek in Brooklyn, serves as a particularly good comparison (Plates 4.17 and 4.18). From the mid-18th century up until destruction by fire in 1936, this mill was similarly positioned at the western end of a causeway in tidal wetland with one sluice gate close to the mill and a second one further east along the causeway (Hunter Research, Inc. 2002).

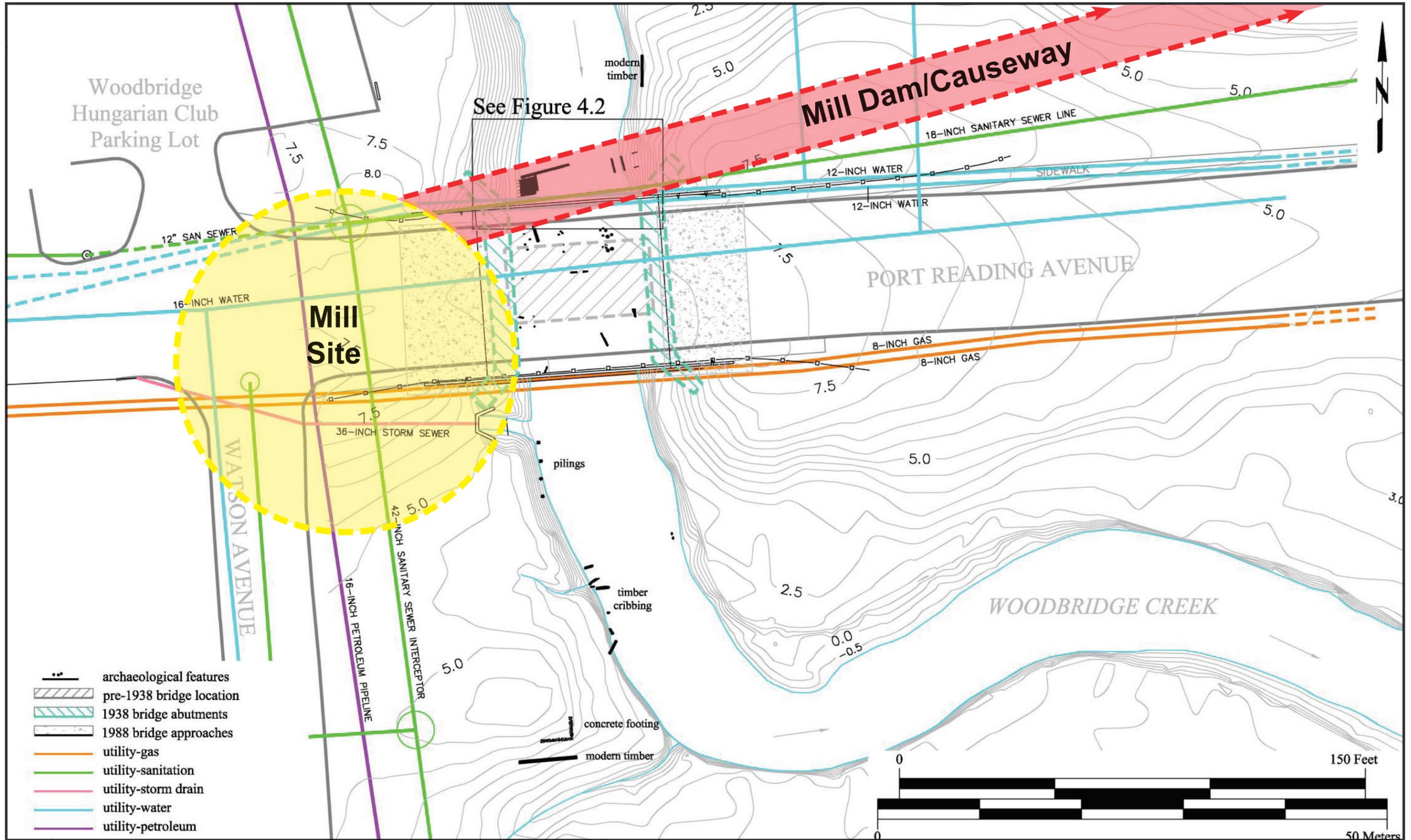


Figure 4.4. Overall Site Plan with Conjectured Location of Mill Site and Dam.



