

**HISTORIC SITE MASTER PLAN
& FEASIBILITY STUDY**

LOCK 2 EAST OF THE MORRIS CANAL

Robert Street
Hugh Force Park
Wharton, Morris County, New Jersey

TO

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BY

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FRONTISPIECE



LOCK 2 EAST
MORRIS CANAL

WHARTON, MORRIS COUNTY, NEW JERSEY

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Frontispiece: View looking west towards Lock 2 East.
Credit: Canal Society of New Jersey

PROJECT DIRECTORY

PROJECT

Historic Site Master Plan & Feasibility Study
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Borough of Wharton, Morris County, New Jersey

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- The Borough of Wharton
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CONDITIONAL STATEMENT

The statements and opinions expressed herein are solely for the use and information of the Borough of Wharton. The opinions reflect the professional judgments of a Registered Architect, Professional Engineer and Archaeologist performing services that are usual and customary. These services are performed with care and skill ordinarily used by other registered architects and engineers when dealing with similar historic sites and structures at the same time and in the same or similar localities. Conclusions drawn in this report are based on those conditions and surfaces that were accessible to the unaided visual observations of the Architect, Engineer and Archaeology. No warranties or guarantees can be inferred from or implied by, the statements or opinions contained in this report. All estimates are conceptual and for planning purposes only.

EXECUTIVE SUMMARY

The Historic Site Master Plan and Feasibility Study (Master Plan) for Lock 2 East of the Morris Canal summarizes the findings and recommendations for the preservation of Lock 2 East, “Bird’s Lock,” located in the Borough of Wharton, Morris County, New Jersey within Hugh Force Park. This Report emphasizes:

- Existing Site Conditions;
- Archaeological Features of Lock 2 East;
- Architectural and Archaeological Features of the Ruins of the Lock Tender’s House;
- Archaeological Features of the Outbuildings;
- Canal Prism, Canal Basin and Adjacent Tributaries;
- Structural Considerations of Lock 2 East;
- Structural Conditions of the Ruins of the Lock Tender’s House;
- Interpretation and Use;
- Site Enhancements;
- Visitorship and Accommodation;
- Feasibility; and
- Fundraising.

The **Introduction** contains a statement of purpose that discusses the need for a Historic Site Master Plan for the Lock 2 East site including portions of the canal prism and auxiliary or adjacent structures that have been incorporated as part of the property through the purchase of adjacent lands as part of Hugh Force Park. This document will guide and recommend the transformation of this site from a park currently maintained by the Morris County Park Commission and the Borough of Wharton to a more active role as an outdoor museum maintained by the Borough and possibly a nonprofit organization. The plan will take into account the historical significance, features, and conditions of the cultural resources. The vision is for the site to play a key interpretive role in the Morris County Greenway. All proposed work must be guided by design and planning, and the project should be a phased development. This section defines the Study Area as the parcels of land owned by the Borough of Wharton and operated in concert with the Morris County Park Commission as well as the adjacent pond (canal basin) which is owned by the Borough. This site includes specific features such as the buried remains of Lock 2 East, the ruins of the lock tender’s house, the land between and surrounding these two features including the tow path and waste weir (which is no longer extant), the watered sections of the canal prism, the former canal basin, and Stephens Brook. The existing parking lot located to the east of the canal prism is an important adjacency to the site that is discussed. Although this adjacency as well as initiatives for the use, interpretation and restoration of other portions of the Morris Canal is discussed, the Project Team was limited in its analysis to this property only and focused primarily on the structures, buildings and ruins within the study area. This section also discusses the Methodology used by the Project Team in its production of this Master Plan. Finally, it puts the study area in a context that takes into account the geography and physiography of the Borough of Wharton.

The **Developmental History** section identifies that Lock 2 East was one of 23 traditional locks¹ and 23 inclined planes within the Morris Canal, which traversed Northern New Jersey in a general east to west direction between Newark and Phillipsburg. The Morris Canal was constructed between 1825 and 1831 and substantially modified between 1845 and 1860. Lock 2 East overcame an elevation change of 8 feet and was the second lock located east of Lake Hopatcong.

¹ There were 23 lift locks, or 35 total locks including feeder, outlet, tidal and guard locks. (Lee, Morris Canal: A Photographic History, 4.)

