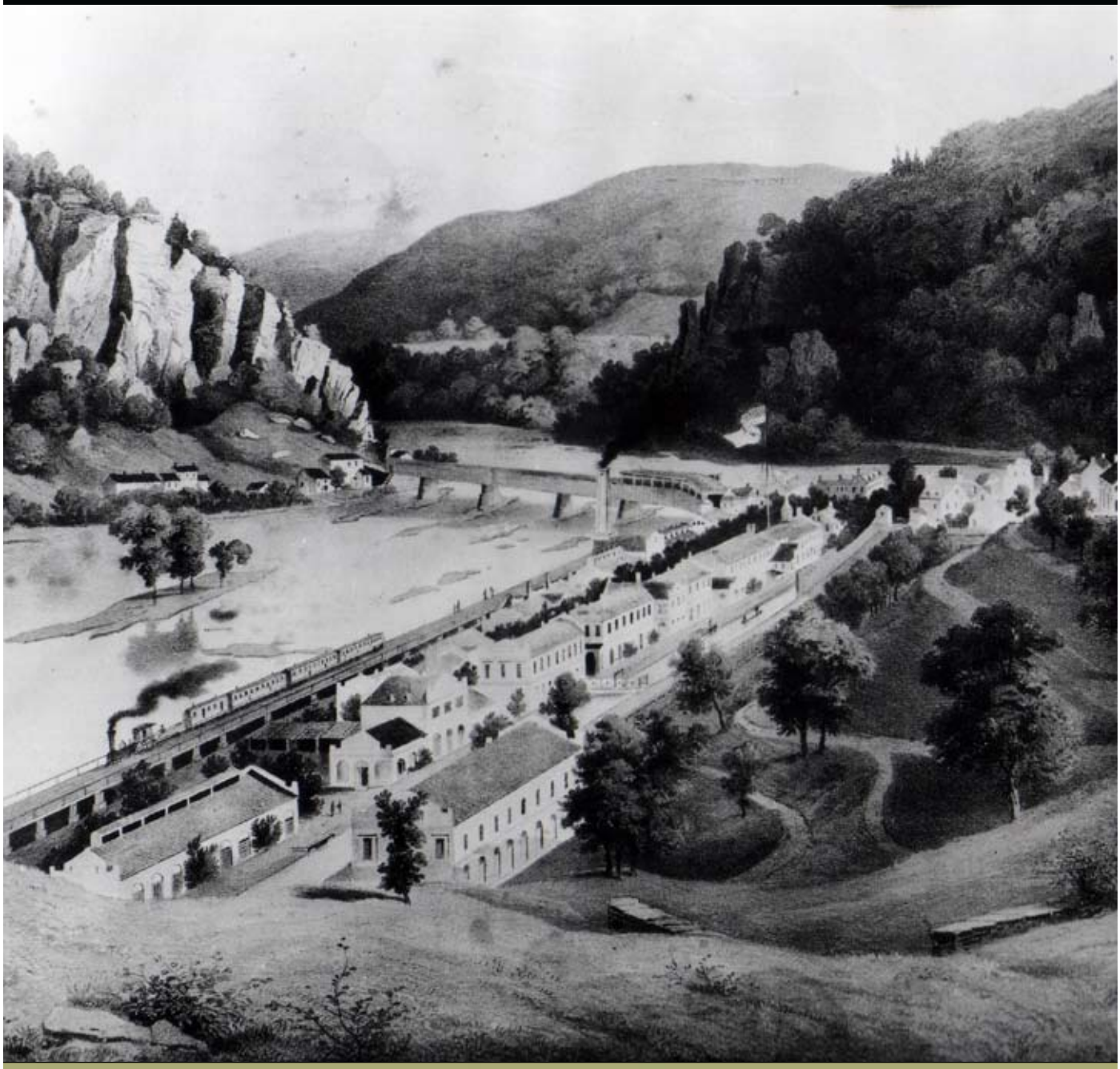
National Park Service
U.S. Department of the Interior



Olmsted Center for Landscape Preservation

Cultural Landscape Report for the United States Armory and Potomac Riverfront

Harpers Ferry National Historical Park

"It is as placid and delightful as that is wild and tremendous. For the mountains being cloven asunder, she presents to your eye, through the cleft, a small catch of smooth blue horizon, . . . inviting you, as it were, from the riot and tumult roaring around to pass through the breach and participate in the calm below."

Thomas Jefferson, 1785

CULTURAL LANDSCAPE REPORT FOR THE UNITED STATES ARMORY AT HARPERS FERRY AND POTOMAC RIVERFRONT

Harpers Ferry National Historical Park

By Allison A. Crosbie, ASLA
Historical Landscape Architect
Olmsted Center for Landscape Preservation

Andrew S. Lee
Archeologist
Harpers Ferry National Historical Park

Olmsted Center for Landscape Preservation
National Park Service, Boston, Massachusetts, 2009

The Olmsted Center for Landscape Preservation, a program of the National Park Service Northeast Region, 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.

Olmsted Center for Landscape Preservation
Boston National Historical Park
Charlestown Navy Yard, Quarters C
Boston, MA 02129
www.nps.gov/oclp/

Library of Congress Cataloging-in-Publication Data
Crosbie, Allison A.
Cultural landscape report for the United States Armory at Harpers Ferry and Potomac riverfront, Harpers Ferry National Historical Park /
By Allison A. Crosbie, Andrew S. Lee.
p. cm. -- (National Park Service, Denver Technical Information Center report ; NPS 385/100212)
"This report was developed by the Olmsted Center for Landscape Preservation"--T.p. verso.
Includes bibliographical references.
1. Harpers Ferry National Historical Park--Antiquities. 2. Harpers Ferry Armory (U.S.)--History. 3. Waterfronts--Harpers Ferry National Historical Park. 4. Waterfronts--Potomac River. 5. Historic buildings--Conservation and restoration--Harpers Ferry National Historical Park. 6. Historic sites--Conservation and restoration--Harpers Ferry National Historical Park. 7. Landscape protection--Harpers Ferry National Historical Park. 8. Harpers Ferry (W. Va.)--Buildings, structures, etc. I. Lee, Andrew S. II. Olmsted Center for Landscape Preservation (U.S.) III. Title.
F249.H2C76 2009
975.4'99--dc22

National Park Service, Denver Technical Information Center Report NPS 385/100212

Cover Photo: NPS Collection, courtesy of the Museum of Early Southern Decorative Arts

TABLE OF CONTENTS

LIST OF FIGURES, TABLES AND DRAWINGS

INTRODUCTION

Figures

SITE HISTORY

Figures

Drawings

EXISTING CONDITIONS

Figures

ANALYSIS AND EVALUATION

Figures

Tables

TREATMENT

Figures

Tables

Drawings

ACKNOWLEDGEMENTS

This report was a collaborative effort between the staff at Harpers Ferry National Historical Park and the Olmsted Center for Landscape Preservation. Steve Lowe, Historical Landscape Architect, provided guidance and oversight as the park's project coordinator and as the point of contact for the Olmsted Center. The site history builds upon the excellent prior work accomplished by Andrew Lee, Archeologist, for the 2006 Historical Resource Study, "The U.S. Armory at Harpers Ferry." Additional park staff contributed to on-site discussions helping to define the treatment approach, including a workshop held in October 2008 and a follow-up meeting held in July 2009. This collaboration included the assistance of Peter Dessauer, Historical Architect, Dennis Frye, Chief of Interpretation, Education & Cultural Resources Partnerships, Bill Hebb, Natural Resource and Lands Program Manager, Mia Parsons, Supervisory Archeologist, Todd Bolton, Chief of Visitor Services Branch, John King, Chief of Living History Branch, Dennis Ebersole, Maintenance Supervisor, Grounds, Roads and Trails, and Elizabeth Kerwin-Nisbet, Interpretation and Exhibits Planner. Input was also provided by Maureen Joseph, Regional Historical Landscape Architect, National Capital Region, with assistance by Saylor Moss, Historical Landscape Architect, National Capital Region. In addition, Patrick MacDonald, Project Manager, Denver Service Center, NPS, also attended the workshop and provided input and guidance for the treatment phase of this project. At the follow-up meeting in July 2009, Rebecca Harriett, Superintendent, Harpers Ferry National Historical Park, was presented with a summary of the site history along with the final treatment concepts recommended in this report. Further discussion and feedback was provided by Steve Lowe, Dennis Frye, Mia Parsons, Maureen Joseph, and Peter Dessauer. Research materials, including historic maps and images, were provided by Richard Raymond, Park Curator, and Nancy Hatcher, Park Museum Specialist.

At the Olmsted Center for Landscape Preservation, Allison A. Crosbie, Historical Landscape Architect, prepared historic period maps and conceptual drawings, the site history incorporating Andrew Lee's Historic Resource Study, as well as the existing conditions, analysis section and the treatment narrative. Eliot Foulds, Historical Landscape Architect, revised the site maps, conceptual drawings, analysis and treatment narratives, and edited all sections of the report. Bob Page, Director of the Olmsted Center, provided project oversight.

Additional research was conducted at the Hagley Museum and Library in Wilmington, Delaware. The Hagley Library Archives contains the papers and photograph collection of Thomas Savery, the businessman and manufacturer who purchased the Armory property in 1884 and established a paper mill on the site.

INTRODUCTION

The United States Armory and Arsenal at Harpers Ferry, one of two federal armories founded under President George Washington at the end of the eighteenth century, played a key role in American military and industrial history. Beyond crafting and storing weapons, the Armory became one of the first industrial centers in the country. The Musket Factory and Arsenal, specifically, were the sites of John Brown's ill-fated attempt in 1859 to seize the stored guns to wage a battle for the freedom of slaves. During the Civil War, the Armory was a center of conflict as the town changed hands eight times, resulting in the destruction of most of the Armory buildings. During this period the Potomac and Shenandoah rivers were harnessed for power and transportation, and Harpers Ferry became an important manufacturing and commercial town. After the Civil War, the federal government sold parcels of the property to private businessmen who attempted to revive the local economy by instituting new industrial uses on the site. Floods in the area in the late nineteenth and early twentieth centuries hindered efforts to revitalize the town. During the same time, railroad expansion further altered the Armory site with new embankments covering large areas of the site. In 1944, President Franklin D. Roosevelt signed legislation to create a national monument at Harpers Ferry. In 1960, Congress authorized the acquisition of the Armory site. And in 1963, legislation redesignated the area as Harpers Ferry National Historical Park and enlarged the boundaries to include 2,000 acres in West Virginia, Maryland and Virginia.

PURPOSE OF THIS REPORT

A cultural landscape report serves the National Park Service as both the primary treatment document for cultural landscapes and as a tool to inform day-to-day management decisions and long-term preservation strategies. This cultural landscape report has been prepared for Harpers Ferry National Historical Park in support of project planning and compliance efforts focused primarily on providing physical public access to and interpretation of the Potomac Riverfront landscape, including the former United States Armory site. The report narrates the evolution of the Harpers Ferry Potomac Riverfront landscape, accompanied by graphics, and identifies landscape characteristics and features contributing to the site's historical significance.

In addition, the report documents the changing historical approaches to site vegetation and vegetation management so as to guide future vegetation treatment and maintenance. Finally, the report provides useful documentation supporting park consultation responsibilities under Section 106 of the National Historic Preservation Act and National Environmental Policy Act.

SCOPE AND METHODOLOGY

This cultural landscape report focuses on the former site of the United States Musket Factory, one of three main complexes comprising the United States Armory and Arsenal at Harpers Ferry. References are also made to other United States Armory holdings at Harpers Ferry including the Arsenal Yard, also known as Arsenal Square, and the rifle factory site on Upper and Lower Hall Islands along the Shenandoah River, which are beyond the study area of this report (Figure 0.1). The report incorporates the Historic Resource Study written in 2006 by Andrew Lee, entitled "The U.S. Armory at Harpers Ferry." Following the general format as outlined in the National Park Service publication, *A Guide to Cultural Landscape Reports: Contents, Process and Techniques* (1998), the report comprises four major chapters. The first is a narrative of the landscape history focusing on the Musket Factory. Narrative text, historic maps and photographs describe and illustrate the evolution of the Armory from its establishment in the late 1700s, through the site's establishment as a national park, and the subsequent physical changes to the property up to the present. The second chapter provides an inventory and assessment of existing conditions. A third chapter provides an overview of the property's significance and presents an analysis of characteristics and features that contribute to the historic character of the site. Finally, a treatment plan, consistent with the aims of park planning goals, is included that will articulate a strategy for the long-term management and treatment of the cultural landscape including strategies for providing site accessibility.

SITE BOUNDARIES

The geographic scope for this report is defined by the limits of the National Park Service property northeast of Potomac Street and southwest of the Potomac River (see Figure 0.1). Although the United States Armory property once comprised various sites in the town of Harpers Ferry, this report focuses on the area referred to as the Musket Factory located along the southwest bank of the Potomac River, above its confluence with the Shenandoah. The Armory is located in Lower Town, the historic center of Harpers Ferry located on the peninsula between the Potomac and Shenandoah Rivers. Throughout the nineteenth century, this area contained a complex of workshops, mills, storefronts, taverns, inns and businesses. The Musket Factory occupied a seventy-two-acre strip of land along the Potomac River. The Arsenal Yard, also referred to as Arsenal Square, is where the arms were stored and was located southeast of the Armory. The United States Rifle Factory was located on an island named after John Hall and referred to as Upper and Lower Hall Islands. Virginius Island is located on the north bank of the Shenandoah River, between Lower Hall Island and Lower Town. Camp Hill is located west of Lower Town and north of Virginius Island. During the Civil War, Camp Hill became a key

encampment site for troops. Jefferson Rock refers to a site, located between Camp Hill and Lower Town, where Thomas Jefferson stood taking in the view, leading to his glowing, oft-quoted description of the landscape. The landmark consists of a large slab of Harpers shale on top of more stone. Four stone pillars were placed under the slab in the late 1850s to keep it stable.

TERMINOLOGY

The terminology used in the cultural landscape report is consistent with references found in historical records and current usage by the Harpers Ferry National Historical Park, specifically the park's website.

The United States Armory at Harpers Ferry was one of only two federal armories in the country. Congress established the United States Armory at Harpers Ferry in 1796, two years after the Springfield Armory in Massachusetts.

Annealing – The process of hardening by heat treatment.

Armory and Arsenal - Both Armory and arsenal are defined in Merriam-Webster's Dictionary as establishments for manufacture or storage of arms and military equipment. The term Armory also refers to facilities constructed in towns and cities across the United States in the late nineteenth century for the local militia. These buildings were typically constructed as fortress-like structures with spaces for drill halls, offices, weapons storage, and dining rooms. In common usage, arsenals are referred to as places where arms are stored and armories as places of manufacturing. At Harpers Ferry, several buildings that store arms are referred to as arsenals.

Arms – The term refers to any handheld weapon.

Boring mill and Rolling Mill – Both terms refer to manipulating metal parts through fabricating holes or rolling into certain forms.

Factory - The term is used to refer to the Armory where manufacturing takes place.

Magazine – Structure for storing munitions, especially gunpowder.

Master Armorer – Along with the superintendent, the master armorer was a designer of new weapons and tasked with overseeing the daily operation of the Armory. The master armorer was subordinate to the superintendent.

Musket – A shoulder firearm that is loaded at the front, or muzzle, with a smooth bore.

Ordnance Department - The Ordnance Corps was established in 1775 by the Continental Congress to study the procurement and storage of ammunition and methods of arms. It was reorganized in 1812 and became the Ordnance Department, responsible for arms and ammunition production, acquisition, distribution and storage. The Ordnance Department therefore oversaw the operation of the Armory at Harpers Ferry and gave final approval of new construction and site improvements.

Paymaster – This position was created to attend to the safe-keeping and distribution of the military stores at the arsenals (storehouses at the Armory). The additional appointments of master armorer and paymaster were intended to create a system of checks and balances of authority.

Proof house – where firearms are tested for integrity.

Rifle – Firearm featuring a spiral grooved bore that gave the bullet a spinning motion which made it more accurate over long distances

Storehouse – Structure for storing goods, also referred to as warehouse.

Superintendent - The superintendent of the Armory was responsible for maintaining an efficient and cost effective arms production facility in service of the United States Government. The position of superintendent of the Armory was first established in 1794 without definite parameters of authority. Military administrators were replaced with civilian administration in the mid-nineteenth century in order to remove political influence and control.

Tilt hammer - A heavy forge hammer with a pivoted lever by which it is lifted up and allowed to drop.

SUMMARY OF FINDINGS

The United States Armory at Harpers Ferry is possibly the most significant site within Harpers Ferry National Historical Park. With the full support of President George Washington, the Armory at Harpers Ferry was one of only two federal armories established, contributing to the advancement of American military self-reliance. As indicated in the National Register, the site's historic significance includes John Brown's attempt to raid the store of weapons at the Armory's Musket Factory, a pivotal event leading to the Civil War. As a strategic military site, the Armory and the town of Harpers Ferry changed hands eight times during the course of the war, resulting the in the obliteration of most of the Armory facilities and much of the town. The National Register also acknowledges the site's local historical significance as a major transportation crossroads with two railroad lines, the former Baltimore & Ohio and the

Winchester & Potomac, as well as the ferry crossing at the confluence of the Potomac and Shenandoah rivers. As a result, there was steady commercial activity here with a reliable supply of raw materials and other goods for manufacturing. Tourists also traveled to the area to take in the natural scenery of the Potomac Water Gap at the confluence of the two rivers. The National Register also recognizes the continued evolution of the area throughout the nineteenth century, including the continued changes in transportation and industry.[1]

Today, the project area retains very few features from the period when the United States Armory Musket Factory was a fully operational and flourishing manufacturing plant in the early to mid-nineteenth century. None of the buildings, except for the Engine House and the Rolling Mill foundations, survives. In addition, topography, circulation patterns, and landscape elements such as the perimeter fence and main gate, are destroyed. With the construction of the railroad embankments in 1892 and 1930, the site is now divided with the majority of below-grade features covered by the earthen railroad embankments. Remnants of the Armory canal and railroad structures can be found throughout the Armory grounds and Canalway, but are obscured by thick vegetation. Archeological investigations have yielded the location of several Armory building foundations as well as information regarding the tailrace structures. Aside from interpretive signage, visitors have no way of understanding the scale and magnitude of the former Armory. As a practical matter, the railroad embankments make it extremely difficult to access the site.

The treatment section of this report discusses the overall vision for the site and identifies Rehabilitation as the appropriate approach given the lack of historic integrity. Generally, treatment recommendations emphasize the need to create a continuous physical connection through the entire site along the Potomac River edge, and the installation of landscape features that convey the historic character of the Musket Factory and Potomac riverfront. By breaching the unused 1892 railroad embankment at Lower Armory Grounds, efforts can begin to convey some of the original layout, scale and organization of the site. Central to this endeavor is the return of John Brown's Fort to its original location in order to highlight one of the most important historical events that occurred on the site. In addition, the treatment section addresses vegetation management, a key factor in protecting historic landscape resources and restoring historic views.

To help define a strategy for undertaking treatment tasks that range in complexity, the recommendations have been organized into three levels, long term, medium term and short term. Examples of short term tasks include the selective removal of woody vegetation around structures and along the river edge, and the installation of landscape elements such as the garrison flagpole, among others. Medium term tasks involve more multi-faceted efforts, such as the

construction of a linear river boardwalk, and a limited breach in the 1892 embankment to reconnect Lower Armory Grounds to the park and to provide for improved pedestrian access.

In order to implement the more ambitious long term treatment recommendations of this report, it is imperative that the park improve its physical access to Lower Armory Grounds. An easement is held by CSX Corporation to provide access to a storage yard located at the southern abutment of the 1892 Potomac River bridge. With this easement in place, it is impossible to develop any of the more large-scale interventions, such as the removal of a significant portion of the embankment and the relocation of John Brown's Fort to its original site. Implementation of long term recommendations will first require that the railroad company's easement here be renegotiated and modified. In addition, a study is required to determine the hydrological effects of removing portions of the embankment because of its location in a flood prone area along the Potomac riverfront.

Furthermore, additional research is required in order to develop appropriate layout and designs for several treatment tasks, including the historic circulation patterns, perimeter fence, flagpole and paving materials. Written historical records and additional archeological investigations of the site could yield critical clues that will help expand our understanding of the Armory landscape.

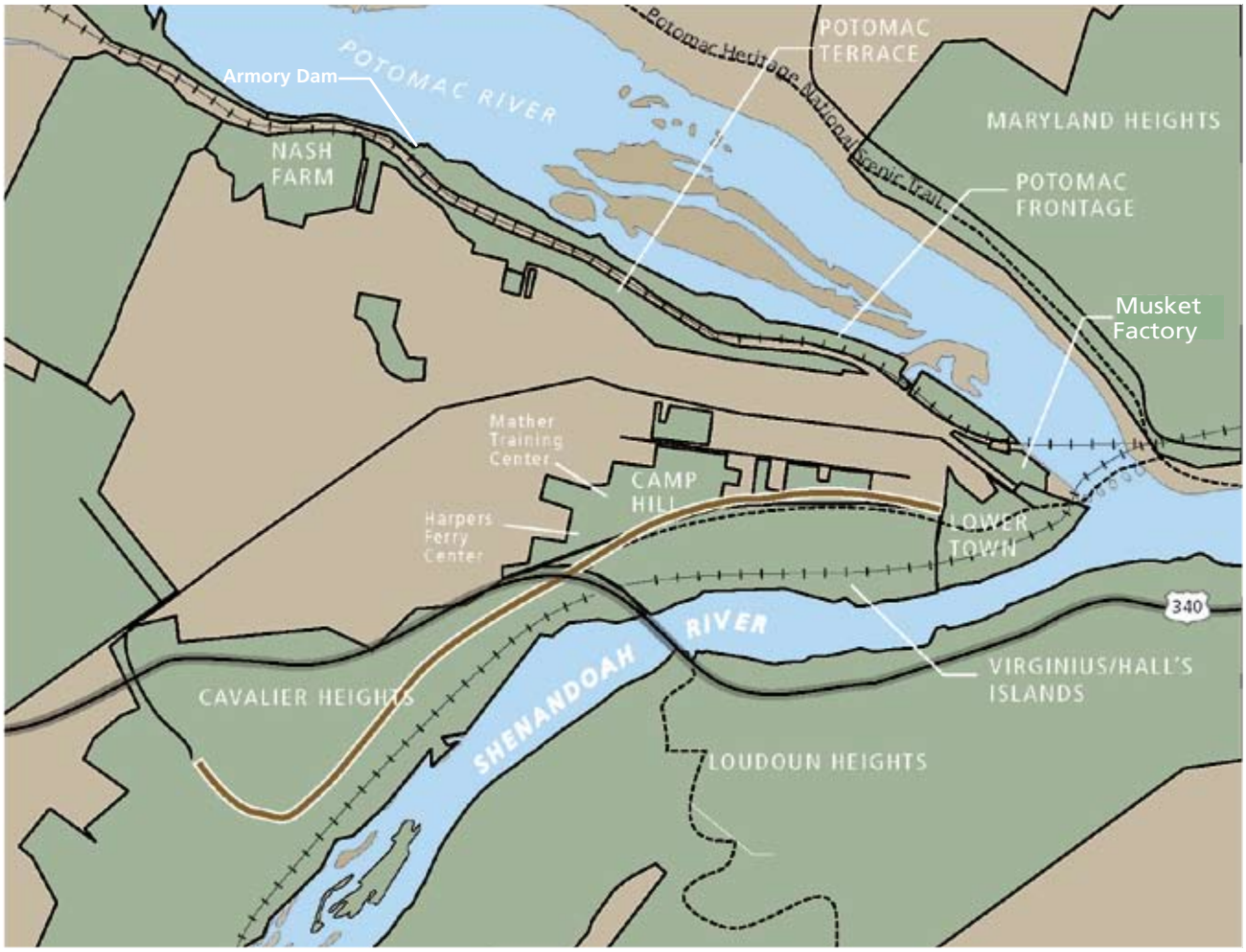


Figure 0.1. The Musket Factory site is located within the Harpers Ferry National Historical Park, adjacent to Lower Town. The study area extends north to the Armory dam. The green areas indicate the park properties spanning three states. Harpers Ferry National Historical Park, Draft General Management Plan, 2006.

SITE HISTORY

INTRODUCTION

The site history portion of this report is divided into six sections coinciding with the dates of significant historical events. The first period recounts the establishment of the Armory. The second period chronicles the expansion of railroads through Harpers Ferry and their influence on the Armory site. The third period covers the Armory during its most productive period of manufacturing. The Civil War and its aftermath are covered in the fourth period. The fifth period recounts attempts to reindustrialize the area and commemorate the Armory site. The final period examines the site as a national park site from 1945 to the present. Each section ends with images from that particular period and a fold-out site plan graphically depicting the physical conditions documented at that time. Landscape features include site boundaries, building locations and footprints, spatial organization, pedestrian and non-pedestrian circulation, topography, vegetation, water features and surrounding context when known.

PRE-HISTORY TO 1798

Harpers Ferry, West Virginia, is located in the Blue Ridge section of the Appalachian Mountain Range. The geological history of the park dates back 550 million years when this area was covered by a shallow sea. Deposition of sediments such as sand, clay and limestone, began at this time. When the continent of Africa collided with the continent of North America approximately 360 million years ago, the Appalachian Mountains rose. Normal compaction along with the heat and pressure generated by this collision changed sediments into the quartzite (sand), phyllite (clay), and limestone (fossil shells and mud) rock types found in the mountains today.[2]

As the Appalachian Mountains rose, the sea evaporated and the Potomac River cut through the rock, eventually forming the water gap between Maryland Heights and Loudoun Heights. This is considered the most prominent geological feature in the park. While the Potomac River was cutting through the gap, the Appalachians, once taller than the Rocky Mountains are today, were being worn down by rock, wind, rain and ice. After this erosion, only the core of the Appalachian Mountain Range remained. Water running off of the mountains began collecting at their base, forming what is now the Shenandoah River. This river flows along the base of the Blue Ridge until reaching Harpers Ferry, where it joins with the Potomac River and flows southeast towards the Chesapeake Bay.

Robert Harper, a millwright[3] in route to the Shenandoah Valley, crossed the Potomac on a ferry at a place called the Hole in 1747 (Figure 1.0). He recognized the commercial potential of the area and bought the ferry. In 1751, Harper purchased 125 acres at the confluence of the Potomac and Shenandoah Rivers from land baron Lord Fairfax. Harper operated the ferry and erected a water-powered gristmill on the Shenandoah River.

By the mid-1790s, conflicts in Europe, especially between Britain and France, demonstrated the need for the newly independent United States to reduce dependence on foreign supplies of weapons.[4] President George Washington worked with Congress to establish a federal armory and arsenal at Harpers Ferry to safeguard the young republic and promote its industrial and commercial development. Congress had initially considered establishing four armories and gave Washington the authority to decide the number of armories, their locations and to appoint the superintendents and master armorers.[5] The first armory was established in Springfield, Massachusetts, in 1794, with Washington's endorsement. Washington, perhaps trying to promote regional economic interests, described Harpers Ferry as the perfect site for an additional armory:

> Not a spot in the United States which combines more, or greater requisites for these, than that does: considered either as a place of immense strength against, and inaccessible by an enemy; although open to inland navigation in all directions, as well as to the Shipping Port at the Federal City, on water transportation to the Western Country; for its centrality among Furnaces and Forges, for its inexhaustible supply of water, having the whole River of Shenandoah as a resource, and for the populous and plentiful country in which it lives.[6]

Washington met some resistance by members of his Cabinet to locate an armory at Harpers Ferry. Timothy Pickering, the Secretary of War, preferred to expand operations at Springfield, Massachusetts, and create only a depot at Harpers Ferry.[7] Pickering commissioned Colonel Stephen Rochefontaine, a French-born military engineer, to examine sites suitable for the construction of armories. Rochefontaine's final report excluded Harpers Ferry as a potential site. In his estimation, Harpers Ferry did not warrant serious consideration since there was no ground on which convenient buildings could be placed at reasonable expense and that water power would be unreliable because of the area's vulnerability to flooding.[8] Washington's enthusiasm for Harpers Ferry did not diminish and he insisted that Rochefontaine return to the area and revise his report to coincide with his expectations.[9]

Washington continued to champion Harpers Ferry as the right place for an armory, and after three years eventually overcame disinterest and commenced with land purchases. Congress applied for and was granted permission from the General Assembly of Virginia to purchase a site comprising 640 acres. Congress also purchased 125 acres from John Wager, Sr., whose wife had inherited the

property from Robert Harper. This parcel formed a triangle between the two rivers and ran from the Potomac River to the Shenandoah River along what is now Union Street. Another tract of approximately 300 acres was purchased from Thomas Rutherford. This tract included the future sites of the seventy-two-acre Musket Factory on the Potomac, the one-acre Arsenal Square located near the confluence of the Shenandoah and Potomac Rivers, and the thirteen-acre United States Rifle Factory on the Upper and Lower Hall Islands in the Shenandoah.[10] The purchase also included a twenty-acre island in the Potomac River opposite Harpers Ferry. Congress also leased 1,300 acres from Lord Fairfax with the right to harvest and grow timber for charcoal and wood stocks. This tract of land was on Loudoun Heights located across the Shenandoah River.

One of the staunchest supporters of an armory at Harpers Ferry was the Secretary of the Navy, Benjamin Stoddert, a former Georgetown merchant and stockholder of the Potowmack Company.[11] In a response to a question posed by Secretary of War James McHenry, Stoddert stated the following:

> I think your submission contained a query, whether the Work begun at Harpers Ferry should be finished – or whether additional works should be made there… It is most clearly my opinion, that the Arsenal at Harpers Ferry…should be the more important – the Mother Arsenal. It is without comparison the most convenient of the three to the Western Country. It is more convenient than either of the other places (Springfield and Rocky Mount, South Carolina) to all parts of the States. It is nearly the centre.[12]

By the spring of 1797, Washington refused to serve another term and relinquished the presidency. With political tensions with France and with a possible war hanging over the nation, the Armory project at Harpers Ferry quickly returned to the forefront of political and military discussion. Although newly elected President John Adams and others still had concerns about the location and the expense of construction, Adams was under intense political pressure and decided to leave the final choice to his Secretary of War, James McHenry. In the summer of 1798, McHenry announced a plan to proceed with building a full-sized armory and manufacturing facility at Harpers Ferry. McHenry's first step was to appoint officials to oversee the commencement of operations. Construction began on the workshops, canal and dam, and the arsenal building in 1799.

In August, 1798, Secretary McHenry appointed Joseph Perkin as the first Armory Superintendent. Perkin, an expert gunsmith who had formerly worked at the Rappahannock Forge near Falmouth, Virginia, and in Philadelphia as a part-time inspector of arms after the Revolutionary War, was well suited for his new position. John Mackey, a friend and political ally of McHenry's, was appointed the Armory Paymaster. Paymaster Mackey has been described as an educated and ambitious yet inept social climber.[13] The relationship between the Armory's two chief administrative officers, Perkin and Mackey, was never cordial, but each

seemed to accept their respective roles. Mackey took charge of the construction program while Perkin's authority was limited to the repair and manufacture of arms. History would show that Mackey's appointment would have negative effects on the early operations at the Armory.

Around the same time as Perkin's and Mackey's appointments, Secretary McHenry hired the noted engineer James Brindley to accompany Superintendent Perkin on a preliminary inspection of the government-owned lands at Harpers Ferry. The purpose of the inspection was to produce technical plans for the dam and canal needed to power the manufacturing processes. Brindley, one of the few experienced canal builders in the nation, was somewhat familiar with the area, having visited Harpers Ferry in 1786 as a consultant for the Potowmack Company. After two weeks examining the site in August, 1798, Brindley and Perkin agreed that the best site for the waterworks and Musket Factory lay on the banks of the Potomac. The river descended twenty-two feet in just over a mile, rendering the site an ideal place to generate water power. Shortly after the inspection, the two men returned to Philadelphia to discuss their findings with Secretary McHenry. Their report recommended that the War Department employ an experienced engineer to build the Armory canal and dam.

Paymaster Mackey arrived in Harpers Ferry in September, 1798, eager to design and begin construction on the necessary Armory buildings. His first task was to provide a temporary space for the armorers to work until the permanent buildings were constructed. In mid-September he informed the Superintendent that a hundred-foot long frame warehouse, which stood at the eastern end of the Potomac riverfront site, was being converted into a temporary Armory or workshop. Perkin and his armorers could work in the converted warehouse repairing and refurbishing weapons while work progressed on the canal and workshops. Mackey also directed the construction of a barracks to serve as quarters for the armorers. In addition, he recommended that a new temporary arsenal be built, as there was no existing structure for the storage of completed arms (Figure 1.1).

The opportunity to plan the government’s ambitious works at Harpers Ferry also intrigued Benjamin Henry Latrobe, one of the leading architects of the day, who later designed the White House and United States Capitol.[14] In a letter to Thomas Jefferson, Latrobe expressed his interest and requested a commission to design the Armory at Harpers Ferry. Another letter from Superintendent Perkin to the War Department reveals Latrobe had actually furnished a plan for the Armory.[15] Although Perkin was enthusiastic about obtaining Latrobe's services, Paymaster Mackey objected. Mackey was convinced that the Armory required nothing elaborate in terms of its design and structure. Conscious of wasting the public's money, Mackey vetoed Latrobe’s involvement and proceeded to develop his own plan. Meanwhile, Perkin returned to Harpers Ferry in October 1798,

bringing with him ten armorers to work in the temporary workshop. With no canal in place, no permanent buildings to work in and winter coming on, there was little for the armorers to do except repair small arms that were shipped in from elsewhere. The only structure that existed at this time was a long frame warehouse at the eastern end of the selected site, near the Wager Ferry, that served as a temporary Armory and workshop. Ten Armory workers were dispatched to the workshop while construction began on the canal and permanent Armory buildings.

DEVELOPMENT OF ARMORY INFRASTRUCTURE, 1799 - 1820

At the start of the nineteenth century, Washington D.C. became the capital of the United States and Thomas Jefferson succeeded John Adams as President, serving for eight years. In March, 1803, Meriwether Lewis arrived in Harpers Ferry to obtain supplies for his western expedition with William Clark through the Northwest Territory. Lewis remained in Harpers Ferry for a month acquiring supplies, especially guns, which were crucial for protection as well as hunting for food.

The United States would find itself in another war against Britain in 1812, which would lead to the creation of a standing peace-time army. As part of the preparations for the war, the Board of War and Ordnance was also reorganized into the Ordnance Department responsible for arms and ammunition production, acquisition, distribution and storage. In 1815, the United States Armory and Arsenal at Harpers Ferry was placed under the Ordnance Department.

Harpers Ferry at this time was still a small village with a post office, tavern, country store and fifteen private homes (Figure 1.2). After formulating a plan in conjunction with the Secretary of War in the early months of 1799, Paymaster Mackey was ready to begin construction. Although he was opposed to hiring a professional architect such as Latrobe to design the Armory buildings, Mackey did not object to engineer James Brindley's construction of the Potomac River dam or his survey for the route of the canal. Mackey understood the importance of completing the canal, as evidenced by his letter to the Superintendent General dated March 12, 1799:

> All the materials for the building have been secured by contracts. Carpenters, Brickburners, Bricklayers are engaged – in a word every thing preparative to our operations is done, but the beginning cannot be made until the course of the Canal be accurately marked, for by this the site of the buildings is to be determined.[16]

The canal survey was completed in May, 1799, and the masonry dam was completed in October, 1799. The dam was 1,800 linear feet and ten feet wide.

The structure was built of timbers bolted together, and the piers were filled with stones. Construction of the Armory's canal became the government's top priority and the responsibility fell to Paymaster Mackey. As he envisioned it, the canal was:

> to be nothing more than a common water course of about fifteen feet wide and three feet deep…The digging of this requires no ingenuity, and in my opinion can be perfected by men of industry in this country, at less expence [sic] and trouble than would be incurred by employing professional men, who commonly make their employers pay for the name.[17]

Mackey contracted three local merchants to manage the canal construction project. They included Captain Abraham Shepherd, a distinguished Revolutionary War veteran and community leader in nearby Shepherdstown. Shepherd was hired as the superintendent of construction, but due to his advanced age and ill-heath, he was unable to make more than an occasional visit to the site. As a result, Mackey also contracted with Robert Whittel, a dry goods store operator, to oversee the construction, and with John Tulley to be the on-site foreman. Unfortunately, none of these men were qualified to supervise the project. Their political connections to the Federalist Party and local influence with Mackey seem to have secured them the contract. Despite Mackey's stated desire to save the government money by hiring so-called "men of industry" instead of experts, he paid the three men nearly double what Brindley had requested.

Construction of the Armory canal was slow from the beginning, and the work immediately fell behind schedule. One of the main problems was finding a reliable supply of laborers to perform the work. The long hours of removing tons of rocks and soil, poor working conditions in an unhealthy environment, and inadequate housing all resulted in a high turnover of laborers. Mackey complained about the labor shortage in a letter dated July 14, 1799:

> We have not been able to muster more than fifty labourers on an average since the Canal was commenced. We use every means in our power to allure them to … but such is the habitual laziness of the poor of this country that nothing but absolute want can drive them from home …[18]

As much as he needed unskilled labor to excavate the canal, Mackey did not use slaves. There was a limited supply of slave labor which meant that Mackey would have had to mix black and white workers on the canal. The social order at that time adhered to strict separation of black and white labor and it was feared that breaking that convention would have created racial discord.[19]

As the project floundered, Mackey filed several conflicting progress reports to his superiors. In one report he stated that one half of the canal was complete, and a week later, reported about one third of the canal was complete. Adding to his troubles, Mackey also triggered a strike among the workmen over the quality of

provisions that he secured. Mackey created intense friction with everyone connected to the project, and at one point described himself in a letter as follows: "Never was a man more universally hated than I am at this moment throughout the whole country."[20]

Mackey provided a glimpse of his progress on the Armory's earliest buildings through his letters and reports. Writing to Superintendent General Samuel Hodgdon on December 26, 1799, he triumphantly reported:

> The smith shop and factory are finished - The arsenal is built but not entirely finished. Two upper floors are yet to be laid. All, even my numerous Democratic Enemies, agree that the Buildings are elegant. The Smith Shop is eighty by twenty-six feet clear of the walls; The Factory 120 by twenty-six feet, and the Arsenal 120 by twenty-seven feet within - The [smith] Shop contains ten forges, one of which is designed for a tilt-hammer. The ground floor of the factory is designed for the boring grinding and polishing machinery; the filers & stockers will occupy the upper floor - The garret will receive gun stocks lumber &c. the mill is almost built, but will not be put together until the water is in the canal. The arsenal has three floors. This building stands within the confluence of the [Shenandoah and Potomac] Rivers.[21]

In January, 1800, faced with a full-scale investigation of his failure to keep systematic records, Mackey submitted his resignation. In April, Secretary of War McHenry appointed Samuel Annin, a former soldier in the Continental Army, as the new Paymaster of the United States Armory and Arsenal at Harpers Ferry. Like Mackey, Paymaster Annin would be responsible for the stores, together with the superintendence of the construction of all the buildings, dams and other business at the Armory. Arriving at Harpers Ferry in May, Annin was given the authority to retain the contractors hired by his predecessor. However, after reviewing the accounts, Annin found discrepancies in the vouchers and dismissed Captain Abraham Shepherd for defrauding the Government of $185. Unable to find a suitable replacement, Annin assumed personal supervision of the canal building program.[22]

Like Mackey before him, Paymaster Annin found it difficult to attract and retain a sufficient workforce upon taking control of the project. As a solution, he recommended that volunteers from the United States Provisional Army take over the construction of the canal, an idea that was first advanced by George Washington. At the time there were three regiments of soldiers under the command of Major General Charles C. Pinckney that were still in their winter encampment at nearby Camp Hill. Over some strong opposition to utilizing soldiers in this way, President Adams gave his permission for the soldiers to work on the canal. Major General Pinckney's orders stated:

> The President has directed that as many soldiers shall be employed on the Canal in the Vicinity of the camp as the good of the service will permit. The

> major general has conversed with the superintendent of the works on this business and the superintendent is desirous of commencing next week with 50 soldiers as fatigue men and a proportionate number of sergeants. They will be allowed a Sixth of a Dollar per day and double rations of provisions per man. This is to be a weekly fatigue agreeable to the strength of the different regiments. Volunteers are preferred for this duty.[23]

By June, Annin's work force increased to a hundred men, and rapid progress was reported on the canal. Unfortunately, this ready source of labor did not last, as the Provisional Army was disbanded later that month. Work slowed down considerably once again as Annin had to rely on private laborers. Canal construction progressed during the entire working season of 1800. Finally, in early 1801, the canal was completed. The canal was fifteen feet wide, one and one quarter mile long, and powered five water wheels.[24]

The completion of the canal did not commence an immediate outpouring of manufactured weapons from Harpers Ferry. As soon as water flowed into the canal, it began to leak. On August 4, 1801, the Acting Secretary of War notified Annin that Superintendent Perkin had reported "that the works at Harpers Ferry are much impeded in their progress by the leaking of the canal and that proper attention to a remedy is not paid."[25] In addition to the leaking canal, difficulties and delays in procuring quality raw materials, tools, and other essentials also contributed to modest production at the Armory. In 1801, Perkin and his workforce of twenty-eight armorers were able to produce a total of 293 flintlock muskets.

Productivity at the Armory for the years 1801-1808 remained sporadic. The number of skilled Armory workers dropped to twenty during 1802 before rising steadily to eighty-seven in 1807.[26] Health and environmental conditions contributed to the meager output, as workers' sicknesses were often attributed to their poor living conditions. Yellow fever epidemics, coinciding with the summer work season, were another reason production remained low. Unhealthy conditions were exacerbated by the low-lying lands that were prone to both flooding and periods of low water. Low water levels also restricted the use of the canal and interrupted the use of the water-powered machinery.

According to historian Merrit Roe Smith, the town's isolated, even frontier-like position was its greatest handicap.[27] The Musket Factory complex along the Potomac at this time consisted of eleven buildings: the Armory (or factory), a smith's shop, a forge, a coal house, a proof house, the Superintendent's residence, and five other structures of unknown purpose.

Compounding all the circumstances affecting the Armory's low-volume output was a lack of public money to support the operation. President Thomas Jefferson took office in 1801, a period of rising military expenditures and mounting debt. Committed to the idea of a simple and frugal federal government, he promptly

initiated policies promoting fiscal responsibility. His administration cut taxes, reduced the size of government, and paid down the national debt. But when Jefferson drastically reduced the budget of the War Department, the Harpers Ferry Armory felt the effects. The reduced appropriations meant fewer funds were available to support the operations at the Armory.

Geo-politics, however, soon led to the modification of many of Jefferson's policies before the end of his second term. Around 1807, activities at the Armory began to increase. Renewed war in Europe, interference with American commerce, and repeated violations of America's neutrality resulted in a crisis for Jefferson. Realizing the nation was unprepared for military conflict, Jefferson opted instead for economic sanctions. With the intention of banning all American ships from foreign trade, Congress passed a series of measures including the Nonimportation Act of 1806 and the Embargo Acts of 1807 and 1808. At the same time, Congress increased military expenditures. The results of these Acts were not what Jefferson had hoped for. The embargo not only failed to change British and French policies, but it had the unintended effect of devastating large sectors of the American economy. In New England, scores of prosperous ship owners were ruined and many seaports entered a severe economic depression. The area around Harpers Ferry, which had enjoyed considerable downriver trade on the Potomac, was also adversely affected, resulting in considerable local opposition to Jefferson's policies. The Embargo Act of 1807 proved so unpopular in the Shepherdstown, (West) Virginia, area that 200 to 300 citizens met in protest on February 23, 1809.[28] Captain Abraham Shepherd, whom a decade earlier was among the individuals contracted to build the Armory canal, was secretary at a formal meeting denouncing the Act.

Failing at peaceful efforts to forestall the political crisis and facing economic depression, Congress was compelled to prepare for war. Measures were taken to increase musket production. In April, 1806, Secretary of War Henry Dearborn wrote Armory Superintendent Perkin, authorizing him to hire eight to ten new workmen to begin work on extra tools and equipment. This increase in manpower brought the total number of armorers to about seventy.

SUPERINTENDENT JAMES STUBBLEFIELD

Superintendent Perkin died in December of 1806, and in April 1807 was replaced by a Virginia gun maker, James Stubblefield. Stubblefield remained in command for the next nineteen years. He was married to Mary Beckham Stubblefield, who belonged to one of the most prominent families in Harpers Ferry. His brother-in-law, Armstead Beckham, was the master armorer.[29] Stubblefield joined various relatives in private business, causing many people to claim a conflict of interest with his duties as superintendent. His management of the Armory would later be scrutinized by the War Department.

Under Stubblefield's management, coinciding with a period of increased funding, the Armory commenced large scale production of muskets in addition to an extensive building program occupying more than three years. In the fall of 1807, Stubblefield informed the War Department that if modest additions were made to the Armory building and smith's shop, there would be room enough to accommodate one hundred men for making muskets. The War Department immediately approved Stubblefield's plan and directed Paymaster Annin "to please adopt measures for making an addition of thirty five feet to the Armory and twenty to the smith's shop; also an additional water wheel, and such other apparatus as may be necessary."[30] Before these additions to the two shops could be made, however, the War Department had formulated an entirely new plan.

Beginning in 1808, Congress appropriated $200,000 annually for the purpose of arming state militias. An additional $218,000 was budgeted that year for use at the arsenals and armories. President Jefferson and his administration now appeared more concerned with weapons production than with balancing the budget. As a result, total expenditures at the United States Armory and Arsenal at Harpers Ferry increased dramatically, from $40,631 in 1807 to $104,953 in 1808, $158,835 in 1809, and $145,042 in 1810.[31] With funds now readily available, the War Department planned to double the production of small arms at Harpers Ferry. In June 1808, Secretary Dearborn wrote to Stubblefield, explaining the new plan:

> It has been determined to enlarge the Armoury Establishment both at Springfield and Harpers Ferry, and I have given Mr. Annin directions to commence the erection of the necessary buildings, water works, machinery and apparatus without delay and to have the whole performed on such dimensions & in such manner, as he and you shall agree on generally. For the machinery &c. you will from time to time furnish him with sketches, drawings or directions which he will follow.
>
> It is desirable that the buildings & machinery should be such as may be sufficient for as many workmen, as would be necessary for the manufacture of from fifteen to 20,000 muskets annually and a due proportion of rifles, pistols and swords.[32]

As a result of this new directive, Stubblefield built seven new workshops between 1808 and 1809, including five in the Musket Factory on the Potomac and two on the Lower Hall island in the Shenandoah River. By May, 1810, the Armory consisted of twenty-eight buildings and employed almost two hundred workers, a considerable increase over a short time frame. Although no original plans for the Musket Factory buildings have been discovered, a great deal of information is known about the various shops. In 1810 and again in 1811, Paymaster Annin submitted a list of all the Armory's structures to the Secretary of War. These lists detail the use, dimensions, number of stories, and materials used for each building.[33]

During the expansion of the Armory, from 1808 to 1810, the Musket Factory was significantly enlarged. The original line of workshops adjacent to the Armory canal was extended to the east and to the west. On the east end near the main entrance to the Musket Factory, a two-story brick residence was built. The structure, intended as the superintendent's quarters, featured a kitchen in the cellar. Between the superintendent's quarters and the existing Armory or factory building, a new two-story brick building was erected in 1810. In addition to a water wheel and machinery, the first floor of this new building contained a finishing shop and a storage room for musket stocks. The second floor housed the superintendent's office, a filing shop, a storeroom, and a room used for religious services. A brick, two-story tilt hammer shop was added in 1809 on the western end of this line of buildings, adjacent to the old smith's shop. A water wheel powered the tilt hammers on the first floor while the second floor was used to provide lodging space for Armory workers.

As part of the expansion, a second row of brick workshops was erected closer to the banks of the Potomac River, parallel with the original line of shops. The workshops in both rows were arranged in rough symmetry so that buildings of about equal length were opposite each other.[34] Between the two rows ran a seventy-foot wide street called Potomac Street (not to be confused with the present-day street of the same name). On the east end of the northern row of shops, opposite the finishing shop on the canal, was a two-story smith's forge. The first floor contained sixteen forges, each equipped with its own chimney. The second floor was used as a stocking shop. Next in the line was another large two-story smith's forge with an additional sixteen forges and chimneys on the first floor. The second floor was intended for use as a filing shop, but served in 1810 and 1811 as lodging for armorers. Opposite the smith's shop was a building that housed ten additional forges. Rounding out this line of workshops was a one-and-a-half story foundry where armorers occupied the loft area of this small shop.

INITIAL STEPS TOWARD INDUSTRIALIZATION

Despite the increased expenditures and significantly expanded facilities, the Armory was not able to meet its quota for arms. When Secretary Dearborn approved the expansion plan of 1808, he was assured the factory would be producing at least 15,000 muskets annually by 1810. That year the Armory produced only 9,400 new arms. The number of weapons produced did increase slightly during the following two years, but never exceeded 10,200.[35] Historian Merritt Roe Smith summarized the conventional wisdom of the day that was used to explain the disappointing production figures. The low output was attributed to "managerial shortcomings, craft traditions, harsh environmental conditions, bizarre local customs, and the baneful influence of several families who owned and controlled the town of Harpers Ferry."[36] Smith also stated that it was

acknowledged that the Armory at Harpers Ferry excelled at making highly finished pattern and presentation pieces, but it could not equal the Springfield Armory's record for consistently producing a sound, reliable and, after 1815, a more uniform product. On many occasions Stubblefield was criticized for turning out muskets so defective in workmanship that they could not be repaired at outlying arsenals without great expense and inconvenience.[37] Also cited was a serious shortage of skilled labor. Competition for workers in the firearms industry was especially intense at that time.

In the pre-industrial period of Armory operations, musket manufacturing relied on hand tools and traditional methods. Gun making was comprised of six separate processes: barrel making, lock forging, lock filing, brazing, stocking, and finishing. A rudimentary division of labor existed under which the individual armorers each made a particular component of the gun, such as the lock, stock, or barrel. The principal responsibility of the master armorer was to coordinate the output of each part to ensure that an equal number of parts were made simultaneously. Despite the division of labor, when assembled each musket was essentially a handcrafted piece. Like other craft pieces, the makers of the individual gun components can often be identified based on a unique style or distinguishing marks. Thus, it was inevitable that the weapons displayed much variation. Though the craft-based labor used at the Armory at Harpers Ferry worked on a small scale, it was not suited for the technical and economic requirements of large-scale weapons manufacturing. Differences in the fit, finish and quality of weapons made at different firearm manufactories, and even variations between weapons produced at the same manufactory, resulted in major problems when replacement parts were needed for broken or damaged weapons. In addition to the problems caused by discrepancies between muskets of the same model, the unit costs associated with producing weapons by traditional methods were extremely high. These drawbacks led the War Department to become a strong advocate of the uniformity system during the 1810s. The idea called for the uniformity, and therefore the interchangeability, of parts and the mechanization of production. These two basic principles became the cornerstone of the emerging factory system. It became so prevalent in the United States that the British later called it "the American System of Manufactures."[38]

Although the concept of uniformity made perfect sense and had tremendous potential, its acceptance and success were not easy to achieve. Skeptics said it would cost too much to fabricate the necessary precision machines. Resistance also came from the Armory workers themselves. Many of the craftsmen at the Armory at Harpers Ferry felt threatened by technology. Except for using commonly known forging, grinding, polishing, boring, and rifling machines, the armorers relied on their manual skills and used traditional hand tools.

Ideologically, they considered themselves artisans and believed they had certain rights and privileges in the ways they performed their work. But as employees of a public institution whose fortunes fluctuated with the course of political events, the Harpers Ferry armorers could not shield themselves from external forces of change. Innovators and entrepreneurs were attracted to the Armory at Harpers Ferry as the United States government continually sought to expand production and increase efficiency.

On June, 18, 1812, the United States declared war against Great Britain. Although war had been avoided for several years, the continued harassment of United States ships and impressment of American sailors by the British finally pushed the nation to the brink. Another cause of the war was the rapid expansion of the American frontier. Land hungry settlers repeatedly clashed with Native Americans and there was a growing suspicion that the British were behind many of the troubles. Resentment grew as stories circulated after every Indian raid of British Army muskets and equipment being found on the field. By 1812, the settlers were convinced that their problems could best be solved by ousting the British from Canada.

Despite overall opposition to the Republican policies of President Jefferson and his successor James Madison, Jefferson County, Virginia, provided at least seven companies of volunteers for the army in the War of 1812.[39]

As one of the nation's two federal arms manufactories, the Harpers Ferry Armory played an important role in the three-year long conflict, dubbed by many "The Second War of Independence." During the first twelve years of its existence, the Armory produced a total of 61,257 small arms. Arsenal records for the period between 1812 and 1814 indicate that 29,500 arms were shipped to Pittsburgh, Pennsylvania, and Knoxville, Tennessee, in support of the war effort. Specifically, the weapons consisted of 27,500 flintlock muskets, 1,000 flintlock rifles, 500 carbines, and 500 pistols. In addition to the guns, the Armory supplied 30,000 cartridges, 500 cartridge boxes, 10,000 gun flints, and 100 cavalry swords.[40] In contrast to Harpers Ferry, the United States Springfield Armory in Massachusetts reflected the sentiments of New Englanders who did not support the war.[41] Springfield Armory's superintendent at the time, Benjamin Prescott, was dismissed for not following orders to ramp up repairs of arms for the war effort.

When the United States Armory and Arsenal at Harpers Ferry was pressed to increase production in the days leading up to the war, Superintendent James Stubblefield initially hoped to increase output by adding additional craftsmen and continuing with the old method of production. Because of intense competition for skilled labor, he could not employ a sufficient number of

armorers. Stubblefield settled upon a new scheme, explaining the situation twenty years later:

> I determined to adopt a new plan of manufacturing the arms for the United States, and in the spring of 1809 commenced making tools and machinery for the purpose of distributing the component parts of the guns so as to make the work more simple and easy. In June, 1810, we got our tools and machinery ready for making arms; and it is upon this uniform plan that they are now made throughout the United States…By this division of labor, a great deal of expense and trouble are saved, a great amount of tools is saved, and the work can be executed with infinitely more ease, more rapidly, as well as more perfectly and uniformly; and moreover, a hand can be taught, in one-tenth part of the time, to be a good workman when he has but one component part to work upon.[42]

During the war, the Ordnance Department encouraged collaboration between the two federal armories in Springfield and Harpers Ferry in order to exchange administrative information, machinery, labor and raw materials.[43] Harpers Ferry tended to reap the most benefits from this exchange as most of the technical knowledge flowed from Springfield.[44] Stubblefield received patterns and drawings for water wheels and various machines for drilling, milling and trimming.

The War of 1812 was at first a distant conflict from the people of Jefferson County and the Armory workers at Harpers Ferry. For the first two years the fighting was confined to Canada, the Great Lakes, and on the high seas. Most of Great Britain's forces were preoccupied with a simultaneous war against Napoleonic France, and Great Britain did not have the resources to wage war in the Middle Atlantic states. Tensions began to rise in 1813, however, when a British war fleet established a blockade at the mouth of the Chesapeake Bay. British forces began raiding the surrounding countryside, roaming and burning and engaging in sporadic fighting. Once Great Britain overthrew Napoleon in April, 1814, it was able to consolidate its forces against the United States. The constant arrival in North America of British reinforcements enabled the enemy to take the offensive in several quarters, and raids along the Chesapeake Bay intensified.

When British warships were spotted on the Patuxent River in Maryland on August 22, 1814, an urgent appeal for aid was sent throughout the region. When the citizens of Charles Town, Virginia, learned that 4,000 British troops landed and were marching towards the nation's capital in Washington D.C., a call for volunteers was made at the town market house. In short order a company of fifty men enrolled. The following day, the men went to the Armory at Harpers Ferry to obtain weapons and ammunition. Enthusiasm for the upcoming fight spilled over to the armorers and about forty of the gun makers, including

Superintendent Stubblefield, representing approximately twenty percent of the Armory's workforce, joined the company.

This contingent of volunteer soldiers and armorers set out from Harpers Ferry on August 24, 1814, aboard two flat boats. After an hour's voyage, the company landed and elected officers. At the same time, Superintendent Stubblefield reconsidered the wisdom of his decision to join the expedition. Feeling that the work back at the Armory was too important to interrupt, he and most of the armorers returned to Harpers Ferry.[45] The remainder of the party continued on, but it was too late to make a difference. The British already had won the Battle of Bladensburg and turned their attention towards Washington, where they succeeded in burning many public buildings, including the White House and the Capitol. Although a treaty was signed in Ghent, Belgium in December 1814, the war continued into 1815.

After the war, in 1816, Stubblefield visited the Springfield Armory under Superintendent Lieutenant Colonel Roswell Lee, and observed the use of triphammers for welding gun barrels. These water powered hammers were quicker and required less labor, reducing the overall cost. Stubblefield intended to introduce the new method to Harpers Ferry, but for reasons poorly understood, this method never materialized.[46] Welding gun barrels remained a handcrafted operation, costing the government more money to produce.

In 1819, the War Department entered into a contract with John H. Hall, a gun maker and inventor from Maine. Under the terms of his contract, Hall would come to Harpers Ferry and produce 1,000 breech loading rifles made entirely of interchangeable parts, a weapon he designed and patented in 1811. In addition to the contracted amount to make the guns at twenty-five dollars per rifle, Hall received a monthly salary of sixty dollars and a royalty of one dollar for each weapon produced. In the following two decades, Hall worked at Harpers Ferry streamlining manufacturing and creating a system of interchangeable parts.

LANDSCAPE DESCRIPTION SUMMARY, 1820

Of the roughly six hundred acres acquired by the federal government, the United States Armory and Arsenal at Harpers Ferry coalesced into three main areas within the town. The Musket Factory occupied a seventy-two-acre tract of land adjacent to the Potomac River (Drawing 1, 1820 Period Plan). Along with the canal and dam, the Musket Factory complex consisted of eleven buildings, mostly two-story structures including the Armory building, a smith's shop, a forge, coal house, proof house, the superintendent's residence and five other structures of unknown use. The Arsenal Yard, comprised of two warehouses, the Arsenal and Small Arsenal, and two office buildings on one acre, was to the east of the Musket Factory, bordering Wager's Ferry Lot. The Armory property also

included a rifle manufacturing complex on thirteen acres at Lower Hall Island in the Shenandoah River.

The siting of the Musket Factory and the overall layout of buildings took advantage of existing natural features. The flat terrain posed little obstacle for the construction of a complex of buildings. Access to water provided power for manufacturing and transportation opportunities for shipping of both arms and raw materials. The surrounding precipitous topography offered a defensible position from possible outside threats. The factory site also had the advantage of being adjacent to the Wager's ferry landing. The next ferry landing was seven hundred feet west along the shoreline of the Shenandoah River. These two river crossings were the critical nodes of the primary transportation system at this time.

Given the linear character of the site and the newly constructed canal, Superintendent Perkin organized the first workshops in a line adjacent to the canal, extending east and west. This line included the superintendent's residence, a tilt hammer shop, warehouse and charcoal house. A year later, Superintendent Stubblefield erected a second row of brick workshops on the banks of the Potomac River, parallel to the original line of shops. This second row consisted of a series of forging shops and a foundry. Both rows of structures were arranged somewhat symmetrically so that buildings of roughly equal length were opposite each other.

The main circulation through the site consisted of a seventy-foot wide street that began at the main entrance at the east end and ran between the two parallel rows of structures. No references were found regarding pedestrian circulation, such as sidewalks or paths, for this early period. Aside from the canal and the river, the lack of enclosure most likely encouraged Armory workers to use random paths of convenience.

Little information is available regarding the existing vegetation at this time. Since there were recurring floods, agricultural use was most likely avoided this close to the Potomac River. In addition, no references have been found concerning landscape treatment on the Musket Factory site during the early 1800s. There were residential gardens in the area to the west of the Musket Factory and on the adjacent hillside.

The Arsenal Yard was a clearly defined space enclosed by two arsenal buildings and offices. A large arsenal building was located at the southernmost point of Lower Town. Perpendicular to this building was a smaller arsenal building. In addition, the superintendent's office and the paymaster's office were at opposite ends of the site along Shenandoah Street. The Yard was bounded by a fence constructed of discarded or inferior musket barrels used as iron palings. The

fence extended along Shenandoah Street from the paymaster's office to the superintendent's office. Stone mortar walls also enclosed the Yard at the eastern and western edges.

In the coming years, the introduction of railroads and other transportation developments transformed the Armory as well as the town into an industrial and commercial hub. The character of the Armory and its physical connection to the town would change significantly.

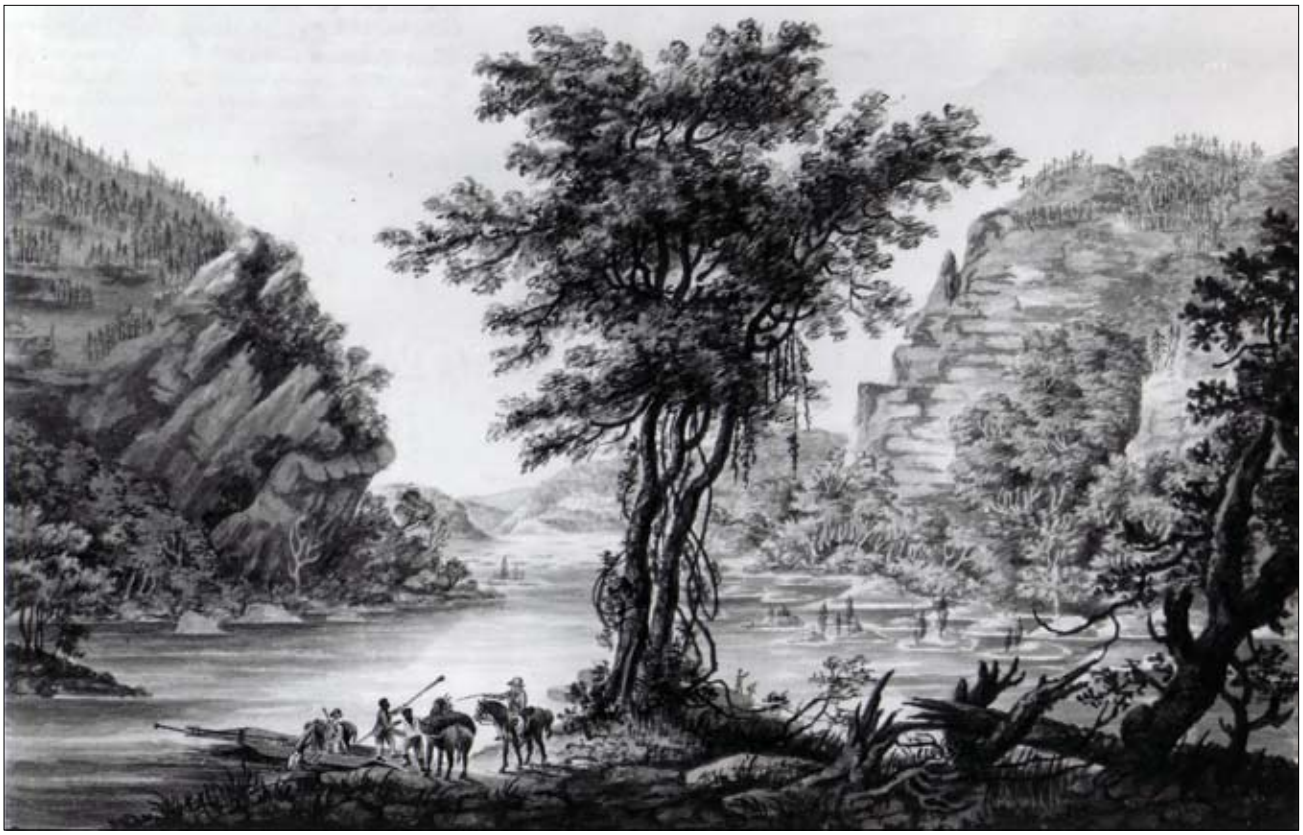


Figure 1.0. This illustration shows early ferry operations at the confluence of the Potomac and Shenandoah rivers, circa 1795. The image captures the dramatic topography and rustic character of the area. Harpers Ferry Historic Photo Collection, HF-01195.

Figure 1.1. Illustration of the Arsenal at Harpers Ferry, circa 1803-1808, viewed from Camp Hill. The ferry is also depicted crossing the Potomac River. Harpers Ferry Historic Photo Collection, HF-0021.

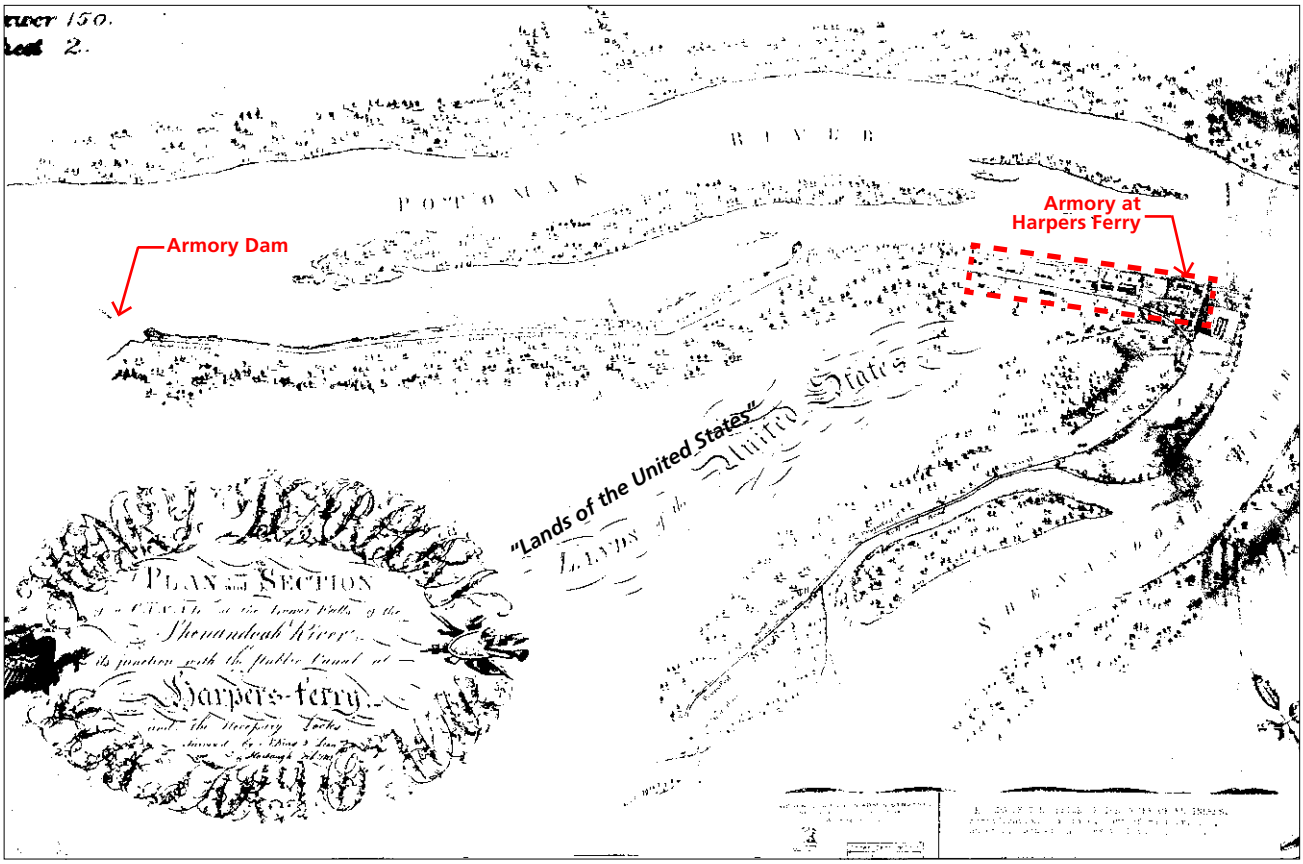


Figure 1.2. Map of Harpers Ferry, circa 1820, depicting Armory buildings at the eastern portion of the site along the Potomac River. The Armory dam is to left, west of the workshops. The map also illustrates the scope of the United States government's land ownership. Harpers Ferry Historic Photo Collection, HAFE-385-3004.

Maryland Heights

Possible Housing

Canal (1803)

Proof House (c.1808)

Foundry (c.1810)

Potomac River

Coal House, (c.1808)

Forges (c.1810)

Tilt Hammer Shop (1809)

Smith's Forge (c.1810)

Smith Shop (c.1808)

Smith's Forge (c.1810)

Armory (c.1808)

Boat Landing
(c. 1811)

Finishing Shop (1810)

Main entry to
Musket Factory

Superintendent's
Residence (1810)

High Street

Ferry
House

Warehouse

Office
(c. 1820)

Wager's Ferry

Shenandoah Street

Arsenal
Yard

Arsenal (c.1800)

Small Arsenal (c.1806)

Jefferson's Rock

Louden St.

Shenandoah River

Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

1820 Period Plan

National Park Service

Olmsted Center for Landscape Preservation

www.nps.gov/oclp

SOURCES

1. "Plan and Section of a Canal, by Harbaugh/King, 1803, HAFE Archives Map, 1803

2. HAFE Lower Town CLR, Historic Base Map, 1750-1815, National Park Service, National Capital Region, M. Delay

DRAWN BY

National Park Service, Allison Crosbie
Olmsted Center for Landscape Preservation
ArcMap GIS 9.1

LEGEND

- Building
- Fence
- Non-pedestrian Circulation
- Tree
- Stone mortar wall
- Approximate Musket Factory Boundary

0' 100'

Drawing 1

TRANSPORTATION DEVELOPMENT, 1821 - 1840

In the 1820s, industrialization began creating a market based economy in the United States, with increased agricultural production in the South and manufacturing in the North. A new reliance on exporting goods generated major transportation improvements, especially in an effort to connect with the West. New turnpikes and toll roads included the Cumberland Road, also known as the National Road. The route started in Cumberland, Maryland and continued through southwestern Pennsylvania to Wheeling, (West) Virginia. The road then extended through Columbus, Ohio, and Indianapolis, Indiana, to Vandalia, Illinois. Additional expanded modes of transport included canals, mainly in the North, and steamboats in the South. In 1825, the Erie Canal was completed, the largest transportation project in the United States at that time, linking Lake Erie and the Hudson River. The Erie Canal increased trade throughout the nation by opening eastern and overseas markets to the Midwest and facilitating migration to the West. In 1828, construction began on the Chesapeake & Ohio Canal, a shipping canal, connecting the Potomac River in Washington D.C. with the Ohio River in western Pennsylvania. Developments in railroad construction included steam locomotion which was first utilized in the United States in 1831.

In Harpers Ferry, the Armory's holdings at this time included twenty workshops, two arsenal buildings, and eighty-six dwellings for employees. The Armory canal was reconstructed and enlarged, incorporating a network of channels and millraces furnishing water power for mills and machinery. At the Musket Factory, the Armory built a stone wall along the river edge, extending the entire length of the complex. The massive mortar masonry wall was four and a half feet thick and was approximately fifteen feet above the low water level. Providing outlets for eight culverts from the tail races from the Armory workshops, the new wall protected the property from high water and reclaimed several feet of land from the river. Additional stone mortar walls were added to the eastern and western edges of the Arsenal Yard, further enclosing that area.

During Superintendent Stubblefield's last years at the Armory, his management capabilities were called into question. The town's most affluent families viewed the Armory not as a federal institution, but as a convenient source of jobs, contracts, and local opportunities.[47] For years this had stifled innovation and productivity. Stubblefield was a member of the ruling elite through his marriage and was accused by many workers of abusing his position to augment the fortunes of his family and friends. While these allegations were investigated, Lieutenant Colonel George Bomford, Chief of the Ordnance Department, proposed that the superintendent of Springfield Armory, Lieutenant Colonel Roswell Lee, should take command. After much resistance, Lee arrived in Harpers Ferry in October, 1826. While in command, Lee attempted to impose

order and discipline by instituting regulations that he found successful in Springfield. After several months, a court of inquiry exonerated Stubblefield, and both superintendents resumed their original posts. Two years later, Stubblefield's competence was once again questioned. He was again found not guilty, but instead of returning to his position, Stubblefield resigned.[48]

Colonel Thomas Dunn took over as superintendent in 1829. Dunn reinforced many of the rules and regulations established earlier by Lee, including rules forbidding loitering, gambling, and consuming alcoholic beverages on Armory premises. He made unexcused absences punishable by immediate dismissal and held each armorer responsible for the damage or destruction of tools consigned to his use.[49] For his troubles, Dunn was soon fatally shot by a disgruntled Armory worker who had been dismissed by Stubblefield and had sought to be reinstated. In 1830, General George Rust was appointed superintendent and held the post for seven years.

The overall appearance of the Armory was considered unsightly with a substandard architecture and a layout lacking any semblance of functional unity.[50] Work did not flow smoothly from one stage of production to another. Workshops with similar functions were separated by long distances. As one observer noted, "the whole establishment is cramped for room, not having been constructed upon a plan arranged beforehand, but put up building after building as appropriations were obtained."[51] Bomford warned Congress that if steps were not taken to improve the physical appearance of the Armory, blame would be placed on the government.[52] In addition, the improvements in transportation did not completely alleviate problems with low production rates at the Armory. In the coming years, the Ordnance Department tried to remedy this situation with a formal examination of the Armory and the appropriation of funds for improvements.

