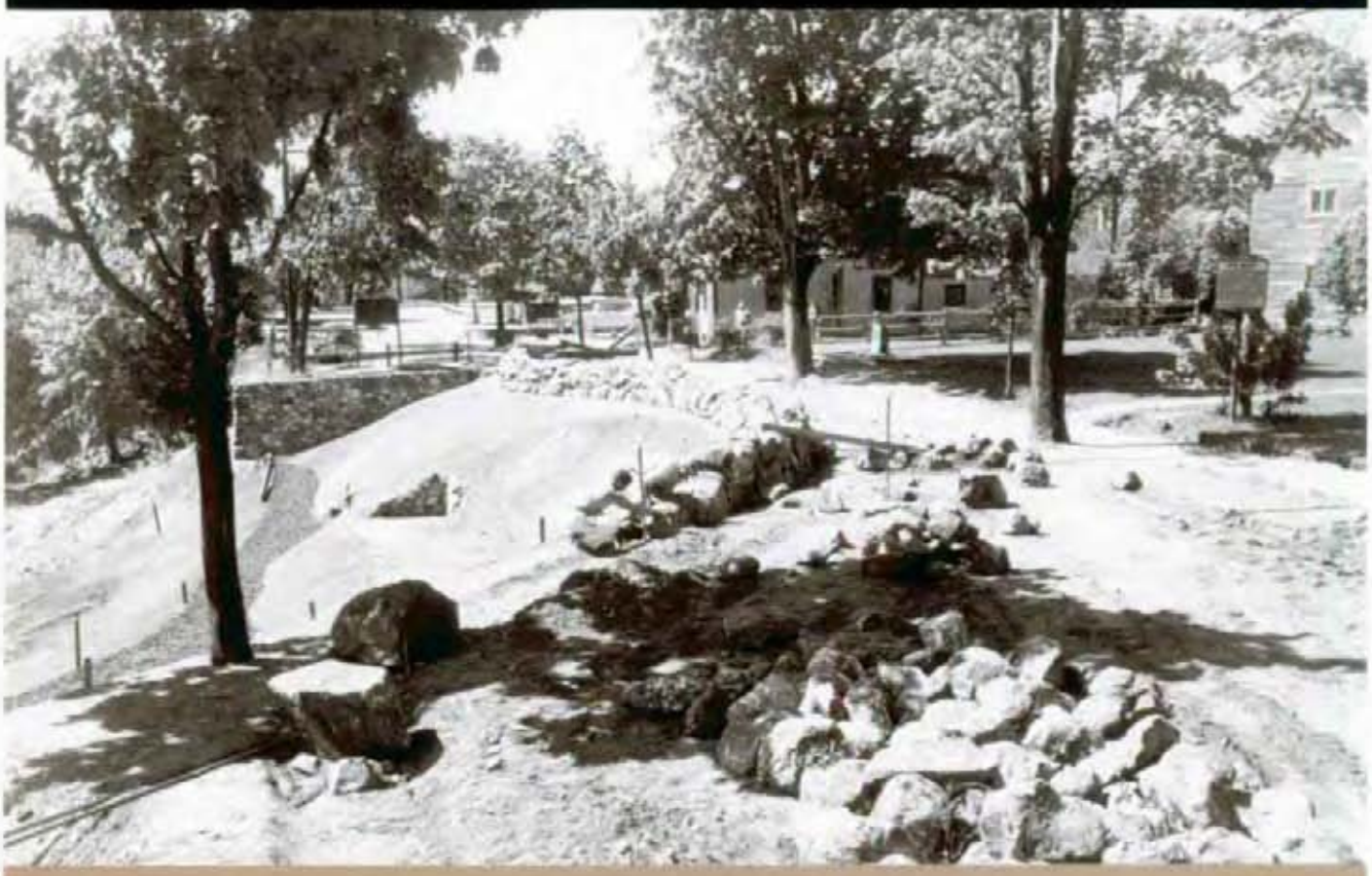
444/D-34

National Park Service
U.S. Department of the Interior



Cultural Landscape Report for Saugus Iron Works National Historic Site:

Twentieth-Century Pedestrian Circulation

Olmsted Center
for Landscape Preservation

Site History, Existing Conditions, and Recommendations

May 2003

PLEASE RETURN TO:
TECHNICAL INFORMATION CENTER
DENVER SERVICE CENTER
NATIONAL PARK SERVICE

Color Scans
1/15/2004



Cultural Landscape Report
for
Saugus Iron Works National Historic Site: Twentieth-Century Pedestrian Circulation

Site History, Existing Conditions, and Recommendations

OLMSTED CENTER
for Landscape Preservation

Prepared by:
Jeffrey Killion, Historical Landscape Architect
H. Eliot Foulds, Historical Landscape Architect
National Park Service, Olmsted Center for Landscape Preservation
In collaboration with the Northeast Building Conservation Branch

May 2003

This Cultural Landscape Report for Saugus Iron Works National Historic Site was produced by the National Park Service, Olmsted Center for Landscape Preservation. The CLR has been prepared in collaboration with the Northeast Building Conservation Branch in Lowell, Massachusetts.

The Olmsted Center for Landscape Preservation promotes the stewardship of significant landscapes through research, planning, and sustainable preservation maintenance. The Center accomplishes its mission in collaboration with a network of partners including national parks, universities, government agencies, and private nonprofit organizations. Techniques and principles of preservation practice are made available through training and publications. Based at the Frederick Law Olmsted National Historic Site, the Center perpetuates the tradition of the Olmsted firms and Frederick Law Olmsted's lifelong commitment to people, parks, and public spaces.

Olmsted Center for Landscape Preservation
99 Warren Street
Brookline, MA 02445
(617) 566-1689
www.nps.gov/frla/oclp.htm

Publication Credits: Information in this publication may be copied and used with the condition that full credit be given to the author and publisher. Appropriate citations and bibliography credits should be made for each use. Photographs and graphics may not be reproduced without the permission of the owners or repositories noted in the captions.

Cover Photograph: View from 1954 showing construction of the free-standing stone wall and newly graded hillside. (SAIR #1169)

Table of Contents

Table of Contents i
List of Figures iii
Acknowledgements vii
Introduction 1
Project Setting 1
Project Area Description 2
Project Background 2
Project Scope 3
Project Methodology 3
Pre-Reconstruction Circulation Features 7
Pre-Colonial Period (up to 1646) 7
Iron Works Plant (1646-1670) 8
Ironworks Farm (1670-1911) 9
Nutting Stewardship (1911-1920) 11
Post-Nutting Period (1920-1947) 12
Conclusions: Pre-Reconstruction Circulation Features 13
Reconstruction Circulation Features 25
First Iron Works Association Stewardship (1947-1968) 25
National Park Service Administration (1968-present) 27
Conclusions: Reconstruction Circulation Features 28
Existing Circulation Features and Conditions 51
Vehicular Circulation 51
Pedestrian Paths and Trails 51
Issues and Recommendations 63
Circulation Issues 63
General Recommendations for Current and Future Circulation and Accessibility Projects 63
Recommendations for PMIS 60099: New Entrance Gate and Walkway 64
Recommendations for PMIS 60099: Accessibility Improvements along Slope and in Industrial Complex 65
Conclusions 71
Suggestions for Further Research/Future Projects 73
Bibliography 75

List of Figures

Introduction

1.1 The core of visitor understanding and interpretation of the seventeenth-century English colonial iron works is the reconstructed buildings at Saugus Iron Works National Historic Site. (Photographic manipulation by Olmsted Center for Landscape Preservation, hereafter called OCLP 2002)

1.2 Location of the Saugus Iron Works National Historic Site in Eastern Massachusetts and within the Essex National Heritage Area. (Saugus Iron Works NHS Website, hereafter called SAIR Website, and *General Management Plan*, hereafter called GMP 2002)

Pre-Reconstruction Circulation Features

2.1 USGS map annotated with historic locations of Native American paths and crossings later used by English settlers. (*USGS Quadrangle for Boston North and Lynn, Massachusetts, 1985*)

2.2 View west of archeological work in the early 1950s and the remains of a corduroy road. (Saugus Iron Works NHS, Archives, hereafter called SAIR)

2.3 Map showing locations of raw materials that fueled the iron works plant. (SAIR Website)

2.4 Tracing of a 1724 map of the subdivided Ironworks Farm showing the location and width of the main road paralleling the river, which will become the future Central Street. (*Historic Structure Report: Saugus Iron Works Ironmaster's House*, NPS, Denver, 1977)

2.5 1884 map showing Central Street and surrounding development. (*Atlas of Essex County, Massachusetts.* George H. Walker and Co., Boston, 1884)

2.6 Taken in 1899 from the east bank of the Saugus River, this photograph is the earliest known view of the iron works site. (SAIR #1493)

2.7 Early twentieth-century view of the slag pile and pasture fenced in by the Central Street retaining wall and the surrounding residential neighborhood. (SAIR #186)

2.8 1947 Period Plan. (Olmsted Center for Landscape Preservation, hereafter OCLP, 2002)

Reconstruction Circulation Features

3.1 Aerial view from 1949 showing new streets, sidewalks, and houses north and west of the iron works site, cobble paths and a driveway/turnaround between the house and barn, and a footpath and footbridge along the former Bridge Street. (SAIR #2174)

3.2 View looking south during archeological investigations in 1949 of the tree-covered slag pile and the Saugus River and the Central Street retaining wall. (SAIR #134)

3.3 View looking northwest in 1949 at the base of the Central Street retaining wall near the blast furnace site. (SAIR #98)

3.4 View of Central Street in 1950, looking north, of the sidewalk and railing on top of the retaining wall. (SAIR #205)

3.5 View looking south of the removal of the Central Street retaining wall, taken from near the intersection of Bridge Street and Central Street in 1950. (SAIR #214)

3.6 View looking northwest from c.1951-1952 showing the beginning stages of the reconstruction of the iron works plant and the transformation of the landscape into a historical park. (SAIR Aerial 1)

3.7 View west of Iron Works House and stepping stone paths shortly after the relocation of Central Street c.1951. (SAIR #1655)

3.8 Drawing from January 1952 showing FIWA's early plans for land acquisition and park development. (SAIR 4500, #54)

3.9 Drawing from September 1953 showing the final locations of the major Iron Works buildings. (SAIR 9300, #85)

3.10 In this view looking north in 1953, the comparatively finished setting of the reconstructed iron works plant contrasts with archeological work underway along the hillside. (SAIR #1062)

3.11 View looking north in 1954 showing the layout of the path subbase, regraded hillside, and free-standing stone wall. (SAIR #1174)

3.12 View south in 1954 of construction of the free-standing stone wall and the newly-graded hillside. (SAIR #1169)
3.13 View northeast taken in 1954 of the curved retaining wall and railing for the rerouted Central Street. (SAIR #1159)
3.14 Workmen spread loam on the wedge of lawn created between old and new Central Street, directly south of the parking lot. View north, 1954. (SAIR #1137)
3.15 This 1954 view looking southwest shows the construction of the warehouse and footbridges parallel to the wharf. (SAIR #1198)
3.16 This view, photographed in 1954, looks north at the terminus of the riverside trail paralleling the curving stone retaining wall on the east bank of the river. (SAIR #1135)
3.17 This 1954 birds-eye sketch illustrates the seventeenth-century iron works as interpreted by FIWA and PSHKD. (Sketch by Charles Overly. SAIR Archives)
3.18 Drawing from 1954 showing much of the present-day path system, curving stone walls, and the visitor contact station. (SAIR 9500, #105)
3.19 View looking east from the blast furnace of the First Iron Works, on dedication day in 1954. (SAIR #1269)
3.20 Picturesque view west toward the reconstructed iron works taken in 1954 or 1955. A dam breach a few years later would dramatically change this scene. (SAIR #1281)
3.21 1954 Period Plan. (OCLP 2002)
3.22 1971 Period Plan. (OCLP 2002)
3.23 Archeological base map. (Boston Support Office: SPNEA/NPS, 1976/78)
3.24 Proposed plan from the 1970s showing major reconfiguration of the circulation system in the upper terrace. (BOSO: Drawing #444/40002)
3.25 Aerial view taken in 1995 of the Saugus Iron Works NHS showing the vehicular entrance into the parking lot from Central Street, bus parking area, and maintenance garage. (SAIR #2-5580)

Existing Circulation Features and Conditions

4.1 2002 Existing Conditions Plan. (OCLP 2002)
4.2 View looking north from Central Street towards one of the park's entrance signs. (OCLP 2002)
4.3 The maintenance garage is clearly visible from the parking lot and has been mistaken by some as the visitors center. (OCLP 2002)
4.4 View looking north at the park's entrance gate and path leading to the visitor contact station. (OCLP 2002)
4.5 Once inside the park, most visitors choose the path on the right and proceed to the reconstructed iron works buildings rather than first visiting the Iron Works House and museum towards the left. (OCLP 2002)
4.6 View looking north of the existing path in front of the Iron Works House. As recommended by the GMP, a new entrance gate and path is proposed from the parking lot to the front door, at which point it will turn left to a proposed visitor center in the Iron Works House Annex. (OCLP 2002)
4.7 The proposed new entrance path will wrap around from the Iron Works House front yard to the Iron Works House Annex, shown here. (OCLP 2002)
4.8 View west of the Iron Works House, museum, and restroom entrance. The park's amphitheater/demonstration area is located on the north side of the museum on the far right. Remains of a nineteenth-century barn have been located in the lawn area in the foreground. (OCLP 2002)
4.9 View looking south at the picnic area in the upper terrace. (OCLP 2002)
4.10 Benches along the path paralleling the stone wall at the top of the bluff offer excellent views of the reconstructed iron works buildings, dock, and wharf. (OCLP 2002)
4.11 View of the south stairway leading to the lower industrial area. This stair marks the beginning of the park's National Recreation Trail. (OCLP 2002)
4.12 View of the north stairway. (OCLP 2002)

4.13 Close up view of the path on the slope showing runnels caused by heavy rainfall and their effect on the flexible trex border. (OCLP 2002)

4.14 This segment of the path leading from the upper terrace to the industrial complex does not meet American with Disabilities Act requirements. Steep portions such as this, and in other areas of the industrial area, are chronically plagued with erosion problems that make for hazardous walking surfaces. (OCLP 2002)

4.15 Without the benefit of a wayside or path, the slag heap appears to be just another hill. (OCLP 2002)

4.16 Improving access for persons with special needs into the forge building is identified in the park's GMP. (OCLP 2002)

4.17 The ramp and path between the forge and the rolling and slitting mill does not meet current accessibility codes. (OCLP 2002)

4.18 Upon exiting the rolling and slitting mill, visitors encounter an eroded switchback characterized by steep grades and loose gravel, creating dangerous walking conditions.. (OCLP 2002)

4.19 The three wood footbridges shown here are part of the park's National Recreation Trail and are in good condition. The corduroy road, between the first and second bridges in this view, was rehabilitated in 2001. (OCLP 2002)

4.20 Compared to paths on the hillside and between the reconstructed buildings, the walkways alongside the river and on the east bank assume a more level grade. Portions of the deck and railing on the bridge crossing the Saugus River, shown here, are showing signs of deterioration. (OCLP 2002)

4.21 The park's National Recreation Trail parallels the shoreline of the Saugus as a grass path. Compare this contemporary view of the river with Figure 3.20 taken almost fifty years ago. (OCLP 2002)

4.22 In this view looking south, the sweep of lawn on the east bank leads to the nature trail at the far end of the clearing. (OCLP 2002)

4.23 View of the industrial complex from the nature trail on the east bank. Compare this somewhat obstructed view with that of Figure 3.16. (OCLP 2002)

4.24 In this view of the maintenance yard looking south, erosion from stockpiles of organic materials have encroached into the lawn area. The maintenance yard is within clear view of visitors using the adjacent picnic area and should be screened with vegetation. (OCLP 2002)

4.25 The concrete sidewalk along Central Street connects the adjacent residential neighborhoods to the park. It also provides an alternative route for visitors with special needs to access the industrial area, via staff-operated golf carts. (OCLP 2002)

4.26 The Bridge Street path, shown here looking west, is separated from the reconstructed iron works and provides a crossing over the Saugus River for the surrounding neighborhood. Visitors unable to negotiate the steep paths and stairs in the park are shuttled to this gate in golf carts. (OCLP 2002)

Issues and Recommendations

5.1 Known archeological resources and disturbances at the park. (MacMahon 1988: Figures 3, 11, and 14 - as cited in Johnson 1997:62)

5.2 Potential archeological areas at the park. (Brown 1975 - as cited in Johnson 1997:33)

5.3 The reconfigured parking lot, new entrance gate, and walkway is intended to improve visitor interpretation and orientation of the park's resources. Views of the iron works plant will improve with the removal of the visitor contact station. (GMP 2002)

5.4 Proposed accessibility improvements around the iron works reconstructions will make the park accessible to those with special needs. (GMP 2002)

Acknowledgements

The authors of this report are indebted to Janet Regan, Museum Technician, and Carl Salmons-Perez, Cultural Resources Program Manager, for their wealth of knowledge and enthusiasm throughout this project. Thanks also to Peggy Albee, Project Manager for the Northeast Building Conservation Branch and Steven Kesselmen, Superintendent of the Saugus Iron Works National Historic Site and Salem Maritime National Historic Site, for comments during the review process.

Introduction

The purpose of this Cultural Landscape Report (CLR) is to expand upon the knowledge of the Saugus Iron Works National Historic Site (NHS) landscape – with this project focusing on the evolution of its twentieth-century circulation elements. This report has been prepared in advance of a pending National Park Service (NPS) Line-Item Construction project that will improve accessibility to the park's historic structures and industrial areas. The objective of the report is to inform the design process for accessibility improvements – with site research leading to solutions that are sensitive to cultural resources.

This CLR has been developed in conjunction with several associated planning documents and initiatives. First, it expands on the problem of accessibility to the reconstructed iron works buildings as identified in the park's 2002 *General Management Plan* (GMP). Second, it revisits recommendations appearing as "Suggestions for Further Research" for the First Iron Works Association Stewardship period (1947-1968) and for the period of NPS Administration (1968-present) found listed within the 1993 *Cultural Landscape Assessment for Saugus Iron Works NHS*.

Project Setting

Saugus Iron Works NHS – listed on the National Register (1966) and designated as a National Historic Landmark (1966) – is historically significant as an excellent demonstration of early iron manufacturing in colonial America. The reconstructed iron works demonstrates industrial technology employed at Saugus that was dispersed throughout the Thirteen Colonies and played a critical role in the development of the American iron industry (Figure 1.1). This is reflected in the park's authorizing legislation, which mandates the preservation of "the first sustained integrated ironworks in the Thirteen Colonies..."[1] Academic scholars and other researchers frequently visit the park to experience first hand the working reconstructions and consult the park's museum collections and archives. The Iron Works House is one of the few remaining high-style First Period (c.1626-c.1725) houses in the country and is an important example of restoration during the early preservation movement of the late-nineteenth and early-twentieth centuries.

The park is located on both banks of the Saugus River and includes wetlands and woodlands. The iron works industrial complex (originally developed c.1646) features five reconstructed industrial buildings – a blast furnace, forge, rolling and slitting mill, wharf, and warehouse – and a pile of slag, itself a legacy of early industrial waste products and pollution. The blacksmith shop, a non-historic building erected by the NPS in 1975, complements the interpretation of the reconstructed industrial core. On a bluff above the river is the Iron Works House and museum. The museum collection of 60,000 items includes pre-contact and contact Native American items, as well as major collections related to the colonial era of the iron works and the twentieth-century colonial revival and preservation movements. The park is also a critical archeological resource having not only further potential to provide evidence of the beginnings of the American iron industry, but also an understanding of colonial society and Native American-related settlements.

Visitation is about 20-25,000 per year, concentrated within the months of April-October when the water wheels can be operated. Visitors may take a guided tour, though self-guided exploration is possible (without viewing machinery in operation). Visitation to the Iron Works House is limited and by scheduled tour only. Overall, visitation has been increasing with the park's role as the southern gateway to the Essex National Heritage Area (Figure 1.2). Saugus Iron Works is especially popular with school groups.

At present, only able-bodied visitors can make the transition between the park's upper terrace and the lower industrial complex. The Iron Works House does not provide universal accessibility. The museum offers some accommodations for persons with visual and auditory disabilities, but in general, few of the park's primary resources are accessible.

Project Area Description

Excluding the river and its wetlands, Saugus Iron Works NHS is an 8.51-acre parcel located in the heart of Saugus, Massachusetts along the banks of the Saugus River. The CLR addresses the entire park and its distinct areas:

- an upper terrace surrounding the Iron Works House, museum, parking area, visitor contact station, picnic area, and maintenance area;
- a steep sloped area separating the upper terrace area and the lower industrial complex, a vertical difference of approximately twenty-one feet;
- the industrial complex on the west bank of the Saugus River consisting of reconstructed iron works buildings, a wharf and warehouse, and the slag heap;
- gently sloping land on the east bank of the Saugus River that includes a blacksmith shop, nature trail, picnic area, and maintenance areas.

The iron works is situated on the fall line of the Saugus River, where the river rapidly descends from hilly uplands of the Breakheart Reservation to the flat, coastal lowlands and marshes of Lynn. The Saugus River is the earliest example of major industrial use of a river in North America. According to E. N. Hartley, in *Iron Works on the Saugus*, the location, drainage, topography, and natural resources of the site made it ideal for development of iron production:

> In the general vicinity were low-lying meadows and swamps containing bog iron ore of good quality. Hard by the bridge which carried the main road from Boston and Salem over Saugus River was a kind of natural amphitheater, so situated that on fairly level land washed by the stream a furnace could be erected with adequate water power and easy charging from a natural elevation rising above the riparian plain. At high tide the Saugus River was navigable right up to the park in question. Handy as the place was to the growing towns of Salem and Lynn, Charlestown, and Boston, it was not far from the common lands of Lynn, much of them covered with stands of virgin timber promising an almost inexhaustible store of wood for charcoal and construction work. One can easily conjure up a picture of Richard Leader (the iron works engineer) standing at the top of the amphitheater and announcing, "This is it!"[2]

Project Background

The core of visitor interpretation and understanding of the seventeenth-century iron works is through the reconstructions designed and completed in 1954 for the First Iron Works Association (FIWA), with major support from the American Iron and Steel Institute. The reconstruction, itself nearly fifty years old, was designed by the same architects as Colonial Williamsburg, one of a number of popular outdoor museums established in the early and mid-twentieth century.

The Massachusetts State Historic Preservation Officer, in review of the park's List of Classified Structures, advised the NPS to develop a historic context study so that the FIWA structures could be evaluated. Due to this lack of context information, the park's GMP identifies most of the twentieth-century structures and landscapes simply as "resources to be managed as cultural resources."