Plate 4.17. Early 20th-century view of the Gerritsen Tide Mill, looking east; milldam at left (Source: Ricciardi 2002).



Plate 4.18. Early 20th-century view of the Gerritsen Tide Mill, looking north; milldam with sluiceway at right (Source: Ricciardi 2002).

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

A. EVALUATION OF SIGNIFICANCE

Historical and archaeological investigations of the area surrounding the Port Reading Avenue crossing of Woodbridge Creek indicate that this location was the site of a gristmill owned by William Stone from at least the mid-1760s until 1786. The mill property was acquired by Isaac Prall in the latter year and continued in operation certainly until his death in late 1789 and perhaps into the 1790s. By 1804 the mill had been “pulled down.” Although a chain of ownership has not been established back into the early 18th and late 17th centuries linking William Stone to the Dunham family, every indication is that this location is also the site of Dunham’s Mill, established in 1670-71 and one of the earliest documented gristmills in New Jersey. From its position on the downstream tidal section of Woodbridge Creek, clear references to a mill dam that doubled as a causeway across the wetlands, and consideration of topographic and hydropower issues, it is fairly certain that this facility was always a tidal mill.

Archaeological study, which involved carefully targeted inspection of the banks and bed of Woodbridge Creek along with some limited manual excavation, found remains of timber cribbing and planking that are interpreted chiefly as parts of the 18th-century (possibly also late 17th-century) mill dam. The remains on the west bank of the creek may also relate to the base of a sluice gate and bridge crossing at what would have been the western end of the late 18th-century causeway. These remains are immediately upstream of the present-day bridge that carries Port Reading Avenue over the creek. Timber remains, chiefly pilings, of earlier bridge crossings were noted beneath the existing bridge and probably date from

the later 19th and early 20th centuries (these may be remnants of the bridge that was replaced by Middlesex County in 1938-39).

On the basis of these interpretations of the archaeological evidence in the field, the probable location of the mill building is thought to lie partially beneath modern Port Reading Avenue and Watson Avenue on the west side of the bridge, extending perhaps 60 feet to the south of the road (Figure 4.4). This area has been heavily modified over the past 75 years or so through successive replacements of the bridge and installation of various utilities (petroleum product and gas pipelines, sanitary and water lines, and storm drains), but mill-related archaeological features may yet survive at depths in excess of three to five feet below existing grade in between and possibly below these modern disruptions. Further remnants of the historic dam/causeway and eastern sluice gate/bridge may also survive in the wetlands to the east of the creek (possibly at depths of as little as one foot below the present ground surface), and more of the hypothesized western sluice gate/bridge may be intact on the west bank of the creek upstream of the bridge (at depths of perhaps five to seven feet). On the assumption that Woodbridge Creek may have been historically navigable as far upstream as the mill, traces of wharves, bulkheading and other buildings may survive in the area extending west of the creek to Watson Avenue immediately to the south of the mill. Such remains could be close to the surface at the present-day creek edge, but are likely more deeply buried (at least three to five feet below grade) further to the west.

The mill-related remains identified in the banks and bed of Woodbridge Creek and any of the other remains postulated as surviving on the adjoining west and east banks of the creek are considered eligible for listing in the New Jersey and National Registers of Historic Places. These are significant under National Register Criterion D for their ability to provide important information concerning the historical development of Woodbridge during the 17th and 18th centuries as well as information concerning early tide mill technology in New Jersey. The mill site is also eligible for listing on the New Jersey and National Registers of Historic Places under Criterion B for its association with Jonathan Dunham, who was an important figure in the 17th-century history of the town of Woodbridge. The Dunham/Stone/Prall mill was integral to the economic growth of the Town of Woodbridge from its earliest days as a nucleated settlement in the 1670s up until the immediate post-Revolutionary War era.