In Lower Town, the streetscape along the southern side of Shenandoah Street, which led to the Armory's main entrance, was entirely residential, lined with houses rented by Armory workers. The government allowed Armory workers to build on available public land throughout the decade.[53] Beyond the developed areas, the remaining landscape of Lower Town was dominated by the steep hillsides and slopes north and west of the commercial core (Figure 1.3).[54] In order to clear rocky areas of the town, blasting and quarrying were undertaken, generating raw material for construction. Great quantities of shale slabs were excavated and used for the construction of buildings, walls, sidewalks and drainage systems. Grade changes along Shenandoah Street through the years resulted in the grade at the Arsenal Yard being approximately one and a half to four feet below street level.[55]

With a population of 1,700, the town of Harpers Ferry was still relatively isolated from sources of raw materials and other manufacturing centers. The closest towns were Frederick, Maryland, twenty miles to the east, and Hagerstown, Maryland, twenty-five miles to the north. The necessary arms-making tools and supplies for the Armory had to be procured in distant cities and shipped to Harper's Ferry at great expense. These materials often came from Baltimore and Philadelphia and were hauled by horse-drawn wagons. Coordinating factory production was difficult due to the poor condition of roads and the seasonal unreliability of river traffic.

Several key developments in the 1830s ended the town's isolation and generated a thriving economy. One improvement was the adoption of new manufacturing technologies. Greater acceptance of emerging ideas about the standardization and interchangeability of parts led to a tremendous expansion of manufacturing. During his time at the Armory at Harpers Ferry from 1819 to 1840, John H. Hall, a gunmaker who had designed and patented a breech-loading rifle, sought to perfect the system of interchangeable manufacturing based upon the uniformity principle. His genius and the success he eventually achieved astonished the military inspectors of the Ordnance Department. Colonel George Talcott recognized the significance of Hall's work and wrote "[Hall's] manufactory has been carried to a greater degree of perfection, as regards the quality of work and uniformity of parts than is to be found elsewhere – almost everything is performed by machinery, leaving very little dependent on manual labor."[56] Whether it was by way of the machinery he designed and the armorers he trained, or indirectly through the spread of his ideas, Hall helped transform Harpers Ferry into a full-fledged industrial center.

Additional modes of transportation served as another catalyst for growth. In 1824, the Wager family hired Lewis Wernwag, a bridge builder and mill owner, to build a wooden highway bridge across the Potomac River, replacing the old Potomac Ferry.[57] Referred to as the Wager Toll Bridge, the new toll bridge was completed in 1828 (Figure 1.4). In addition, in the mid-1830s, the nearly simultaneous arrival of the Baltimore & Ohio Railroad (B&O) and the Chesapeake and Ohio Canal (C&O) on the Maryland side of the Potomac assured a steady supply of raw materials to local factories and workshops. These new means of transportation linked the Armory and town to nearby urban markets and the broader national economy. The regularity of the delivery of goods by railroad and canal also simplified procurement of materials and made coordinating factory output easier.

In November, 1833, the C&O Canal reached a point opposite Harpers Ferry in Maryland. An inlet lock permitted barges loaded with supplies destined for the Armory to cross the river, enter into the Armory canal, and make deliveries to the workshops at the Musket Factory. The construction of the C&O Canal, a

continuous waterway with locks that controlled water flow, was a vast improvement over the series of skirting canals that were built along the Potomac in the late eighteenth century. When construction of the C&O Canal was completed in 1850, it extended 184.5 miles from Georgetown in the District of Columbia to Cumberland, Maryland. The canal allowed barges as large as ninety-two feet long by fourteen-and-a-half feet wide to travel both upstream and downstream. The canal remained a fixture at Harpers Ferry for years, reaching its heyday in the late 1800s.

Merchants from the city of Baltimore, not wanting to miss out on the promise and profits about to be captured by the C&O Canal, countered with a scheme of their own. The Baltimore & Ohio (B&O) Railroad Company was incorporated in 1827, and construction began in 1828. The company's immediate goal was to construct a rail line up the north bank of the Potomac as far as Harpers Ferry. The proposed B&O railroad line at Harpers Ferry was surveyed around 1833. The B&O railroad arrived at Harpers Ferry on December 1, 1834, about one year after the C&O Canal had reached the same location. At Harpers Ferry, an important junction could be made with the Winchester & Potomac (W&P) Railroad, also under construction along the southern edge of the town. The W&P railroad was a thirty-two mile rail line that, when completed in 1835, connected Winchester, Virginia, to Harpers Ferry and the Potomac River. A B&O connection to the W&P railroad, it was reasoned, would bring traffic from the fertile Shenandoah Valley and provide a steady stream of traffic and revenue.

Benjamin Latrobe designed a new railroad bridge spanning the Potomac River, connecting the B&O railroad to the new W&P railroad (Figures 1.5, 1.6). Completed in 1837, the new bridge transformed the old ferry landing, known as the Ferry Lot at the confluence of the Shenandoah and Potomac, into an area of bustling commercial activity. The Ferry Lot was a parcel of land retained by private landowners as the federal government acquired the surrounding property for its Armory and arsenal buildings.[58]

In 1838, the B&O Railroad sought to continue onward to Cumberland, Maryland, and beyond to the Ohio River. The most logical route involved leasing six miles of track from the W&P Railroad, but the W&P refused to lease the track. The B&O Railroad had little choice but to utilize the south bank of the Potomac River for its route west, which meant going through the Armory property (Figure 1.7). An agreement was reached that permitted the B&O Railroad to run its track along the edge of the Armory, but stipulated that the line be built upon an elevated trestle and that nothing should be done to injure the Armory property. Benjamin Latrobe constructed a curved span or "y" at the Harpers Ferry shoreline, and laid a route northwest following the Potomac, using a ten-foot right-of-way obtained from the government through the Armory grounds. To elevate the track, the railroad company had to construct a stone

river wall that paralleled the Armory's own river wall at a distance of about twenty feet. The space between the two walls was to be left open for the free passage of river water. The railroad's new wall was to contain sufficient openings for each of the eight Musket Factory tail races to discharge water back into the river. The legs of the wooden trestle had to be no more than eighteen inches in diameter and be set at least fifteen feet apart. One set of legs was to be built on top of the Armory's river wall and the other atop the stone wall built by the railroad. By 1839, the B&O Railroad's river wall extended 1,380 feet from the abutment at the old Armory boat landing to above the rolling mill at the west end of the Musket Factory yard. The stone wall was four and a half feet thick and stood approximately fifteen feet above the level of the river.

With the construction of the B&O and W&P railroads and the C&O Canal by 1840, the town of Harpers Ferry became more industrialized as manufacturers took advantage of efficient and reliable transportation as well as the availability of water power. These transportation improvements also ensured a steady supply of raw materials and machinery, strengthening the Armory's manufacturing proficiency. In the next twenty years, the Armory would reach its peak in arms production and the town would expand into an industrial center.

LANDSCAPE DESCRIPTION SUMMARY, 1840

The introduction of railroad lines in Harpers Ferry and a new canal on the Maryland side of the Potomac River ushered in sweeping changes to the Musket Factory landscape at Harpers Ferry. The railroad line constructed along the shoreline on top of a trestle defined the river edge of the Armory property and introduced an industrial character to the town landscape. The new curving railroad line straddled the Potomac River and the Armory grounds (Drawing 2, 1840 Period Plan). Along with the railroad line, the four-and-a half-foot thick Armory river wall became a defining feature of the Musket Factory, marking the northern boundary of the site. The new wall protected the property from high water and reclaimed several feet of land from the river.

At the conclusion of this period in 1840, the Armory layout was not organized for optimal production. Workshops with similar functions were separated by long distances. Structures appeared to be built as needed with no underlying long range plan in mind. Physical improvements did occur at the Musket Factory, including modifications to the Armory canal to create additional channels and millraces to furnish more power.

Circulation also improved by limiting access to the Armory to the front gate which helped control the movements of the workers. Images from this period also depict a series of pathways winding along the hill overlooking the Armory and offering a scenic promenade (see Figure 1.4). The Armory itself became part

of the scenic view. The biggest transformation of the Armory's physical appearance took place in the next period when the Armory came under military leadership. Beginning with Colonel Henry K. Craig, and later Major John Symington, the Armory at Harpers Ferry became a modernized, industrial facility.

Figure 1.3. Painting, circa 1820, of Harpers Ferry with the Potomac Water Gap in the background. Paths terraced the hillside, providing a promenade for visitors. The Armory's complex of buildings along the river presented a contrast to the surrounding bucolic scenery. Original painting in collection of Maryland Historical Society. Harpers Ferry Historic Photo Collection, HF-0628.

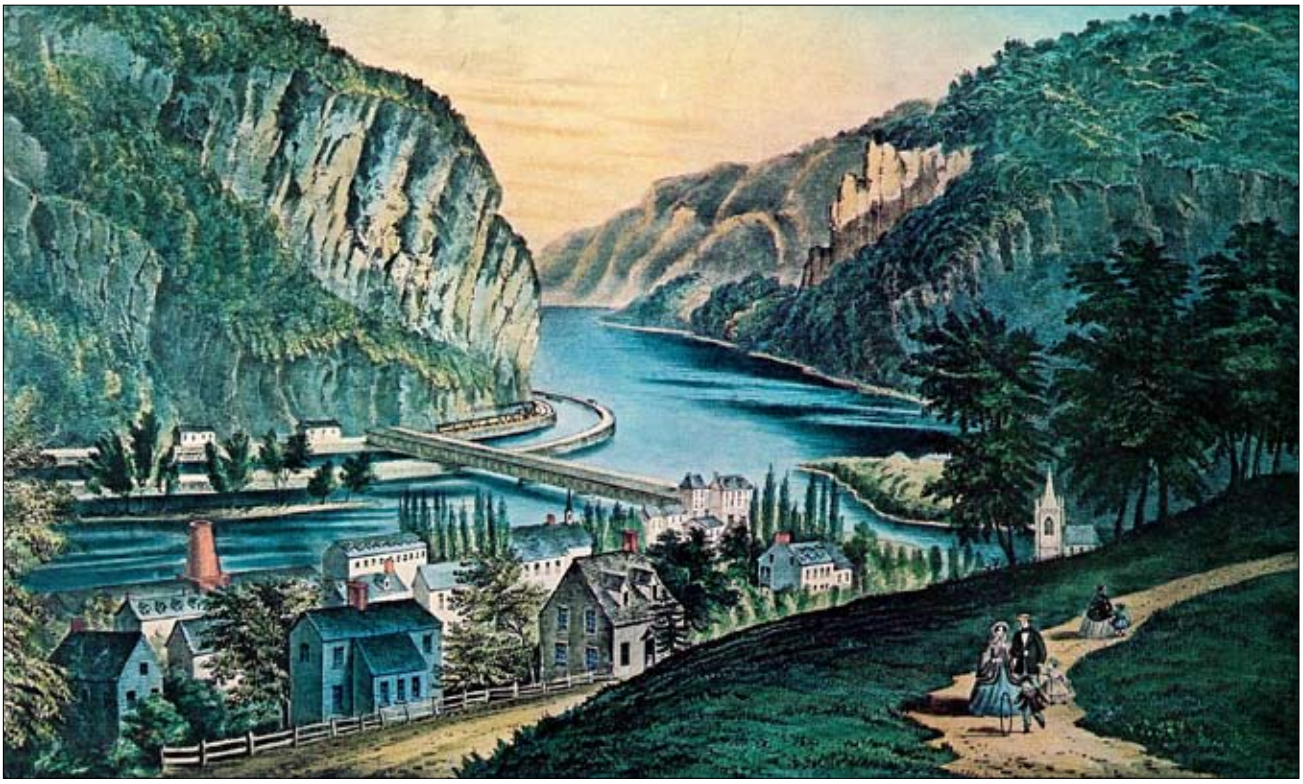


Figure 1.4. Currier & Ives illustration of Harpers Ferry from the mid-1830s, overlooking the Potomac River and the new toll bridge built by Lewis Wernwag. Usually referred to as the Wager Bridge, it was owned by the Wager family who had run the ferry. The Armory's smoke stack is visible to the left. Note the walking paths to the right. Harpers Ferry Historic Photo Collection, Currier & Ives postcard.

Figure 1.5. The view in this drawing, circa late 1830s, is similar to the Currier & Ives illustration but depicts, left to right, both the Wager toll bridge and the Baltimore & Ohio railroad crossing. Harpers Ferry Historic Photo Collection, HF-00221-nd.

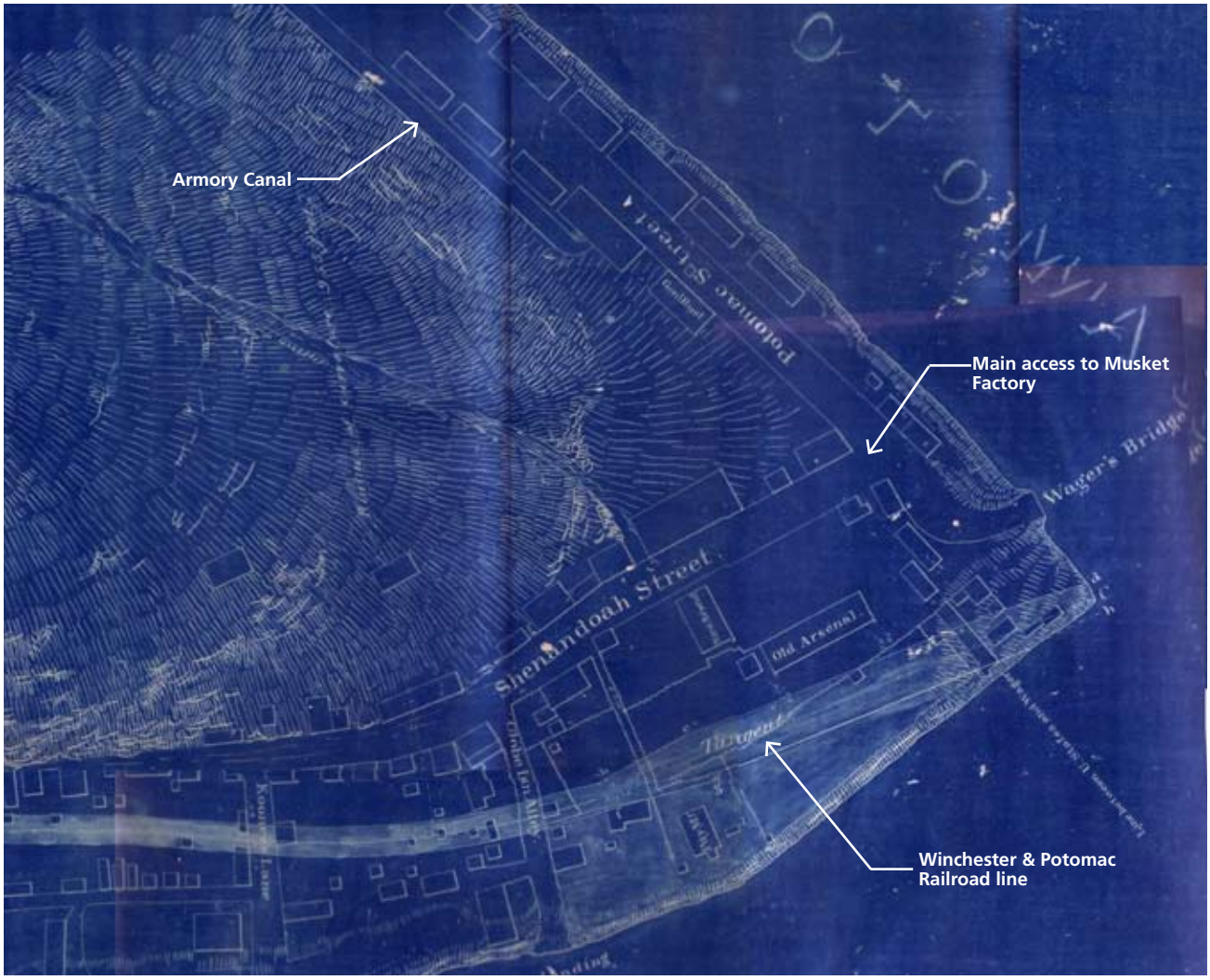


Figure 1.6. Blueprint map from 1835 entitled "Harpers Ferry Showing the Location of the Winchester & Potomac Railroad." The map depicts the eastern end of the Musket Factory grounds, including the arrangement of buildings along its main road and the canal. Hagley Museum Archives, ACC 1534, oversized.

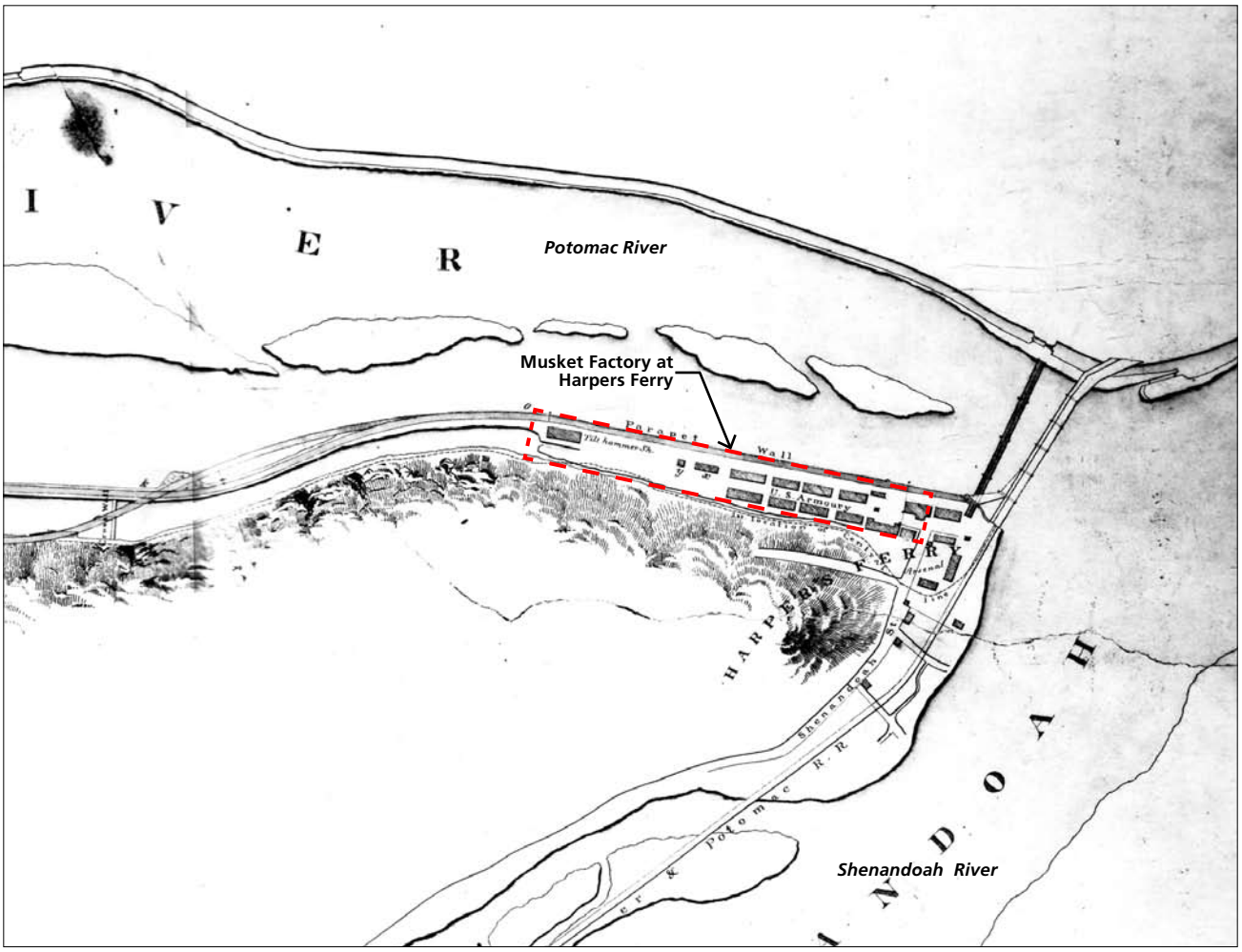
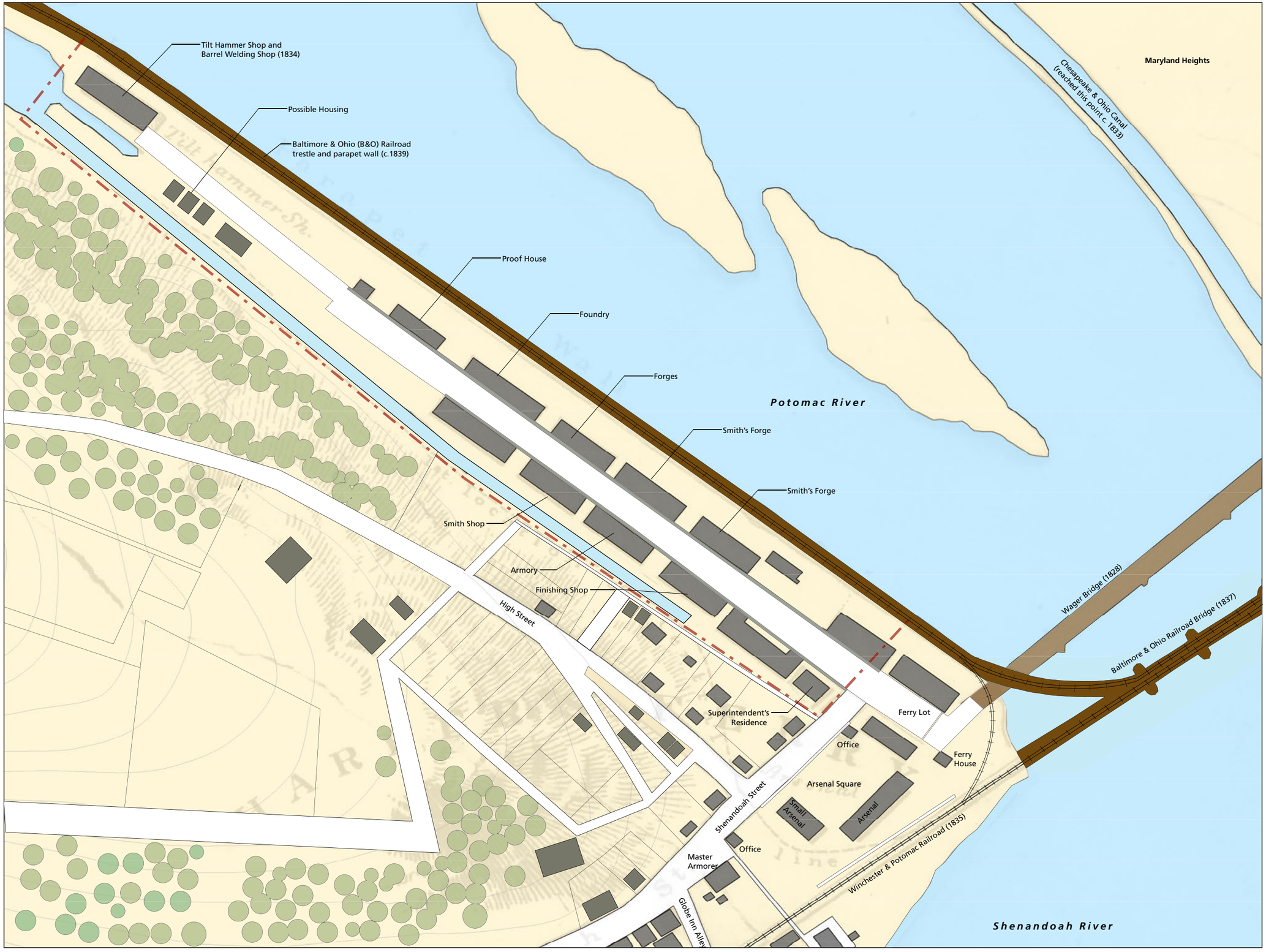


Figure 1.7. Map from 1835 depicting the surveyed routes for the continuation of the Baltimore & Ohio (B&O) railroad through Harpers Ferry and the Armory. The Winchester & Potomac (W&P) railroad is shown along the edge of Harpers Ferry along the Shenandoah River. Harpers Ferry Historic Photo Collection, HMF-00476.



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

1840 Period Plan

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. 1835 Survey by H. Latrobe for B&O Railroad

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

LEGEND

- Building
- Wall
- Railroad
- Non-pedestrian Circulation
- Tree
- Property Line
- Approximate Musket Factory Boundary

0' 100'

Drawing 2

AMERICAN SYSTEM OF MANUFACTURING, 1841-1860

As industrialism progressed in the United States, urbanization in the North grew at unprecedented rates with a massive influx of immigration. Many immigrants to the cities were the Irish escaping the potato famine. A large number of Germans also immigrated to the United States, but tended to settle outside of cities. Poor working conditions in the mills and factories led to labor strikes. Many of these efforts succeeded and trade unions were legalized in 1842. Unlike the North, reliance on the cotton gin in the South meant that the slave society remained largely unaltered. By 1860, the South was producing seventy-five percent of Britain's cotton supply.[59]

With the development of new technologies, including telegraph lines, and new modes of transportation, Harpers Ferry emerged as one of the southern United States' few industrial centers. A key factor in the growth of the Armory was the introduction of administrative reforms. In 1841, a new management philosophy was implemented, whereby civilian leadership was replaced with military superintendents. Change did not come easily, however. Because of the unique way in which the Armory and town had developed, with a few well-connected individuals wielding great power and influence, any action that was perceived as a challenge to local authority was discouraged. Locals viewed outsiders as a source of interference and they were regarded with suspicion. This generated persistent problems at the Armory with the enforcing of regulations, changing personnel and altering administrative procedures. The appointment of military superintendents and the reforms they required succeeded in creating a more organized and regimented operation. As a result, the work at the Armory evolved into a more disciplined factory system dedicated to interchangeable manufacturing. Its physical layout expanded to a facility of more than fifty buildings employing nearly 250 workers.

The expansion of the Armory during the first half of the nineteenth century did not occur according to a comprehensive plan, but rather proceeded on a piecemeal basis. A combination of inconsistent funding, unsatisfactory civilian management, inefficient labor practices, and simple neglect resulted in a random arrangement of dilapidated buildings. By the 1840s, most of the workshops and storage buildings were at least thirty years old, dating from 1810 or earlier. As early as 1827, the Inspector General of the Ordnance Department remarked on the rundown appearance of the Armory facilities. In a confidential report he wrote:

> This establishment has, undoubtedly, been badly managed. Large sums of money have been expended without reference to permanency or utility. Everything about it bears a temporary aspect. Very few, if any, substantial buildings are to be found at the place. The shops are built of brick but in a

> state of dilapidation. These are surrounded by small buildings not fit for habitation… To pull down the buildings, which are a disgrace to the establishment and improperly located, and to erect those of a permanent character for the habitation of the workmen, and to make such other improvements as are necessary to place the establishment on a proper and respectable footing, would probably cost forty or fifty thousand dollars, which sum might have been saved if due regard had been paid originally to the location and construction of the buildings.[60]

No solutions were offered over the next decade to remedy the situation. This led Chief of Ordnance, Colonel George Bomford, to warn Congress in 1839, "the strongest necessity exists for the improvement of the public buildings at Harper's Ferry Armory – they are exceedingly unsightly and unworthy of a National Establishment."[61] In his opinion the Armory had become second rate and a source of embarrassment for the War Department. Indeed, much criticism of the Armory's general appearance was leveled against the government. A program of modernization was undoubtedly needed.

On February 2, 1842, the Secretary of War ordered the Ordnance Department to make a formal and detailed examination of the United States Armory at Harpers Ferry. Inspector General Colonel S. Churchill and Major Henry K. Craig, the new superintendent of the Harpers Ferry Armory, were appointed to make the study. Their report recognized:

> …the necessity of very extensive improvements, repairs, and additions to the buildings, machinery, &c attached to this Armory; not only for the increase and quality of its production, but for the security of those productions and of the other public property, and also for the comfort and preservation of the health of the officers and workmen of the Armory…"[62]

Confronted with the hodgepodge of structures, there seemed to be no way for Superintendent Craig to modernize operations short of renewing the entire physical plant. To achieve that goal, Craig needed funds. In 1841, Congress appropriated $38,000 in a special fund for the purpose of making repairs and improvements at the Harpers Ferry Armory. Most of the money was used to make repairs to buildings and to pay off cost over-runs accrued by the previous civilian superintendent.[63] Additional money was still required to install new machinery for manufacturing the new Model 1842 Percussion musket which was to go into production as soon as possible.

In 1842, the Ordnance Department asked Congress for an additional $40,000 to make improvements at the Armory at Harpers Ferry. In contrast to the usually specific budget requests, the Department's submission was somewhat vague, citing only generalized needs for repairs to workshops, machinery, dams, and embankments. Perhaps because its spending plan lacked the required details, the Armory received only seventy-five percent of the requested amount. More

importantly, the vagueness of the request indicates that a definite plan for renovating the Armory was not in place.

The estimate for the following fiscal year, 1843, was more definitive on how appropriations would be spent. The requested amount would be spent building a new boring mill and a new proof house, as well as completing the construction of a warehouse. In all, during the two and a half year period from January, 1842 to June, 1844, Congress appropriated $90,500 for improvements at the Armory at Harpers Ferry. During that time, Superintendent Craig began the process of reconstructing the Armory's physical plant. Despite a lingering national economic depression that severely restricted War Department finances, six structures were built during his tenure.[64] Craig also established new standards for all future construction projects, insisting that all new buildings be well designed, of superior workmanship, and made of the finest materials.

Major Craig left Harpers Ferry in November, 1844, for new duties at another post and Major John Symington became superintendent. The appointment of Symington, a talented engineer and graduate of West Point, had long-lasting, positive consequences. As a young lieutenant, Symington had once briefly served as acting superintendent following the resignation of James Stubblefield in August, 1829. During that time he familiarized himself not only with many of the land-use issues that plagued the Armory, but also with the schemes being devised to resolve them.

During his official tenure that lasted from 1845 to 1851, Symington revived many of the plans that were never successfully executed due to changing political and economic conditions. During his term, Symington displayed considerable skills as a builder, architect, and town planner. Among his most notable accomplishments, Symington imposed a uniform architectural style on the Armory buildings; solved the persistent problem of inadequate housing for Armory employees; and in 1850 laid out the basic street and lot plan for town of Harpers Ferry that prevails to this day.

One month on the job, Symington presented a master plan to improve the Musket Factory to his superiors in the War Department. The plan entailed thirteen detailed cost estimates along with five detailed sketches of proposed buildings. The overall plan proposed ideas for rebuilding workshops and storage facilities at both the Musket Factory and the Rifle Works, and also for repairing and constructing machinery. Another important component of Symington's master plan concerned the acquisition of additional necessary land and, conversely, the disposal of unproductive lots. Symington devised two alternative land buying programs, one for purchasing thirty-six buildings and eighteen lots and the second for acquiring forty buildings and twenty-two lots. The two proposals were accompanied by a detailed and accurate map drawn to scale and

rendered in color. The map depicted the lots and buildings to be purchased under each plan. In an effort to provide workers with arable land, Symington also recommended that the government purchase additional land on Byrnes Island in the Potomac River to provide "excellent gardening ground for the armorers, who may be disposed to cultivate it."[65]

Impressed by Symington's proposals, Chief of Ordnance Colonel George Talcott presented the plans and map to the Secretary of War in his annual report for operations, remarking:

> The officer [Symington] who has recently taken charge of the Armory has furnished plans and estimates for renewing several of these defective buildings; they have been prepared since the completion of the annual estimates submitted to Congress, and the importance and urgency of the case is believed sufficient to justify their presentation at this time; and I respectfully recommend them to your favorable consideration…[66]

Talcott also recommended the careful consideration and the implementation of one of the two proposed land purchasing programs.

International events in the mid-1840s greatly aided Symington's plans. In May, 1846, the United States declared war on Mexico, and for the duration of the two-year conflict, Congress readily designated large sums for repairs and improvements at the Armory at Harpers Ferry. Economic conditions within the United States improved and this also helped Symington's initiatives. Benefiting from increased funding, thirty buildings were added to the Armory during Symington's tenure. Nineteen were newly constructed, eight were purchased, and three that Major Craig had begun were completed. Many of the new structures were built at the Musket Factory along the Potomac riverfront as part of Symington's master plan for transforming the Armory into a modern facility (Figure 1.8).

With some finishing touches made in 1843, construction of a two-story warehouse was completed. A new boring mill was erected in 1845. Around 1846, two of the forging shops erected in 1810 were torn down and replaced with a new one-story forging shop with an adjacent two-story building used for the inspector's office and model and pattern rooms. This structure contained a large chimney stack, ninety feet tall, and connected to a line of double forges in the forging shop by horizontal flues. A new three-story stock house was also completed in 1846. A new smith's shop, completed in 1848, connected to the forging shop and inspector's office. When completed, the combination smith and forging shop was the largest workshop ever erected at the Armory.

Symington also built an engine and guard-house. Completed in 1848, the structure had room for two fire engines and also a guard room for the night watchmen. Located at the east end of the Musket Factory, this relatively minor

structure would achieve notoriety in October, 1859 as "John Brown's Fort." It was within this structure that Brown and several of his followers barricaded themselves during their ill-fated raid.

The next structure erected at the Musket Factory was the stocking and machine shop, completed in 1850. The bell or finishing shop, built prior to 1810, was extensively renovated and modernized around 1850. A new polishing shop was built in 1850, connecting the finishing shop to the boring mill and housing a large waterwheel driving some of the machinery in adjacent shops. Symington designed and erected a tilt hammer and barrel welding shop and a new grinding mill, saw mill, and carpenter's shop. He also completed an annealing shop and brass foundry in 1852. The final building in Symington's plan for the Musket Factory was a new rolling mill at the far west end of the complex. Symington designed the mill but it was completed by his successors in 1855.[67]

Symington continued the practices instituted by his predecessor. Like Superintendent Craig, Symington insisted that all new Armory workshops be constructed of quality materials and of the finest workmanship. In sharp contrast to the old structures, his plans for the various new buildings shared many design elements in common, unifying the facility. Symington had designed the major workshops and storehouses with substantial foundations of cut stone. Their walls were made of brick and trimmed with cut stone water tables, window and door sills, and coping. Doors and window frames were generally of cast iron. The gabled roofs were fitted with gutters and downspouts made of copper and were covered with either slate or sheet iron to lessen the danger from fire. The shops also were protected by lightning rods. Brick walls were painted with two coats of oil paint or cement wash and the shops were heated by cast iron stoves.[68]

Referred to as a Factory Gothic style, the side gable ends of the buildings, as well as the front facing gables of the center buildings, featured brick parapet walls that were crenellated, capped with cut stone coping, and rose above the edge of the roof. The first stories were subdivided into repeating arcaded bays. Each bay was comprised of a round arch supported by capped brick pilasters and a recessed brick panel that contained either an arched window or a door. All of the major workshops and storehouses that were built at the United States Armory at Harpers Ferry between 1852 and 1861 were constructed according to Symington's basic architectural plan and style.

Beyond the construction of new, well-integrated buildings, the mid-century renewal program included improvements to other aspects of the Armory facility as well. The Armory canal was enlarged again and fittings for machinery were modernized. Drainage ditches, privies and cesspools, and drinking water cisterns were constructed to improve sanitation and health conditions. Other enhancements included the installation of lightning rods, water hydrants, and

other firefighting equipment throughout the workshops. Street lamps were installed in 1852 and sidewalks were built in 1855. The street lamps appear to be the same style installed at the Springfield Armory in Massachusetts. Considerable grading and filling of the grounds was undertaken in an attempt to raise the buildings above typical flood levels. In 1853, landscape improvements, including the planting of grass and shade trees, gave a neat and well-groomed appearance. According to a Historic Grounds Report prepared in 1965, the Ordnance Department recorded improvements at the Armory:

> The roads in the Armory Yard were graded and macadamized, grass plots piled up, graded and sown with grass seed. Six cast iron lamp posts were put up and furnished with lamps complete.[69]

Symington believed that the entire town, from Camp Hill to Lower Town, fell under the scope of the federal government, and that all public land should be considered under Armory stewardship.[70] He also believed that the confined proximity of the narrow alley bordering the Armory canal was a potential safety threat to the workshops and machinery. The concentration of so many wooden outbuildings and the general congestion caused by the stores and the marketplace on the street posed a fire hazard on the two accessible sides of the Armory yard. To create a buffer between the High Street service yards and the Armory canal, he advised purchasing the privately owned lots and demolishing all associated outbuildings and service buildings. The remaining portions of the yards could then be cultivated and the existing north/south alley widened into a thoroughfare. By purchasing three additional lots, and removing the standing structures, Symington was able to transform the alley into North Cliff Street, soon after referred to as Potomac Street. A stone retaining wall was also built on one side to prevent the deposit of waste from the nearby hill into the Armory canal. These changes improved the principal access to the Musket Factory and reduced commercial traffic congestion.

To unify the site, the Musket Factory was enclosed with a wall and a formal entrance facing towards Shenandoah Street and the Wager Ferry Lot. The entrance featured a large double wrought-iron gate with two single wrought-iron gates (Figure 1.9). The walls on either side of the gates consisted of high brick piers and low brick panel walls mounted on a granite base and coped with red Seneca sandstone. The upper portion of the panels was fitted with twelve panels of iron railing to the height of the piers, making the total height nine feet. The portion along Potomac (or North Cliff Street) was located between the street and the Armory canal.

In addition, Symington proposed that the government remove dilapidated Armory dwellings and sell any remaining structures to the workers. As a consequence, he eliminated a substantial expense to the government of maintaining residential property and increased the private housing stock in the

town. Symington also wanted to relocate the public marketplace away from the area adjacent to the factory gate.[71] His solution was to design and oversee the construction of a new building southeast of the Arsenal Yard, called the Market House, for use as a public market.

Except for work on a new dam and some minor enhancements, the renovation of the Harpers Ferry Armory was completed by 1855. By then, the canal and waterworks system were essentially rebuilt, new workshops were erected, and new machinery was installed. The era of interchangeable manufacturing was underway. The new facility, with its spacious buildings neatly arranged along paved streets on landscaped grounds, stood in striking contrast to the muddle of decrepit buildings that were previously a source of embarrassment (Figure 1.10). In 1859, the Armory began constructing a new dam on a stone base with a timber superstructure. Only about half of the dam had been completed by the time the Civil War broke out in 1861.

The Ordnance Department was impressed with the transformation that occurred at the Harpers Ferry Armory. The Department's inspector of arsenals and armories expressed his satisfaction with the new operations, declaring "the system under which they are conducted is a very excellent one."[72] In 1854, Colonel Henry K. Craig, former Armory superintendent and now the Chief of Ordnance, wrote that "the buildings are now of a decidedly superior character to what they formerly were, and the machines, which have been almost entirely renewed are of the best kind and most improved patterns."[73]

By the mid-nineteenth century, Harpers Ferry had evolved from a little-known frontier village into a sprawling industrial town (Figure 1.11). In addition to the recently renewed and expanded Armory, the town boasted numerous other manufacturing enterprises, including a textile mill, a flour mill, a saw mill, an iron foundry, a machine shop, and over forty other mercantile shops.[74] The B&O Railroad and C&O Canal made Harpers Ferry an important transportation center, linking the town, its merchants and manufacturers to regional and even national economies. An 1855 observer of the town stated:

> The village is compactly, though irregularly built around the base of a hill, and is the center of considerable trade. It contains four or five churches, several manufactories and flour mills, a United States Armory in which about 250 hands are employed, producing, among other articles, some 10,000 muskets annually, and a national arsenal. In the latter are continually stored from 80,000 to 90,000 stand of arms.[75]

For many nineteenth-century travelers, the unique scenery of the town and the rivers was a source of inspiration. In *Rambles in the Path of the Steam-Horse*, Eli Bowen encouraged tourists to follow his example in completing a rigorous walking tour of Harpers Ferry and its surrounding hills (Figure 1.12). He recommended a route up the steep ledges between Jefferson Rock and

Shenandoah Street for a survey of the famous vista and exploration of the rocky walls and the "Chimney Rock" tower on the Loudoun Heights cliff. The Armory workshops, the canal and the, the divided bridge, and the rail trestle fixed on the Armory river wall, were all described as "worthy of admiration."[76]

On August 5, 1854, with Symington's work substantially completed and after much political wrangling, Congress signed an appropriations bill that included restoring civilian superintendents at the armories.[77] With the end of military leadership, operations at Harpers Ferry reverted back to the old practices of favoritism and patronage. This resulted in a loss of discipline and order, lower production and a decline in quality. Over-employment and unreasonably high wages were instituted and expenditures exceeded appropriations.[78] In 1859, Colonel Ripley, formerly of the Springfield Armory, visited the Armory and reported the following:

> The mal-administration of the Armory affairs has by no means been confined to carelessness in watching over its financial interests, or in affording in its shops an asylum for ignorant or indifferent work men. The general regulations of the Department governing its operations, have in many ways been violated, and in every instance which has come under my notice, the Government has invariably been the loser.[79]

Very soon after Ripley's harsh assessment, Harpers Ferry became the scene of an event that led to a national crisis from which it never recovered. In October, 1859, John Brown attempted to seize 100,000 rifles and muskets as part of his scheme to rid the nation of slavery. Two days later, Lieutenant Colonel Robert E. Lee led a force of United States marines to end the siege (Figure 1.13). John Brown was captured and later executed. Graphic depictions from this event were broadcast to the public and they also revealed contrasting landscapes. From certain vantage points, Jefferson Rock and Cemetery Hill, Harpers Ferry retained its inherent picturesque quality, while from other spots, at the river's edge and on the streets, the character of the town was overwhelmingly urban and industrial.[80]

John Brown's attack on the arsenal and Armory at Harpers Ferry began the night of October 16, 1859. Thirty-six hours later, he and his remaining force were captured in the Armory's small Engine House. The sensation caused by the raid and its effects on an already polarized nation had lasting consequences. For the Armory, the raid hastened the end of all arms manufacturing at Harpers Ferry. Though damage to the Armory was slight during the raid, the Civil War soon led to its destruction and ultimate abandonment.

Brown's raid began when he and his twenty-one followers, armed with Sharps rifles, seized the B&O Railroad bridge across the Potomac River and then overpowered the watchman at the front gate of the Armory. A small contingent of Brown's men was then sent to secure the arsenal, the Shenandoah River bridge, and the Rifle Factory on Hall's Island. Still others were sent to take

hostages and to cut telegraph wires. Despite their best efforts to go unnoticed, a gunshot sounded around midnight as the bridge watchman's relief appeared for duty. Then, at about 1:30 a.m., an eastbound train was detained and during the commotion that followed, the station's baggage man was mortally wounded. Brown eventually allowed the train to proceed to Baltimore, carrying with it the shocking news of the raid outside of the community.

In the morning came the realization that something was amiss. As the armorers dutifully reported to their workplaces, many were taken prisoner by the awaiting insurgents. Joseph Barry relates how Brown and his raiders took the workers completely by surprise:

> It was now daylight and the armorers proceeded singly or in parties of two or three from their various homes to work at the shops. They were gobbled up in detail and marched to prison, lost in astonishment at the strange doings and many, perhaps, doubting if they were not yet asleep and dreaming. Several of the officers of the Armory were captured…[81]

According to the official report of Acting Superintendent A. M. Kitzmiller, himself one of the captives, fifty or more Armory workers were corralled into the Musket Factory yard. Meanwhile, wild rumors of a sizable abolitionist insurrection at the Armory quickly spread throughout Harpers Ferry. Messengers hastened to alert militia forces at Charles Town, Shepherdstown, and other nearby villages. Militia companies from Maryland and Virginia moved into the town during the day on October 17th. The fear that initially swept over the townspeople quickly turned to anger as it became clear that the imagined invasion force was made up of no more than a few dozen increasingly desperate abolitionists. By noon, drunken vigilantes encircled the Armory brandishing weapons, some of which were taken from the Armory. Several of the raiders were captured and brutally executed.

Brown, along with the remaining raiders and a handful of the hostages, was then cornered in the small brick building that served as the Armory's Fire Engine House. Militiamen exchanged fire with the raiders, with some taking up positions just across the street near the Armory's warehouse. At daybreak on October 18, 1859, Brown declined an order to surrender. A storming party proceeded to break through the sturdy doors of the Engine House and, after a brief scuffle, John Brown was captured.

Kitzmiller reported that damage to the Armory was minor, except perhaps the loss of rifles that, in the excitement of the moment, were issued to townspeople and not returned. Tensions remained high in the aftermath of the failed raid. Rumors persisted that a large force of abolitionists was lurking across the Pennsylvania border, seeking revenge or ready to invade and free the jailed John Brown. Kitzmiller attempted to resume business as usual on the morning

following Brown's capture, but work at the facility came to a halt. Superintendent Alfred Barbour, away during the raid, hurried back to Harpers Ferry to find the Armory in disarray. Troops were billeted in the workshops and Large Arsenal, standing ready to protect government property against further attacks. Windows were broken and tools were scattered. The workers remained anxious and it took more than a week before repairs were made and operations returned to normal.[82]

News of the raid reached the public primarily through the pages of newspapers, including *Harper's Weekly* and *Frank Leslie's Illustrated Newspaper*. Reporters described in dramatic terms the events of the raid, and the town of Harpers Ferry was etched into the public consciousness. Depending upon their viewpoint, readers reacted with either dismay or approval, to the sensational disclosure that Brown was secretly backed by other prominent Northern abolitionists. As Brown's trial played out in the media, the B&O Railroad bridge, the Armory gate, and especially the Engine House all garnered prominence. The Engine House itself became a landmark of sorts, and is known to this day as "John Brown's Fort."[83]

Brown's execution at Charles Town for treason on December 2, 1859, did nothing to settle the emotions that the raid had stirred. The citizens of Harpers Ferry remained in a state of perpetual alarm through 1860 and into 1861. In addition to requesting the garrison of soldiers at the Armory, the townspeople formed four companies of their own local militia. Pickets were posted and night patrols were established. Already somewhat wary of northerners and other outsiders, their fear bordered on paranoia as regional political differences came into sharp focus.[84] A letter written by Armory employee George Mauzy illustrates the extent to which the town and surrounding area braced itself for further troubles:

> There is an immense concourse of military at Charlestown, not less than 2,000 men are quartered there, the Courthouse, all the churches & all the Lawyers offices are occupied. We have upwards of 300 regulars and seventy-five or eighty Montgomery Guards. These men were all sent here by the Sec. of War & [Virginia] Gov. Wise to prevent a rescue of Brown & his party by northern infidels and fanatics…
>
> There were some four or five thousand of Halls Rifles on hand in the arsenal, which have nearly all been given out to the citizens in this place & in this and the adjoining counties: it would not be advisable for any desperado to make a descent upon this place now unless they were much stronger than Brown's party, if even the soldiers were not here.[85]

The divisiveness brought about by John Brown's raid stressed the already uneasy relationship between Virginia and the Federal government. In January, 1860, less than two months after Brown's execution, the Virginia assembly passed a bill "For the better defence [sic] of the State." The old Virginia Manufactory of

Arms, renamed the Richmond Armory in 1861, was reactivated after being shuttered for thirty-eight years. When J. R. Anderson & Company was awarded a large contract to supply new and updated machinery for the reactivated manufactory, the firm hired the experienced engineer James H. Burton to manage the contract. A former master armorer at the Armory at Harpers Ferry, Burton returned to Harpers Ferry where he was allowed "free access to the drawings patterns &c. in the Armory" for his new employer, returning to Richmond with a large portfolio of drawings.[86]

Throughout the following year, with the election of Abraham Lincoln and the secession of South Carolina, Superintendent Barbour proceeded cautiously whenever he hired any new Armory employees. He feared that the community, already highly suspicious of outsiders, would react negatively to any new armorers from the North. In January, 1861, anti-Union sentiments and the fear of "Yankee radicalism" reached new heights and caused spirited debate in Harpers Ferry and surrounding Jefferson County. The jittery superintendent warned his superiors in the War Department that he had "reason to apprehend that some assault will be made upon the United States Armory at Harpers Ferry."[87] Ominously, Virginia's ex-Governor Henry Wise, a militant supporter of states' rights, began calling aggressively for Virginia to seize any and all Federal property within its borders and proclaim neutrality.

Though public opinion remained divided on a number of social and political issues, by April, 1861, an inevitable course towards a civil war was set. John Brown's raid on the Musket Factory further polarized a deeply divided nation on the contentious issue of African American slavery. Scholars agree that Brown's shocking attack on the Armory and his execution elevating his status to martyr helped bring about the Civil War. This terrible national conflict had stark consequences for the small town of Harpers Ferry and the Armory site along the Potomac.

LANDSCAPE DESCRIPTION SUMMARY, 1860

By 1860, Harpers Ferry had become a leading industrial center in the Southern United States owing to its abundant water power, adoption of innovative technologies, and expanding transportation network, as well as the stability instilled by government sponsored arms manufacturing. The town also offered tourists recreational opportunities with walks around the hillside, affording views of the dramatic natural scenery as well as the industrial character of the town highlighted by the Armory's riverfront complex. Along with the Armory canal and the bridge, the Armory workshops and rail trestle were prominent features in the landscape (Drawing 3, 1860 Period Plan).

Superintendent Major John Symington reorganized the Armory's layout and circulation to create a more streamlined and efficient system within a more cohesive and contained facility. He also introduced a uniform architectural style to the Armory buildings and solved the persistent problem of inadequate housing for Armory employees. Overall, Symington's efforts demonstrated a comprehensive plan for the future growth of the town of Harpers Ferry that emphasized separating residential and civic structures from the activities of the factories and the river crossing.[88]

Symington improved circulation and the condition of the perimeter area just outside of the Armory. He purchased property near the southeastern edge of the Armory and removed the structures, clearing the entrance to the Musket Factory. Symington also created a buffer between the service yards on the back side of High Street and the Armory canal by purchasing the lots and demolishing the buildings. The removal of structures widened the street into a thoroughfare and eliminated the deposit of waste and debris into the canal. By widening the adjacent road (today's Potomac Street) and opening up the entrance to the Armory, Symington not only improved accessibility but he also created a sense of enclosure by creating a significant amount of space between the Armory and the town.

Symington's circulation improvements also laid out the basic street and lot plan for Harpers Ferry that prevails today. The realignment and widening of the north/south alley to create what is now Potomac Street, the establishment of a main entry gate and the opening of a new east/west alley passage significantly reduced the congestion and commercial traffic associated with this area. Symington also delineated pedestrian circulation by installing flagstone sidewalks along the western edge of the main road and on Shenandoah Street around Arsenal Yard.

Symington established a formal entrance at the main gate facing east towards Shenandoah Street and the Wager Ferry Lot, consisting of four cut-stone posts and both a double and two single iron paling gates. A brick wall with piers and low panels topped by iron palings enclosed the front of the yard on both sides of the gates next to it. On the western boundary, a nine-foot high brick wall, constructed with a stone foundation and cut-stone coping, completed the enclosure and separated the Armory canal from the town. A few years earlier, the Springfield Armory in Massachusetts had completed an ornamental fence around the main complex. Like the fence at Harpers Ferry, the fence at Springfield was nine feet high and utilized scrap iron for the pickets. The Springfield Armory also used locally quarried material including red sandstone for the piers. The stone for the Harpers Ferry fence was also red sandstone from the Seneca quarry in Maryland, downstream from Harpers Ferry.

Symington's site improvements also included macadam paving for the main road through the Armory and the installation of cast iron street lamps. He also regraded the ground around the buildings to alleviate drainage problems. Symington constructed drainage ditches, privies, cesspools and drinking water cisterns. Newly planted shade trees and grass added to the neat and orderly appearance of the Musket Factory. Images from this period show that trees were located along the main road in the Musket Factory and adjacent to the workshops. Trees and grass were also planted in Arsenal Yard. In addition, several historic images depict a flagpole, approximately seventy feet tall, located near the main entrance. The flagpole was a prominent feature of the landscape that could be seen from a long distance. It is not known exactly when the flagpole was erected. Post-Civil War images show that the flagpole had been removed sometime during the war.

In the next few years, the country would be embroiled in a bloody civil war. The Armory and town of Harpers Ferry became a center of turmoil for its strategic geographical location and weapons industry. Both would never fully recover from the war.

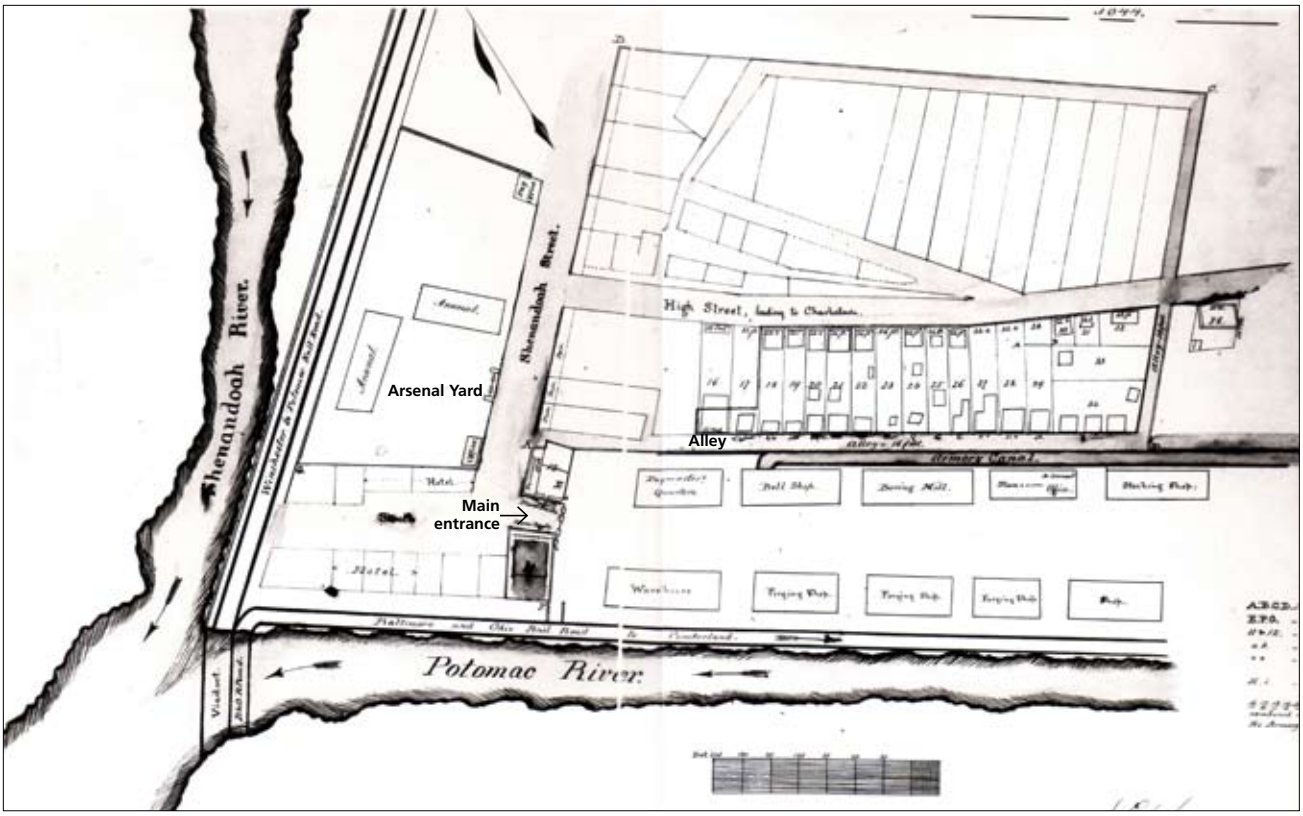


Figure 1.8. Map from 1847 showing Superintendent Symington's reorganization of the Armory grounds completed by 1855. Symington removed structures that impeded access through the main gate, and widened the alley adjacent to the canal and added a stone wall to one side to stop the accumulation of refuse by the bordering lots. Harpers Ferry Historic Photo Collection, HMF-00479.

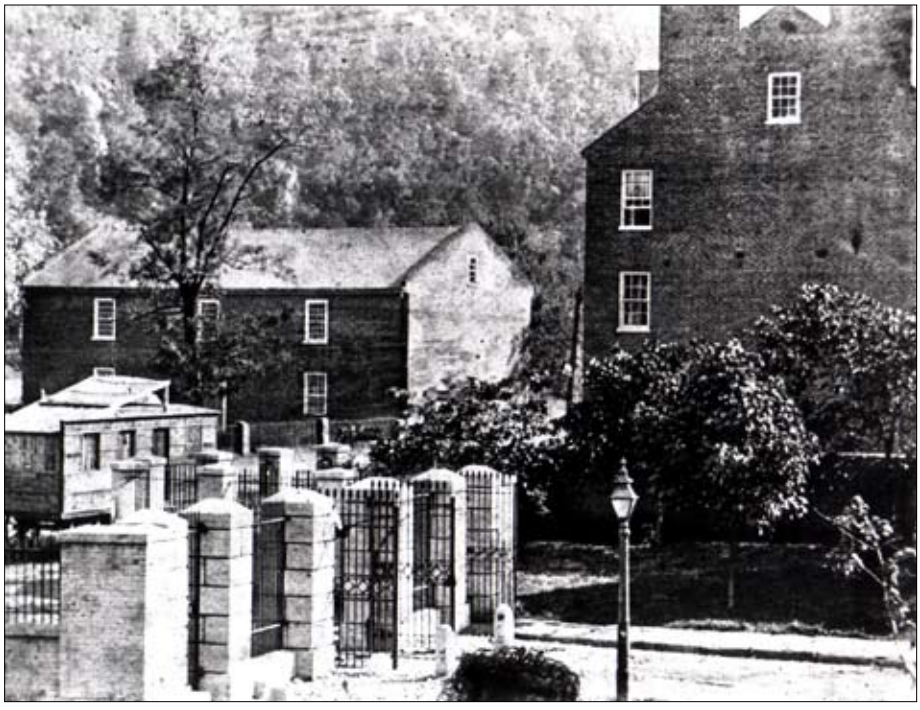


Figure 1.9. View from 1858 looking from inside the main gated entrance at the Musket Factory, built in the early 1850s. Note the two bollards in front and the flagstone walk and the lightpost. The lightpost appears to be very similar to the ones that still remain at Springfield Armory in Massachusetts. Also, note the young trees adjacent to the Armory wall. Harpers Ferry Historic Photo Collection, HF-00090.

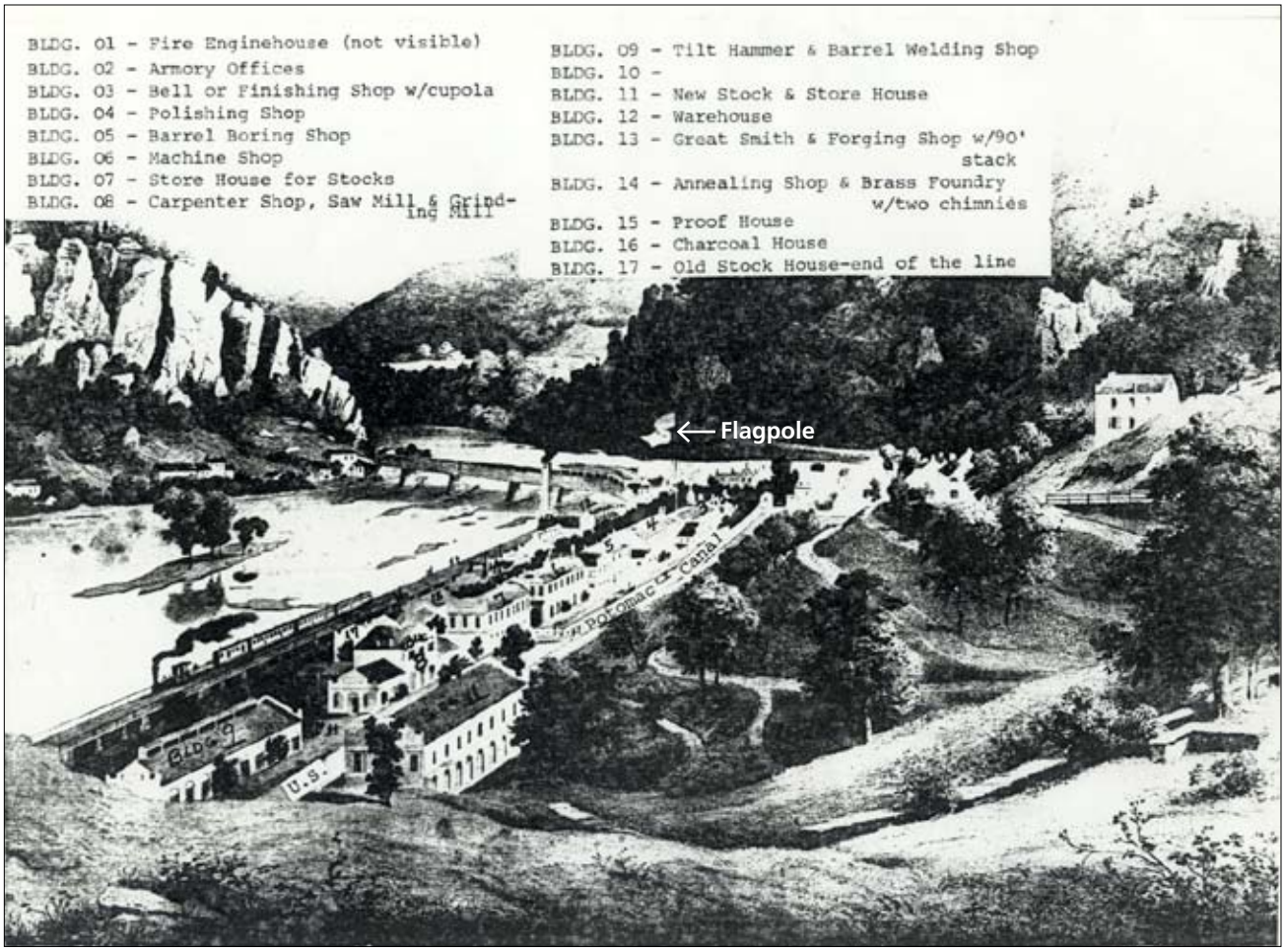


Figure 1.10. Rendering from 1857 with Armory buildings identified. The image also depicts the Baltimore & Ohio train riding along the trestle on the edge of the Armory property. Note the paths traversing the hillside and the benches, in the foreground to the right, providing a place to sit while enjoying the view. Harpers Ferry Historic Photo Collection, HF-0051.

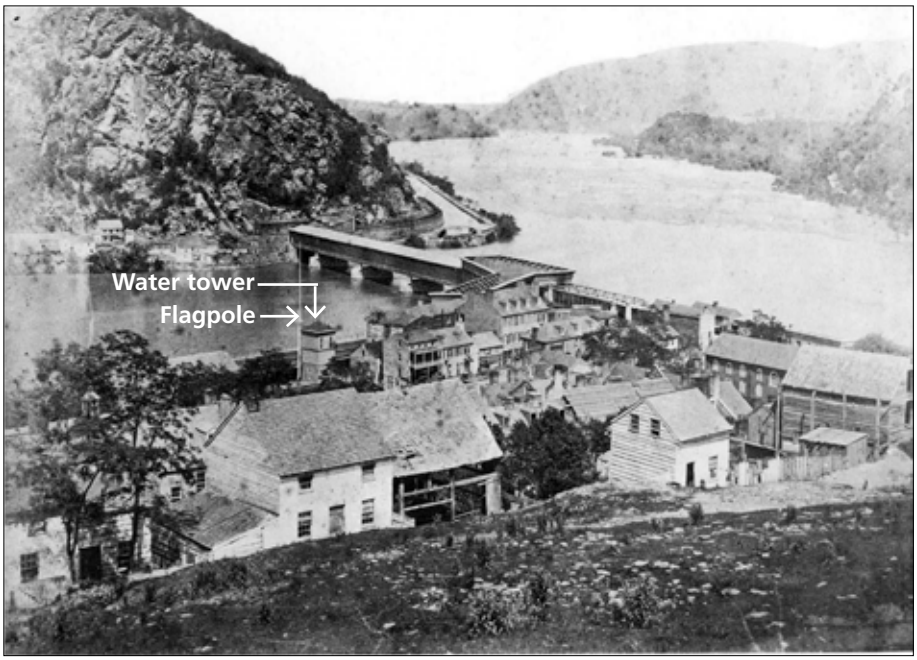


Figure 1.11. View from 1859 overlooking the Armory and bridge beyond. The water tower for the railroad and flagpole are also visible. Harpers Ferry Historic Photo Collection, HF-0066.

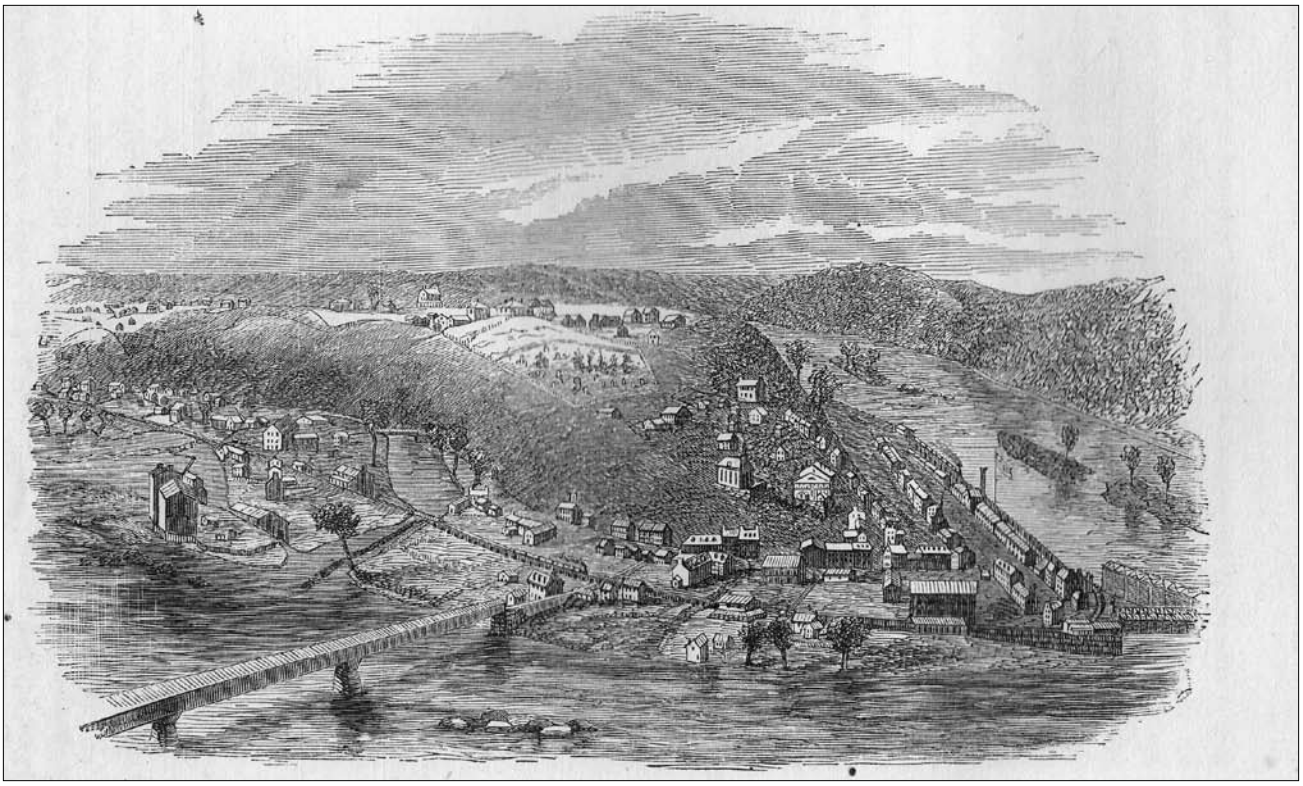


Figure 1.12. This rendering from 1855 shows the view of Harpers Ferry from Loudoun Heights. The image illustrates the long, linear character of the Musket Factory to the right. Engraving from *Rambles in the Path of the Steam Horse* by Eli Bowen, 1855, page 191, Hagley Museum Archive.

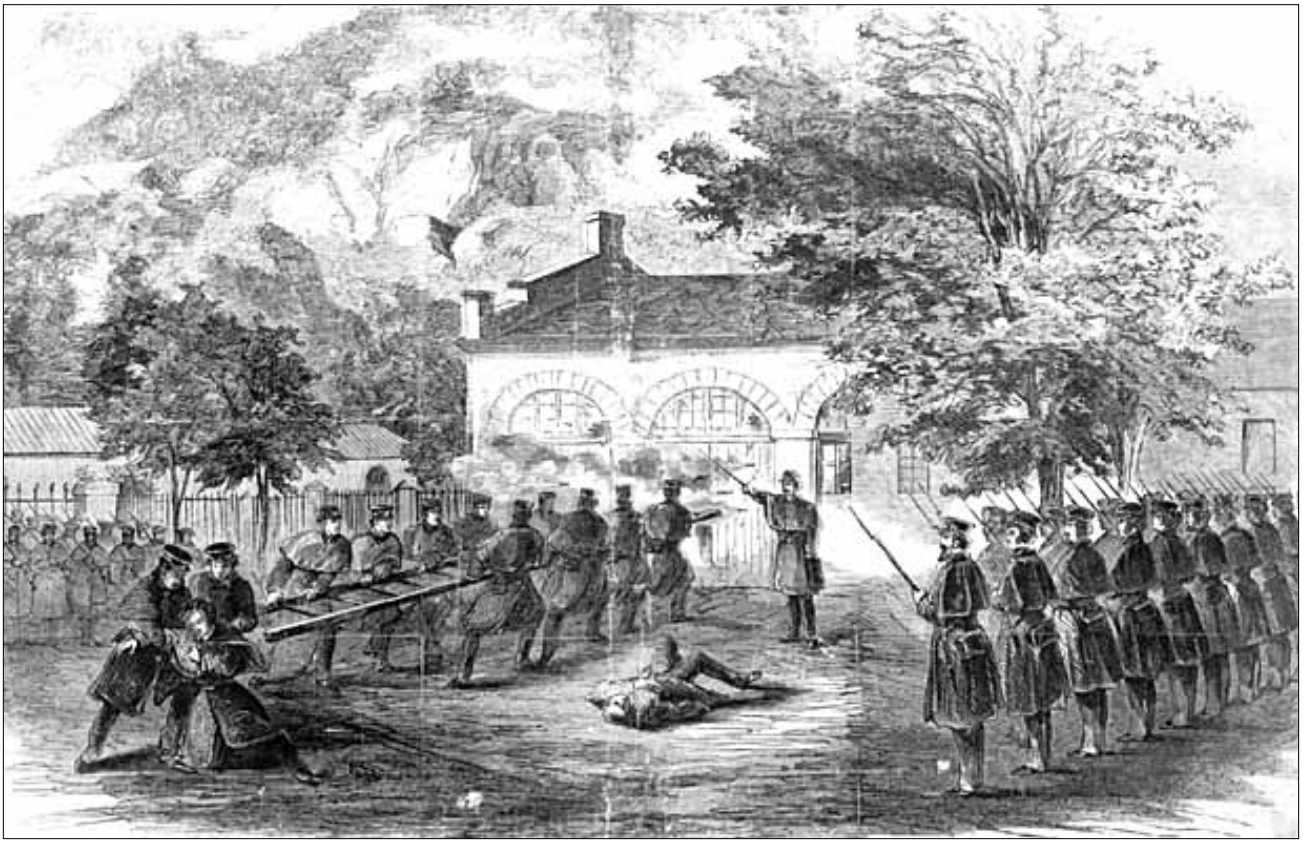


Figure 1.13. Illustration from *Harpers Weekly*, 1859, depicting the United States Marines storming the Engine House commandeered by John Brown in his attempt to sieze the Armory store of guns. Note the trees within the Armory grounds to the right and left. The perimeter fence is also visible to the left. Harpers Ferry Historic Photo Collection, HF-0115.

Rolling Mill (1855)
Tilt Hammer Shop (1850)
Grinding Mill (c.1850)
Baltimore & Ohio (B&O) Railroad trestle and parapet wall
Old Stock House
Charcoal House
New Proof House (c. 1850)
Saw Mill (1850)
Carpenter Shop (1850)
Annealing and Brass Foundry (1852)
Storehouse
macadam paving (c.1853)
Forges/Offices/Smith Shop (1846)
Machine Shop
Office
Stocking Shop
Wheelhouse
Boring Mill (1845)
Polishing Shop (1850)
Bell or Finishing Shop (modernized 1850)
Warehouse (1843)
Boat Landing
Flagpole
Water Tower
Main Gates (c.1850)
Offices
Engine House (1848)
Ferry Lot
Arsenal Square
Small Arsenal
Arsenal
Gardens
Jefferson's Rock
Armory Canal
C&O Canal
Potomac River
Shenandoah River
Washington Street
Potomac Street
Clay Street
High Street
Alley
Shenandoah Street
Cliff Street
Winchester & Potomac Railroad
HARPER'S GRAVE YARD (4 ACRES)
Cemetery
METH. PROTESTANT CH.
METH. EPISCOPAL CH.
CATHOLIC SCHOOL

Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

1860 Period Plan

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. HAFE Archives Map, Base HF-NM 9004, 1859
2. 1857 Rendering with labels, HF-0051.