Project Scope

Saugus Iron Works NHS is listed on the National Register for its significance as the nation's first sustained, fully-integrated iron works (1646-1670).[3] The park's resources may also be significant for their association with the colonial revival and historic preservation movements in the early to mid-twentieth centuries: the restoration of the Iron Works House completed by Wallace Nutting and the iron works reconstructions designed by Perry, Shaw, Hepburn, Kehoe, and Dean.[4] The twentieth-century significance will require thorough documentation and research and is beyond the scope of this project. Consequently, the historical significance and integrity of the twentieth-century circulation system is not addressed in this report.

The CLR project is timed to inform the pending Line-Item Construction project entitled "Rehabilitate Resources for Accessibility and Safety (PMIS 60099)." Proposed improvements to the park's accessibility were a primary focus of the park's GMP, completed in 2002. Since most of the park's above-ground features are twentieth-century reconstructions, this CLR will focus on the evolution of park's circulation system as designed to serve the reconstructed buildings, Iron Works House and museum, and visitor facilities. This information is essential to design accessible routes that comply with federal accessibility requirements, such as the Americans with Disabilities Act (ADA), and to establish appropriate cultural resource management strategies for the twentieth-century structures and landscapes.

Project Methodology

The report begins by presenting a brief historical narrative of the Saugus Iron Works NHS landscape drawn from primary and secondary sources, and specific discussions regarding circulation features and characteristics. The narrative is subdivided into historical periods based on ownership as established in the 1993 *Cultural Landscape Assessment for Saugus Iron Works National Historic Park*. Subsequent sections analyze and evaluate the park's existing twentieth-century circulation features and offer recommendations pertaining to proposed circulation changes.

The research and evaluation that follows will show how the park's circulation system was influenced by the layout of paths and roads first introduced by local Native American communities and European settlers and ultimately expanded by the town of Saugus. It will also show that, except for a shared utilitarian function, the appearance of the manicured walkways serving the reconstructed iron works complex probably bears little resemblance to the industrial workyard setting of roads and paths present during the iron works operation in the seventeenth century.

Endnotes - Introduction

[1] Heidi Hohmann, *Cultural Landscape Assessment for Saugus Iron Works National Historic Park*. (Boston, MA: Cultural Landscape Program, Division of Cultural Resources Management, North Atlantic Region, 1993), Appendix A.

[2] E.N. Hartley, *Iron Works on the Saugus*. (Norman, OK and London: University of Oklahoma Press, 1957), 123-124 – as cited in Eric S. Johnson, *Archeological Overview and Assessment of the Saugus Iron Works National Historic Park, Saugus, Massachusetts*. (Boston, MA: National Park Service, New England Support Office, 1997), 6.

[3] Hohmann 1993:23.

[4] Hohmann 1993:23.



Figure 1.1. The core of visitor understanding and interpretation of the seventeenth-century English colonial iron works is the reconstructed buildings at Saugus Iron Works National Historic Site. (Photographic manipulation by Olmsted Center for Landscape Preservation, hereafter called OCLP 2002)

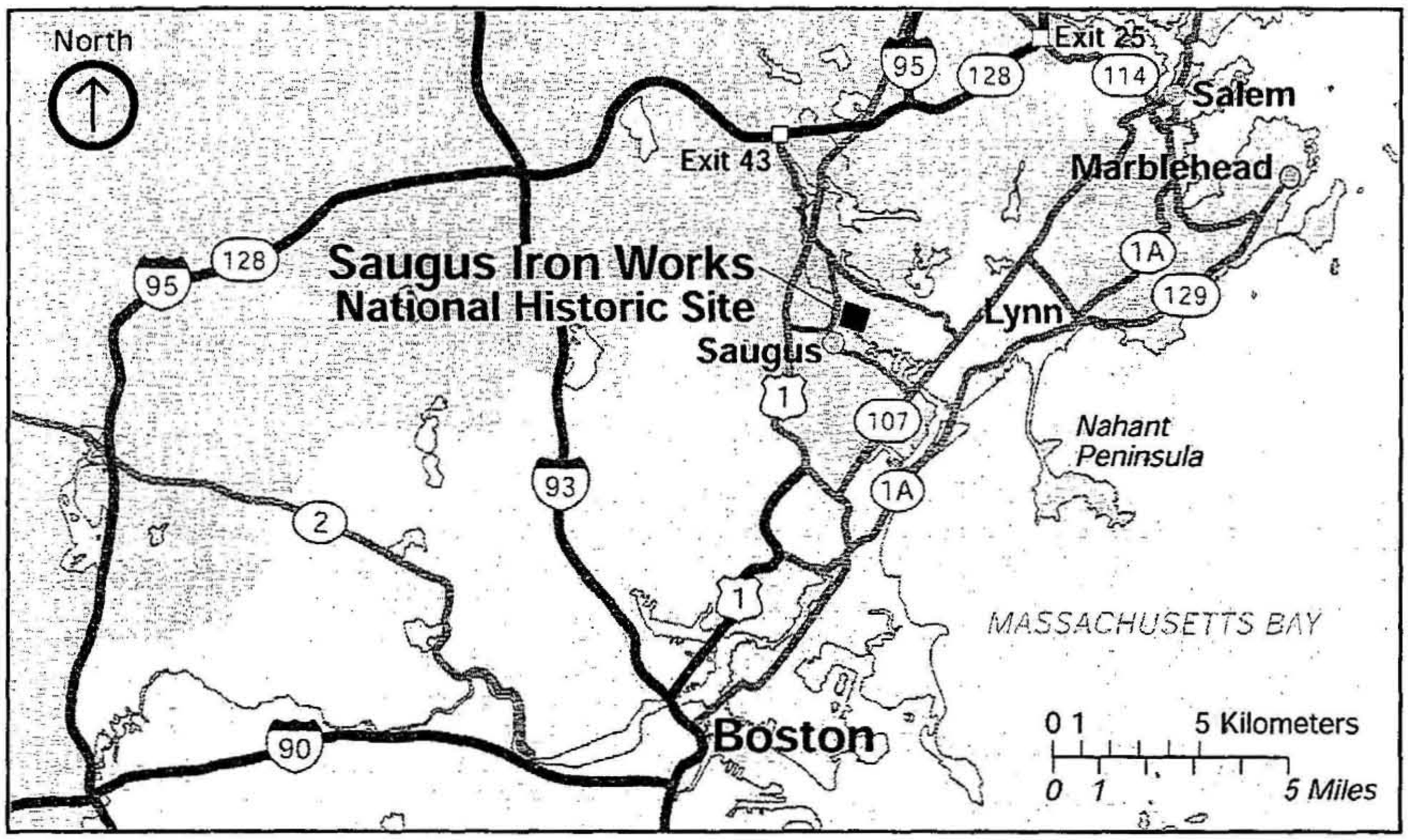
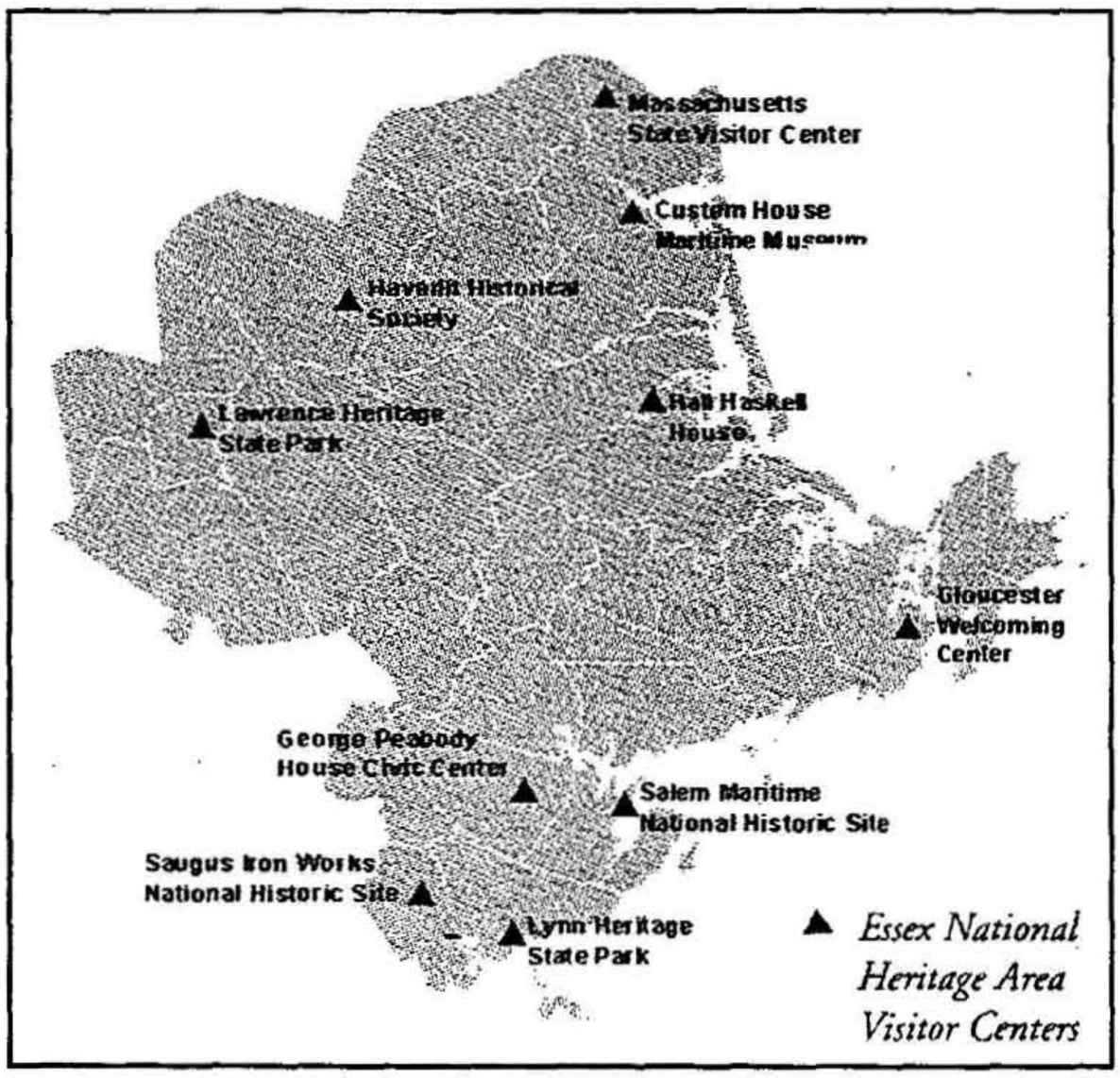


Figure 1.2.

Above: Location of the Saugus Iron Works National Historic Site in Eastern Massachusetts. (Saugus Iron Works NHS Website, hereafter called SAIR Website)

Right: The park is the southern gateway to the Essex National Heritage Area, which links thousands of historic places in Essex County related to three historic themes: early settlement, maritime trade, and early industrialization. (*General Management Plan* 2002, hereafter called GMP 2002)



Pre-Reconstruction Circulation Features

Pre-Colonial Period (up to 1646)

Contextual History

The Saugus area has been home to humans for at least 10,000 years, and of those ten millennia, only the last four centuries are documented through written records.[1] The earliest people, called Paleoindians, congregated in small groups and hunted and gathered the resources of the forests, wetlands, and waterways. Archeological evidence suggests that the area's Native American inhabitants moved often and that site locations responded to seasonal resources, sea level changes, and increases in population. Sites were usually located along coasts and rivers, and in particular, near waterfalls and fall lines, indicating the importance of migratory fish. This is corroborated by the discovery of Native American materials along the Saugus River at the iron works site.[2]

Prior to European contact in the seventeenth century, the area's Native Americans lived in small communities with well-defined communal lands, within which people migrated between summer agricultural fields, fall and winter hunting camps, winter settlements, and spring fishing grounds.[3] Seventeenth-century English accounts refer to this local population as the Pawtuckets. Important Pawtucket settlements were located downstream from the iron works site around present-day Lynn, Cliftondale, and East Saugus. Burial grounds have been recorded in the latter and an individual grave has also been reported at the iron works site.[4]

In the early part of the seventeenth century, new trade opportunities, disease, warfare, climate change and new English settlements at Plymouth (1620), Salem (1626), and Boston and Saugus (1630) combined to displace the Pawtucket community. Alliances were forged with the English in the form of land sales, labor, and trade to better survive the increasing threat of raids from rival Native American groups. After a devastating smallpox epidemic in 1633, and throughout the seventeenth century, many Pawtuckets moved inland to join other groups.[5]

By 1630, English colonization was well-established at Saugus and Lynn with farmsteads scattered along the Saugus River. Much like the Pawtuckets, who had for millennia gathered local wetland resources for food and shelter, settlers cut hay for livestock in the coastal salt marshes and harvested shellfish and fish from the Saugus river and its wetlands. By 1639, the iron works site was part of a 600-acre tract owned by Thomas Dexter, of which some eighty acres were cleared and farmed. Dexter made numerous improvements to the land, constructing a weir, a dwelling, and a grist mill.[6]

Pre-Colonial Circulation Features

While no physical evidence of circulation features has been found for the period prior to the iron works operation, written documentation speaks of a dynamic system of Native American footpaths and trails that were later used by English settlers. The local Pawtucket communities were hunters, gatherers, and farmers who traveled between settlements, agricultural fields, and hunting and fishing grounds by way of rivers and footpaths. One of the most important trails followed the coast, linking Massachusetts Bay with Cape Ann, and it is thought to have forded the Saugus River not far downstream from the iron works site, at present-day Lincoln Avenue.[7] There is also documentary evidence of a path that paralleled the river along what is now

Central and Winter Streets, which at one time passed through the iron works site.[8] By the seventeenth century, European settlers were using many of the same trails for trade and transportation, including the crossing in East Saugus (Figure 2.1).

Iron Works Plant (1646-1670)

Contextual History

English entrepreneurs saw great potential in New England's quality bog ore and seemingly endless supply of timber.[9] One such group, the Company of Undertakers for Iron Works in New England, found Thomas Dexter's expansive farm ideal for a new iron production plant. Spread out on both sides of the navigable Saugus River, the woods and marshes of the 600-acre property encompassed the present day Saugus town center and reached southward at least as far as East Saugus.[10] In addition to a vast supply of natural resources, the farm was well-positioned between the colony's two largest towns, Boston and Salem. Beginning in 1645, the company's agent, Richard Leader, arranged for the purchase of Dexter's land. Full-scale iron production began the following year on the present site of the Saugus Iron Works NHS.

According to E. N. Hartley, the plant at Saugus was the first integrated iron works in America conceived and built on a grand scale.[11] The three primary structures included a blast furnace, a forge, and a rolling and slitting mill. Enormous machinery such as bellows, a triphammer, and rollers and slitters were powered by water from the Saugus River impounded upstream by a massive dam and fed to the buildings through a network of collection basins, canals, and sluices. The complex was built along a natural escarpment on the fall line of the Saugus:

> "a bank of glacial origin shaped vaguely like an amphitheater [that] rose above and somewhat back from the swampy banks of the Saugus River. Though it would take clearing and filling in some portions, the amphitheater offered a means of setting up the three main units in a such a way that all would have adequate water power and yet permit materials to be moved from furnace to forge and slitting mill on level or downward sloping surfaces."[12]

In addition to the main buildings, the iron works plant included a blacksmith shop operated by Joseph Jenks, a wharf and warehouse from which raw materials and finished products were unloaded and loaded, storage sheds, and a housing area known as Hammersmith. Documentary evidence suggests Hammersmith consisted of farm buildings, gardens, orchards, grasslands, and houses for the rank and file workmen. The workforce included part-time workers from the surrounding farms, skilled artisans, Native Americans, indentured servants from England and even a group of Scottish prisoners of war who arrived in 1650 to work off seven year terms of indenture.[13] The exact location of Hammersmith is unknown, but researchers suggest it was across the river, east of the plant itself.[14]

The site's raw materials, river water power, natural harbor and bluff, and imported labor force initially combined to produce a successful operation; as much as eight tons of bar iron were produced per week.[15] In 1651, John Gifford replaced Leader and the iron works plant continued to produce large amounts of cast and wrought iron. However, mismanagement by subsequent managers, high production costs, and a decline in sales eventually closed down the plant and the company's assets were handed over to creditors. By around 1670, the plant was no longer producing iron, and within six years had been cleared of "utensils" and "stock" and much of the surrounding land returned to agricultural and husbandry uses.[16]

Iron Works Plant Circulation Features

The only archeological evidence found so far regarding specific landscape circulation features occurred in the early 1950s with the discoveries of wood supports for the wharf and a corduroy road along the river bank (Figure 2.2). This type of road featured wood timbers laid across the width of the path and was designed to provide a stable and firm surface in tidal areas such as the iron works site. Despite the lack of any other physical evidence, a review of documentary sources and the iron production process can help formulate several hypotheses regarding circulation patterns and features.

Archeological investigations in the 1950s throughout the iron works site revealed numerous deposits of bog ore, charcoal, and gabbro - the three main ingredients in the production of iron.[17] During the iron works operation, bog iron ore was mined from local low-lying meadows and marshes and charcoal was made in pits and mounds in wooded areas of the property and hauled to the coal house for storage (the remains of the coal house were found on Marion Road). Gabbro was shipped up the Saugus River from the Nahant Peninsula and likely stored around the blast furnace (Figure 2.3).[18] Waste from the iron-making process was dumped into the Saugus, creating the still-extant slag pile. Historic documents refer to these materials as hauled about in carts, wheelbarrows, and baskets, and drawn by horses and oxen.[19]

While the alignments of specific paths and roads are unclear, the existence of several routes can be presumed. First, there was likely a crossing over the river close to the iron works plant to allow workers to haul materials from surrounding areas and to provide travel between the plant and Hammersmith village located on the east bank. Second, paths and roads likely existed in Hammersmith itself; however, little archeology has been done for this area, and more research is needed. Third, the Native American path or road that paralleled the west side of the river was likely used for iron works activities as well as connecting traders and trade to local markets and to the main road between Boston and Salem.

The river was a major transportation corridor. In addition to shipping raw material to the plant, boats shipped finished products to Boston where the iron works operated a wharf and warehouse. From here, products were shipped to other American colonies and to England. [20]

The iron works landscape, then, probably resembled a busy and extraordinarily gritty industrial work yard characterized by a dynamic arrangement of paths and roads, piles of raw material and industrial waste, and containers of finished iron products awaiting shipment. The act of moving these items around the iron works plant likely took the least circuitous route and shifted often depending on where the piles were on a particular day. Aside from ground too steep for wagons to traverse, *everything* around the iron works plant was the "circulation" system. It may also be presumed that roads or paths that existed on the property prior to the iron works operation were used and expanded to suit the needs of the Iron Works Company.

Ironworks Farm (1670-1911)

Contextual History

With the closing of the iron works plant, the Saugus area returned to a predominantly agricultural economy and dispersed rural settlement pattern. Industrial development was limited, although the river's water power continued to attract a variety of mills and a small iron works venture upstream from the abandoned iron works site. By the first half of the nineteenth century, however, factories and brickyards returned to the riverbanks in the East Saugus neighborhood, signaling a shift towards a pattern of

concentrated urban settlements centered around industrial sites. Two important complexes emerged just upstream from the former iron works site that today still bear their names: Scotts Mill, which began as a leather-processing plant, and Prankers Mill, which diversified from chocolate to fabrics.

Between 1830 to 1870, Saugus's population grew rapidly from 960 to 2200, stimulated in part by construction of new turnpikes and a railroad spur to Boston, the latter of which enabled people to live in Saugus and work in Lynn or Boston.[21] The northern parts of town remained mostly agricultural, although residential and commercial development did occur along the Boston-Newburyport turnpike.[22] By the 1910s, the population had quadrupled to over 10,000 and the Saugus Center, East Saugus, and Cliftondale areas of town expanded rapidly with new streets, streetcars, and residential developments.[23] Industry sustained the town's livelihood with textiles, bricks, tobacco, and shoes, and the northern agricultural areas produced dairy products, poultry, and hay.[24]

While the landscape of Saugus was changing dramatically during this period, the scene at the former iron works site along the river was comparatively quiet. By 1670, most of 600-acre property had been cleared of trees by the Iron Works Company. In 1676, Samuel Appleton, Jr. inherited and began farming the property, which became known as Ironworks Farm. Around this time, Appleton may have built the house now referred to as the Iron Works House, although the exact construction date is still debated.[25]

In 1682, the iron works dam was breached by local townspeople, possibly because of long-standing complaints that the dam had restricted access to the ocean and reduced migrating fish populations. However, the resulting flood made their situation worse as it inundated fields and pastures, and so clogged the river with soil that boats could no longer navigate the channel as before, except to a mile downstream.[26] Subsequent dams were eventually built along this part of the Saugus to power new mills and factories, a testament of the river's valuable waterpower.

Appleton began selling portions of the large farm after 1685. Most of the land passed to James Taylor, who continued farming and constructed barns, a brick kitchen, and a smith's shop, although none of these structures have been precisely located.[27] After Taylor's death in 1724, the 600-acre Ironworks Farm was subdivided in probate court, which in effect created the skeletal layout of the modern town of Saugus (Figure 2.4).[28] The Iron Works House and associated structures became part of a 17-acre parcel. The probate records refer to the iron works site along the river and its past and future use: "all the land where the old iron works stood...is to lie open as a way and for the benefit of creatures to go down to the river as has been usual."[29] The *Cultural Landscape Assessment of Saugus Iron Works NHS* notes that it is possible that until the time of reconstruction in the 1950s, the iron works site had not been built upon since at least 1724.[30]

Although the iron works site remained relatively undisturbed, the landscape around the Iron Works House changed dramatically over the next one hundred years. Both the Iron Works House parcel and iron works site were owned by a number of families, including Taylor's heirs, the Mansfields, and the Scotts. Several barns and outbuildings were built around the Iron Works House: a barn southeast of the house by William Roby, along what would become Central Street (between 1745 and 1756); a shoemaker's shop (c.1793); a workshop and corn barn somewhere near the house (c.1809); a barn northwest of the house and a shed south of the house (c.1830). Thomas Mansfield built another house at or adjacent to the Roby barn by 1820, and it stood until 1976.[31] By 1868, local industrialist Andrew Scott bought the Iron Works House and converted it into a tenement for his factory workers. He gradually sold off portions of the 17-acre Iron Works House property and acquired other adjacent parcels, including the iron works site.

Ironworks Farm Circulation Features

This 225-year period witnessed the transformation of the former 600-acre iron works property into a single farm of pastures and fields and then, beginning around 1724, into a subdivided landscape of smaller farms, houses, and mills. Little is known about specific circulation features on the vast Ironworks Farm before its division. However, it is probable that some of the same roads and paths used by iron workers to transport raw materials from forested areas of the property to the iron works plant were used for agrarian and husbandry activities. The plant site itself reverted to pasture and was used as a public route and wayside for farmers bringing livestock to the river and to markets in town.