B. ASSESSMENT OF EFFECT

The mill-related remains identified in the banks and bed of Woodbridge Creek will not be affected by the planned wetland restoration activities or by the proposed public access improvements. In both cases, these project actions will take place in areas located a safe distance from these remains. However, there is a possibility that additional remains of the mill dam/causeway and eastern sluice gate/bridge could be encountered during wetland restoration work east of the creek, north of Port Reading Avenue, if excavation for the removal of phragmites and for new plantings extends more than one foot below the present ground surface (Figure 5.1). Likewise, despite extensive disturbance from bridge and road reconstruction and utilities installation over the past 75 years, the proposed landscaping and construction activities associated with the public access area and boat launch on the west bank of the creek south of Port Reading Avenue may encounter mill-related

remains within the core of the mill site and traces of wharves, bulkheading and other buildings in the area adjoining the mill site to the south. These remains would probably lie between three to five feet and ten feet below grade, but could be closer to the surface along the creek edge (Figure 5.2).

C. RECOMMENDATIONS

As a precautionary measure, to ensure that mill-related remains identified in the banks and bed of Woodbridge Creek are not damaged, wetland restoration activity immediately east of the creek and north of Port Reading Avenue should be undertaken with particular care with phragmites removal and planting being accomplished using excavation machinery positioned east of and distant from the creek's eastern bank.

To mitigate the possibility of wetland restoration activity having an adverse effect on potential archaeological remains of the mill dam/causeway and the sluice gate/bridge north of Port Reading Avenue and east of Woodbridge Creek, it is recommended that provision be made for archaeological monitoring of project-related ground disturbance in excess of one foot in depth for a distance of 125 feet north of the northern edge of the roadway. If substantial remains of the mill dam/causeway and sluice gate/bridge are exposed, these should be recorded through photography, measurements and sketch drawings. Where feasible, any exposed remains should be avoided and left in place.

To mitigate the possibility of the proposed improvements to the public access area having an adverse effect on potential archaeological remains in and immediately adjacent to the core of the Dunham/Stone/Prall mill site south of Port Reading Avenue and west of Woodbridge Creek, it is recommended that provision be made for archaeological monitoring of project-related ground disturbance in excess of

three feet in depth for a distance of 150 feet south of the southern edge of the roadway. All disturbance of the creek bank in this same area should also be monitored. If substantial remains of the mill building, wharfage, bulkheading or other buildings are exposed, these should be recorded through photography, measurements and sketch drawings prior to their removal.

All archaeological monitoring should be carried out by a qualified historical or industrial archaeologist with experience of water-powered industrial sites in accordance with the guidelines and standards of the New Jersey Historic Preservation Office. Particular attention should be given to the coordination of archaeological monitoring with low tide conditions. Monitoring work may offer an opportunity for retrieval of wood samples suitable for dendrochronological analysis and wood species identification. Reasonable efforts should be made to retrieve such samples in the field, since this technique may provide the best means of accurately dating the timber remains found at this site.