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

LEGEND

- Building
- Wall
- Railroad
- Non-pedestrian Circulation
- Flagstone Walkways
- Tree
- Grass Plot (conjectured)
- Approximate Musket Factory Boundary
- Approximate Location of Tailrace

0' 100'

Drawing 3

CIVIL WAR AND POST-WAR RUINS, 1861 – 1869

When hostilities finally broke out at Fort Sumter in South Carolina on April 12, 1861, the allegiance of the Commonwealth of Virginia to the federal government was still very much in doubt. Passions ran high as delegates gathered in Richmond to decide the question of Virginia' secession. News of the surrender at Fort Sumter reached the city only days before and many celebrated what they viewed as a successful rebuke of unwarranted northern aggression in South Carolina. Virginia's Ex-Governor Wise, who was in office during John Brown's raid, made fiery speeches in favor of states' rights and secession. Another faction favored a position of armed neutrality. Others, more moderate, counseled reconciliation and restraint. Slowly, however, the momentum shifted towards secession. Even Armory Superintendent Barbour, who attended the convention as a Unionist delegate for Jefferson County, eventually supported a resolution for secession.[89] On April 17, 1861, the Virginia Convention met in secret session and formally adopted an Ordinance of Secession. A large portion of the western region of Virginia did not agree with the state's decision. Delegates from that area met in a convention to vote again on the matter with the majority coming out against ratification of secession. As a consequence, a second meeting convened claiming the Secession Convention was not valid because it had been called without the consent of the people. The pro-north delegation, representing the area soon to be known as West Virginia, went on to propose breaking away from Virginia and becoming a separate state. The new state wasn't finally admitted into the Union until 1863 when President Lincoln issued a proclamation.

Even as the various political positions crystallized, strategic military events were occurring. Planners on both sides recognized the strategic importance of holding Harpers Ferry, located at the gateway into the Shenandoah Valley. Even without the extremely valuable arms-making equipment located at the Armory, Harpers Ferry was important as a railway junction and a canal town. The B&O Railroad and the C&O Canal were both important transportation and supply arteries connecting east to west. Nestled in a gap in the Blue Ridge, the town itself was a natural gateway toward Washington, D.C. as well as the agriculturally rich Shenandoah Valley. But above all else, it was the Armory machinery that made Harpers Ferry a true prize of war.

Among the first acts of war by Virginia was to send several companies of militia to capture the Harpers Ferry Armory and Arsenal in order to obtain stores of arms and equipment for Confederate use. The day after the Convention, on April 18, 1861, Virginia troops began converging in numbers, preparing to march on Harpers Ferry. In Winchester, Virginia, numerous companies of militia were seen throughout the day passing through the town. At Charles Town, Confederate Captain John D. Imboden began moving his battery of six guns

toward Harpers Ferry. Additional militia men congregated at Halltown, four miles west from the Armory.

The Virginia forces, under the command of Major General Kenton Harper, moved against Harpers Ferry on the night of April 18. Before entering town, Major General Harper sent a note demanding the surrender of the government works. The demand for surrender stated:

> To the Superintendent of the Armory at Harpers Ferry: I command you in the name and by the authority of the State of Virginia to Surrender to me forthwith the Armory and public property in your possession.
>
> Major General Kenton Harper[90]

The messenger bearing the note found no one in authority and the surrender order was returned to the Virginia headquarters. Upon learning of the approach of the Virginia troops, Lieutenant Roger Jones, commanding a military detachment of forty-two regular United States soldiers and a handful of volunteers, set fire to the buildings and fled with his men (Figure 1.14). Fearing the Armory would be captured, Lieutenant Jones set fire to the arsenal in order to destroy the finished weapons while a demolition team set bundles of combustible material on fire in some of the principal workshops. Another of George Mauzy's letters provides details on the day's events; it also states which buildings were torched by the retreating Federals:

> Considerable excitement prevailed here today…What should [they] do but get a large quantity of Powder from the magazine during the day, & after night had it distributed through the shops & the two Arsenals, and at about ten o'clock at night they set fire to the Carpenter shop & grinding mill, Stocking shop, & the two arsenals, which were both burned down together with some 15,000 guns of various kinds. The two first named shops are also a perfect heap of ruins, fortunately the stock shop was saved with but little damage.[91]

When the smoke cleared, the two arsenal buildings were destroyed, but at the Musket Factory a significant amount of materials was saved from the blaze by the Confederate forces. The capture of the Harpers Ferry Armory represented a major early victory for the South. The town and Armory were then occupied by Virginia and Confederate forces for about two months.

On April 19, 1861, the day after the fire at the Armory, news reached town of a riot in Baltimore that occurred when Massachusetts soldiers were attacked while en route to the national capital. Shortly after this disturbance, many of the rioters and other South-supporting volunteers from the State of Maryland came to Harpers Ferry. They were joined by additional Southern troops arriving from Mississippi, Alabama, Tennessee and Kentucky.[92] Martial law was declared and the citizens of Harpers Ferry received their first, though certainly not their last, taste of military occupation. During this time, all United States Armory property

at Harpers Ferry was seized by the Commonwealth of Virginia. Many of the Armory workers were forced to vacate their government-owned living quarters so that the structures could be used as billet, or lodging, for various militiamen.[93]

Under the scrutiny of Harpers Ferry Southern commander Colonel Thomas J. Jackson, many soldiers and former Armory workers were set to the task of dismantling the machines of the Musket Factory and Rifle Works, salvaging useful machines, materials, and tools. Inventories show that over 300 machines for musket and rifle-making, comprising nearly two complete sets, and thousands of feet of belting and shafting were confiscated from the workshops of the Armory. Over 57,000 assorted tools and gun parts in various stages of manufacture were taken, as were 4,287 finished firearms and enough components to assemble between 7,000 and 10,000 weapons of the latest design.[94] Perhaps because it was too badly damaged, some of the machinery, consisting primarily of tilt and drop hammers located in the tilt hammer shop, and shafting was not dismantled, but left in place.

Shortly after the capture of the Harpers Ferry Armory, the new Confederate government attempted to assess the industrial capacity of the South, with particular attention paid to its ability to manufacture war material. While the South had numerous flour mills, cotton mills, and small manufacturing establishments such as iron forges, the region traditionally relied more on agriculture and less on industry to sustain its economy. The Tredegar Iron Works, located in Richmond, Virginia, was the only manufacturing plant located in the South producing heavy ordnance, cannon, shot, and shell, in any quantity before the war. Small-arms production was practically non-existent. Making matters worse, supplies of raw materials were inadequate to meet the emergency needs of the Confederacy. The importance of the Harpers Ferry Armory machinery to the nascent Confederacy was critical.[95]

During the first weeks of June, 1861, the confiscated materials were placed into crates and sent from Harpers Ferry by rail to Winchester, Virginia. It was then loaded on wagons and hauled by teamsters over land to Strasburg, Virginia. At Strasburg it was re-loaded onto the Manassas Gap Railroad and transported to Confederate armories elsewhere in the South. The musket machinery was sent to Richmond, Virginia, and the rifle machinery was eventually shipped to Fayetteville, North Carolina.

The machinery seized at Harpers Ferry basically formed the backbone of Confederate arms manufacturing. Observers on the Southern side made note of its timely acquisition, coming as it did after "the national difficulties had culminated in the disruption of the Union, and the enforcement, by the mobs of the North, of a practical embargo upon the exportation of their manufactures to the South." They boasted that the Harpers Ferry Armory machinery was:

> …of the best description, worth in the aggregate upwards of two hundred thousand dollars, and which, under the most favorable circumstances, of ordinary methods of supply could only have been furnished us after years of delay. (And with it)…our Armory can now turn out as perfect a musket as ever emanated from Harper's Ferry. Made – lock, stock, barrel and mounting – entirely by means of machinery formerly employed by the old Government for the same purpose.[96]

Having stripped the Armory factories of useful materials, the Confederates withdrew from Harpers Ferry, falling back on June 14, 1861, to a safer position at Winchester, Virginia. Before evacuating the town, however, the departing army destroyed the B&O railroad bridge (Figure 1.15) and burned the remaining Musket Factory buildings, a total of twenty-two structures. The interiors of the workshops, offices, and storehouses, many of which had wood floors and frame roofs, were completely gutted. With the exception of a few buildings at the eastern end of the Yard, only brick walls remained standing.

First Sergeant Augustus L. P. Vairin, a soldier in the Second Mississippi Infantry, was an eyewitness to these events. In his diary he wrote:

> 14 June Thursday, fine day. 6 a.m. orders to cook breakfast & strike tents & we waited for further orders which were to march at 6 p.m. At 6 a.m. the bridges over the Potomac were blown up & burned by order of Gen. Joe Johnston commanding. During the forenoon all the public buildings at H.F. & the long tresseling of the Baltimore & Ohio Railroad were burned, all of which was in plain view of our camp. This was a great destruction of fine & expensive works but it was all for the best as it will not do to leave & give the enemy a chance to follow us quickly as we are encumbered with many sick…[97]

Two weeks later, on June 28, 1861, a Confederate regiment returned to set fire to the Rifle Works and the Shenandoah River bridge. Vairin's diary reveals that, in addition to their work of destruction, companies of soldiers were detailed to load "machinery, lead, copper & c," presumably items from the Rifle Works that were left behind the first time, for transport to Winchester. With the destruction of the buildings of the Rifle Works, the entire physical plant of the Harpers Ferry Armory, comprised of seventy-eight workshops and storehouses, was now completely in ruins. Of the town, Vairin noted that "The place looks quite deserted…"[98]

Arms-making machinery was not the only asset the Confederacy gained when it captured Harpers Ferry in 1861. Much of the Armory workforce followed the machines to the Southern side. While each individual worker ultimately had to decide where his loyalties were, many factors may have pushed the majority to become citizens of the Confederate States. First, if the men, already skilled in the use of these highly specialized machines, stayed with the machines, they remained gainfully employed. Many workers were desperate to provide for their

families. James Shewbridge was typical of many of these employees. He wrote to his brother asking for help:

> David, we are in dreadful condishon [sic] here. Our Armory is burnt and we have no money and no nothing else. At this time there is about five thousand soldiers at this place and more coming. Our men is leaving – them that have money enough to carry them away…We have two months work that we expect to lose. Most of the hands here have not a cent and I am…now in a suffering condishon [with] a large family, no money, and no work.[99]

Stripped of its industry, the town of Harpers Ferry offered few opportunities for the unemployed. Many of the armorers possibly viewed the South's newly established armories as job advancement opportunities, a chance to rise through the ranks of the new and rapidly expanding Confederate Ordnance Bureau. Starting largely from scratch, the South was in great need of skilled labor in order to produce quality weapons. An examination of the personnel records of the Confederate States Armory in Richmond in 1861 reveals that the superintendent, all four of the shop foremen, and nearly one-sixth of the two hundred-member workforce were former Harpers Ferry armorers.[100] The industrial expertise the men gained at Harpers Ferry certainly aided them in finding work after the workshops of Harpers Ferry were destroyed.

Among the most distinguished of the "graduates" of the Harpers Ferry Armory was James H. Burton. Burton began working at Harpers Ferry in 1844 as a mechanic, worked his way up to Foreman of the Rifle Factory Machine Shop, and eventually was named Acting Master Armorer, all within a span of five years. A gifted draftsman with an appreciation for the benefits of the mechanization of arms production, Burton left Harpers Ferry in 1854 to take a job as a consultant with the Ames Company of Chicopee, Massachusetts. The Ames Company supplied both federal armories with precision machine tools for the manufacture of firearms. After serving as Chief Engineer of the Royal Small Arms Manufactory in Enfield, England, Burton returned to the United States and was hired as a contractor in 1860 to supply machinery for the recently re-activated Richmond Armory.

When the Civil War began, Burton cast his lot with his native Virginia and the Confederate side. He was soon appointed superintendent of the Richmond Armory and he personally supervised and directed the transfer of the machinery confiscated at Harpers Ferry. His precise drawings of key fixtures, patterns, and tools of the Harpers Ferry Armory were of immense value in re-assembling the complicated equipment and fixing damaged parts. So great was Burton's knowledge of firearms manufacturing and so complete was his familiarity with the machinery, he was commissioned a Lieutenant Colonel in the Confederate States Army in December 1861, and placed in charge of all Southern armories.[101]

When the Confederates abandoned Harpers Ferry in June, 1861, taking the Armory machinery with them, the town was briefly unoccupied. After only two months of war, the citizens of Harpers Ferry were stunned, many without work and not knowing what to do. Local resident and historian Joseph Barry remarked:

> It was sad to see the rapid demoralization of the people at this time and the various phases of corrupt human nature suddenly brought to light by the war. Not only were the government buildings ransacked for plunder, but the abandoned houses of the citizens shares the same fate.[102]

On July 21, 1861, the same day as the First Battle of Bull Run, Union Major General Robert Patterson's men fell back from a position in Charles Town to Harpers Ferry. Patterson's men, consisting for the most part of "three month's men" (men who were enlisted into United States service for three months), bivouacked in the Musket Factory Yard and occupied the town for several days. During their short stint at Harpers Ferry, according to Barry, Patterson's men were unsupervised and freely plundered the town. Barry's sarcasm was obvious when he wrote of Patterson's men:

> Whatever may be said of their exploits on the field of battle their achievements in the foraging line are certainly worthy of mention…[I]f they were not thieves before their enlistment their proficiency in the art of stealing was extraordinary…Indeed, every thing movable disappeared before them…"[103]

Barry was especially puzzled after learning that a half dozen soldiers were witnessed carrying a tombstone from the Methodist cemetery to their campsite down in the Armory yard.

From the time Union troops finally departed on August 17, 1861, until February 25, 1862, the town became a no-man's land. The majority of the buildings in the Musket Factory Yard stood as burnt out shells, but the flat ground around them was utilized again and again throughout the rest of the war. Adjacent to the railroad along one of the Union's major east-west supply corridors, the old Armory site became an important staging ground for all kinds of quartermaster's and commissary supplies. It also served as a convenient place for accommodating the tents, wagon trains, and horses serving a large number of soldiers and other personnel.

Beginning in late February, 1862, Harpers Ferry served as the primary supply depot in support of the Shenandoah Valley operations of Union commander Major General Nathaniel Prentiss Banks.[104] Later, during the Confederate siege of Harpers Ferry in September 1862, Union forces used an Armory building to store ammunition, either in one of the re-roofed structures in the Musket Factory yard or in the similarly repaired Large Arsenal building on Shenandoah Street. After the town was reoccupied by Federal forces on September 20, 1862, they

maintained a guard house in the Musket Factory Yard, a structure described as having a "dungeon." This probably refers to the Paymaster's old office, which had a burglar, air, and light proof vault. Other Armory workshops were converted into a bakery and a slaughterhouse, though the documentation is unclear as to the exact structure or structures that were used.[105]

Despite a difference of opinion with General-in-Chief Henry W. Halleck, Major General George McClellan decided to establish Harpers Ferry as his new base of operations for the Army of the Potomac on September 24, 1862, one week after the Battle of Antietam. Accordingly, large amounts of supplies were forwarded to Harpers Ferry. McClellan's First Corps commander, General John Reynolds, reported in mid-October that many of his men were without shoes and poorly clothed. In response, the Quartermaster General forwarded 10,000 pairs of shoes by wagon train to Harpers Ferry. Headquarters informed Reynolds: "At least 10,000 suits, 20,000 blankets, and 10,000 shelter-tents… should soon be at Harpers Ferry" and instructed him to draw his supplies from the storehouses there.[106] An inventory of supplies at Harpers Ferry on October 22 included: 24,000 booties, 1,800 blankets, 3,000 stockings, 4,000 infantry trousers, 4,000 infantry overcoats, 7,500 knit jackets, 1,500 cavalry trousers, and 3,000 cavalry overcoats. Clearly, the depot at Harpers Ferry played a major role in supplying the Army of the Potomac.

In addition to providing storage space, the abandoned Armory buildings sometimes provided cover for sharpshooters or other fighting forces. In July, 1864, the Armory's massive river wall served briefly as cover for Confederate artillery and sharpshooters. During his campaign to threaten Washington, D.C., Confederate Lieutenant General Jubal Early directed a portion of his forces to feint towards Harpers Ferry, which was then guarded by approximately 6,500 Union men.

As part of this action, on July 4, 1864, a Confederate regiment of Brigadier General Cullen A. Battle's brigade captured Lower Town along with a large cache of supplies left behind when the Union forces retreated to fortified positions on Maryland Heights. Late in the evening, Battle's artillery opened fire from its position hidden behind the stone river wall in the Musket Factory Yard. The artillery duel and sporadic fighting continued the following day and a Union signal station operator at Sandy Hook noted: "The sharpshooters from behind the railroad wall have been and are yet exchanging leaden compliments with our men."[107]

Being on low ground, the river wall was not an especially advantageous position and a North Carolina regiment lost several men to Union sharpshooters while trying to relieve the forces occupying Lower Town. Colonel David G. Cowand of the 32nd North Carolina Infantry wrote:

> After getting in the village it was quite dangerous relieving the troops then on duty. This regiment (43rd) lost several men while relieving Battle's by the fire of the sharpshooters on the Maryland Heights. About night the 32nd North Carolina was ordered in the town to assist in doing garrison duty and to help load the wagons with the quartermaster's and commissary supplies that we captured...[108]

Skirmishing continued between the two armies, neither side too anxious for a fight. Confederate commanders found it impossible to hold Harpers Ferry, after capturing it. Late in the evening of July 6, as they prepared to withdraw, the Confederates set fire to portions of the town. E.R. Warner, an employee of the B&O Railroad Company wrote:

> Eleven o'clock p.m. observing a light at Harper's Ferry, Mr. Donohoo and myself started up to ascertain the cause...Saw the enemy running about. The government buildings [Musket Factory and Arsenal Square structures] and property are burning and I fear our [B&O] platform, trestle, office and all will go in consequence of their close proximity to the government buildings. Capt. Gardner left some 300,000 pounds of forage there and all of it makes a big fire and is now burning brightly...[109]

The fire damaged one hundred yards of the riverside railroad trestle and much of what remained of the B&O's Potomac River bridge. There are no reports describing what damage was sustained by the Armory buildings in the fire. By July 7, Early's troops bypassed the United States troops on Maryland Heights, moved through Frederick, Maryland, to fight in the Battle of Monocacy.[110]

SHERIDAN'S VALLEY CAMPAIGN: AUGUST 1864 - MARCH 1865

As a vital rail, river, and canal junction, Harpers Ferry played an important role as a supply depot during the Civil War, but the town became especially active during the autumn of 1864. As the war continued, the Shenandoah Valley increased in importance as a Union target. The valley's physiographic alignment from southwest to northeast made it a natural Confederate avenue of approach, enabling the South to carry the war into the North. A continued Confederate presence there also threatened vital Union transportation and communication lines, and made Washington, D.C. vulnerable. The agricultural produce of the Shenandoah Valley was a key asset as well, as Valley farms continued to provide a large portion of the food required by Lee's army and sustenance for other parts of the Confederacy as well. Appreciating this, General Ulysses S. Grant made the Shenandoah Valley a key part of his strategic planning for Federal forces in the spring of 1864. As a result, from August 1864 to November, 1864, Harpers Ferry served as Union Major General Philip E. Sheridan's base of operations during his Shenandoah Valley campaign (Figures 1.16, 1.17).

A key factor of the plan to use Harpers Ferry as a Union logistical base was the B&O Railroad. The Confederates harassed and raided the B&O Railroad Company throughout the war at Harpers Ferry. The railroad bridge across the

Potomac was destroyed and rebuilt nine times during the course of the conflict. In the end, however, the North's ability to repair the damage and keep the trains running outstripped the South's ability to disrupt the railroad. Supplies also arrived at Harpers Ferry via the C&O Canal, but the vast majority was shipped by rail. The Winchester and Potomac Railroad, which was destroyed by Confederates, was also repaired in preparation for Sheridan's campaign. The buildings and grounds of the now abandoned Armory, both at the Musket Factory and the Rifle Works, made ideal depots and military staging grounds.

The configuration of the B&O railroad at Harpers Ferry was such that the two tracks of the main line ran along the Potomac River front, perched upon an elevated iron trestle that stretched the entire length of the Musket Factory. A 240-foot long wood platform, situated at the West Virginia end of the Potomac River bridge, was a ready point to unload supplies. The burned out Armory buildings stood thirteen feet below the track and platform behind the four-foot thick river wall. After repairs were made to roofs and floors by the Quartermaster Corps, the ruined buildings served as convenient warehouses for the goods shipped from Union depots in Washington and Baltimore.

Several Musket Factory workshops were once again put into service. The buildings included the 1843 warehouse, the smith and forging shop, the annealing shop and brass foundry, the stock house, the Engine House (John Brown's Fort), the Armory offices, and the finishing (or bell) shop. In addition, United States forces adapted at least two former Armory structures in nearby Arsenal Square for use. The floor ruins of the Large Arsenal building were used as a bakery and the old Superintendent's Office was used as the post office. Union army officers also took up residence in former Armory structures. Sheridan, himself, utilized the Armory Paymaster's Quarters on Camp Hill as his headquarters.[111]

Sheridan's army consisted of approximately 45,000 men and 20,000 horses. Supplying such a force, especially as it ventured further and further from Harpers Ferry, was difficult. To meet the challenge, the Quartermaster Corps, the Ordnance Department, the Provost Marshall, the Sanitary Commission, the United States Military Railroad Corps, and the United States Medical Corps all established operations in the town. These organizations supplied food; clothing and equipment; arms and ammunition; medical supplies; engineering expertise; and the necessary infrastructure required to sustain the troops. Later, additional staging areas were established at Martinsburg and at Stephenson's Depot near Winchester, Virginia.

An estimated 250 tons of supplies arrived at Harpers Ferry daily. Huge quantities of foodstuffs passed through Harpers Ferry including bread, meat, vegetables, sugar, and coffee for men; hundreds of thousands of pounds of grains and fodder for the mules and horses. Crate loads of uniforms were delivered and

distributed. Enormous numbers of rifles and their replacement parts were shipped there as were bandages, medicines, blankets, tents, and horseshoes. Along with vast quantities of coal, lumber, and other construction supplies, it is easy to imagine the busy scene that unfolded at the former Musket Factory yard.[112]

Sheridan's army departed Harpers Ferry on August 28, 1864. His supplies were forwarded by means of immense wagon trains, sometimes numbering up to 1,000 wagons. Several thousand soldiers were detailed to escort the wagons and protect the supply lines. After delivering the supplies, the wagons returned to Harpers Ferry carrying prisoners and the spoils of war. Thousands of wounded soldiers from both sides were also delivered by wagon and rail to the large medical depot and field hospitals established in Harpers Ferry.[113]

Partly a result of major battles at Third Winchester, Fisher's Hill and Cedar Creek, and partly the result of the Union strategy of laying waste to the Shenandoah Valley, civilian refugees and runaway slaves fled to the relative safety of the Union camps at Harpers Ferry. Union officers did not immediately receive direction on how to manage this civilian addition to their numbers. Referred to as "contraband of war" or simply as "contrabands," photographic evidence indicates that a tent camp was established for these refugees just inside the main gate and entrance wall of the Musket Factory (Figures 1.18, 1.19). Alfred R. Waud, the *Harper's Weekly* sketch artist who documented Sheridan's campaign, wrote of the contrabands:

> There is something very touching in seeing these poor people coming into camp-giving up all the little ties that cluster about home, such as it is in slavery, and trustfully throwing themselves on the mercy of the Yankees, in the hope of getting permission to own themselves and keep their children from the auction-block.[114]

In other places, contrabands were used to supplement labor forces, but no evidence was found to indicate the fate of those who stayed behind the lines at the Harpers Ferry garrison.

At the end of the war, the town of Harpers Ferry was badly dilapidated. Hundreds of residents were either homeless or had moved on. The few buildings that remained at the Musket Factory and the Rifle Works were ruined (Figures 1.20, 1.21). Pieces of scrap iron and damaged machine parts were littered about the Musket Factory yard. Though still legally considered government property, the ruins were left to deteriorate. The United States was never to manufacture arms again at Harpers Ferry.

POST-CIVIL WAR

The Civil War in the east came to a close on April 9, 1865, with Lee's surrender to Grant at Appomatox Courthouse. In order to assist former slaves, Congress established the Bureau of Refugees, Freedmen, and Abandoned Lands, also known as the Freedmen's Bureau. The Bureau provided food, medial care, established schools and helped with resettlement.

After the war, rebuilding occurred in Harpers Ferry, and there was hope that the town would flourish once again. New construction began on a few private residences, but Harpers Ferry found itself in the grips of a severe economic downturn. At the end of the war, the United States government still owned nearly 1,670 acres of land in Harpers Ferry. Its holdings included twenty-five dwellings, a powder magazine, a stable, nine storerooms, as well as the ruins of the former Armory dams, canals, and workshops.[115] Although the war was over, the town continued to play a limited role as a depot in service of the Middle Military Division (an organization of the Union Army), with structures dedicated to the storage of arms and the preservation of munitions. Under the charge of Captain Daniel J. Young, a former Master Machinist at the Rifle Works, officers received and issued ordnance, and thirty to forty men were employed repairing and cleaning arms.[116]

Within a few months of the war's end, the military prepared an inventory of its real property at Harpers Ferry. In July, 1865, Brigadier General Edward D. Ramsey made a detailed inspection of the military fortifications and other property utilized by the Army. His report was submitted to Brigadier General A.B. Dyer, Chief of Ordnance, on July 27, 1865. Included in the report are details on the condition of the former Armory buildings. Ramsey reported:

> The stone walls of the Armory buildings on the Potomac and Shenandoah remain, and in condition to be built upon. These could readily be converted into manufacturing purposes, or into barracks for troops. Much of the valuable machinery remains in good condition – as for example the shafting and pit gearing for the undershot wheels, with the wheels, are in good condition. The greater part of the machinery for the rolling mill, with the rolls and tilt-hammers, remain, but little injured, and the furnaces are good…[117]

Ramsey provided a condition assessment of the Armory buildings at the east end of the Musket Factory Yard, stating "the Q.M. (Quartermaster) and Commissary have been and are occupying some of the buildings, but have put upon them very inferior repairs." The repairs consisted of new floors and roofs. He also remarked on the crowded nature of the storehouses.

Of the town's most noteworthy structure, the inspector wrote "the small Engine House, celebrated as the citadel of John Brown, is used as a magazine. I consider this very dangerous, and the ammunition should be removed to a place of greater

security." The condition of the former Armory offices, a brick structure located next to John Brown's Fort, was listed in the report as good and the inspector indicates that it was partially utilized as a small arms repair shop.[118]

Other items that Brigadier General Ramsey found laying about in the Musket Factory Yard in 1865 included:

8 cast iron anvil blocks in good condition

1 large turning lathe, in Machine shop, damaged

8 grind stone frames, in good condition

34 cast iron columns, new

1 iron forebay or flume, new

1 Rolling Mill with machinery, furnace and forge, damaged

arch window frames, new

square window frames, new tons cast iron, scrap tons wrought iron, scrap

1 lot dressed stone, good

water wheels, in Armory buildings, damaged

1 lot iron fence around Armory buildings, in good condition[119]

Yet given the magnitude of the destruction brought by the Civil War, it soon became clear that the United States government would not re-establish the Armory at Harpers Ferry. In spite of its extensive land holdings, the Ordnance Department decided to abandon the Armory site. This decision coincided with a general shift in the government's focus to the rapidly developing territories west of the Mississippi River. As a result of this new focus, the Ordnance Department worked to divest itself of any assets from the operation at Harpers Ferry. Excess property would be offered for sale and the proceeds were to help fund construction of a new national Armory in the west.[120]

Between September, 1865 and March, 1866, Brevet Major and Acting Quartermaster George A. Flagg placed several advertisements in local newspapers to notify the public of sales of excess government property.[121] Large numbers of serviceable mules and horses were auctioned, both singly and in lots. Wagons, wagon whips, leads, and harnesses were also sold. Various surplus equipment and supplies were auctioned including thousands of tents and tools, in addition to 155 tons of scrap cast and wrought iron.

Building supplies were also sold, including the lumber from dismantled railroad platforms, lead pipes, stove pipes, and over 100,000 bricks. Bidders also vied for miscellaneous items, such as clothing, trumpets, and the cast iron columns that Ramsey had inventoried. Apparently the government bakery that was housed in the arsenal building during the war was also dismantled, as bread racks, pans, a

bread table, and the bricks of eight bake ovens were offered at auction in December 1865.

Thus, unencumbered of building contents, the War Department turned to disposing of its land and buildings at Harpers Ferry. In May, 1866, Chief of Ordnance Dyer informed the Secretary of War:

> Harpers Ferry cannot, in my opinion, be ever again used to advantage for the manufacture of arms, the retention of the property of the United States at that place is not necessary or advantageous to the public interest…and I recommend that…all the public land, buildings, and other property there be sold …[122]

On December 15, 1868, the United States Congress authorized and directed the Secretary of War to sell at public auction the United States lands, buildings, surplus machinery, and water power privileges at Harpers Ferry. Prior to the sale, S. Howell Brown, a surveyor, platted the Armory property into lots. The impending sale was advertised to begin on November 30, 1869, and to continue daily thereafter until all was sold. The advertisement proclaimed that the "value of this property for manufacturing purposes is too well known to render it necessary to describe it herein."[123] Terms of the sale were easy, with credit extended to the highest bidder and up to two years time to pay.

The site of the former Musket Factory was the first lot for sale, described in the advertisement of sale as:

> …seventy-two acres embracing a strip of land running to the western boundary on the Potomac, the Armory canal, and water power of the river. The walls of two large buildings are standing on this ground, and the foundations of several others; and the water-wheels with gearing, and the flumes, are almost in perfect order. Three of them are turbines of the most approved kind, and the others are mostly cast iron with wooden buckets.[124]

When the auction began for the Musket Factory property, Captain Francis C. Adams, an entrepreneur from Washington, D.C., contested with Mr. John L. Wilson, Esquire, an agent representing the B&O Railroad Company. Wilson began the bidding at $10,000. Bids in opposition were placed by several parties until the amount reached $100,000, at which time the bidding narrowed to Captain Adams and the railroad company. Bids were then placed in increments of $1,000 until the amount offered by the B&O was $175,000. Adams ultimately won the bidding at $176,000. Adams also purchased the Rifle Works on the Shenandoah River for $30,000.

Great optimism resulted among the people of Harpers Ferry at the conclusion of the sale on December 2, 1869. Adams, it was rumored, represented the interests of a company of wealthy capitalists of Washington, New York, and Boston, and that they planned to build woolen and cotton factories at the former Musket

Factory site and an extensive paper mill at the old Rifle Works.[125] Great expectations were raised, and as the results of the auctions were announced, "cheer after cheer rent the air, the assembled residents seeming to read in the dim future a glorious record for Harper's Ferry."[126] The government had sold 248 lots for a total of $297,793.50.

Encouraged by the prospect of reviving industry and eager for renewed prosperity, many of the poorer local citizens purchased lots at over-inflated prices on similar credit terms.[127] Assured that Adams and his partners would soon commence manufacturing, an editor of the *Virginia Free Press* pondered "may we not expect that ere long many of the wants of our valley may be supplied by them, and that Harper's Ferry will, in the future, be far more prosperous than in the past?"[128] Just when new development seemed to be on the horizon, a disastrous flood would soon strike Harpers Ferry that continue to mire the local economy.

LANDSCAPE DESCRIPTION SUMMARY, 1869

During the Civil War, the Armory as well as the town of Harpers Ferry changed hands eight times between Confederate and Union forces. As a result, every building in the Musket Factory was damaged beyond repair except the Engine House where John Brown made his stand (Drawing 4, 1869 Period Plan). The chimney tower also endured as a towering monument. The river wall and most of the canal also survived. The flagstone walks and main gates remained, but much of the fence along the canal had been destroyed with some masonry posts surviving.

The B&O railroad bridge was destroyed by the Confederates as well as the wooden bridge across the Shenandoah River. A 240-foot long wooden platform, situated at the West Virginia end of the Potomac River bridge, was utilized to unload supplies. The burned out Armory buildings stood thirteen feet below the track and platform behind the four-foot thick river wall. The stone river wall itself had been used for cover as Confederate soldiers opened fire on Union forces located in fortifications on Maryland Heights.

The Musket Factory took on new roles as it changed hands between the two warring sides, including supply depot and refugee camp. The site's flat terrain presented an ideal location for staging purposes during General Sheridan's campaign. Tents were set up and several building shells were re-roofed in order to store supplies. In addition, the Union army established contraband camps where civilian refugees and runaway slaves who were housed within the Armory grounds near the main gates in make-shift shelters and tents.

The landscape around Harpers Ferry also suffered major deforestation during troop encampments. Trees were cut down exposing the hillsides. The lack of vegetation would prove to be significant when the area experienced flooding in the coming years.

With no economic base, many residents chose not to return to Harpers Ferry after the war, and Armory workers sought employment elsewhere. After the war, the government did not re-establish the Armory and sold off its holdings. By purchasing the government lands, businessmen in Harpers Ferry attempted to reinvigorate the economy and reprise its past prosperity. However, several natural disasters in the following years made these endeavors far more challenging than anticipated.

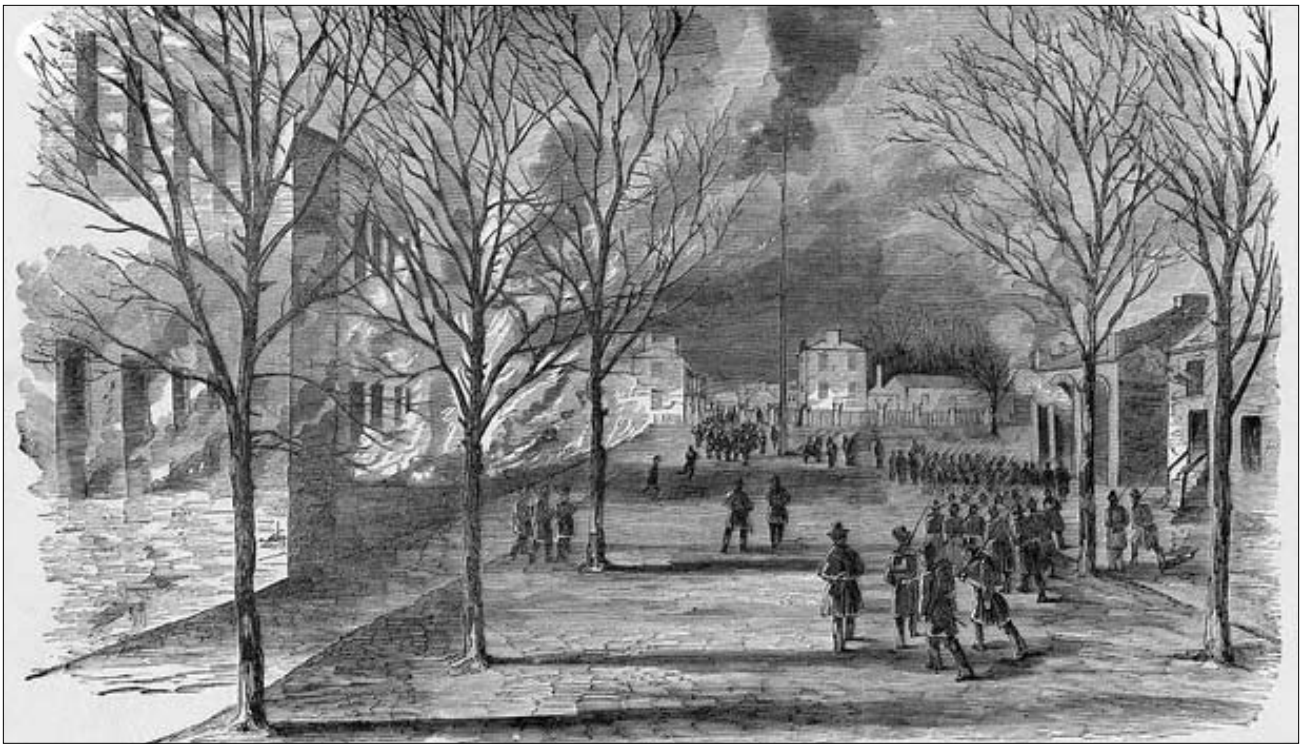


Figure 1.14. This newspaper rendering from 1861 depicts the Armory at Harpers Ferry burned by Federal soldiers after Virginia seceded from the Union. Note the main road with trees planted on either side. The whole thoroughfare had been macadamized prior to 1860. Harpers Ferry Historic Photo Collection, HF-001276.

Figure 1.15. View of the ruins of the Baltimore & Ohio Railroad bridge destroyed by Confederate forces on June 14, 1861. On the Harpers Ferry side, a water tower, flagpole and trees on the Musket Factory grounds are visible along with the workshops and the river wall. Harpers Ferry Historic Photo Collection, HF-0237.

Figure 1.16. Illustration, by A. R. Waud, 1864, of Major General Sheridan's occupation of the Armory. The large building with smoke stack housed the smith shops. Note the flagstone walk in the foreground and the train passing at the far right on the elevated trestle. Harpers Ferry Historic Photo Collection, HF-00089.

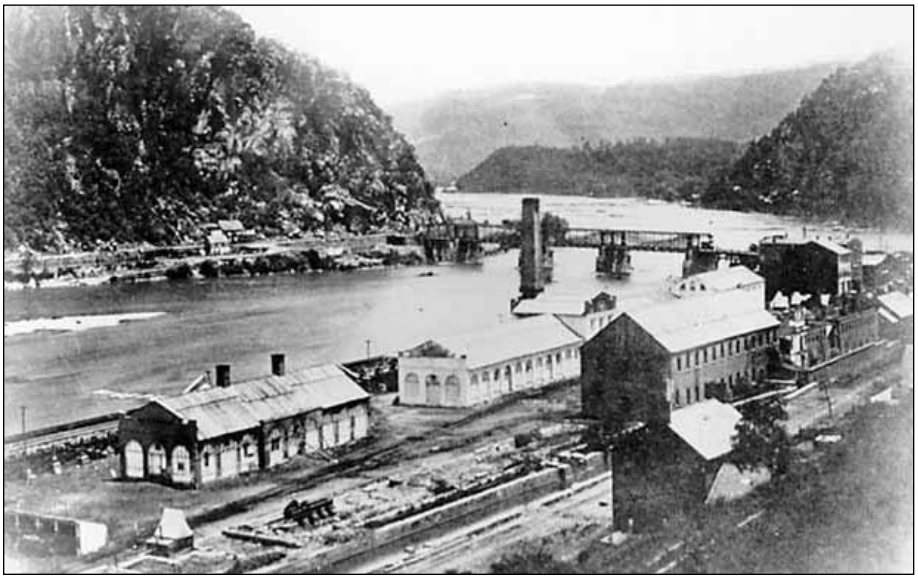


Figure 1.17. View of the Armory buildings at the end of the war. The grounds served as a Union quartermaster depot during Major General Philip Sheridan's Shenandoah Valley Campaign. Buildings were rehabilitated and debris was removed from the area. Harpers Ferry Historic Photo Collection, HF-0619.

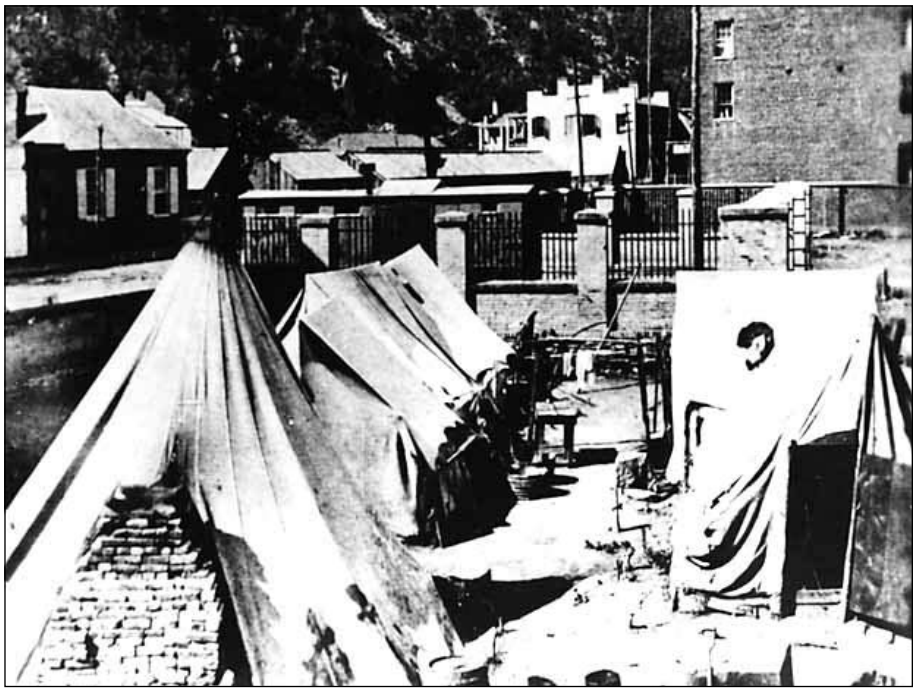


Figure 1.18. Referred to as "contraband camps," the Union Army set up tents inside the Armory grounds during the Civil War to house civilian refugees and runaway slaves. This view, taken at the end of the war, is of the encampment located near the main entrance. Note the ornamental fence in the background. Harpers Ferry Historic Photo Collection, HF-0018.

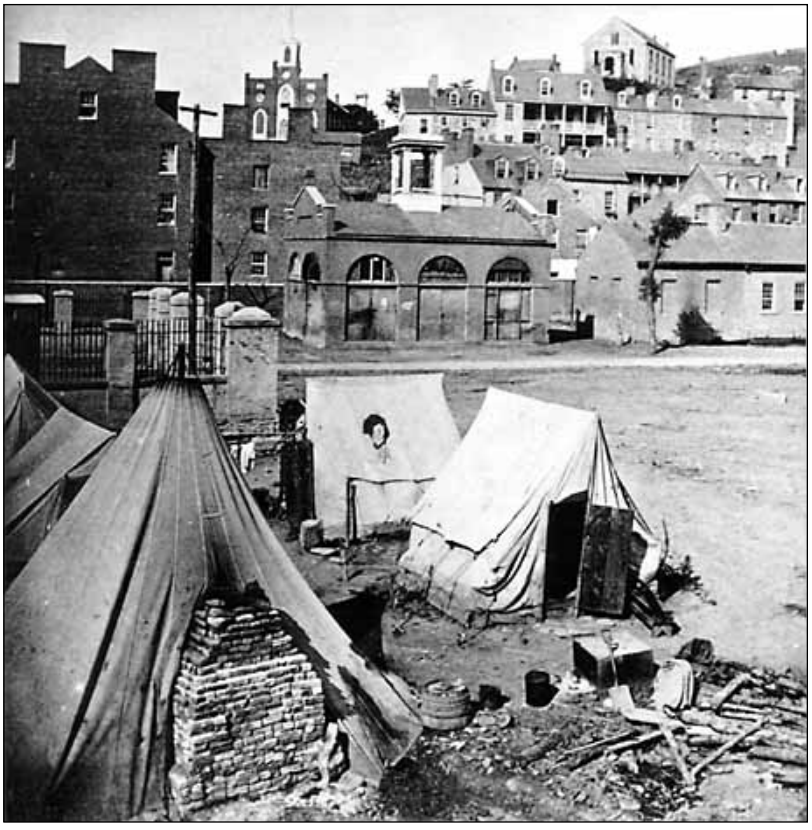


Figure 1.19. Another view of the Armory grounds at the end of the Civil War. Note the ornamental iron and stone pier fence to the left and the view of the town beyond. The Engine House that served as John Brown's last refuge is seen in the background in its original location with the canal wall behind it. Note the damaged tree to the right of the Engine House. Harpers Ferry Historic Photo Collection, HF-1200.

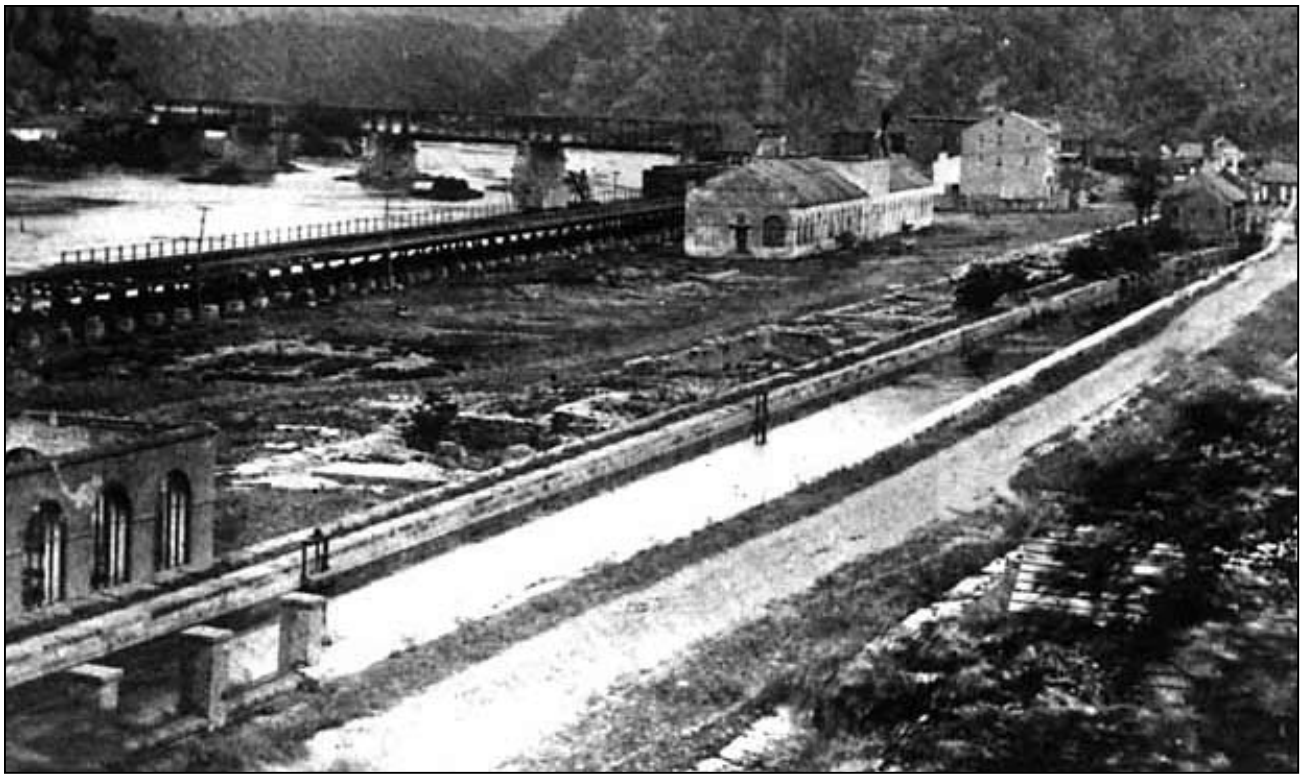


Figure 1.20. View of the Musket Factory from 1868. Two headgate mechanisms are visible along the waterpower canal. Note the railroad trestle along the river and remnants of the ornamental perimeter fence at the lower left. Harpers Ferry Historic Photo Collection, HF-0646.

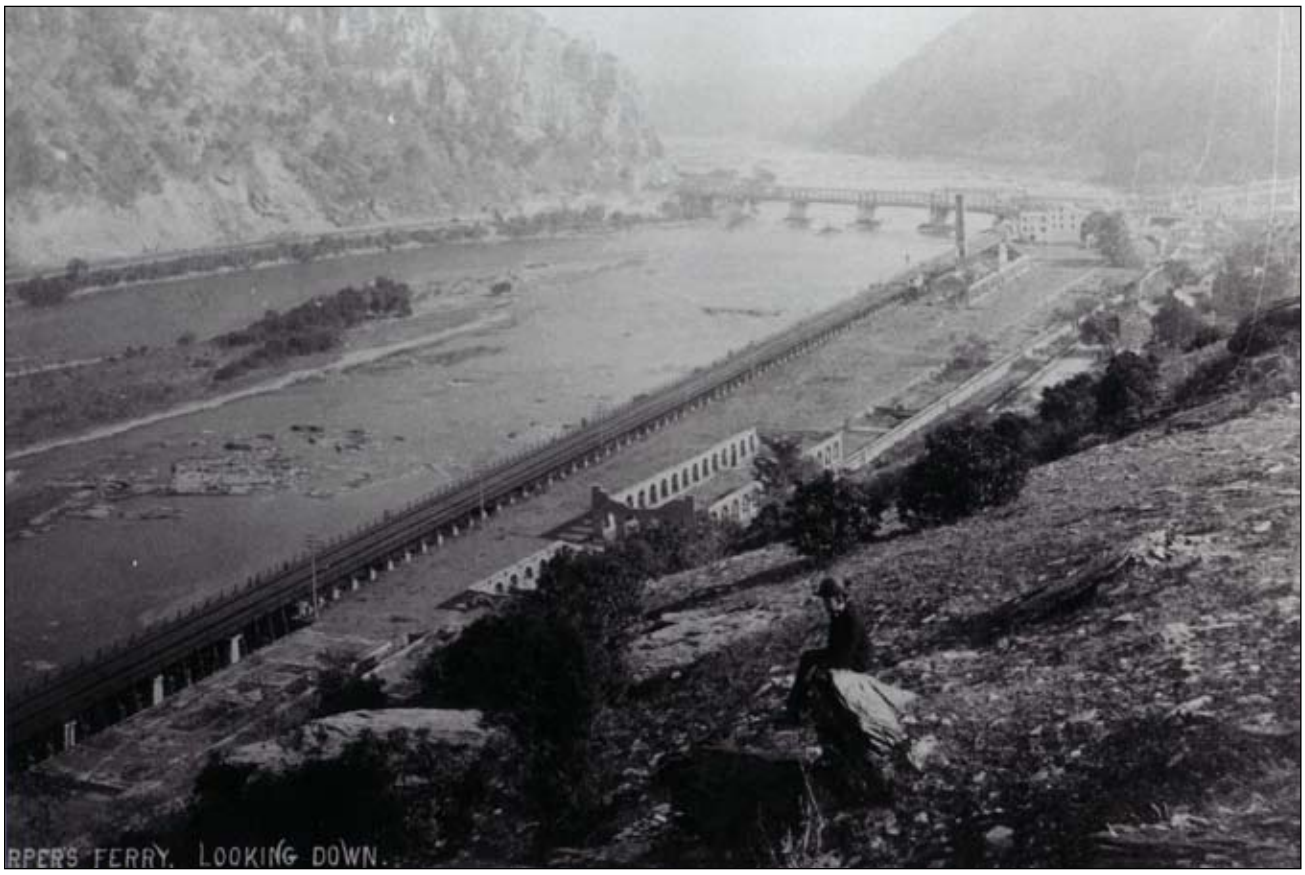
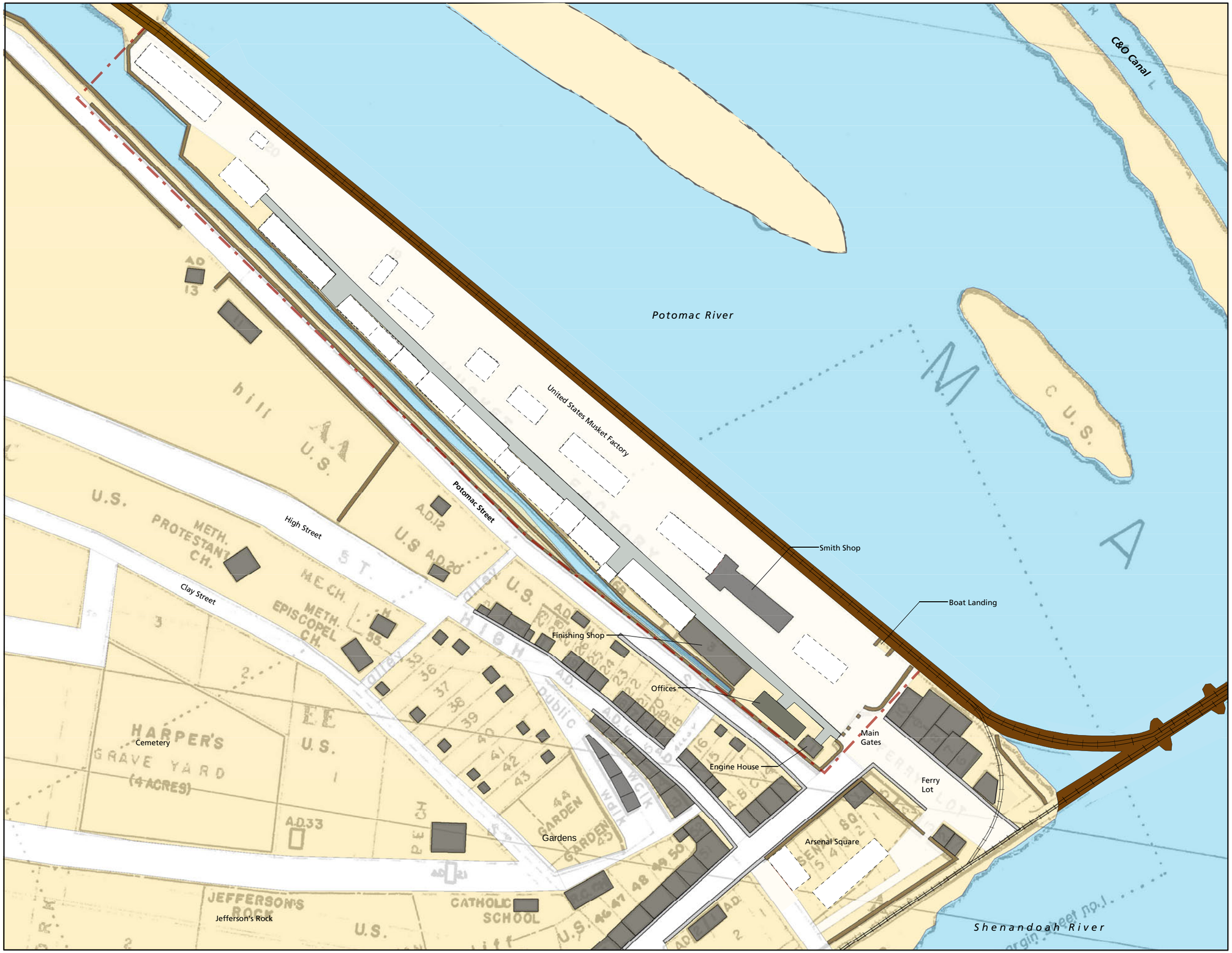


Figure 1.21. Aside from some shrubs, little vegetation remains on the hillside overlooking the ruins of the United States Armory at Harpers Ferry after the Civil War. The Armory site itself is shown devoid of vegetation as well. Harpers Ferry Historic Photo Collection, HF-01323.



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

1869 Period Plan

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. HAFE Historical Base Map, 1859 NHP-HF 3021

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

LEGEND

- Building
- Location of Destroyed Building
- Wall
- Railroad
- Non-pedestrian Circulation
- Flagstone Walkway
- Approximate Musket Factory Boundary

0' 100'

Drawing 4

REINDUSTRIALIZATION AND COMMEMORATION, 1870 - 1944

After the Civil War, the following Reconstruction period in the United States would see the passage of three amendments to the Constitution. Slavery was abolished and citizenship was granted to those born or naturalized in the United States, except for Native Americans. In addition, the right to vote could not be denied because of race, color or previous condition of servitude. The United States then entered an era known as the Gilded Age. This term was coined by Mark Twain describing the extravagant displays of wealth and excess by America's upper class. It was also an era noted for major population growth, rapid industrialization, and technological advances such as the telephone, phonograph and cable car.

On September 30, 1870, Harpers Ferry was inundated with the most destructive flood to date. Largely confined to the Shenandoah River, the fast-moving waters crested at about thirty feet above flood stage. It claimed the lives of forty-two people in the Harpers Ferry area and obliterated much of what remained on Virginius Island. The flood swept away the machine shop, iron foundry, sawmill, carriage shop, schoolhouse, and around seventy houses.[129] It was a serious blow to a town already struggling to emerge from the damage inflicted during the Civil War.

After the flood of 1870, many of the purchasers of the surplus government property defaulted on the terms of payment. Due to the distress caused by the great calamity, a bill was introduced into Congress to extend the time for payment to five years. At about this same time, Captain Francis C. Adams and his business partners, now incorporated under the name The Harper's Ferry Manufacturing and Water Power Company, filed a suit of ejectment, or repossession, against the Baltimore & Ohio Railroad Company, claiming that the railroad company's tracks through the old Musket Factory Yard violated the original 1838 agreement with the government. Adams alleged that his company now owned the right-of-way and that the breach of the agreement damaged the potential value of the property. He demanded the B&O Company pay a high price to continue using the route along the riverfront or otherwise to relocate the tracks.

Though Adams hired a watchman to guard the Musket Factory site, and he himself made occasional visits to the place, it became clear that Adams and his associates had no real interest in reestablishing industry at Harpers Ferry. Instead, they were speculators interested only in the considerable profit they stood to gain if their suit was successful.[130] The Harper's Ferry Manufacturing and Water Power Company lost its suit in 1873 and then refused to pay the government for the property, claiming that the B&O Railroad presence clouded

the title. Additional suits, countersuits, and appeals followed. The final outcome resulted in the United States repurchasing the properties at a court-ordered sale in September, 1876. The United States paid $70,000 to reclaim its title to the waterpower rights of both rivers and to the sites of the Musket and Rifle Factories.[131] The federal government received the deeds for the properties in June, 1877, seven and one-half years after they originally disposed of it.

The government finally succeeded in selling the Musket Factory site to another party in the mid-1880s. The Chief Clerk for the Solicitor of the Treasury visited the site in May, 1877. Though he described the old Musket Factory site as "a sublime ruin," the clerk made note of its potential value. He warned his colleagues that "year by year its immense capabilities are diminishing, and the question of what shall be done with it, is one not of easy solution."[132]

Before any action was taken, another flood on November 25, 1877, did considerable damage to both the town and the C&O Canal. The major floods at Harpers Ferry during the last decades of the 19th century (1870, 1877, 1889, and 1896) were particularly destructive because of the extensive vegetation and timber clearing in surrounding valleys. The deforestation that occurred during the Civil War in combination with the unsound environmental practices that followed led to severe erosion and flooding. To the increasing dismay of local citizens, the Musket Factory property continued to lay idle and deteriorate. Congress authorized a second public sale of the Armory grounds, scheduled to take place on May 25, 1880.

The public announcement for the 1880 sale included a description of the deteriorated Musket Factory lot with a reference to the building made infamous by John Brown's raid:

> . . .the walls of two large buildings, the John Brown Engine House and the foundations of several other buildings are standing, and large quantities of dressed building, flagging and other stone are upon the ground. The Machinery consists of three Turbine Wheels and four Cast Iron wheels of large dimension, with Gearing, Flumes, &c. . .[133]

The sale only solicited a single low bid of $10,000 for the water power rights of the Potomac. The lot was withdrawn from the sale and the offer was rejected. As time passed, the Treasury Department changed its view on the matter. Conscious of the considerable technological advances that were made since 1861 and aware of the twenty years of neglect that occurred, government officials realized that lower, more realistic sale prices should be accepted. Eager to sell the property, Congress authorized a third public offering.

On October 22, 1884, manufacturer and inventor Thomas H. Savery of Wilmington, Delaware, purchased the Musket Factory lot for $24,100, outbidding the Baltimore & Ohio Railroad Company by $1,000. The deed was

conveyed to Savery on March 2, 1885.[134] The property included the water power rights on the Potomac, the dam and Armory canal; seventy-two acres of the Musket Factory Yard, the ruins and machinery of the old workshops, and the two extant Armory buildings (John Brown's Fort and Armory office).

Although the sale included water power rights, a dispute soon erupted when the owners of the C&O Canal declared that Savery did not have the water rights to the entire Potomac River at Harpers Ferry. The C&O Canal Company claimed that the mill's water use was disrupting operations at the canal. Tension mounted in 1885 when Savery's mill did not comply with C&O Canal Company's request to keep their headgate closed. The C&O Company's superintendent proceeded to threaten to throw rocks in front of the locks to stop the closure. An employee of Savery's mill recounted his reaction to the threat:

> I at once sent word to the Canal people that when they were ready to try that game on, that I would be fully prepared to meet them on the premises. I had intended to either have them arrested or employ a force of men from here, sufficiently strong to throw the entire Canal gang into the Potomac River.[135]

Savery wrote to the president of the C&O Canal Company apprising him of the threat of intimidation undertaken by his superintendent. The president of the C&O Canal Company, S. Victor Baughman, reinforced the stance taken by his superintendent and claimed water rights on the Potomac River, igniting a protracted legal dispute. Savery looked to the government to furnish proof of his entitlement and gain assurances that he was in the right. The entire legal disposition is not available, but it is apparent that the two enterprises came to some kind of agreement since they both continued to utilize the water power.

Between 1887 and 1889, Savery erected two pulp mills, one on the Shenandoah River and the other along the Potomac River at the site of Armory's former rolling mill. On the Potomac site, Savery built a structure on top of the existing foundations and incorporated the existing Armory dam and canal into his operations (Figure 1.22). Encouraged by Savery's status as an industrial leader and good businessman, town chronicler Joseph Barry sensed a new era of opportunity, writing: "it would appear as if they had come to stay, and give a start to a new Harper's Ferry."[136] The mill's main activity was to grind wood into a wet fibrous pulp that paper mills used as an alternative to rag paper.[137] Unfortunately, Savery's mills employed only a small number of workers and profits suffered when the price of paper dropped considerably.[138] The remainder of the former Musket Factory property appeared to be left unused (Figure 1.23).

During the 1880s, the B&O Railroad Company built a twenty-one acre amusement park, called Island Park, on Byrnes Island in the Potomac River.[139] The park provided outdoor recreational entertainment for residents and tourists. This was a common practice among railroad and trolley companies during the

late nineteenth century to create destinations located conveniently along their transportation route in order to generate more business.

In 1892, Savery granted the B&O Railroad Company a new right-of-way through the abandoned musket factory. The company cut a tunnel more than 800 feet in length through the Maryland Heights to improve the mainline opposite Harpers Ferry. The railroad also erected a new bridge on stone piers that took advantage of the adjustments made on the Maryland shore and crossed the Potomac River northwest of the Bollman Bridge. With the angle of approach altered, the course of the mainline through Lower Town was relocated from the iron trestle on the Potomac River wall to a curving rail bed that extended from the new bridge, across the former Musket Factory grounds, and continued along the West Virginia side of the Potomac River. By sweeping the tracks broadly around on the town side rather than the river side of the Armory grounds, the result was a much less severe turn coming off the new bridge (Figure 1.24). In order to connect the new rail bed and bridge junction to the track on the Maryland side, the B&O Railroad constructed a twenty-foot earthen embankment on the old factory site using rubble from the tunnel excavation. The embankment buried the southern end of the Armory grounds and concealed the foundations of several work buildings, the Engine House, the entry gate and the wall. The old Armory smoke stack was also torn down at this time. This new large berm blocked the view of the old Armory grounds from the rest of Lower Town. The new embankment also necessitated the removal of a cluster of structures from the old Ferry Lot.[140] Two large granite block walls were constructed at right angles to each other on the Shenandoah Street side of the embankment. Incorporated into the wall was the opening for an eight-foot arched culvert, engineered to function as a drainage outlet for periods of high water on Shenandoah and Potomac streets (Figure 1.25). Water backing up the Shenandoah River was delivered into this culvert and reintroduced into the Potomac River. The design for the wall also included a long flight of granite block steps connecting the platform area on the top of the embankment to the street below. The large platform, located within the curve of the new track alignment, was planked with wood and edged with concrete paving and stone curbs. During the same year, E. Francis Baldwin, an architect with B&O Railroad, designed a depot building and station house. Completed in 1894, they were located on the platform as the focus of the site as well as the eastern end of Shenandoah Street (Figure 1.26).[141]

The new railroad line went over top the site of John Brown's Fort. The Engine House structure had been sold in 1891 to William S. Brown, a Kansas City businessman, and a group of investors. This group intended to turn the Engine House into a historic attraction at the World's Columbian Exposition in Chicago in 1893. To accomplish this, the building was dismantled and sent by train to

Chicago. The exhibit did not generate much public interest and was soon taken apart again and stored on a vacant lot.[142]

In 1894, Washington, D.C. journalist Kate Field organized a campaign to return the John Brown Fort to Harpers Ferry. The disassembled building was shipped back to the Harpers Ferry area via the B&O railroad, free of charge. Field had the structure rebuilt on the farm of Alexander Murphy, who provided five acres of his nearby farm for location of the symbolic structure. In 1903, staff members at Storer College, chartered in 1867 to educate newly freed slaves, launched their own campaign to purchase John Brown's Fort. By 1909, the college had purchased and moved the building to the campus on Camp Hill for the celebration of the fiftieth anniversary of the John Brown Raid.

The Valley line (former W&P line) junction was also redesigned and its embankment was expanded with an overpass bridge connecting with the B&O railroad (see Figure 1.27). The cluster of postwar structures on the former Ferry Lot and all remnants of the Harper and Wager ownership of the Potomac crossing and landing were eliminated by the construction of both embankments. Potomac Street was realigned to pass diagonally under the embankments to provide pedestrian and vehicular access to the junction of the newly reconstructed Shenandoah River Bridge and the Bollman Bridge. The railroad and all its accompanying structures occupied a commanding position on the embankment above the commercial district.[143]

From 1880 to 1930, the railroad made Harpers Ferry a regular destination and departure point for numerous tourist excursion trains. Monuments and memorials were erected and became tourist attractions. In 1894, a group of African Americans led by Frederick Douglass wanted to commemorate John Brown's deeds. A year later, an obelisk was installed on the B&O Railroad right-of way to mark the original location of John Brown's Fort. The eight-foot high, gray limestone monument was placed on a spot above the original grade of the structure. In 1897, the War Department installed five iron tablets commemorating the 1862 capture of Harpers Ferry (Figure 1.28). They were lined up in a small grassy area next to the John Brown monument so they could be seen from the train and platform. The signs were later moved in the 1930s to another location along the main highway.

In 1898, Savery explored utilizing a portion of the power generated at his pulp mill as an electric power plant. This initiative developed into the Harpers Ferry Power and Light Company.[144] The new enterprise occupied the upper story of the main Harpers Ferry Paper Company mill building. The power company only operated at night and provided electricity for the streetlights in Harpers Ferry as well as Brunswick, Maryland.

By 1900, the resort economy and the hotel business which had spurred development in the late nineteenth century were an intrinsic part of turn-of-the-century life in Harpers Ferry. Tourist brochures and literature described several important town landmarks including the site of John Brown's Fort and monument, the ruins of the former United States Armory and Jefferson Rock (Figure 1.29). Many brochures illustrated these historic points of interest as part of a scenic pedestrian route through the town.[145] In order to provide open air concerts and lectures, a covered hexagon-shaped bandstand was placed in the intersection of Shenandoah and Potomac streets.[146]

In 1916, the B&O Railroad Company began construction of a large commemorative garden on the grounds of the old Armory between the railroad berm and the Potomac River (Figure 1.30). Debris was removed and the ground surface was groomed. The design for the garden incorporated the embankment, mature trees and shrubs planted along the old river wall, and rectangular outlines of old building foundations.[147] B&O landscape gardeners established flower beds and planted grass and shade trees on the site. Lombardy poplar (*Populus nigra 'Italica'*) trees and ornamental shrubs grew along the Potomac River wall. Using whitewashed or painted stones, workmen constructed rectangular outlines in the approximate locations of some of the former Armory buildings. Rectangular outlines marked the general vicinity of the Armory's 1841 warehouse and both wings of the 1840s smith and forging shop.

By the 1920s, the automobile was beginning to replace the train as the preferred mode of transportation. This shift affected not only the town's economy but eventually its physical form. New routes for both cars and B&O trains were established in Lower Town and several changes occurred in the commercial center that reflected this evolution. Among the changes were the introduction of service and parking garages, parking spaces at the depot and along the streets, and amenities such as lunchrooms.[148] To better accommodate automobile traffic, the surface of both Shenandoah and High Streets were regraded and paved in concrete with concrete curbs and gutters. Resurfacing the road also brought about the redevelopment of circulation at the intersection of Shenandoah and Potomac Streets, necessitating the removal of the bandstand and the "public square" in Lower Town.[149]

Two more disasters struck Harpers Ferry in the mid-1920s. In 1924, more flooding occurred. Both rivers rose to twenty-eight feet above flood stage, affecting residences and businesses on Shenandoah Street the most. All rail traffic was halted, preventing assistance from reaching the community. Two sections of the Bollman highway bridge washed into the Potomac and could not be repaired for three weeks. Commerce on the ravaged Chesapeake and Ohio Canal stopped and never resumed.[150]

In 1925, Harpers Ferry Paper Company burned down and pulp making operations at the mill ceased. The building walls withstood the blaze, and Savery's company immediately rebuilt a power plant on the pulp mill foundations with new electrical equipment and still utilizing power from the canal and dam (Figure 1.31). The reconstructed building was significantly smaller that the original pulp mill (Figure 1.32). In 1928, the power plant was sold to the National Electric Power Company, a subsidiary of the Virginia Public Service Company. The plant changed hands several more times, including the Potomac Edison Company of West Virginia and Allegheny Power. The plant generated electricity for Harpers Ferry, West Virginia, Brunswick, Maryland and several other nearby communities.[151] The plant later closed in 1991.

In 1930, the B&O Railroad Company purchased most of the remainder of the former Armory property from the Harpers Ferry Paper Company. The railroad then completed a new railroad bridge aligned on a tangent to the Maryland Heights tunnel, eliminating the curvature on the Maryland shore.

The train station was then moved adjacent to the new bridge. On the West Virginia side, the new track alignment resulted in a wider, more sweeping curve that permitted nearly unrestricted train speeds. The new bridge met the West Virginia shore upriver from the landing of the previous one, but still within the former Armory grounds. This alignment required yet more changes to the Armory site. The B&O Company constructed an abutment and short subway tunnel set at an angle to the Armory's river wall. The approach to the new bridge required filling another embankment on top of the former Armory grounds. Once again, about twenty feet of fill material was placed on the site, this time covering the location of the Armory's annealing shop and nearly half of the neighboring smith and forging shop. The newly enlarged berm divided the Armory site in half, creating a physical interruption between the east and west ends of the grounds (Figure 1.33). Bulldozers prepared a roughly triangular-shaped platform that stretched all the way from the river wall across the Armory grounds to Potomac Street. This flat area became the new home for the Harpers Ferry train station which was moved to its new site in 1930 (Figure 1.34). After the railroad station was moved, the B&O Railroad Company apparently neglected to maintain the Civil War tablets. According to John K. Beckenbaugh, the superintendent of Antietam National Battlefield, the markers were "so faded that they could scarcely be read."[152] Beckenbaugh received permission from the Vice President of the B&O Railroad Company to relocate the tablets to another site on the railroad property. The tablets were moved to an area along the highway, U.S. 340, visible to tourists and summer visitors. They remained by the highway for twenty years and later relocated to a site adjacent to Arsenal Square.

In the late 1930s and early 1940s, the landscape of Harpers Ferry changed yet again, reducing the town to a disconnected, remote place with no commercial

center or convenient tourist destination. In March, 1936, flood levels crested thirty-six and a half feet over the bank, washing the Bollman Bridge into the Potomac and cutting off all automobile access to Maryland (Figure 1.35). The Shenandoah Bridge also collapsed, further isolating the town from surrounding communities. Temporary measures included reviving the ferry on the Virginia side, and planking over the Valley Line bridge so that automobiles and trains could reach Maryland. A large paved ramp was also constructed on earthen fill at the east end of Shenandoah Street to guide automobiles up to the entrance to the converted dual purpose bridge.[153] In the 1940s, the construction of modern highway bridges enabled interstate traffic to circumvent the narrow streets and steep hills of Harpers Ferry. New bridge spans bypassed the center of Harpers Ferry, leaving only the railroad as the major point of entry to Lower Town.[154]

Harpers Ferry had long been recognized for its historical associations and scenic beauty, and the federal government formally identified Harpers Ferry as a potential national historic site in 1935. A year later, largely due to the promotional efforts of Dr. Henry Temple McDonald, an avid amateur historian and President of Storer College, a tour of the town was scheduled for influential business leaders and politicians. Among the dignitaries scheduled to attend was West Virginia Congressman Jennings Randolph. Unfortunately, the tour was postponed because of the devastating flood of March 17, 1936.

In 1938, another meeting of politicians and citizens was held to encourage the commemoration of Harpers Ferry, made all the more urgent by the economic decline and physical destruction wreaked by the record-setting 1936 flood. A representative of the B&O Railroad attended the 1938 meeting and remarked favorably on the prospect of a federal park, conscious of the dividends that increased tourism promised to bring.