In 1724, the subdivision of the Ironworks Farm created many of the main roads still used in Saugus today (Figure 2.4). The "First Division" included the iron works site and the Iron Works House and was bounded on the south by a "one pole way" and on the east by a "two pole way," today's Main Street and Central Street, respectively. On the map, the future Central Street is clearly a main road as it is the widest and is the only north-south route to the meeting house established a few years earlier.[32]

The 1724 plan of the new road featured conspicuous 'kinks' in its alignment in and around the iron works site. These may have been influenced by whatever road or path was present at that time, as well as locations of the edge of the bluff, extant property and fence lines, dwellings, outbuildings, pastures, and fields. The iron works structures, apparently, were not among these constraints. Archeological investigations in the 1950s by Roland Wells Robbins (which informed the current iron works reconstructions) placed the blast furnace's water wheel and charging bridge directly under Central Street and its retaining wall. This suggests that by 1724, the structure was in such ruin that the road was simply aligned over it.

The retaining wall, constructed along the river-side part of the road sometime in the middle of the nineteenth century, also featured the conspicuous 'kinks'.[33] The remains of the water wheel were located under some twenty vertical feet of fill, suggesting that massive amounts of fill were brought in to create a level grade for the road.[34] While it seems likely that most of the above ground elements of the blast furnace were gone by the mid -1800s, portions of the structure's foundation may have influenced the siting of the retaining wall. According to local officials, the "...curve in the retaining wall just above the furnace was built that way to go around something."[35]

By 1884, the road is officially called Central Street, an appropriate designation given the number of new streets, lots, and structures that front it (Figure 2.5). The street also connects to the town center, which has expanded from the original meeting house site, and to a depot along the railroad spur. The earliest photograph of the iron works site and the Iron Works House dates from 1899. It shows the Central Street retaining wall and the slag pile, the only remaining visible legacy of the seventeenth-century iron works plant (Figure 2.6).

Nutting Stewardship (1911-1920)

Contextual History

The residential boom that characterized Saugus in the late nineteenth century extended well into the twentieth century, and the town continued its gradual change from an industrial economy to a residential enclave. Manufacturing, commerce, and agriculture remained the principal occupations, but more and more residents worked in nearby towns and cities.[36]

The Scott family put the Iron Works House up for sale in 1911, and a year later the house was identified as culturally significant by the Society for the Preservation of New England Antiquities.[37] This designation was timely because by 1915, the Iron Works House parcel had been significantly reduced in size. Fortunately, the house was purchased and restored by Wallace Nutting who demolished several outbuildings and built a blacksmith shop directly north of the house. This building is now used as the park's museum. He also purchased Scotts Mill and converted it from water power to electric power to house his furniture reproduction and photograph-tinting businesses. In 1920, Nutting sold the Iron Works House parcel and it passed to a variety of owners. The iron works site, by contrast, continued to remain undeveloped.

Nutting Stewardship Circulation Features

The construction of new streets and houses around the town's enclaves in Saugus Center, Cliftondale, and East Saugus were a testament to Saugus' population growth.[38] Along Central Street, several previously undeveloped areas south and west of the Iron Works House were subdivided for new homes. By 1915, the Iron Works House was confined to a parcel of approximately 100 feet (fronting Central Street) by 300 feet.[39]

Nutting's restoration of the Iron Works House was extensive, and owing to his interest in photography, well-represented by dozens of photographs, although little written documentation is known to survive. Exterior photographs show the grounds immediately around the house as flat and covered mostly in grass. Some fences and a stone wall are visible, but their exact locations are unclear. The surrounding landscape appears to be mainly open with occasional houses and trees. Around this time, the pasture that was the former iron works plant is hemmed in by Central Street and an increasingly suburban neighborhood (Figure 2.7).

Post-Nutting Period (1920-1947)

Contextual History

Residential development continued to expand during the 1920s and 1930s, particularly in parcels separating the town's three major centers. Many agricultural areas in the north and west parts of town were subdivided and developed, and houses were built in the Lynnhurst area on the east side of the Saugus River near the iron works site. Commercial development accelerated to serve the needs of a large population increasingly using the automobile as transportation. In particular, development along Route 1 on the west side of town increased while some of the older town centers away from the busiest roads subsequently declined. Industrial production also fell during this period as most of the town's work force was employed in other towns.[40] By the end of period, and up to the present time, Saugus could be described as primarily a residential enclave with limited industrial and agricultural activity.

Perhaps because of the rapidly changing landscape and the loss of industry, interest in the former iron works site increased during this time. In 1938, the Parson Roby Chapter of the Daughters of the American Revolution (DAR) acquired the iron works site along the river (it is unclear who owned it previously). After Nutting sold the restored Iron Works House in 1920, it passed through a variety of owners until purchased in 1941 by the Henry Ford Alumni Association, which intended to move the house to Dearborn, Michigan to become part of an outdoor museum of historic buildings. Local residents rallied to form the First Iron Works Association (FIWA) in 1943 and successfully prevented the move. By 1946, FIWA had purchased and furnished the Iron Works House and grounds and opened it to the public. The DAR donated the iron works site to FIWA that same year.

Post-Nutting Circulation Features

The Saugus area continued to grow in residential and commercial development and decline in industrial and agricultural activity during this period. The Route 1 corridor matured as a commercial destination, and new subdivisions appeared throughout the town, many of which featured curvilinear streets typical for this time.[41] Areas surrounding the Iron Works House became residential in character as new houses were built and new roads were platted, among them Greystone Road (a dirt road) laid out directly north of Nutting's blacksmith shop. Also around this time, a bridge over the Saugus River was constructed between Marion Street on the west bank and Riverbank Road on the east bank.[42] Just as the construction of Central Street had done previously, the new Bridge Street passed directly over the former iron works plant. This road was short-lived, however, as the road was apparently closed to vehicular traffic by the late 1940s. The bridge's stone abutments are still in place as the Bridge Street bridge.

The 1947 Period Plan shows conditions prior to FIWA stewardship and archeological work at the iron works site. The future iron works reconstructions are ghosted on the plan to show their relationship to Central Street. The rerouting of this street a few years later will be the most significant circulation change to the site since the subdivision of the Ironworks Farm in 1724 (Figure 2.8).

Conclusions: Pre-Reconstruction Circulation Features

Prior to the iron works operation, written documentation speaks of a dynamic system of Native American footpaths and trails that were later used by English settlers. One of the most important of these followed the coast and crossed the Saugus River downstream from the iron works site, at present-day Lincoln Avenue. There is also evidence of a path paralleling the river along what is now Central and Winter Streets.

With the exception of the corduroy road discovered near the riverbank, there is virtually no physical evidence of specific roads or paths at the iron works site. However, documentary evidence suggests that materials and supplies were hauled around the property in carts, wheelbarrows, and baskets. This type of physical labor likely created a landscape of utility and work described by a constantly changing network of roads and paths servicing stockpiles of raw materials and finished products. Given the sheer size of the property, roads or paths that existed prior to the iron works operation were probably used and expanded to transport materials to and from the plant, including the main road along the west bank of the Saugus that would become Central Street. A river crossing would also have been needed to access the forested land on the east side of the river as well as the presumed location of Hammersmith, the workers village.

After the iron works plant was closed and sold in the 1670s, the site reverted to pasture and was used as a public route to bring cattle to the river. The rest of the immense Iron Works Company property was returned to agrarian and husbandry uses and became known as Ironworks Farm. Many of the same roads and paths used by the iron workers were probably used to support these uses.

In 1724, the subdivision of the Ironworks Farm created several of the main roads still used in Saugus today, including the former configuration of the present-day Central Street. The use of fill and retaining walls for this road at the iron works site suggests that the natural edge of the bluff may have been situated farther west and that the path or road that existed prior to 1724 may also have tracked farther west. The new road and retaining wall were constructed directly over the blast furnace, suggesting that most, if not all, of the iron works structures had been removed or had fallen into disrepair by this time.

By the late nineteenth century, the main road had been designated as Central Street and new streets and subdivisions grew around it to accommodate the growing population of Saugus. New roads included Greystone Road, directly north of Nutting's blacksmith shop, and Bridge Street located directly above portions of the iron works plant. By 1946, the only visible links to the former Iron Works Company's vast iron production enterprise were the Iron Works House and the tree-covered slag pile along the Saugus River.

Endnotes – Pre-Reconstruction Period

[1] Johnson 1997:9.

[2] Johnson 1997:12-13.

[3] Johnson 1997:14.

[4] MacMahon, Darcie A. *Archeological Collections Management at The Saugus Iron Works National Historic Park.* (Boston, MA: National Park Service, 1988) and Massachusetts Historical Commission (MHC). Inventory of Prehistoric and Historic Properties of the Commonwealth of Massachusetts. (Boston, MA: on file at Massachusetts Historical Commission, n.d.) - as cited in Johnson 1997:14-15.

[5] Johnson 1997:17.

[6] Cummings, Abbot Lowell. "The Iron Works Farm" In Saugus, Essex County, Massachusetts: The History of Ownership from the Origins of the Town to the 20th Century. Report on file at Charlestown, MA: New England Museum Services Center, Marine Barracks, Boston National Historical Park, Charlestown Unit, 1975), 3-4; Saugus Historical Commission (SHC). Historic Narrative, Saugus, Massachusetts. (Report on file Boston, MA: Massachusetts Historical Commission, 1986), 2; and Hartley 1957:124 - all cited in Johnson 1997:18.

[7] Johnson 1997:15.

[8] MHC. Reconnaissance Survey Report: Saugus. (Report on file at Boston, MA: Massachusetts Historical Commission, 1985), 3 - as cited in Johnson 1997:15.

[9] Johnson 1997:17.

[10] Cummings, Abbot Lowell. "A History of Ownership – 'The Ironworks Farm' in Saugus, Essex County, Massachusetts" in John Albright, Orville Carroll, Abbot Lowell Cummings, *Historic Structures Report: Ironmaster's House, Historical and Architectural Data, and a History of Ownership – Saugus Iron Works National Historic Park, Massachusetts.* (Denver, CO: National Park Service, Denver Service Center, Historic Preservation Division, 1977), 357 - as cited in Hohmann 1993:4.

[11] Hartley 1957:165 - as cited in Johnson 1997:18.

[12] Hartley 1957:182 - as cited in Hohmann 1993:4,5.

[13] Hartley 1957:198-202 - as cited in Johnson 1997:18.

[14] Carlson, Steve. *Historical Sketch, Saugus Iron Works National Historic Park.* (Boston, MA: National Park Service, 1973), 34 - as cited in Hohmann 1993:6.

[15] Carlson 1973:16-19; Hartley 1957: SHC 1986:2 - as cited in Johnson 1997:18.

[16] Johnson 1997:19.

[17] Park Archives: Wormser, Richard. *Iron Works Papers: A Collection of Papers Relating to the Iron works at Lynn and More Particularly to the Suit between Mr. John Giffard the Agent for the Undertakers of the Iron works and the Inhabitants of the Massachusetts Bay Colony dated 1650 Et Seq.* (transcript). (Cambridge, MA: Harvard University, Baker Library, 1946): 190, 204, 205, 214, 218.

[18] *General Management Plan/Environmental Assessment: Saugus Iron Works National Historic Park.* (Boston, MA: National Park Service, 2002), 52.

[19] Park Archives: Wormser 1946:188.

[20] Comments from Janet Regan and Carl Salmons-Perez, 12/12/02.

[21] Massachusetts, Commonwealth of. *Census of the Commonwealth of Massachusetts.* (Boston, MA: Wright and Potter, 1909), 874 -as cited in Johnson 1997:22.

[22] Johnson 1997:22.

[23] Johnson 1997:22.

[24] MHC 1985:14-15 - as cited in Johnson 1997:23.

[25] Cummings 1977:16-20 - as cited in Johnson 1997:19.

[26] Cummings 1977:374 - as cited in Hohmann 1993:7.

[27] Cummings 1977:21-30 - as cited in Johnson 1997:19.

[28] Cummings 1977:353 - as cited in Hohmann 1993:8.

[29] Cummings 1977:381 - as cited in Hohmann 1993:8.

[30] Hohmann 1993:8.

[31] Johnson 1997:19-20.

[32] Correspondence from Janet Regan, SAIR Museum Technician, 7/17/02.

[33] Roland Wells Robbins' Archeological Notes for Saugus Restoration Project, January 18, 1950. From correspondence from Janet Regan, SAIR Museum Technician, 1/16/03.

[34] Correspondence from Janet Regan, SAIR Museum Technician, 12/12/02.

[35] Opinion of Mr. Comey, Town Assistant Engineer and Mr. Seaver, Town Surveyor as noted in Roland Wells Robbins' Archeological Notes for Saugus Restoration Project, February 17, 1950. From correspondence with Janet Regan, SAIR Museum Technician, 1/16/03.

[36] Johnson 1997:22.

[37] Hohmann 1993:10.

[38] MHC 1985:16; SHC 1986:12 - as cited in Johnson 1997:23

[39] Hohmann 1993:10.

[40] MHC 1985:16-17; SHC 1986:12-13 - as cited in Johnson 1997:23.

[41] Hohmann 1993:20.

[42] Hohmann 1993:20.

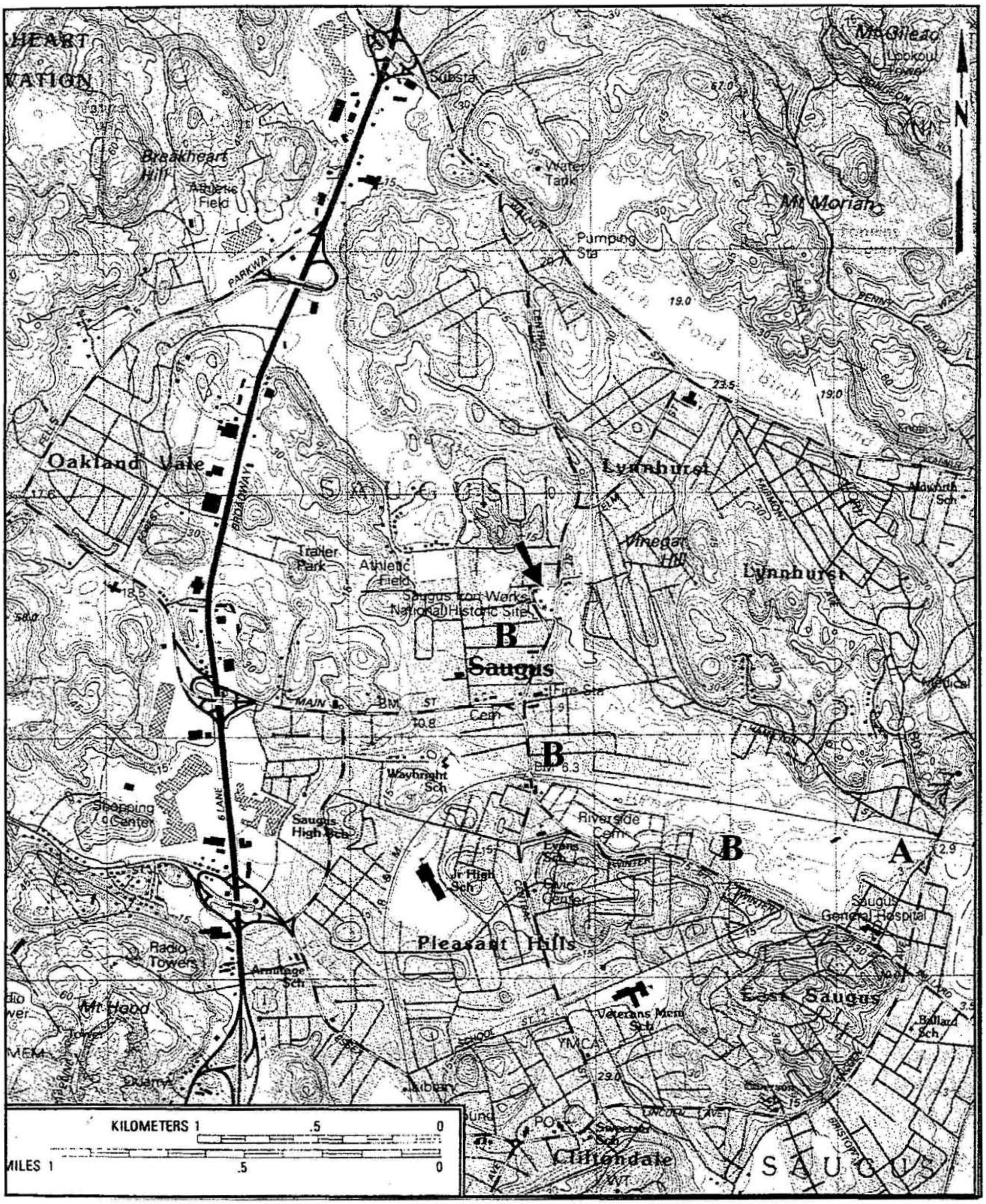


Figure 2.1. Archeological evidence of Native American settlements dating from the sixteenth century has been located downstream from the iron works site (indicated by an arrow on the map) in the vicinity of Lynn, East Saugus, and Cliftondale. One of the main trails crossed the river at near what is now Lincoln Avenue (A). There is also documentary evidence of a path that paralleled the river, the alignment of which possibly resembled the alignment of present-day Central and Winter Streets (B). (*USGS Quadrangle for Boston North and Lynn, Massachusetts, 1985*)



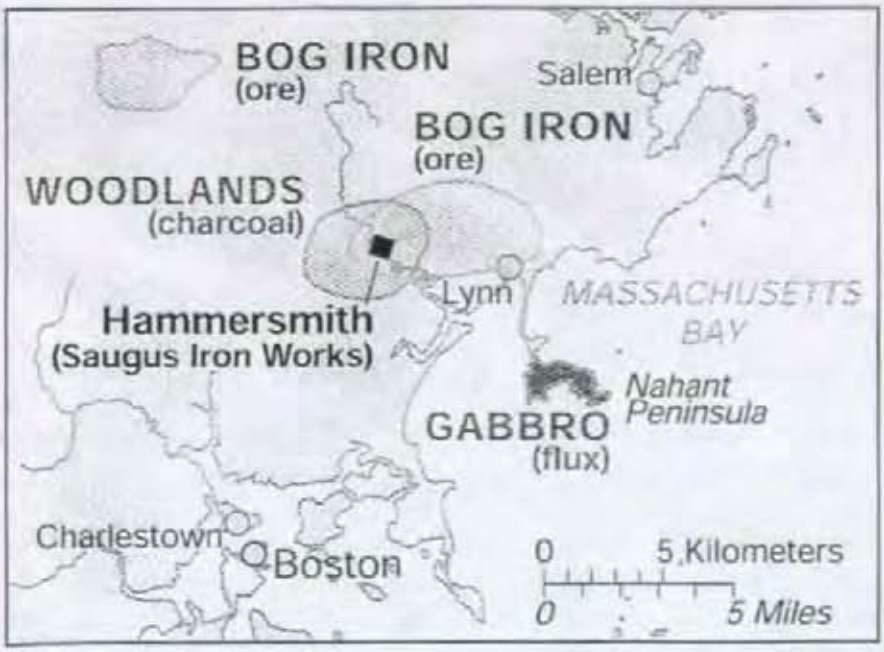


Figure 2.2. View looking west of archeological work in the early 1950s and the remains of a corduroy road. This type of road probably helped prevent carts loaded with heavy materials from sinking into the wet ground. (Saugus Iron Works NHS, Archives, hereafter called SAIR)

Figure 2.3. Map showing locations of raw materials that fueled the iron works plant. (SAIR Website)

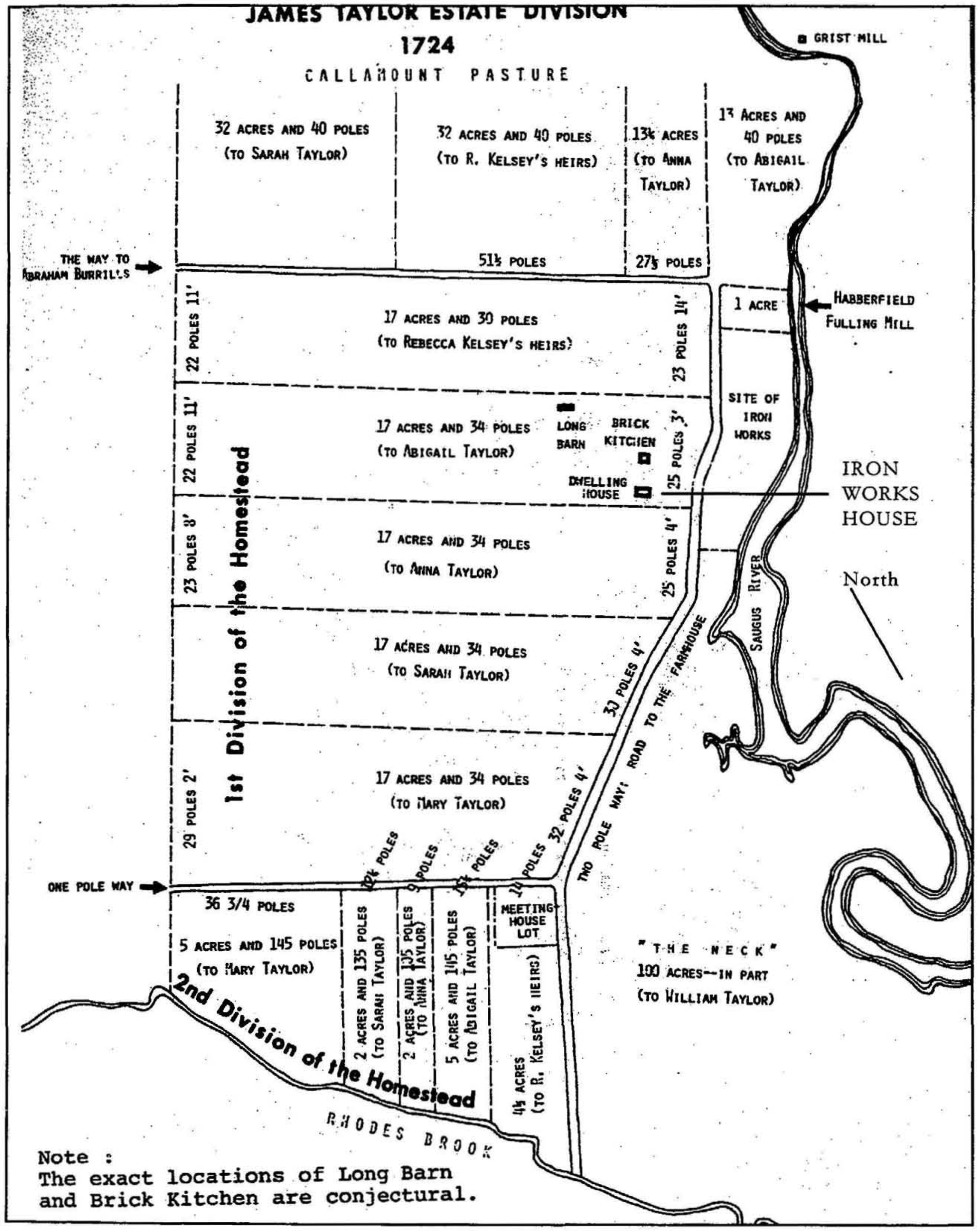


Figure 2.4. This tracing of a 1724 map of the subdivided Ironworks Farm shows the location and width of the main road paralleling the river, which will become the future Central Street. Note the location of the meeting house lot in what is now the Saugus town center. (*Historic Structure Report: Saugus Iron Works Ironmaster's House*, NPS, Denver, 1977)