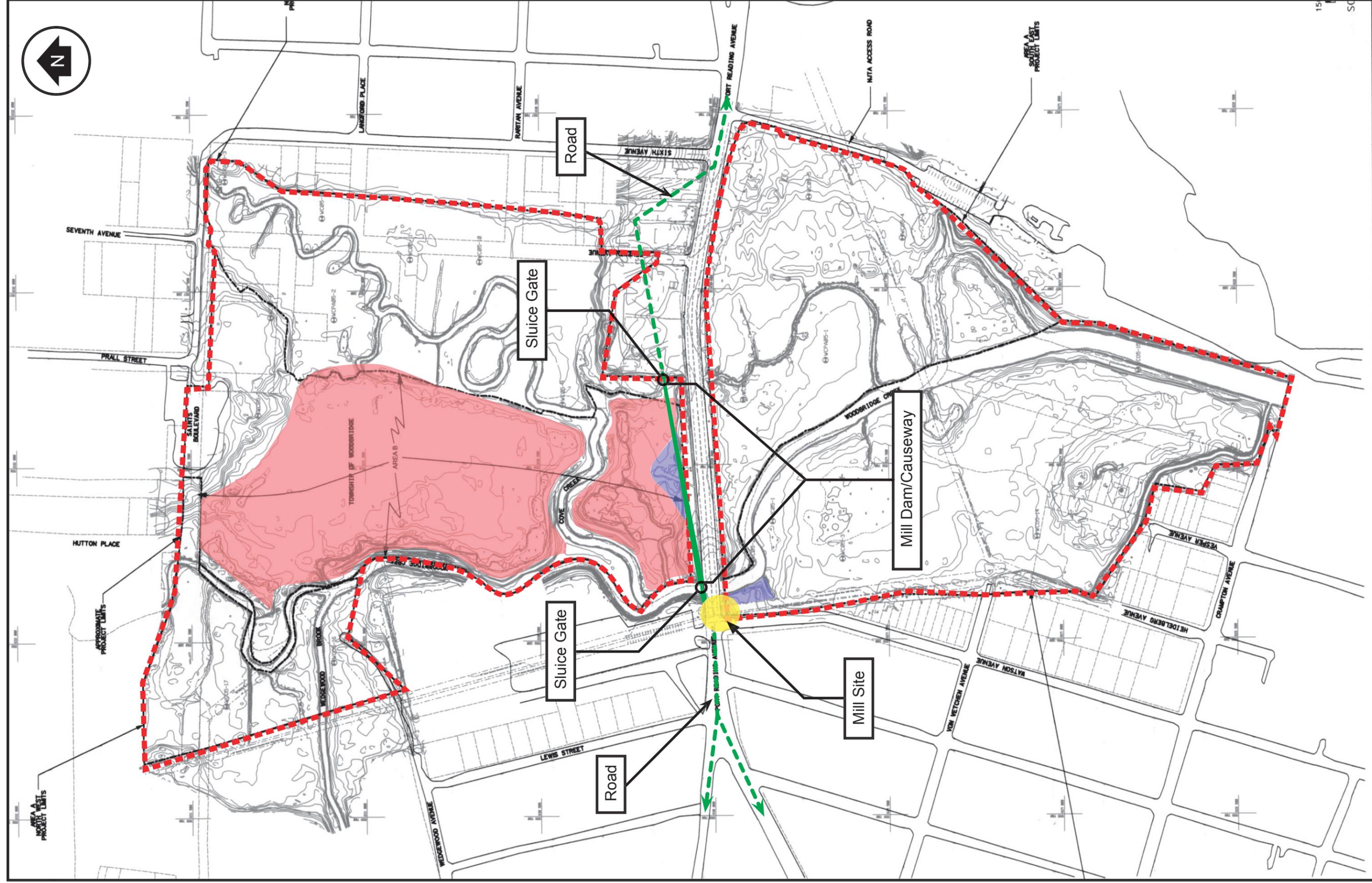


Figure 5.1. Detailed Location of Project Site Showing Probable Site of Dunham's Mill and Mill Dam/Causeway. Overall U.S. Army Corps of Engineers Wetland Restoration Area Limits Outlined in Red; National Oceanic & Atmospheric Administration/New Jersey Department of Environmental Protection Wetland Restoration Site Shaded in Red; Proposed Public Access Areas Shaded in Purple. Scale: 1 inch = 270 feet (approximately).