Throughout the 1930s, Dr. McDonald and Representative Randolph worked in partnership with state and federal officials to coordinate legislation, fundraising, financing, and the donations of land necessary to preserve the history and scenery at Harpers Ferry. After two unsuccessful attempts, Randolph introduced a bill that was passed on June 30, 1944 and signed into law creating Harpers Ferry National Monument. Even after this success, significant bureaucratic obstacles remained. Administrative delays and a lack of funds to acquire land for the newly created National Monument prompted McDonald to continue his own public relations campaign. He published articles about the monument, organized visits and tours, and gave public presentations to a variety of civic organizations.

Determined in his efforts, McDonald enlisted the help of B&O executives to maintain the public relations momentum created by the federal designation of the Monument. The B&O Company's advertising manager responded by offering to correct inaccuracies that McDonald pointed out in their "Historic Harpers

Ferry" brochure. Four hundred copies of the brochure were then provided for distribution among visiting newspaper editors.

McDonald also asked the B&O president to have railroad company lobbyists to the West Virginia legislature put in a good word for the Monument.[155] McDonald recognized that in order to achieve his vision for the Monument, a good relationship had to be forged and maintained with the B&O Railroad Company."

In 1944, President Franklin D. Roosevelt signed the legislation creating the Harpers Ferry National Monument. Early in the 1950s, the State of West Virginia began acquiring land in Lower Town, and on Bolivar and Loudoun Heights, donating it to the federal government in 1953.

LANDSCAPE DESCRIPTION SUMMARY, 1944

By 1944, the former Musket Factory site had weathered twenty years of abandonment, new industrial uses and several devastating floods. Once the B&O Company completed its improvements, the site was fully integrated into the railroad infrastructure (Drawing 5, 1944 Period Plan). The surviving original Armory features consisted of the dam and canal, the river wall and an Armory office. John Brown's Fort had been relocated to Storer College after two previous moves. The fort's original location was now buried under one of the embankments.

The spatial organization of the site was drastically altered with the landscape now dominated by two twenty-foot high earthen embankments. The lower embankment, completed in 1894, buried the southern end of the Armory grounds and concealed the foundations of several work buildings, the Engine House, the entry gate and the wall. The berm also blocked views of the old Armory grounds from Lower Town as well as physically separating it. The additional fill for a second embankment in 1930 covered the site of the Armory's annealing shop and nearly half of the neighboring smith and forging shops, and divided the Musket Factory site in two.

New structures on the former Musket Factory site included the train station and depot which occupied a triangular-shaped platform that stretched from the river wall across the Armory grounds to Potomac Street. Two new granite block walls retained the embankment on the Shenandoah Street side. A set of granite block steps connected the platform on top of the embankment and the street below. The new track alignment incorporated a wooden planked platform, edged with concrete paving and stone curbs. An eight-foot high culvert was also incorporated into the wall construction to mitigate periodic high water levels. The new construction significantly altered circulation patterns, including the

realignment of Potomac Street directly under the embankments. The former Musket Factory was now completely cut off from the rest of Harpers Ferry. In addition, flooding caused the destruction of the Shenandoah bridge, leaving the railroad as the main point of entry into Lower Town.

The enclosed space created by the large berm was adapted into a commemorative garden. Trees, including Lombardy poplar (*Populus nigra 'Italica'*), ornamental and evergreen shrubs and flower beds were planted along the old Potomac River wall and the perimeter of the space. Lines of stones, painted white, delineated the rectangular outlines of subsurface building foundations within an open, manicured grass lawn. Other memorials included the cut stone obelisk marking the site of John Brown's Fort. The War Department installed five iron tablets adjacent to the obelisk, commemorating the capture of Harpers Ferry. These monuments were visible from the train and platform. The tablets were moved to a site near the main highway in the 1930s. The Armory grounds would receive renewed interest as Harpers Ferry became a national monument and efforts to tell its story commenced.

Figure 1.22. View of the Harpers Ferry Paper Company, circa 1900, erected on the foundations of the former Armory's Rolling Mill. Harpers Ferry Historic Photo Collection, HF-1143.

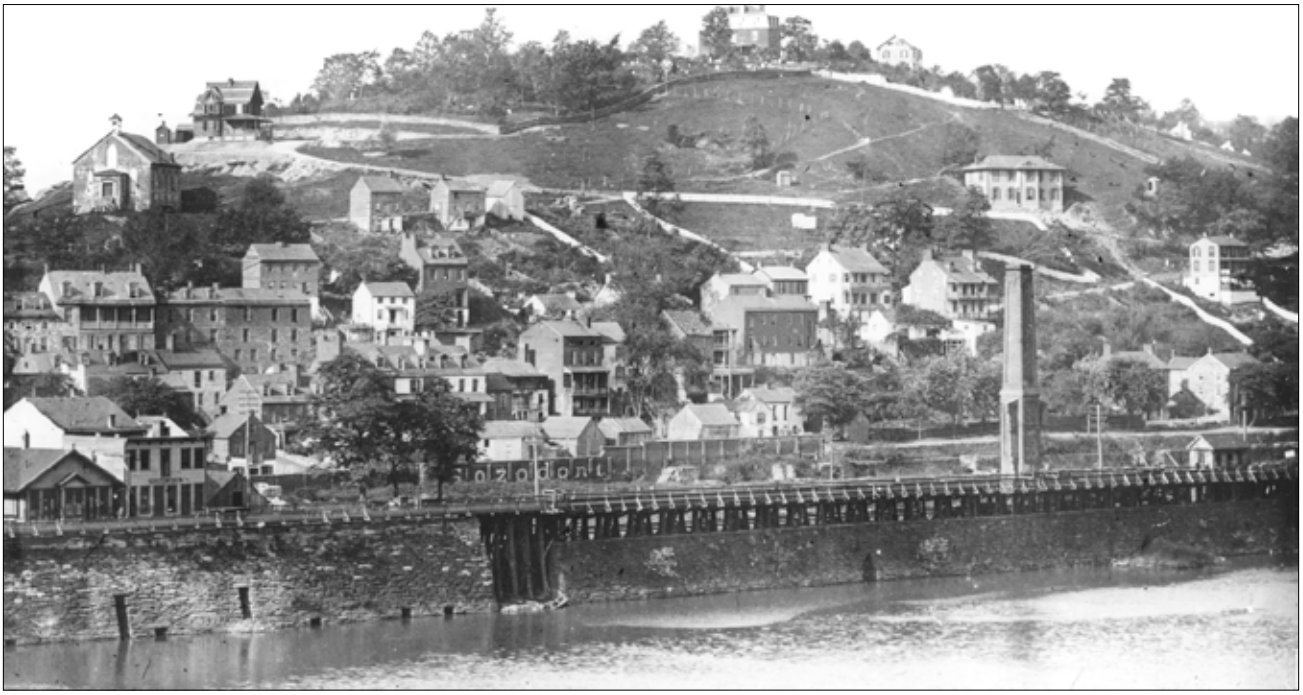


Figure 1.23. View from 1890 of Lower Town and Camp Hill. In the foreground is the original rail line through the former Musket Factory site along the Potomac shoreline. Note the remaining smoke stack to the right, which was later removed when the railroad was re-aligned. Also note the Armory wall with graffiti, parallel to Potomac Street. Harpers Ferry Historic Photo Collection, HF-1155.

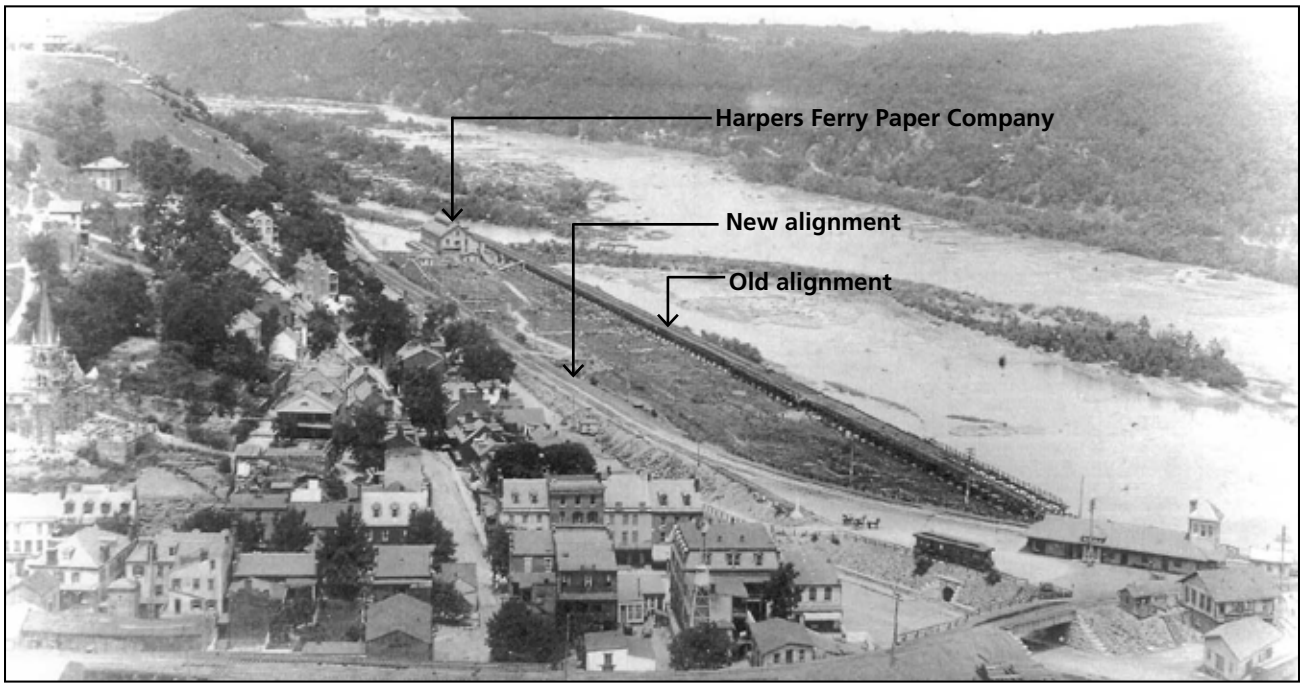


Figure 1.24. View of the former Armory site from Loudoun Heights, circa 1896. The structure at the west end of the site was the Harpers Ferry Paper Company, erected by Thomas H. Savery who purchased the Armory site at a public auction. Note that the new B&O alignment is to the left of the original. Harpers Ferry Historic Photo Collection, HF-0092.

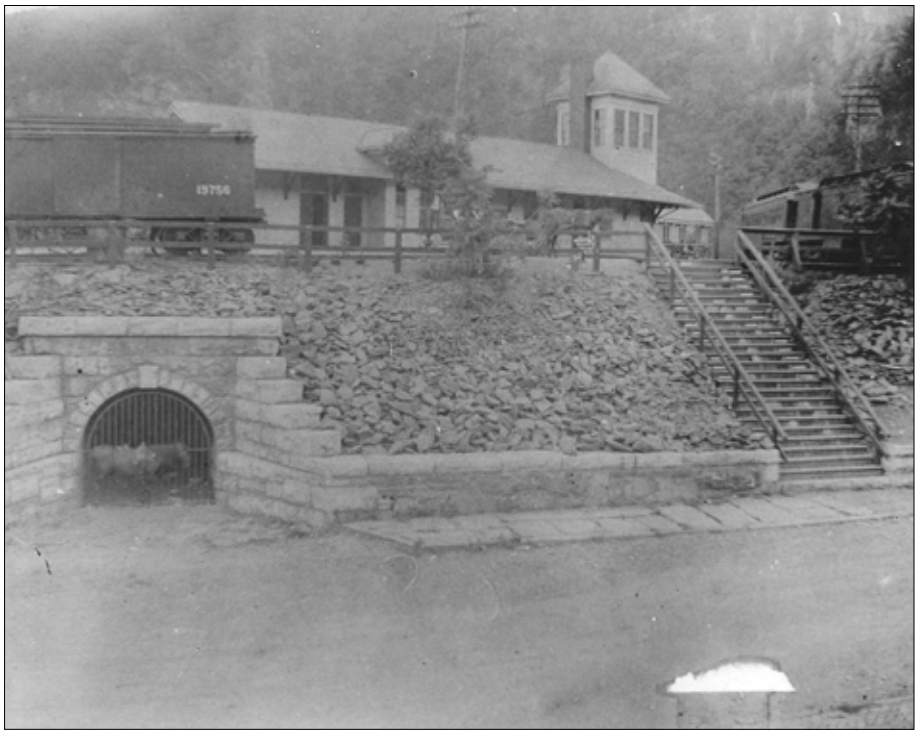


Figure 1.25. Photograph taken in the late 1890s of the train station at Harpers Ferry. A drainage culvert is to the left supported by sandstone masonry. A wooden staircase and railing provided access to the station for pedestrians. Note the slope stabilized with loose rocks and what appears to be an evergreen tree at the top of the slope, and the flagstone sidewalk at the base. Harpers Ferry Historic Photo Collection, HF-1818.

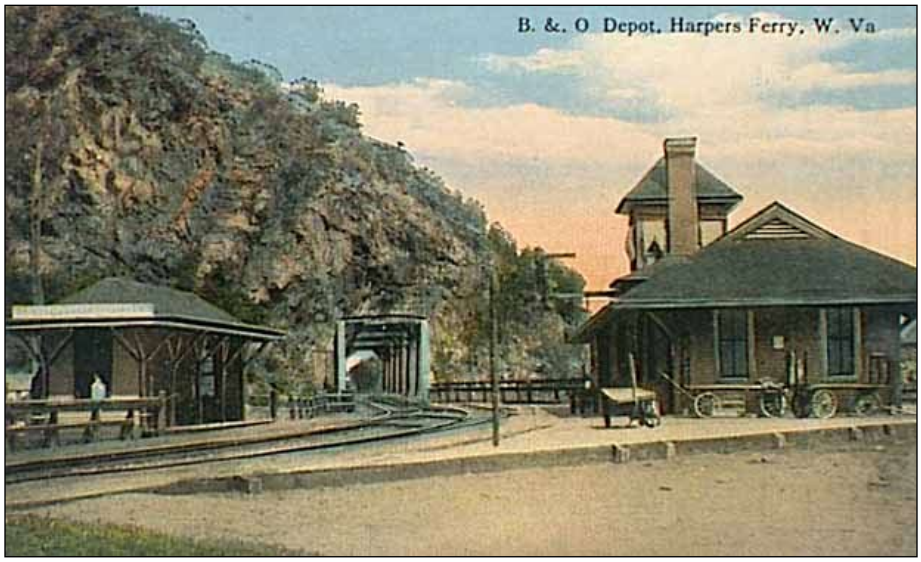


Figure 1.26. Postcard from 1910 depicting the railroad station and depot for the B&O railroad at Harpers Ferry, completed in 1894. Harpers Ferry Historic Photo Collection, HF-0946.

Figure 1.27. View of Lower Town in 1896 from Maryland Heights. A new overpass bridge connected the former W&P railroad, now the Valley Line, with the B&O railroad. The new B&O track and passenger depot opened two years earlier, covering the east end of the Armory grounds with a twenty-foot high earthen embankment. Harpers Ferry Historic Photo Collection, HF-0096.

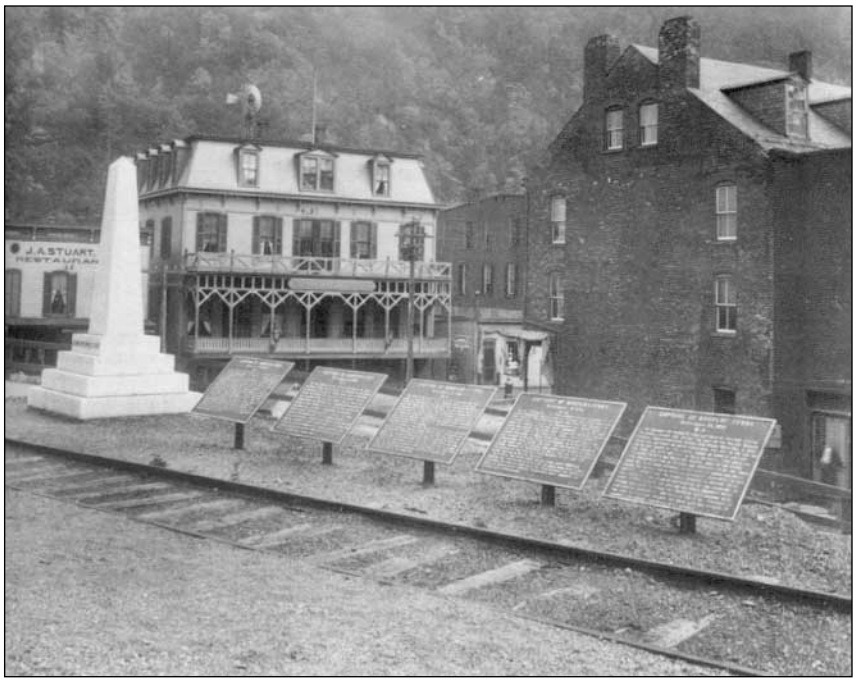


Figure 1.28. John Brown monument and comemmorative Civil War tablets adjacent to the Baltimore & Ohio Railroad depot on the new embankment, circa 1900. The Hotel Connor, built on the original site of the Arsenal, is seen just beyond the monument. Harpers Ferry Historic Photo Collection, HF-1142.

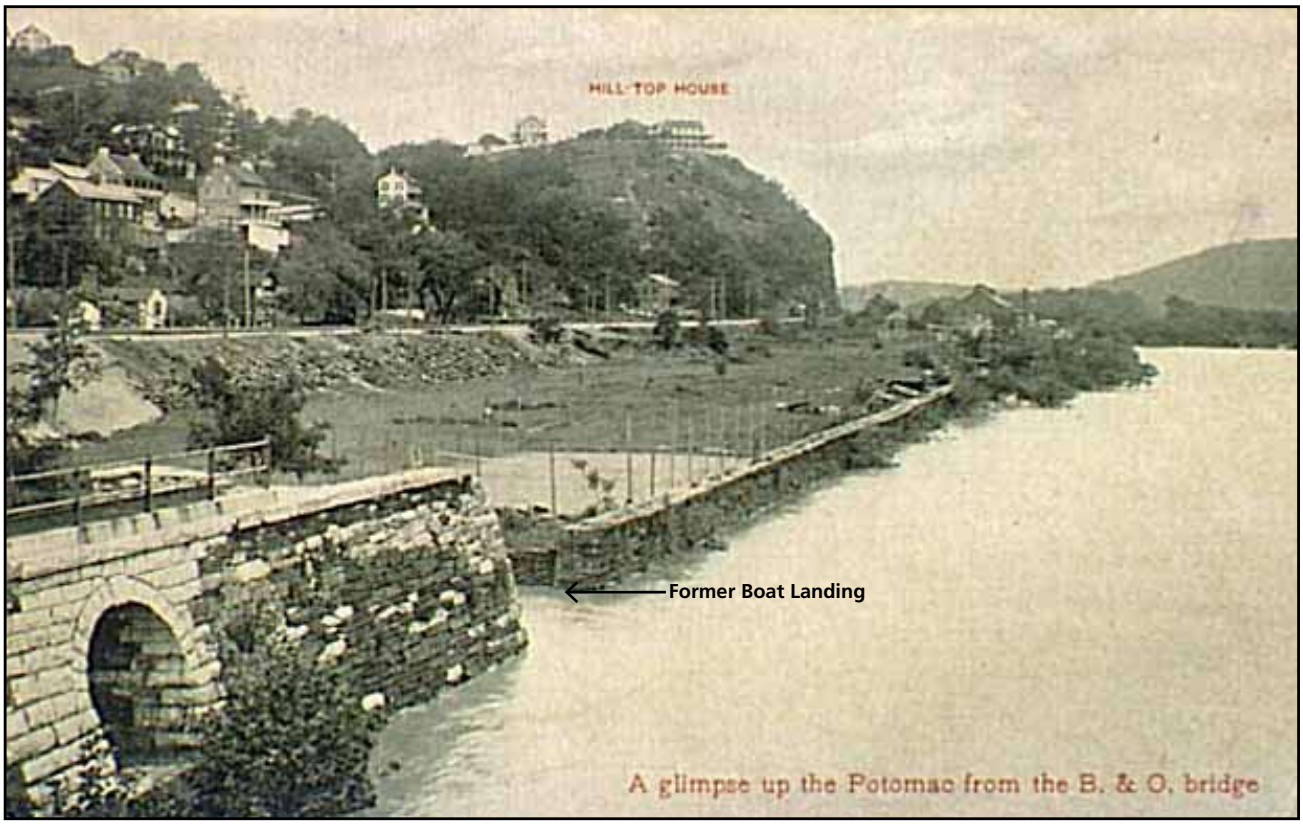


Figure 1.29. Postcard from 1908 shows the site of the former Armory along the Potomac shoreline and enclosed on the other side by the berm. The opening in the wall was a former boat landing. The postcard also highlights the Hill Top House hotel. The hotel is said to incorporate salvaged building materials from the former Armory site. Harpers Ferry Historic Photo Collection, HF-0474.

Figure 1.30. View from 1939 of a commemorative garden started in 1916 at the former Armory with building outlines overlaid in the ground with flush stone paving. In addition, the site consisted of a mown lawn, deciduous trees along the perimeter and shrubs planted on the north side with views to the river. The railroad embankment is to the left. Harpers Ferry Historic Photo Collection, HF-1049.

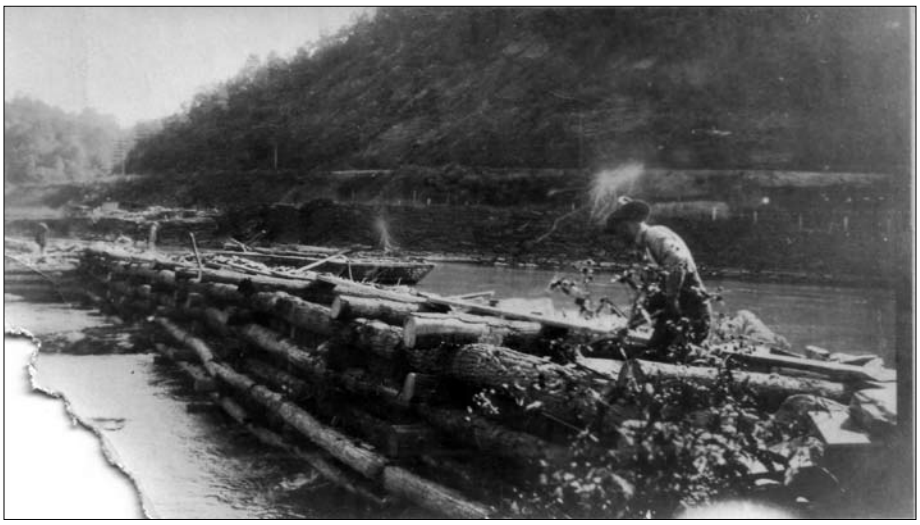


Figure 1.31. View, taken prior to 1936, shows work being done on the former Armory dam in the Potomac River. Referred to as a crib dam, the structure is built of heavy timbers in the manner of a log house and the interior is filled with earth or rubble. The heavy crib structure supported the dam's face and the weight of the water. Photo from Thomas Savery Collection 72.369, Hagley Museum and Archive.

Figure 1.32. View of Harpers Ferry Power Plant constructed on top of foundations of former pulp mill which was on top of the original Armory Rolling Mill. HAER WV-61-2.

Figure 1.33. Aerial view of Lower Town of Harpers Ferry, circa 1930. The commemorative garden on the grounds of the former Armory is visible with planted river edge with poplar trees, and the building outlines. Note how the space is cut off from the rest of the town by the large berm constructed by the railroad. Harpers Ferry Historic Photo Collection, HF-0341x.

Figure 1.34. View from 1931 showing the Harpers Ferry train station being moved north, adjacent to the new bridge. Harpers Ferry Historic Photo Collection, HF-1236.

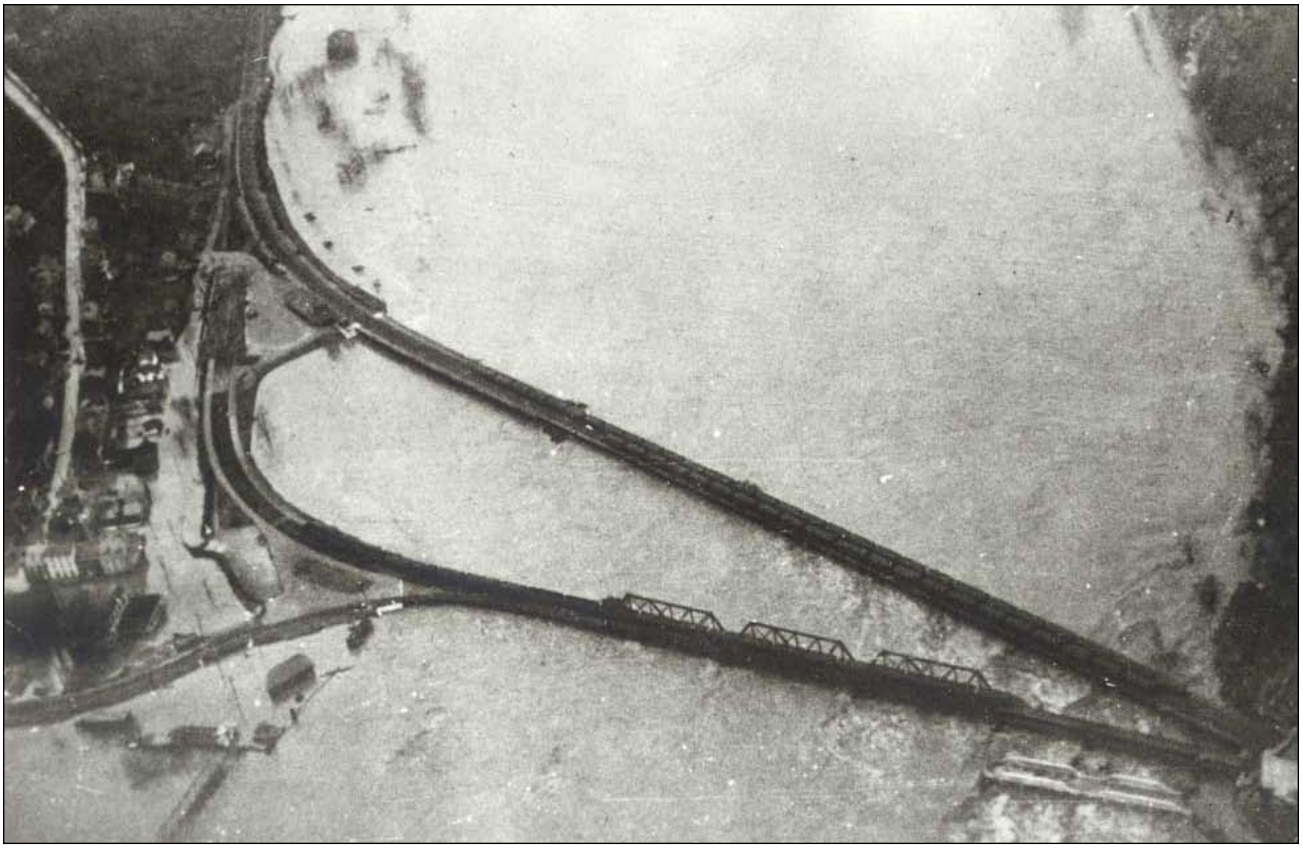
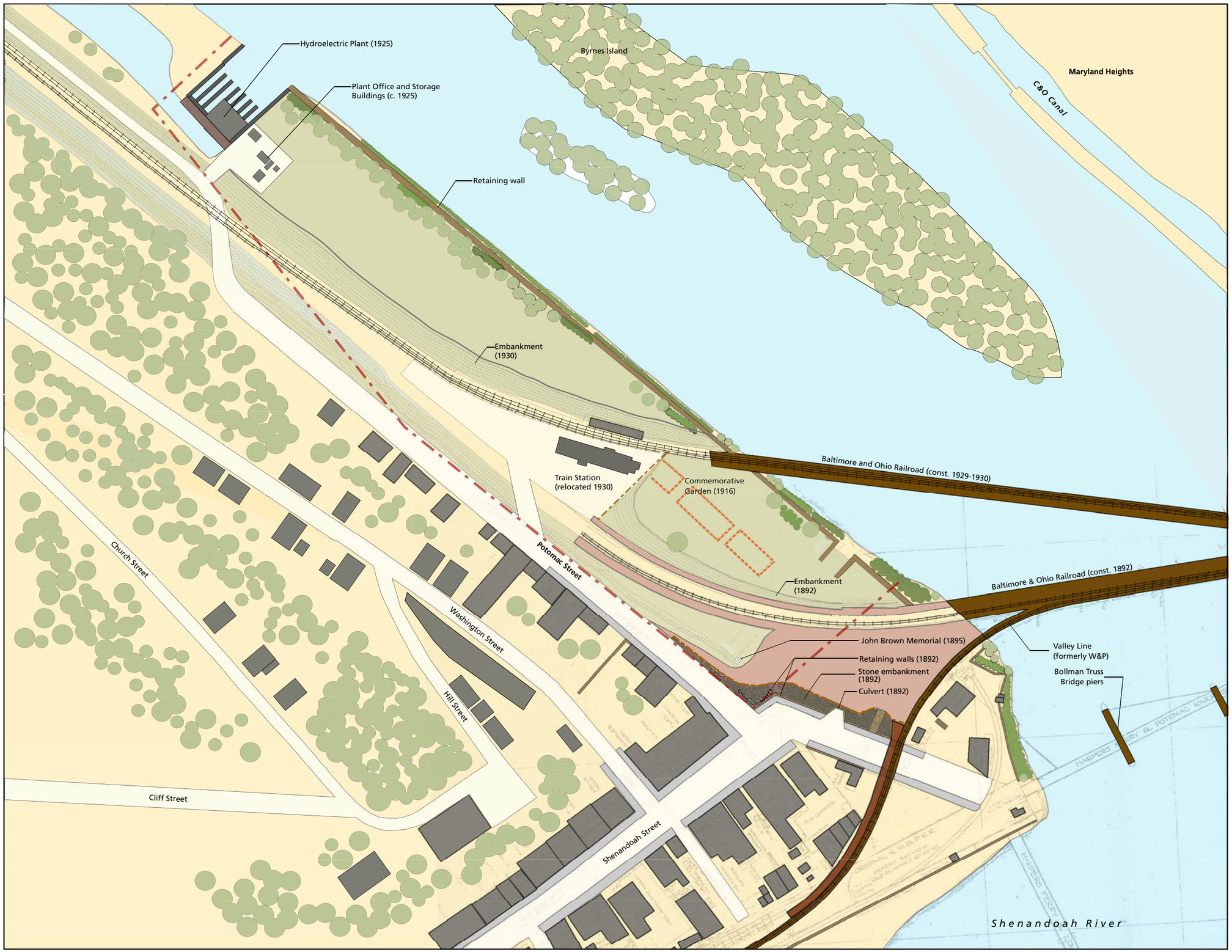


Figure 1.35. Aerial view of 1936 flood inundating the banks of both rivers. The Armory grounds to the left were submerged and automobile access to Maryland was cut off. Harpers Ferry Historic Photo Collection, HF-1724.



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park

West Virginia

1944 Period Plan

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. Baltimore & Ohio Railroad Main Line District, 1913, HAFE Archives, HF-0385-9003
2. Sanborn Map, 1922, HAFE Archives, HF-1878-s

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

LEGEND

- Building
- Wall
- Non-pedestrian Circulation
- Pedestrian Circulation
- Railroad
- Brick Platform
- Fence
- Tree
- Lawn
- Armory Building Outline
- Approximate Musket Factory Boundary

0' 60'

Drawing 5

HARPERS FERRY NATIONAL HISTORICAL PARK, 1945 - PRESENT

In 1950, when the establishment of a National Park Service (NPS) administered site at Harpers Ferry seemed closer at hand, National Park Service Assistant Director Conrad Wirth wrote to B&O officials informing them that West Virginia was beginning to acquire land for the Monument. Noting that the railroad company had long promoted the area's natural scenery and history, Wirth suggested a partnership between the Park Service and the railroad company. He complimented the B&O Railroad for marking the site of the Armory associated with John Brown and asked permission to direct visitors to the spot. He also requested that the company inform the National Park Service long in advance should it "plan at some future date to dispose of or alter the site."[156] The B&O Railroad agreed to cooperate with any National Park Service interpretive program, including allowing public access to the site. The B&O Railroad also assured Wirth that no changes to its adjacent main line tracks were planned.[157]

In March 1951, the West Virginia State Legislature finally appropriated money to begin acquiring land for Harpers Ferry National Monument. Almost from the start, obtaining the original site of the United States Armory and John Brown's Fort became a top priority. In the meantime, the National Park Service assessed newly acquired properties and formulated a framework for interpreting the site to visitors. The National Park Service decided to restore the town to the period encompassing two significant historical events in the development of Harpers Ferry. These were John Brown's Raid and the Civil War. Accordingly, the National Park Service focused its energies on establishing and depicting an 1859-1865 setting throughout Lower Town. This process involved the removal of buildings constructed after the 1859-1865 period, including several Victorian structures that stood in the former Arsenal Yard.

In 1952, the National Park Service generated a Master Plan Development Outline, including a roughly sketched scheme for downtown interpretation that incorporated the east end of the Armory site (Figure 1.36). The plan showed a series of informational plaques adjacent to the Armory grounds as well as circulation routes for pedestrians and vehicles. In addition, the plan marked specific buildings to be removed to enhance the historic character of the area.

As part of its plans to restore Harpers Ferry to its 1859-1865 appearance, National Park Service planners and professionals conducted comprehensive supporting research. Both the historical development of the town and the physical fabric of many of its buildings were thoroughly documented up through 1865. As part of this effort, in 1955 National Park Service Chief Historian Herbert Kahler solicited comments from historian William Everhart on the

Harpers Ferry brochure distributed by the B&O Railroad. After reviewing the brochure, Everhart expressed a low opinion of the information the railroad company provided prospective tourists. The narrative of events in the folder is highly inaccurate and would almost require re-writing, rather than correction.[158] Nevertheless, the National Park Service took great care to maintain good relations with the B&O Railroad hoping that the company might eventually agree to relinquish the original site of John Brown's Fort.

Efforts by the National Park Service to document and interpret the Harpers Ferry National Monument also included archeological research. In 1958, Regional Archeologist John Cotter established a list of priorities for archeological studies at Harpers Ferry. The first priority concerned replacing the John Brown Fort on its original foundations. The project had to be deferred, however, because it required acquisition of the site from the B&O Railroad and removal of the twenty feet of fill (Figure 1.37). Other archeological investigations related to the Harpers Ferry Armory were eventually conducted, including the excavation of two arsenal buildings beginning in the summer of 1959. These excavations provided a dramatic window into the destruction of the Armory, as archeologists unearthed a jumbled pile of melted metal and deformed musket parts atop the arsenal floor. The digs generated much excitement among the visiting public and soon became a central attraction of the Monument. Fences were installed around the archeological digs allowing visitors a close-up view of the on-going work (Figure 1.38). Additional archeological surveys were conducted in 1964 and 1965, revealing the macadam roadway for Shenandoah Street as well as the location and structure of the arsenal fence foundations (Figure 1.39).[159] National Park Service planners and administrators, however, remained focused on acquiring the former Armory property.

In 1957, National Park Service officials were considering a plan to acquire the former Armory property through a land exchange. The B&O Railroad Company was receptive to this idea and asked for a survey of the requested land. A civil engineer surveyed the site in November 1958, and plans were prepared in January 1959. These developments raised hopes that the site might be acquired in time for the 1959 Centennial of John Brown's raid. The B&O Railroad was interested in C&O Canal property near Cumberland, and these coincidental interests seemed to provide an opening for the National Park Service to acquire the fort site without having to request a special Congressional appropriation. These discussions stalled in May 1959, when National Park Service Associate Director E.T. Scoyen informed regional officers that he was reluctant to proceed at this time since the exchange might complicate the establishment of a C&O Canal National Historical Park which was then under Congressional consideration.[160]

The 1960 legislation that provided for the inclusion of the Storer College property into the Harpers Ferry National Monument also authorized an exchange of National Park Service land for the John Brown Fort site. Subsequently, the Eastern Office of Design and Construction of the National Park Service estimated the cost of removing the railroad fill from the site at $87,800 ($608,000 in 2007 dollars)[161] and restoring the John Brown Fort on the original location at $62,500 ($433,000 in 2007 dollars).[162] But again, there was confusion over the status of the land to be exchanged and the negotiations were shelved. John Brown's Fort remained at Storer College until 1968 when it was moved to Lower Town. Since the original site of the structure was covered with a railroad embankment in 1892, the building currently sits about a hundred and fifty feet east of its original location.

In 1962, the National Park Service drafted a Mission 66 Edition Master Plan for Harpers Ferry National Monument. Its stated purpose was to recapture the Harpers Ferry of 1859-65, townscape and scenic setting, thus bringing alive for the visitor the richly varied "town in war" story from which the area derives its principal interest as well as the story of its importance in industrial and transportation history.[163] Regarding significant resources, the plan mentions that the partially excavated site of the arsenal adds further reminder to the "time-torn" scene.[164] In order to accomplish the preservation objectives, emphasis was placed on general exterior preservation or restoration of the surviving historic structures in the downtown area. Limited historic reconstructions were also determined important to achieve the physical effect of the 1859-65 period, including restoring John Brown's Fort as well as streets and sidewalks. Removal of non-historic intrusions, minimal service development and controlled vegetative treatment were also considered critical in realizing an appropriate historic setting.

In 1963, although approximately seventy-four acres near Cumberland was being offered for less than three acres at Harpers Ferry, the B&O Railroad Company refused to make the exchange. The company objected on the grounds that the values of the tracts were unequal and asked for additional monetary payment or concessions such as allowing the company to replace the wooden trestle of the W&P Railroad line at Harpers Ferry with fill.[165] Further complicating the proposed exchange, Chesapeake & Ohio Superintendent (and former Harpers Ferry National Monument Superintendent) Edwin M. "Mac" Dale objected to C&O property being "raided" to the benefit Harpers Ferry.[166] And even though some were now urging the National Park Service Director to pursue legislation for an outright purchase, advising that Senator Randolph would be glad to do this, this alternative was apparently not pursued.[167] Two deeds were drafted in 1969, but these were never executed.

In 1965, the National Park Service prepared a Historic Grounds Report for Arsenal Square, and also included the easternmost portion of the Musket Factory. The report recommended rebuilding the historic stone, brick and iron wall that enclosed Arsenal Square, restoring flagstone walks and macadam roads as well restoring the original grade of Potomac Street in this area. The report also looked to future restoration of the Armory tract with the hope that negotiations with the B&O Railroad would result in the removal of fill in order to recover the original site. A plan was drawn up illustrating the possible restoration of this vicinity, including the relocation of the Engine House (Figure 1.40). The plan also included restoring the Armory gates, walkways and buildings.

Legislation in 1963 redesignated the area as Harpers Ferry National Historical Park. Legislation in 1974 enlarged the boundaries to include 2,000 acres in West Virginia, Maryland and Virginia (Figure 1.41). In 1980, the park acquired an additional 475 acres on Short Hill on the Virginia side of the Potomac River. During the same year, the National Park Service produced a new Development Concept Plan (DCP) and Interpretive Prospectus that expanded interpretation to include the entire nineteenth century.[168] The DCP illustrated a proposed hiking trail extending through the former Musket Factory site (Figure 1.42). The plan also identified the Potomac Power Plant and Lower Town as two development areas. The Potomac Power Plant would provide Armory interpretation as well as fishing access. And Lower Town would highlight restored historic structures and setting, encompassing part of the eastern portion of the former Armory site. The plan also recommended that the National Park Service acquire land bordering Lower Town in order to replace contemporary enterprises with more "tasteful exhibits and concessions."[169]

In 1982, the National Park Service lands office renewed efforts to acquire the Armory property by approaching the B&O Company's corporate successor, Chessie System Railroads, without success. A breakthrough finally occurred in the late 1990s, as Harpers Ferry National Historical Park conducted a number of boundary studies while considering expansions to the park boundaries. Private and public advocacy during this time, which included the efforts of the influential West Virginia Senator Robert C. Byrd, resulted in renewed interest in acquiring the former Armory property.

In September, 2001, an agreement based on the original 1959 exchange plan was finally reached between the National Park Service and CSX Corporation. The property conveyed to the park included three separate parcels (Figure 1.43). The agreement also provided two easements for CSX which would provide access to their right-of-way for repair, maintenance, and operation. One easement consists of ten feet along the northern boundary of Parcel B. The other easement encompasses an access route off of Potomac Street to a rectangular portion of the southern part of Parcel B. After nearly half a century of intermittent negotiations,

Harpers Ferry National Historical Park finally acquired title to the much sought after six acres.

In addition, through the 2001 agreement, the National Park Service acquired the Baltimore and Ohio railroad train station. In 2002, the station was documented as part of the Historic American Engineering Record (HAER), a long range program which documents historically significant engineering and industrial works in the United States. The park then embarked on a program to rehabilitate the exterior features as well as the building interior in order to meet current building and accessibility codes. While still functioning as an active passenger rail operation, the structure also provides public exhibits on the history of transportation. Rehabilitation of the train station was completed in 2006.

In 2004, a property owner adjacent to the Camp Hill Methodist Church donated a large cache of reddish-brown, cut sandstone blocks to the National Park Service. These stones, beveled on one side to form a cap stone, were found in the back yard during the installation of a patio. While the original provenance of these cap stones is not known, it seems likely that they were originally part of the Armory fences. The stone is from the Seneca quarry near Seneca Creek in Maryland, and such blocks were widely used as decorative copping stones in the Musket Factory gates and walls. Deed research on the property may provide insight on how and when these distinctive stones were deposited on the Camp Hill site. Local tradition also states that similar cap stones were incorporated into the 1888 Hilltop House Hotel, located at the site of the former Armory magazine on a high bluff a short distance away from the former Musket Factory site.

Currently, efforts are underway at the park to provide visitor access to the Armory grounds and clear vegetation in order to open up the site. The following section will address the existing conditions in depth of the Armory site at Harpers Ferry.

LANDSCAPE DESCRIPTION SUMMARY, PRESENT

Today, the Musket Factory site is disconnected physically from the surrounding national park by two earthen railroad embankments and the operation of the railroad. The 1930 embankment and railroad tracks have also divided the former factory site into two areas, Lower and Upper Armory Grounds. Lower Armory Grounds, south the 1930 embankment, contains archeological sites of the factory building foundations. Upper Armory Grounds contains the former hydroelectric plant and the northern portion of the factory grounds which is covered with volunteer tree growth. Structures consist of the river retaining wall, remnants of the canal, various drainage structures as well as bridge abutments.

Non-pedestrian circulation consists of three roads. Potomac Street is the southern boundary of the site. After crossing the railroad tracks at Upper Armory Grounds, Potomac Street turns into a narrow gravel road, known as Upper Potomac Street, providing access to the former hydroelectric plant and continues parallel with the river up to the former Armory dam. An entry drive off of Potomac Street provides vehicular access to the railroad station and adjacent parking lot. A gravel access road at Lower Armory Grounds is used by the railroad company for moving equipment. Pedestrian access is limited to a footpath along the top of the lower embankment which follows the abandoned railroad tracks and provides visitors the opportunity to view the John Brown monument. A set of wooden steps built on the slope of the 1892 embankment brings visitors to the archeological sites in Lower Armory Grounds. There is no formal pedestrian circulation through Upper Armory Grounds and beyond to the former Armory dam.

Vegetation on the site is comprised of mostly volunteer woody plants. Trees include silver maple (*Acer saccharinum*), sycamores (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), and cottonwoods (*Populus deltoides*). Other plants that can be found along the river edge include a variety of ferns and prairie grasses. Plantings from the commemorative garden do not appear to have survived.

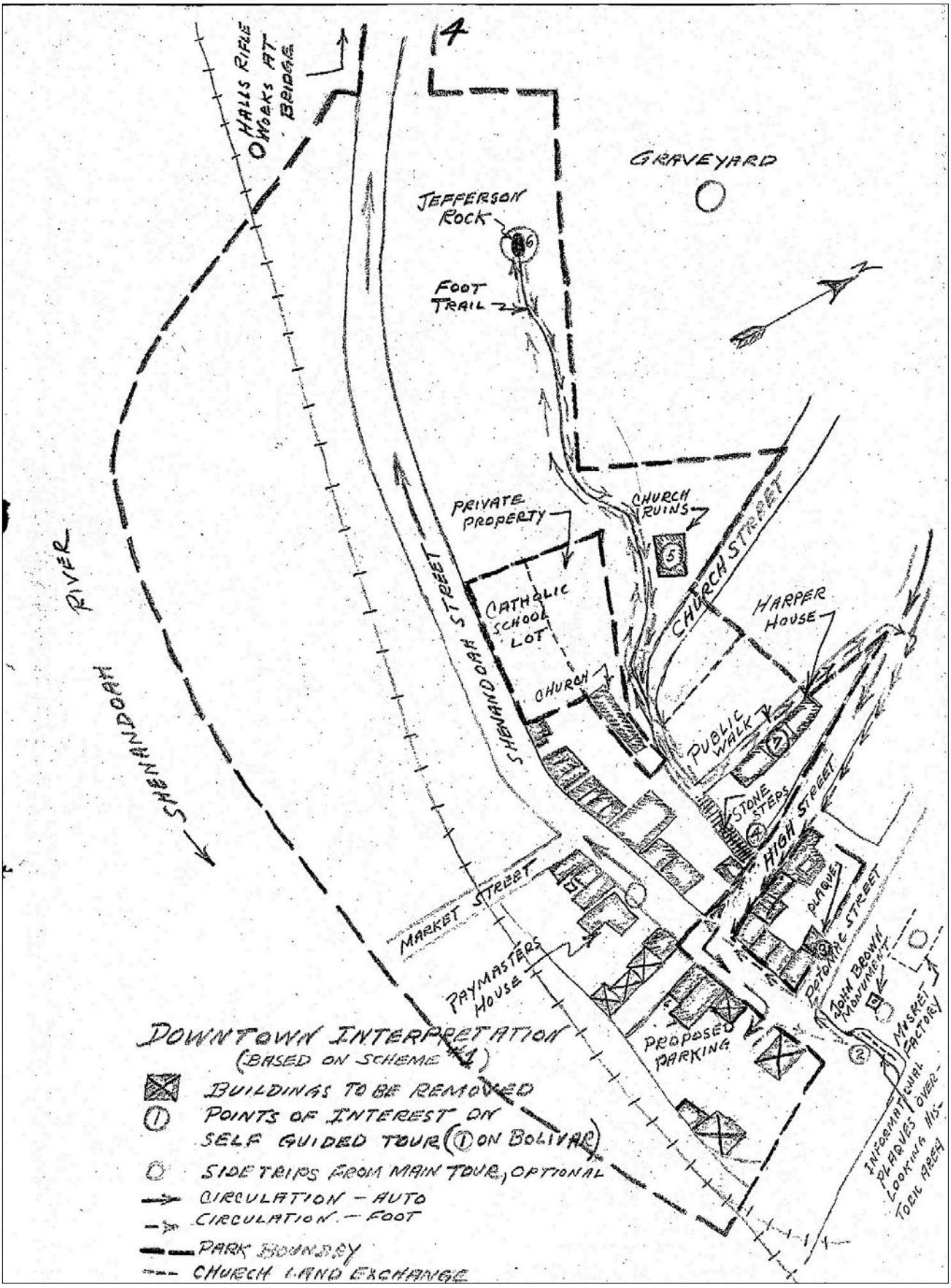


Figure 1.36. Sketch of proposal at Harpers Ferry, 1952, from a Master Plan Development Outline prepared by the National Park Service. To the right, note the proposed restoration of John Brown's Fort to its original location and the Armory building outline. The buildings marked with an X were to be removed.

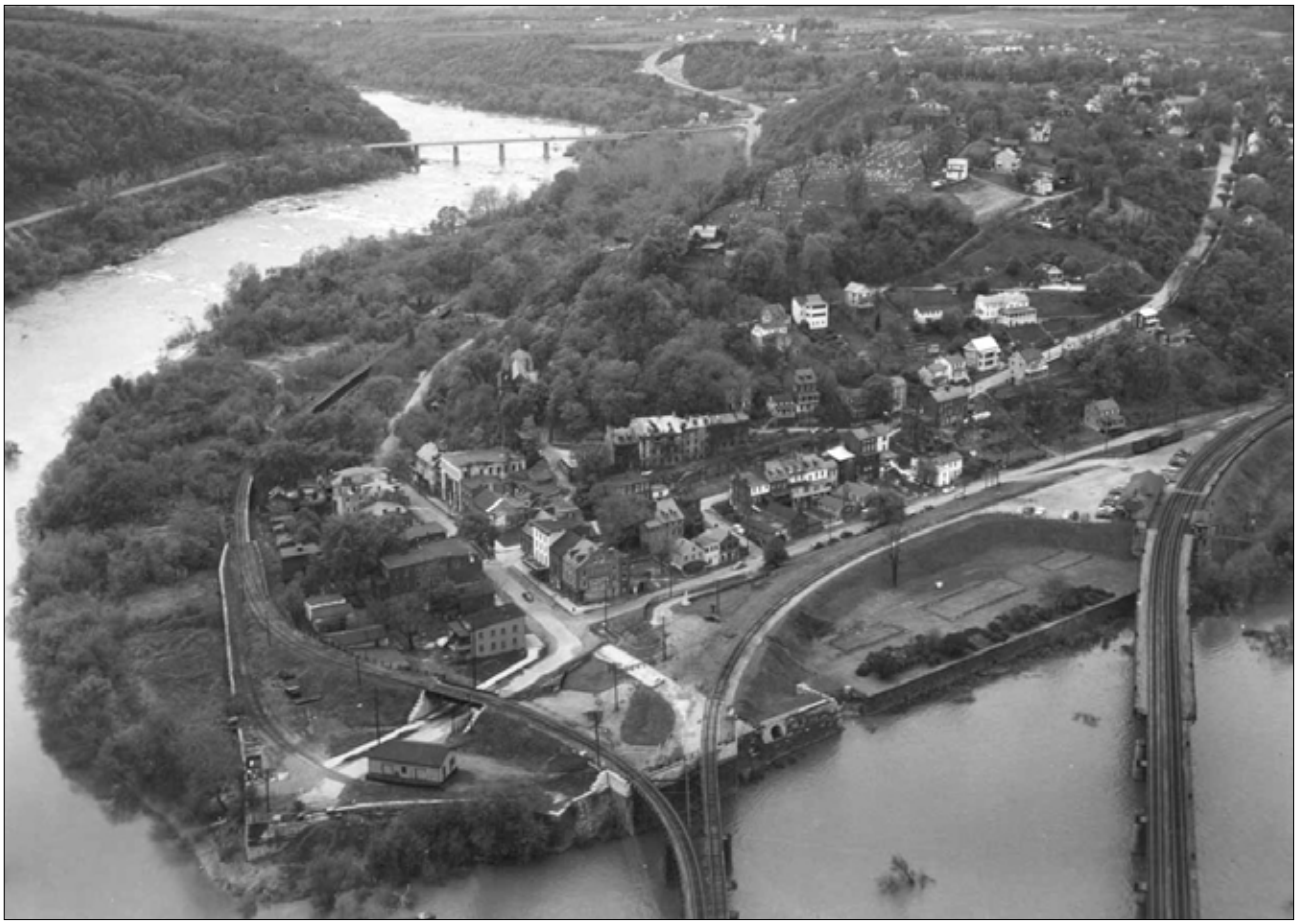


Figure 1.37. Aerial view of Harpers Ferry taken in 1955. The view shows the plantings in the commemorative garden along the river wall. The site of John Brown's fort was still covered with the earthen embankment and marked by a memorial on top. Harpers Ferry Historic Photo Collection, HF-0804.

Figure 1.38. Archeological dig c.1960 at Arsenal Square proved to be a popular tourist spot. Harpers Ferry Historic Photo Collection, HFR-662.

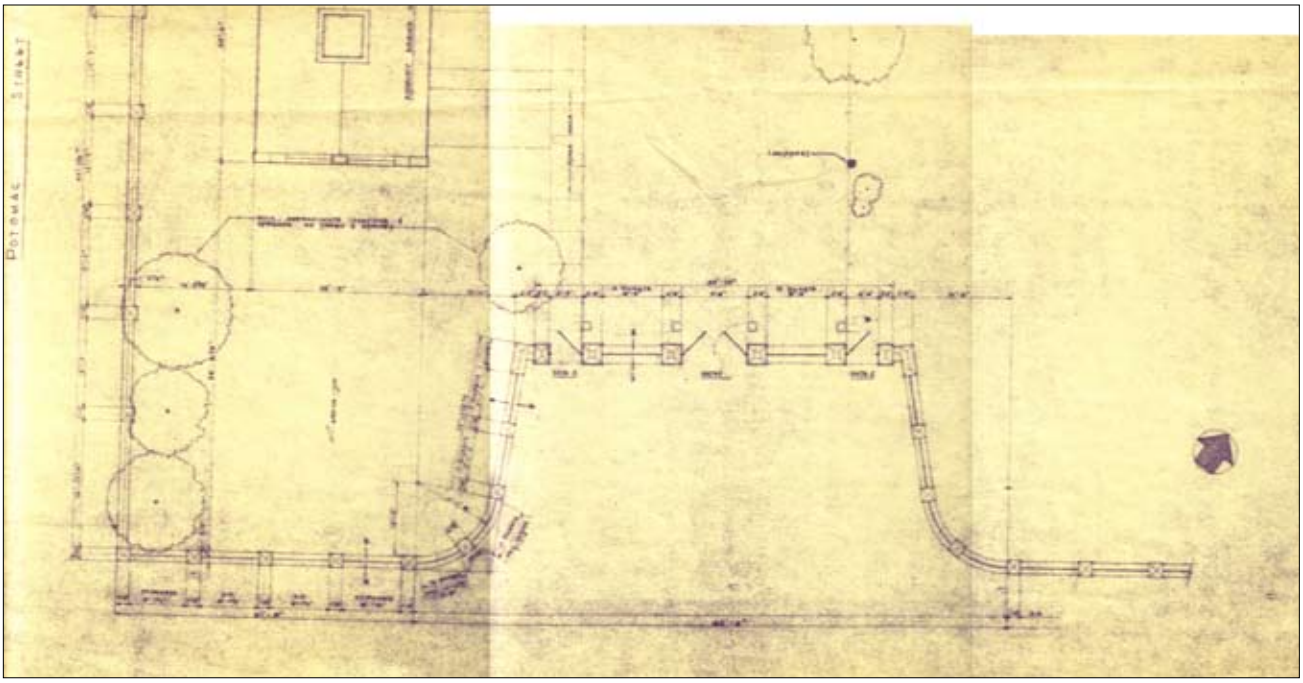


Figure 1.39. Architectural rendering, produced in 1963, of the brick and iron fence at the main entrance of the Musket Factory. The drawing depicts the piers and the spacing of the gates. Harpers Ferry Historic Photo Collection, HMF-00295 .

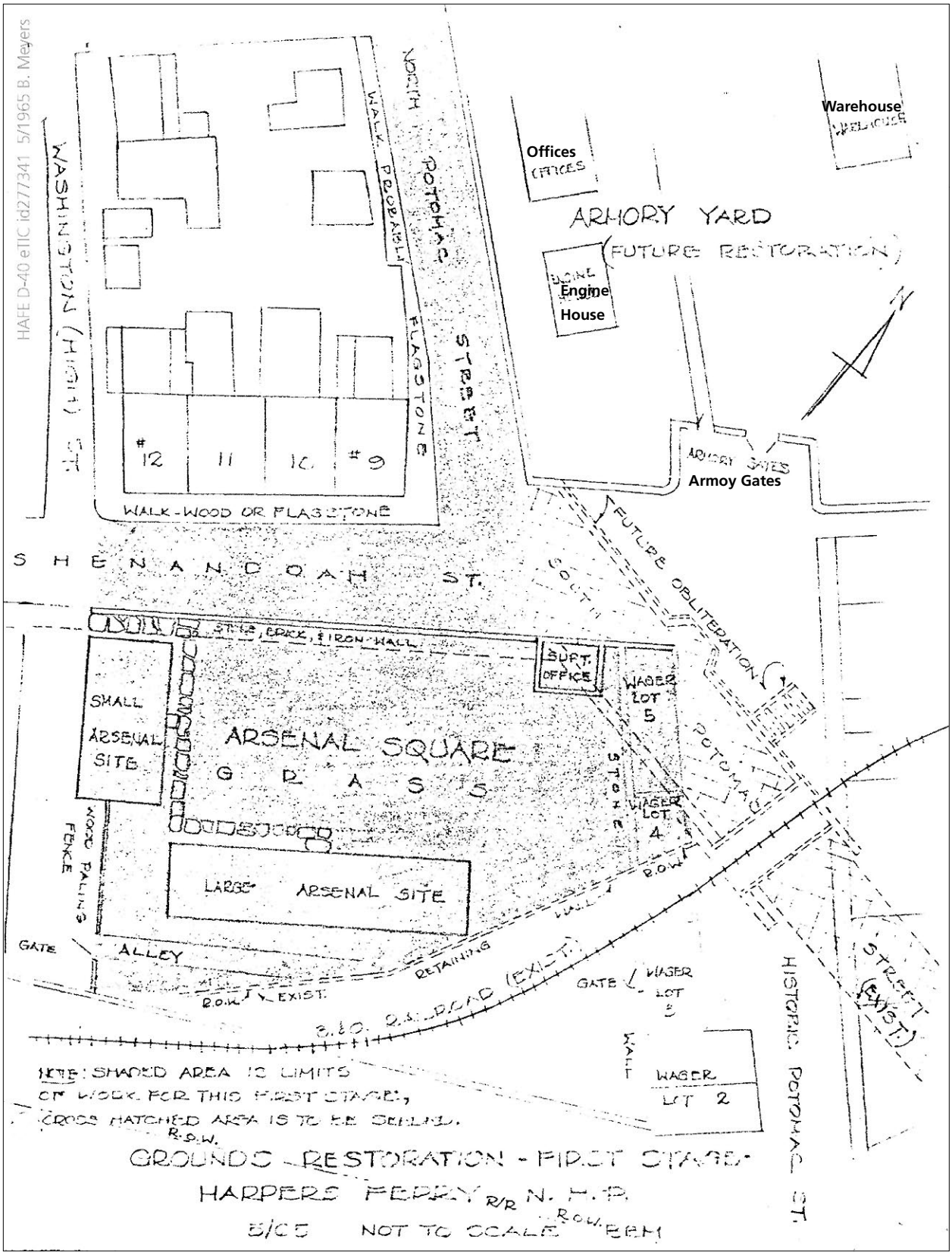


Figure 1.40. Plan from 1965 Historic Grounds Report showing possible restoration of Arsenal Square and the eastern portion of the Musket Factory site. Bruce B. Meyers, National Park Service, Eastern Office, Construction and Design, Division of Landscape Architecture.

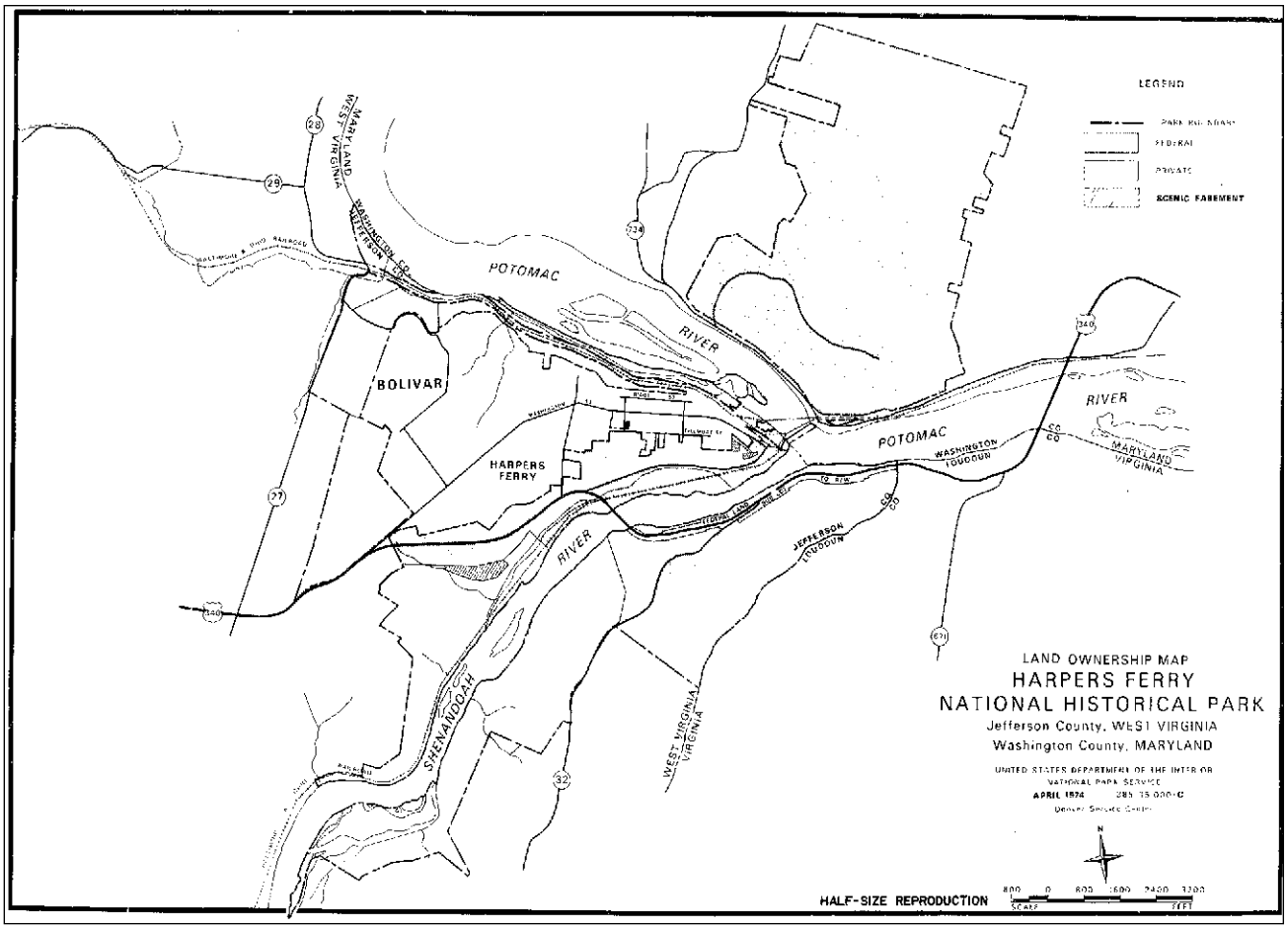


Figure 1.41. Map showing land under the boundaries of the 1963 National Historical Park. Harpers Ferry National Historical Park.

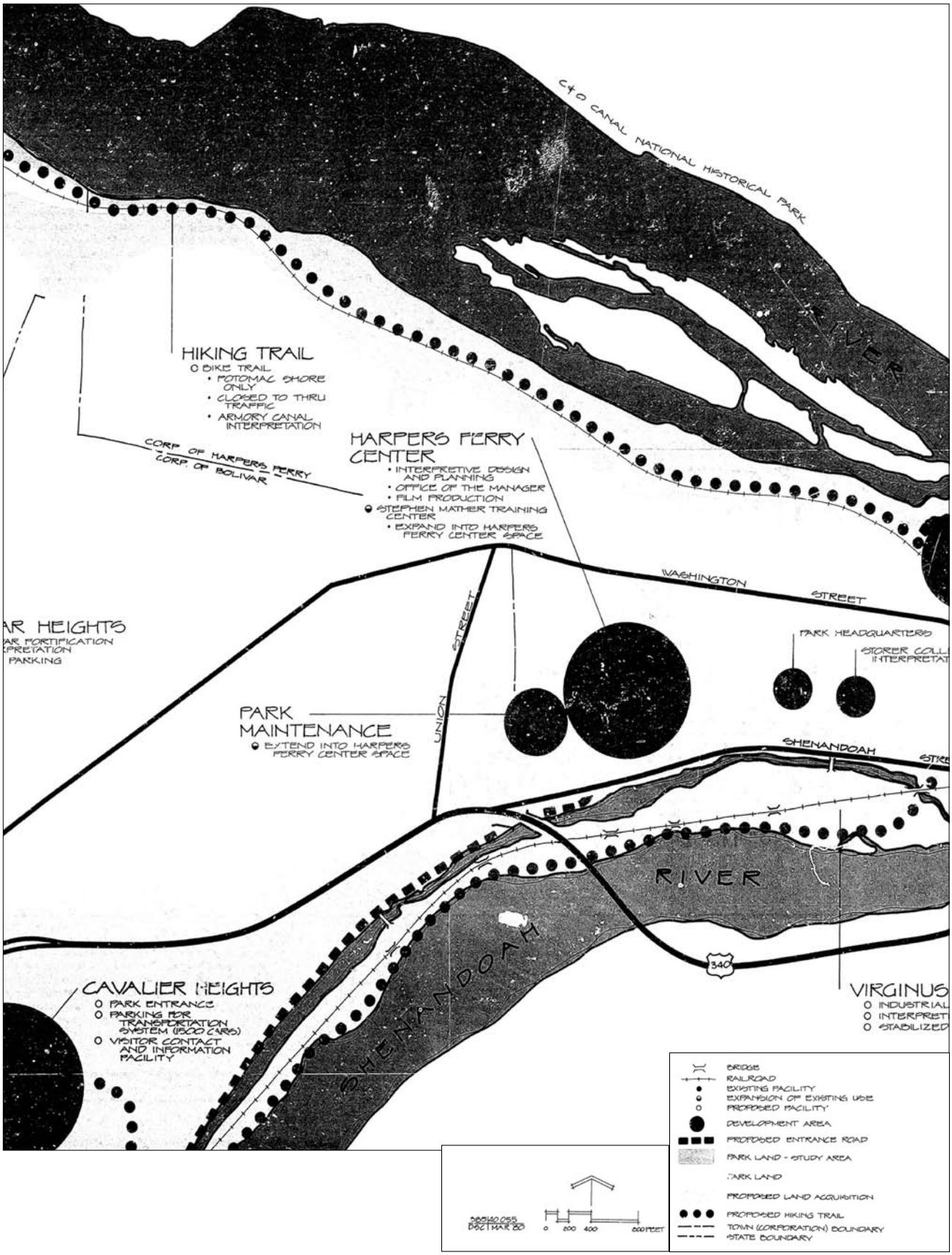
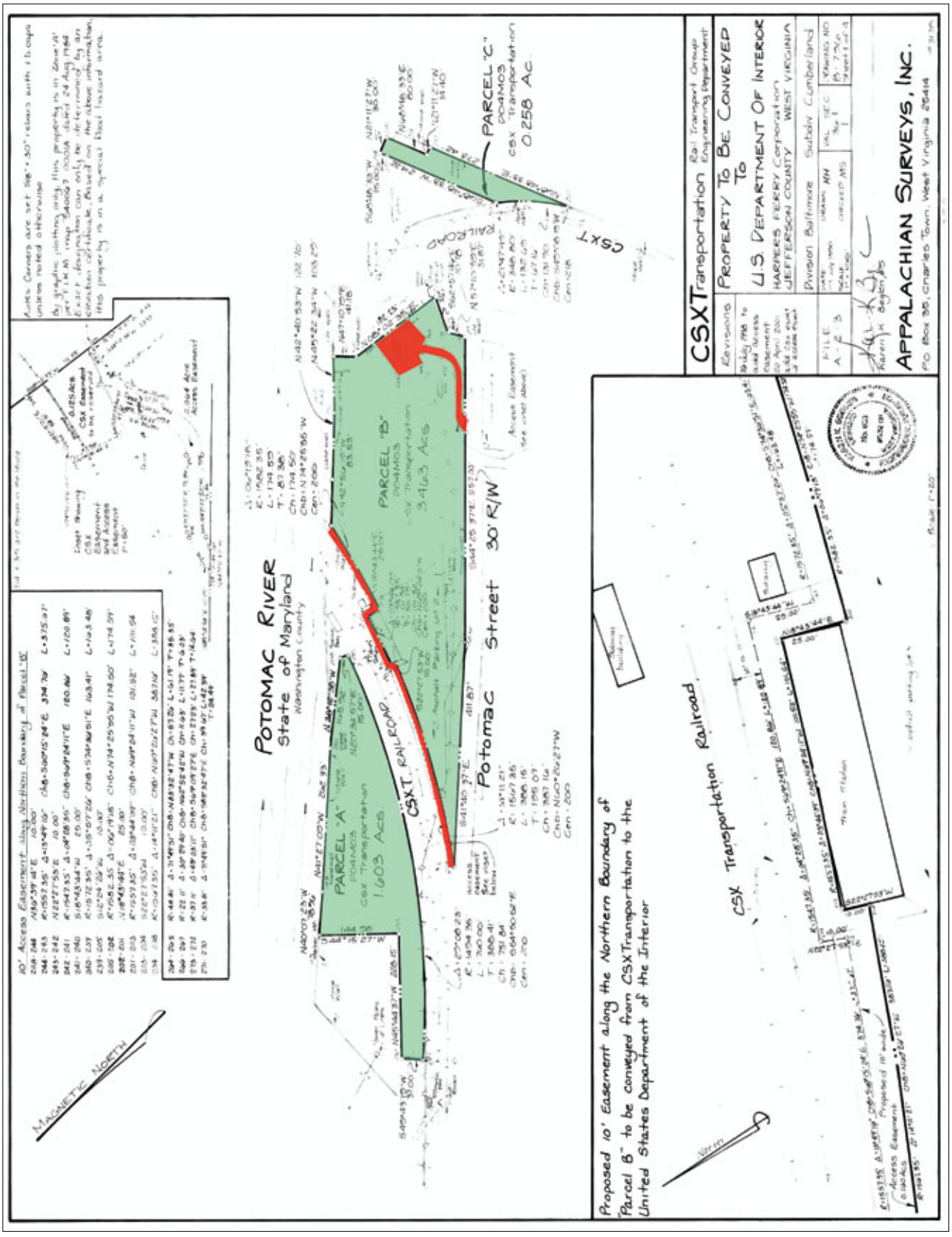


Figure 1.42. Portion of Concept Development Plan created in 1980. Proposals included a new hiking trail that traversed the former Musket Factory site. Development areas proposed to expand Lower Town to include bordering properties and a portion of the Musket Factory. In addition, the area around the hydroelectric plant was also highlighted as a development area that would provide Armory interpretation as well as access to fishing. National Park Service, Harpers Ferry National Historical Park.



Property Conveyed to the Park Easements

Figure 1.43. Map showing the three parcels of land conveyed to Harpers Ferry National Historical Park (in green),and the two easements (in red). Appalachian Surveys, Inc., Charles Town, West Virginia, 1990.

Former Hydroelectric Plant
Gravel Road
Parking
Byrnes Island
Maryland Heights
Sandyhook Road or Harpers Ferry Road
Upper Embankment
River Wall
Potomac River
Train Station
Parking
Potomac Street
High Street
Hog Alley
Church Street
Public Way
Shenandoah Street
Archeological Sites
Interpretive Sign
Lower Embankment
Wooden Steps
Gravel Access Road
John Brown Obelisk
Wooden Fence
Railroad Yard

Cultural Landscape Report

Musket Factory/Potomac Riverfront Harpers Ferry National Historical Park

West Virginia

Existing Conditions

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. Harpers Ferry National Historical Park, 2001 Aerial
2. GIS map, Harpers Ferry National Historical Park, 2007

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

LEGEND

- Building
- Wall
- Non-pedestrian Circulation
- Pedestrian Circulation
- Tree
- Approximate Musket Factory Boundary

0′ 80′

Drawing 6

EXISTING CONDITIONS

The following chapter describes the existing physical setting and landscape conditions and includes documentation of landscape characteristics including topography, spatial organization, land use, vegetation, circulation, buildings and structures, views and vistas, small scale features and archeological sites.

PHYSICAL SETTING

The seventy-two acre Musket Factory site is situated along the southwest bank of the Potomac River at the base of a ridge forming part of the Blue Ridge Geological Province. The site is surrounded by dramatic topography including three distinct landforms including Maryland Heights at 1,448 feet above the river, Loudoun Heights at 1,175 feet and Bolivar Heights at 668 feet (Figure 2.0). Located within a hundred-year floodplain, the site has been inundated with major flooding roughly fourteen times since the mid-1700s. [170]

The Armory was the physical and economic core of Harpers Ferry between 1800 and 1860. The United States Armory at Harpers Ferry shaped the overall landscape character of Lower Town in the layout of roads and pedestrian paths, as well as the style, materials and technology used to construct buildings, water works, dams, culverts, canals and structural walls. After the Civil War, part of the site continued to be utilized for industry when Thomas Savery purchased the property in 1884 and constructed a paper mill. The site later served as a commemorative landscape telling the story of John Brown's raid and the fate of the town during the war. An embankment was built in the 1890s and further expanded in the 1930s when the railroad moved the track north of the previous one. This large earthen railroad embankment divided the site into two segments. In 2001, an agreement was reached between the National Park Service and CSX Corporation allowing the National Park Service to acquire six acres of former Armory property, completing the park's ownership of the majority of the Armory site. Today, general access to the site remains limited.