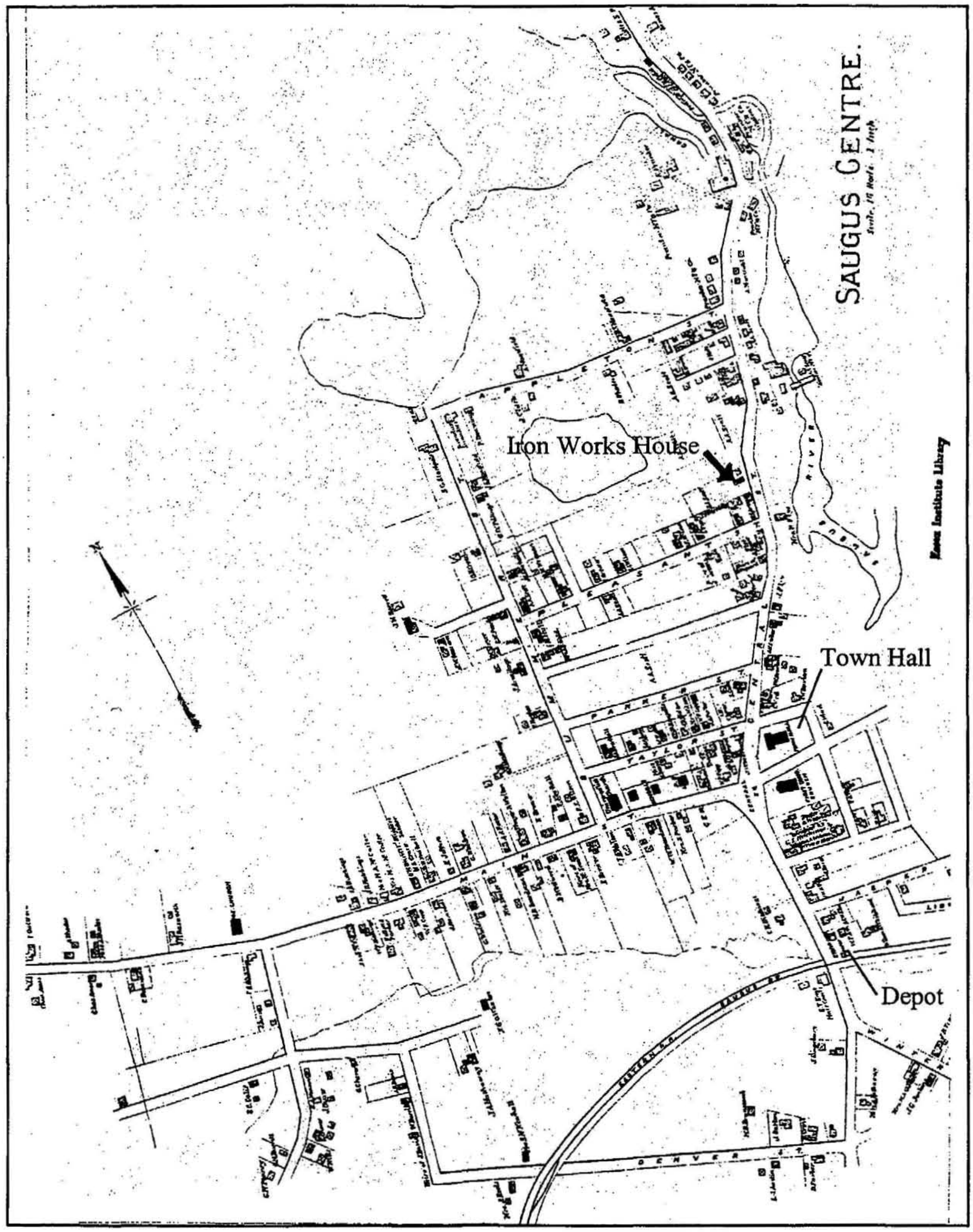


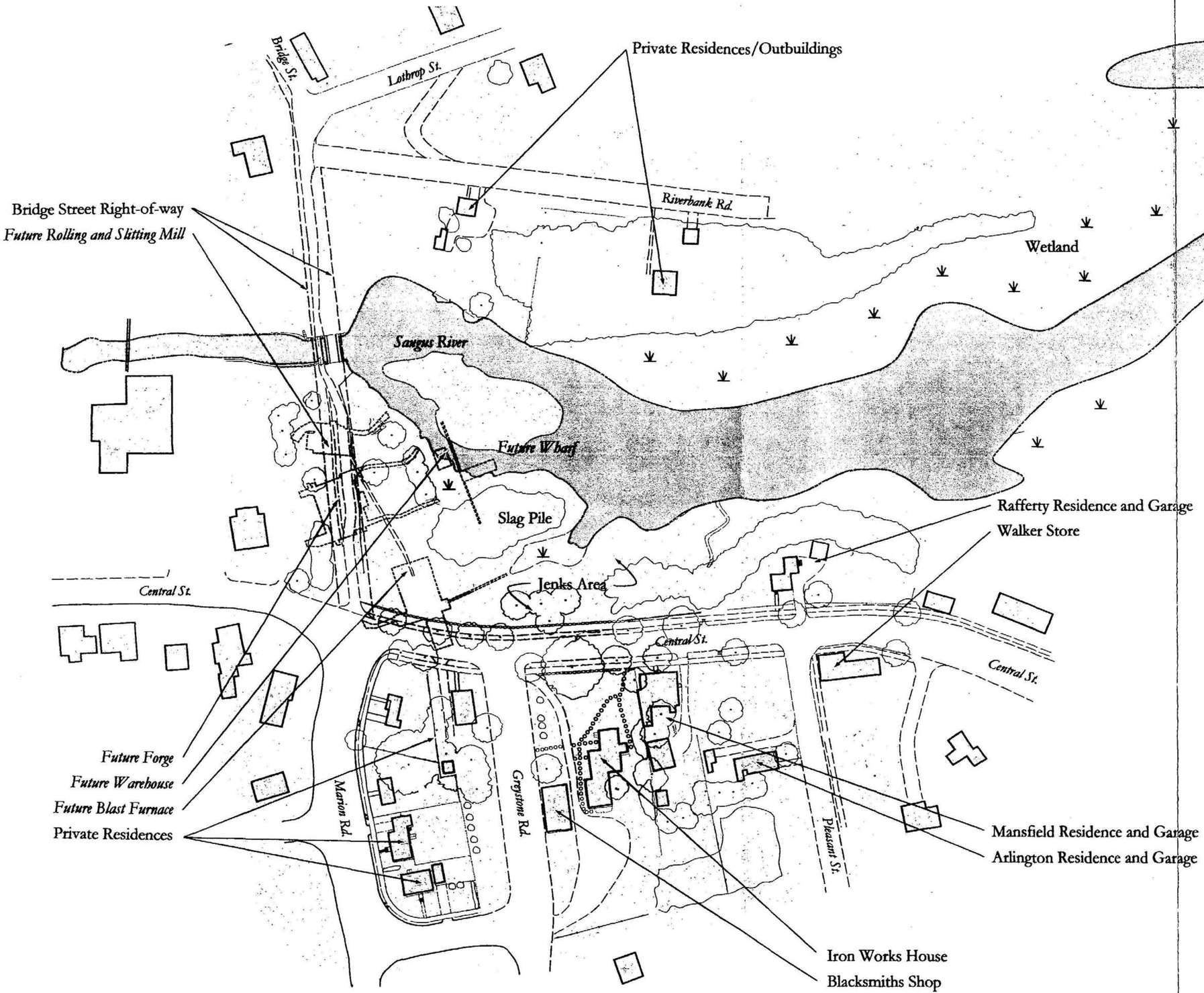
Figure 2.5. In this 1884 map, Central Street is shown as a main thoroughfare. The railroad spur and depot south of the town center, and the increased number of streets, individual lots, and structures illustrate the growth of Saugus. (*Atlas of Essex County, Massachusetts.* George H. Walker and Co., Boston, 1884)



Figure 2.6. Taken in 1899 from the east bank of the Saugus River, this photograph is the earliest known view of the iron works site. The slag pile is located in front of the Central Street retaining wall and is the only visible and intact reminder of the iron works plant. It is possible that stones from the iron works buildings were used in the retaining wall. The Iron Works House, before restoration, is in the center. (SAIR #1493).



Figure 2.7. This early twentieth-century view looks northwest from the east bank of the river. Taken prior to archeological field work, it shows the slag pile and the Central Street retaining wall. The site's openness suggests its use as a pasture, although surrounding suburbanization had probably diminished this type of activity by this point. A conspicuous ell-shaped stone structure is visible on the opposite bank in the center of the photograph, possibly a foundation, well, or perhaps a sluice outfall from the iron works plant. (SAIR #186)



Saugus Iron Works
NATIONAL HISTORIC SITE

Figure 2.8: 1947 Period Plan

This map was prepared using a series of historic and contemporary maps and photographs. To reconcile disagreements between maps, a 1971 NPS map was used as a base. Locations of all features are approximate.
Referenced drawings include:
- General Plan of Proposed Restoration, PSHKD #2, 1/52
- General Map, PSHKD #1000, 6/52
- Development Plan of Restoration, PSHKD #2A, 9/53
- Plan of Restoration, PSHKD #23, 6/54
- Utilities and Existing Conditions, NPS #444/41002, 10/71
- Archeological Base Map, SPNEA, 7/76
- Maintenance Area Topo. Survey, NPS #444/80001, 2/90
- Existing Conditions, GMP, NPS, 4/02

Structure
Water
Curbed Road/Paved Walk
Paved Road/Gravel Walk
Fence
Park Boundary
Tree/Shrub

Approximate Scale
0 100' 200'
North

Olmsted Center for Landscape Preservation

Drawn by: JTK
Date: 4-30-03

Reconstruction Circulation Features

First Iron Works Association Stewardship (1947-1968)

Brief History

FIWA acquired the iron works site from the DAR in 1946, and by this time, much of it had reverted to woodlands, an indication that its use as pasture had been on the decline. In 1948, FIWA enlisted the services of archeologist Roland Wells Robbins to determine the extent of underground remains. With the financial support of the American Iron and Steel Institute, research continued for four years, during which period Robbins uncovered the remains of the blast furnace, forge, rolling and slitting mill, and several waterways.

Robbins' discoveries stimulated great interest and plans were made to reconstruct some of the iron works' major structures. In 1951/1952, FIWA surveyed the Saugus River, Pranker's Pond to the north, and areas adjacent to the iron works site to establish the historic water levels and determine how the waterwheels may have worked. It was determined that the river's water level had risen three feet since the seventeenth century, meaning elevations for the reconstructed buildings had to be set "essentially floating over their respective excavation sites."[1] FIWA was mindful of aesthetics, and early on they decided to construct a small stone dam downstream with tidal gates to "prevent the unsightly condition of mud flats at low tide and insure a continuous existence of water in the iron works area."[2]

FIWA selected the same architectural firm that designed much of Colonial Williamsburg – Perry, Shaw, Hepburn, Kehoe, and Dean (PSHKD) – to design the reconstructed iron works plant. Archeological investigations continued alongside reconstruction work until Robbins resigned in 1953. The final layout of the plant was based on a complex decision-making process that resolved sometimes conflicting archeological findings, documentary evidence, and advice from iron making experts from around the world.[3]. The reconstructions – blast furnace, forge, rolling and slitting mill, wharf, and warehouse – were finally completed in 1954 and the site was opened to the public as the First Iron Works.

In 1957, a failed attempt to harvest gravel and silt from Pranker's Pond breached a dam. As was the case in the 1682 dam breach, the released silt wrecked havoc downstream, this time filling in most of the reconstructed wharf area and producing the wetland marsh that today landlocks the dock.

The American Iron and Steel Institute withdrew its funding in 1961 and FIWA was unable to properly maintain the site and prevent its gradual deterioration. Dialogue with the National Park Service regarding a donation of the reconstructed buildings, Iron Works House, and surrounding lands followed, and in 1968 the First Iron Works became the Saugus Iron Works National Historic Site.

First Iron Works Association Circulation Features

Aided by a 1946 engineering survey, Roland Robbins's initial archeological investigations in late 1948 located a waterwheel pit under about twenty feet of fill just behind the Central Street retaining wall, northeast of the Iron Works House.[4] By 1949, FIWA had convinced the city to abandon this portion of Central Street to permit excavation and in 1950, the street was rerouted along Union Street and Marion Street. This significant event set the stage for the development of the iron works site for public visitation and

interpretation and altered the relationship of the Iron Works House with Central Street that had been in place since at least 1724 (Figures 3.1 through 3.5).[5]

Around 1950, FIWA began acquiring and developing parcels surrounding the Iron Works House, the former plant site, and along the east bank of the Saugus River. The abandonment and rerouting of Central Street made possible the closure of Greystone Road immediately north of the Nutting blacksmith shop. The road beds were regraded and planted with grass, establishing the spatial relationship between the Iron Works House and the reconstructions still extant today. FIWA also relocated, demolished, or converted into park uses several residences and outbuildings. As the First Iron Works developed, street and sidewalk configurations were also modified, including the construction of a parking lot for twenty cars south of the Mansfield House (Figures 3.6 and 3.7).

As noted previously, the layout of the iron works plant layout was informed by archeological and documentary evidence as well as consultations with iron works specialists. Plans from 1952 and 1953 illustrate the evolution of thought and also the development of the site for visitors, particularly in regards to the locations of the museum and parking areas (Figures 3.8 and 3.9). FIWA was apparently aware of the encroaching suburbs; both plans identify buffer properties already purchased and parcels desirable for future acquisition. Some properties, such as the Rafferty lot on the bluff and several parcels between Greystone Road and Marion Road, were eventually obtained. Others were not because of homeowner's refusal to sell. This is part of the reason the proposed Union Street extension shown on the plans was not built.

By the end of 1953, reconstructions of the blast furnace and forge had been completed and work was underway on the rolling and slitting mill, warehouse, and dock (Figure 3.10). The finished landscape in place today also took form around this time, with some of the grading work directed by Robbins (Figure 3.11). While the primary focus was to locate evidence of the iron works plant, Robbins had hoped to discover the original contours of the natural ravine. In the process, large amounts of fill were removed and hauled off from the roadbeds beneath Central and Bridge Streets. According to archeologist Marley Roberts Brown, "restoration work also involved the back-filling and 'shaping' of areas which had already been excavated....Some areas were filled and re-excavated several times over in the course of the four years Robbins worked at the iron works site (Figures 3.12 and 3.13)."[6]

To date, no overall PSHDK planting or grading plans have been located, although there are many park-specific plans and sections - an indication that the buildings were integrated into the existing landscape.[7] Documents between FIWA and PSHKD provide directions for grading, seeding, planting, and landscaping. The slag heap, for example, was regraded and "restored to original contours," though it is unclear whether this means the pre-excavation or seventeenth century contours.[8] Progress reports also refer to "original paths" and "ancient" stone walls, but their locations have not been determined (Figures 3.14 through 3.16).[9]

The degree to which these original paths influenced the design of the path system installed in 1954, and still in use today, is unclear. In an illustration by Charles Overly, the seventeenth-century iron works buildings are shown connected to each other and the surrounding landscape of fields and forests by a simple network of paths, roads, and bridges (Figure 3.17). This is probably an accurate representation of the historic circulation features, and may explain the straightforward and utilitarian design of the 1954 path system (Figure 3.18).

By the time the site was opened to the public in September 1954, FIWA had, in the course of eight years, transformed part of a residential neighborhood and former pasture into a replica of a seventeenth-century iron works plant (Figures 3.19 and 3.20). The 1954 Period Plan shows the extent of these changes: three

houses northeast of the Iron Works House have been removed or relocated, Nutting's blacksmith shop has been converted into a museum, and a visitor contact station has been built. A series of gravel paths, granite steps, and wooden bridges take visitors from the visitor contact station to the Iron Works House and museum area and down the steep slope to the reconstructions overlooking the Saugus River. On the east bank, a portion of Riverbank Road is used for park uses, and a gravel nature trail parallels the river (Figure 3.21).

National Park Service Administration (1968-present)

Brief Park History

The loss of financial support from the American Iron and Steel Institute in 1961 severely limited FIWA's ability to maintain its reconstructed buildings. Discussions regarding federal acquisition with NPS commenced soon after, and by 1964, the Department of the Interior designated the First Iron Works site as historically significant. On April 5, 1968, President Lyndon Johnson signed the law enacting the creation of the Saugus Iron Works National Historic Site.

NPS stewardship officially began on July 1, 1969, and by this time, the new national park had acquired the two residences at the northwest corner of the park for staff housing as well as the Rafferty property along the bluff. The First Iron Works site had not changed significantly since its opening in 1954, with one major exception; the river basin – so important to interpreting why the original iron works plant had been located here and how it operated – was now mostly filled in with silt initiated by the 1957 dam breach.

Although several site surveys were completed and a variety of changes were implemented throughout the 1970s and 1980s, the overall FIWA/PSHKD site plan remained essentially intact and unchanged, mainly because of the park's many known and potential archeological areas. The NPS removed the Mansfield and Rafferty houses and outbuildings and a work shed on east bank, and in the mid-1980s, a restroom annex was constructed on the south end of the museum annex. Maintenance facilities expanded as well, including a carpenter's shop/work yard (1976), woodshed (1977), and shelter (1988) on the east bank and a maintenance garage on the bluff (1980). The park also instituted a new water recirculation system to feed the reconstructed sluiceways, replacing the old system that relied exclusively on town water.

Many interpretive programs were introduced as well. One of these included the construction of a blacksmith shop on the east bank in 1975 for demonstrations (the seventeenth-century iron works plant did have a blacksmith shop but FIWA chose not to reconstruct it).[10] In 1996, to enhance the larger regional story told at Saugus, the park became the southern gateway for the Essex National Heritage Area, a collection of local, state, and federal parks significant to the region's early settlement, maritime trade, and early industrialization.

National Park Service Circulation Features

Improvements to FIWA's circulation system began soon after the park was physically acquired in 1969. The 1971 Period Plan shows that most circulation-related changes occurred in the upper terrace: cobble paths around the Iron Works House have been widened and converted to gravel and the path from the house and museum has been realigned to better guide visitors to the north stairway at the bluff (Figure 3.22). The latter change may have been made to avoid impacting the remains of a nineteenth-century barn noted on the archeological base map (Figure 3.23).

One of the most significant circulation-related changes made by NPS occurred when the Mansfield house was demolished in the early 1970s. This removed the visual and physical obstacle between the parking lot and the Iron Works House that had prompted FIWA to construct the visitor contact station. Subsequent plans proposed a wide range of improvements in visitor circulation and interpretation at the park, particularly in the upper terrace (Figure 3.24). However, most of the changes that were implemented were minor and focused on improving existing circulation features. These included reconstructing the granite stairs (early 1970s), rehabilitating the corduroy road (1970s and again in 2001), expanding the parking lot to the west (1983), and enlarging the maintenance yard on the east bank (1980s) (Figure 3.25). In the early 1980s, the nature trail was extended southward and in 1989, it became part of the one-half mile long Saugus National Recreation Trail. It extends from the south stair on the bluff, follows the path that passes by the dock, and crosses the bridge to the loop nature trail on the east bank.

Around 1975, the park resurfaced the paths in the industrial area with scale, a waste product of local commercial forging operations. This loose, dense, silvery material was intended to blend with the historic scene, but erosion from visitor use, poor drainage, and weather caused accessibility problems and threatened to damage archeological sites. The material was removed in the early 1990s. The paths were then widened to an average width of sixty inches, bordered with wood boards, and resurfaced with crushed stone and stone dust.[11] The latest improvements have included the installation of a recycled wood/plastic trex border along the paths and new crushed stone.

Conclusions: Reconstruction Circulation Features

The discovery of the blast furnace foundation under Central Street in 1948 set into motion the development of a reconstructed seventeenth-century iron works plant and the transformation of the neighborhood surrounding the Iron Works House. The First Iron Works Association persuaded the town of Saugus to reroute a portion of Central Street and permanently abandon Greystone Road and Bridge Street for the development of the iron works site as a park. The reconstructions of the blast furnace, forge, rolling and slitting mill, warehouse, dock, and wharf were accompanied by grading, seeding, planting, and landscaping. By 1954, a utilitarian network of gravel paths, granite steps, and wood bridges had been built to take visitors from the contact station to the Iron Works House and museum area and down the steep slope to the reconstructed iron works plant, the picnic area, and trail.

The National Park Service has operated the park since in 1968. Due to the numerous archeological sites, changes to the 1954 path system have been limited to resurfacing existing paths and rebuilding steps. Some new construction has occurred over the last thirty-four years, however, including expansion of maintenance facilities and work areas, improvements to paths around the Iron Works House and museum, construction of a new path from the museum to the north staircase, expansion of the parking lot and the nature trail, and reconstruction of the corduroy road along the wharf.

The demolition of the Mansfield House in the 1970s removed the last visual and physical obstacle between the park's main entrance and the Iron Works House. This will make construction of a new entrance and path – as part of a larger visitor interpretation, orientation, and accessibility improvement project – a possibility. This project will be discussed in the next section.

Endnotes – Reconstruction Period

[1] Park Archives: Crosby to PSHKD, 1/9/52, in FIWA/PSHKD Correspondence, Box 21 - as cited in Hohmann 1993:20.

[2] Correspondence from Janet Regan, SAIR Museum Technician, 10/17/02: Excerpt of Letter from FIWA to American Iron and Steel Institute, 10/7/54.

[3] Carlson, Steve. *First Iron Work: A History of the First Iron Works Association.* Saugus, MA: Saugus Historical Society, 1991: 21,27.

[4] Correspondence from Janet Regan, SAIR Museum Technician, 12/12/02.

[5] Hohmann 1993:12.

[6] Brown 1975:17-20 - as cited in Hohmann 1993:12-13.

[7] Hohmann 1993:13.

[8] SAIR Archives - as cited in Hohmann 1993:12-13.

[9] Hohmann 1993:13.

[10] Correspondence from Janet Regan, SAIR Museum Technician, 7/19/02.

[11] GMP 2002:150-154.