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The Morris Canal is listed on the New Jersey and National Registers of Historic Places. The property of the canal and Lock 2 East was sold by the State to local municipalities, farmers and residents after the abandonment in 1924. The Borough of Wharton purchased the lock site, the canal prism and other adjacent properties beginning in 1926 directly from the State. The lock site is part of Hugh Force Park providing passive recreation to area residents. In 1976 the Borough excavated the existing watered portion of the canal in order to restore the canal prism, becoming one of only a handful of sections of the canal prism that reflects its historic appearance.

The **Developmental History** also includes descriptions of the site, buildings and structures within the study area based on the in-field observations of the Project Team coupled with historical documentation. The evaluation is the result of a review of the historical documentation including photographs, maps and written histories. The descriptions focus solely on those objects that are visible above ground; an evaluation of the archaeological resources is provided peripherally and is covered in more detail by the archaeology team in Section 3. This includes a general description of how the lock operated during its use. A Statement of Significance has been developed that evaluates the historical, architectural and archaeological significance of the Morris Canal in general and the Lock 2 East site specifically. This section also determines the period of significance for Lock 2 East as 1825 to 1924.

The Archaeological Investigation and Assessment is a summary of the findings of extensive archaeological excavations of Lock 2 East including shovel tests, trenches and excavated pits at select areas of the lock site from the canal basin east to the canal prism, from the tow path to beyond the ruins of the lock tender's house. Sub-surface investigations at the ruins of the lock tender's house were limited due to the dangerous conditions in the vicinity of the lock tender's house. The investigations and assessment led to numerous discoveries regarding the integrity of the lock and the changes made to the landscape since abandonment, as well as determined that the site is rich in cultural resources that can provide ground truth to the history, development and significance of this historic site.

The **Analysis** summarizes the results of a survey-level assessment and analysis of the existing buildings and site features of the Lock 2 East site. This section also identifies the significant features, and analyzes the potential for use and interpretation. The analysis of use and interpretation helped to guide the recommendations for Lock 2 East.

The **Analysis** included field assessments performed by the office of HJGA Consulting, Architecture & Historic Preservation, and other members of the Project Team including the engineer, James B. Huffman, P.E. and the archaeology team, Hunter Research led by Richard Hunter and James Lee. The assessment consisted of four site visits, beginning September 2006 through October 2006 with an intensive survey of the site by the archaeological team the weeks of September 25 and October 2, 2006. On-site evaluations included the exterior from ground level, and the exposed and accessible areas of the ruins of the lock tender's house. The evaluation included visual examinations, and critical conditions were documented in graphic, narrative and photographic form. The evaluation also included an archaeological inventory of the above and below-ground features and significant and extensive archaeological investigations of the lock structure and surrounding site features; archaeological investigations were limited to the area bounded by the basin to the west, the tow path to the north, the canal prism to the east and the lock tender's house ruins to the south.

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The assessment resulted in the following general observations at Lock 2 East:

- The lock remains are extensive including the lock walls and the splayed headwall at the prism.
- The ruins of the lock tender's house are limited to small sections of its stone walls at the main house, its first floor at the kitchen wing, and a majority of its foundation.
- The canal prism is watered for approximately one quarter of a mile east of the lock and provides important historic context as well as a water source should the lock be restored.
- The canal basin located to the west of the lock site is separated from the lock by an earthen embankment and vegetation. This basin has the potential to also be a source of water should the lock be restored.
- A large portion of the tow path is extant extending on both sides of the lock with the potential for lost or modified sections to be restored.
- The adjacency of Stephens Brook, a tertiary water source, continues to flow and may be able to be repaired where compromised.
- The site is rich with archaeological artifacts from the period of the Morris Canal; the information garnered from archaeological investigations can be used to help restore the site and to enhance interpretation of the site to its period of significance.
- Once the lock is restored, there will be an impact to the surrounding properties that must be addressed in the planning, design and implementation of the lock's restoration.
- The site is currently a key component of the proposed Morris Canal Greenway in Morris County and any restoration work as well as use and interpretation of the site will enhance its role in the promotion and education of the importance of the Morris Canal in New Jersey and United States history.
- The location of the site and its current adjacent facilities, such as adjacent parkland, proximity to Wharton's central business district, and parking facilities, will enhance its ability to function as an outdoor museum environment.
- Interpretive signage will be an important component of the site's use and interpretation.