LANDSCAPE CHARACTERISTICS

The following landscape characteristics represent the natural and cultural processes and features that define the significance of the Harpers Ferry Armory cultural landscape. Landscape characteristics are the general aspects of the landscape that define its historic character and aid in understanding its historic significance.

Topography/Hydrology: Geologic and surface water features and patterns that influence the development and form of a landscape.

Spatial Organization: Arrangement of elements creating the ground, vertical and overhead planes that define and create spaces.

Land Use: Organization, form and shape of the landscape.

Vegetation: Indigenous or introduced trees, shrubs, vines, groundcovers and herbaceous materials.

Circulation: Spaces, features and materials that constitute systems of movement.

Buildings and Structures: Three-dimensional constructs such as houses, barns, garages, stables, bridges and memorials.

Views and Vistas: Features that create or allow a range of vision which can be natural or designed and controlled.

Small Scale Features: Elements that provide detail and diversity combined with function and aesthetics.

Archeological Sites: Sites containing surface and subsurface remnants related to historic or prehistoric land use.

LANDSCAPE CHARACTER AREAS

The Armory site can be divided into three landscape character areas. The division of the landscape into character areas helps to organize and frame the information and analysis. The site consists of two main areas overlain and bisected by the railroad tracks, train station and parking lot (see Figure 2.0). Lower Armory Grounds occupies the site south of the railroad tracks and includes the train station, the Armory archeological sites and the John Brown monument. Upper Armory Grounds is the area north of the tracks extending westward to the hydroelectric plant. The third landscape character area is the canal which extends northwest to the former Armory dam, also known as Dam Number Three.

TOPOGRAPHY

Located at the confluence of the Potomac and Shenandoah rivers, the Armory site was originally a fairly flat linear area situated in a northwest to southeast direction at the base of a steep hillside. Ongoing railroad expansion has resulted in a landscape divided by the construction of two twenty-foot earthen embankments (Figures 2.1, 2.2). Extending along the edge of Potomac Street,

these berms also physically and visually separate the site from the rest of Harpers Ferry. The river edge of the site is bounded by a stone retaining wall with grade changes up to twelve feet along its length (Figures 2.3, 2.4). Today, the site's terrain has little resemblance to the historic topography.

SPATIAL ORGANIZATION

The Armory site does not retain its original spatial organization when it functioned as an arms manufacturing facility. While in private ownership, the landscape has been transformed significantly, obliterating or burying much of the historic fabric of the Armory. All the buildings except for the engine house once occupied by John Brown have been destroyed. The ornamental iron fence enclosing the complex was also eliminated along with the paving and main road that once ran down the center of the Armory parallel to Potomac Street. Lower Armory Grounds provides the main visitor attractions, including the archeological sites and the John Brown memorial as well as the train station and parking. The railroad company also utilizes the southeast portion of the top of the embankment for equipment storage. Upper Armory Grounds consists of a large area of thick woody vegetation and the former hydroelectric plant located to the northwest along the river.

LAND USE

Land use describes the principal activities in a landscape that form, shape and organize the landscape as a result of human interaction. The project site ceased to function as an arms manufacturing facility during the Civil War. Since then, it continued to be utilized by the railroads and new businesses including a paper mill at the Upper Armory Grounds. More recently, a hydroelectric plant made use of the same site until 1991. Markers were also established commemorating John Brown's raid, the Civil War and the Musket Factory. Currently, the former Musket Factory site offers visitor attractions including the monument to John Brown as well as archeological investigations into the Armory building foundations. The railroad also continues its presence in the landscape, with its associated parking lot, train station and track the most dominant features on the site.

VEGETATION

Vegetation on the site is comprised of mostly volunteer woody growth that has matured over the past fifty years. Trees have grown all along the river edge, screening views of the river (Figure 2.5) and potentially undermining the foundations of the river wall. Trees also prevent panoramic views out to the Potomac River and beyond (Figure 2.6). The change in vegetation can clearly be seen by comparing a contemporary photograph of the area at Lower Armory

Grounds with a photograph taken in 1958 at the same location (Figures 2.7, 2.8). The trees dramatically alter the spatial quality of the landscape and prevent a visual connection between the viewer, the historic Armory site and the railroad station. There appears to be no remaining shrub plantings surviving from the commemorative garden established in 1916 at the Lower Armory Grounds. Vines and other volunteer growth are growing in and over the river and canal walls causing some deterioration to these structures. The canal itself is also hard to perceive because it is completely overgrown in areas (Figure 2.9). Vegetation along the shoreline today includes maples, river birch, cottonwoods and willow trees. Mown turf is maintained on the embankment.

CIRCULATION

Circulation includes the spaces, features and applied material finishes that constitute the systems of movement in a landscape. At the Lower Armory Grounds, there is a gravel road leading from Potomac Street to an area over the culvert where the CSX Railroad Company stores equipment. An original flagstone sidewalk at the eastern end of Potomac Street provides a route for pedestrians but does not extend the entire length of the grounds (Figure 2.10). A footpath edged with wood is located along the top of the embankment and passes by the John Brown monument (Figure 2.11, 2.12). There are a set of concrete steps leading from Potomac Street to the top of the embankment near the culvert, but it is currently closed off (Figure 2.13). Wooden steps beginning at the top of the berm lead down to the archeological sites (Figure 2.14). Another set of steps has recently been installed at the corner of Potomac and Shenandoah streets to create a more visible access point to Lower Armory Grounds (Figure2.15). As of yet, there is no handicap accessibility to this area. At the train station area, non-pedestrian circulation is comprised of an asphalt road, built by the railroad company, leading from Potomac Street to a parking lot with approximately eighty-five spaces adjacent to the station (Figure 2.16). A gravel access road leads to the top of the 1892 embankment and the CSX storage area (Figure 2.17). This access road was the former entry drive to the original train station location. There are also abandoned tracks on the top of the embankment at Lower Armory Grounds (Figure 2.18). To reach Upper Armory Grounds where the former hydroelectric plant is located, visitors can drive on Potomac Street which crosses the train tracks and turns into a roughly twelve-foot wide gravel road, known as Upper Potomac Street (Figure 2.19). At the Upper Armory Grounds, there is no defined pedestrian access through the area. Railroad tracks cross the Potomac River from Maryland and bisect the site into two areas before continuing northwest.

BUILDINGS AND STRUCTURES

Buildings are elements constructed primarily for sheltering any form of human activity in a landscape. At Lower Armory Grounds, a one-story railroad station was built in 1894 and moved to its current location in 1931. At Upper Armory Grounds, the former hydroelectric plant is located at the western end of the site (Figure 2.20). This building is constructed on the foundations of the former paper mill owned by Thomas Savery. Prior to Savery's purchase of the land and subsequent business, the Armory's tilt hammer shop stood on this location. John Brown's Fort (and former Armory engine house), which was moved to its present location in 1968, originally stood near the main entrance of the Armory at Lower Armory Grounds, is now situated about 150 feet east of its original location.

Structures are elements constructed for functional purposes other than sheltering human activity in a landscape. Structures in the study area include the retaining river wall that runs the length of the whole musket factory site (Figure 2.21). Constructed of stone, the wall extends 1,380 feet and is four and a half feet thick. It rises fifteen feet above the low water level and has eight culverts. Remnants of the original Armory canal used to power manufacturing equipment survive and are still visible. Along the canal wall, water outlets can also still be seen (2.22). Various drainage structures have been added through the years to help mitigate flooding. Remnants of the canal used to power manufacturing equipment are also still visible (Figures 2.23, 2.24). At the Lower Armory Grounds, the B&O Railroad designed an eight-foot high culvert in the embankment construction between Potomac Street and the river in 1892 to ease floodwaters backing up the Shenandoah River (Figure 2.25).

VIEWS AND VISTAS

Views and vistas are the prospect created by a range of vision in a landscape, conferred by the composition of other landscape characteristics. The views from Harpers Ferry, especially from Jefferson's Rock and Camp Hill, were historically one of the main attractions of the town. At the Armory site, the embankment at Lower Armory Grounds affords views out across Potomac Street to the town of Harpers Ferry with the Blue Ridge in the background (Figure 2.26). In contrast, views of the Musket Factory archeological sites and across the river are partially concealed by trees (Figure 2.27). There are also dramatic views of the railroad bridges from the river edge and beyond (Figure 2.28). Near the Armory canal, an overlook located near the former dam provides a different experience by providing visual access over the river and affording wide open views of the river and surrounding scenery (Figure 2.29).

SMALL SCALE FEATURES

Small scale features are the elements providing detail and diversity for both functional needs and aesthetic concerns in a landscape. At Lower Armory Grounds, small scale features include the John Brown monument and wayside interpretation exhibit describing the history of John Brown's ill fated attack on the Armory (see Figure 2.13). Constructed of granite on a four-step base, the six foot high obelisk is located over the original site of the building John Brown used as his refuge. Another interpretive sign is located at the entry road leading up to the railroad station. The sign describes Meriwether Lewis' visit to Harpers Ferry in 1803 to gather supplies in preparation for his historic expedition to the Pacific coast with William Clark. Additional small scale features include wooden fencing installed by the park service to screen railroad equipment from view (Figure 2.30). An iron picket fence lines the gravel access road on the lower embankment (see Figure 2.6). At Upper Armory Grounds, there are presently no visible small scale features.

ARCHEOLOGICAL SITES

There are several archeological features at Lower Armory Grounds adjacent to the embankment (Figures 2.31). The park has recently installed wayside interpretive exhibits to describe the history of the site. Portions of Lower Armory Grounds have been excavated in the recent past, uncovering building foundations of a warehouse and smith and forging shop as well as miscellaneous artifacts. There have been no archeological investigations undertaken at Upper Armory Grounds or the Canalway to date.

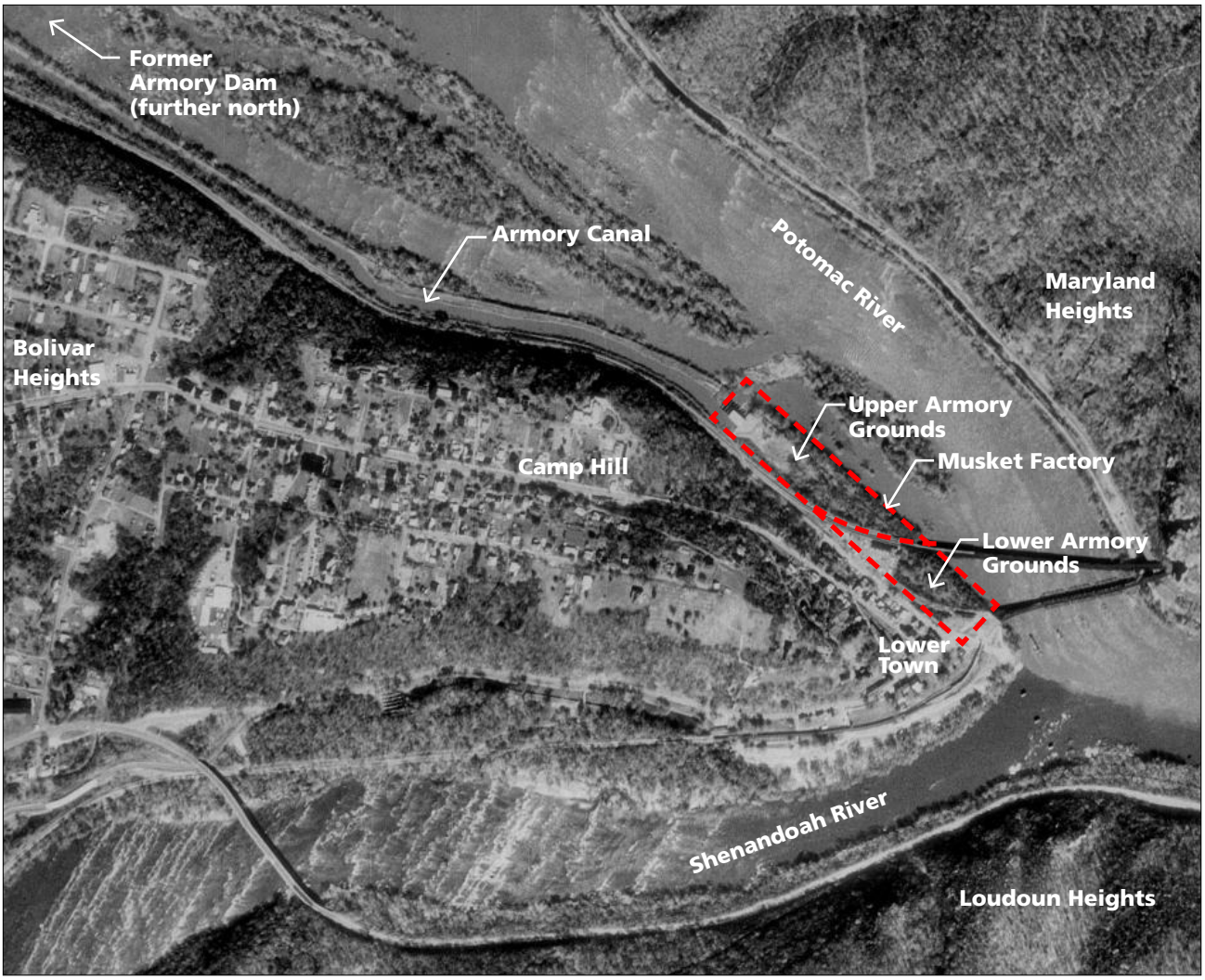


Figure 2.0. Aerial photograph, taken in 1988, of Harpers Ferry showing the Musket Factory site outlined in red, divided into Upper and Lower Armory Grounds and surrounded by three distinct landforms, including Maryland Heights, Loudoun Heights and Bolivar Heights. Harpers Ferry Photo Collection, HF-1988.

Figure 2.1. View looking west along Potomac Street. To the right is the embankment built in 1892, enclosing the Armory site at Lower Armory Grounds. The John Brown monument is on top of the berm in the distance to the right. Directly above is the W&P railroad overpass. OCLP, July, 2009.

Figure 2.2. Wooden steps lead down from the top of the berm to the Armory archeological sites at the Lower Armory Grounds. OCLP, July, 2009.

Figure 2.3. Stone retaining wall along the Potomac River at Lower Armory grounds. The change in grade is roughly twelve to fifteen feet. OCLP, February, 2007.

Figure 2.4. Another view of the retaining river wall revealing more of the stonework. OCLP, June, 2006.

Figure 2.5. Typical vegetation at Upper Armory Grounds. There are no trails through this area. OCLP, July, 2009.

Figure 2.6. The trees edging the archeological sites and along the shoreline partially obstruct views out to the bridge and beyond to the Maryland shore. OCLP, July, 2009.

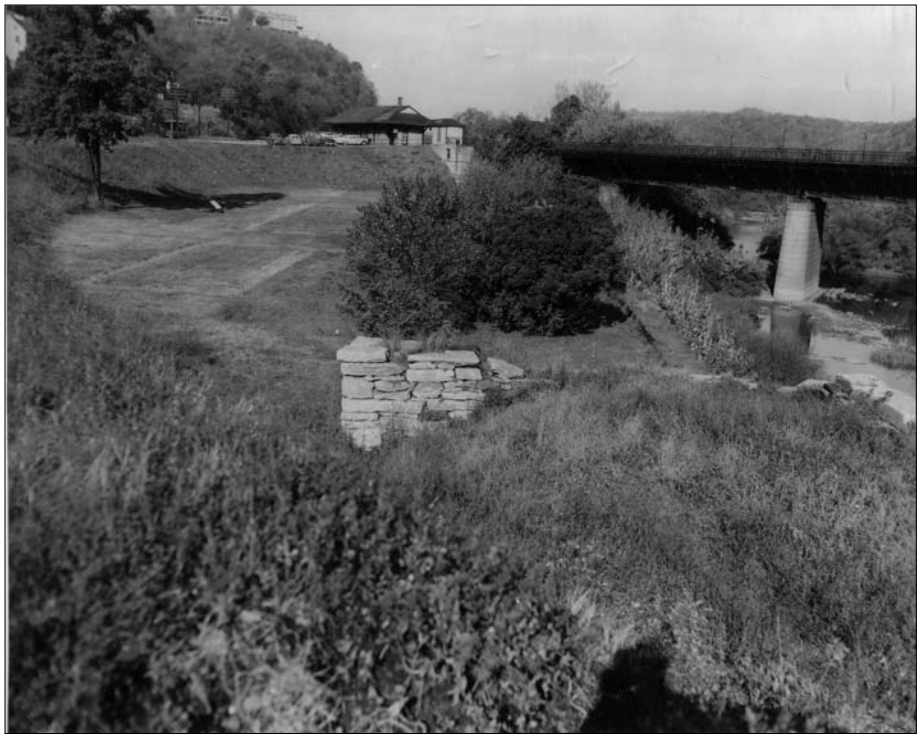


Figure 2.7. View of Lower Armory Grounds in 1958, showing the armory building foundations outlined in the ground. Vegetation included mown turf, one tree along the edge of the berm and shrubs along the river edge. The open character of the space provided views out to the bridge beyond as well as the railroad station. Note the stone river wall in the foreground. Harpers Ferry Photo Collection.

Figure 2.8. Contemporary view of the same location as above at Lower Armory Grounds. The only visual cues that link these two images are the stone wall in the foreground and the bridge beyond, barely seen in the bottom photo. The character of this particular landscape has completely changed with the tree coverage and the elimination of the shrubs by the wall. The trees also obscure views out to the bridge and the railroad station beyond. OCLP, February, 2007.

Figure 2.9. View into the Armory canal, northwest of the Armory grounds, covered in vegetation in summer. OCLP, June, 2006.

Figure 2.10. Potomac Street, looking east. To the left is a flagstone sidewalk along the 1892 embankment. OCLP, June, 2006.

Figure 2.11. View of John Brown monument atop the 1892 embankment on the original site of the Engine House. Note the hillside with historic buildings in the background and angle-iron picket fence lining the gravel drive behind the monument. OCLP, July, 2009.

Figure 2.12. View of the top of the 1892 embankment at Lower Armory Grounds, looking west. To the right is a dirt footpath leading to the parking lot beyond. OCLP, July, 2009.

Figure 2.13. View of concrete steps at Lower Armory Grounds with flagstone sidewalk and stone retaining wall in foreground. Access is currently closed. OCLP, June, 2006.

Figure 2.14. View of wooden steps at Lower Armory Grounds from the top of the 1892 berm overlooking the archeological sites. These steps are the only way to access this area. OCLP, July, 2009.

Figure 2.15. A new set of steps has recently been installed at the corner of Potomac and Shenandoah streets to facilitate more access to Lower Armory Grounds. OLCP, July, 2009.

Figure 2.16. Asphalt paved parking lot adjacent to the train station on top of 1930 embankment. OCLP, February, 2007.

Figure 2.17. Gravel access road at the 1892 embankment. The lower portion of the embankment is retained by a stone wall while the upper portion is retained by a concrete wall and grassy slope. OCLP, February, 2007.

Figure 2.18. View of abandoned railroad track alongside footpath atop the 1892 embankment. The train station parking lot is in the background. OCLP, July, 2009.

Figure 2.19. View of gravel-paved Upper Potomac Street, which extends to the former Armory dam. The Potomac River is to the right. Note the sloping topography on either side of the road and thick vegetation. OCLP, June, 2006.

Figure 2.20. View of Upper Armory Grounds with former hydroelectric plant to the left, enclosed by chainlink fencing. OCLP, July, 2009.

Figure 2.21. View of the historic river wall that supported the train trestle structure and extended the length of the Armory along the Potomac River. OCLP, June, 2006.

Figure 2.22. View of water outlet at the Armory canal that helped control the water level. Note the encroachment of vegetation through the structure. Most visitors are not aware of these features on the canal. OCLP, July, 2009.

Figures 2.23, 2.24. Views of the canal walls. The canal system played an important role providing water power for the manufacturing process at the Musket Factory. Note the vegetation infiltrating the structures as well. OCLP, June, 2006.

Figure 2.25. View of culvert built in 1892, along with the embankment, in order to mitigate drainage problems when the water level rose. This portion of the embankment was originally reinforced with stone. OCLP, June, 2006.

Figure 2.26. View from the top of the embankment looking eastward toward Lower Town with the Blue Ridge in the background. Potomac Street is immediately to the right of the berm. OCLP, November, 2007.

Figure 2.27. Trees covered in ivy block views to archeological sites and the river beyond. OCLP, July, 2009.

Figure 2.28. Visitors are rewarded with a dramatic view of the railroad bridges on the Potomac River after negotiating their way to the river's edge. M. Joseph, June, 2006.

Figure 2.29. View of the dam abutment northwest of the Armory Grounds. This bridge and platform provide the only opportunity at the study area to experience the river and take in wide, open views of the river scenery. OCLP, June, 2006.

Figure 2.30. View of wooden fencing installed by the park to screen CSX equipment on the embankment at Lower Armory Grounds. OCLP, July, 2009.

Figure 2.31. View of archeological sites at Lower Armory Grounds. Most of the investigations here have centered on the Armory building foundations. A view of the river to the left is obscured by volunteer tree growth. OCLP, July, 2009.

ANALYSIS AND EVALUATION

This chapter provides an overview of the historical significance of the study area of this report, described previously as the Historic United States Armory and Potomac Riverfront. The boundaries of this area includes the seventy-two acre former United States Armory Musket Factory site, extending along the southern banks of the Potomac River northwesterly to the water intake structures designed to fill the former canal that once powered the various workshops. The following analysis and evaluation is presented in two main sections. The first of these reviews the status, significance and overall integrity of the United States Armory and Potomac Riverfront landscape according to National Register of Historic Places documentation and according to National Register definitions and criteria.

The second portion of this analysis provides an evaluation of historic landscape character based on the cultural landscape methodology outlined in *A Guide to Cultural Landscape Reports: Contents, Process and Techniques*, published by the National Park Service in 1998. This methodology examines general landscape characteristics, such as spatial organization, circulation and vegetation, comparing existing landscape conditions with what is documented or otherwise understood of the historic condition of these landscape characteristics during the period of historical significance. An evaluation of "contributing" or otherwise "non-contributing" is assigned to each landscape characteristic examined based on the survival of tangible historic landscape features and also intangible landscape relationships that make it either possible or impossible for existing landscape conditions to convey the significance of the historic property.

A summary table of landscape features is provided at the end of the chapter specifically listing all documented landscape features and providing a convenient evaluation of that feature's historic significance, integrity or lack thereof. Seventy-two landscape features are listed on the chart with thirty-four of those features being evaluated as contributing. The table offers a concise reference to inform cultural resource decision making through the identification of these contributing and non-contributing landscape features.

For the purposes of the following analysis and evaluation, the project area is divided geographically into three landscape character areas consistent with the earlier description of existing site conditions. The Lower Armory Grounds occupies the site south of the active railroad line and includes the Armory archeological sites and the John Brown monument as well as the train station. The Upper Armory Grounds is the area north of the active railroad tracks extending northwest to the former hydroelectric power plant. The third sub-area, the Armory Canalway, extends from the former hydroelectric plant

northwest along the south shore of the Potomac River to the Armory dam and historic water intake structures that once provided water to the Armory canal.

NATIONAL REGISTER DOCUMENTATION

This analysis and evaluation is based on criteria and aspects of integrity developed by the National Register of Historic Places Program, which lists properties that are significant to our nation's history and prehistory. According to the National Register, historic significance may be present in districts, sites, buildings, structures and objects that possess integrity of location, design, materials, workmanship, feeling and association which meet at least one of the following criteria:

A. Associated with events that have made a significant contribution to the broad patterns of history.

B. Associated with the lives of persons significant in our past.

C. Embodies the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

D. Have yielded, or may be likely to yield, information important in prehistory or history.

In 1944, Congress established Harpers Ferry National Monument, including portions of Lower Town, Camp Hill, Loudoun Heights, Bolivar Heights and Maryland Heights owing to this landscape's role in both John Brown's raid upon the Armory in 1859, and for its history as bitterly contested ground throughout the Civil War (1981-1865). The West Virginia Legislature appropriated funds for acquiring land in 1951. Efforts at that time focused on restoring the town to reflect the period that encompassed these two major historical events. In 1963, subsequent legislation redesignated the national monument as Harpers Ferry National Historical Park.

On October 15, 1966, Harpers Ferry National Historical Park was administratively listed on the National Register of Historic Places following passage of the National Historic Preservation Act. In 1974, the original 1944 enabling legislation establishing the Harpers Ferry National Monument was amended to facilitate the expansion of the official park boundary to an unspecified limit not to exceed 2,000 acres, as well as to provide funds to develop parking and a shuttle transportation system. The 1974 amendment effectively

expanded the park boundaries well beyond West Virginia to include additional nearby lands within both Maryland and Virginia.

Five years later during 1979, the State Historic Preservation Office approved a formal National Register of Historic Places nomination, prepared to officially document the resources comprising the Harpers Ferry Historic District. The 1979 National Register documentation identified several periods of significance, including 1751, 1795, and 1800-1865. The three hundred-acre historic district preserves one hundred structures and sites, including historic cemeteries, sites of historic buildings, Civil War fortifications, the Musket Factory site, Armory dwellings, the Wager Lot and Camp Hill. Areas of historical significance expressed in the 1979 National Register documentation included archeology, architecture, commerce, industry, invention, military, politics/government, social and transportation. The boundaries of the area documented in 1979 were characterized as an early nineteenth century town with many residential buildings retaining their original exteriors.

One year prior to the 1979 National Register documentation of the Harpers Ferry Historic District, a draft National Register nomination was prepared for the Baltimore & Ohio Potomac River Crossing, then owned by the former Chessie System, this being the corporate predecessor to the CSX Corporation. The period of significance proposed in this1978 draft nomination covered three centuries from the eighteenth through the twentieth century, with specific dates including 1836, 1851, 1892 and 1931. The proposed areas of significance included commerce, engineering, industry, invention, military and transportation. The statement of significance recounted how the river crossing illustrates the relationship between railroad engineering and railroad economics. The State Historic Preservation Office and the National Park Service never approved the nomination, which remains in draft .

In 1980, legislation again increased the acreage within the official park boundary, this time by an additional 475 acres to the east, on the Virginia side of the Shenandoah River. The following year, additional National Register documentation was prepared and approved documenting historic resources within the park. The 1981 National Register documentation expanded the period of historical significance to include the entire nineteenth century in order to incorporate important themes of post Civil War history consistent with that of the former Storer College and the education of freed slaves, along with additional extant resources appearing after the Civil War. The areas of significance identified excluded transportation. The statement of significance expressed in the 1981 National Register documentation highlights the site's geographic location, John Hall's pioneering work in the manufacture of interchangeable parts, and John Brown's 1859 attempt to raid the Armory. It also notes the events that occurred during the Civil War and the early efforts to educate freed slaves.

In addition, the statement describes the site as an important archeological resource with many subsurface resources. Since 1981, the park has acquired additional properties, some of which have been independently listed on the National Register. A multiple property documentation form was approved to consolidate both existing and new information and to update the national historical park boundaries in December 1999.

In 2001, the former hydroelectric power plant, located on the site of Savery's former paper mill, as well as the former United States Armory Rolling Mill, was independently nominated for listing on the National Register. It is referred to as the Rolling Mill on the National Register under Harpers Ferry National Historical Park. The proposed statement of significance includes the building's association with three of the major water-powered industries in the Harpers Ferry economy from 1799 to 1991, and its architectural integrity as an early twentieth century water-powered electrical generating plant. The nomination was approved by the State Historic Preservation Office but was not certified by the Keeper of the National Register.

In 2004, after decades of intermittent negotiations, the most significant portion of this report's study area, being the former Armory Musket Factory site, was conveyed to the National Park Service from CSX Transportation Inc., the corporate entity created out of the former Chessie [railroad] System. The property was conveyed in three parcels encumbered by two easements facilitating continued use of the area adjacent to the southern Potomac bridge abutment as a railroad maintenance and staging area. During the same year, Congress passed the Harpers Ferry National Historical Park Revision Act, authorizing the addition of 1,240 acres of Civil War battlefield and viewshed to the park.

SUMMARY OF SIGNIFICANCE FOR THE UNITED STATES ARMORY AND POTOMAC RIVERFRONT SITE AT HARPERS FERRY

The Harpers Ferry National Historic Park landscape is significant in American history for association with historical events spanning approximate one-hundred years beginning with the late 18th century origins of the national armory at this location to the late 19th century post-Civil War accommodations made on behalf of freed African-American slaves. The park generally, and the study area of this report specifically, are of national significance as the setting of the abolitionist John Brown's failed 1859 raid upon the United States Armory, this event being widely accepted as a critical precursor to the 1861outbreak of the American Civil War.

The United States Armory and Potomac Riverfront landscape is nationally significant under National Register Criteria A, B and D. Under Criterion A, the site being significant in the areas of military and political events including the early formation of the United States' military organization and industrial capacity as well as the War of 1812 and the Civil War, 1861-1865. The Armory is also important under Criterion B for its association with productive life and activities of the abolitionist John Brown who was memorialized on site in 1894 by a group of African-Americans led by Frederick Douglass. Under Criterion D, the study area of this report preserves historical archeological sites which have yielded, and retain the promise of yielding additional, information regarding the United States Armory Musket Factory during the early nineteenth century. Also significant under Criterion D, the site has great potential to provide additional information regarding Native American habitation at the confluence of the Potomac and Shenandoah Rivers.

While of less-than-national significance, on site post Civil War resources are nevertheless regionally significant at a state or perhaps local level to the history of the economics of post Civil War industry and transportation. Thomas Savery's 1885 purchase of the ruined Armory property reintroduced a productive industrial use for the surviving water-powered infrastructure. Surviving yet abandoned late 19th and early 20th century railroad embankments on site, which overlay much of study area, are locally significant in the area of transportation, these earthen structures being part of Harpers Ferry's long history as a regional crossroads for rail transportation.

Politics/Government

Current National Register documentation makes reference to the role of politics and government as significant themes associated with the United States Armory at Harpers Ferry. George Washington designated Harpers Ferry as the location of one of two federal armories in 1796 because of its geography and natural resources. As the president of the Potowmack Company, Washington had visited Harpers Ferry and surrounding area earlier in 1785 seeking favorable locations for canals and sluices and perceived the great potential here for water power and transportation. The steep terrain offered protection against attack and the surrounding forests supplied ample timber. Once the Armory was in operation, two main bases of manufacturing evolved, consisting of the Musket Factory along the Potomac River and the Rifle Works on Hall's Island along the Shenandoah River. Through the operation of armories at Harpers Ferry and Springfield, Massachusetts, the young United States successfully reduced its dependence on foreign arms manufacturers. Meriwether Lewis visited Harpers Ferry in the spring of 1803 with William Clark in order to obtain supplies for his exploration of the Northwest Territory. At the Harpers Ferry Armory, Lewis procured fifteen rifles and powder horns, extra rifle and musket locks and a variety of other

tools and supplies. During the War of 1812, the Armory was able to manufacture 29,500 arms over the course of two years in support of the war effort. In 1846, the United States Armory at Harpers Ferry again furnished arms supporting the United States' war against Mexico. Manufacturing at the Armory ceased at the 1861 onset of the Civil War. The National Register recognizes the study area's importance to the park's historic significance under politics and government for its role as part of the early American federal government.

Commerce/Industry/Invention

National Register of historic places documentation notes the Armory's significance under the three areas of commerce, industry and invention. The Armory became a center for technological innovation and a model of the American System of Manufacturing. John Hall developed devices at the Rifle Works on nearby Hall's Island in the Shenandoah River that helped standardize and streamline the process of rifle manufacturing. The Musket Factory constructed parallel to the Potomac River shoreline was slower to embrace new methods for gun making. More traditional means were used at the Musket Factory site to manufacture the United States Model 1816 Flintlock Musket. The model was in service until 1844 when it was replaced with the Model 1842 United States Percussion Musket. The study area did eventually adopt many of the devices and machinery that resulted from the new technology. The National Register recognizes the innovations associated with John Hall but does not relate directly the study area of this report specifically with these technical advancements.

After the United States sold the Armory property in 1884, new industrial uses were introduced on the site. The new owner, Delaware businessman Thomas Savery, constructed a paper mill on the foundations of the former Rolling Mill at the western end of the Armory grounds. He then utilized some of the power harnessed at the mill to establish an electrical power plant. After a fire destroyed the paper mill in 1925, a new building was constructed for generating water powered electricity for the immediate vicinity. Although the National Register documents the role of the study area in private industry during the latter part of the nineteenth century, the period of national significance ends in 1865 at the conclusion of the Civil War.

Social/Humanitarian

The National Register identifies the Armory's for its association with social and humanitarian historical events. John Brown was a leader of the anti-slavery movement to the point of attempting to personally free the slaves. He chose Harpers Ferry as the starting point of his campaign because of the store of arms and access to slaves whom he wished to free and arm. On October 16, 1859, Brown instigated his raid with eighteen other men. Brown's raiders briefly

captured the Armory and attempted to take hostages and incite an insurrection among slaves in the immediate region. After shooting broke out, John Brown and his men sought refuge in the Armory's Engine House, located on the Musket Factory grounds near the main entrance. The following day United States Marines, led by Colonel Robert E. Lee, were able to capture Brown and end the crisis. Brown was found guilty of treason and of conspiring with slaves to rebel and of murder. He was then hanged in December 1859. His trial and execution galvanized both sides of the slavery debate and provided a catalyst for the outbreak of the Civil War. In 1894, Frederick Douglass led an effort to commemorate John Brown's raid at the United States Armory at Harpers Ferry and succeeded in having a monument erected on what was then B&O Company property. The memorial consists of an obelisk situated over top of the original location of the Engine House. The National Register recognizes the historic significance of John Brown's raid of the United States Armory at Harpers Ferry.

Military

The National Register recognizes the study area's historic significance for its association with military events. Between 1861 and 1865, control of the Armory and the town of Harpers Ferry alternated eight times among Confederate and Union forces. On April 17, 1861, the state of Virginia met in a secret session and voted to secede from the Union. The western portion of Virginia never agreed politically with the eastern side over secession, causing internal turmoil within the state legislature. The western region was eventually admitted to the Union as a new separate state in 1863. After Virginia had initially seceded, Federal soldiers set fire to the Armory and arsenal and destroyed 15,000 weapons, although Confederate forces were able to salvage some of the gun making equipment and ship it to other southern manufacturing centers. In 1862, Major General Stonewall Jackson surrounded and captured 12,693 men of the Union garrison stationed at Harpers Ferry, the largest surrender of Union forces throughout the war. Following several episodes of capture and recapture, Union General Philip H. Sheridan used Harpers Ferry as his base of operations and defeated Confederate troops in the Shenandoah Valley. By the time the Civil War ended in 1865 most of the Armory had been destroyed along with other industries and dwellings in the town. In 1897, the War Department installed five tablets commemorating the capture of Harpers Ferry during the Civil War. The tablets were initially located next to the John Brown memorial obelisk. In 1931, after the train station relocated, the tablets were moved to a location along the US-340 highway. After approximately twenty years, the tablets were then placed adjacent to Arsenal Square in Lower Town. The study area is historically significant for its role as a strategic location and resource during the Civil War.

Archeology – Historic (Prehistoric)

National Register documentation references the archeological significance of Harpers Ferry National Historical Park. Approximately forty-three percent of the park land has been surveyed and inventoried for archeological sites. Archeological surveys were conducted in 1964 and 1965, revealing the original macadam roadway surface of Shenandoah Street as well as the location of the Armory perimeter fence foundations. Work performed in the 1990s discovered evidence of Native American habitation at the confluence of the two rivers. A three-year archeological investigation at the Armory grounds is currently underway, specifically in the northeast quadrant of the Lower Armory Grounds where portions of a warehouse and smith and forging shops are accessible. At the Upper Armory Grounds, the ruins of ten additional Armory structures may be accessed in the future. The remaining Armory building foundations lay beneath the massive 1892 and 1931 railroad embankments. The study area is significant in the area of archeology for the subsurface resources relating to the Armory as well as the potential to provide information regarding prehistoric habitation.

NATIONAL REGISTER INTEGRITY

Integrity is the ability of a property to convey its historic identity and significance. While evaluation of integrity is often a subjective judgment, it must be grounded in an understanding of a property's physical features and how these relate to its significance. The National Register identifies seven aspects of integrity comprising location, design, setting, materials, workmanship, feeling and association. Retention of these qualities is essential for a property to convey its significance, though all seven qualities need not be present to convey a sense of past time and place. Using these seven aspects of integrity, the six areas of significance identified above are summarized in the following table.

Overall, the United States Armory at Harpers Ferry/Potomac Riverfront retains little above-ground historical integrity. Most of the Armory structures were destroyed by the end of the Civil War. The original topography has been profoundly altered and bears almost no resemblance to when the site functioned as an arms manufacturing facility. Surviving Armory structures include the river wall, remnants of the canal and the dam, the Rolling Mill foundations, as well as the reconstructed John Brown's Fort located off-site. The most visible historic landscape characteristics today relate to the 1870-1944 time period when the current overall topography and land use was established. By 1944, the two railroad embankments were in place and the remaining Lower Armory grounds was maintained as a memorial space. Although no longer operational, the former hydroelectric plant at Upper Armory Grounds is still extant. Aside from the use of interpretive signage, it is a challenge to convey the former scale and magnitude

of the Armory landscape as well as the events that occurred on site, under existing conditions.

EVALUATION OF LANDSCAPE CHARACTERISTICS AND FEATURES

The following evaluation of landscape characteristics examines the entire study area, followed by a table outlining all documented features. Each of the following landscape characteristics are evaluated based on a comparison between existing conditions and historic conditions, concluding with a determination regarding the contribution of each landscape characteristic. Extant characteristics and features evaluated as "contributing" are those that were present during the period of significance and that are in a condition that continues to convey the historic character of the property. Characteristics evaluated as "non-contributing" are those that were not present during the historic period, or which have changed to an extent that make it difficult to convey the historic character of the property to park visitors. The following is the format used for the evaluation of each landscape characteristic:

Historic Condition: A brief outline of the history of landscape characteristics and associated features.

Existing Condition: A brief description of the physical condition.

Evaluation: A determination of each landscape characteristic or feature's contribution to the significance of the landscape.

> Contributing – Characteristics and features that contribute to the significance of the historic district were present during the period of significance, possess historic integrity and are related to the areas of historic significance.
>
> Non-contributing – Characteristics and features that do not contribute to the significance of the historic district were not present during the period of significance, do not retain historic integrity or are unrelated to the area of historic significance.
>
> Undetermined – Characteristics and features that require additional information to determine if they contribute to the significance of the historic district.

The landscape characteristics associated with the United States Armory and Potomac Riverfront landscape are:

TOPOGRAPHY

Historic Condition: Located at the confluence of the Potomac and Shenandoah rivers, the study area was originally a fairly flat, linear area situated in a northwest to southeast direction at the base of a steep hillside. These topographical features not only influenced the location of the Musket Factory, but also the layout of the complex as two long, continuous rows of buildings parallel to the river.

Existing Condition: Railroad expansion, in 1892 and again in 1930, has resulted in a landscape divided into Lower and Upper Armory Grounds by the construction of two twenty-foot high earthen embankments. In addition, both embankments cover much of the Armory's archeological sites, including many of the Armory buildings. Running along the edge of Potomac Street, these embankments also physically and visually separate the site from the rest of the town of Harpers Ferry.

Evaluation: Non-contributing because of extensive land manipulation. The existing topography does not contribute to the historic character of the landscape.

SPATIAL ORGANIZATION

Historic Condition: Originally, the Musket Factory site was organized into two parallel rows of buildings housing the manufacturing operations as well as offices and some housing for the workers. A seventy-foot wide road began at the main entrance to the southeast and ran between the two rows of structures. The site was bounded by the Potomac River train trestle to the north and the Armory canal and perimeter fence to the south.

Existing Condition: While in private ownership, the landscape was transformed significantly, obliterating or burying much of the historic fabric of the Armory. All the buildings, except for the Engine House once occupied by John Brown, have been destroyed. The ornamental iron perimeter fence enclosing the complex was also eliminated along with the paved main road that once ran down the center of the Armory parallel to the current Potomac Street.

Evaluation: Non-contributing because of the removal of most Armory structures. The Armory site does not retain its original spatial organization when it functioned as an arms manufacturing facility.

LAND USE

Historic Condition: During the period of significance, the project site functioned as a manufacturing facility for muskets, consisting of water-powered machinery, forges, stock warehouses and offices. In addition, the tilt-hammer shop constructed in 1809 housed some of the workers. The site ceased to operate as

an arms manufacturer at the onset of the Civil War and was subsequently used as a staging area and storage depot. After the war, the project site continued to be utilized by the railroads and new businesses, including a paper mill at the site of the former Rolling Mill. In 1898, a portion of the power generated at the mill was used for a hydroelectric plant. After a fire in 1925, the building was rebuilt solely for hydroelectricity and stayed in operation until 1991. Memorials were also established, beginning in 1897, on the Armory grounds commemorating John Brown's raid, the Civil War and the Musket Factory.

Existing Condition: The railroad introduced significant changes in land use when it built an embankment at the east end of the Armory site in 1892 and another embankment in 1930. The railroad continues prominence in the landscape, with its associated parking lot, train station and tracks, as well as the two embankments. The former Musket Factory site offers visitor attractions including the monument to John Brown as well as archeological sites at the Lower Armory Grounds.

Evaluation: Non-contributing. The current land use does not contribute to the historic character of the landscape.

VEGETATION

Historic Condition: Prior to the 1850s, little attention was given to the landscape. In the mid-1850s, the grounds around the buildings were landscaped with turf grass and shade trees along the main thoroughfare. Historic images provide a view of treetops within the complex seen from afar, but their exact locations were not recorded.

Existing Condition: In 1916, the Baltimore & Ohio (B&O) Railroad created a commemorative garden on the site of the Armory buildings at what is now called Lower Armory Grounds. Trees were planted around the base of the embankment and the river edge along with shrubs, but none of the shrubs remain. Today, vegetation on the site is comprised of mostly self-sown woody growth that has matured in the absence of maintenance over the past fifty years. Trees have grown all along the river edge, blocking views of the river and potentially undermining the foundations of the river wall. Many trees are also covered with vines. Vegetation along the shoreline today includes maples, river birch, cottonwoods and willow trees. Invasive shrubs and vines are growing in and over the river and canal walls. Mown turf is maintained on the 1892 embankment.

Evaluation: Non-contributing. The existing vegetation does not contribute to the historic character of the landscape.

CIRCULATION

Historic Condition: Circulation at the Musket Factory consisted of one main vehicular road starting at the main entrance off of Shenandoah Street, bisecting the two rows of buildings. Most of the site appeared to have been paved up to the river. Pedestrian circulation once included flagstone walks in front of the buildings along the main road. Along the river edge, the B&O Railroad constructed tracks on an elevated trestle structure in 1839, spanning the entire length of the Musket Factory as it made its way to Maryland and beyond to the Ohio River.

Existing Condition: Railroad tracks cross the Potomac River from Maryland and bisect the site before continuing north. There are also abandoned tracks on the top of the embankment at Lower Armory Grounds. Non-pedestrian circulation at Lower Armory Grounds is comprised of a paved road, built by the railroad company, leading from Potomac Street to a parking lot adjacent to the train station. There is also a road leading off of Potomac Street to an area over the culvert where the CSX Corporation currently stores equipment and materials. In addition, a gravel access road is located at the northeastern corner of Lower Armory Grounds ascending the embankment to the CSX storage area. For pedestrians, there is a flagstone sidewalk on the edge of the Armory site where Shenandoah Street ends at Potomac Street. To continue walking down Potomac Street, pedestrians must cross the street opposite the Armory. A footpath is located along the top of the berm parallel to the abandoned railroad tracks. Wooden steps lead visitors down the side of the embankment to the archeological sites. There is also a set of concrete steps from Potomac Street to the top of the embankment near the culvert, but it is currently closed. A new set of steps has recently been built into the slope of the berm at the corner of Potomac and Shenandoah streets for additional access.

To reach Upper Armory Grounds, where the former hydroelectric plant is located, visitors can drive on Potomac Street which crosses the train tracks and turns into a roughly twelve-foot wide gravel road, referred to as Upper Potomac Street. At the Upper Armory Grounds, there is no defined pedestrian access through the area. Upper Potomac Street continues through the Canalway area up to Dam #3. A trail has recently been established in this area, beginning at the dam, tracing the top of the railroad berm and canal dike. The trail is projected to eventually connect southeastward to Upper Armory Grounds.

Evaluation: Non-contributing. The existing circulation does not contribute to the historic character of the landscape.

BUILDINGS AND STRUCTURES

Historic Condition: The study area once comprised twenty buildings at the height of arms production in the mid to late 1850s, housing various forging, smith, annealing shops as well as the storage of raw materials, warehouses and offices. Structures consisted of the dam and the canal that ran along the southern edge of the site, the Armory river wall and adjacent trestle that supported the former B&O Railroad. Additional structures consisted of the perimeter fence enclosing the southern and eastern edges of the Armory and wrought iron gates at the main entrance. By the end of the Civil War, many of the buildings in the Musket Factory had been destroyed.

Existing Condition: There are currently three buildings within the study area of this report. These include the railroad station, built in 1894 and moved to its present site in 1931, located adjacent to the tracks along the 1930 embankment, and the former hydroelectric plant, constructed on the foundations of the former Rolling Mill in 1925, located at Upper Armory Grounds. John Brown's Fort is an original structure from the Musket Factory, but has been rebuilt and relocated several times. It is now situated about 150 feet east of its original location.

Structures on the project site consist of the retaining river wall and remnants of the canal used to power manufacturing equipment. Along the canal wall, water outlets can also still be seen. At the Lower Armory Grounds, the B&O Railroad incorporated an eight-foot high culvert in the embankment between Potomac Street and the river in 1892. Additional drainage structures are located throughout the site, including a drain under the 1892 railroad embankment and another drainage structure under Upper Potomac Street.

Evaluation: The retaining river wall, dam and canal and train station contribute to the character of the historic landscape. The hydroelectric plant contributes to the character of the landscape because it retains portions of earlier buildings associated with the Armory site in addition to its continued industrial use, including water power, until 1991.

VIEWS AND VISTAS

Historic Condition: From its location along the banks of the Potomac River, the Armory site once offered views of the surrounding dramatic topography including Maryland Heights to the north and Camp Hill immediately south. The Armory itself was also part of the viewshed from Jefferson's Rock and Camp Hill, which were popular tourist attractions at Harpers Ferry in the mid-nineteenth century.

Existing Condition: At the Armory site, the 1892 embankment at the eastern end affords views out across Potomac Street to the town of Harpers Ferry with the

Blue Ridge Mountains in the background. In contrast, views of the Musket Factory archeological sites and across the river are blocked by trees. There are also dramatic views of the railroad bridges from the river edge, but there is no defined path to access it. The former hydroelectric plant at the Upper Armory Grounds provides a different perspective by providing visual access over the river and affording open views of the river and surrounding scenery. Since the Musket Factory complex does not survive, the historic view from Jefferson's Rock and Camp Hill no longer exists.

Evaluation: Contributing, but views from the project area are impacted by the growth of non-historic woody vegetation.

SMALL SCALE FEATURES

Historic Condition: Small scale features at the Musket Factory once consisted of street lamps that lined the main road and entrance. A flagpole was also located at the eastern end of the Musket Factory site, in close proximity to the entrance gate to the complex. There were also bollards, most likely granite, lined up along the main entrance as well.

Existing Conditions: At the Armory site, small scale features include the John Brown monument and wayside interpretation exhibit describing the history of John Brown's ill fated attack on the Armory. Constructed of granite, the obelisk is located over the original site of the building John Brown used as refuge. An interpretive sign is located at the entry road leading up to the railroad station. The sign describes Meriwether Lewis' visit to Harpers Ferry in 1803 to gather supplies in preparation for his expedition to the Pacific coast with William Clark. A new series of interpretive wayside exhibits have been installed at Lower Armory Grounds, including around the archeological sites, the top of the berm, and at the Point.

At the train station area, there are two types of light fixtures, which are included on the List of Classified Structures (LCS) for its association with the Baltimore & Ohio Railroad Station. One of these features a straight lamp standard, mounting a lantern-style luminaire, while the second type features a curved goose-neck style lamp standard, with the light provided below a broad shade. The goose-neck style lamp standards identified by the LCS have been removed, and the recent rehabilitation of the train station has introduced contemporary light fixtures employing the curved lamp standard as a motif element. Additional small scale features include non-historic wooden fencing installed by the park service to screen equipment from view at the Lower Armory Grounds.

Evaluation: Contributing. The John Brown obelisk contributes to the historic character of the landscape.

ARCHEOLOGICAL SITES

Historic Condition: Construction began on the United States Armory at Harpers Ferry in 1798 and continued through 1855. Except for the Rolling Mill foundations and John Brown's Fort, most of the structures and physical features of the Musket Factory site no longer survive above ground.

Existing Condition: Excavations have been recently conducted at Lower Armory Grounds adjacent to the embankment. Portions of a warehouse and the smith and forging shops are located within Lower Armory Grounds. The Upper Armory Grounds, which is over the site of ten Armory structures, has yet to be explored archeologically.

Evaluation: Contributing. The archeological resources contribute or have the potential to contribute to knowledge and understanding of the historic cultural landscape.

The following table provides a summary of existing landscape features, along with a determination as to whether the feature contributes to the site's historic significance. The table is divided into the three main landscape character areas, Lower Armory Grounds, Upper Armory Grounds, and the Canalway, and indicates if the feature was extant during two key historical periods. The first significant period is 1865 covering the end of the Civil War during which the Armory, along with the town, was a center of conflict resulting in the destruction of the Musket Factory and the end of federal arms manufacturing at Harpers Ferry. The second key period is 1900 when the site was under private ownership and utilized for commercial transportation and industry. The table then identifies whether the feature is contributing and if so, the key historical themes are then identified, such as industrial, military, and transportation. The next column lists the level of significance, including national, state or local, providing a context within which to understand the particular theme. The final column furnishes additional information about the feature. Certain features are currently listed as "undetermined" due to a lack of information regarding its history.

The following table evaluates individual landscape features organized by sub-area and by characteristic type.

TABLE 1: SUMMARY OF LANDSCAPE CHARACTERISTICS AND FEATURES

CULTURAL LANDSCAPE REPORT FOR UNITED STATES ARMORY AND POTOMAC RIVERFRONT - HARPERS FERRY NATIONAL HISTORICAL PARK

LOWER ARMORY GROUNDS

Feature	Extant 1865	Extant 1900	Contrib-uting	Theme	Level	Notes
Lower Armory Circulation Features						
Concrete steps at eastern end of 1892 embankment (Figure 3.1)	No	Yes	Yes	Industry/ Transpor-tation	State	The set of approximately thirty-five steps was built into the 1892 embankment, providing pedestrian access from Potomac Street to a brick platform and train station. The steps are currently closed to foot traffic.
Potomac Street (LCS ID 000571)	Yes	Yes	Yes	Town fabric	Local	One of the oldest streets in Harpers Ferry, Potomac Street forms the southern boundary of the study area. Under Superintendent Major John Symington's direction in the late 1840s, the street was widened, and a stone retaining wall was constructed on one side to prevent the deposit of waste from the hill into the Armory canal.
Flagstone sidewalk on northern edge of Potomac Street (Figure 3.2)	No	Yes	Yes	Town fabric	Local	The flagstone sidewalk is located at the eastern edge of the study area under the railroad bridge and is edged with vertical bluestone and granite curbing, fifteen inches in height. The sidewalk appears to be original to when the 1892 embankment was built.
Gravel access road along 1892 embankment (Figure 3.3)	No	Yes	Yes	Industry/ Transpor-tation	Local	The road was constructed along with the 1892 embankment to provide vehicular access to the original train station site. The station was later moved in 1930.
Pedestrian bridge/ spur trail at the Point (Figure 3.4)	No	No	Yes	Industry/ Transpor-tation	Local	The pedestrian bridge is integrated with the railroad bridge spanning the Potomac River.
Asphalt driveway to train station	No	No	No	None	n/a	The road provides access off of Potomac Street to the train station and parking lot.
Asphalt parking lot at train station	No	No	No	None	n/a	Asphalt paved parking lot, with concrete wheelstops, provides approximately eighty-five spaces, southwest of the train station.
Footpath along 1892 embankment (Figure 3.5)	No	No	No	None	n/a	A dirt footpath runs along the top of the 1892 embankment, parallel to the abandoned railroad tracks. This unpaved footpath was once a paved boardwalk or concrete sidewalk, the only remnant of which is a concrete curbing.
Wooden steps at railroad embankment (Figure 3.6)	No	No	No	None	n/a	A set of wooden steps with handrails are located on the northern slope of the 1892 railroad embankment. These were constructed post-2004 after the NPS acquired the site.
New concrete viewing platform	No	No	No	None	n/a	An accessible concrete landing has been installed at the western end of the 1892 embankment near the train station

						overlooking Lower Armory Grounds.
Potomac Street terminus at the Point	No	No	No	None	n/a	Open, gravel paved area was once the site of the Ferry Lot, a bustling commercial hub until the Civil War.
Timber curbing at the Point	No	No	No	None	n/a	Timber curb, consisting of 6"x6" notched boards, for edging at gravel paving by pedestrian spur trail.
Gravel access road from CSX yard to Lower Armory Grounds (Figure 3.7)	No	No	No	None	n/a	The access road is located on the northwest side of the 1892 embankment within Lower Armory Grounds.
Stone steps to gravel access road at 1892 embankment (Figure 3.8)	No	Unknown	Undet-ermined			A set of four stone steps with dry-laid stone cheek walls are located off of Potomac Street, leading to the gravel access road.
Lower Armory Buildings and Structures						
John Brown's Fort (Engine House) (Figure 3.9)	Yes	No *(off-site)*	Yes	Military	National	Constructed in 1848, the Engine House was John Browns refuge at the end his attempted raid on the Musket Factory. Thomas Savery sold the Engine House to businessmen in 1891 who exhibited the building at the World's Columbian Exposition in Chicago. It was then moved to the grounds of Murphy's Farm near Storer College, then to the campus itself. It is currently located at Arsenal Square.
Musket Factory Retaining Wall (LCS ID 045495) (Figure 3.10)	Yes	Yes	Yes	Industry/ Transpor-tation	National	The stone river wall was constructed by the B&O Railroad, from 1840-1843, to support a railroad trestle and runs the length of the Musket Factory. Trees have grown along the wall that could potentially impair structural integrity.
Train station (LCS ID 251723)	No	Yes	Yes	Industry/ Transpor-tation	Local	The B&O Railroad built the train station in 1894. The building was moved to its present location in 1931 after a second embankment was constructed to realign the railroad line. The building is listed separately on the National Register.
B&O Railroad Embankment (lower), 1892	No	Yes	Yes	Industry/ Transpor-tation	State	Constructed in 1892, the embankment, with stone and mortar retaining wall, is at the eastern and southern edges of the Musket Factory site and covers the site of John Brown's Fort. The embankment was constructed in part with fill from the tunnel excavation through Maryland Heights, across the Potomac River.
Stone culvert and associated stone retaining walls at eastern portion of the 1892 embankment (Figure 3.11)	No	Yes	Yes	Industry/ Transpor-tation	State	The eight-foot diameter culvert was constructed along with the railroad embankment in 1892 to mitigate flooding.
Battered, dry-laid rubble retaining wall on Potomac Street (Figure 3.12)	No	Yes	Yes	Industry/ Transpor-tation	State	A stone retaining wall is located on the southern side of the 1892 embankment on Potomac Street.
Concrete, board finished, retaining wall along gravel	No	No	No	None	n/a	The concrete retaining wall is located along the northern edge of the gravel access road on the 1892 embankment.

access road (see Figure 3.3)						
Utility access platform with wooden steps (Figure 3.13)	No	No	No	None	n/a	A new utility has been installed and set on a wooden platform recently built into the side of the 1892 embankment with wooden steps, adjacent to the train station parking lot.
Lower Armory Small Scale Features						
John Brown memorial obelisk (LCS ID 045505) (Figure 3.14)	No	Yes	Yes	Memorial	National	In 1894, Frederick Douglass, a leading American abolitionist, led a group of African-Americans in an effort to commemorate the deeds of John Brown and established a memorial obelisk at Harpers Ferry. The eight-foot local gray limestone obelisk is located over the original site of John Brown's Fort.
Lamp posts at train station area (LCS ID 251897) (Figures 3.15, 3.16)	No	Yes	Yes, see notes	Transpor-tation	Local	Seven metal lamp posts and light fixtures, including two in disrepair, are located around the train station and parking lot. Curved goose-neck lamp standards installed in the train station parking lot are non-historic, being installed during a 2007 rehabilitation project.
Angle-iron picket fence (Figure 3.17)	No	No	No	Industry/ Transpor-tation	Local	Installed around 1910, an iron picket fence lines the southern edge of the access gravel road on the 1892 embankment.
Civil War tablets at the Point (Figure 3.18)	No	Yes	No	None	n/a	Five iron tablets, installed by the War Department in 1897, are located near the railroad embankment at the southwest area of the Point. They were originally located on the 1892 railroad embankment adjacent to the John Brown obelisk, and were moved in the 1930s near U.S. Highway 340.
Wayside interpretive exhibits	No	No	No	None	n/a	Nineteen interpretive signs have been installed throughout Lower Armory Grounds.
Various regulatory and parking signage around	No	No	No	None	n/a	A series of no parking signs and other miscellaneous signs are located along the southern edge of Lower Armory Grounds on Potomac Street.
Lewis & Clark wayside interpretive sign (Figure 3.19)	No	No	No	None	n/a	A metal signpost adjacent to the gravel access road describes Meriwether Lewis' visit to Harpers Ferry to gather supplies for his expedition through the Northwest Territory with William Clark.
Wooden fence (Figure 3.20)	No	No	No	None	n/a	The NPS installed a wooden board fence, located on the 1892 embankment, for screening railroad equipment around the CSX storage yard.
Metal access gate at gravel road	No	No	No	None	n/a	A metal gate, painted brown, is located at the bottom of the access road.
Drinking fountain (Figure 3.21)	No	No	No	None	n/a	Painted wood post with metal pipe and spigot, located on the corner of Potomac and Shenandoah streets. Fixture is designed in the motif of a hand pump
Trash receptacles at the Point and train station area	No	No	No	None	n/a	Two metal receptacles, painted brown, are located near the guardrail and wayside exhibits at the Point. Three other receptacles are located adjacent to the train station.
Metal bicycle racks at the Point	No	No	No	None	n/a	Two metal bicycle racks, painted brown, are located adjacent to the Civil War tablets.
Chain link fence at the Point	No	No	No	None	n/a	At the northwest corner of the Point, the fence separates the CSX yard from the Point.
Metal safety railing	No	No	No	None	n/a	A painted metal safety railing runs along the

at the Point						elevated river edge of the Point and along the edge of the pedestrian spur trail.
Metal safety railing atop 1892 embankment	No	No	No	None	n/a	A new metal pipe safety railing, painted black, has been installed adjacent to the accessible overlook at the western end of the 1892 embankment.
Interpretive wayside exhibits	No	No	No	None	n/a	The signs are located along the riverside edge of the Point.
Utility poles	No	No	No	None	n/a	Utility poles are located near the Civil War tablets at the southwest side of the Point.
Lamp posts (refer back to Figure 3.4)	No	No	No	None	n/a	Two wooden lamp posts, at the Point by the spur trail, and on Potomac Street. The light posts feature glass and metal lantern light fixtures.
Wood benches	No	No	No	None	n/a	Two wooden backless benches, painted brown, are located along the eastern edge of the Point.
Metal guardrail by train station (Figure 3.22)	No	No	No			A metal pipe railing with welded pickets is located along northern edge of railroad tracks along the 1930 embankment.
Concrete drainage gutter (Figure 3.23)	No	Unknown	Undetermined			The drainage gutter is located along the southern edge of the gravel access road on the 1892 embankment.
Lower Armory Archeological Features						
Lower Armory Grounds buildings and circulation	Yes	Yes	Yes	Military/ Industrial	National	Archeological investigations were performed from 2005-2008.
Armory river wall and tailraces	Yes	Yes	Yes	Military/ Industrial	National	The stone retaining wall with water outlets was constructed by the Armory from 1837 to 1839. The structure is currently below grade.
Lower Armory Views						
View from banks of Potomac River	Yes	Yes	Yes	Historic View, Setting	Local	The views are blocked by the growth of non-historic volunteer trees throughout the site.
View from the Point of the Potomac Water Gap	Yes	Yes	Yes	Historic View, Setting	National	The viewshed from the Point has been a popular visitor attraction since the Point, formerly known as the Ferry Lot, was a bustling commercial center in the early and mid-nineteenth century with a ferry landing, hotel, shops, a saloon, and restaurant.
View of the Musket Factory from Jefferson's Rock and Camp Hill	Yes	Yes	Yes	Historic View, Setting	Local	The Musket Factory itself was part of the vista enjoyed by visitors to the area in the nineteenth century and can be seen in historic engravings. With the Armory complex eliminated, the historic viewshed no longer exists.
Lower Armory Vegetation						
Volunteer plant growth	No	No	No	None	n/a	Portions of the study area are covered with volunteer trees, many of which are covered with vines, including the river edge, the 1892 embankment and around the Point.

UPPER ARMORY GROUNDS						
Feature	**Extant 1865**	**Extant 1900**	**Contri-buting**	**Theme**	**Level**	**Notes**
Upper Armory Circulation Features						
Gravel driveway into Upper Armory Grounds (Figure 3.24)	No	Yes	Yes	Industry/ Transpor-tation	State	The gravel drive provides access to the former hydroelectric plant area.
Upper Potomac	Yes	Yes	Yes	Town	Local	Beginning at Upper Armory Grounds, the

Street (Figure 3.25)				fabric		twelve-foot wide gravel road extends from Potomac Street and runs parallel to the Canalway and Potomac River and reaches to the former Armory dam.
Upper Armory Buildings and Structures						
Musket Factory Retaining Wall (LCS ID 045495) (Figure 3.26)	Yes	Yes	Yes	Industry/ Transpor-tation	National	The river wall was constructed by the B&O Railroad, 1840 to 1843, to support a railroad trestle and runs the length of the Musket Factory. Trees have grown along the wall that could potentially impair structural integrity.
Musket Factory Rolling Mill (LCS ID 045494) (Figure 3.27)	Yes	Yes	Yes	Military/ Industry	National and State	A Rolling Mill was constructed in 1853 on the foundations of the old tilt hammer shop. In 1889, a paper mill was constructed on the foundations of the Rolling Mill. A fire in 1925 damaged much of the structure and a brick hydro-electric plant was then built, incorporating the surviving exterior walls. Built on the foundations of the former Armory Rolling Mill, the hydroelectric plant operated from 1925 until 1991. The building is also on the National Register and the, and recorded by HAER, WV-61.
Armory canal wall remnants (Figure 3.28)	Yes	Yes	Yes	Military/ Industry	National	Portions of the Armory canal wall constructed 1799-1801 are exposed in this area and have been impacted by the growth of unmanaged vegetation.
Upper Armory Small Scale Features						
Chain link fencing	No	No	No	None	n/a	Chain link fencing encloses the former hydroelectric plant and its immediate area.
Signage	No	No	No	None	n/a	Metal park regulatory signage posted on chain link fence.
Utility poles	No	No	No	None	n/a	Utility poles are located on the northern edge of Potomac and Upper Potomac streets.
Upper Armory Archeological Features						
Upper Armory Grounds buildings and circulation	Yes	Yes	Yes	Military/ Industrial	National	Archeological investigations have not been undertaken in this area.
Armory river wall	Yes	Yes	Yes	Military/ Industrial	National	The stone retaining wall was constructed by the Armory from 1837 to 1839. The structure is mostly below grade.
Upper Armory Views						
View from banks of Potomac River	Yes	Yes	Yes	Historic View, Setting	Local	The views are blocked by the growth of non-historic volunteer trees throughout the site.
View of the Musket Factory from Jefferson's Rock and Camp Hill	Yes	Yes	Yes	Historic View, Setting	Local	The Musket Factory itself was part of the viewshed enjoyed by visitors to the area in the early nineteenth century and can be seen in historic engravings. With the Armory complex eliminated, the historic viewshed no longer exists.
Upper Armory Vegetation						
Volunteer plant growth	No	No	No	None	n/a	Much of the study area is covered with volunteer tree growth and brush, making it difficult to view historic features such as remnants of the canal wall and the river retaining wall.

CANALWAY						
Feature	**Extant 1865**	**Extant 1900**	**Contri-buting**	**Theme**	**Level**	**Notes**
Canalway Circulation Features						
Trail on top of berm	No	No	No	None	n/a	A new trail has recently been cut on top of the canal berm starting at the dam towards Upper Armory Grounds.
Canalway Buildings and Structures						
Armory dam (LCS ID 045493)	Yes	Yes	Yes	Military/ Industrial	National	The ruins of the dam are currently capped with concrete.
Dam intake structure (Figures 3.29, 3.30)	Yes	Yes	Yes	Military/ Industry	National	The visible structure consists of 20th century concrete piers and metal gates with a wooden walkway and metal guardrail on top, and a metal set of steps. Contemporary structure is constructed over early 19th century intake structures.
Brick arch and flood gate (Figure 3.31)	Yes	Yes	Yes	Military/ Industry	National	The structure was part of the original canal system and could potentially be damaged by the growth of vines and trees.
Canal outlet structure (Figure 3.32)	Yes	Yes	Yes	Military/ Industrial	National	Water outlet constructed as part of canal structure with metal gate.
1836 Canal Bridge Abutments (LCS ID 045476) (Figure 3.33)	Yes	Yes	Yes	Industry	State	Originally designed by Benjamin Henry Latrobe, the stone masonry abutments were part of a railroad bridge and trestle system that crossed over the Armory canal and the Potomac River into Maryland Heights.
Railroad trestle base piers (Figure 3.34)	Yes	Yes	Yes	Industry/ Transpor-tation	State	Eight rows of two stone piers, 2'x2' each, spaced 12' on center lengthwise, and 5' on center in width.
Canalway Small Scale Features						
Gabion baskets (Figure 3.35)	No	No	No	None	n/a	Gabion baskets have been installed along portions of the canal wall for stabilization.
Canalway Archeological Features						
Armory canal and associated structures	Yes	Yes	Yes	Military/ Industry	National	Constructed 1799-1801, archeological investigation is needed to determine extent and condition of below-grade canal resources.
Canalway Views						
Views of the Potomac River and surrounding landscape	Yes	Yes	Yes	Industry/ Tranpsor-tation	Local	Historically, the Canalway provided panoramic views for most of its length, however views are currently limited to the area around the dam and intake structure.
Canalway Vegetation						
Volunteer plant growth	No	No	No	None	n/a	The Canalway is a thickly wooded area that visually obscures remnants of Armory structures and is also impacting the structural stability of some of these features. Invasive shrubs can also be found throughout the site.

Figure 3.1. Lower Armory Grounds: Concrete steps at 1892 embankment at Potomac and Shenandoah streets. Extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.2. Lower Armory Grounds: Flagstone sidewalk at northern edge of Potomac Street with bluestone and granite curbing. Extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.3. Lower Armory Grounds: View of gravel access road with metal gate along 1892 embankment. To the left is a concrete board-finish retaining wall. Extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.4. Lower Armory Grounds: View of brick-paved pedestrian bridge/spur trail ending at Potomac Street terminus area at the "Point" the confluence of the Potomac and Shenandoah Rivers. To the left of the path is a wooden lamp post with historic style light fixture and interpretive wayside exhibits. Non-extant c. 1900. Non-contributing. OCLP, July, 2009.

Figure 3.5. Lower Armory Grounds: View of dirt footpath parallel to abandoned railroad tracks on top of 1892 embankment. Non-extant c. 1900. Non-contributing. OCLP, July, 2009.

Figure 3.6. Lower Armory Grounds: View of wooden set of steps at 1892 railroad embankment leading to archeological sites. Non-extant c. 1900. Constructed post 2004. Non-contributing. OCLP, July, 2009.

Figure 3.7. Lower Armory Grounds: View of gravel access road from CSX storage yard to the Lower Armory Grounds, Non-extant c. 1900. Non-contributing. OCLP, July, 2009.

Figure 3.8. Lower Armory Grounds: View of stone steps and cheek walls leading from Potomac Street to the gravel access road at 1892 embankment. Unknown date of construction, Evaluation undetermined. OCLP, July, 2009.

Figure 3.9. Lower Armory Grounds- Arsenal Square: View of John Brown's Fort, also known as the Armory Engine House, currently located at Arsenal Square, southeast of Lower Armory Grounds. Extant c. 1865, non-extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.10. Lower Armory Grounds: View of Musket Factory Retaining Wall (LCS 045495) along the length of the former U.S. Armory Musket Factory grounds. Contructed 1840-1843 by the former B&O Railroad. Contributing. OCLP, June, 2006.

Figure 3.11. Lower Armory Grounds: View of stone culvert and adjoining retaining walls at 1892 railroad embankment. Constructed in 1892 by the former B&O Railroad. Contributing. OCLP, June, 2006.

Figure 3.12. Lower Armory Grounds: View of battered dry-laid rubble retaining wall along 1892 embankment on Potomac Street. Extant c. 1900. Contributing. Above the wall, new timber steps have recently been installed. OCLP, July, 2009.

Figure 3.13. Lower Armory Grounds: View of new utility access platform and steps located at 1930 railroad embankment slope adjacent to train station and parking lot. Constructed 2007. Non-contributing. OCLP, July, 2009.

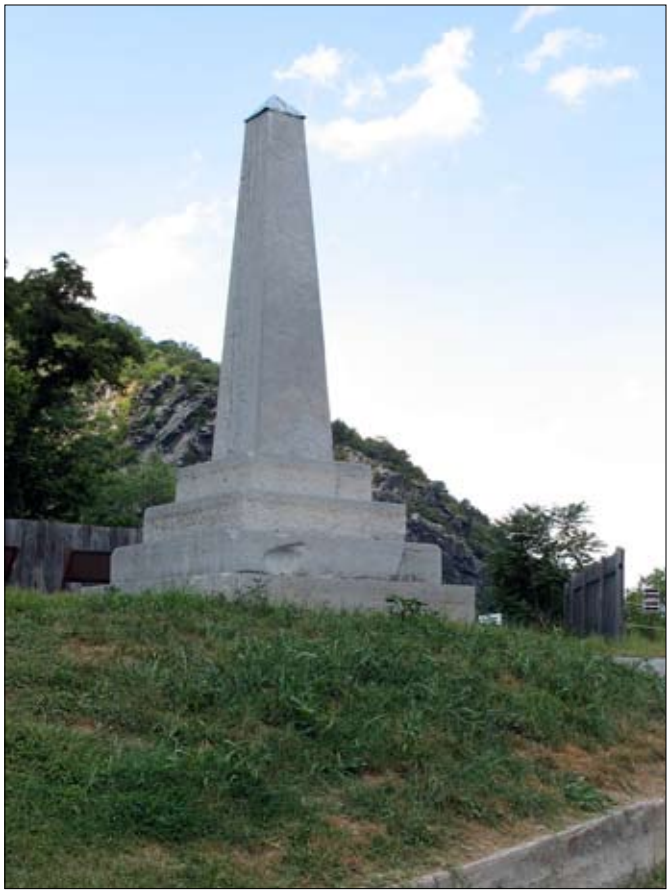


Figure 3.14. Lower Armory Grounds: View of the John Brown monument atop the 1892 railroad embankment being placed over the original site of the Armory Engine House, also known as John Brown's Fort. Constructed 1894. Contributing (LCS 045505). OCLP, July, 2009.

Figure 3.15. Lower Armory Grounds: View of historic lamp post along railroad track north of the train station. Extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.16. Lower Armory Grounds: View of goose-neck lamp fixtures at train station parking lot. These fixtures were installed in 2007 in the motif of missing fixtures once present on-site. Non-contributing. OCLP, July, 2009.

Figure 3.17. Lower Armory Grounds: Iron angle fence along gravel access road at 1892 embankment. Non-extant c. 1900. Installed c. 1910, historic photographs indicate a rail-type fence in this location c. 1900. Non-contributing. OLCP, July, 2009.

Figure 3.18. Lower Armory Grounds: View of War Department Civil War tablets, currently located at the Point, being the area at the confluence of the Potomac and Shenandoah Rivers. Extant c. 1900, moved to current location. Non-contributing. OCLP, July, 2009.

Figure 3.19. Lower Armory Grounds: View of cast metal Lewis and Clark interpretive sign adjacent to gravel access road at 1892 embankment at Lower Armory Grounds. Non-extant c. 1900. Non-contributing. OCLP, July, 2009.

Figure 3.20. Lower Armory Grounds: View of wooden fence installed to screen CSX storage yard. Non-extant c. 1900. Non-contributing. OCLP, July, 2009.

Figure 3.21. Lower Armory Grounds: View of water fountain at corner of Potomac and Shenandoah streets. Fixture is designed in the motif of a hand pump. Constructed c. 1970s. Non-contributing. OCLP, July, 2009.

Figure 3.22. Lower Armory Grounds: View of metal guardrail at train station. Non-extant c. 1900, constructed c. 1930. Non-contributing. OCLP, July, 2009.