Figure 3.1. In this aerial view taken soon after archeological work began in 1949, new streets, sidewalks, and houses north and west of the iron works site are clearly distinguishable from older neighborhoods. In the vicinity of the Iron Works House, cobble paths and a driveway/turnaround between the house and barn are visible. On the north side of the iron works site, a makeshift footbridge is all that remains of what appears to be substantial abutments of a larger bridge. This path connects to a field lane on the east bank, the future Riverbank Road. Also notable is an apparent footpath passing diagonally through the iron works site. (SAIR #2174)



Figure 3.2. View looking south during archeological investigations in 1949. On the left is the tree-covered slag pile and the Saugus River. On the right is a portion of the Central Street retaining wall and a good view of its relationship to the topography of the lowland. (SAIR #134)



Figure 3.3. View looking northwest in 1949 at the base of the Central Street retaining wall near the blast furnace site. Robbins' investigations suggest the furnace's waterwheel was under Central Street and FIWA successfully lobbied the city to close this section of the road. (SAIR #98)



Figure 3.4. View of Central Street in 1950, looking north. Greystone Road is at left center. The sidewalk and fence on top of the retaining wall are visible on the right. The waterwheel pit for the blast furnace was later reconstructed on the east side of the street approximately opposite the parked car. (SAIR #205)



Figure 3.5. View looking south of the removal of the Central Street retaining wall, taken from near the intersection of Bridge Street and Central Street in 1950. The blast furnace excavation is visible in the lower left corner and the roof of the Iron Works House is in the center background. (SAIR #214)

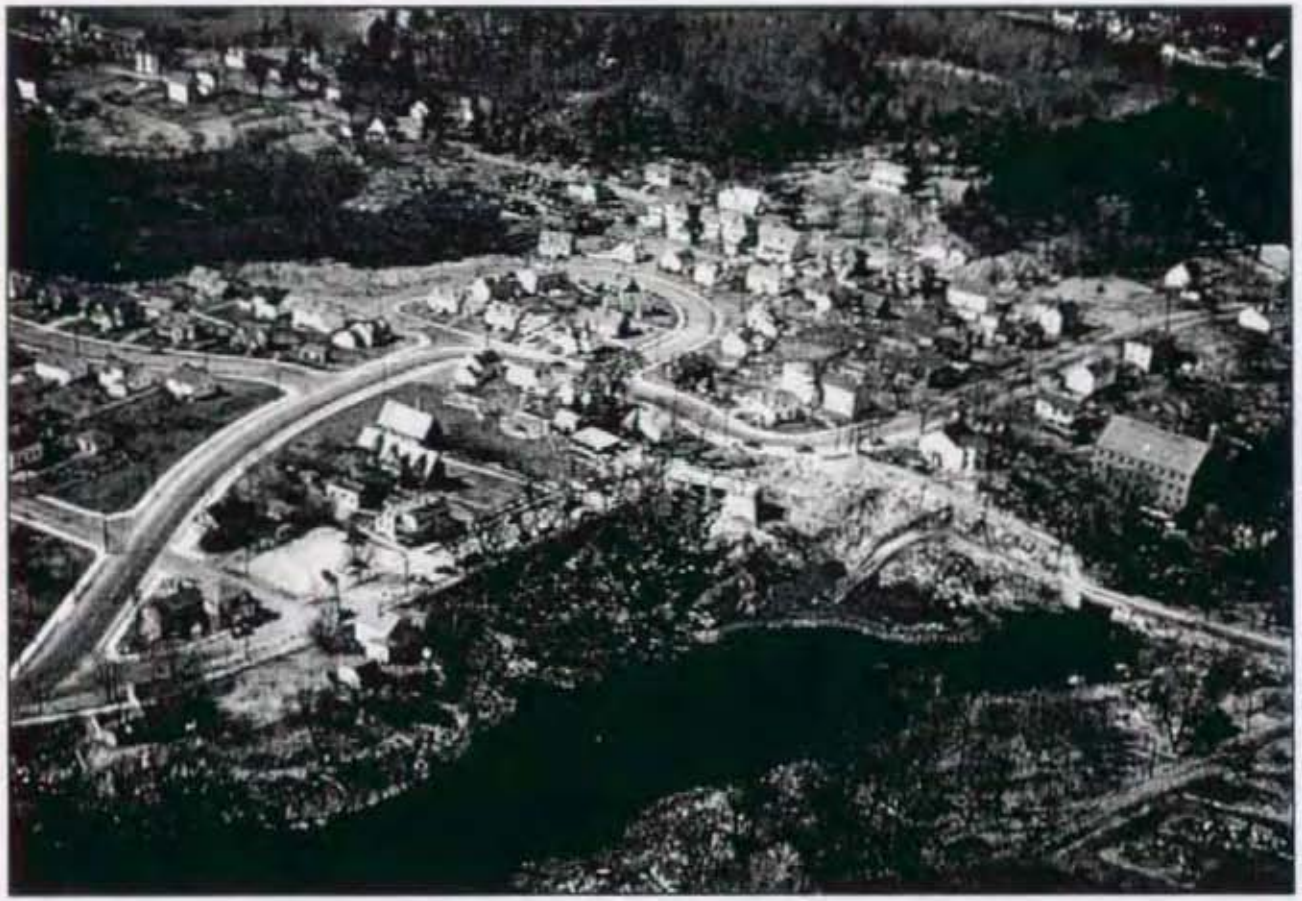


Figure 3.6. This view, looking northwest, dates from c.1951-1952 and shows the beginning stages of the reconstruction of the iron works plant and the transformation of the landscape into a historical park: Central Street has been rerouted to Union Street and outfitted with new sidewalks; Greystone Road, north of the Nutting blacksmith shop has been abandoned and planted with grass; the former driveway has been converted into a sidewalk; and a parking area has been carved out south of the Mansfield House. At the iron works site, reconstruction of the blast furnace is underway and an earthen coffer dam has been constructed to protect the archeological sites. To the north, the Bridge Street path has been re-routed away from active archeological sites. (SAIR Aerial 1)



Figure 3.7. View west of Iron Works House shortly after the relocation of Central Street c.1951. Note the perimeter fence along the sidewalk and the stepping stones around the house. The walkways around the Iron Works House today currently follow the alignment of these former paths. (SAIR #1655)

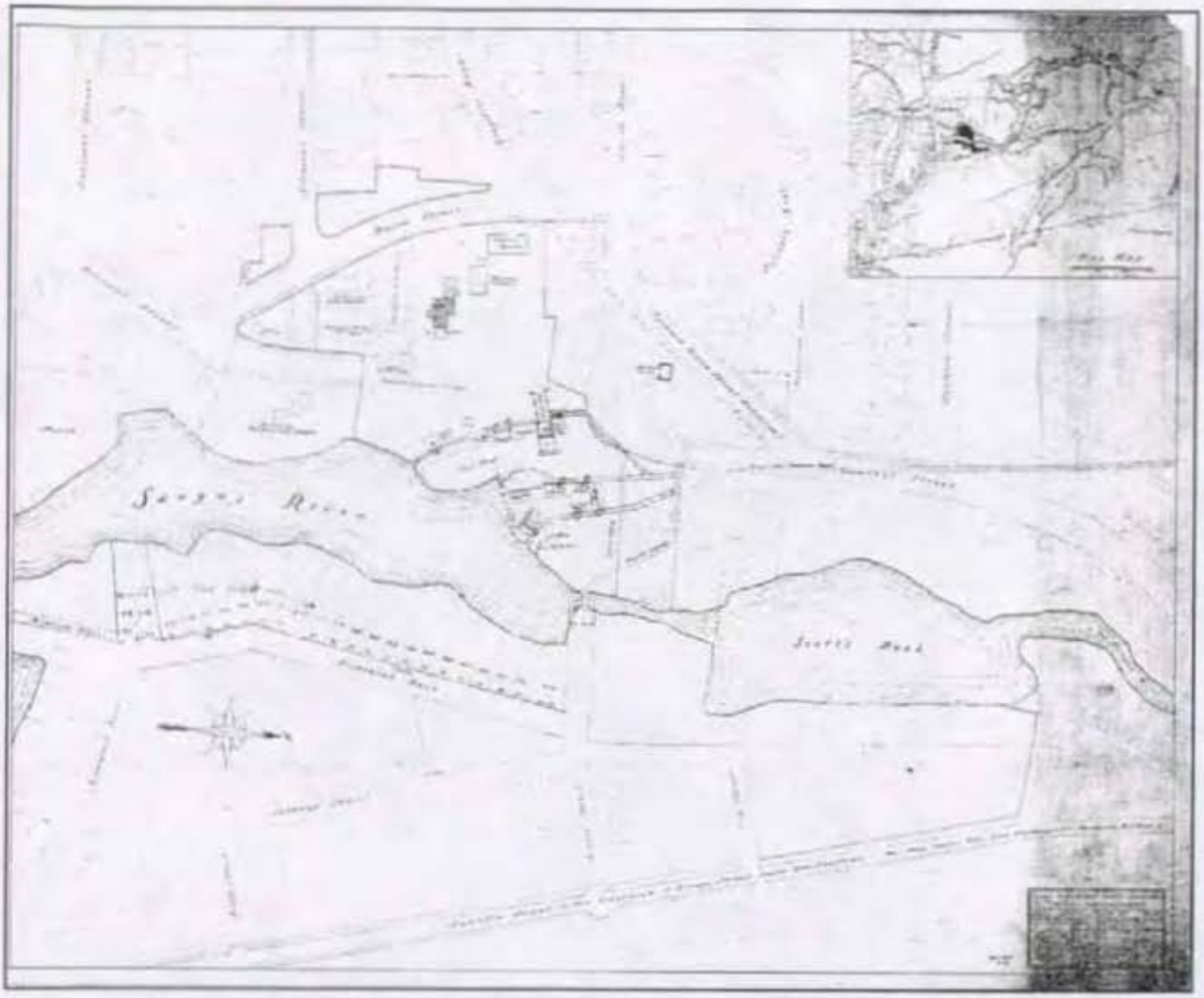


Figure 3.8. In this drawing dated January 1952, the bulk of the current NPS property has been established by FIWA. In addition to the largest parcel around the Iron Works House and the iron works plant, there are two parcels on the north side of Union Street as well as a large swath of subdivided land on the east bank of the Saugus River. Perhaps it was the growing threat of suburbanization around the site that inclined FIWA to obtain as much of a buffer as possible. The plan also shows a proposed extension of Union Street around the charcoal house and another realignment of the Bridge Street footpath around the collection basin and canals; both would seem to suggest FIWA's desire to obtain more property. The Nutting blacksmith shop is shown as temporary museum with a new museum proposed next to it. (SAIR 4500, #54)

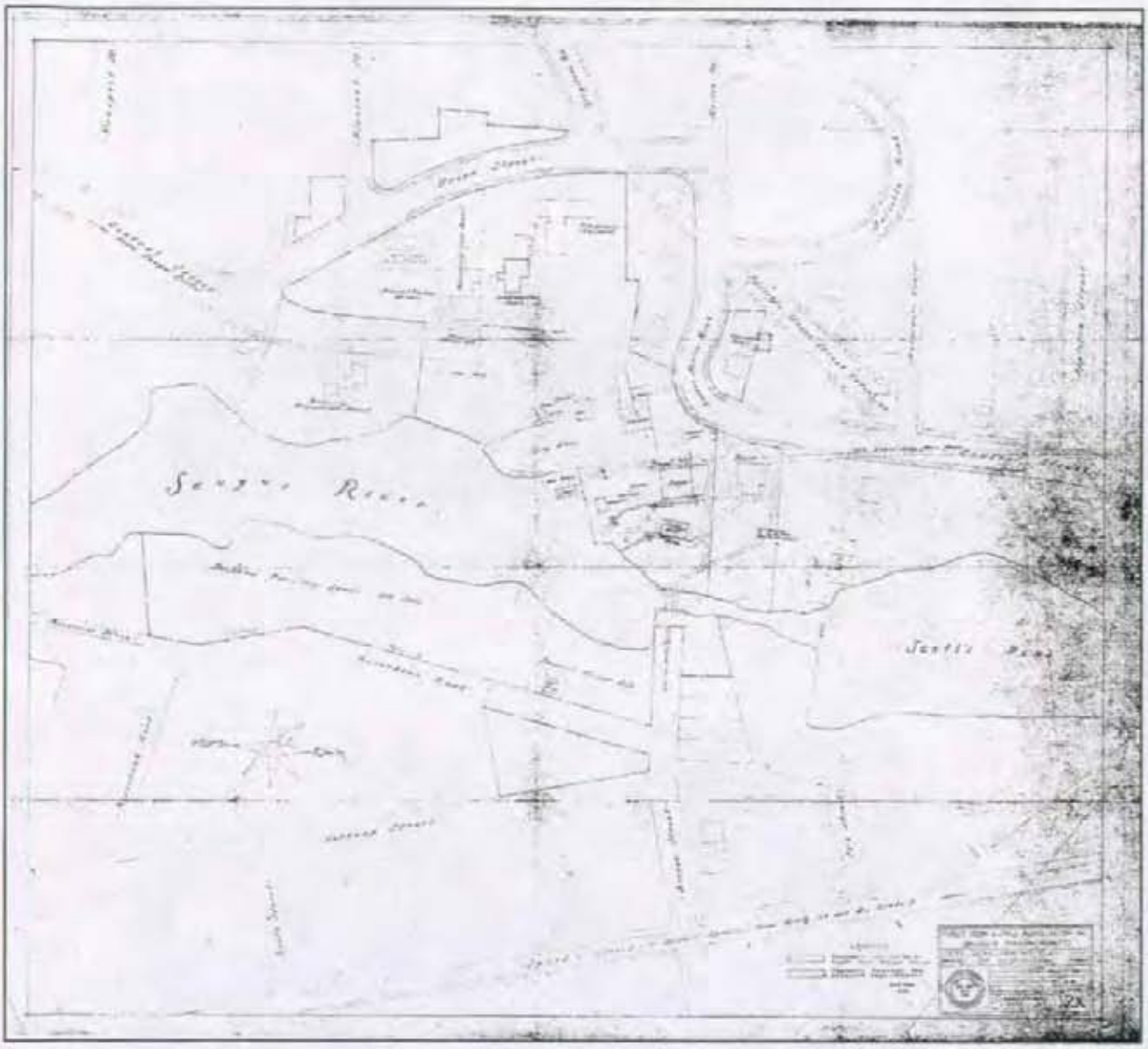


Figure 3.9. This plan dates from September 1953, and except for the blast furnace, the location of the major iron works buildings have changed and are shown in the positions seen today. Ideas for the museum have changed as well; a temporary addition is shown attached to the west side of the Nutting blacksmith shop, and a proposed museum is shown on the east bank next to a proposed 200-space parking area. This site may have been considered for the museum because of its proximity to Saville Street, identified here as a main artery. FIWA had plans to build a visitor center on the east bank as well, preferring to keep it outside of the seventeenth-century resource area and giving visitors a good initial view of the plant. (SAIR 9300, #85)



Figure 3.10. In this view looking north in 1953, the comparatively finished setting of the reconstructed iron works plant contrasts with archeological work underway along the hillside. The path and bridge between blast furnace and forge is in place. The two trees on the hillside closest to the camera will eventually be removed for the hillside path. (SAIR #1062)



Figure 3.11. View looking north in 1954 showing the layout of the path subbase, regraded hillside, and free-standing stone wall. Stakes in the hillside may be for grading or for path layout. Two of the three trees on the hillside shown in Figure 3.10 have been removed. (SAIR #1174)



Figure 3.12. View south in 1954 of construction of the free-standing stone wall, the alignment of which likely corresponds to the westward extent of archeological investigations on the hillside. The slope has been graded, but it is unclear if this is intended to reflect the seventeenth-century contours of the bluff. By opening day, the sidewalk along Central Street was removed, but the path leading to the Iron Works House and barn, along the former driveway, remained. The extant north stairway to the industrial complex would be built next to the tree on the left. (SAIR #1169)



Figure 3.13. View northeast taken in 1954 from the charging bridge of the curved retaining wall and railing for the rerouted Central Street. The packed soil visible on the lower portion of the wall may indicate that this area had been regraded and sodded but was reopened for more archeological work. Note the shelter for the mailboxes at the head of the Bridge Street pedestrian path. (SAIR #1159)



Figure 3.14. Workmen spread loam on the wedge of lawn created between old and new Central Street, directly south of the parking lot. The presence of the two residential properties adjacent to the parking lot prevented visitors from directly accessing the Iron Works House area from the parking lot. FIWA's solution was to construct a visitor contact station at the end of the sidewalk on the abandoned Central Street. View north, 1954. (SAIR #1137)



Figure 3.15. This 1954 view looking southwest shows the construction of the warehouse and foot-bridges parallel to the wharf. The path system on the hillside appears to be in place and the south stairway connecting the upper terrace to the lower industrial complex is now visible. (SAIR #1198)



Figure 3.16. This view, photographed in 1954, looks north at the terminus of the riverside trail paralleling the curving stone retaining wall on the east bank of the river. From here, visitors had a framed view of the river and the reconstructed iron works plant. (SAIR #1135)



Figure 3.17. This 1954 birds-eye sketch illustrates the seventeenth-century iron works as interpreted by FIWA and PSHKD. The plant is shown set amongst a sparsely populated landscape of woodlands and fields. Fronting the Iron Works House (at the time, it was thought to have dated from the period), in the upper left hand corner, is a main road (likely the future Central Street) that extends north past the charging bridge to an intersection with a road that heads east to the river and, presumably, to woodlands beyond. A forked road/path extends south from the blast furnace along the slag pile and past the Jenks area. Paths, stairs, and bridges are shown crisscrossing the sluiceways and hillside. (Sketch by Charles Overly. SAIR Archives)

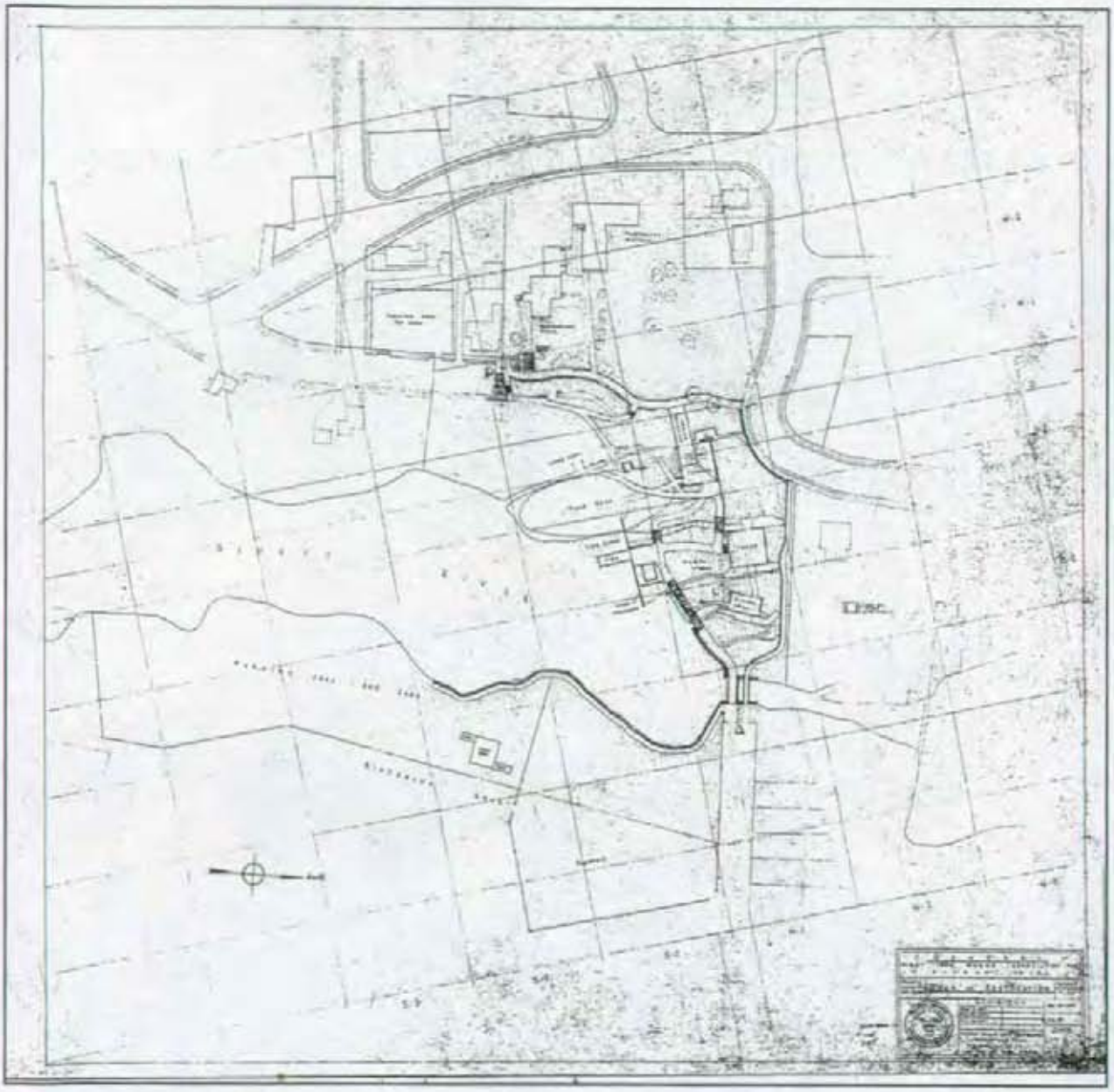


Figure 3.18. This 1954 drawing shows much of the present-day path system in place, with the exception of paths connecting the Iron Works House to the path at the top of the bluff. Curving stone walls are shown along the top of the bluff and along the riverbanks. The visitor contact station has been constructed to receive visitors from the upper parking lot, now shown encircled with a fence. On the east bank, the proposed parking area is still shown, but the proposed museum is not. The alternative Bridge Street pedestrian path, shown in Figures 3.8 and 3.9, is no longer shown on the plan. (SAIR 9500, #105)