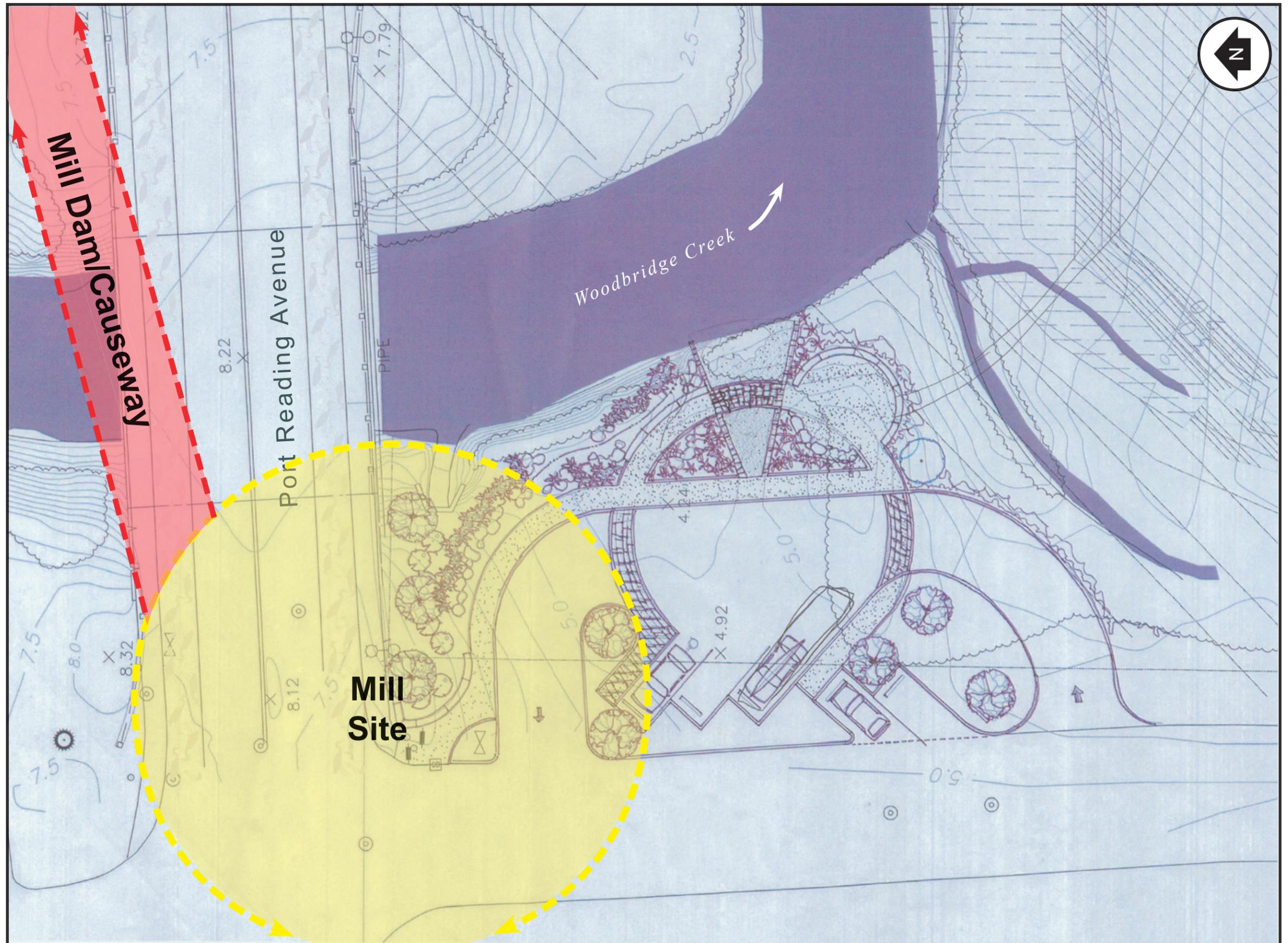


Figure 5.2. Conceptual Design of Proposed Public Access Area South of Port Reading Avenue and West of Woodbridge Creek in Relation to Probable Site of Dunham's Mill and Mill Dam/Causeway. Scale: 1 inch= 18 feet (approximately). (Source: Louis Berger and Associates, Inc. 2005).

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**APPENDICIES
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