Figure 3.23. Lower Armory Grounds: View of concrete drainage gutter at gravel access road at 1892 embankment. Construction date unknown. Evaluation undetermined. OCLP, July, 2009.

Figure 3.24. Upper Armory Grounds: View of gravel driveway at Upper Armory Grounds. This driveway provides access from Upper Potomac Street to the former hydroelectric plant. Extant c. 1900. Contributing. OCLP, November, 2008.

Figure 3.25. Upper Armory Grounds: View of Upper Potomac Street with Upper Armory Grounds seen to the right. Extant c. 1865, and c. 1900. Contributing. OCLP, July, 2009.

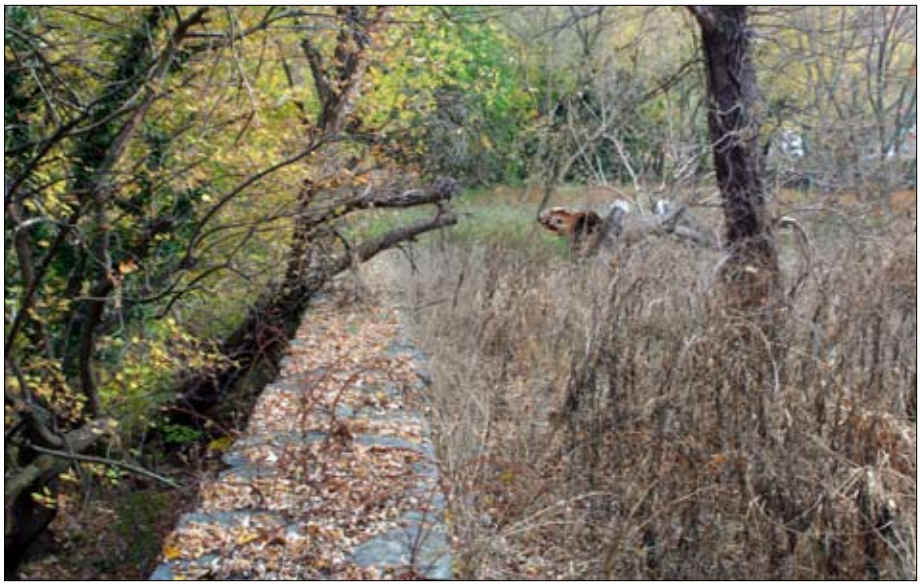


Figure 3.26. Upper Armory Grounds: View of Armory river retaining wall at Upper Armory Grounds, obscured by the growth of vegetation. Constructed 1840-1843 by the former B&O Railroad. Contributing (LCS 045495) OCLP, November, 2008.

Figure 3.27. Upper Armory Grounds: View of former hydroelectric plant at Upper Armory Grounds. The electrical generating plant was last in use in 1991, and incorporates foundations of the U.S. Armory's former tilt hammer shop. Extant c. 1900. Contributing (LCS 045494) OCLP, July, 2009.

Figure 3.28. Upper Armory Grounds: View of exposed Armory canal wall remnants at Upper Armory Grounds, obscured by vegetation. Constructed 1799-1801. Contributing. OCLP, July, 2009.

Figure 3.29. Canalway: View of contemporary 20th century canal intake structure at former Armory dam on the Potomac River. This modern construction incorporates foundation elements of early 19th century construction. Contributing. OCLP, July, 2009.

Figure 3.30. Canalway: View of top of canal intake structure at former Armory dam. Contributing. OCLP, November, 2008.

Figure 3.31. Canalway: View of brick arch and floodgate in the Canalway area. This feature is located nearby the former hydroelectric plant. Extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.32. Canalway: View of canal flood control outlet in the Canalway area. Steel mechanism is of the early 20th century. Contributing. OCLP, July, 2009.

Figure 3.33. Canalway. View of 1836 bridge pier abutments. The former railroad bridge at this location transferred the railroad alignment from atop the Armory canal dike to the southern bank of the Potomac River. This alignment and brige were abandoned c. 1892. Contributing. OCLP, November, 2008.

Figure 3.34. Canalway: View of remnant railroad trestle base piers at the Canalway area, directly northwest of the former hydroelectric plant. Constructed c. 1840, extant c. 1865, and extant c. 1900. Contributing. OCLP, July, 2009.

Figure 3.35. Canalway: View of gabion baskets found along portions of the breeched canal structure. These features are indicative of 20th century repairs to the canal, used for electrical power generation until 1991. Non-contributing. OCLP, July, 2009.

TREATMENT

Preservation treatment describes tasks leading to a future condition of the property that are undertaken with the objective of preserving and enhancing the historic character of the landscape. This chapter recommends modifications to the cultural landscape to preserve and enhance the overall historic character. Treatment tasks are also developed within the context of park management goals including maintenance, use and interpretation. These recommendations are based on the findings of the site history, analysis and evaluation chapters of this report as well as through discussion and collaboration with knowledgeable park staff. Treatment is also a strategy for the short- and long-term stewardship of a landscape, providing a framework to inform physical changes at the conceptual level. Treatment does not provide detailed drawings and specifications that can be used to contract construction work, nor does it prescribe actions necessary to maintain the landscape.[171]

The United States Armory at Harpers Ferry is perhaps the most significant site within the Harpers Ferry National Historical Park. As one of two federal armories founded under President George Washington, the United States Armory at Harpers Ferry contributed to the development of the American military and industrial independence. The Musket Factory site, specifically, was the site of John Brown's attempt to seize arms in order to fight for the freedom of African-American slaves. During the Civil War, the Musket Factory was at the center of conflict as the Armory and the town changed hands eight times between Union and Confederate forces, leading to the ultimate destruction of the factory and arsenal. Although profoundly altered since the mid-nineteenth century, the site offers a unique opportunity to help current citizens both understand and appreciate these historical themes and events in our nation's history.

Since the Civil War, the site has undergone substantial physical changes that have eliminated most of the historic fabric including former buildings and structures, topography, land use, spatial organization and circulation. One of the most difficult constraints on the site is the presence of a massive earthen railroad embankment, constructed in 1930, and in continued daily use, dividing the Armory into two disconnected areas. Pedestrian access throughout the property is limited and challenging. In addition, the growth of unmanaged vegetation during the last fifty years has obscured the historic Armory river wall as well as the scenic views of the river and the heights beyond. Overcoming these difficult and longstanding issues requires the National Park Service to clearly articulate a bold vision for this property, and to pursue a creative approach to landscape treatment (Figure 4.1).

After forty-eight years of discussion and effort, in 2004, Harpers Ferry National Historical Park acquired critical parcels of the former federal Musket Factory site

along the Potomac River. The acquisition of these parcels served as an important force leading to the renewal of park planning efforts. The product of these efforts is a new General Management Plan. Considering three plausible alternatives, the preferred alternative outlines the vision and goals intended to guide park managers over the next twenty years.[172] In November 2008, as part of this cultural landscape report project, an on-site cultural landscape treatment workshop was held, providing the opportunity for park staff to discuss and refine the planning goals and tasks with specific reference to the study area of this report. The on-site discussion also involved consideration of two key anniversaries, including the 2009 Sesquicentennial anniversary of John Brown's 1859 raid on the Armory at Harpers Ferry and the 150th anniversary of the Civil War in 2011. The treatment guidelines and tasks presented below are a result of a collaborative effort with park staff to make appropriate choices while addressing management concerns and goals.

TREATMENT FRAMEWORK

The treatment of a cultural landscape is framed by enabling legislation and the mission of the park, by National Park Service policies, standards and guidelines for cultural and natural resources, and by the park's current planning efforts. In 1944, Congress established Harpers Ferry National Monument, including portions of Lower Town, Camp Hill, Loudoun Heights, Bolivar Heights and Maryland Heights. In 1960, Congress passed additional legislation enabling the federal acquisition of the original site of John Brown's Fort and the federal Armory.

In 1963, subsequent legislation designated the national monument as Harpers Ferry National Historical Park. On October 15, 1966, Harpers Ferry National Historical Park was administratively listed on the National Register of Historic Places following passage of the National Historic Preservation Act. The State Historic Preservation Office approved a formal nomination documenting the resources comprising the Harpers Ferry Historic District in 1979. The 1979 documentation cited several periods of significance, including 1751, 1795 and 1800-1865. The three hundred-acre district incorporated a hundred structures and sites, including historic cemeteries, sites of historic buildings and Civil War fortifications, the Musket Factory, Armory dwellings, the Wager Lot and Camp Hill. Areas of significance included archeology, architecture, commerce, industry, invention, military, politics/government, social and transportation. The area was characterized as an early nineteenth century town with many residential buildings retaining their original exteriors.

In 1981, National Register of Historic Places documentation was completed specifically for Harpers Ferry National Historic Park. The 1981 documentation

recommended a broader historic period of significance, spanning the entire nineteenth century, in order to incorporate the post-Civil War history of Storer College and the education of freed African-American slaves, along with additional commercial uses that occurred later in the period.

In addition, the park prepared a Development Concept Plan in 1980 aimed at placing more emphasis on the history of Harpers Ferry during the nineteenth century. This included the story of John Brown, the industrial history of the Armory and Rifle Works, the Civil War and the social movement associated with Storer College.[173] The plan proposed to create a trail around the park that would traverse the shores of the Potomac and Shenandoah Rivers. The plan also indicated the need to restore several miles of shoreline that had been acquired in 1974. Other objectives included making all park facilities accessible, stabilizing ruins and acquiring additional land along the Potomac River. Since 1981, the park has acquired additional properties, some of which have been independently listed in the National Register. In 1999, a multiple property documentation form was approved that consolidated both existing and new information and updated the park boundaries.[174]

Although two significant parcels of the former Musket Factory were acquired by the National Park Service from the CSX Corporation in September of 2001, the agency does not hold title to the entire site (Figure 4.2). The CSX Transportation Inc., previously merging with the Chessie System, transferred two parcels comprising approximately six acres of the former Musket Factory property. The active railroad right-of-way separates the two tracts. As part of the 2001 real estate transfer, the CSX Corporation retained other important maintenance easements that further encumber the ultimate National Park Service treatment and use of the property (Figure 4.3).

The park is currently finalizing a new General Management Plan. Since 1980, the park has acquired over a thousand additional acres. When completed, the new planning document will clearly define current resource conditions and visitor experiences and provide a framework for National Park Service managers that will guide and coordinate the planning and management for the next twenty years. The General Management Plan proposes nine objectives for the Armory grounds and Potomac River frontage site including restoring the Armory canal, rehabilitating the former hydroelectric plant building for contemporary park uses, and moving the historic Engine House back to its original location, and creating a physical link between Lower and Upper Armory Grounds. In addition, the plan cites interpretation, tree removal, restoring views and accessibility as primary goals. Early drafts of the plan had proposed locating a Civil War-era locomotive on top of the 1892 embankment, but it has been deemed unfeasible given the requirements to protect the exhibit, which include providing a new structure to shelter the locomotive from the elements.

TREATMENT ISSUES

The study area of this report presents many constraints that need to be addressed in order to provide a coherent and consistent treatment approach. Both the 1892 and 1930 railroad embankments pose the greatest physical restrictions to site access. The separation of the Musket Factory into discrete sites prevents visitors from fully understanding the scale and unity of the former industrial complex. Access throughout the property is limited as a result of these dramatic topographical alterations. Historic foundations of former Armory buildings are buried beneath both embankments, hindering archeological investigations as well as interpretation of the site. The growth of woody vegetation over the last fifty years may have also affected archeological resources by infiltrating below-ground features and compromising their stability. Also, National Register documentation supports the 1892 railroad embankments as historically significant due to its contributions to late nineteenth and early twentieth century transportation and commercial activity. This broader rendering of the significance of these later topographic features poses a challenge as to how to reveal and interpret characteristics and features of the earlier history without compromising features of a later period.

In addition, the Armory grounds and Potomac River frontage are prone to flooding. Since the 1700s, fourteen floods have been recorded with the most recent occurring in 1996 (Figure 4.4). Prior to undertaking any kind of major intervention on the study area, it is critical to understand the role of the existing embankments, if any, in mitigating flood damage.

The following treatment recommendations will examine these issues and outline a series of guidelines and tasks. These measures will include long, medium and short-term tasks that effectively mitigate longstanding issues relating to access and lack of integrity, while enhancing the historic character of the landscape and improving the visitor experience. Owing to the national significance of the nineteenth century events that occurred at the United States Armory at Harpers Ferry, proposed landscape treatment tasks will emphasize the period of the Armory's industrial height and its role in John Brown's raid and the Civil War.

RECOMMENDED TREATMENT APPROACH

The recommended primary treatment for the Armory grounds and Potomac River frontage is Rehabilitation. As a choice among the four approaches sanctioned by the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, Rehabilitation will allow the park to meet objectives of both preserving and enhancing the property for public visitation. Considering both management objectives and the diminished physical integrity of the former

Armory facilities, Rehabilitation is the most appropriate treatment for the Armory grounds and Potomac riverfront.

Treatment needs to address contemporary park functions and visitor services, such as interpretation, pedestrian circulation, universal accessibility, parking and maintenance. Construction of compatible new non-historic elements will provide access and facilitate interpretation. The intent of Rehabilitation as defined by the Secretary of the Interior is to "…[make] possible a compatible use for a property through repair, alterations and additions while preserving those portions or features which convey its historical, cultural or architectural values."[175] This treatment concept is defined within the ten standards for Rehabilitation.

1. A cultural landscape is used as it was historically or is given a new or adaptive use that maximizes the retention of historic materials, features, spaces, and spatial relationships.

2. The historic character of a cultural landscape is retained and preserved. The replacement or removal of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a landscape is avoided.

3. Each cultural landscape is recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features from other landscapes, are not undertaken. Work needed to stabilize, consolidate, and conserve historic materials and features is physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a cultural landscape that have acquired historical significance in their own right are retained and preserved.

5. Historic materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a cultural landscape are preserved.

6. Deteriorated historic features are repaired rather than replaced. Where the severity of deterioration requires repair or replacement of a historic feature, the new feature matches the old in design, color, texture, and, where possible, materials. Repair or replacement of missing features is substantiated by archeological, documentary, or physical evidence.

7. Chemical or physical treatments that cause damage to historic materials are not used.

8. Archeological and structural resources are protected and preserved in place. If such resources must be disturbed, mitigation measures are undertaken including recovery, curation and documentation.

9. Additions, alterations, or related new construction do not destroy historic materials, features, and spatial relationships that characterize the cultural landscape. New work is differentiated from the old and is compatible with the historic materials, features, size, scale and proportion, and massing of the landscape.

10. Additions and adjacent or related new construction are undertaken in such a manner that if removed in the future, the essential form and integrity of the cultural landscape would be unimpaired.[176]

PRIMARY TREATMENT ALTERNATIVES CONSIDERED BUT NOT RECOMMENDED

The other three treatment approaches sanctioned by the *Secretary of the Interior's Standards for the Treatment of Historic Properties* are Preservation Restoration and Reconstruction. Preservation, as a primary approach to treating an historic property, is not recommended as the primary treatment for the Armory grounds and Potomac riverfront because it would retain its existing appearance that is inconsistent with the management and interpretive goals of the park.

Restoration is not recommended as the primary treatment approach for the Armory grounds and riverfront due to the fact that there is little left remaining above ground that survives to convey the significance of the Armory as a leading early manufacturing center, or as the site of John Brown's pivotal raid. Given the facts on-site, any attempt to restore the property to a point in time prior to the Civil War would amount instead to the Reconstruction of a vanished landscape. An attempt to restore the property to a point in its post-Civil War history prior to 1892 would amount to the reconstruction of a landscape in ruins (Figure 4.5). In addition, Restoration does not address the park's contemporary visitor uses.

Generally out of favor as one of the four approaches to treatment owing to the intense intervention required, Reconstruction inescapably presents the public with an interpretation of the past which may be mistaken for genuine historic fabric. As current park planning documents refer to the site as an "archeological preserve," Reconstruction would destroy or otherwise greatly impact much of the archeological information preserved in the layers of soil. For these reasons, as well as due to obvious impracticalities, neither Reconstruction nor Restoration is recommended as a general approach to treatment within the study area of this report.

TREATMENT VISION

By the end of the 1850s, the United States Armory at Harpers Ferry had been transformed into a streamlined manufacturing facility employing about 400 workers. At the Musket Factory, Major John Symington succeeded in constructing new buildings with a unified architectural style. He modernized the machinery, improved circulation and added new landscape features including exterior lighting, sidewalks and plantings of trees and grass. It is this era of industry and military enterprise that has vanished from the Armory landscape today. It is the intention of the treatment guidelines to recapture some of the significant elements and site relationships of this period in order for visitors to be able to imagine the landscape as it once appeared before the construction of the railroad embankments. Major modifications are necessary in order to accomplish this ambitious goal. The park will have to work with CSX Inc. to remove a portion of the existing storage yard and to modify company operations in the area immediately east of Lower Armory Grounds. The 1892 embankment will require extensive modification in order to return the Engine House to its original location. In addition, the design of a continuous pathway system linking the three disconnected sites entails engineered structures including cantilevered walkways and a pedestrian bridge spanning the hydroelectric tailrace foundations. By developing acceptable designs for these important elements of the proposed Rehabilitation, a significant passage in American history can once again be told through the landscape.

TREATMENT GOALS

The recommended overall treatment goal for the Rehabilitation of the former United States Armory grounds and riverfront is to reestablish critical site relationships belonging to the landscape during the mid-nineteenth century. Doing so will provide opportunities to understand the unity and scope of the federal industrial complex that once occupied the site as well as the events that occurred both before and during the Civil War. The recommended treatment also supports the objectives of the park as outlined in the new General Management Plan. By restoring surviving historic features and introducing appropriate new visitor infrastructure into the landscape, the full historical context of the site can be more fully appreciated. The intent is not to attempt to depict the landscape at a specific date, but rather to evoke the character as it evolved through the nineteenth century. Since the Armory grounds are also occupied by an active railroad operation, treatment of the landscape cannot interfere with the ongoing function of the railroad.

SITEWIDE TREATMENT ISSUES

The following section provides recommendations that apply to the three cultural landscape areas that comprise the project site: Lower Armory Grounds, Upper

Armory Grounds and the Canalway to Dam Number Three. One of the main challenges facing the park is the fact that very little remains above ground from the period when the Armory was in operation. Since the end of the Civil War, most of the buildings have been destroyed, circulation patterns have been erased and the topography has been drastically altered. Above-ground historic features that survive include portions of the canal, the river wall, building foundations, the hydroelectric plant (on top of former Armory building foundations) and the Engine House. Consistent with the Rehabilitation approach to treatment, the park can add interpretive landscape elements that help tell the story of the site, and also reveal existing below-ground historic features to make the site's past more visible.

Circulation and Accessibility

One of the primary goals of the General Management Plan is to provide improved visitor access to Lower Armory Grounds, as well as physically link Lower and Upper Armory Grounds and to continue this connection along the Potomac riverfront to Dam Number 3 (Figure 4.6). Currently, the only pedestrian pathway is located on top the embankment at Lower Armory Grounds. The park has also recently started building/clearing a trail in the Canalway area on top of the river wall and berm and extending eastward. Reaching the river requires traversing over tree roots and steep uneven ground with no clearly delineated route.

For users with mobility issues, there is limited accessibility at the Armory grounds due to the steep topography created by the two railroad embankments. Currently, access is possible via the steep vehicular drive at the train station with a fairly flat gravel path extending along the top of the embankment. The park's goals include creating an accessible route that would allow visitors to experience the riverfront edge of the Armory grounds. Providing a continuous route will require portions of the path to be cantilevered over the river as well as require a new pedestrian bridge spanning the former hydroelectric plant tailraces. In order to provide universal access at the project site, the design is required to adhere to guidelines established by the Americans with Disabilities Act (ADA). These guidelines include specific information regarding the design of pathways, ramps and steps. An important aspect of the guidelines concerns handrails and guardrails which are especially relevant to the study area given the changes in grade that occur throughout the site.

Vegetation

The unmanaged growth of woody vegetation throughout the project area needs to be addressed in order to reestablish historic site relationships including historic views to the river. Over the last fifty years, self-sown trees have proliferated and matured to the point that many features and views are no longer

visible. In addition, non-woody vegetation has infiltrated historic structures including the canal and river walls. During the operation of the Musket Factory, vegetation was well managed with shade trees planted along the main route through the complex. In 1916, the B&O Railroad maintained the grounds as a commemorative garden with flower beds, planted grass, shrubs, and shade trees. None of these plantings survive today. To reestablish views and spatial relationships, and to preserve existing masonry features, it is essential to remove self sown trees, and plant replacements according to historic patterns (Figure 4.7).

Interpretation

Educational programming, such as interpretive exhibits of landscape features, is needed to enhance the quality of the visitor experience and public understanding and appreciation of the Armory at Harpers Ferry. The park has completed the design of nineteen wayside interpretive exhibits for Lower Armory Grounds. These exhibits have recently been installed throughout the grounds including upon the top of the 1892 embankment and around various archeological sites (Figure 4.8). Some of these exhibits will need to be relocated when longer term treatment tasks are completed on the site. Additional proposed forms of interpretation include introducing elements into the landscape that recall the history of the site, including reflecting the missing building footprints above grade, the relocation of the Armory Engine House to its original site, and the development of historic circulation patterns including a river walk linking the three disconnected parcels making up the former Musket Factory site.

Buildings and Structures

One of the most historically significant buildings within the entire park is the Engine House, also known as John Brown's Fort (Figure 4.9). Built in 1848, the structure originally stood within the Armory grounds near the main entrance gates. Its original footprint is currently buried beneath the railroad embankment constructed in 1892. In order to relocate the building, a major portion of the embankment will have to be removed, requiring further negotiations with CSX. If successful, the entire undertaking would not be completed by October 2009 for the sesquicentennial of John Brown's raid. Returning the Engine House back to its original site is a long-term goal that requires more study to understand the hydrological implications of engineering a breach in the embankment as well as the easement retained by the CSX Corporation.

Views

Views are a key component of the cultural landscape at Harpers Ferry National Historical Park. The Point, at the confluence of the Potomac and Shenandoah rivers, is the location of one the most popular viewing attractions for visitors since the eighteenth century. This view of the confluence inspired Thomas

Jefferson to write at length about its charm in *Notes on the State of Virginia*, published in 1785. The view also impressed George Washington who later established the Armory in its vicinity. The National Park Service has acquired much of the surrounding heights in Virginia and Maryland in order to preserve the natural viewshed as seen from the park and to protect historic sites. Encroaching development, including a proposed communications tower, continues to threaten the viewshed. Maintaining the historic view of this area is critical. In addition, views to the Potomac River from the Armory grounds as well as the town are another historic feature, but the growth of trees over the past fifty years has blocked these views. By removing a significant number of trees along the riverfront, historic views and historic site relationships will be reestablished (Figure 4.10).

Archeological Sites

The study area contains a rich preserve of archeological resources including Armory building foundations and underground tunnels. There are potentially other artifacts and landscape features beneath the surface that have yet to be discovered. Additional studies are needed to locate additional building foundations and other possible structures (Figure 4.11). The General Management Plan intends for the Armory grounds to be maintained as an archeological preserve whereby the landscape would be maintained to limit disturbance to archeological features. Removing vegetative growth that is adversely impacting these resources is an essential element of effective landscape treatment.

Lighting

This report has identified the former pre-Civil War exterior lighting at the Armory grounds as being the same as those at Springfield Armory in Massachusetts. The lamp posts were modeled after cannon tubes and still survive at Springfield. Replicating the lamp posts and installing limited examples on the Armory grounds would enhance the historic character of the site and support interpretation efforts (Figure 4.12).

TREATMENT GUIDELINES AND TASKS

This section provides guidelines for implementing the rehabilitation of the Armory grounds and riverfront according to the treatment framework previously outlined. These guidelines are organized according to the three following landscape treatment areas: Lower Armory Grounds, Upper Armory Grounds and the Canalway to Dam Number Three. Under each area, the guidelines are further organized and presented by three project time lines including long, medium and

short-term efforts. Long-term tasks are presented first in order to emphasize the more ambitious goals of a lengthy treatment program.

LOWER ARMORY GROUNDS TREATMENT GUIDELINES AND TASKS

The Lower Armory Grounds is currently the only portion of the project area that offers visitors a way into the site, via a set of stairs. It is also the only area that has undergone archeological investigations, although building foundations remain unexposed today. To address the General Management Plan's objectives concerning access and interpretation, several short-term tasks can be accomplished prior to the Sesquicentennial in June 2009. The installation of interpretive elements that reference the pre-Civil War configuration of the landscape is a critical component in helping visitors understand the industrial and military significance of the site. Providing a route along the river with open views and well coordinated with the interpretive exhibits will invite more visitors and enhance the experience of the Armory grounds. These initial short and medium-term steps will start to illuminate the history of the Armory and redefine some of the historic fabric of the site. In addition, longer range tasks will realize the overall goals of re-connecting the site to the river and reestablishing the scale and site relationships that existed in the landscape during the mid-nineteenth century. These tasks include further interpreting building structures, planting trees, installing lighting and providing universal access (Drawing 7). In order to capture the overall vision for the treatment of the landscape, the long-term tasks are presented first, followed by medium and short-term tasks.

LONG-TERM LANDSCAPE TREATMENT TASKS

LA.1: Relocate Armory Engine House to original location.

The Engine House represents a pivotal event in American history when the abolitionist John Brown occupied the building in 1859 at the end of his attempt to raid the Armory's arms supply to wage battle against slavery (Figure 4.13). Referred to as John Brown's Fort, the building became a symbol of the anti-slavery movement. It is also the only building that survives from the Musket Factory (Figure 4.14). The building has been relocated and rebuilt several times and currently occupies a site nearby in Arsenal Square. The recent General Management Plan highlights the historic significance of the Engine House and recommends conducting a feasibility study for returning the building to its historic location (Figure 4.15).

The building originally stood within the Musket Factory grounds near the main entrance gates (see Drawing 7). Relocating the Engine House requires the restoration of the original grade by removing a large portion of the 1892 railroad embankment (Figure 4.16). A hydrological study of the embankment needs to be

prepared in order to understand possible impacts of removing or reducing a portion of the berm in this flood prone area. In addition, this undertaking would also involve modifying the easement agreement retained by the CSX Corporation.

LA.2: Reconstruct Armory main gates.

Reconstructing the main gates will help orient visitors to the site and to further delineate the original organization of the factory. Facing Shenandoah Street, the main Armory gates were one of the most public features belonging to the Musket Factory (Figure 4.17). During the 1840s and early 1850s, Superintendent Major John Symington made extensive improvements to unify the site aesthetically and functionally to create a more streamlined and efficient operation. Physically closing off the site from Lower Town and controlling access into the factory was a key component of Symington's vision. To this end, Symington installed a large double-wrought iron gate with two single gates on either side. Nine-foot walls on either side of the gates were constructed of brick piers and low panel walls on a granite base and topped with red Seneca sandstone. The upper portion of the panels was fitted with iron railings (Figures 4.18). Reconstructing the main gates will reestablish the original entrance and circulation pattern (See Figure 4.16). The adjoining walls can be partially rebuilt to extend into the remaining embankments. Additional research, including written descriptions, of the historic design of the gates is necessary in order to move forward with developing an accurate representation.

LA.3: Install three-dimensional representation of former 90-foot tall Armory smokestack.

The smokestack was once part of a forging shop constructed around 1846. By 1848, this forging shop was connected to a new stock house and inspector's office, creating the largest workshop at the Musket Factory. The smokestack survived when the building itself was demolished after the Civil War (Figure 4.19). The railroad company later removed it in 1892 in order to construct a twenty-foot high earthen embankment on the site. By re-creating the massing of the original ninety-foot structure, visitors can gain an appreciation for the magnitude of the industrial complex. The scale of this structure would require major underground structural reinforcement. Prior to any type of design and installation, further-study is required to examine potential disturbance to subsurface archeological resources. The study would analyze any possible risks and develop mitigation strategies in addition to providing structural requirements and guidelines. The interpretive smokestack feature would then be engineered to meet resource preservation requirements. Interpretive and sculptural structures at other historic sites illustrate the use of a metal frame design that could be left open or covered with fabric, metal mesh or glass (Figures 4.20, 4.21). An example of another historic smokestack is the Confederate

Powderworks Chimney in Augusta, Georgia (Figure 4.22). The chimney is the only remaining structure from the gunpowder complex constructed in 1862. A mill was constructed on the site and retained the chimney as a memorial to those who fought for the Confederacy.[177] The structure is very similar to the Armory smokestack in scale, form, and materials, and illustrates how the smokestack must have dominated the adjacent landscape.

LA.4: Rehabilitate surviving below-grade building foundations to present entire above-ground building footprints.

Currently, portions of a Warehouse, and Smith and Forging Shops are below-grade and not visible at Lower Armory Grounds.[178] The foundations of these former buildings date to the 1840s and 1850s. Additional resources are buried beneath the railroad embankments. In order to expand interpretive opportunities on the site, historic building foundations and walls could be exposed. A key component of this effort is the identification and restoration of the original grade elevations. Once the grade is reestablished, building walls could be exposed and stabilized, or built up above grade in order to be visible (Figure 4.23). A combination of the two methods can also be employed (Figure 4.24*)*. Consultation and supervision by the park archeologist is critical in determining the historic grade as well as the specific techniques and materials to be utilized in stabilizing and highlighting these subsurface features. Visitors would then gain an understanding of the layout and spatial organization of the Armory. Archeological investigations leading to reestablishing the historic grades may also discover the alignment of historic roadways and sidewalks, as well as the arrangement of grass plots and trees that are known to have existed.

LA.5: Install new formal entrance at main gate.

In order to accommodate a greater number of visitors to Lower Armory Grounds and improve the visibility of the resource, create an entrance plaza in front of the reconstructed main gate. Historically, this area was part of the privately owned Ferry Lot, and was a hub of commercial activity until the mid-nineteenth century due to its proximity to rail and river transportation. A variety of businesses occupied the site, including shops, a hotel, a restaurant and a saloon. The prominent location of the proposed plaza, at the corner of Potomac and Shenandoah streets, provides a formal gateway into the Armory landscape. The entrance plaza is also an important element in creating a link between the two river shorelines. The space encourages visitors leaving the Point, a popular attraction at the park, to explore the Armory and Potomac River landscape. The layout also offers a vantage point from which to view the Armory site as it might have been seen in the mid-1850s. In addition, the open space creates a visible and convenient meeting place for people exploring the general area.

LA.6: Relocate John Brown monument adjacent to Engine House.

Along with the changes proposed for the Engine House, the displaced John Brown monument should be sited adjacent to the building. The stone obelisk was originally erected in 1895 through the efforts of a group, led by Frederick Douglass, to commemorate John Brown's raid. At the time, the site was part of the B&O Railroad right-of-way. Placing the monument on the actual location of the Engine House was not only historically accurate, but it could also be viewed by passing trains. As a historic feature from the late nineteenth century, the obelisk reflects the early efforts of African-Americans to memorialize an important event in the history of the abolition movement. The obelisk should therefore remain part of the cultural landscape.

LA.7: Install street trees in Lower Armory Grounds as indicated in period engravings of the site.

Historic pre-Civil War engravings at the time of the John Brown raid indicate plantings of shade trees within grass plots between the two rows of Armory buildings (Figure 4.25). Historic photographs taken during and after the Civil War confirm the more limited presence of shade trees on the Musket Factory grounds (see Figure 4.17). In order to convey a sense of the historic landscape, install two formal rows of shade trees aligned with the exposed building locations along the main thoroughfare (see Drawing 7). The alignment and spacing of these trees must be subject to further archeological investigations and consultation with archeologists. Reestablished plantings of shade trees, mirroring the alignment of exposed building foundations will provide a three-dimensional cue to the vast scope of the former Musket Factory complex. The layout of trees must work in conjunction with other layout features including circulation and grass plots. Spacing of trees should be determined based on these alignments as well. The choice of tree species should be based on what is known to have grown in Harpers Ferry at the time, such as pin oaks or honeylocusts.[179] It is also important to avoid surface rooted trees such as red maple, which could in time present tripping hazards to the visiting public. Tree caliper should be a minimum of three and half inches. When examining specific trees for planting, select trees that share a similar overall habit and shape.

LA.8: Provide limited site lighting based on historic features and documentation.

The General Management Plan calls for a period lighting plan that would be compatible with the historic campus while not illuminating the night sky.[180] Within the study area of this report, it is possible to install period lighting comprised of the canon tube lamppost style that was original to the Armory grounds in the 1840s. The design and dimensions are available at Springfield Armory National Historic Site where the same lamp posts were installed and survive today (see Figure 4.12). The only modification that has occurred at

Springfield Armory is the replacement of the lamp itself during the early twentieth century to a globe fixture along with the change to electrical power. Install lamp posts aligned with the known location of the interior road to further express the layout of the historic Armory grounds. The recommended locations for six lamp posts are shown on Drawing 7.

LA.9: Retain non-historic entrance opposite Hog Alley.

To facilitate the flow of visitors through Lower Armory Grounds, provide another entrance through the Armory fence on Potomac Street across from Hog Alley. The fence was originally constructed to enclose the Musket Factory and control access to the site. But by opening up a portion of the fence, visitors can have the option of exiting the site without doubling back. It is also important to provide a secondary means of egress in the event of an emergency. The location is also the approximate site of one of the Armory tailraces and a corresponding interpretive exhibit could also be installed.

LA.10: Install a period wooden railroad trestle at Lower Armory Grounds.

In 1838, the Baltimore & Ohio (B&O) Railroad was permitted to extend its route along the south bank of the Potomac River that ran adjacent to the Armory property. The Armory agreed to let the railroad construct an elevated track on top of a new stone river wall that paralleled the Armory wall, ensuring that the Musket Factory tailraces would continue to discharge water into the river. By constructing a portion of the railroad trestle, visitors will recognize the railroad's historic relationship to the Armory landscape (Figure 4.26).

LA.11. Excavate and retain wider breach in 1892 railroad embankment.

In order to bring back some of the defining features of the Musket Factory landscape, including the Engine House, the perimeter fence and gate, building footprints, circulation system and plantings, a major excavation of the 1892 railroad embankment is critical. This task is the key to reclaiming the Musket Factory site and expressing significant landscape characteristics, such as the scale and magnitude of the historic industrial and military landscape. It will also further enhance the story of John Brown and his attempted raid at the Musket Factory by bringing visitors to the actual site of the historical event.

Such a major enterprise first requires a feasibility study to examine the existing hydrological conditions of the site, the impacts on below-ground features and the potential effects on the surrounding environment. A detailed, phased plan will then be developed by engineers to achieve the removal and stabilization of the embankment. If further study indicates that there is a flood-control benefit to the 1892 railroad berm, discouraging the removal of a portion of the embankment down to historic topographic grades, then it may be possible to create a partial breach by merely lowering the height of the embankment. Doing so would make

more conventional approaches to site accessibility, including a system of ramps and landings, more feasible and attractive (Figure 4.27).

MEDIUM TERM LANDSCAPE TREATMENT TASKS

LA.12: Construct linear river boardwalk along edge of Armory river retaining wall.

The General Management Plan articulates a need to establish continuity between all three of the character areas, affording visitors a safe and continuous walking route through the area. Locating the walkway close to the river edge would highlight both the history of the United States Armory and the B&O Railroad. Historically, there was a boardwalk along the elevated railroad trestle (Figure 4.28). The proposed walkway will run along the top of the river wall and provide interpretation and recreational opportunities for the history of the railroad on the site, reconnect visitors to the river itself, and provide interpretive opportunities for the original U.S. Armory wall as well (Figures 4.29, 4.30). Using a material such as mesh panels, or perforated steel would require less maintenance than wood and the use of a neutral color can blend into the surroundings so as not to detract from the character of the landscape. The design of the handrails should reflect the historic character of those originally installed along the trestle boardwalk while also adhering to current safety codes (see Figure 4.28). In addition, the use of removable handrails should be explored so they might be removed during flood events to prevent them from being damaged. An example of removable handrails can be found at Olmsted Island at C&O Canal where they were installed on a bridge (Figure 4.31).

Ultimately, this walkway is proposed to extend from Lower Armory Grounds westward to the Canalway. The boardwalk will begin at the eastern end of Lower Armory Grounds along the river wall, extending from a paved pathway. The boardwalk will provide a continuous route along the river that will involve circumnavigating the bridge abutment, requiring a cantilevered structure.

LA.13: Restore original grades and other known features to the extent possible given the presence of the 1892 and 1930 railroad berms.

Historic documentation indicates that improved circulation patterns and new landscape features were implemented at the Musket Factory under Symington's tenure in the mid-1850s. These improvements included sidewalks and shade trees planted in grass plots along the main thoroughfare of the Armory grounds. Conduct archeological investigations to determine the original grade and layout of the grass plots and trees and possibly enhance exposed original paving materials (Figure 4.32).

Reestablish original grade and enhance exposed features by planting grass plots as indicated through excavations, and expose and stabilize other historical paving materials (see Drawing 8). Integrate any additional discoveries, such as drains and outlets, revealed through these investigations. In addition, the Engine House site is a major feature of Lower Armory Grounds, marked currently only by the nineteenth century obelisk monument. Its location under the existing twenty-foot earthen embankment precludes exposing original foundations in the short term. Therefore, to emphasize the structure's historic significance, outline the building footprint with bollards and chains. Highlighting these features will further define the scale and character of the Armory at its height in the 1850s.

LA.14 Excavate and construct a limited breach in the 1892 railroad embankment to facilitate site accessibility.

Businessman Thomas Savery purchased the Musket Factory property in 1884 and constructed a pulp mill on top of the rolling mill foundations at the northwest corner of the site. Four years later, Savery granted a new right-of-way to the B&O Railroad, allowing the company to realign the railroad track by building a twenty-foot earthen embankment. The new embankment buried the southern end of the Armory grounds, including the sites of the Engine House, several work buildings, the main entry gate and adjacent wall. By creating a limited breach in the 1892 embankment with ramped access into the resource, the park will be able to provide improved accessibility to Lower Armory Grounds without elaborate hydrological studies and engineering efforts (Drawing 8). The recommended excavation site, across from Hog Alley, physically and visually connects the Armory site with the existing circulation system and the town itself.

SHORT-TERM LANDSCAPE TREATMENT TASKS

LA.15 Remove existing utility on 1930 railroad embankment.

Recently, a utility structure, with a concrete base and wooden set of steps, has been constructed on the slope of the 1930 railroad embankment, overlooking the archeological sites at Lower Armory Grounds. The structure diminishes the visitor experience at Lower Armory Grounds by inserting a contemporary element that visually intrudes upon the landscape setting. Removing the existing utility will enhance the historic character of the landscape.

LA.16 Install newly fabricated interpretive wayside panels in appropriate locations.

Educational programming such as interpretive exhibits of landscape features contribute to the quality of the visitor experience and to the understanding and appreciation of the significance of the Armory at Harpers Ferry. Nineteen interpretive wayside panels have been designed and installed at the Lower

Armory Grounds. The layout of the interpretive exhibits will require adjustments as changes in the circulation and topography of the site as tasks are completed.

LA.17 Remove self-sown trees blocking the historic views to the Potomac River, as well as large trees threatening the foundations at the base of the river wall.

One of the more pressing issues at Lower Armory Grounds is the growth of volunteer trees (Figures 4.33, 4.34). Trees have established themselves throughout the site and matured to the point that historic views to the river are obscured. In addition, the trees may have compromised archeological sites and the structural integrity of extant structures, such as the river wall. Views have always been an important feature of the site with references made through history by Washington and Jefferson, among others, who saw the beauty and the industrial potential of the Potomac and Shenandoah Rivers.

A critical issue is the masonry river wall which contains sections already undermined by tree roots. Initial efforts should focus on stabilizing these areas. An evaluation of the existing trees on top of and adjacent to wall should be undertaken in order to assess the tree's health and impact on the structure. In general, it is recommended that all trees that are more than six inches in diameter at breast height within a distance of four feet from the Armory river wall be removed. Trees larger than six inches in diameter have the potential to undermine the structure's stability. This removal process will have to continue on a recurring basis to ensure the continued structural integrity of the features. Beyond the four-foot distance from the river wall, it is appropriate to selectively remove trees that obscure views or have been assessed as failing. The purpose of this recommendation is to actively manage the size of the woody vegetation in promotion of cultural resource values (Figure 4.35). Another important factor in the tree removal process is the need to preserve some trees for shade along portions of the site to create a pleasant experience for visitors by offering protection from prolonged sun exposure.

LA.18 Redesign and reconstruct existing non-historic stairs.

There is currently a set of wooden steps leading down to Lower Armory Grounds from the top of the 1892 embankment that has recently been expanded (Figure 4.36). The stairs are steep and do not comply with current ADA code regulations concerning hand and guardrails. As the only formal access to Lower Armory Grounds, the steps should be redesigned to provide a more gracious transition by providing a gentler stair tread to riser relationship and generous landings, until such time as a ramped solution to site access can be implemented (Figures 4.37, 4.38). The new design should offer opportunities to look out over the archeological sites and views out to the river (Figure 4.39). This is especially useful for visitors who have limited mobility. Utilizing perforated metal or mesh as the main material require less maintenance by allowing water and some debris

to flow through the structure instead of accumulating on the steps and posing a safety hazard (Figure 4.40).

LA.19 Construct new stairs leading from the corner of Shenandoah and Potomac streets to the top of the railroad berm.

The most visited area of the park is the area at the confluence of the two rivers just south of Lower Armory Grounds, known as the Point. The 1892 twenty-foot embankment physically as well as visually cuts visitors off from the Armory grounds. As a result, visitors can pass right by the Armory grounds and not be aware of the resource. By installing steps at the corner of Shenandoah and Potomac Streets, access to the site will be readily visible and pedestrians can then re-directed to the site (see Drawing 8). To date, a set of wooden steps has been installed at this location but has not opened to the public (Figure 4.41).

LA.20.Install new 70-foot tall flagpole near its original location as indicated in period images of the site.

Historic photos and images show a large flag flying near the main entrance gates of the Musket Factory (see Figures 4.42, 4.43). It was most likely removed soon after the Civil War when the government no longer occupied the site. Installing a new flagpole near its original location will create a visual cue indicating the former federal presence on the landscape. Although historian Charles Snell depicted the location of the flagpole at the southeastern portion of the site in his 1959 historical base map, additional period photographs and engravings reveal the flagpole as more centrally located near the main entrance. Snell's map is otherwise an excellent source for understanding the layout of the Musket Factory buildings and features. The dimensions should closely match the original flagpole which had been approximately seventy feet tall. The flag itself was selected based on the weather and the velocity of the wind. During periods of fair weather and light breezes, a garrison flag measuring twenty feet by thirty-eight feet was flown from the top of the flagstaff, signaling the presence of a federal facility to all within sight of it. To accommodate such a large feature, a substantial base and foundation will be required. By locating the flagpole on top of the embankment, impacts to sub-surface nineteenth century archeological resources can be avoided, until such time as a portion of the embankment is carefully removed (see Drawing 8). Once the next steps are taken regarding removing a significant portion of the embankment, the flagpole can then be relocated on grade to its approximate original position. If installed on the original grade, care must be taken to prevent any potential negative impact to archeological resources.

LA.21: Install new paving atop the 1892 embankment.

Along with the newly installed features on the embankment, paving should be put in to create a more cohesive space. Flagpoles symbolize a sense of ceremony, and

the presence of the imposing garrison flag suggests a dignified setting. Paving can help create the appropriate setting and further define the space by connecting the new landscape elements. In addition, paving will help to guide visitors from the new steps at Potomac and Shenandoah streets to the Engine House site, the flagpole and the relocated steps leading down to a portion of Lower Armory Grounds. As a short-term task, the paving is not intended to be a permanent feature, so recommended materials include finely crushed stone or other permeable paving.

LA.22: Install cut masonry stones along location of original Armory river wall.

In the 1820s, the Armory constructed a massive mortar stone masonry wall along the river edge of the Musket Factory, fifteen feet above the low water level. Extending the length of the complex, the river wall provided outlets for eight culverts from the tailraces from the workshops and protected the property from high water. This wall is currently below grade. To aid visitors in understanding the historic industrial landscape, install a linear row of similar stones to delineate the location of the below-grade feature (see Figure 4.26).

UPPER ARMORY GROUNDS TREATMENT GUIDELINES AND TASKS

Perhaps due to its less than central location and overgrowth of unmanaged vegetation, the Upper Armory Grounds receives few visitors. There is no formal pathway system through the area, but visitors both walk and drive to the site and park off-street across the road from the former hydroelectric plant. The area is mostly covered with trees and brush, obscuring the river wall and remnants of the canal. The most critical task is an inventory of archeological resources within the site which contains approximately ten Armory structure foundations. The inventory can then guide future actions including what trees are removed and the location of new features such as trails or parking. The General Management Plan proposes this area as an archeological preserve with less formalized circulation and interpretive exhibits. In addition, the park intends to utilize the former hydroelectric plant as a multi-use facility with exact programming to be determined. These new uses will require the park to address parking and accessibility issues that are outside the scope of this report.

MEDIUM AND LONG-TERM LANDSCAPE TREATMENT TASKS

UA.1: Construct pedestrian footbridge using existing supports to provide a link between Upper Armory and the Canalway and Dam Area.

At the former hydroelectric plant, remnant foundations of the original railroad trestle bridge still survive. The B&O Railroad established the line running along the length of the Musket Factory in the 1840s. The line was still active when Thomas Savery operated his pulp mill at the same site (Figure 4.44). Constructing

a pedestrian bridge over the trestle foundations system will enhance the visitor experience by bringing people right over the river to experience panoramic views (Drawing 9). In addition, visitors will be able to closely view industrial remnants that survive from several periods (Figure 4.45). The footbridge will be incorporated into the pedestrian walkway system established through Lower and Upper Armory Grounds. Various manufacturers provide prefabricated structures that can be modified to individual needs (Figure 4.46). Wood is the recommended material which will help the footbridge superstructure blend into the surroundings and not detract from the historic character of the site.

SHORT-TERM LANDSCAPE TREATMENT TASKS

UA.2: Remove woody vegetation impacting both surface and below-grade historical features.

Upper Armory Grounds contains a rich reserve of archeological resources including Armory building foundations and underground tunnels. There are potentially other artifacts and landscape features beneath the surface that have yet to be discovered. Studies are needed to locate all building foundations and other possible structures. The General Management Plan intends for the Upper Armory Grounds to be maintained as an archeological preserve whereby the landscape would be maintained to limit disturbance to archeological features. Removing vegetative growth that is adversely impacting these resources is an essential element of effective landscape treatment. Conduct an archeological inventory to locate foundations of buildings and other structures. Once locations are verified, remove vegetation using techniques that will not harm below-grade features. As stated in Treatment recommendations outlined for Lower Armory Grounds, it is recommended that trees within a distance of four-feet from the retaining river wall be removed. Beyond a distance of four-feet from the river wall, it is appropriate to remove trees where they obstruct historic views (Drawing 9). The removal process includes using hand or power tools, depending on the location relative to existing features. To prevent re-sprouting, mechanically and chemically treat the stumps. Ground protection may also be utilized if deemed appropriate, comprising of layers of plywood in a criss-cross pattern to fully cover area. An alternative to plywood is to use limbs trimmed from trees to cover the area, reducing the need for additional materials.

Above-ground historic features include the Armory river wall and canal (Figures 4.47, 4.48). The canal has been filled in over the years with vegetation which has undermined the structure in some areas. Initial efforts should focus on stabilizing the structure by careful removal of vegetation and sediment within the canal prism with the long-term view of re-watering the canal to further enhance the historic landscape. Manual removal of woody vegetation may be necessary to prevent damage to the structure. Chemical treatment may be used for broad

swaths of non-woody material. In addition, remove vegetation six feet on either side of the canal to provide access and visibility (Figure 4.49). A trail can then be installed to bring visitors to the feature. The original Armory river wall from the 1820s is another historic resource that has not been fully revealed and interpreted. By removing vegetation and integrating the wall into a pedestrian circulation system, visitors would be able to understand the full extent of the Armory complex and its relationship to the river.

UA.3: Regrade Upper Potomac Street for improved visitor accessibility.

Potomac Street began as an alley and was transformed under Symington's tenure into a street in order to reduce congestion and streamline access to the Musket Factory. The street was adjacent to the Armory canal, forming a boundary of the Musket Factory and a buffer between the industrial complex and surrounding neighborhood. Currently, Potomac Street crosses the train tracks and transitions to a narrow rutted, unimproved road, known as Upper Potomac Street, leading northwest to Dam Three (Figures 4.50, 4.51). Its current condition does not encourage visitors to venture beyond the hydroelectric plant. To promote visitor use, it is recommended that Potomac Street be regraded and resurfaced with crushed-stone aggregate in support of two way traffic and bicycle use (Figure 4.52). This task requires negotiating with the municipality owning and maintaining the public roadway. The General Management Plan initially considered the concept of making park trails accessible to bicycles. But it was decided that this was inappropriate given the commemorative nature of much the grounds.[181] The General Management Plan further states that the local transportation district is planning on constructing new bicycle paths.[182] This would allow bicyclists to use public roads and rights-of-way to access the park. Continuing communication and coordination between the park and the local administration will help facilitate a better plan that can meet the goals of both parties.

UA.4: Design and construct parking area facilitating the multiple-use rehabilitation of the former hydroelectric plant.

The hydroelectric plant, also referred to as the former Potomac Edison Hydroelectric Plant, is comprised of the foundations of the original Armory rolling mill from the 1850s and remnants of the pulp mill built circa 1889. The hydroelectric plant was constructed in 1925 after the pulp mill burned down. The plant closed in 1991 and has remained unused. The building is currently enclosed with chain link fencing and barbed wire and surrounded by brush (Figure 4.53).

According to the General Management Plan, the building is envisioned as housing interpretation, maintenance and training functions. More specific

programming for the building needs to be identified in order to design and provide appropriate access which is beyond the scope of this report.

CANALWAY AND DAM AREA TREATMENT GUIDELINES AND TASKS (DRAWING 9)

The Canalway area is a heavily wooded landscape featuring dramatic topography along its riverine edge with a linear configuration consisting of the railroad, Upper Potomac Street, and the former Armory canal, all of which parallel the Potomac River (Figure 4.54). Much of the Armory canal is not a visible resource, obscured by vegetation and inaccessible by pedestrians. The dam and canal intake structures are currently popular spots for fishing and provides panoramic views (Figure 4.55). The canal has historically been used for fishing and recreation as well (Figure 4.56). Both the canal and the dam have the potential to become more prominent features of the historic landscape. According to the preferred alternative in the General Management Plan, there is interest in conducting a study to assess the condition of the canal in order to restore it to its original appearance during the historic industrial period.[183] This could potentially include re-watering the canal and highlighting the surviving tailgate structures and bridge abutments as well. Portions of the retaining wall by the dam have deteriorated and are in need of major repair.

LONG-TERM LANDSCAPE TREATMENT TASKS

CD.1: Re-water Armory canal.

Originally constructed in 1801, the canal was enlarged in the 1820s and again in the 1850s to provide additional water power to the Armory mills and machine shops. Thomas Savery incorporated the canal into his pulp mill operations in the late 1880s. Large sections of the canal were buried when the embankments were constructed. An initial feasibility study for re-watering the canal is required, beginning at the former hydroelectric plant and extending northwest to the dam. The study should identify and address hydrological impacts and drainage issues and establish the endpoint of the canal. In addition, an assessment of the existing condition of the canal is required to determine the extent and cost of any necessary repairs. Depending on the findings of the study and environmental assessment, a plan for re-watering canal can then be developed (Figures 4.57, 4.58). Several tests might have to be conducted before the final re-watering process is initiated. An important first step to rewatering the canal is the removal of vegetation growing within the engineered canal prism (Drawing 10).

MEDIUM LANDSCAPE TREATMENT TASKS

CD.2: Repair failing sections of canal walls and other masonry features.

Preserve the historic character of the surviving canal walls and masonry retaining structures. There are currently several locations where severe structural damage has occurred (Figures 4.59, 4.60). Prepare an inventory of damaged sections and proceed to stabilize retaining walls by rebuilding collapsed portions using original stones when possible. If new stonework must be introduced, use similar materials (Figure 4.61). Maintaining the historic character of the structure is critical to the overall preservation of this landscape feature.

SHORT-TERM LANDSCAPE TREATMENT TASKS

CD.3: Remove vegetation within engineered canal prism.

The Armory canal is currently obscured by thick woody vegetation (Figure 4.62). Remove vegetation inside the canal and six feet on both sides where possible. In addition, remove accumulated detritus at the bottom of the structure. As with removal of vegetation at the canal at Upper Armory Grounds, care must be also given to prevent further damage (see Task UA.2).

CD.4: Regrade Upper Potomac Street for improved visitor accessibility.

Continue efforts to provide a smoother, well drained roadway that can accommodate two-way traffic as well as bicyclists, similar to the effort at Upper Armory Grounds (see Task UA.3). By providing easier access, more visitors can enjoy the views afforded by the lookout area at the dam and have the opportunity to view the historic Armory canal and appreciate and understand its relationship to the Potomac River and the Armory.

CD.5: Install pedestrian walking surface atop riverfront canal berm.

A trail is currently under construction along the top of the canal berm, which prevents any potential damage to below-grade resources and will provide views out to the river as well (Figure 4.63). The trail is basically a clearing, but has the potential to become accessible with appropriate surface materials that are firm and stable, and able to withstand frequent foot traffic without degrading (Figures 4.64, 4.65). Crushed stone with a binder has been used successfully. The minimum width is thirty-six inches but a wider trail would more easily accommodate two-way pedestrian flow or two visitors walking side by side. As for grading, the cross slope should be a maximum of five percent and no more than eight percent along the length. The path should be clear of any obstacles such as tree roots that could potentially cause a tripping hazard.

TREATMENT SUMMARY AND PRIORITIES

The following table summarizes the recommended tasks for the rehabilitation of the former Musket Factory grounds and Canalway at Harpers Ferry.

TABLE 2: SUMMARY OF LANDSCAPE TREATMENT TASKS

CULTURAL LANDSCAPE REPORT FOR UNITED STATES ARMORY AND POTOMAC RIVERFRONT - HARPERS FERRY NATIONAL HISTORICAL PARK

LOWER ARMORY GROUNDS

Number	Task Name	Priority	Related Task
LA.1	Relocate Armory Engine House to original location	Long-Term	LA.11
LA.2	Reconstruct main Armory gates and fence	"	LA.11
LA.3	Install three-dimensional representation of former 90-foot tall Armory smokestack	"	
LA.4	Rehabilitate surviving below-grade building foundations to present entire above-grade building footprints	"	LA.11
LA.5	Install new formal entrance at main gate	"	LA.11
LA.6	Relocate John Brown monument adjacent to Engine House	"	LA.11
LA.7	Install street trees in Lower Armory Grounds	"	
LA.8	Provide limited site lighting based on historic features and documentation	"	LA.4
LA.9	Retain non-historic entrance opposite Hog Alley	"	LA.11
LA.10	Install a wooden railroad trestle at Lower Armory Grounds	"	
LA.11	Excavate and retain a breach in the 1892 railroad embankment	"	
LA.12	Construct linear river-walk parallel to the original (inner) Armory retaining wall	Medium-Term	LA.10
LA.13	Restore original grades and circulation features – to the extent possible given the presence of the 1892 and 1930 railroad embankment	"	LA.11
LA.14	Excavate and construct a limited breach in the 1892 railroad embankment to facilitate accessibility		
LA.15	Remove utility and associated concrete base and steps from 1930 embankment	Short-Term	
LA.16	Install newly fabricated interpretive wayside panels – appropriate locations - Completed	"	Locations will change with future landscape modifications
LA.17	Remove self-sown trees	"	
LA.18	Redesign and reconstruct existing non-historic stairs	"	
LA.19	Construct new stairs to Lower Armory Grounds -Completed	"	
LA.20	Install new garrison flagpole near its original location	"	
LA.21	Install new paving atop 1892 embankment	"	
LA.22	Install boulders along location of original Armory river wall	"	

UPPER ARMORY GROUNDS

Number	Task Name	Priority	Related Task
UA.1	Construct pedestrian footbridge	Short-term	
UA.2	Remove woody vegetation	"	
UA.3	Regrade Upper Potomac Street	Medium-term	
UA.4	Design and construct small parking area	"	

CANALWAY			
Number	**Task Name**	**Priority**	**Related Task**
CD.1	Re-water Armory canal	Long-Term	CD.2, CD.3
CD.2	Repair failing sections of canal walls and other masonry features	Medium-Term	CD.3
CD.3	Remove vegetation within engineered canal prism	"	
CD.4	Regrade Upper Potomac Street for improved visitor accessibility	"	
CD.5	Install pedestrian walking surface atop riverfront canal berm-Under Construction	"	CD.3

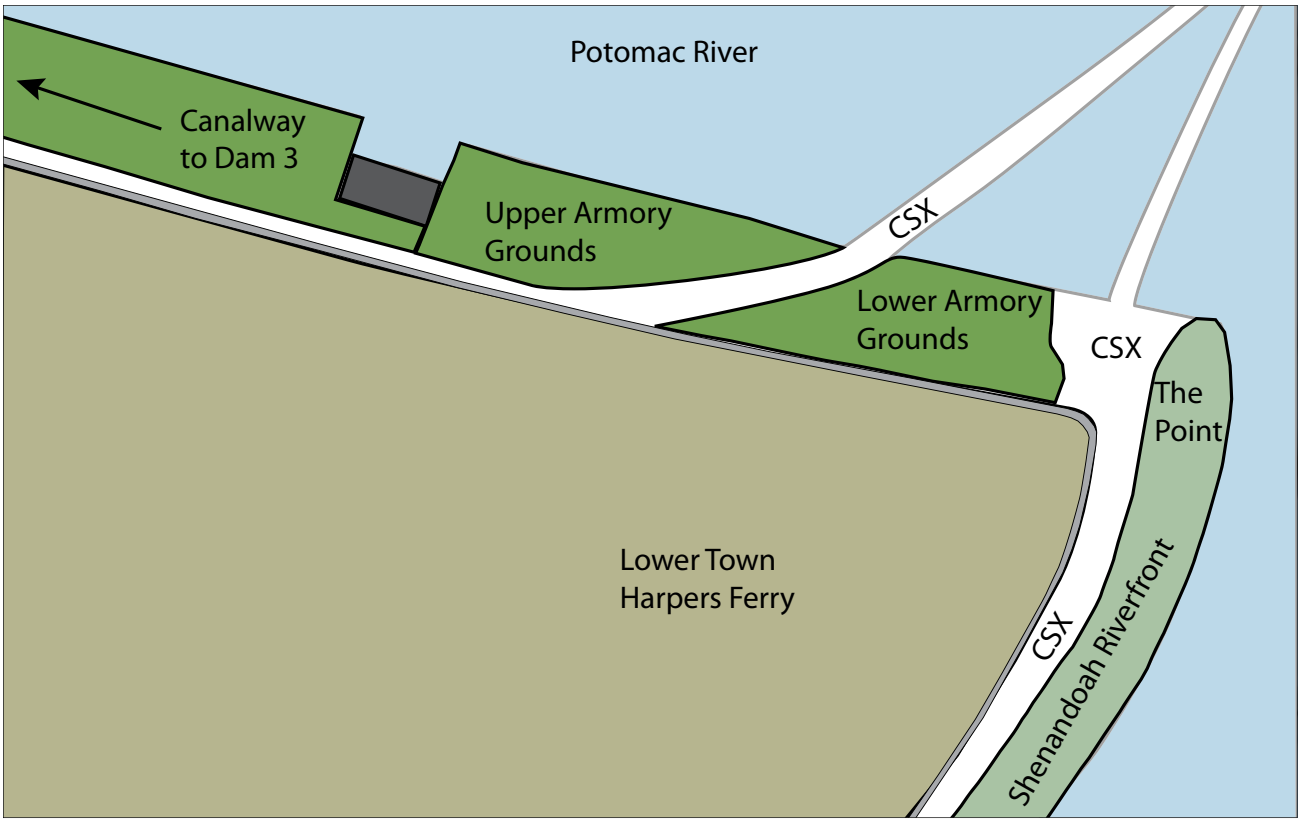


Figure 4.1: Diagram of study area showing the disjointed nature of the property by the railroad dividing the site into Lower and Upper Armory Grounds and separating the site from the Point. OCLP, 2009.

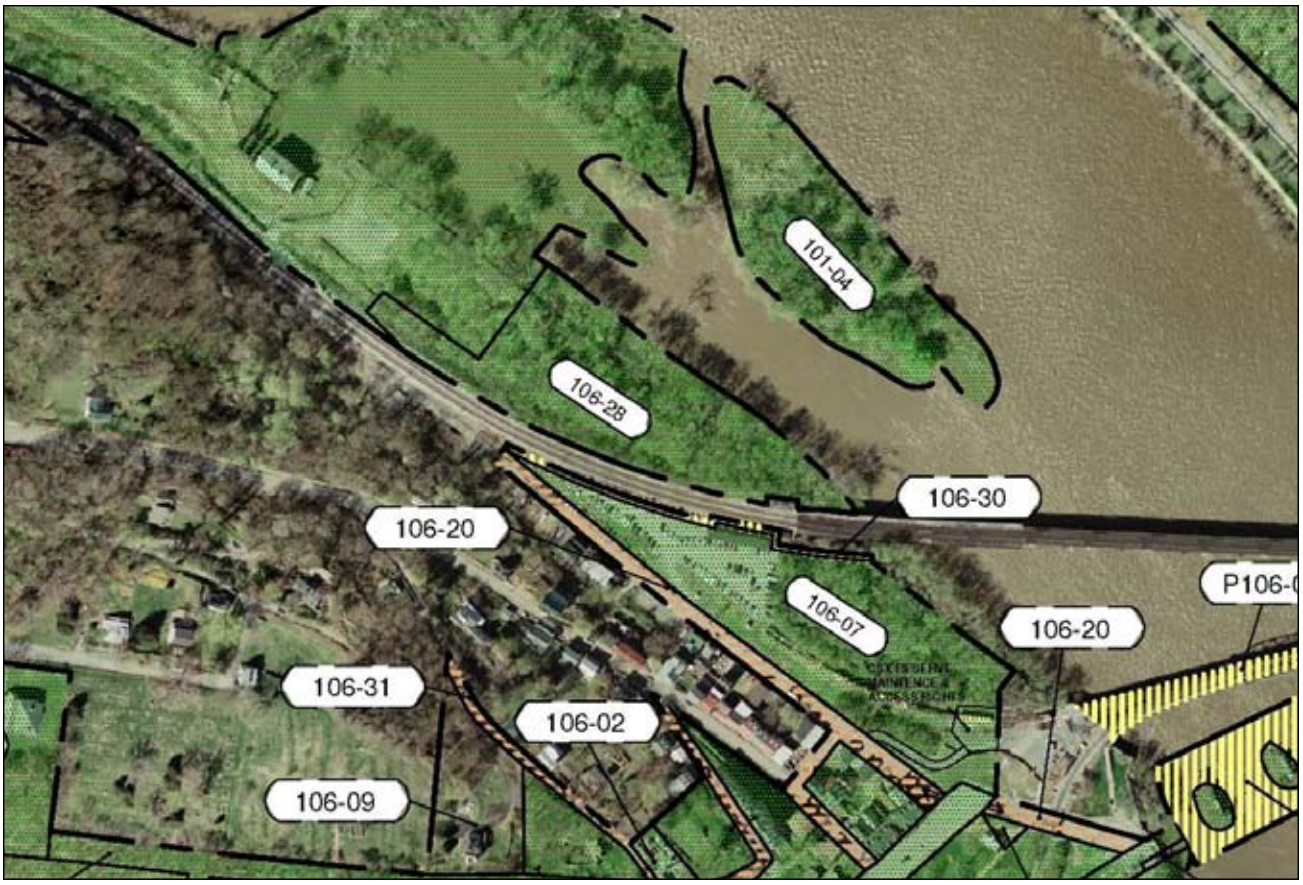


Figure 4.2. Detail from deed plan with green areas denoting park ownership. Harpers Ferry National Historical Park, Segment 106, prepared by the Land Resources Center, National Capital Region, May 16, 2002.

Figure 4.3. View of railroad company's fenced storage yard on top of 1892 embankment and access road in the foreground. OCLP, July, 2009.

Figure 4.4. View of the former Armory grounds during the flood of 1936 with the hydroelectric plant in the foreground. The rivers rose thirty-six and a half feet, resulting in the all-time record crest for Harpers Ferry. Harpers Ferry Historic Photo Collection, HF-1272.

Figure 4.5. View of Armory grounds in post-war ruins, circa 1880s, prior to the construction of the 1892 embankment. Lower Town is in the foreground. Harpers Ferry Historic Photo Collection, HF-1728.

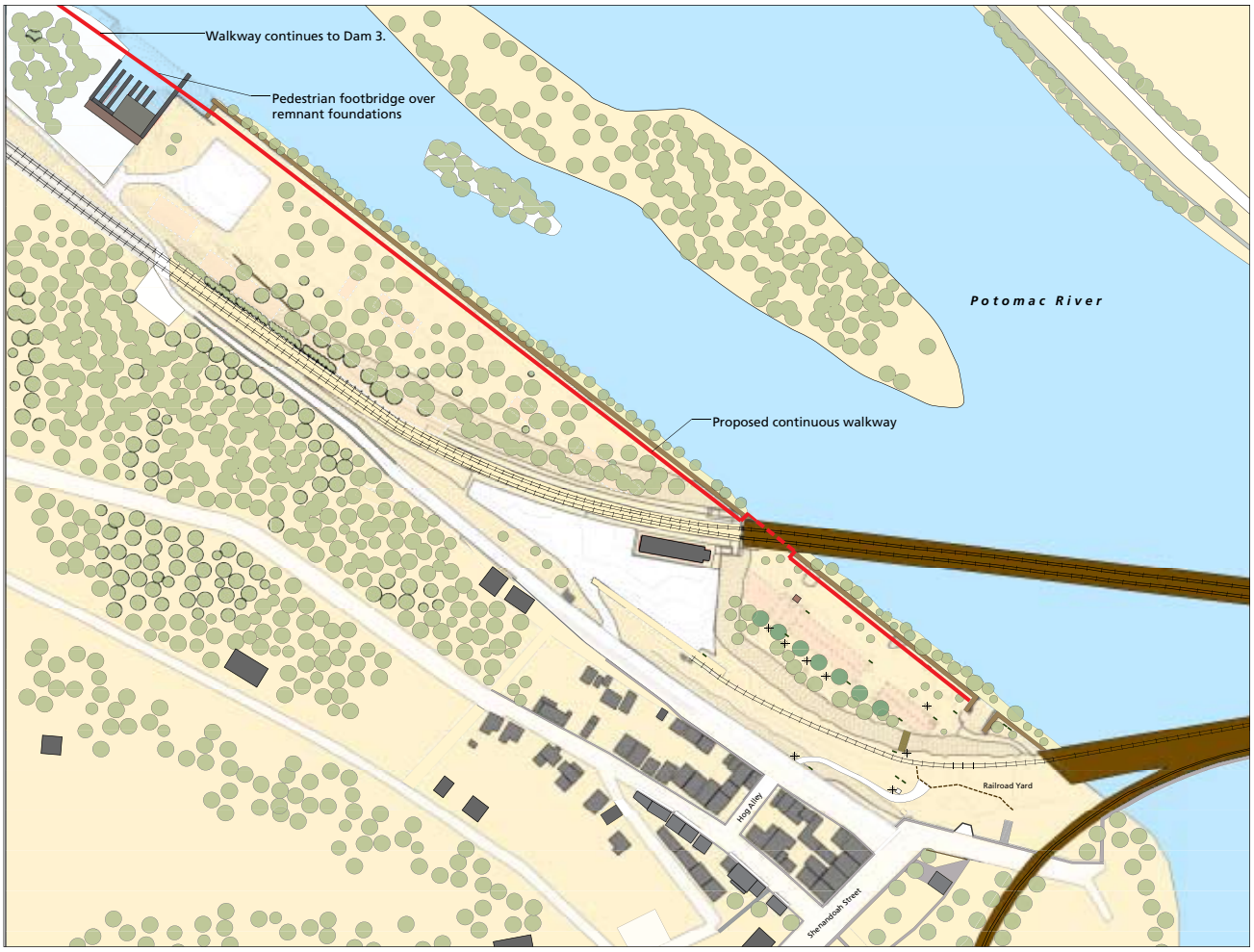


Figure 4.6. Diagram illustrating proposed continuous walkway, in red, from Lower and Upper Armory Grounds and beyond to the Dam. A cantilevered segment will be required under the railroad bridge to maintain continuity. OCLP, 2009.

Figure 4.7. View of Armory grounds as a commemorative garden in 1939. Note the wide open space with mowed grass. Today, woody vegetation has taken over much of the site. Harpers Ferry Historic Photo Collection, HF-1049.

Figure 4.8. View of wayside interpretive exhibits at Lower Armory Grounds including, in the foreground, a facsimile of the collapsible iron boat frame developed at Harpers Ferry for Lewis and Clark's expedition. The locations of some of the waysides will need to be modified in order to accommodate later treatment recommendations, such as the relocation of the steps, exposing archeological features, and the installation of a new walkway along the river wall. OCLP, July, 2009.

Figure 4.9. View of former Engine House, also known as John Brown's Fort, in its current location in Harpers Ferry. Restoring the building to its original site is one of the long term goals of the treatment plan and will enhance the historical integrity of both Arsenal Square and Lower Armory Grounds. OCLP, July, 2009.

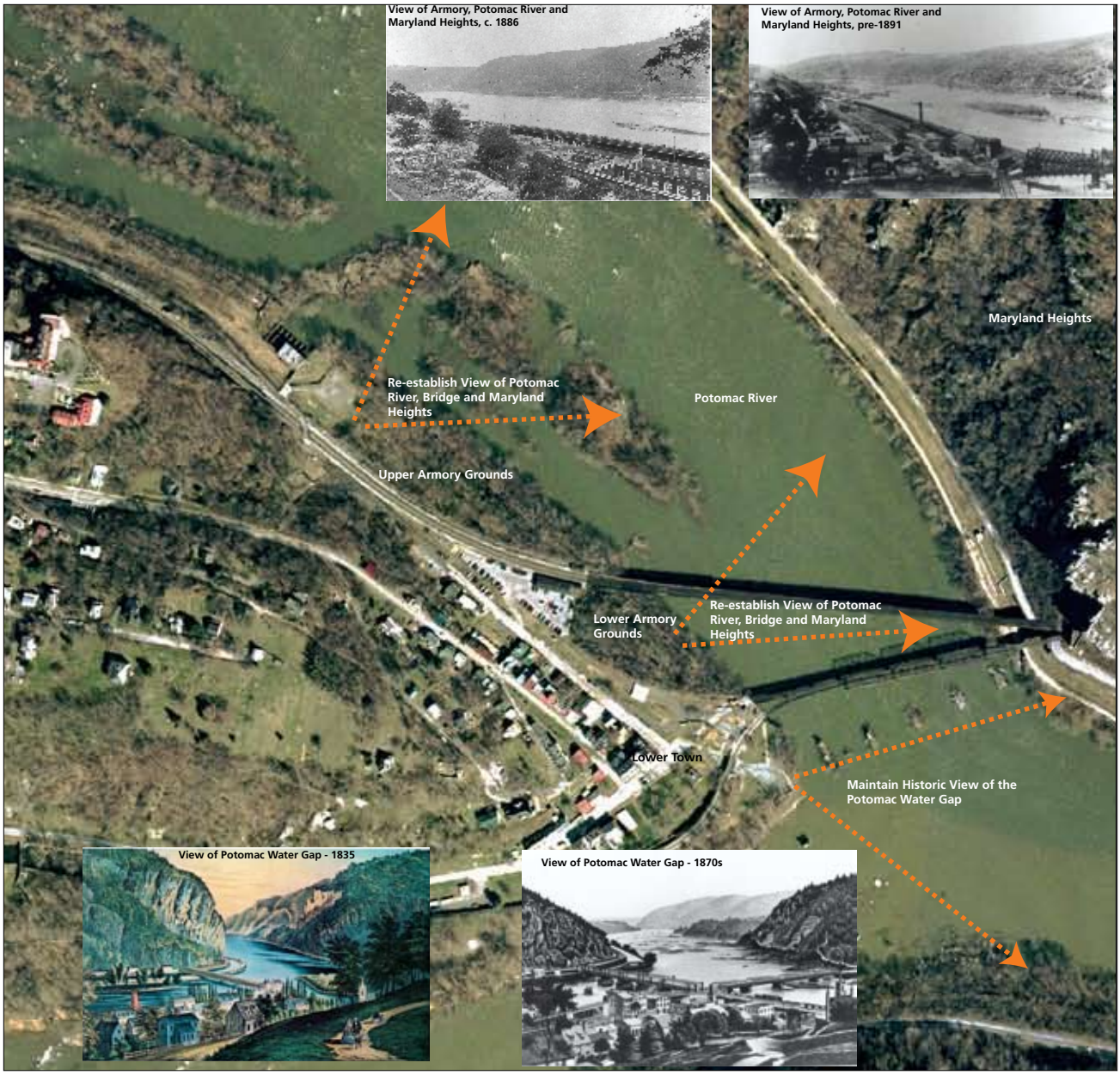


Figure 4.10. Aerial view of the study area with historical images of the views of the Potomac River and Maryland Heights. Removing woody vegetation that has grown over the last fifty years would reestablish these views and the historic character of the landscape. Harpers Ferry Historic Photo Collection, HF-0768, HF-1728, HF-0670, Currier & Ives print.