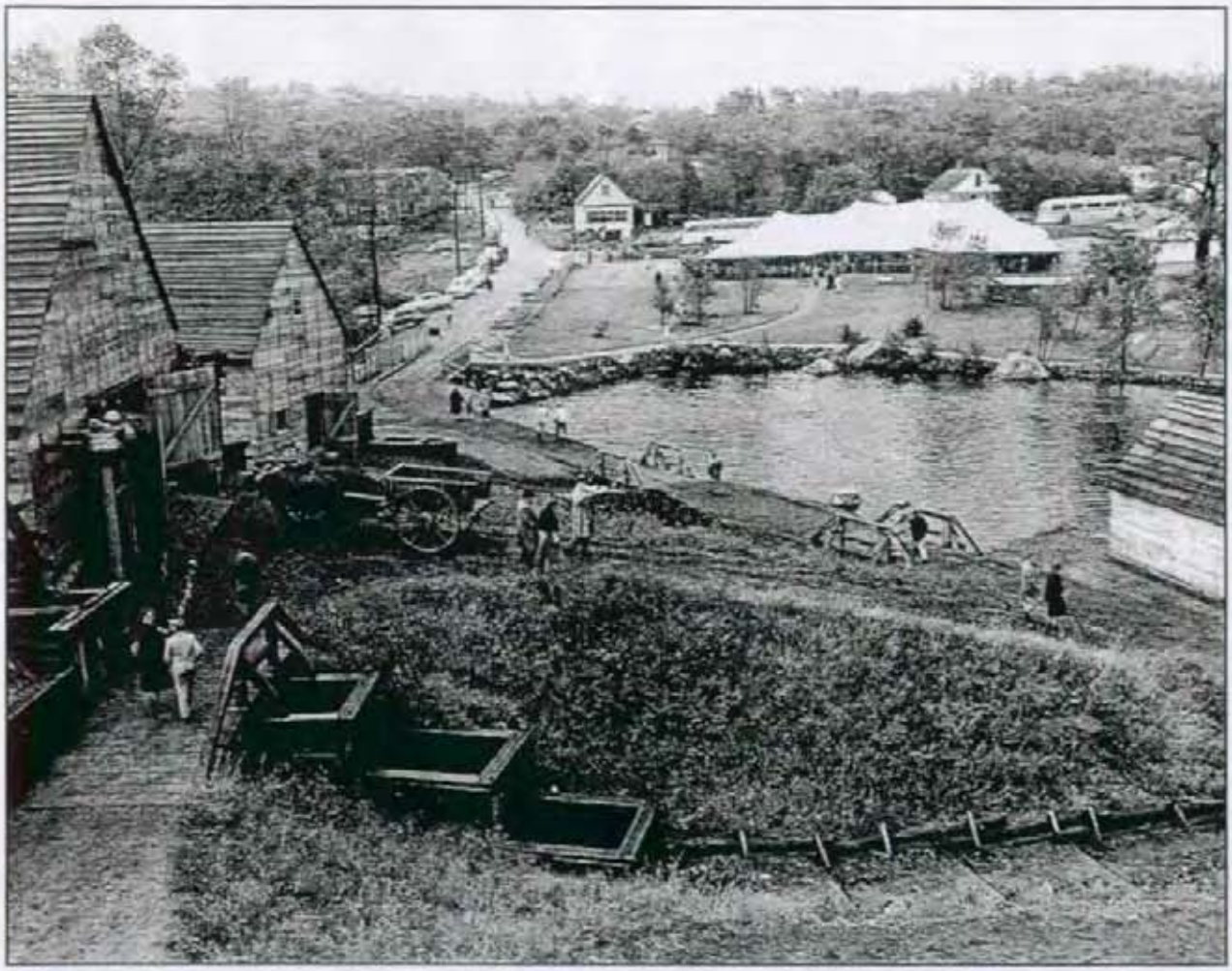
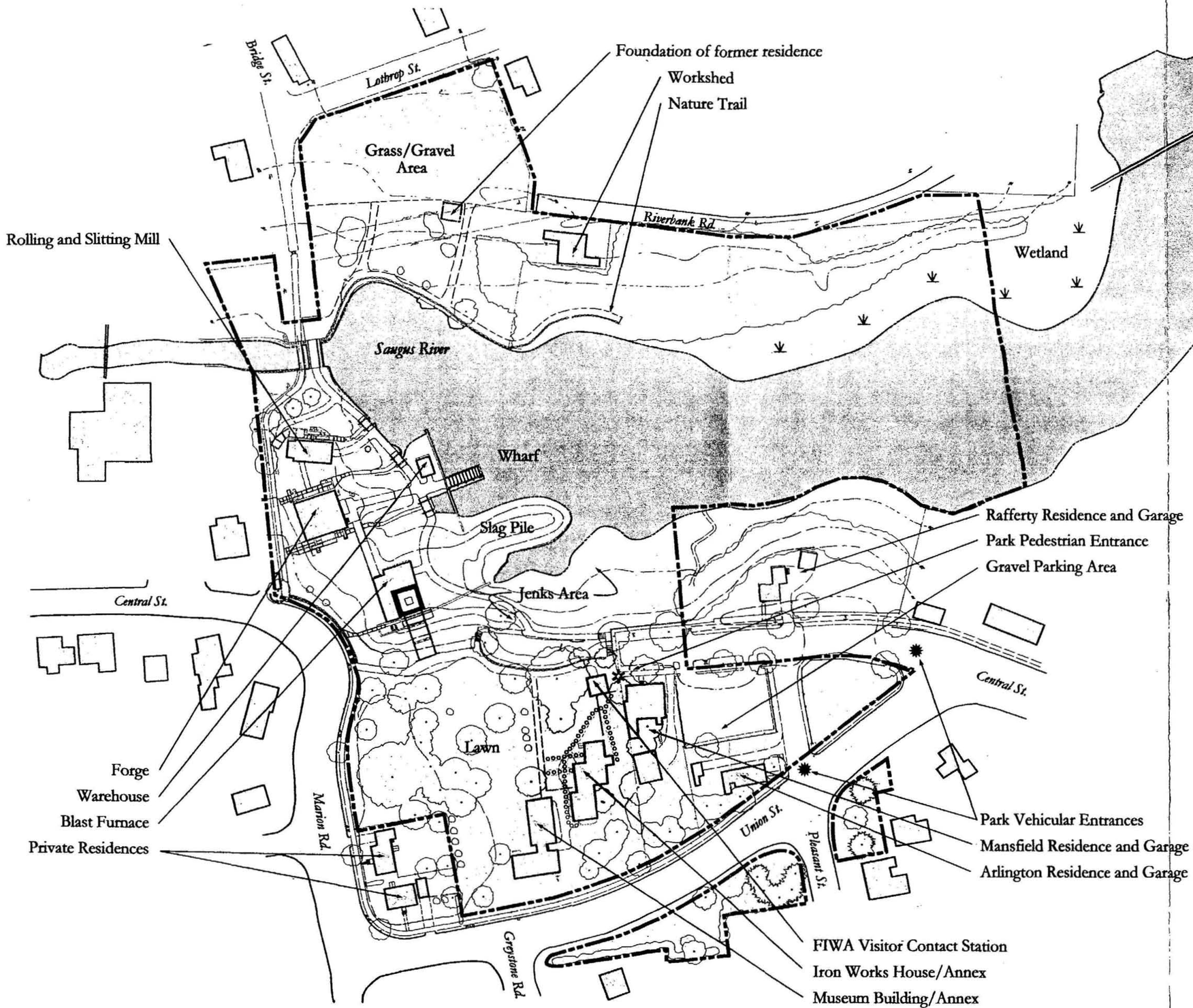


Figure 3.19. View looking east from the blast furnace at the First Iron Works, on dedication day in 1954. The east bank was a suitable location for the tent because of its ample space and uncluttered views toward the reconstructed iron works plant; extant shade trees would likely have prevented the setup of such a large tent in the upper terrace. On the east bank, the two paths extending from the riverside path to the tent are no longer extant, and the stone foundation of a demolished house is visible on the right side of the main tent. Note that along the water's edge and between the two visible footbridges there is no corduroy road; it was installed by FIWA at a later date. (SAIR #1269)



Figure 3.20. Picturesque view west toward the reconstructed iron works taken in 1954 or 1955. A dam breach a few years later would dramatically change this scene. (SAIR #1281)



Saugus Iron Works
NATIONAL HISTORIC SITE

Figure 3.21: 1954 Period Plan

This map was prepared using a series of historic and contemporary maps and photographs. To reconcile disagreements between maps, a 1971 NPS map was used as a base. Locations of all features are approximate.
Referenced drawings include:
- General Plan of Proposed Restoration, PSHKD #2, 1/52
- General Map, PSHKD #1000, 6/52
- Development Plan of Restoration, PSHKD #2A, 9/53
- Plan of Restoration, PSHKD #23, 6/54
- Utilities and Existing Conditions, NPS #444/41002, 10/71
- Archeological Base Map, SPNEA, 7/76
- Maintenance Area Topo. Survey, NPS #444/80001, 2/90
- Existing Conditions, GMP, NPS, 4/02

Structure
Water
Curbed Road/Paved Walk
Paved Road/Gravel Walk
Fence
Park Boundary
Tree/Shrub

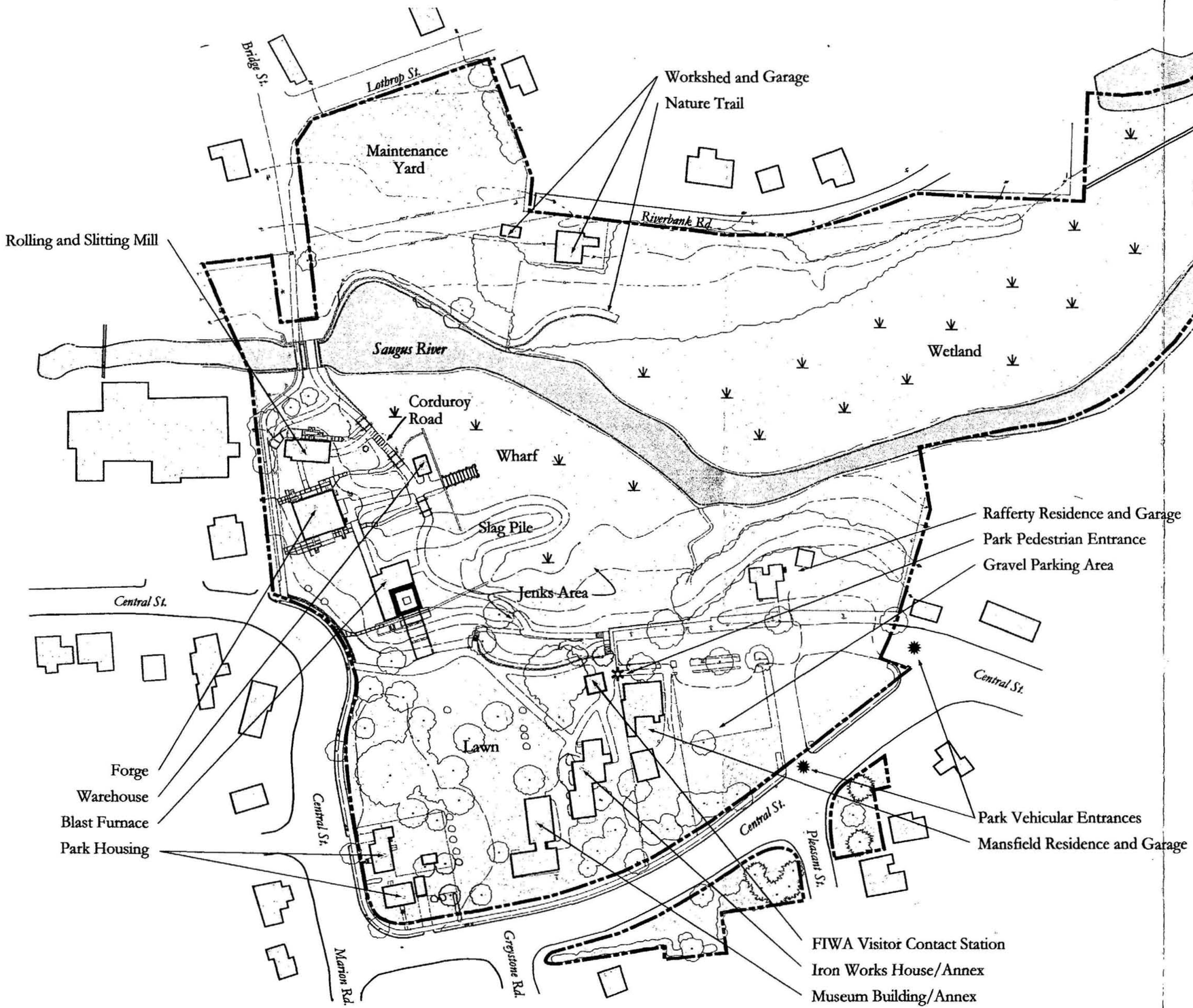
Approximate Scale
0 100' 200'

North

Olmsted Center for Landscape Preservation

Drawn by: JTK

Date: 4-30-03



Saugus Iron Works
NATIONAL HISTORIC SITE

Figure 3.22: 1971 Period Plan

This map was prepared using a series of historic and contemporary maps and photographs. To reconcile disagreements between maps, a 1971 NPS map was used as a base. Locations of all features are approximate.
Referenced drawings include:
- General Plan of Proposed Restoration, PSHKD #2, 1/52
- General Map, PSHKD #1000, 6/52
- Development Plan of Restoration, PSHKD #2A, 9/53
- Plan of Restoration, PSHKD #23, 6/54
- Utilities and Existing Conditions, NPS #444/41002, 10/71
- Archeological Base Map, SPNEA, 7/76
- Maintenance Area Topo. Survey, NPS #444/80001, 2/90
- Existing Conditions, GMP, NPS, 4/02

Structure
Water
Curbed Road/Paved Walk
Paved Road/Gravel Walk
Fence
Park Boundary
Tree/Shrub

Approximate Scale
0 100' 200'
North

Olmsted Center for Landscape Preservation

Drawn by: JTK
Date: 4-30-03

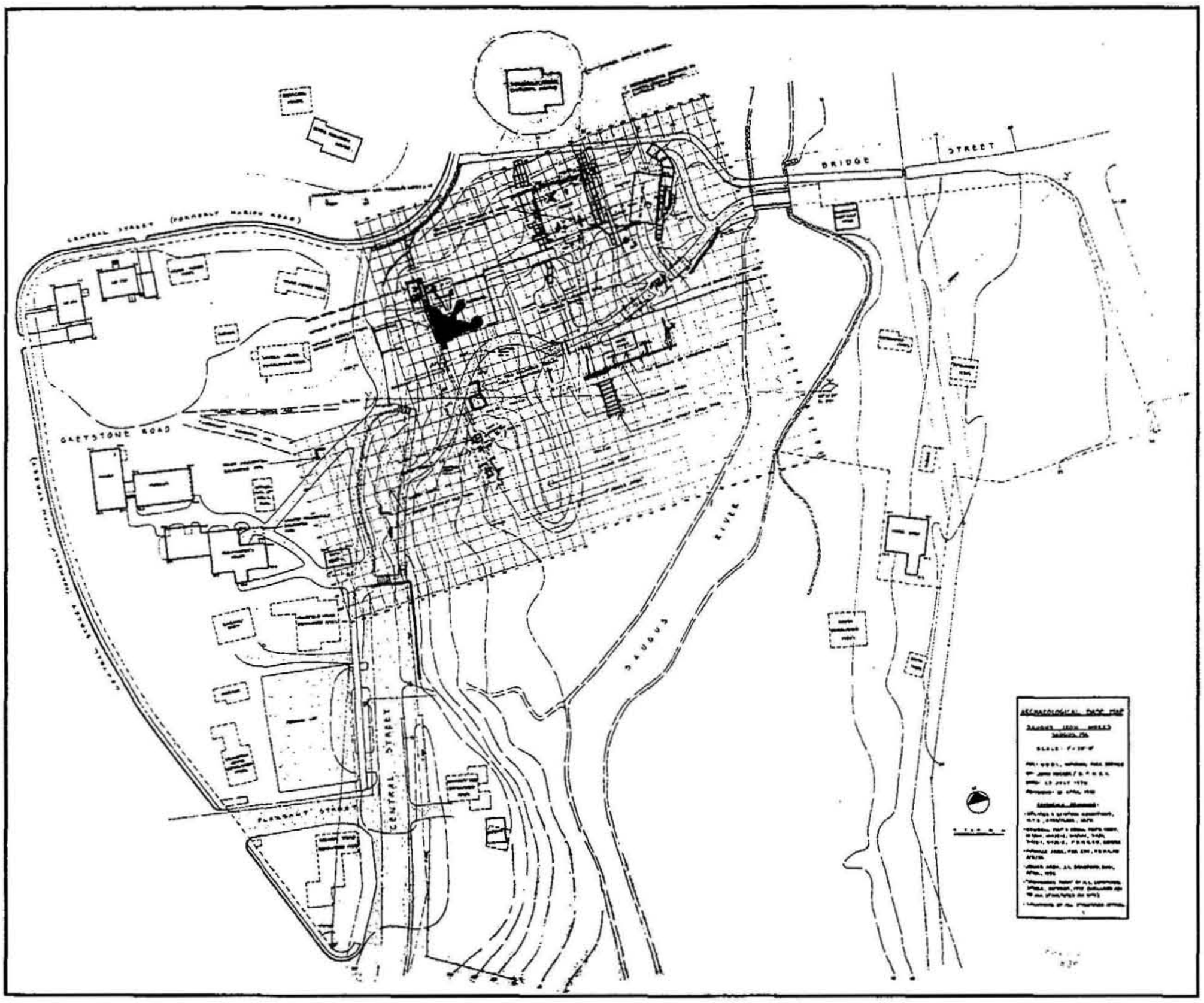


Figure 3.23. Produced in the mid-1970s, this base map shows many of the park's archeological features, including a waterway that possibly led to the Jenks area, a nineteenth-century barn next to the Iron Works House, and off-site locales of the holding basin, charcoal house, and other foundation remains. (BOSO: SPNEA/NPS, 1976/78)

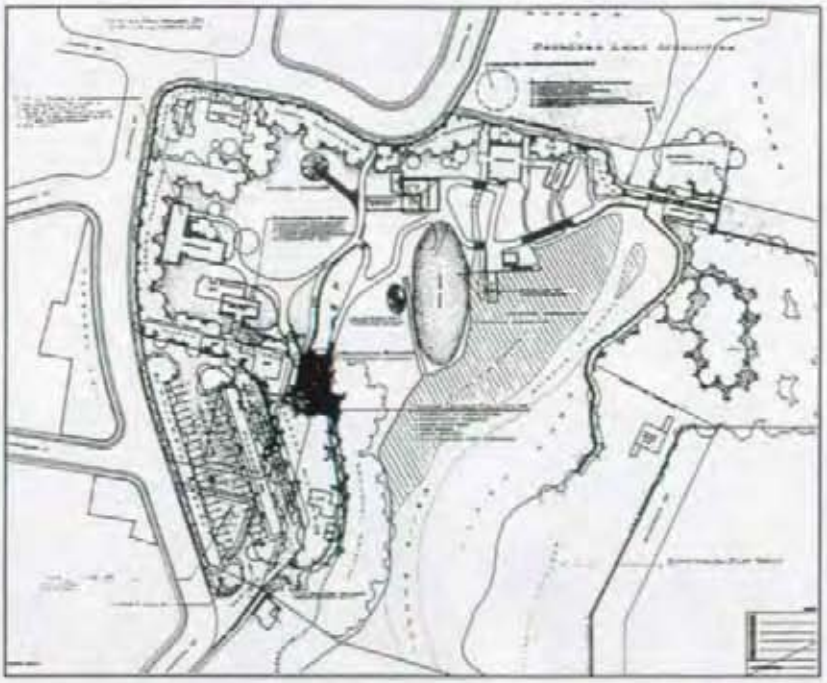


Figure 3.24. This plan, from the 1970s, proposed major reconfiguration of FIWA's circulation system. The expanded parking area features spaces for busses, one-way traffic flow with separate entrance and exit, and a drop-off area. The visitor contact station is replaced by an overlook visitor center, from which walkways are to the Iron Works House, museum, and outdoor exhibits. Also note the hillside maintenance road, new land acquisition, and screen plantings. The plan was never implemented. (BOSO: Drawing #444/40002)



Figure 3.25. 1995 aerial view of the Saugus Iron Works NHS shows the vehicular entrance into the parking lot from Central Street, bus parking area, and maintenance garage. The clear view of the maintenance garage from the parking lot has caused some visitors to mistake it for the visitors center. Note the width of the river channel compared to the view in 1951/52, in Figure 3.6. (SAIR #2-5580)

Existing Circulation Features and Conditions

The 2002 Existing Conditions Plan documents existing conditions and features at the Saugus Iron Works NHS (Figure 4.1). Compared to the conditions in 1971, most of the physical changes at the park have focused on improving visitor and maintenance facilities: in the upper terrace, the former Rafferty property has become the park's maintenance garage, the Mansfield residence and outbuildings have been removed and landscaped, and restrooms have been added to the museum annex. Expansion and reconfiguration of the parking area has eliminated the south vehicular entrance at Central Street and relocated the pedestrian entrance gate to a point farther south of the visitor contact station. On the east bank, a blacksmith shop and numerous maintenance facilities have been built and the riverside trail has been extended south into the wetlands.

Vehicular Circulation

The park is situated near major highways, but its location in a residential neighborhood makes access somewhat problematic. Brown UNICOR signs currently direct visitors from Route 1 to arterials that lead to the park, but more signs are needed. In particular, the rotary at the town center would benefit from additional signage.

Visitors currently enter the park from Central Street, the entrance of which is handsomely identified with custom dark brown wood signs with gold lettering (Figure 4.2). The asphalt parking lot accommodates twenty-eight vehicles (includes two spaces for persons with disabilities) and two busses, and is in good condition. The northern row of spaces next to the fence may need to be reconfigured to widen the area between the two disabled spaces, which is currently too narrow.[1] Park staff also use the parking lot, so the number of spaces has been insufficient at times.[2]

Maintenance facilities are currently divided between the garage adjacent to the parking lot and the woodshed, shelter, and carpenter's shop on the east bank. Most vehicular maintenance activities operate out of the garage, which creates a potential conflict with visitors during peak visitation months. Vehicular maintenance access to the reconstructed iron works plant is from the east bank facility, which is currently served by city streets.

Pedestrian Paths and Trails

A majority of the park's visitors arrive in private vehicles or by bus. Although asphalt walkways physically connect the parking lot to the entrance gate currently located at the northeast corner of the parking lot, this entrance is somewhat counter-intuitive. Some visitors have mistaken the maintenance garage, which at first appearance resembles a Mission 66 NPS visitors center, with the visitor contact station built by FIWA in 1954. Because the visitor contact station is somewhat removed from the pedestrian entrance gate, directional signs have recently been installed to help alleviate the confusion (Figures 4.3 and 4.4).

Inside the gate at the visitor contact station is a junction where the path splits. One branch leads to the Iron Works House and museum area and another leads to the lower industrial complex (Figure 4.5). The pathways throughout the upper terrace are composed of crushed gray stone and vary in width between five and eight feet. They are in good condition (Figures 4.6 through 4.8). Visitors can rest on two wood benches

located along the path paralleling the stone wall or at wood picnic tables arranged under the large beech tree on the north end of the lawn area. Both of these features are in good condition (Figures 4.9 through 4.10).

One of the main circulation issues at the park is that visitors often proceed directly to the reconstructions and miss or skip the Iron Works House and museum.[3] This has been attributed in part to the small size of the visitor contact station, which limits opportunities to orient visitors to the park, as well as the proximity of the entrance gate to the reconstructed industrial complex.[4]

Two sets of outdoor stairways connect the upper terrace to the walkways in the lower industrial complex (Figures 4.11 and 4.12). Both feature granite steps and are equipped with steel handrails; the handrail along the north stairway is in fair condition with evidence of rust, and the handrail along the south stairway is in good condition.

Gray crushed stone paths continue from the stairways through a series of switchbacks to the industrial complex. Portions of these paths were recently improved with a trex border to contain the crushed stone during heavy rains. This solution worked in some areas, but there remains a significant number of runnels and erosion along the steeper segments. Additionally, the flexible nature of the trex border does not maintain its shape when stressed by foot traffic compared to more rigid steel edging (Figure 4.13).

Access to and within the industrial complex has been another concern. As currently designed, the outdoor stairs on the bluff and steep segments of paths in the industrial complex are not compliant with current accessibility regulations and laws (Figures 4.14 through 4.18). Presently, visitors with special needs are transported to this area by golf carts operated by park staff.

The industrial complex circulation system also features three small wood footbridges with railings, and a wood dock. The decking on all four of these structures is in good condition. However, the decking and railing of the footbridge that crosses the Saugus River is showing preliminary signs of deterioration. The corduroy road adjacent to the wharf was refurbished in 2001 and is in good condition (Figures 4.19 and 4.20).

On the east bank, historic photographs suggest part of the riverside walkway was surfaced in gravel or crushed stone. This pathway is now maintained as grass, and in 1980 it was extended south as a loop trail through woodlands and wetlands along the east bank. The path/trail is the last segment of the park's National Recreation Trail. Designated in 1989, the trail begins at the south stairway on the slope and follows the path along the wharf to the east bank. There are currently no signs identifying this notable designation (Figures 4.21 through 4.23).

A gate at Bridge and Lothrop Streets provides vehicular access to a large maintenance yard and the woodshed, carpenter's shop, and shelter. The yard is a mix of compacted gravel, soil, and weeds and is clearly visible from the picnic area. It is physically separated from the picnic area by wood timbers set into the ground. Maintenance activity around stockpiles of loam and mulch has damaged some of the timbers and is creating an erosion problem in the adjacent lawn area (Figure 4.24).

As previously mentioned, visitors unable to negotiate the stairways on the slope or the steep grades in the industrial complex are shuttled to a gate on the east bank in golf carts driven by park staff. The most typical route is via the concrete sidewalks along Central Street and the asphalt/crushed stone path along Bridge Street. The Central Street sidewalks are in good condition but portions of the Bridge Street path are in need of rehabilitation. Although both walkways do a good job of physically connecting the park to its surrounding

neighborhoods, connections between the park and other areas of pedestrian activity, such as the town center, need to be developed (Figures 4.25 and 4.26).[5]

Endnotes – Existing Circulation Features and Conditions

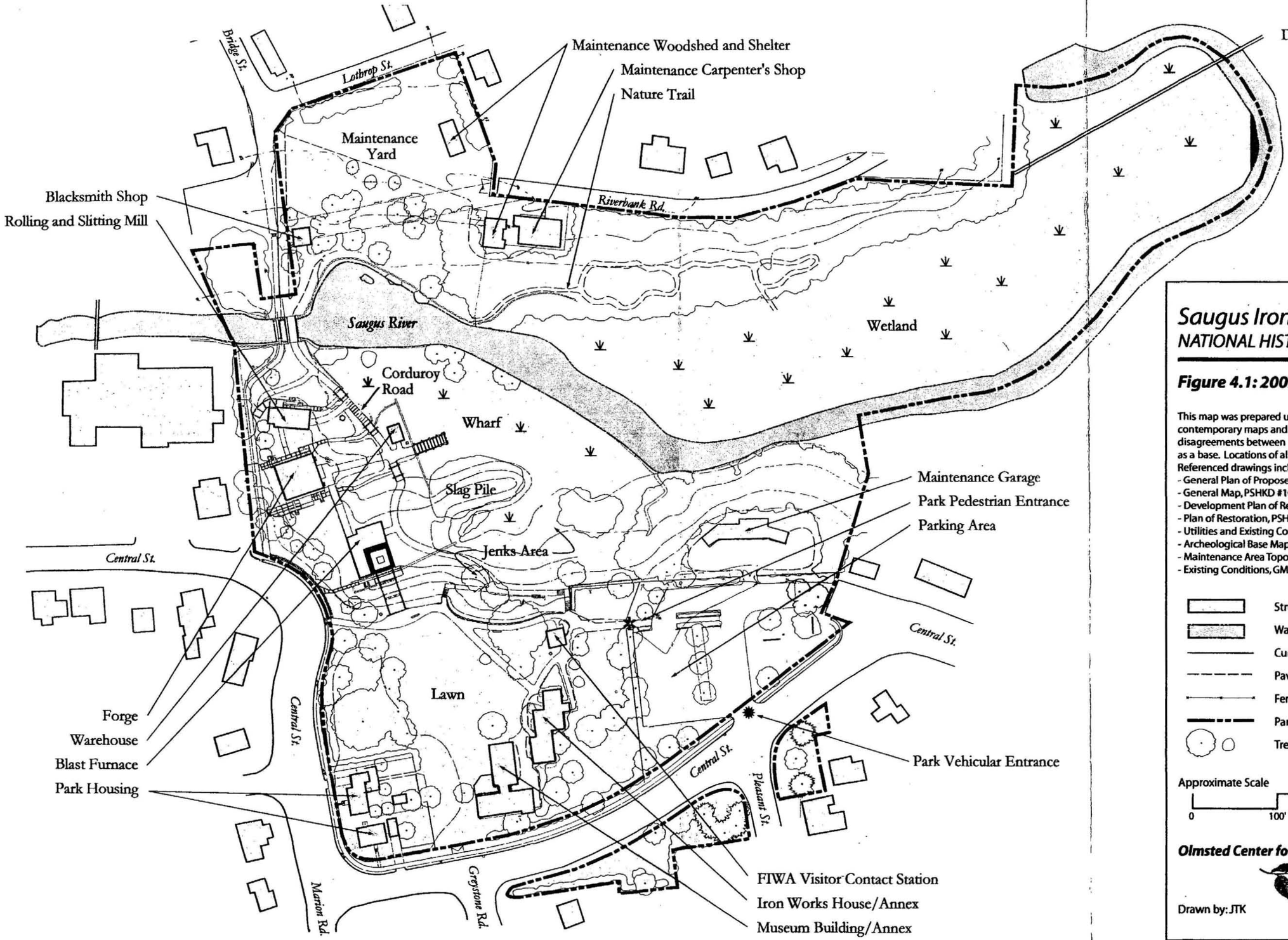
[1] The space in between the two disabled persons parking lot stalls is not compliant and needs to be 8'-wide and crosshatched. In addition, the size and orientation of the storm drain openings on the asphalt path near the entrance gate may create an accessibility problem. Letter from MOD (Hickey) to NPS (Earl), 7-24-98 – as cited in GMP 2002:120.

[2] GMP 2002:27.

[3] GMP 2002:27.

[4] GMP 2002:27.

[5] GMP 2002:27.



Saugus Iron Works
NATIONAL HISTORIC SITE

Figure 4.1: 2002 Existing Conditions

This map was prepared using a series of historic and contemporary maps and photographs. To reconcile disagreements between maps, a 1971 NPS map was used as a base. Locations of all features are approximate.
Referenced drawings include:
- General Plan of Proposed Restoration, PSHKD #2, 1/52
- General Map, PSHKD #1000, 6/52
- Development Plan of Restoration, PSHKD #2A, 9/53
- Plan of Restoration, PSHKD #23, 6/54
- Utilities and Existing Conditions, NPS #444/41002, 10/71
- Archeological Base Map, SPNEA, 7/76
- Maintenance Area Topo. Survey, NPS #444/80001, 2/90
- Existing Conditions, GMP, NPS, 4/02

Structure
Water
Curbed Road/Paved Walk
Paved Road/Gravel Walk
Fence
Park Boundary
Tree/Shrub

Approximate Scale
0 100' 200'

North

Olmsted Center for Landscape Preservation

Drawn by: JTK

Date: 4-30-03



Figure 4.2. View looking north from Central Street towards one of the park's entrance signs. (OCLP 2002)

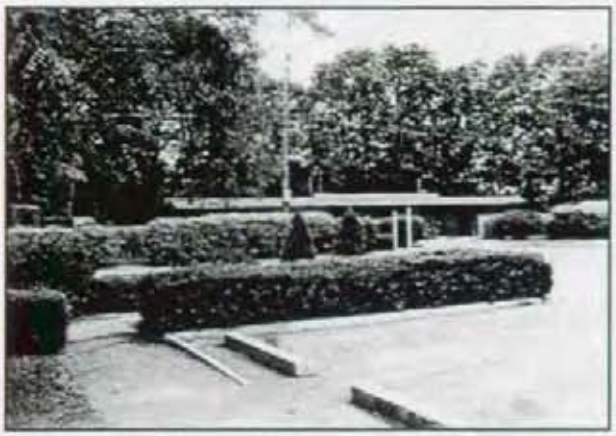


Figure 4.3. Some visitors have mistaken the maintenance garage for a visitor center. (OCLP 2002)



Figure 4.4. View looking north at the park's entrance gate and path leading to the visitor contact station. (OCLP 2002)



Figure 4.5. Once inside the park, most visitors choose the path on the right and proceed to the reconstructed iron works buildings rather than first visiting the Iron Works House and museum towards the left. (OCLP 2002)



Figure 4.6. View looking north of the existing path in front of the Iron Works House. As recommended by the GMP, a new entrance gate and path is proposed from the parking lot to the front door, at which point it will turn left to a proposed visitor center in the Iron Works House Annex. (OCLP 2002)



Figure 4.7. Paths throughout the upper terrace are composed of crushed gray stone. The proposed new entrance path will wrap around from the Iron Works House front yard to the Iron Works House Annex, shown here. (OCLP 2002)



Figure 4.9. View looking south at the picnic area in the upper terrace. (OCLP 2002)



Figure 4.8. View west of the Iron Works House, museum, and restroom entrance. The park's amphitheater/demonstration area is located on the north side of the museum on the far right. Remains of a nineteenth-century barn have been located in the lawn area in the foreground. (OCLP 2002)



Figure 4.10. Benches along the path paralleling the stone wall at the top of the bluff offer excellent views of the reconstructed iron works buildings, wharf, and warehouse. Prior to construction of this path and wall, the west edge of Central Street was located next to the large shade tree shown in front (north side) of the visitor contact station, and intersected Greystone Road near the lilac shrub on the right. (OCLP 2002)



Figure 4.11. View of the south stairway leading to the lower industrial area. Stair lifts have been proposed here to provide persons with special needs with better access to the lower industrial area and eliminate the current system of using golf carts. (OCLP 2002)

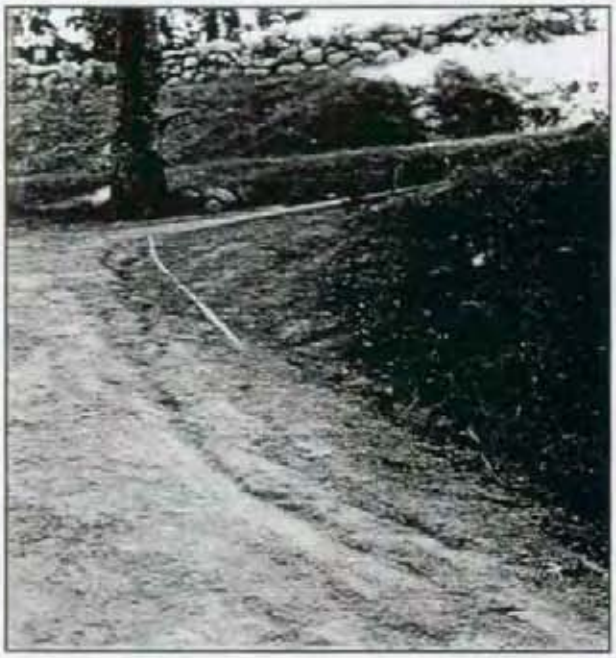


Figure 4.13. Close up view of the path on the slope showing runnels caused by heavy rainfall and their effect on the flexible trex border. (OCLP 2002)



Figure 4.12. The north stairway marks the beginning of the park's National Recreation Trail. (OCLP 2002)



Figure 4.14. This segment of the path leading from the upper terrace to the industrial complex does not meet American with Disabilities Act requirements. Steep portions such as this, and in other areas of the industrial area, are chronically plagued with erosion problems that make for hazardous walking surfaces. (OCLP 2002)



Figure 4.15. Without the benefit of a wayside or path, the slag heap appears to be just another hill. (OCLP 2002)

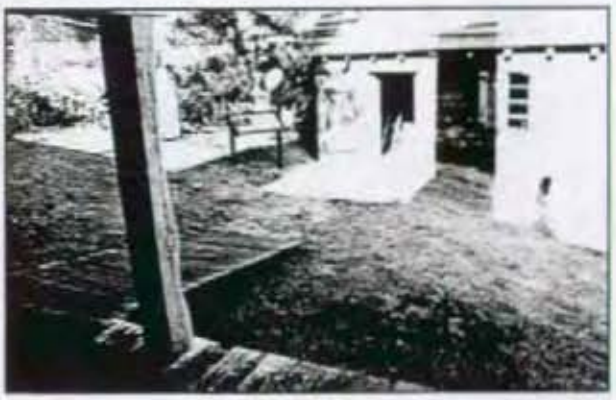


Figure 4.17. The ramp and path between the forge and the rolling and slitting mill does not meet current accessibility codes. (OCLP 2002)



Figure 4.16. Improving access for persons with special needs into the forge building is identified in the park's GMP. (OCLP 2002)



Figure 4.18. Upon exiting the rolling and slitting mill, visitors encounter an eroded switchback characterized by steep grades and loose gravel, creating dangerous walking conditions. (OCLP 2002)



Figure 4.19. The three wood footbridges shown here are part of the park's National Recreation Trail and are in good condition. The corduroy road, between the first and second bridges in this view, was rehabilitated in 2001. Note the masses of invasive vegetation on the left; this would have been open water as late as 1957. (OCLP 2002)



Figure 4.20. Compared to paths on the hillside and between the reconstructed buildings, the walkways alongside the river and on the east bank assume a more level grade. Portions of the deck and railing on the bridge crossing the Saugus River, shown here, are showing signs of deterioration. (OCLP 2002)



Figure 4.21. The park's National Recreation Trail parallels the shoreline of the Saugus as a grass path. Compare this contemporary view of the river with Figure 3.20 taken almost fifty years ago. (OCLP 2002)



Figure 4.22. In this view looking south, the sweep of lawn on the east bank leads to the nature trail at the far end of the clearing. (OCLP 2002)



Figure 4.23. View of the industrial complex from the nature trail on the east bank. Compare this somewhat obstructed view with that of Figure 3.16. (OCLP 2002)



Figure 4.24. In this view of the maintenance yard looking south, erosion from stockpiles of organic materials have encroached into the lawn area. The maintenance yard is within clear view of visitors using the adjacent picnic area and should be screened with vegetation. (OCLP 2002)



Figure 4.25. The concrete sidewalk along Central Street connects the adjacent residential neighborhoods to the park. It also provides an alternative route for visitors with special needs to access the industrial area, via staff-operated golf carts. View looking north. (OCLP 2002)



Figure 4.26. The Bridge Street path, shown here looking west, is separated from the reconstructed iron works and provides a crossing over the Saugus River for the surrounding neighborhood. Visitors unable to negotiate the steep paths and stairs in the park are shuttled to this gate in golf carts. (OCLP 2002)

Issues and Recommendations

Circulation Issues

There are currently two circulation-related issues at Saugus Iron Works NHS. The first involves the pedestrian circulation pattern in the upper terrace, in the area roughly bounded by the parking lot and the reconstructed industrial complex. The existing pedestrian entrance is problematic to find, and its placement, along with that of the existing visitor contact station, inclines most visitors to proceed directly to the reconstructions without experiencing interpretive programs and resources in the museum and the Iron Works House.

The second issue concerns access from the upper terrace to the lower industrial complex as well as the paths between the reconstructed buildings. The current path system features several outdoor stairs and grades that do not comply with current accessibility regulations and laws. Consequently, visitors with special needs must be transported to the lower industrial yard in golf carts, separating them from the rest of their party. Erosion on some of the steeper path surfaces has also created less than ideal walking conditions for all visitors and staff.

The Line-Item Construction project entitled "Rehabilitate Resources for Accessibility and Safety (PMIS 60099)" addresses these issues:

- Rehabilitate and restore portions of the historic Iron Works House, currently used for offices and storage, into an accessible visitor interpretive and orientation space. Convert the non-historic houses into museum collections storage, curatorial workspace, and office space.
- Provide accessibility for persons with disabilities, revise the pathway from the Iron Works House to the iron works industrial area by installing a mechanical stairlift, and provide accessibility within the industrial area with regrading, revised paths, and two stairlifts.

The PMIS project addresses some of the recommended circulation and accessibility improvements identified in the park's GMP, which also include consolidating maintenance activities and staff parking on the east bank, creating an overlook on the bluff, and tying the park's existing trail into a regional trail network. In the sections that follow, this report offers general recommendations regarding circulation and accessibility improvements as well as specific recommendations pertaining to PMIS 60099.

General Recommendations for Current and Future Circulation and Accessibility Projects

Saugus Iron Works NHS is an area of high archeological sensitivity, and as such, changes to the existing circulation system or construction of new circulation features should be carefully planned. Field investigations and documentary research have identified a wide range of known and potential archeological resources throughout the park (Figures 5.1 and 5.2). The most significant and best documented of these is the seventeenth-century iron works site. Other resources include Native American materials and possible gravesites, eighteenth- through nineteenth-century agricultural and residential structures, and the mid-twentieth-century iron works excavation and reconstruction.[1] Given the almost complete lack of physical evidence of specific circulation features before 1724, these known and potential archeological resources can hopefully forge an understanding of what roles circulation features may have played as part of the Saugus Iron Works NHS cultural landscape.

Various parts of the iron works property have been impacted in different ways and excavated or tested to varying degrees. In his overview and assessment of the park's archeological resources, Eric J. Johnson recommended that any planned ground disturbances should be preceded by careful field testing informed by documentary research and a clear research plan.[2]

The GMP recognizes the sensitivity of the park's resources through the identification of distinct management zones. Three areas – the two park residences, the parking lot and maintenance garage, and the maintenance yard on the east bank – are part of the development zone and have been identified for new construction or development. The remainder of the park is within a cultural zone and includes resources that contribute to the park's historical significance and establishment as a National Historic Site. This zone will be managed to preserve, protect, and interpret those resources and their settings.[3]

As stated in the GMP, new structures, landscape features, or utilities may be constructed in the cultural management zone if other on-park or off-park solutions are not feasible and if such construction will not impair the integrity of the historic landscape or structure or other resources managed as a cultural resource. The first consideration will be given to reusing existing historic features. New construction will be subject to design considerations for compatibility with its surroundings.[4]

Recommendations for PMIS 60099: New Entrance Gate and Walkway

GMP Preferred Alternative

In support of converting portions of the Iron Works House to better serve visitors, the GMP proposes removing the current visitor contact station and relocating the entrance gate and path. Extending from the reconfigured parking lot, the new path will be aligned with the centerline of the front door of the Iron Works House and then extend west and north to a new entrance on the west side of the Iron Works House Annex building, adapted as a visitor orientation center (Figure 5.3). The goal is to immediately introduce visitors to the seventeenth century while providing clear circulation flow patterns that include all visitor facilities and primary resources.[5]

Specific Recommendations

1. Conduct Archeology

While most of the known archeological resources in the upper terrace area are located north and east of the Iron Works House and museum, well away from the proposed new walkway, any planned ground disturbances should be preceded by a careful field testing informed by documentary research and a clear research plan, particularly since human burials may exist in the area.[6] According to Johnson, the area around the Iron Works House and museum has retained considerable integrity despite centuries of construction, utility work, and landscaping, and may yield information about the lives of the farmers and mill workers who lived and worked there. The closest known archeological feature is a concentration of stones of unknown origin or function (Figure 5.1, #6). However, field testing has located postholes immediately south and west of the Iron Works House, which are considered potential archeological resources (Figure 5.2, #1b).

2. Create Compatible Design

The proposed entrance gate and walkway are located within the cultural management zone, and as this is new construction, they should be designed to blend with the surrounding landscape. The surface of the walkway should sit slightly above the existing grade of the lawn to facilitate drainage and minimize excavation.

During construction and tree removal, the use of heavy equipment should be minimized if possible. The surface dressing should be gray crushed stone to match the existing paths in the upper terrace.

Recommendations for PMIS 60099: Accessibility Improvements along Slope and in Industrial Complex

GMP Preferred Alternative

The GMP recommends several actions to improve access from the Iron Works House to the lower industrial complex. The first action proposes installing a mechanical stair rider on the south staircase, and iimproves on the current method which separates visitors for the entire tour. The second action proposes regrading and reconfiguring paths within the industrial complex. This will likely involve adjusting the heights of several footbridges, providing mechanical lifts at the forge and the rolling and slitting mill, and resurfacing paths (Figure 5.4). The goal is to make all paths conducive to wheelchair and stroller movement.[7]

Specific Recommendations

1. Conduct Archeology

The proposed installation of a stair rider on the south staircase will likely have minimal impact on the surrounding cultural landscape and archeological resources.

The slope area is presumably damaged by the former Central Street and Robbins' excavations and grading, but still may contain significant resources. Visible stone ruins on the slope may have been part of the Jenks blacksmith operation or associated with the waterways that presumably powered it (Figure 5.2, #2a, #2b, and #2c). Changes in the path system here, as around the Iron Works House, should be informed by archeological testing.

The slag heap is the only known relatively intact feature directly associated with the seventeenth-century iron works. It has not undergone extensive archeological testing. The slag heap was recently cleared of scrub vegetation to better approximate its appearance during the iron works operation and time of initial reconstruction. These plants, however, worked to protect this feature and it will be important to monitor the slag pile to prevent damage of potential archeological resources. It is hoped that a wayside is developed in the future for this important cultural resource, in which case design and construction should be preceded by field testing.

The industrial complex has undergone the most disturbance (Figure 5.1). Despite numerous site disturbances, including the floods of 1682 and 1957, Robbins' excavations, and FIWA's reconstructions, extant archeological resources may help to document differences between the original iron works landscape features (circulation, buildings, etc.) and reconstructed features. Knowing the difference is important for research and interpretive purposes. Therefore, any ground disturbing activities around the buildings should be informed by field testing to ensure that no valuable information is lost.[8]

2. Create Compatible Design

The proposed accessibility improvements are within the cultural management zone, and as such, should consider reusing existing historic features. Although the current circulation system is not listed as a historic or cultural resource in the National Register, it does have a direct association with the reconstructed buildings which are currently managed as cultural resources. Therefore, any improvements made to the alignment,

elevation, and surface treatment of the paths and bridges should stay within their original configurations whenever possible. If any new paths are constructed, their design should be compatible with the surrounding paths, and none should be paved with asphalt or concrete.