Figure 4.11. View of archeological excavation at Lower Armory Grounds in 2006. Additional archeological investigations are needed to locate all Musket Factory building foundations and features, including the layout of pedestrian and vehicular circulation. OCLP, June, 2006.

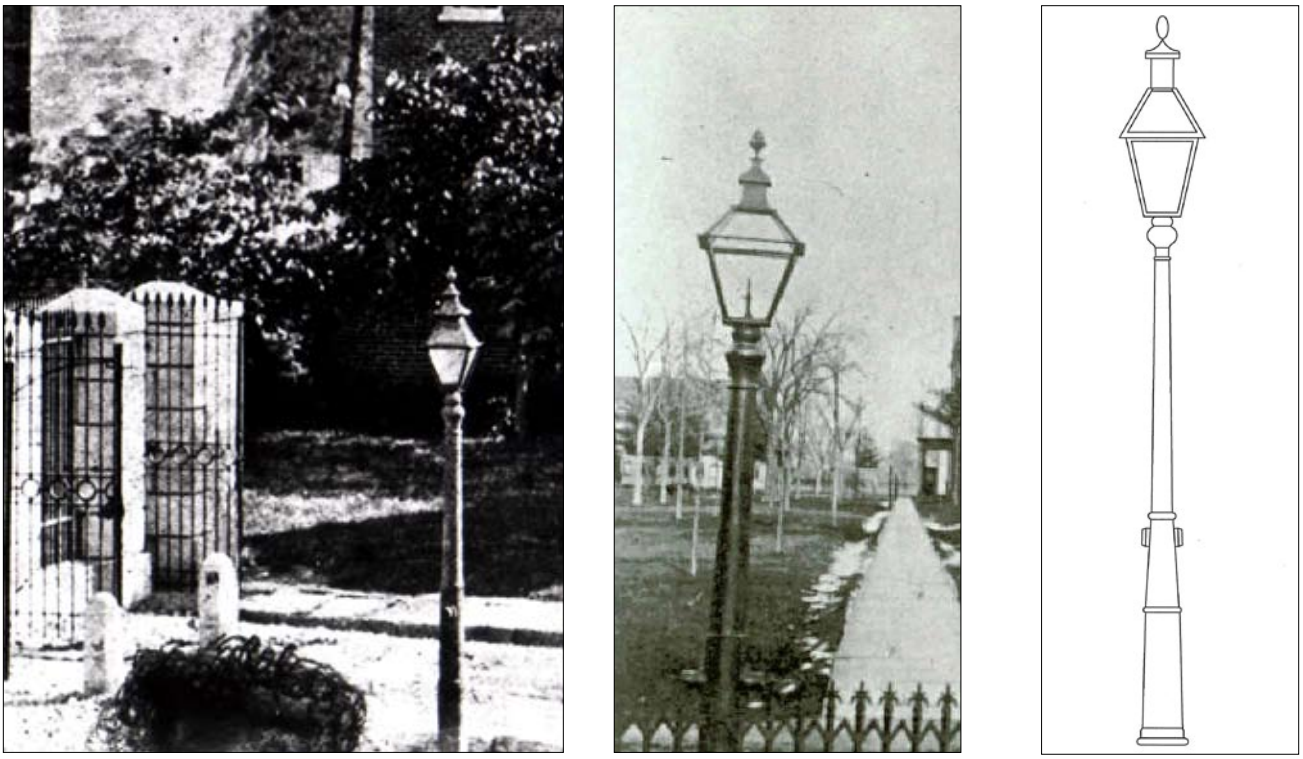


Figure 4.12. The image to the left shows a typical lamp post at the Harpers Ferry Armory in the late 1850s, which appears to be very similar to the lamp post at Springfield Armory in 1871, illustrated by the center image. To the right is a sketch facsimile of the fixture. Note the resemblance of the post to a cannon tube. The original lamp posts still survive at Springfield and could be used as a model to fabricate new ones for Harpers Ferry. Harpers Ferry Historic Photo Collection, HF-00090, SPAR Museum Archives, Box 002, Folder 05,

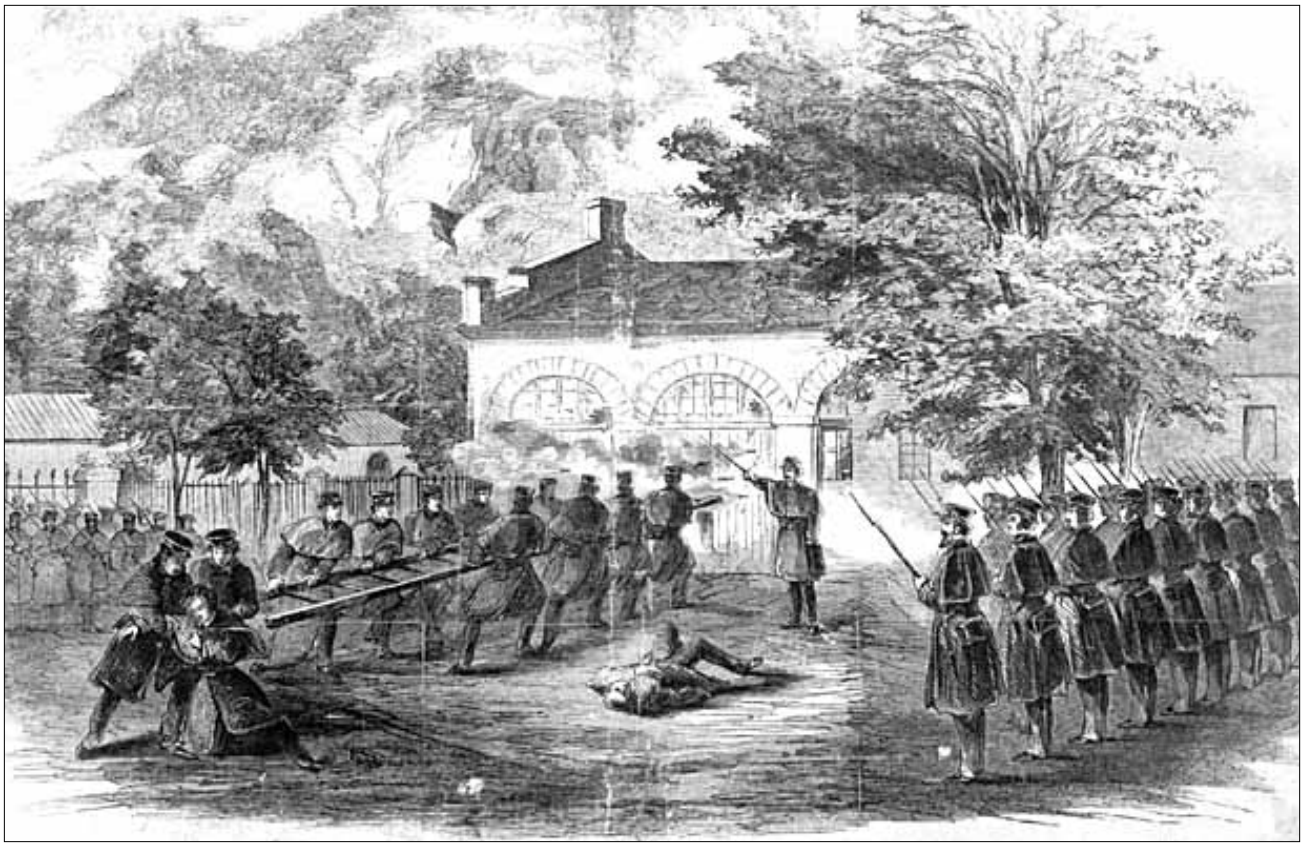


Figure 4.13. Illustration from *Harpers Weekly*, 1859, depicting the United States Marines storming the Engine House commandeered by John Brown. The Engine House later became known as John Brown's Fort and is currently located at Arsenal Square. Harpers Ferry Historic Photo Collection, HF-0115.

Figure 4.14. View of John Brown's Fort, circa 1882-1886. The building site is currently buried beneath the 1892 railroad embankment. Harpers Ferry Historic Photo Collection, HF-0379.

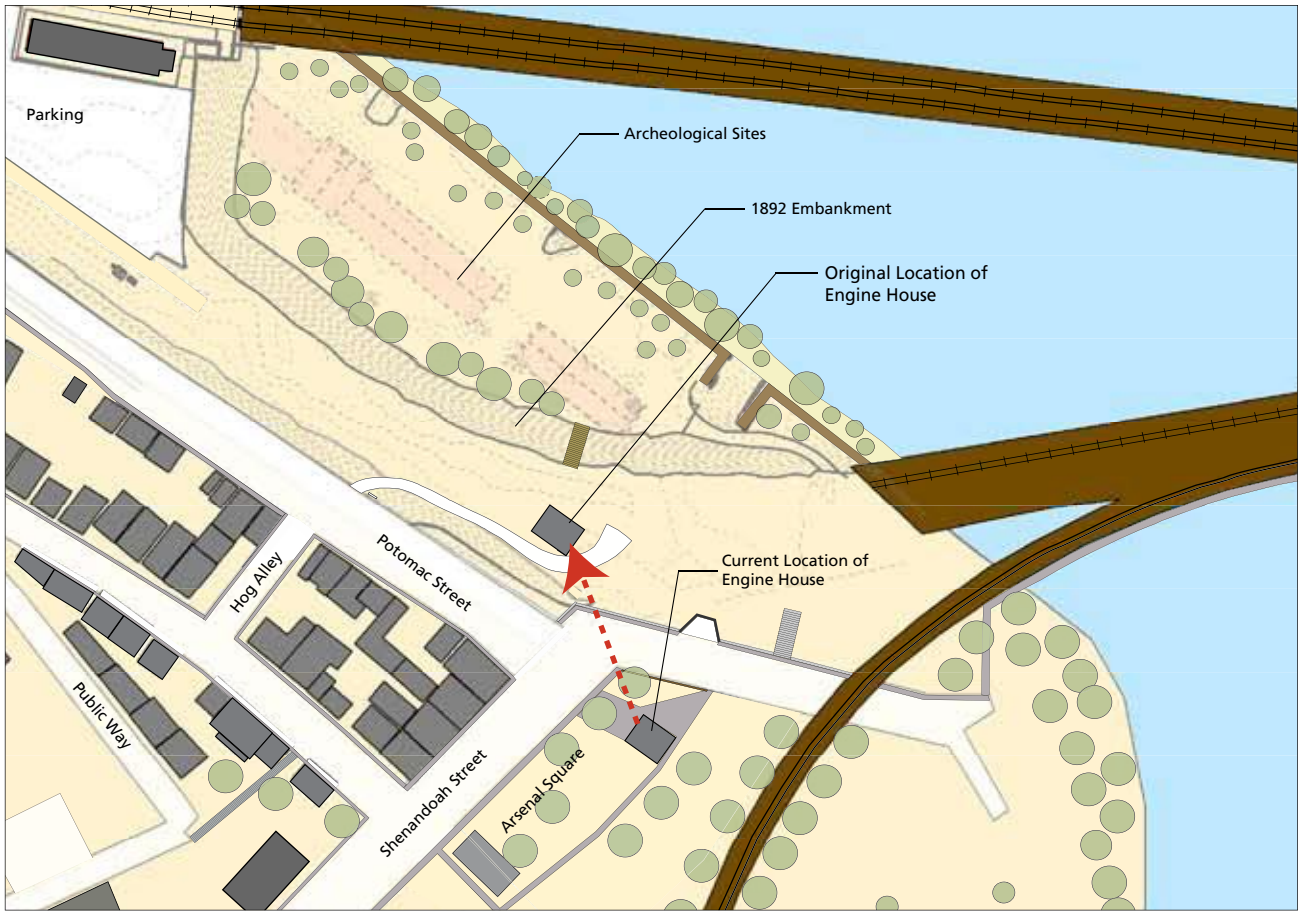


Figure 4.15. Diagram showing the current and original location of the John Brown Fort on the Musket Factory site. OCLP, 2009.

Figure 4.16. Before and After photosimulation showing the effect of the proposed relocation of John Brown's Fort to its original location, as well as the construction of Musket Factory gates, after the removal of the 1892 railroad embankment. Note that the white color of perimeter wall is likely not historic, but a product of digital modeling. OCLP with digital imagery by Dirk DeVault.

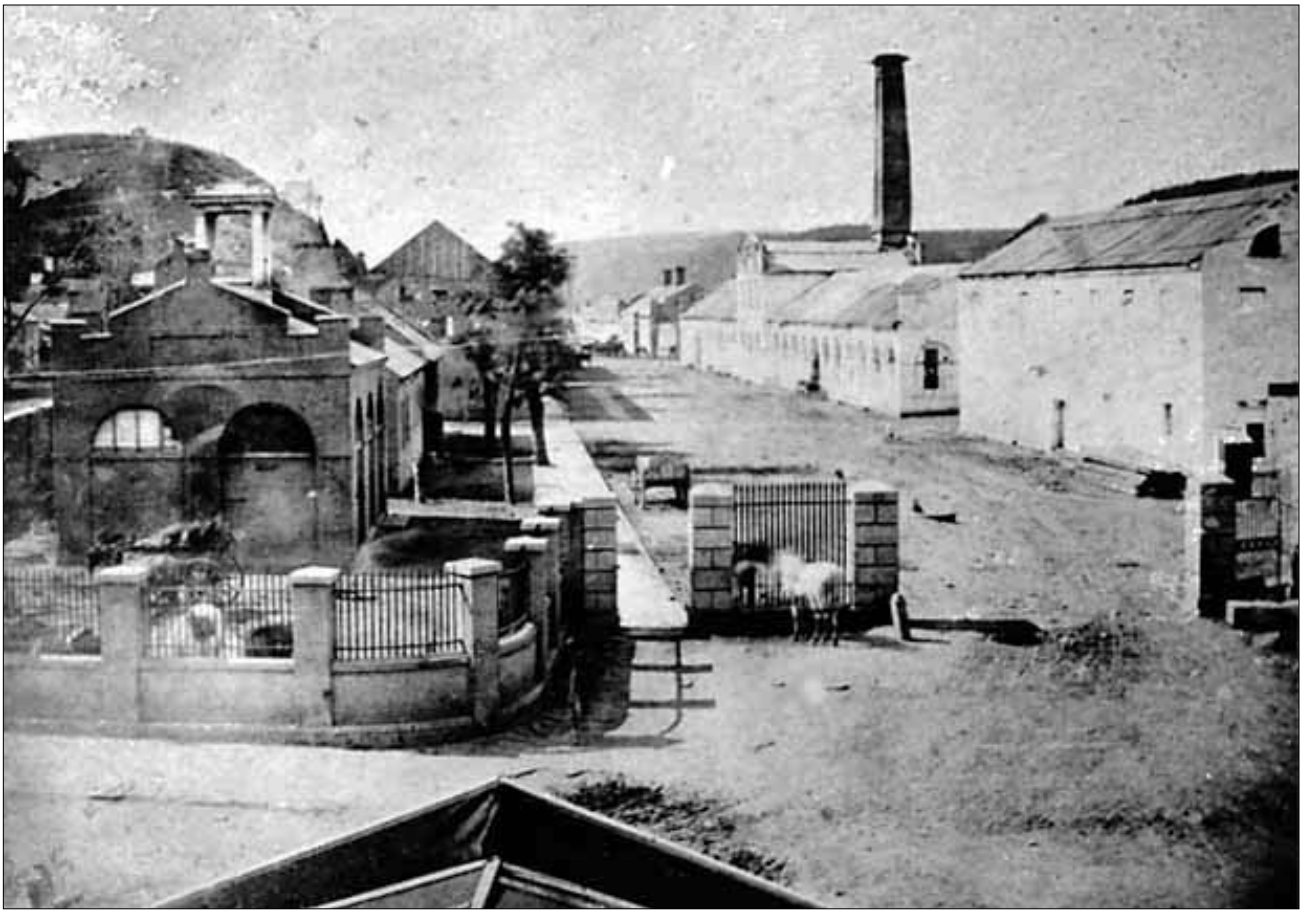


Figure 4.17. View of main Armory gates, circa 1862 with John Brown's Fort to the left. During the destruction of Armory buildings in 1861, the intensity of the fire killed the majority of trees. Only a few remained to the left, adjacent to the Engine House. In order to restore the perimeter fence and main gates, along with John Brown's Fort, a major portion of the 1892 embankment would need to be removed. Harpers Ferry Historic Photo Collection, HF-0027.

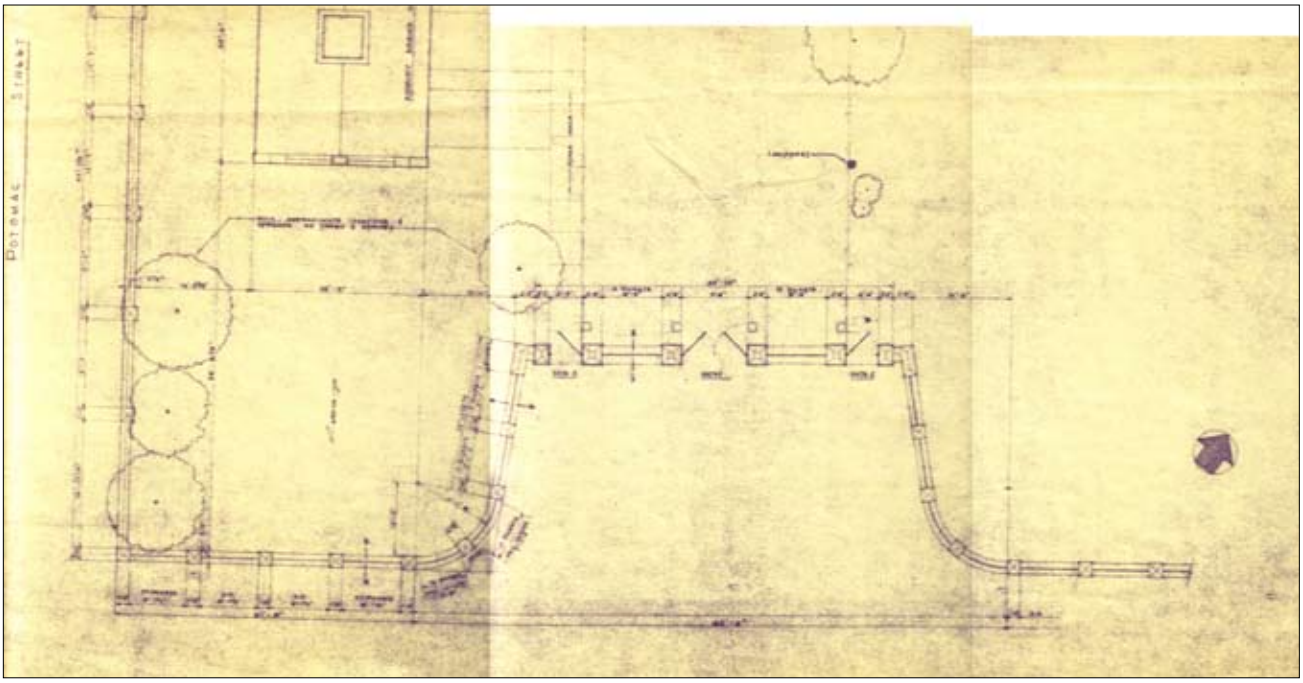


Figure 4.18. Architectural rendering, drawn in 1963, of the brick and iron fence at the main entrance of the Musket Factory. Harpers Ferry Historic Photo Collection, HMF-00295.

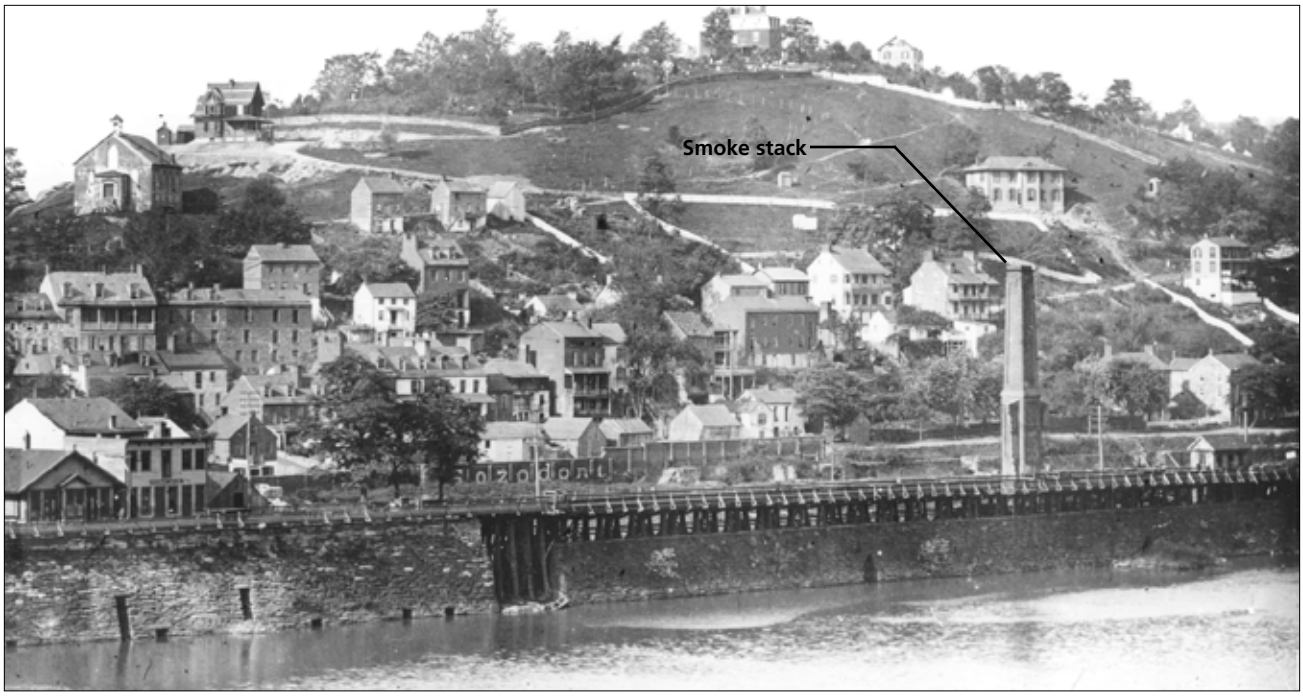


Figure 4.19. View from 1890 of the Musket Factory grounds with Lower Town and Camp Hill beyond. To the right is the remaining smoke stack, which was later removed when the railroad was realigned. Harpers Ferry Historic Photo Collection, HF-1155.

Figure 4.20. Interpretive structures made out of metal frames seen from a distance at WIllamette Mission State Park. http://dev.umns.umc.org/photos/02/02334.jpg.

Figures 4.21. This memorial structure in Boston utilizes metal and glass to fashion a tower structure that could also be used for creating an interpretive smoke stack structure at the Lower Armory Grounds. OCLP, January, 2009.

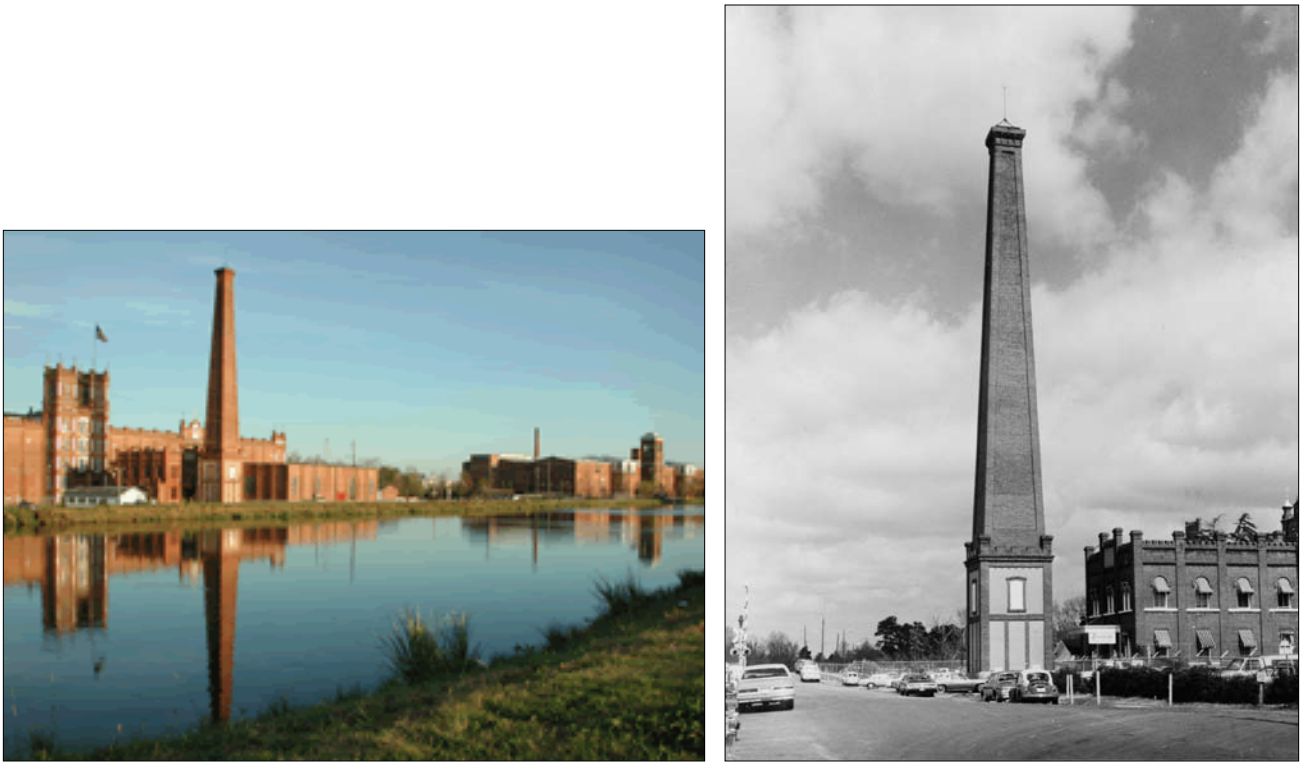


Figure 4.22. In Augusta, Georgia, a smokestack from the Confederate Powderworks was saved from demolition in order to remain as a memorial to Confederate soldiers and incorporated into new construction. The smokestack is very similar to the former Musket Factory smokestack and these images reveal how much of a visual impact the structure has on the landscape. nps.gov/history/nr/travel/augusta/sibleymill.html, HABS GA 123-AUG.54A-1.

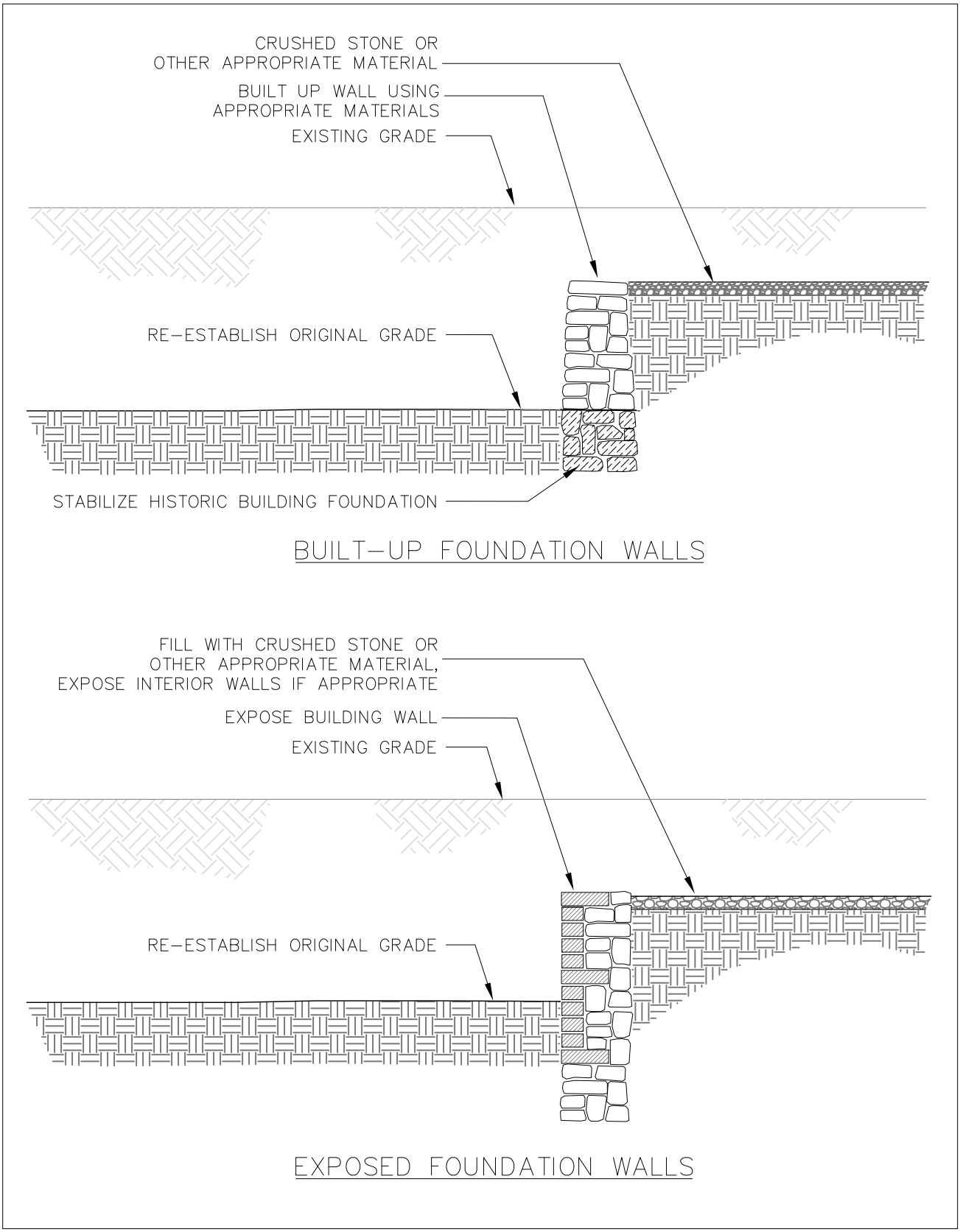


Figure 4.23. Sections illustrating the options for foundation treatments, including exposing the original structure wall, or building up the foundation to above grade. Specific materials and techniques will need to be determined by the park archeologist. OCLP, 2009.

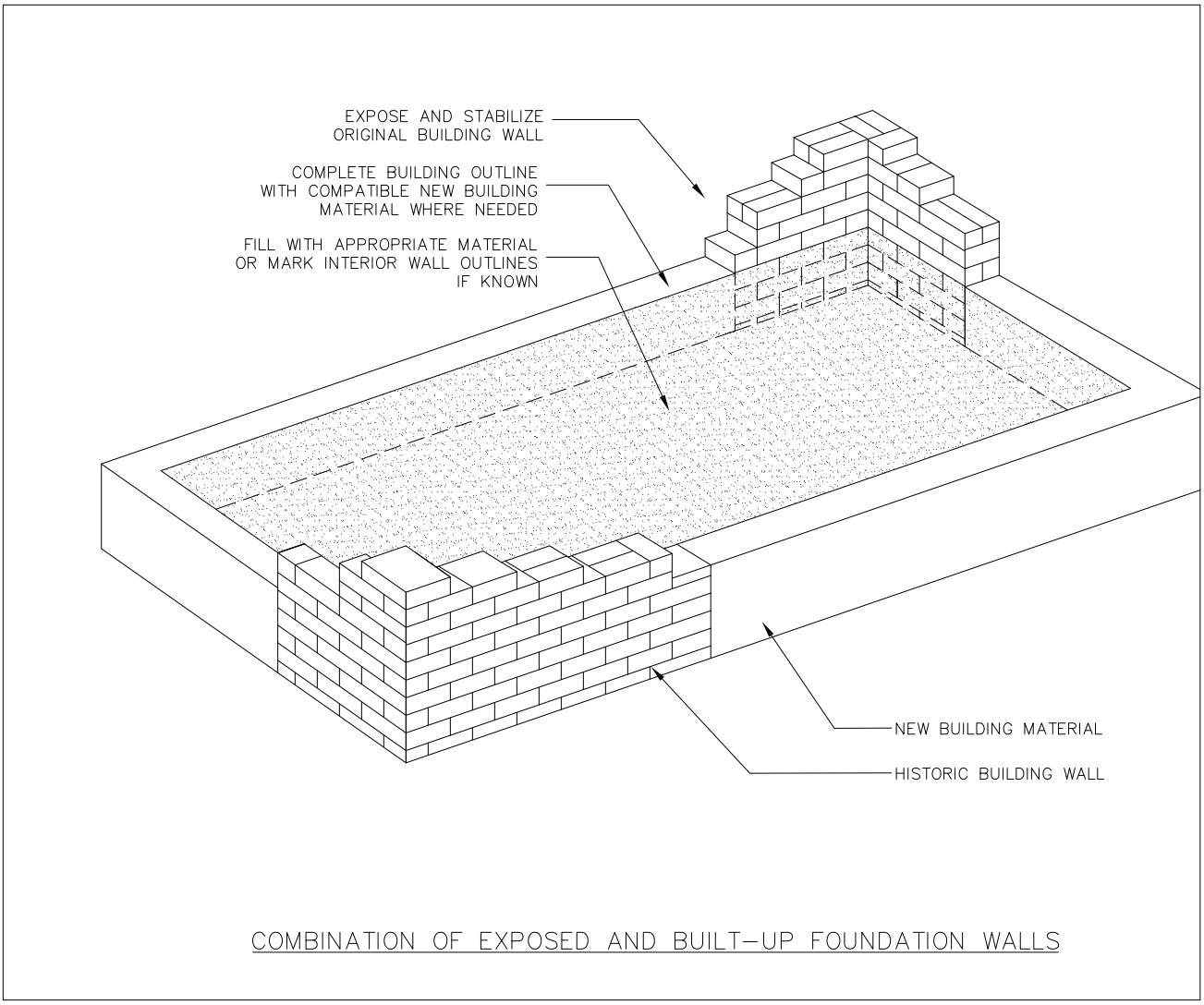


Figure 4.24. Sketch illustrating the option for combining foundation treatments including exposing the original structure wall and building up the foundation to above grade. OCLP, 2009.

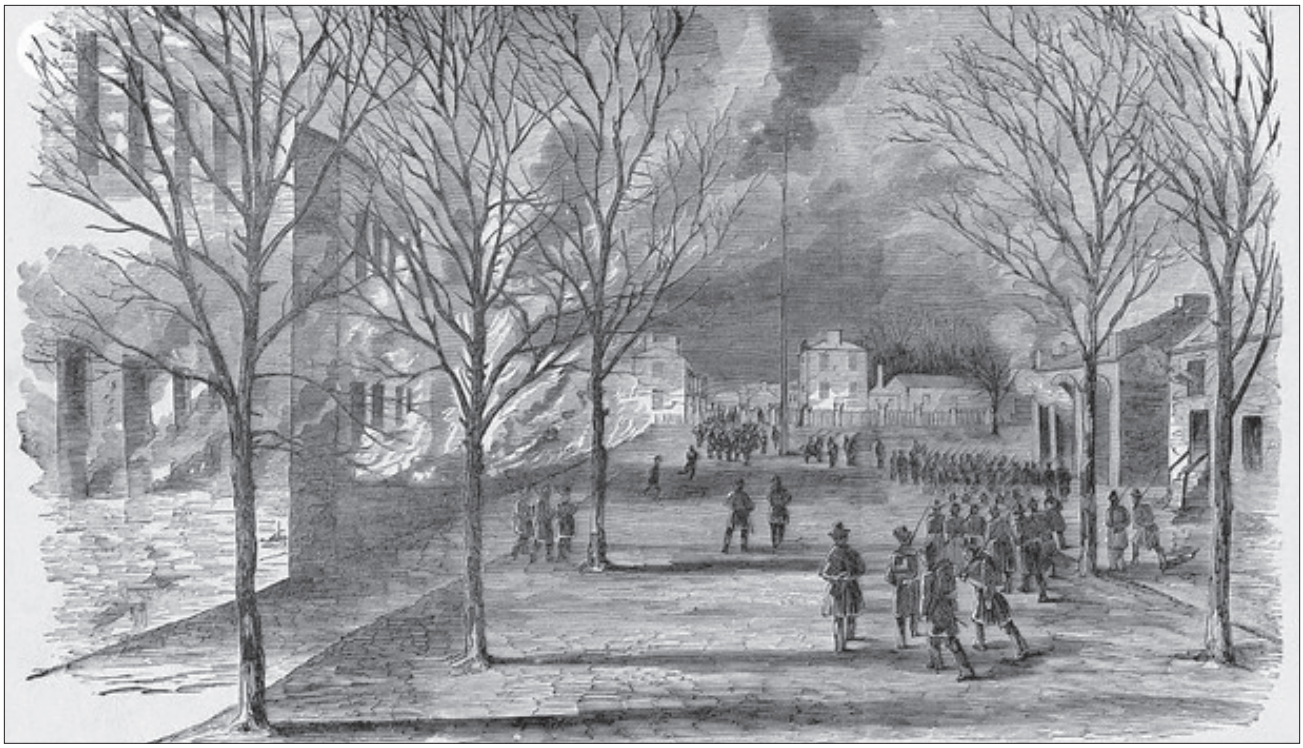


Figure 4.25. Newspaper rendering from 1861 depicting the main road through the grounds of the Musket Factory. Note the line of trees planted on either side. These trees would not have survived the blaze as shown. In the background are the Armory flagpole and entry gates. Harpers Ferry Historic Photo Collection, HF-001276.

Figure 4.26. Photoshop image showing how the installation of a portion of an elevated railroad trestle at Lower Armory Grounds can reveal to visitors the scale of the historic industrial landscape of the Musket Factory. To the left, a line of cut-stone masonry blocks demarcates the location of the original stone Armory river wall, which is currently below grade.

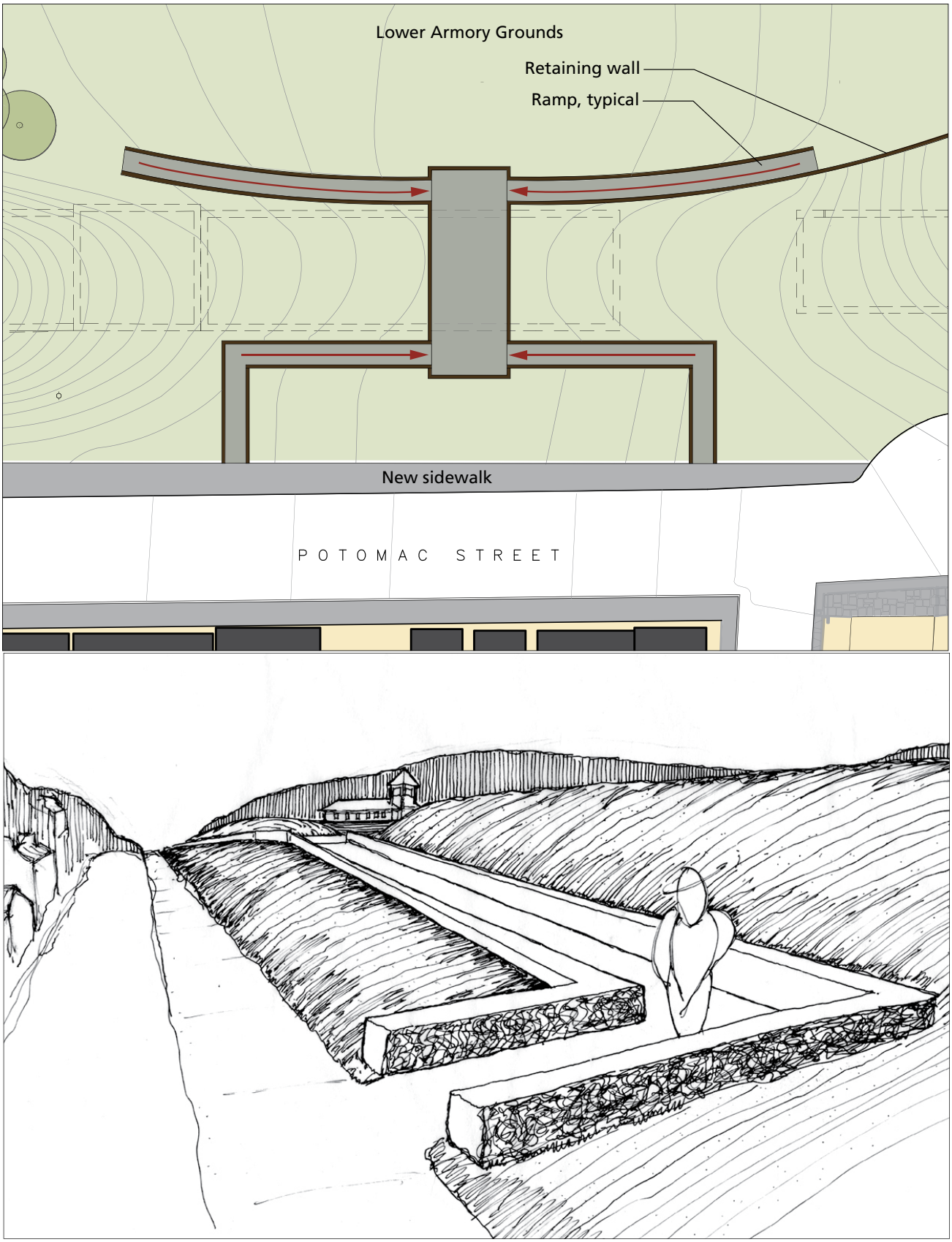


Figure 4.27. Plan and sketch concepts for interim treatment of the1892 embankment involving the creation of a limited breach, including ramped walkways on either side of the berm for access. This concept may be most appropriate for providing universal pedestrian access should hydrological studies indicate a flood control benefit to the existing railroad embankment. OCLP, 2009.

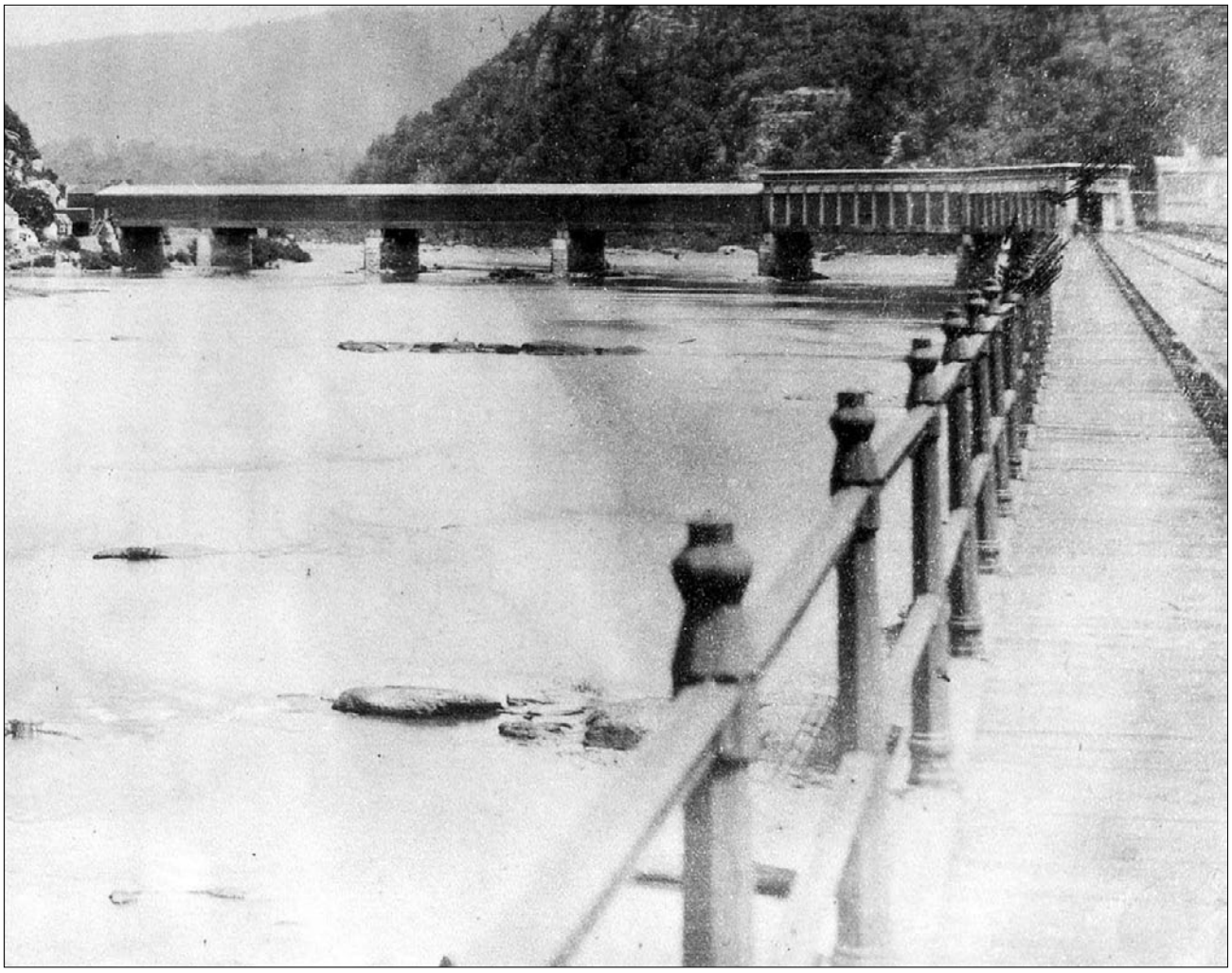


Figure 4.28. View of historic railroad trestle along the Potomac River edge of the Musket Factory grounds. The trestle incorporated a walking surface with a metal railing. Harpers Ferry Historic Photo Collection, HF-00065.

Figure 4.29. Perforated metal walkways, such as this elevated path system through a forested area at right, provide low maintenance and built-in drainage, and can prevent overcompaction. For the armory grounds at Harpers Ferry, a handrail would also be required. The image above illustrates another type of metal mesh. Mcnichols.com website.

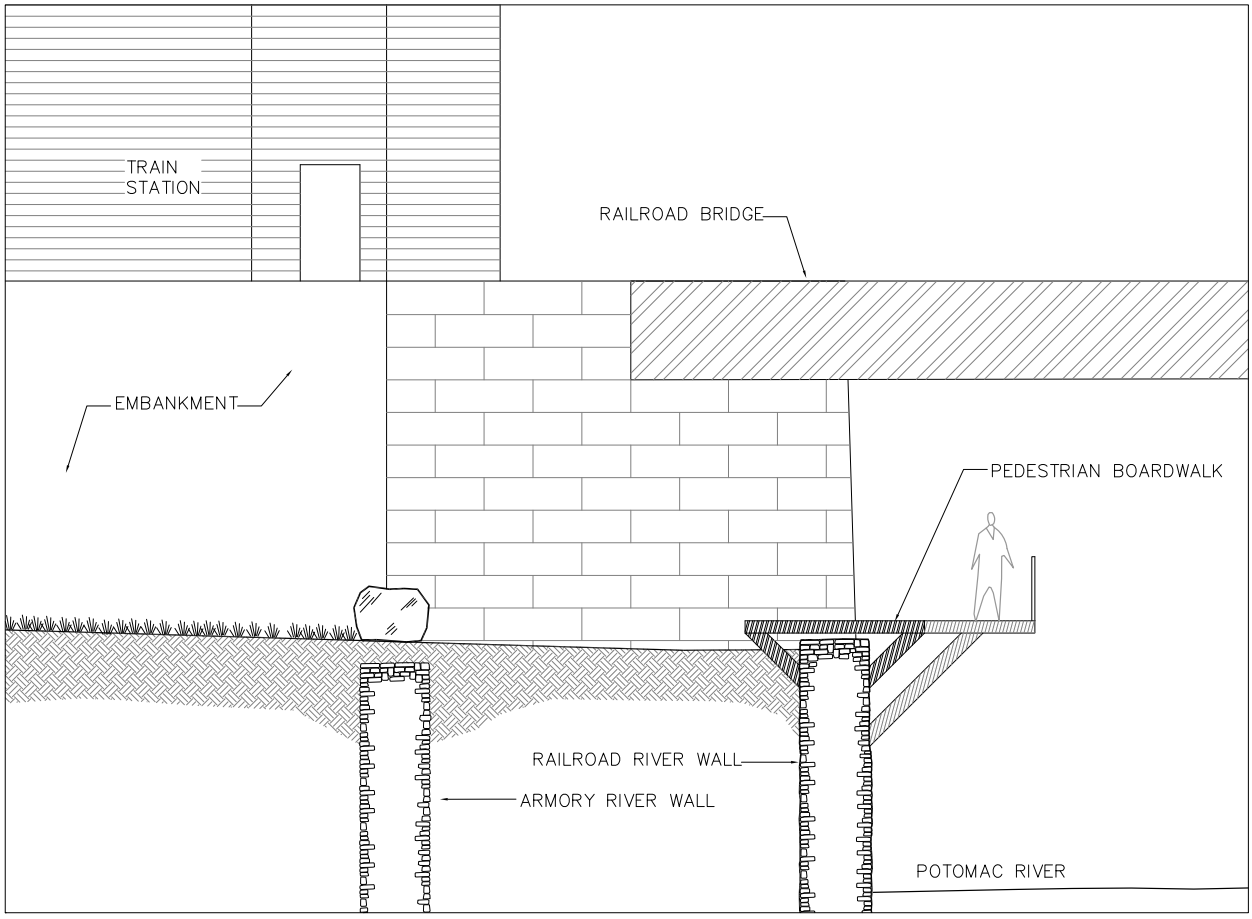


Figure 4.30. Diagram of proposed metal walkway constructed on retaining river wall at Lower Armory Grounds and cantilevered over the river to continue through Upper Armory Grounds. OCLP, 2009.

Figure 4.31. View of removable handrails installed on a bridge constructed at Olmsted Island at Chesapeake & Ohio Canal National Park. www.panoramio.com/photos/original/22366336.jpg

Figure 4.32. Archeological investigations like this one conducted at Lower Armory Grounds can help to determine original grades, paving materials and locations of planted areas. OCLP, June, 2006.

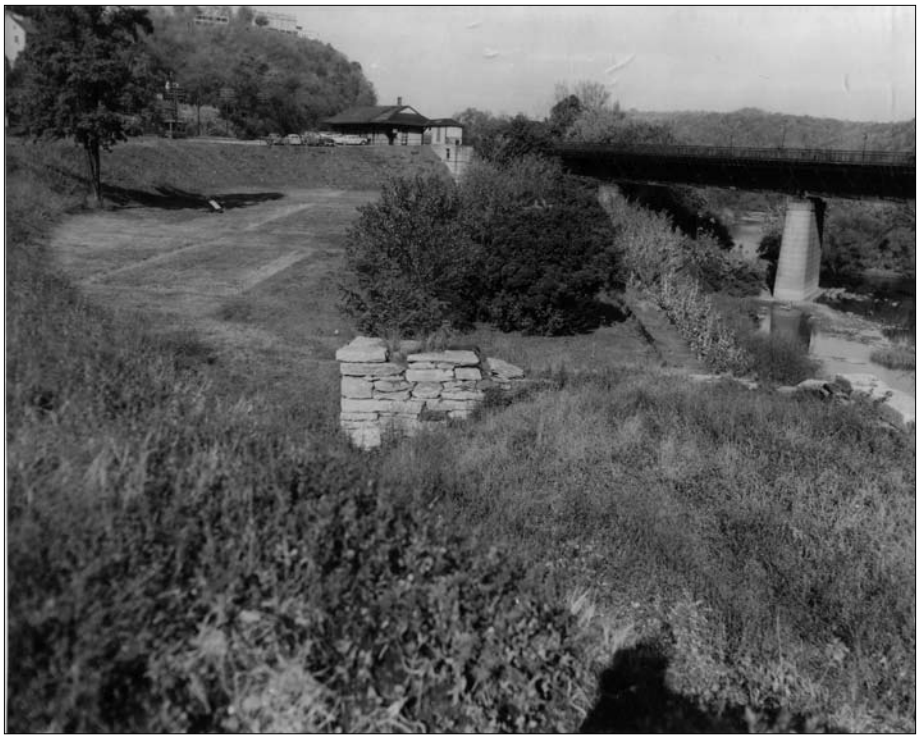


Figure 4.33. View of Lower Armory Grounds in 1958. Vegetation included mown turf, one tree along the edge of the berm and shrubs along the river edge. The site's open character afforded views out to the river and beyond. Harpers Ferry Photo Collection, NHF-01164.

Figure 4.34. Contemporary view of the same location as above at Lower Armory Grounds. Note the dramatic change in the landscape with the growth of trees and the elimination of the shrubs by the wall. Trees now screen out views of the river and bridge. OCLP, February, 2007.

Figure 4.35. Tree cutting along the D&H Canal in New York, intending to protect the remnant structural features of the canal. A similar tree removal process is recommended for the Armory riverfront. OCLP, 2008.

Figure 4.36. View of existing steps leading from the top of the1892 embankment down to Lower Armory Grounds. OCLP, July, 2009.

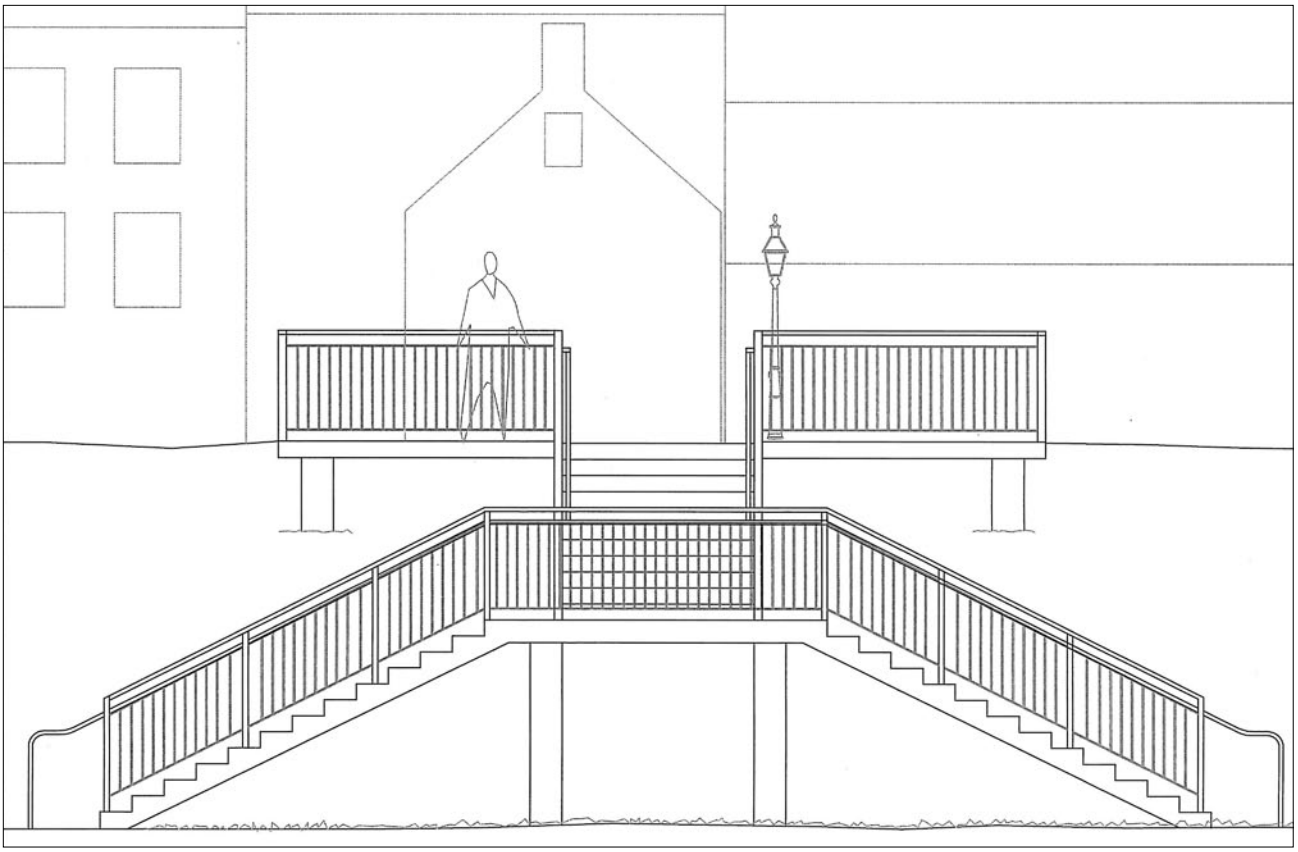


Figure 4.37. Elevation illustrating a set of steps at Lower Armory Grounds that is code compliant with handrails and guardrails, and accommodating a larger number of visitors with wider steps and two ways to reach the Lower Armory Grounds. OCLP, 2009.

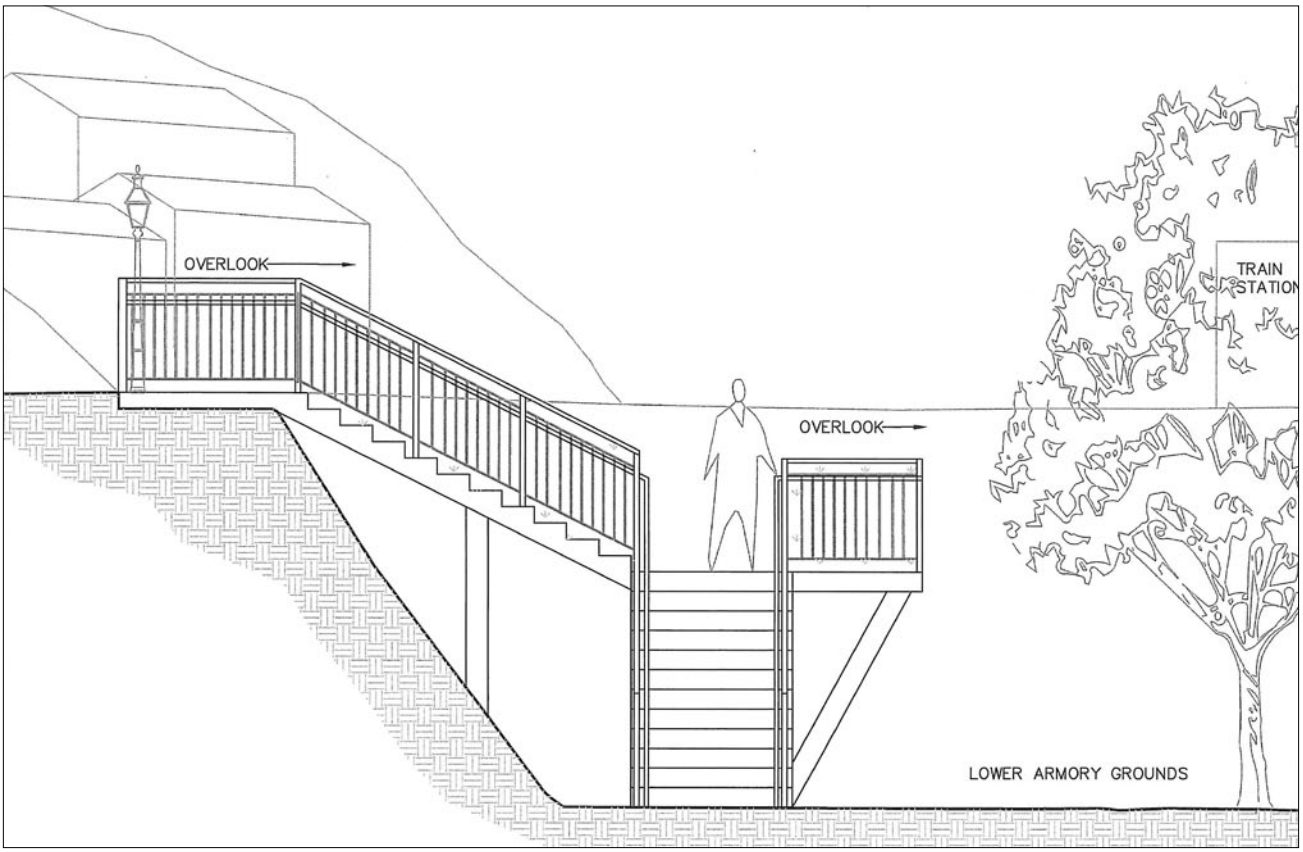


Figure 4.38. Section/elevation demonstrating how a new design could provide more than one opportunity to take in the view of the Lower Armory Grounds and the river beyond. OCLP, 2009.

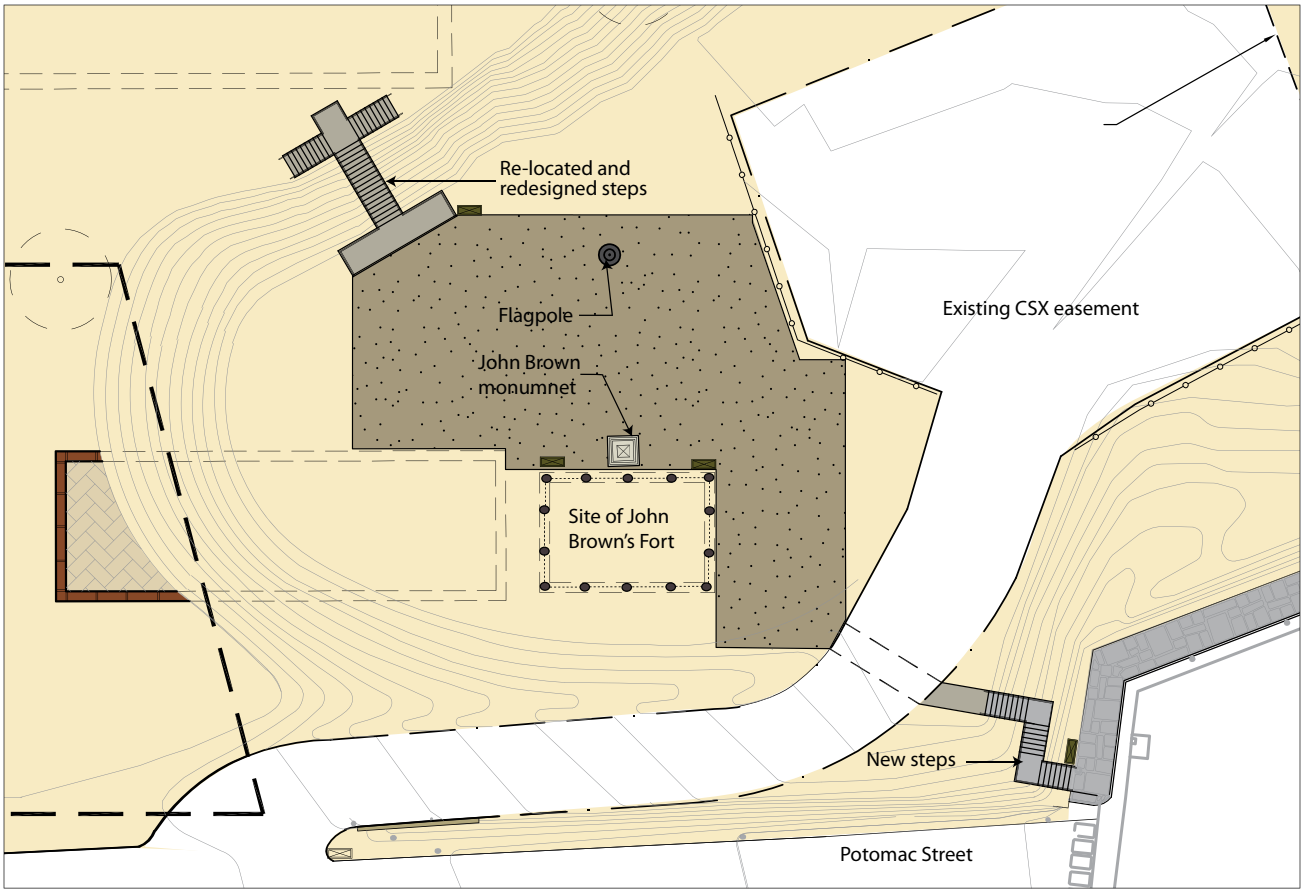


Figure 4.39. Plan enlargement of Lower Armory Grounds showing proposed short and medium term tasks including the new flagpole and Engine House footprint. Paving is comprised of crushed stone bordered and retained with masonry edging. OCLP, 2009.

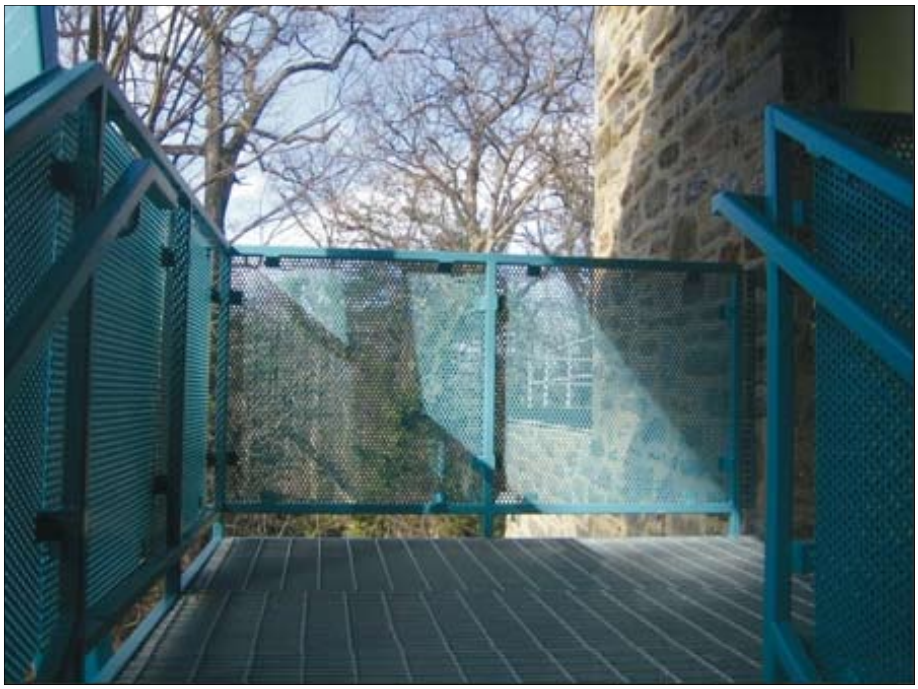


Figure 4.40. To reduce maintenance and increase longevity, metal can be utilized for steps and walkways and even handrails. In this example, the metal structure has also been painted blue. Other colors are also available. Hendrickmfg.com website.

Figure 4.41. View of new steps constructed on the 1892 embankment at the corner of Potomac Street and Shenandoah Street. The steps at this location can help redirect foot traffic to Lower Armory Grounds. OCLP, July, 2009.

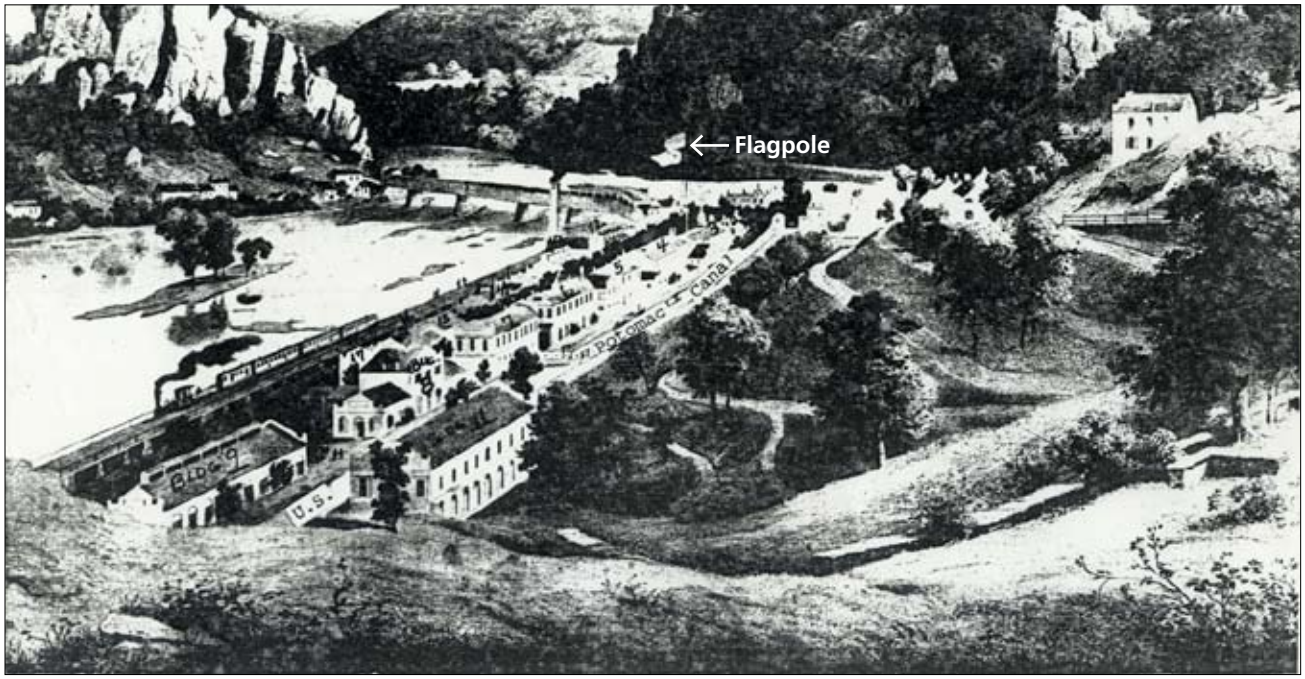


Figure 4.42. Rendering from 1857 of the Musket Factory with a large flag billowing at the far end of the site. The height and size of the flagpole and flag provided a visual landmark. Reconstructing the flagpole on the armory grounds would help express the site's historic federal identity. Harpers Ferry Historic Photo Collection, HF-0051.

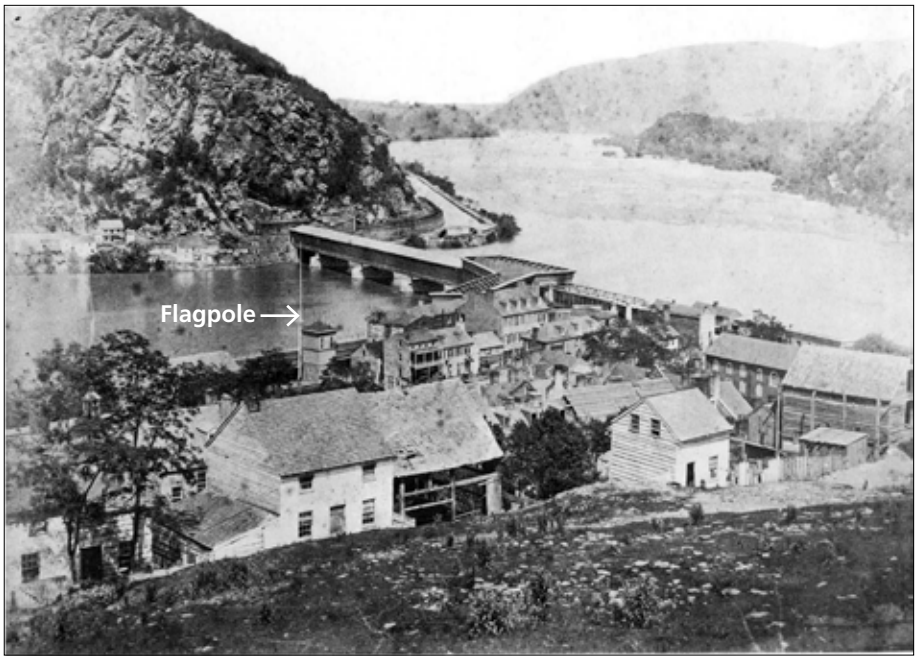


Figure 4.43. Another view of the Musket Factory from 1859. The flagpole is also visible in this image, revealing its proximity to the main entrance. Harpers Ferry Historic Photo Collection, HF-0066.

Figure 4.44. View of the Harpers Ferry Paper Company, circa 1900, erected on the foundations of the former Armory's Rolling Mill. The proposed river boardwalk could be installed tracing the route of the abandoned railroad trestle structure along the river edge, as seen above. Harpers Ferry Historic Photo Collection, HF-1143.

Figure 4.45. View of the remnant tailrace flumes of the original Armory rolling mill and later pulp mill. A footbridge suspended over this area, to the right of the flumes, will provide the desired continuous access through the Upper Armory Grounds up to the Canalway. David T. Gilbert, 1994, HAFE website.