The proposed improvements along the slope and in the industrial complex will eliminate some, but not all of the steeper path segments, and the erosive effects of weather and traffic on the paths will likely continue. To maintain the current widths of the paths and improve their appearance, the existing flexible trex border should be replaced with a more durable and rigid steel edging.

It is strongly recommended that a binder or binding system (gums, clays, fibers, etc.) be included in any application of stone dust or crushed stone materials. This will create a more durable surface conducive to wheelchair and stroller use and will extend the life of the current surface treatment (Minuteman National Historic Park has had success with this type of material on the approaches to the North Bridge). It may also eliminate the more expensive options of solid aggregate surfaces such as bituminous macadam or cement that would require engineering for proper drainage into a wetland area.

As with the new entrance gate and path in the upper terrace, the use of heavy construction equipment should be limited to minimize disturbance of known and potential archeological resources.

Endnotes – Issues and Recommendations

[1] Johnson 1997:59,66.
[2] Johnson 1997:66-68.
[3] GMP 2002:36-37.
[4] GMP 2002:36-37.
[5] GMP 2002:9.
[6] Johnson 1997:66.
[7] GMP 2002:9,35,and 43.
[8] Johnson 1997:67.

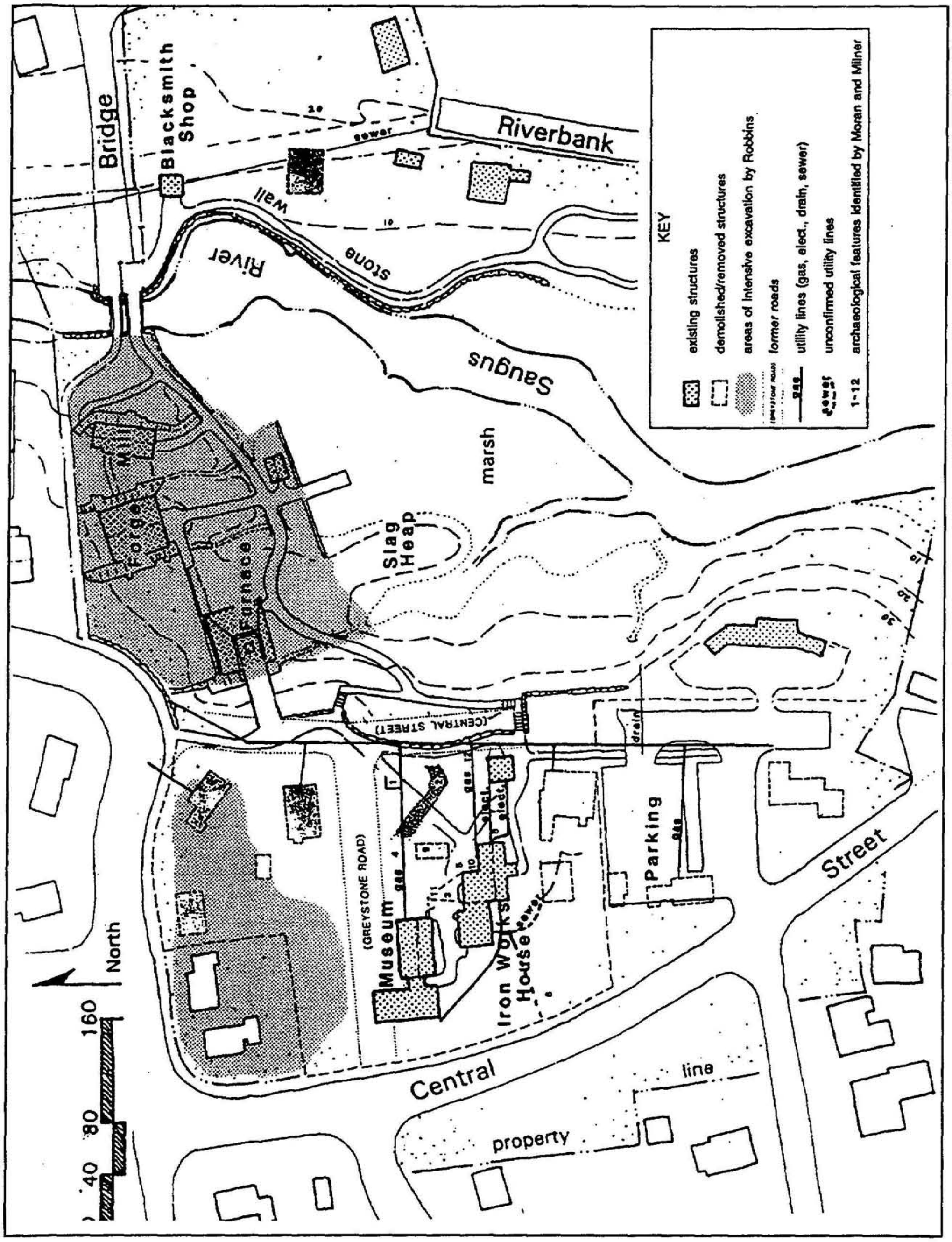


Figure 5.1. Known archeological resources and disturbances at the park. (MacMahon 1988: Figures 3, 11, and 14 - as cited in Johnson 1997:62)

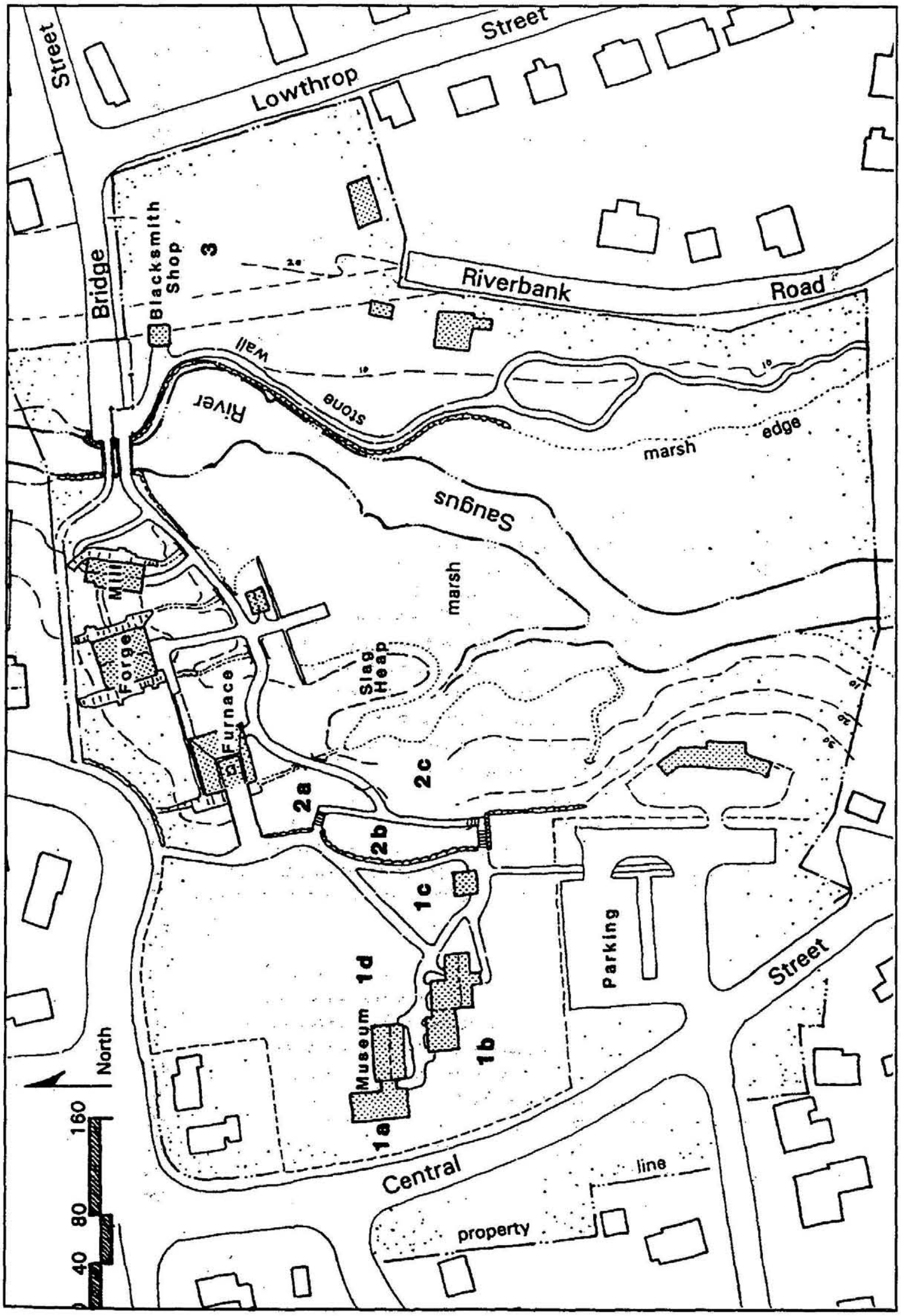


Figure 5.2. Potential archeological areas at the park. (Brown 1975 - as cited in Johnson 1997:33)

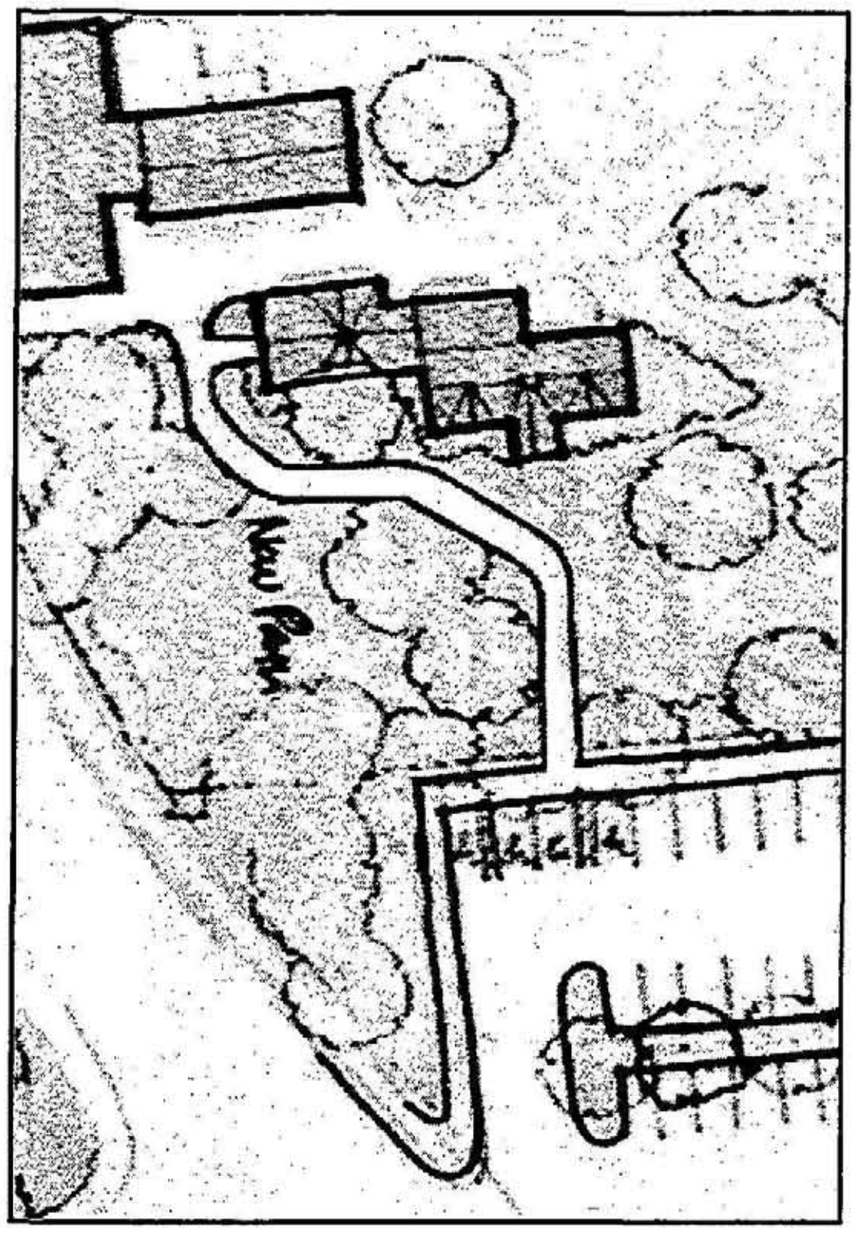
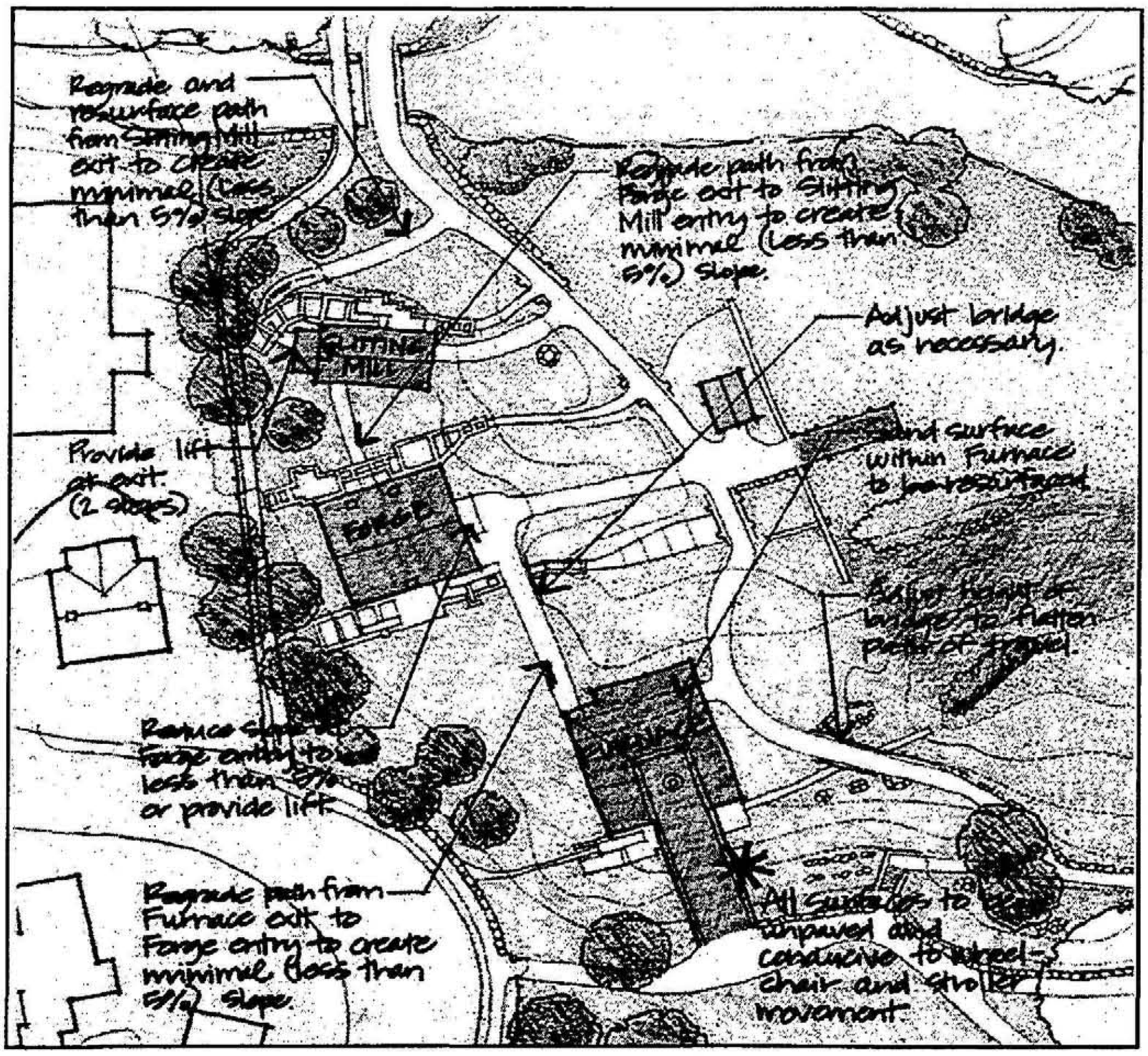


Figure 5.3. The reconfigured parking lot, new entrance gate, and walkway is intended to improve visitor interpretation and orientation of the park's resources. Views of the iron works plant will improve with the removal of the visitor contact station. (GMP 2002)

Figure 5.4. Proposed accessibility improvements around the iron works reconstructions will make the park accessible to those with special needs. (GMP 2002)



Conclusions

The twentieth-century reconstructions at Saugus Iron Works National Historic Site represent the original seventeenth-century iron works plant that stood on the site from 1646 to 1670. The park interprets early iron manufacturing in colonial America and the early development of the American iron industry. Together with the Iron Works House and museum, the park represents an important chapter in the larger story of settlement, trade, and industry in Essex County, Massachusetts.

The focus of this CLR has been the evolution of park's circulation system initiated by the First Iron Works Association in 1954. This efficient network of walkways, steps, and bridges was designed to connect the Iron Works House, museum, and visitor facilities in the upper terrace to the reconstructed iron works buildings, picnic area, and trail along the banks of the Saugus River. The reviews of contextual histories and circulation features prior to reconstruction have shown how some of the early paths and roads developed by local Native American communities and early English settlers were used and expanded by the iron works operation, and later, by agricultural production and suburban development. This chronology ultimately influenced the layout of the 1954 circulation system.

Research has also shown that during the iron works operation, a dynamic arrangement of paths and roads in and around the plant served a utilitarian function, which was simply to move materials and goods from one part of the work yard to another in the most efficient and straightforward manner. The appearance of these paths and roads – within a gritty industrial landscape of raw materials, industrial waste, and human toil – was quite different than that of the manicured walkways present at the iron works site today.

The National Park Service has carefully managed the park since 1968 and now wishes to implement major updates to visitor interpretation, orientation, and access. Specific circulation changes will relocate the entrance gate and path to a new visitor center in the Iron Works House Annex and improve access from the Iron Works House to the reconstructed iron works complex with stairlifts and regraded paths. The park's cultural landscape is rich in known and potential archeological resources from the iron works operation as well as Native American habitation and eighteenth- and nineteenth-century agricultural and residential complexes. Because of this, the construction of new paths and the reconfiguration of existing paths should be informed by archeology and should be designed to be compatible to their surroundings. Doing so will reinforce appropriate cultural resource management strategies for the twentieth-century structures and landscapes.

Suggestions for Further Research/Future Projects

This CLR has addressed several of the recommendations listed as future research topics in the 1993 *Cultural Landscape Assessment for Saugus Iron Works National Historic Park*. However, there remain many more areas to address to fully understand the park's complex cultural landscape. Given this, the park should consider funding a comprehensive CLR that builds on this report and previous scholarly work. A complete CLR will provide information related to the entire landscape's evolution over time. It will also include treatment recommendations consistent with the *Secretary of Interiors Standards for the Treatment of Historic Properties* and the park's *General Management Plan* that will serve as the park's primary tool for long-term landscape management.

Bibliography

Sources Consulted

Albright, John, Orville Carroll, and Abbot Lowell Cummings. *Historic Structures Report: Ironmaster's House, Historical and Architectural Data, and a History of Ownership – Saugus Iron Works National Historic Park, Massachusetts.* Denver, CO: National Park Service, Denver Service Center, Historic Preservation Division, 1977.

General Management Plan/Environmental Assessment: Saugus Iron Works National Historic Park. Boston, MA: National Park Service, 2002.

Hohmann, Heidi. *Cultural Landscape Assessment for Saugus Iron Works National Historic Park.* Boston, MA: National Park Service, North Atlantic Region, Division of Cultural Resources Management, Cultural Landscape Program, 1993.

Johnson, Eric S. *Archeological Overview and Assessment of the Saugus Iron Works National Historic Park, Saugus, Massachusetts.* Boston, MA: National Park Service, New England Support Office, 1997.

Sources Cited

Atlas of Essex County, Massachusetts. Boston, MA: George H. Walker and Co., 1884.

Brown, M.R. III. *Saugus Iron Works National Historic Park: An Evaluation of Roland Wells Robbins Archeology.* Denver, CO: Report prepared for National Park Service, Denver Service Center, 1975.

Carlson, Steve. *Historical Sketch, Saugus Iron Works National Historic Park.* Boston, MA: National Park Service, 1973.

Carlson, Steve. *First Iron Work: A History of the First Iron Works Association.* Saugus, MA: Saugus Historical Society, 1991.

Correspondence from Janet Regan, SAIR Museum Technician, 7/17/02.

Cummings, Abbot Lowell. "The Iron Works Farm" In Saugus, Essex County, Massachusetts: The History of Ownership from the Origins of the Town to the 20th Century. Report on file at Charlestown, MA: New England Museum Services Center, Marine Barracks, Boston National Historical Park, Charlestown Unit, 1975.

Files. National Park Service, Boston Support Office.

Hartley, E.N. *Iron Works on the Saugus.* Norman, OK and London, England: University of Oklahoma Press, 1957.

MacMahon, Darcie A. *Archeological Collections Management at The Saugus Iron Works National Historic Park.* Boston, MA: National Park Service, North Atlantic Regional Office, Division of Cultural Resources, 1988.

Massachusetts, Commonwealth of. *Census of the Commonwealth of Massachusetts.* Boston, MA: Wright and Potter, 1909.

Massachusetts Historical Commission (MHC). Inventory of Prehistoric and Historic Properties of the Commonwealth of Massachusetts. Boston, MA: Report on file at Massachusetts Historical Commission, n.d.

Massachusetts Historical Commission (MHC). Reconnaissance Survey Report: Saugus. Report on file at Boston, MA: Massachusetts Historical Commission, 1985.

Park Archives. Saugus Iron Works National Historic Park.

Saugus Historical Commission (SHC). Historic Narrative, Saugus, Massachusetts. Report on file at Boston, MA: Massachusetts Historical Commission, 1986.

United States Geological Survey (USGS). Boston North, Massachusetts. 7.5 x 15 minute Quadrangle. 1:25,000 scale metric. Washington D.C.: USGS, 1985a.

United States Geological Survey (USGS). Lynn, Massachusetts. 7.5 x 15 minute Quadrangle. 1:25,000 scale metric. Washington D.C.: USGS, 1985b.

Wormser, Richard. *Iron Works Papers: A Collection of Papers Relating to the Iron works at Lynn and More Particularly to the Suit between Mr. John Giffard the Agent for the Undertakers of the Iron works and the Inhabitants of the Massachusetts Bay Colony dated 1650 Et Seq.* (transcript). Cambridge, MA: Harvard University, Baker Library, 1946.

National Park Service
U.S. Department of the Interior

Olmsted Center for Landscape Preservation
99 Warren Avenue
Brookline, Massachusetts 02445
617-566-1689
www.nps.gov/frla/oclp.htm

Saugus Iron Works National Historic Site
244 Central Street
Saugus, MA 01906-2107
781-233-0050
www.nps.gov/sair