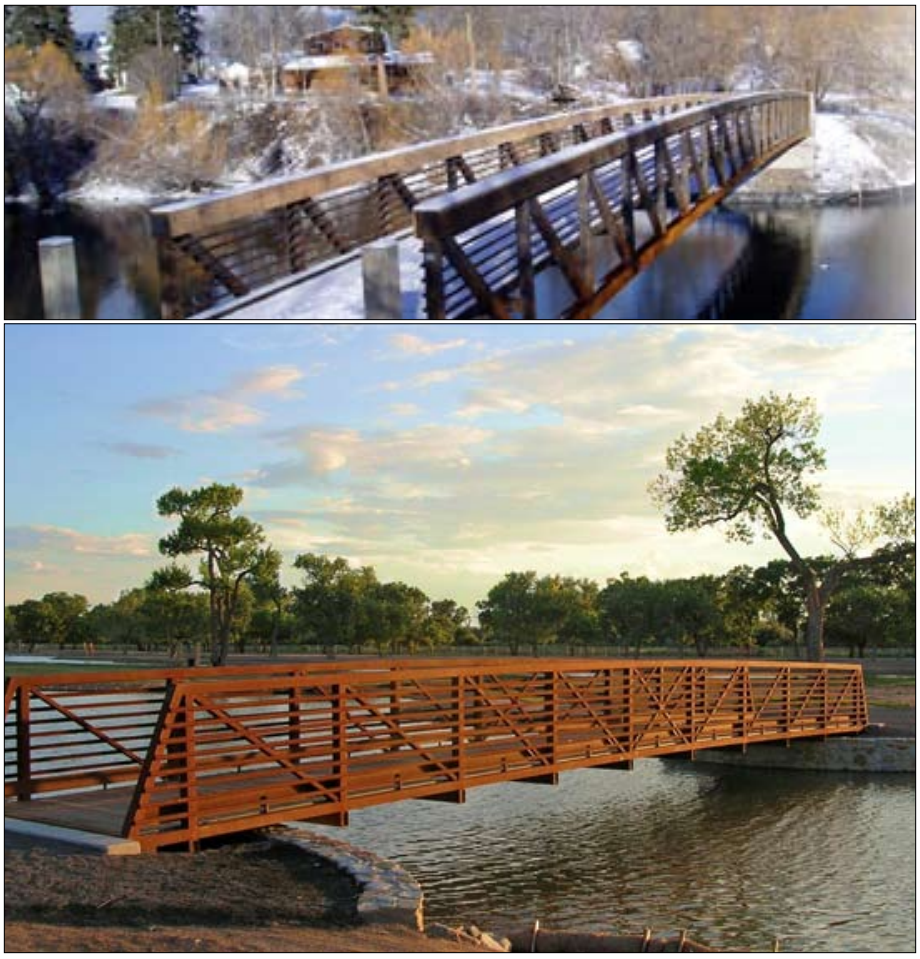


Figure 4.46. Examples of pre-fabricated pedestrian footbridges from two manufacturers. Both of these styles employ wood, but metal is also available. http://www.contech-cpi.com/SlideShow.aspx?displayPicId=4260 http://www.roscoebridge.com/bridges_pedestrian.html.

Figure 4.47. View of river wall along the edge of the Musket Factory grounds. Removing the trees would enhance the visibility of the feaure and prevent structural damage. M. Joseph, June, 2006.

Figure 4.48. View of the Armory canal wall in the Canalway area. OCLP, July, 2009.

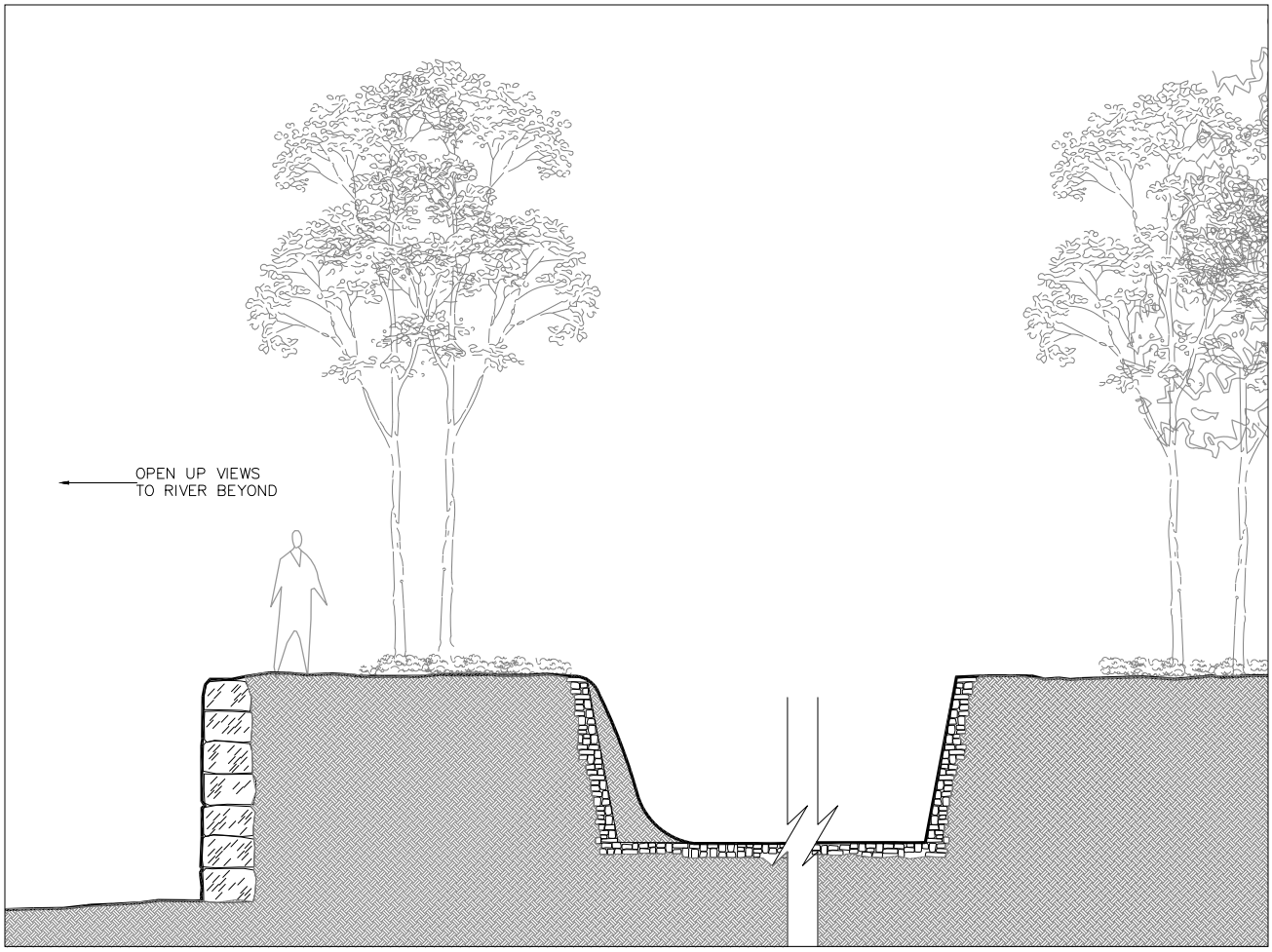


Figure 4.49. Section illustrating a four-foot vegetation clearance zone on each side of the Armory canal to open up views and promote visitor access. OCLP, 2009.

Figure 4.50. View of Upper Potomac Street with the Potomac River to the left and the railroad to the right. The unpaved condition of the road makes access difficult for vehicles as well as bicyclists and pedestrians. OCLP, November, 2007.

Figure 4.51. View of Upper Potomac Street heading toward Dam #3. By widening the road where possible and improving the driving surface, visitors would be more likely to venture further. A bicycle lane would also encourage non-vehicular access. OCLP, June, 2006.

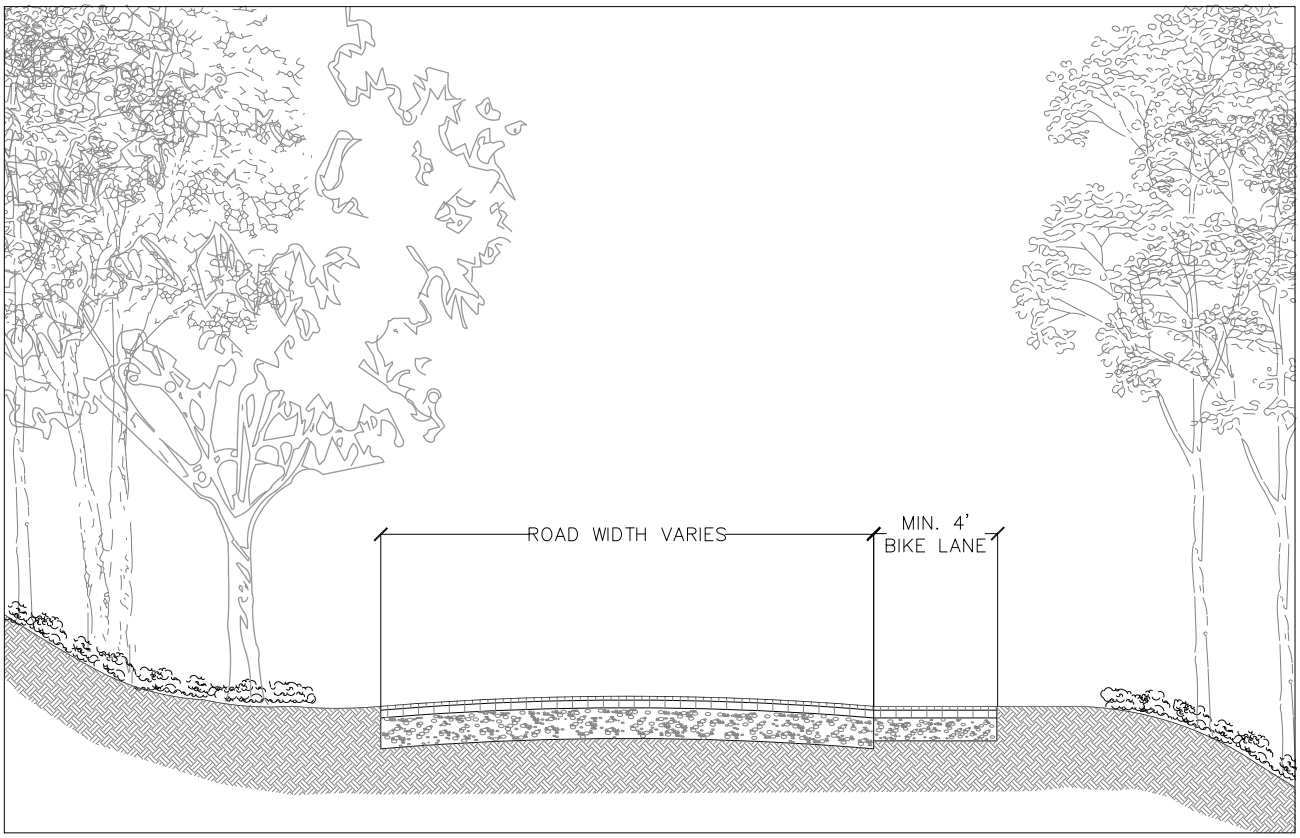


Figure 4.52. Section proposing bituminous concrete paving for Potomac Street with a minimum four-foot wide bike lane to encourage non-vehicular access along the Potomac River frontage. OCLP, 2009.

Figure 4.53. View of former hydroelectric plant at Upper Armory Grounds. The building is currently unused and enclosed with chainlink fencing and barbed wire. OCLP, July, 2009.

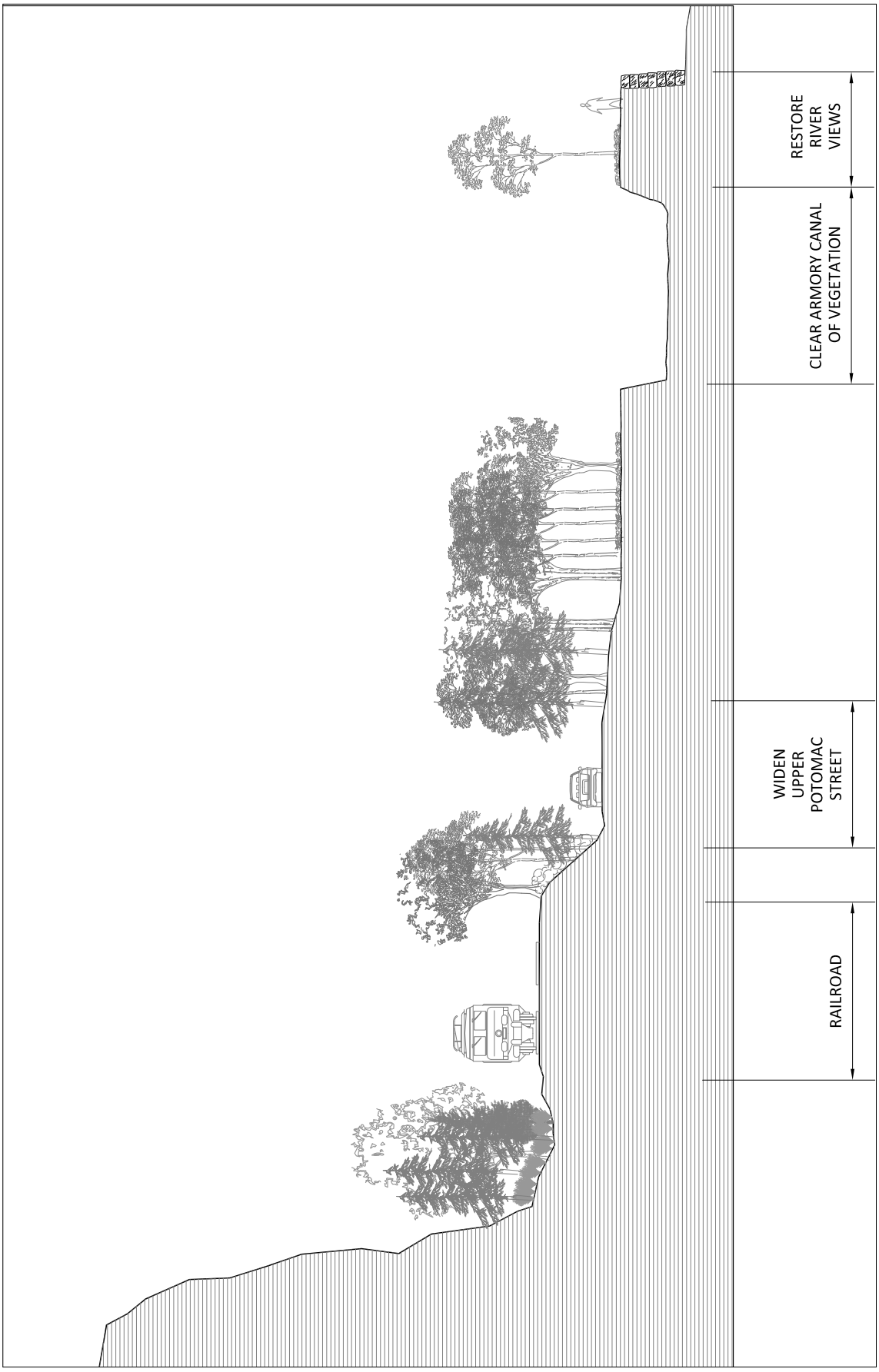


Figure 4.54. Diagrammatic section taken through the Canalway riverfront area illustrating the dramatic topography along the Potomac River frontage. Not to scale. OCLP, 2009.

Figure 4.55. View from Dam Number 3. This part of the project site is a popular fishing area and affords the only open views out to the river and Maryland Heights beyond. OCLP, June, 2006.

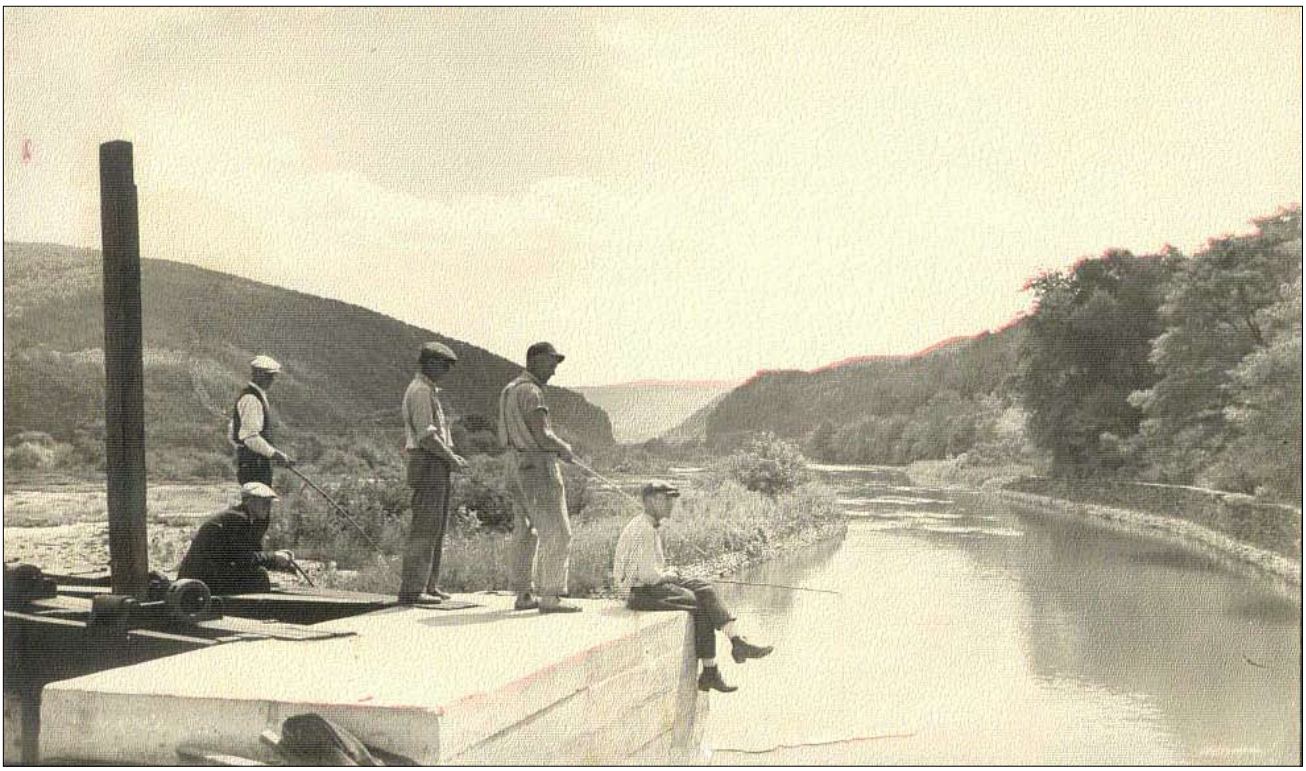


Figure 4.56. View of the Armory canal as a popular fishing location in the 1930s. Note the canal wall to the right and the panoramic views of the area. J. Mauzy Collection, HF-1231.

Figure 4.57. View of the C&O Canal and lock illustrating how re-watering the Armory canal and providing pedestrian access could enhance the visitor experience at the project site. Laura Lutz, Bayjournal.com

Figure 4.58. View of towpath along the C&O Canal. The surrounding wooded vegetation is similar to the Armory canal landscape. The image illustrates the scale of pedestrian access and vegetation clearance that is appropriate to the project site. Canaltrust.org.

Figure 4.59. An example of erosion and deterioration of the Armory canal. The growth of woody vegetation over the years has taken a toll on several portions of the canal. OCLP, July, 2009.

Figure 4.60. View of the retaining wall at the former Armory dam area. Severe damage has occurred in several places along this wall. OCLP, November, 2008.

Figure 4.61. An example of dry stone wall repair work on a retaining wall at Roebling Aqueduct in Minisink, New York. http://www.drystone.org/gallery/album27/Roebling_NY_11_13_nr_023.

Figure 4.62. The Armory canal northwest of the Musket Factory grounds is obscured by vegetation in the summer months. OCLP, July, 2009.

Figure 4.63. View of the newly cleared trail along the top of the Armory canal berm. The river is to the right. OCLP, July, 2009.

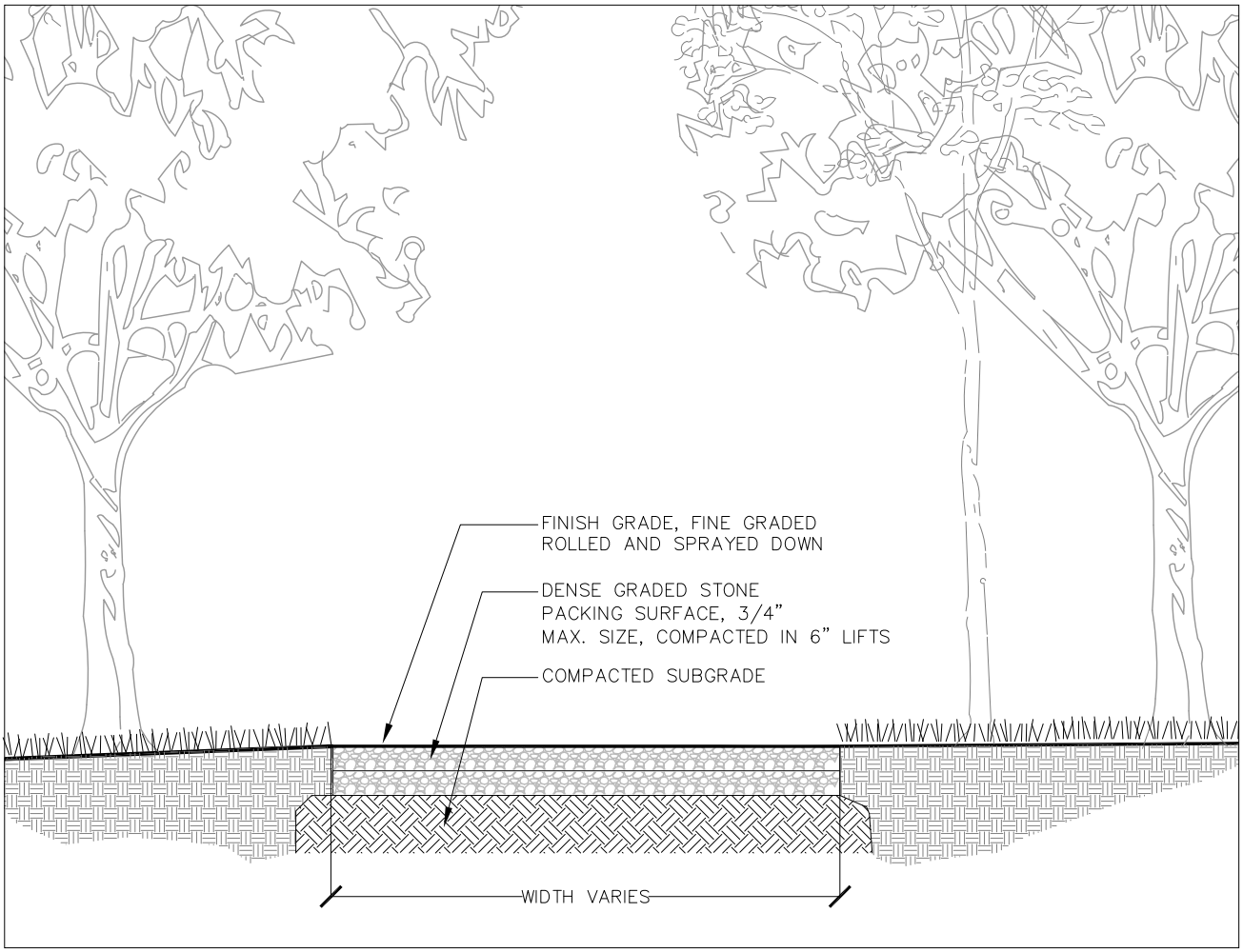
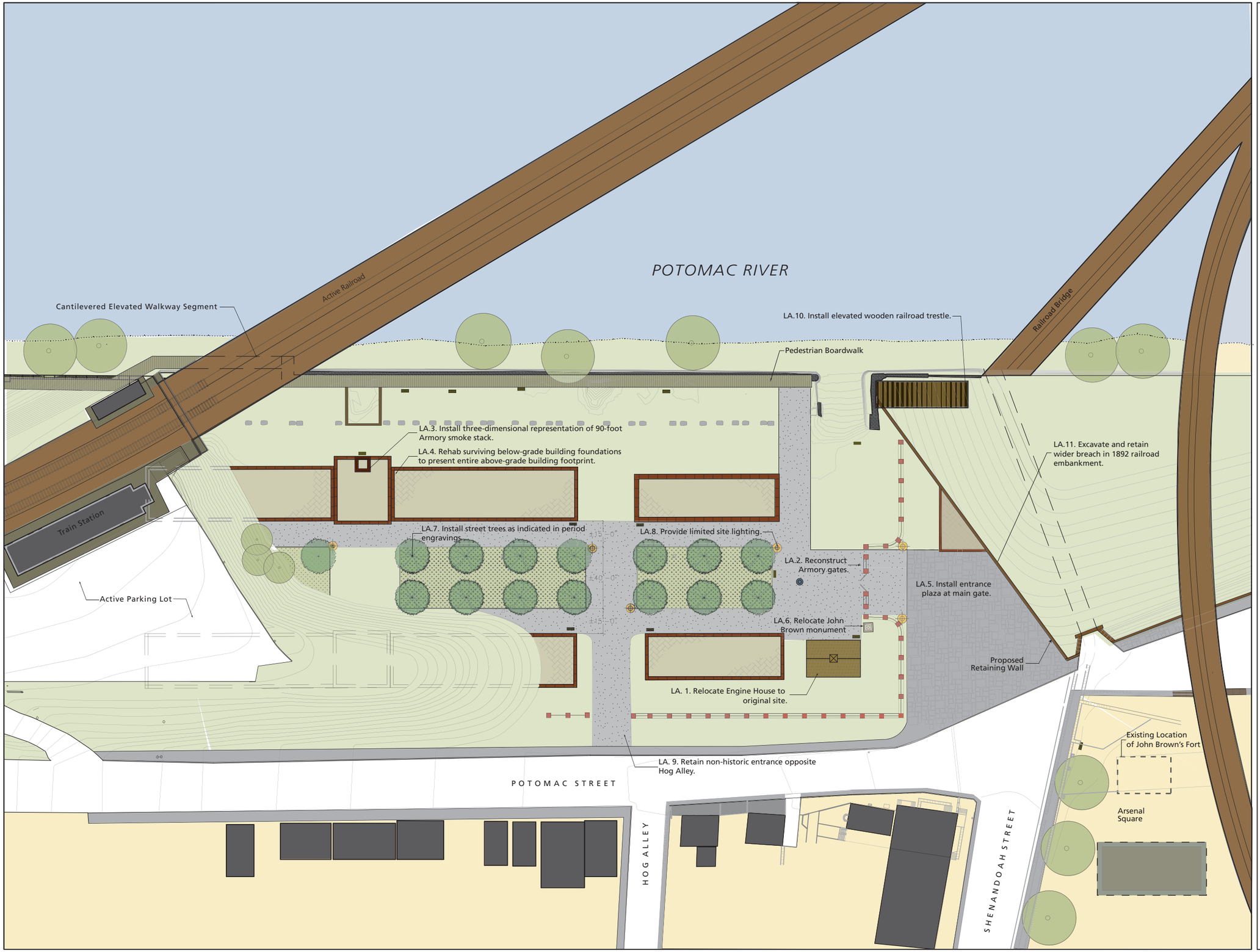


Figure 4.64. Section detail for pedestrian walking surface atop riverfront canal berm. The detail shows an example of accessible stone paving. OCLP, 2009.

Figure 4.65. View of trail near C&O Canal, depicting a similar trail design proposed for the riverfront berm along the Potomac River at Harpers Ferry. Candocanal.org.



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

Treatment Plan
Lower Armory Grounds

National Park Service

Olmsted Center for Landscape Preservation

www.nps.gov/oclp

SOURCES

1. AutoCAD file converted from GIS file prepared by A. Lee, HAFE, 2007.

DRAWN BY

National Park Service / A. Crosbie, Olmsted Center for Landscape Preservation, AutoCAD 2002, Adobe Suite CS3 Illustrator, 2009.

LONG TERM TREATMENT TASKS

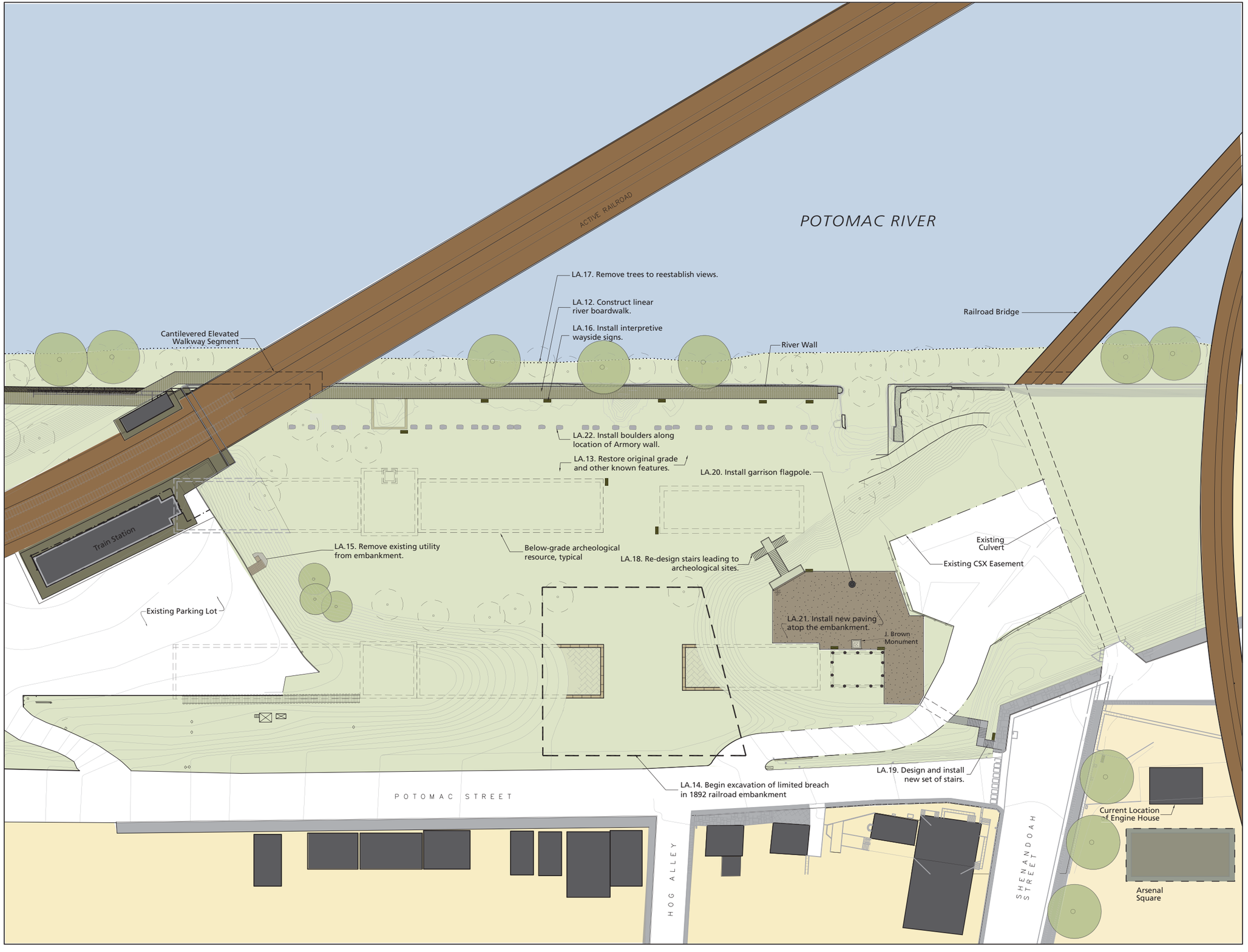
LA.1. Relocate armory Engine House to original site.
LA.2. Reconstruct armory gates.
LA.3. Install three-dimensional representation of 90-foot armory smoke stack.
LA.4. Rehab surviving below-grade building foundations to present entire above-grade building footprint.
LA.5. Install new formal entrance at main gate.
LA.6. Relocate John Brown monument adjacent to Engine House.
LA.7. Install street trees as indicated in period engravings.
LA.8. Provide limited site lighting.
LA.9. Retain non-historic entrance opposite Hog Alley.
LA.10. Install elevated wooden railroad trestle.
LA.11. Excavate and retain wider breach in 1892 berm.

Legend

- Site Lighting
- Interpretive Wayside Exhibit
- Building
- Above Ground Archeological Feature
- Below Ground Archeological Feature
- Pedestrian Circulation
- Vehicular Circulation
- Grass plot
- Existing Tree
- New Tree

30′ 0′ 60′

Drawing 7



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

Treatment Plan
Lower Armory Grounds

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. AutoCAD file converted from GIS file prepared by A. Lee, HAFE, 2007.

DRAWN BY

National Park Service / A. Crosbie, Olmsted Center for Landscape Preservation, AutoCAD 2002, Adobe Suite CS3 Illustrator, 2009.

SHORT AND MEDIUM TERM TREATMENT TASKS

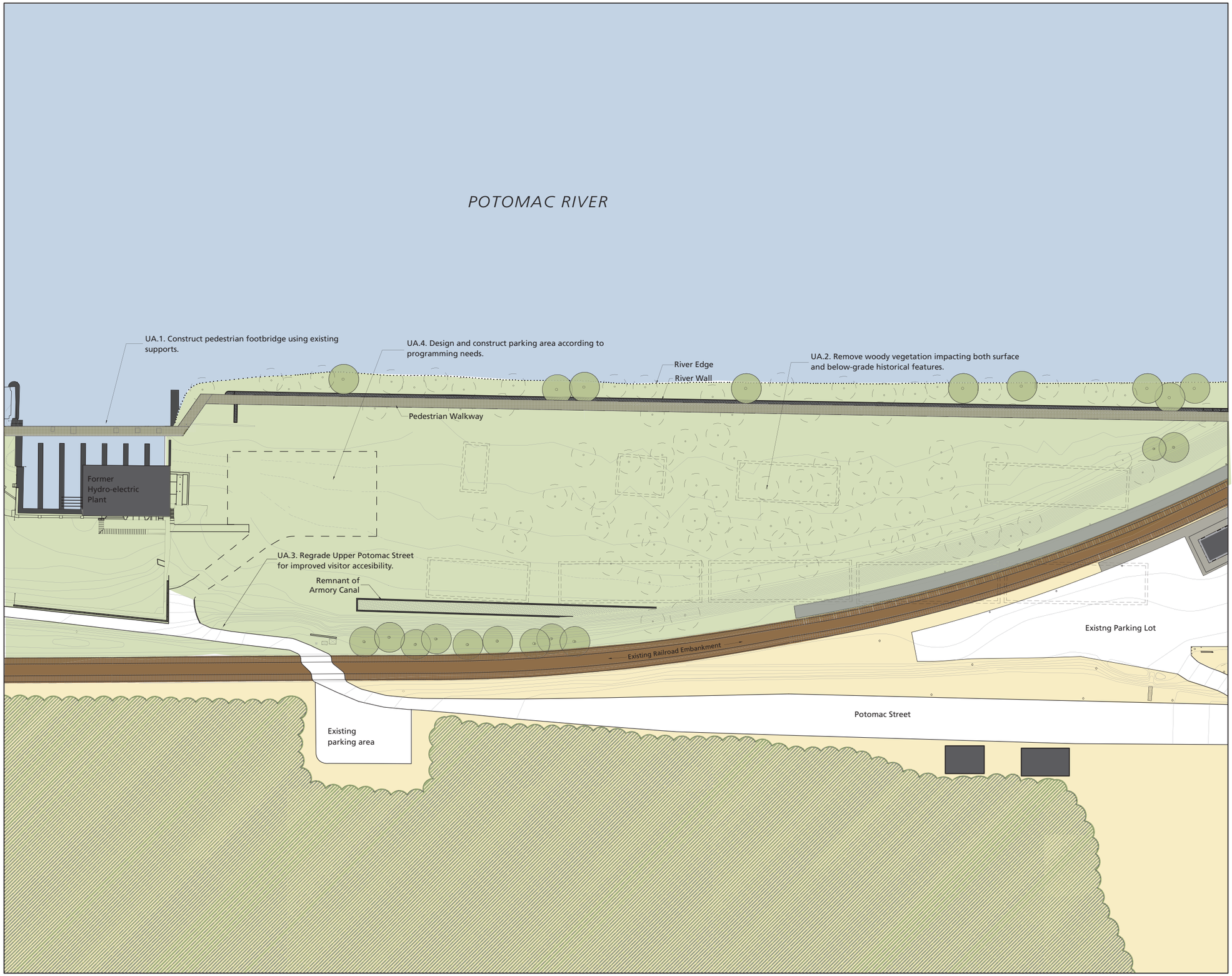
LA.12. Construct linear river boardwalk.
LA.13. Restore original grade and other known features.
LA.14. Excavate limited breach in 1892 embankment.
LA.15. Remove existing utility on 1930 embankment.
LA.16. Install interpretive wayside signs. Completed.
LA.17. Remove trees to reestablish views.
LA.18. Redesign stairs leading to archeological sites.
LA.19. Design and install new set of stairs at the corner of Potomac and Shenandoah streets.
LA.20. Install garrison flagpole.
LA.21. Install new paving atop the 1892 embankment.
LA.22. Install stone blocks along location of original Armory wall.

Legend

- Interpretive Wayside Exhibit
- Below Ground Archeological Feature
- Above Ground Archeological Feature
- Building
- Pedestrian Circulation
- Vehicular Circulation
- Tree to be removed
- Existing Tree

30′ 0′ 60′

Drawing 8



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

Treatment Plan
Upper Armory Grounds

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. AutoCAD file converted from GIS file prepared by A. Lee, HAFE, 2007.

DRAWN BY

National Park Service / A. Crosbie, Olmsted Center for Landscape Preservation, AutoCAD 2002, Adobe Suite CS3 Illustrator, 2009.

MEDIUM AND LONG TERM TREATMENT TASKS

UA.1. Construct pedestrian footbridge using existing supports to provide a link between Upper Armory and the Canalway and Dam area.

SHORT TERM TREATMENT TASKS

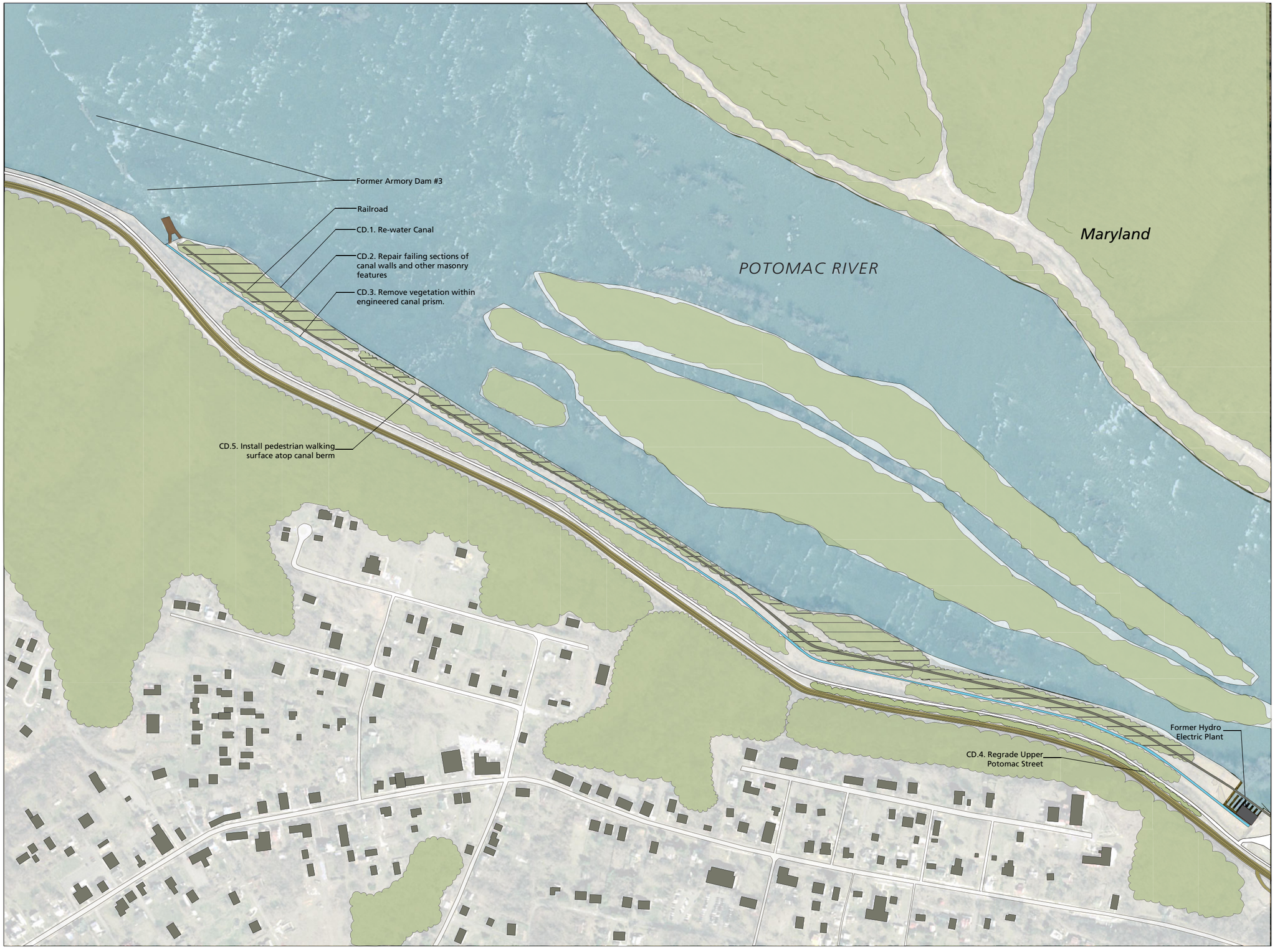
UA.2. Remove woody vegetation impacting both surface and below-grade historical features.
UA.3. Regrade Upper Potomac Street for improved visitor accesibility.
UA.4. Design and construct parking area at former hydroelectric plant according to programming needs.

Legend

- Building
- Below Ground Archeological Feature
- Pedestrian Circulation
- Vehicular Circulation
- Existing Tree
- Tree to be Removed
- Existing Vegetation

40′ 0′ 80′

Drawing 9



Cultural Landscape Report

Musket Factory/Potomac Riverfront
Harpers Ferry National Historical Park
West Virginia

Treatment Plan
Canalway

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. Harpers Ferry National Historical Park, 2001 Aerial

DRAWN BY

National Park Service / Allison Crosbie
Olmsted Center for Landscape Preservation
Using ArcMap GIS 9.1

SHORT, MEDIUM AND LONG TERM TREATMENT TASKS

CD.1. Re-water Armory canal.
CD.2. Repair failing sections of canal walls and other masonry features.
CD.3. Remove vegetation within engineered canal prism.
CD.4. Regrade Upper Potomac Street for improved visitor accessibility.
CD.5. Install pedestrian walking surface atop riverfront canal berm.

LEGEND

- Building
- Vehicular Circulation
- Canal
- Pedestrian Circulation
- Vegetation
- Vegetation to be Removed

0' 200'

Drawing 10

ENDNOTES

[1] National Park Service, National Capital Region, National Register, "Harpers Ferry National Historical Park," 1980, Item 8, p.8.
[2] Harpers Ferry National Historical Park website
[3] A millwright is one who designs, builds or repairs mills or mill machinery.
[4] Andrew Lee, The U.S. Armory at Harpers Ferry, Historic Resource Study, 2006, 2.
[5] Merrit Roe Smith, *Harpers Ferry Armory and the New Technology*, 1977, 28.
[6] Fitzpatrick, *Writings of Washington*, *Vol. XXXVI*, 253.
[7] Smith, 1977, 30-31.
[8] Ibid., 31.
[9] U.S., *Annals of Congress*, 6:2569-2570: Washington to Burges Ball, March 2, 1795, to Lear, November 30, 1795, *Writings*, 34:129, 381: Lear to Washington, October 19, 1795, Washington to Lear, November 2, 1795, PGW.
[10] Charles W. Snell, A History of the Physical Plant, Vol. I, 1959, 17-19, as cited in Smith, 1977, 31.
[11] Smith, 1977, 36.
[12] Stoddert to McHenry, August 1, 1799, quoted in Steiner, 401-402, as cited in Smith, 1977, 37.
[13] Smith, 1977, 37-39.
[14] Lee, 2006, 8.
[15] Military Book No. 1-A, 11/10/1800 to 11/17/1803 – War Office. Records of the War Department, Office of the Secretary of War. See also Hamlin, *Benjamin Henry Latrobe*, 25, 255-256.
[16] Mackey to Hodgdon, 3/12/1799, HAFE Document 102, No.9.
[17] Mackey to Hodgdon, 3/12/1799, HAFE Document 102, No. 9.
[18] Mackey to Hodgdon, 7/14/1799, HAFE Document 103, No. 3.
[19] Smith, 1977, 44.
[20] Mackey to Hodgdon, 7/10/1799, HAFE Document 102, No. 22: 7/17/1799, HAFE Document 102, No. 14.
[21] Mackey to Hodgdon, 12/26/1799, HAFE Document 102, No. 14.
[22] Smith, 1977, 49.
[23] Records of the Office of the Judge Advocate General, National Archives Records Administration (NARA), Record Group (RG) 153, Orderly Book, Division Orders, 5/22/1800.
[24] Dave Gilbert, *Where Industry Failed, Water Powered Mills at Harpers Ferry*, 1984, 28.
[25] HAFE Microfilm, Reel 18, Vol. 1, 21, as quoted in Snell, "History of the Physical Plant…," Vol. I, 46.
[26] Snell, 1959, Vol. 1, 64.
[27] Smith, 1977, 20.
[28] Millard K. Bushong, *Historic Jefferson County*, 1972, 107.
[29] Shackel, 1996.
[30] Stubblefield to Dearborn, October 1807, Letters Received, Office of the Secretary of War. Dearborn to Annin, 11/11/1807, Miscellaneous Letters Sent, Office of the Secretary of War, NARA, RG 107.
[31] Smith, 1977, 75.
[32] Dearborn to Stubblefield, 6/3/1808, Miscellaneous Letters Sent, Office of the Secretary of War, NARA, RG 107.
[33] See "Public Buildings at Harpers Ferry in Virginia, 1st January 1810," and "Public Buildings at Harpers Ferry in Virginia, 1st October 1811," submitted by Annin to Office of the Secretary of War, abstracted in Snell, "A Physical History," Vol. I, 29-30.
[34] Snell, 1959, Vol. I, 78.
[35] Ibid., 27.
[36] Smith, 1977, 76.
[37] Ibid., 101.
[38] Ibid., 219.
[39] Bushong, 1972, 107.
[40] Snell, 1959, Vol. 1, 31.
[41] Whittlesley, 1920, 72.
[42] Stubblefield to Bomford, 7/11/1829, NARA, RG 156, Records of the Office of the Chief of Ordnance, as in Smith, 1977, 80.
[43] Smith, 1977, 138.
[44] Ibid.

[45] *Virginia Free Press* (VFP), 8/3/1868, 2 col. 2-3; Bushong, 1972, 109.
[46] Smith, 1977, 114-115.
[47] Andrew Lee, "The U.S. Armory at Harpers Ferry, Historic Resource Study," Harpers Ferry National Historical Park, 2006, 29.
[48] Derwent Whittlesley, "The Springfield Armory, A Study in Institutional Development," 1920, 94-97.
[49] Moyer, et al., 2004, 19.
[50] Lee, 2006, 46.
[51] Maynadier to William L. Marcy, 6/18/1846, from NARA RG 156, Records of the Office of the Chief of Ordnance, as quoted in Smith, 275.
[52]Special Estimates for Additional Appropriations for the Service of the Ordnance Department for the Year 1839," 11/16/1838, HAFE Document; Microfilm Reel 20, Vol. 6, 624. From NARA RG 156, Records of the Office of the Chief of Ordnance, Entry 129, Vol. II, 6.
[53] Cathy Gilbert, Maureen De Lay Joseph, Perry Carpenter Wheelock, Cultural Landscape Report: Lower Town, Harpers Ferry National Historical Park, Washington DC: Department of the Interior, National Park Service, National Capitol Region, 1993, 3-32.
[54] Gilbert, CLR, 1993, 3-24.
[55] Gilbert,CLR, 1993, 3-24.
[56] Colonel George Talcott to Chief of Ordnance Bomford, 12/15/1832, "Inspection of Hall's Rifle Factory at the Harpers Ferry Armory," NARA, RG 156, Records of the Office of the Chief of Ordnance.
[57] Dave Gilbert, *Where Industry Failed; Water Powered Mills at Harpers Ferry, West Virginia*, Charleston, WV: Pictorial Histories Publishing Company, 1984, 31.
[58] Gilbert et al, CLR, 1993, 3-28.
[59] Sven Beckert, "Emancipation and Empire: Reconstructing the Worldwide Web of Cotton Production in the Age of the American Civil War," The American Historical Review, December 2004, http://www.historycooperative.org/journals/ahr/109.5/beckert.html.
[60] "Confidential Report," John E. Wool, U.S. Army to Major General Isaac Brown, 11/16/1827, HAFE Document; Microfilm Reel 18, Vol. 13, 1302-1303.
[61] Special Estimates for Additional Appropriations for the Service of the Ordnance Department for the Year 1839," 11/16/1838, HAFE Document; Microfilm Reel 20, Vol. 6, 624. From NARA RG 156, Records of the Office of the Chief of Ordnance, Entry 129, Vol. II, 6.
[62] "Permanent Improvements," Public Documents of the United States, Serial No. 404, Document No. 207, 44.
[63] Snell, 1959, Vol. II, 10.
[64] Smith, 1977, 277; Snell, 1959, Vol. II, 11.
[65] Gilbert et al., CLR, 1993, 3-44.
[66] Public Documents of the United States, Serial No. 464, Document No. 43, 2.
[67] Snell, 1959, 2-8.
[68] Snell, 1959, Vol. II, 49.
[69] Report of the Principal Operations of the Ordnance Department during the year ending June 30, 1853, Reel 20, V. 2, p. 148, as cited in Bruce B. Meyers, Historic Grounds Report, National Park Service, May, 1965, 3.
[70] Gilbert et al., CLR, 1993, 3-37.
[71] Gilbert et al., CLR, 1993, 3-42.
[72] Baker to Craig, 7/19/1854, "Reports of Inspections of Arsenals and Depots" from NARA RG 156, Records of the Office of the Chief of Ordnance, as quoted in Smith, 97.
[73] Colonel H. K. Craig to Secretary of War Jefferson Davis, 3/17/1854, as in Gilbert, Waterpower, 75.
[74] Gilbert et al., "Cultural Landscape Report," 1.
[75] Edwards as in Noffsinger, 43.
[76] Gilbert et al., CLR, 1993, 3-35.
[77] Smith, 1977, 301.
[78] Ibid., 302.
[79] Ripley to Craig, April 14, 1859, Reports of Inspections of Arsenals and Depots, OCO, as cited in Smith, 1997, 302.
[80] Gilbert et al., CLR, 1993, 3-50.
[81] Joseph Barry, *The Strange Story of Harpers Ferry*, *With Legends of the Surrounding Country*. Sheperdstown, WV: The Woman's Club of Harpers Ferry District, The Sheperdstown Register, Inc., 1988 (originally published in 1903)50.
[82] Smith, 1977, 307.
[83] Gilbert et al., CLR, 1993, 3-50.
[84] Smith, 1977, 309.

[85] George Mauzy to Mr. and Mrs. James H. Burton, 12/3/1859, HAFE Document, available at www.nps.gov/hafe/historyculture/the-mauzy-letters.htm.
[86] Smith, 312-315; Burton Diary: 12/5/1860 (James Henry Burton Papers, Manuscript Group #117 Box I).
[87] *Richmond Enquirer*, 10/11/1861; Wellman, as quoted in Gilbert, *Waterpower…*, 122.
[88] Gilbert et al., CLR, 1993, 3-43.
[89] Smith, *Harpers Ferry Armory*, 315.
[90] WV State Archives, WV Memory Culture website: http://www.wvmemory.wvculture.org
[91] George Mauzy to James A. Burton, 4/19/1861, http://www.wvmemory.wvculture.org
[92] Barry, 100.
[93] Snell, 1959, 283.
[94] Davies, 330-339; Norman 2-4.
[95] Norman, 1-2.
[96] *Richmond Enquirer*, 10/11/1861.
[97] Brown, "Diary of Old Ord…," unpaginated
[98] Ibid.
[99] James Shewbridge to David Shewbridge, 4/23/1861, Shewbridge Letters, HAFE Document 581.
[100] Davies, 5; *Richmond Enquirer*, 10/11/1861.
[101] For an excellent overview of Burton and his role at the Harpers Ferry Armory, see the "Burton Collection Online Exhibit" located on the Harpers Ferry National Historical Park website http://www.nps.gov/hafe.net The exhibit includes drawings that detail the evolution of the minié bullet and illustrate Armory buildings, furnaces, lock mechanisms, machine tools, and various aspects of the water-powered works.
[102] Barry, 109.
[103] Ibid., 110.
[104] Frye, *Antietam Revealed*, 22.
[105] Snell, "A Report on the Federal Fortifications…," 6; Snell, "A Physical History…," Vol. II, 289.
[106] Frye, *Antietam Revealed*, 149, 151, 155, and 159; *Official Records (O.R.) of the War of Rebellion*, Vol. XIX, (1):430, 437, 464-465; (2):466, 488.
[107] *O.R.*, Vol. XXXVII, 180-183.
[108] *O.R.*, Vol. XLIII, (1):602.
[109] Warner to W.P. Smith, 7/6/1864, HAFE Document, R.15, V.4, 589.
[110] Snell, "Harpers Ferry Repels…," 26-27.
[111] Snell, "Harpers Ferry Repels…," 36, 43, 76.
[112] *O.R.*, XLIII, (2):670, 683, 697, 708-711, 717, 726, 750, 756, 765, 800, 816, 82; Vol. XLVI, (2):188-189,898; (3):541, 828.
[113] Snell, "Harpers Ferry Repels…," 40, 47-49.
[114] Library of Congress, American Memory exhibit, http://rs6.loc.gov/ammem/aaohtml/exhibit/aopart4.html
[115] Snell, "Physical History…," Vol. II, 296; *VFP*, 7/5/1866, 2, col. 2.
[116] *VFP*, 12/ 7/1865, 2, col. 2; Ramsey to Dyer, 7/27/1865, 7 pages, NARA RG 156, Records of the Office of the Chief of Ordnance.
[117] Ramsey to Dyer, 7/27/1865, 7 pages, NARA RG 156, Records of the Office of the Chief of Ordnance.
[118] Daniel .J. Young to Brevet Major A.B. Dyer, 3/12/1866. NARA, RG 92, Office of the Quartermaster General, Consolidated Correspondence File: 1794-1915, Box 377.
[119] Ramsey to Dyer, 7/27/1865, 7 pages, NARA RG 156, Records of the Office of the Chief of Ordnance.
[120] Gilbert et al., 3-73.
[121] See, for example, *VFP*, 9/21/1865; 10/19/1865; 10/25/1865; 11/2/1865; 11/23/1865; 12/8/1865; 1/4/1866; 1/18/1866; 2/8/1866; 2/15/1866; Gilbert et al., 3-73. and 3/15/1866.
[122] Benét, Brigadier General Stephen V., *A Collection of Annual Reports and Other Important Papers Relating to the Ordnance Department Taken from the Records of the Office of the Chief of Ordnance, from Public Documents, and from Other Sources,* Vol. IV, 1049-1050, as quoted in Snell, "Physical History…," Vol. II, 296.
[123] "Letter from the Chief Clerk of the War Department," 32 pages, NARA, RG 121, Public Buildings Service, File 28, as in Noffsinger, 135.
[124] "Letter from the Chief Clerk of the War Department," 32 pages, NARA, RG 121, Public Buildings Service, File 28, as in Noffsinger, 135.
[125] *Spirit of Jefferson (SOJ)*, 12/7/1869, 3, col. 1-2.
[126] *VFP*, 12/2/1869, 2, col. 1.
[127] Barry, *Strange Story…*,146; Noffsinger, "Toward a Physical History…," 51.
[128] *VFP*, 12/2/1869, 2, col. 1.

[129] Gilbert, David T., *Waterpower*…, 134-135; Barry, *Strange Story*…, 151-165.
[130] Barry, *Strange Story*…, 172.
[131] Snell, "Physical History…," Vol. II, 298.
[132] Chief Clerk for the Solicitor of the Treasury, Webster Elmes to Solicitor of the Treasury, George F. Talbot, 5/29/1877, 9 pages, NARA, RG 121, Public Buildings Service, Case No. 155.
[133] "Announcement," K. Rayner , pre-5/19/1880, 4 pages, NARA, RG 121, Public Buildings Service, Case No. 155.
[134] Gilbert, *Waterpower*…, 139.
[135] Correspondence from Jas. D. Butt to Thomas H. Savery, September 12, 1885, Hagley Museum Archives, Thomas Savery Collection, Accession 72.369.
[136] Barry, *Strange Story*…, 173.
[137] *Historic American Engineering Record*, National Park Service, Christopher Marston, 1998.
[138] Edith Wallace, "National Register of Historic Places, Hydroelectric Power Plant," section 8, p. 3.
[139] Teresa A. Moyer, Paul Shackel, *The Making of Harpers Ferry National Historical Park*, 2007, 24-25.
[140] Gilbert et al., CLR, 1993, 3-95.
[141] Ibid., 3-89-90.
[142] Andrew Lee, "The U.S. Armory at Harpers Ferry, Historic Resources Study," Harpers Ferry National Historical Park, 2006, 100.
[143] Ibid., 3-90.
[144] Wallace, section 8, p. 4.
[145] Ibid., 3-101.
[146] Ibid., 3-102.
[147] Ibid., 3-101.
[148] Gilbert et al., CLR, 1993, 3-111.
[149] Ibid., 3-112.
[150] Ibid., 3-117.
[151] Harpers Ferry National Historical Park website, http://www.nps.gov/archive/hafe/powerplant.htm.
[152] Teresa Moyer and Paul Shackel, The Making of Harpers Ferry, 2007, 114-115.
[153] Ibid., 3-117.
[154] Ibid., 3-118-119.
[155] Moyer, et al., " '*To Preserve the Evidences*'…," 67.
[156] Moyer, et al., " '*To Preserve the Evidences*'…," 331; Asst. Director Conrad Wirth to Baltimore and Ohio Railroad Company, 9/6/1950, Folder "HFNHP 1938-1954," NPS HD Collection, HD/NPSDC as in Moyer et al., 331.
[157] Asst. Director Conrad Wirth to B&O Director of Public Relations Robert M. Van Sant, 9/20/1950, Folder "H30," Admin. Coll., BH/HAFE.
[158] Moyer, et al., " '*To Preserve the Evidences*'…," 129-130.
[159] Moyer, et al., 2004, 192.
[160] Associate Director Scoyen to Region Five Regional Director, Memo, "John Brown Fort Site – HFNHM," 5/19/1959 as in Moyer et al., 332.
[161] Calculations based on www.westegg.com/inflation program.
[162] Calculations based on www.westegg.com/inflation program.
[163] Master Plan for the Preservation and Use of Harpers Ferry National Monument, Mission 66 Edition, 1962, foreword.
[164] Mission 66 Master Plan, 2.
[165] Regional Chief of Lands Thomas D. Anderson to Asst. Manager Properties Department, Baltimore and Ohio Railroad Company Robert D. Clark, 10/158/1963, Folder "HFNHP Land Exchange and B&O 1957-1967," Box 26, 413, RG 79-68-0636, NARA-MA (PH).
[166] Superintendent Edwin M. Dale to Northeast Region Regional Director, Memo, "Package Master Plan - Harpers Ferry," 5/12/1964, Item 3, Folder "HFNHP 1963," Box 63, RG 79-68-0636, NARA-MA (PH).
[167] Superintendent Joseph R. Prentice to Northeast Region Regional Director, Memo, "Status of Land Exchange with B&O Railroad Involving Original Site of John Brown Fort (Fire Engine House)," 10/26/1966; and Regional Director Lemuel A. Garrison to Director, "Status of Land Exchange with B&O Railroad Involving Original Site of John Brown Fort (Fire Engine House), Harpers Ferry," 11/4/1966, Folder "HFNHP Land Exchange and B&O 1957-1967, Box 26, 413, RG 79, NARA-MA (PH).
[168] Moyer, et.al, 2004, 6.
[169] Chief, Office of Park Planning and Environmental Quality to Regional Director National Capital Region, Memo "HFHNP DCP Assessment of Alternatives," December 21, 1978, Box on floor, Admin. Coll., BH/HAFE, as cited in Moyer, et al., 2004, 274.
[170] http://www.nps.gov/hafe/historyculture/memorable-floods-at-harpers-ferry.htm

[171] Cultural landscape maintenance is typically addressed in a separate document known as a Preservation Maintenance Plan.
[172] *General Management Plan/Environmental Impact Statement*, *Draft*, Harpers Ferry National Historical Park, Harpers Ferry, WV, April, 2007, introduction.
[173] *Development Concept Plan*, Harpers Ferry National Historical Park, 1980, presentation text.
[174] *General Management Plan, 2008*, 119.
[175] Charles A. Birnbaum and Christine Capella Peters, eds. *The Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes* (Washington D.C.: U.S. Department of the Interior. 1996), 48.
[176] NPS_28 Cultural Resource Management Guideline, Chapter 7: Management of Cultural Landscapes, http://www.nps.gov/history/history/online_books/nps28/28chap7.htm
[177] National Park Service website, http://www.nps.gov/history/nr/travel/Augusta/sibleymill.html.
[178] *General Management Plan/Environmental Impact Statement*, *Draft*, Harpers Ferry National Historical Park, Harpers Ferry, WV, April, 2007, 125.
[179] Cathy Gilbert, Maureen De Lay Joseph, Perry Carpenter Wheelock, Cultural Landscape Report: Lower Town, Harpers Ferry National Historical Park, Washington DC: Department of the Interior, National Park Service, National Capitol Region, 1993, 5-47-49.
[180] *General Management Plan/Environmental Impact Statement*, *Draft*, Harpers Ferry National Historical Park, Harpers Ferry, WV, April, 2007, 71.
[181] *General Management Plan*, *2008*, 95.
[182] *General Management Plan*, *2008*, 30, 95.
[183] *General Management Plan*, *2008*, 74.

BIBLIOGRAPHY

Barry, Joseph. *The Strange Story of Harper's Ferry With Legends of the Surrounding Country*. Sheperdstown, WV: The Woman's Club of Harpers Ferry District, The Sheperdstown Register, Inc., 1988 (originally published in 1903).

Beckert, Sven. "Emancipation and Empire: Reconstructing the Worldwide Web of Cotton Production in the Age of the American Civil War," The American Historical Review, December 2004, http://www.historycooperative.org/journals/ahr/109.5/beckert.html.

Boteler, Alexander R. "Recollections of the John Brown Raid by a Virginian Who Witnessed the Fight," Century Magazine, 26: 399-411, July 1883.

Brown, Andrew, editor "Diary of Old Ord, Sgt. A.L.P. Vairin, Co. B 2nd Mississippi Infantry, 1861-1865." Unpublished manuscript. Available online at: rootsweb.com/~mscivilw/vairindiary.htm

Bushong, Millard K. *Historic Jefferson County*. Boyce, VA: Carr Publishing Company, Inc., 1972.

Caplinger, Michael W. Bridges. *Over Time: A Technological Context for the Baltimore and Ohio Main Stem at Harpers Ferry*. Morgantown, WV: West Virginia University Press, 1997.

Davies, Paul J. C.S. Armory Richmond. Bethlehem, Pennsylvania: American Society of Arms Collectors, 2000.

DeVoto, Bernard, editor. *The Journals of Lewis and Clark*. Boston, MA: Houghton Mifflin, 1953.

Dew, Charles B. *Ironmaker to the Confederacy: Joseph R. Anderson and the Tredegar Iron Works*. Wilmington, NC: Broadfoot Publishing Company, 1987.

Eicher, David J. *The Longest Night: A Military History of the Civil War*. New York, New York: Simon & Schuster, 2001.

Fitzpatrick, John C., editor. *Writings of George Washington from the Original Manuscript Sources*, 1745-1799. Vol. I-XXXIX. Washington, D.C.: Washington Bicentennial Commission, 1931-1944.

Frye, Dennis E. *Antietam Revealed: The Battle of Antietam and the Maryland Campaign as You Have Never Seen it Before*. New Jersey: C.W. Historicals, Collingswood, 2004.

Gilbert, Cathy, Maureen De Lay Joseph and Perry Carpenter Wheelock. *Cultural Landscape Report: Lower Town, Harpers Ferry National Historical Park*. Washington, D.C.: National Park Service, National Capital Region, 1993.

Gilbert, Dave. *Where Industry Failed; Water-Powered Mills at Harpers Ferry, West Virginia*. Charleston, WV: Pictorial Histories Publishing Company, 1984.

Hagerstown Morning Herald Mail [Hagerstown, Maryland], no author "No Bell to Toll: Group Wants John Brown Souvenir Back," October 1, 1987.

Hamlin, Talbot Faulkner Benjamin Henry Latrobe. New York, NY: Oxford University, 1955.

Hearns, Chester. *Six Years of Hell: Harpers Ferry During the Civil War*. Louisiana State University Press, 1999.

Hunter, Andrew. "John Brown's Raid: By Andrew Hunter, the Prosecuting Attorney." Publications of the Southern History Association, July 1897, Vol. I, No. 3, pp. 165-195.

Jackson, Donald, editor. *Letters of the Lewis and Clark Expedition, with Related Documents, 1783-1854*. Urbana, IL: University of Illinois Press, 1962.

James Henry Burton Papers. New Haven, CT: Manuscripts and Archives, Yale University Library.

Jefferson, Thomas. *Notes on the State of Virginia*. Chapel Hill, NC: University of North Carolina Press, 1954, originally published 1784.

Jeffrey, Joseph D. "Meriwether Lewis at Harpers Ferry." *We Proceeded On*, Journal of the Lewis & Clark Trail Heritage Foundation, November 1994.

Kercheval, Samuel. *A History of the Valley of Virginia*. Strasbourg, VA: Shenandoah Publishing House, 1833, reprinted by C. J. Carrier Company, Harrisonburg, Virginia, 1986.

Kochan, James L. Manuscript Collection. Harpers Ferry/Cumberland Iron Works Papers, 59 documents; Letters, accounts, and related manuscript materials, 1795-1823. Inventory of manuscript items, "A Manuscript Archive Relating to Iron Supplies for the United States Armory & Arsenal at Harper's Ferry," prepared by James L. Kochan, December 2003.

Lee, Andrew. *The U.S. Armory at Harpers Ferry, Historic Resource Study*. Harpers Ferry, WV: Harpers Ferry National Historical Park, Archeology Program, 2004.

Lewis, Ralph H. *An Historical Sketch of Camp Hill–Wesley Methodist Church, Harpers Ferry, West Virginia*. Harpers Ferry Historical Association, 1996.

Magazine of the Jefferson County Historical Society, vol. XXVI, December 1961.

Moyer, Teresa S., Paul A. Shackel and Kim E. Wallace. "To Preserve the Evidences of a Noble Past; An Administrative History of Harpers Ferry National Historical Park." Maryland: Catoctin Center for Regional Studies, Frederick Community College and Center for Heritage Resource Studies, Department of Anthropology, University of Maryland, 2004.

Moyer, Teresa S., Paul A. Shackel. *The Making of Harpers Ferry National Historical Park, A Devil, Two Rivers and a Dream*. Lanham, MD: Rowman & Littlefield Publishers, Inc., 2007.

Myers, Bruce B. "Historic Grounds Report, Part II. Landscape Data Section on Portions of Shenandoah and Potomac Streets, Harper." Philadelphia, PA: National Park Service Eastern Office, Office of Design and Construction, May, 1965.

National Park Service, "Master Plan, Harpers Ferry National Monument, Mission 66 Edition," 1962.

Noffsinger, James P. *Harpers Ferry, West Virginia, Contributions Towards a Physical History*. Philadelphia, PA: National Park Service Eastern Office of Design and Construction, November, 1958.

Norman, Matthew W. *Colonel Burton's Spiller & Burr Revolver: An Untimely Venture in Confederate Small-Arms Manufacturing*. Macon, GA: Mercer University Press, 1996.

Pitch, Anthony S. "The Burning of Washington." White House History Journal, White House Historical Association, Number 4, Fall 1998.

Shackel, Paul A. *Archeology and Created Memory, Public History in a National Park*. New York, NY: Kluwer Academic/Plenum Publishers, 2000.

Culture Change and the New Technology: An Archeology of the Early American Industrial Era. New York, NY: Kluwer Academic/Plenum Publishers, 1996.

Sisson, William Lee. "Harpers Ferry Improvement." *Transactions of the American Society of Civil Engineers*, Vol. XXXII, October 1894.

Smith, Merritt Roe. *Harpers Ferry Armory and the New Technology: The Challenge of Change*. Ithaca, NY: Cornell University Press, 1977.

Snell, Charles W.
The Town of Harpers Ferry in 1859: A Physical History." Harpers Ferry, WV: Department of the Interior, National Park Service, Harpers Ferry National Monument, 1959.

A Report on the Federal Fortifications at Harpers Ferry, Virginia, and of the Confederate and Union Troop Movements During the Siege of Harpers Ferry, September 12-15, 1862, Harpers Ferry National Monument, West Virginia." Harpers Ferry, WV: Department of the Interior, National Park Service, Harpers Ferry National Monument, 1959.

"Harpers Ferry Repels an Attack and Becomes the Major Base of Operations for Sheridan's Army, July 4, 1864, to July 27, 1865." Harpers Ferry, WV: Department of the Interior, National Park Service, Harpers Ferry National Monument, 1960.

"A History of the Physical Plant of the U.S. Armory at Harpers Ferry, Virginia, Its Evolution and Development." Vol. I-II. Denver, CO: Department of the Interior, National Park Service, Denver Service Center, 1980.

"A Physical History of the U.S. Musket Factory Plant, 1794-1885, U.S. Armory at Harpers Ferry, Virginia." Vol. I-III. Denver, Colorado: Department of the Interior, National Park Service, Denver Service Center, 1981.

"Historic Structures Report for the U.S. Musket Factory Canal and Dam on the Potomac River, 1799–1884, Harpers Ferry Armory, Virginia." Denver, CO: Department of the Interior, National Park Service, Denver Service Center, (draft) June 1981.

Stinson, Dwight E. "The First Railroad Bridge at Harpers Ferry." Harpers Ferry, WV: Department of the Interior, National Park Service, Harpers Ferry National Historical Park, 1970.

Stover, John F. *History of the Baltimore and Ohio Railroad*. West Lafayette, IN: Purdue University Press, 1987.

Theriault, William D. Explorer: The West Virginia History Database, Jefferson County Module (CD-ROM), Charleston, WV: West Virginia Division of Culture and History, 1996.

U.S. Army "Weapons of the Expedition," Available online at: http//www.army.mil/cmh-pg/lc/The%20Mission/Facts/weapons.htm, as of January 2007. 122.

U.S. Department of the Interior, Historic American Engineering Record "Potomac Power Plant, On West Virginia Shore of Potomac River, About 1 Mile Upriver from Confluence with Shenandoah River, Harpers Ferry, Jefferson County, WV," Prints and Photographs Division, Library of Congress, Washington, D.C., No. WV-61, 1998.

"Shenandoah Pulp Mill, Shenandoah Street, Harpers Ferry, Jefferson County, WV," Prints and Photographs Division, Library of Congress, Washington, D.C., No. WV-59, 1994.

U.S. Statutes at Large Volumes I–XII contain laws, resolutions, and appropriations for the Harpers Ferry Armory, 1794-1861.

U.S. War Department, *War of the Rebellion: Official Records of the Union and Confederate Armies*, Washington, D.C.: Government Printing Office, 1881-1901.

Wallace, Edith. National Register of Historic Places, Hydro Electric Power Plant, 1999.

Whittlesley, Derwent Stainthorpe. "The Springfield Armory: A Study in Institutional Development." PhD diss., University of Chicago, December, 1920, 94-97.

Newspapers

*Farmer's Advocat*e [Charles Town, (West) Virginia].

Farmers-Repository [Harpers Ferry, (West) Virginia].

Hagerstown Morning Herald Mail [Hagerstown, Maryland].

Richmond Enquirer [Richmond, Virginia].

Spirit of Jefferson [Charles Town, (West) Virginia].

Virginia Free Press [Charles Town, (West) Virginia].

Public Records

RG 79 Records of the National Park Service.

RG 92 Records of the Office of the Quartermaster General.

RG 107 Records of the Office of the Secretary of War.

RG 121 Records of the Public Buildings Service.

RG 153 Records of the Office of the Judge Advocate General.

RG 156 Records of the Office of the Chief of Ordnance.

RG 159 Records of the Office of Inspector General.

RG 217 Records of the United States General Accounting Office.

Primary Sources

Savery, Thomas H. Papers, 1885-1938, Wilmington, DE: Hagley Museum and Library, Accession 0915.

National Park Service
U.S. Department of the Interior

Olmsted Center for Landscape Preservation
Boston National Historical Park
Charlestown Navy Yard, Quarters C
Boston, MA 02129
Phone: 617.241.6954
Fax: 617.241.3952
web: www.nps.gov/oclp/