The **Recommendations** develop a preservation philosophy and find that the treatment recommendations for Lock 2 East generally fall under preservation, restoration (with elements of reconstruction), and rehabilitation. The preservation of the canal and lock features and the use of the entire site as an outdoor museum and passive recreation site should be planned, undertaken and supervised in compliance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*.

The **Recommendations** present a proposed preservation treatment plan based on the information available at the time of this report. This treatment plan is the basis for a preliminary estimate of conceptual costs and includes:

- Stabilize the lock tender's house to ensure its long-term preservation and ability to enhance the use and interpretation of the site.
- Restore and reconstruct the lock to an operable condition including stabilization of the lock walls, lining the lock with appropriate wood planking, restoration of the lock floor, installation of new gates and other mechanisms to facilitate operation.
- Enhance the existing canal prism including select removal of overgrown trees at the canal to enhance the historical appearance, removing debris and overgrowth within the prism to allow a free-flow of water, and stabilizing where required the sides of the canal prism to ensure its long-term preservation.
- Restore Stephens Brook where compromised to allow a free-flow of water to the canal prism.
- Restore the bank of the canal basin and the connection between the lock and the basin; the water from the basin will be critical for the operation of the lock.

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- Restore the tow paths from the parking area to beyond the lock along the basin. Tie any improvements in this area with the proposed recommendation for the establishment of the Morris Canal Greenway in Morris County.
- Restore the overflow ditch (waste weir) that connected the basin with the canal prism including any footbridges and other site enhancements as seen in the historic photographs and as revealed through archaeological investigations.
- Based on use and operation of the site, any additional information that may become available, and other factors not yet determined, restore the lock tender's house including the adaptive re-use of the interior to support museum purposes. It is essentially too early in the planning and development stage to determine whether it is feasible to restore the lock tender's house.
- Install interpretive signage at key points along the canal route and at the lock and lock tender's sites.
- Create a nonprofit organization that has ties with the Borough Council to oversee use and operation of the site including the lock itself, and developing programming for the site.
- Archaeological investigations will be required throughout the planning, design and development processes to ensure that the integrity of buried features is not compromised, to be able to learn more about the site and its occupants, and to satisfy governmental regulations.
- Prepare design development and contract documents for each proposed phase of work.

The **Recommendations** section includes phasing of the work programs. The initial phase already under development by the Borough is the installation of interpretive signage. This signage will begin the process of making the visiting public more aware of the importance of the site and garnering public support for the long-term initiatives. The first phase of the restoration project will be the preparation of the contract documents for the second phase of the project including obtaining the necessary permits and approvals. The second phase will be two-fold. The first component includes stabilization of the lock tender's house. This work will include removal and organized storage of fallen building materials (fragile materials such as ironwork and other archaeological materials should be stored in a designated area off-site), installation of shoring at existing walls, removal of existing graffiti, and creation of a protected archaeological zone. The plans for restoration developed early in the process will help the Borough in raising the funds for the lock's restoration including the development of more concrete estimates of probable cost. Therefore, the second component will be the restoration of the lock. This work will be focused on the lock itself and its operable components and its direct connections with the canal prism and basin. Drainage considerations and restoring the landscape around the lock including the tow path and possibly the waste weir will have to be addressed during this phase in order to support operation of the lock for interpretive and museum purposes. The third phase shall include restoration of the supporting features of the lock including further enhancement of drainage considerations, reconstruction of missing features such as footbridges, operator's shed and other supporting structures. This work will essentially enhance the appearance of the site providing an improved historic context as well as improving mobility around the site. The fourth phase, which should be considered once the site is operational and there is a good gauge on the need for such an enhancement, would be to restore the lock tender's house to its historic exterior appearance and to rehabilitate the interior for use as a museum. This work would include bringing electricity to the site and other enhancements which in the long-run may be deemed too expensive or having too great an impact on the historic appearance of the site.

The **Recommendations** section presents a conceptual planning budget of \$3 million dollars for construction and non-construction work, including a 20% conceptual level contingency. This figure does not include land acquisition, or the acquisition or reproduction of material artifacts or exhibits for museum purposes such as a canal boat.

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The report concludes with a brief discussion on the findings of the public outreach component of the project addressing some of the feedback the Project Team received during the development of the report. The **Feasibility** section also addresses the benefits of restoring the site, the issues that must be considered to ensure the site's long-term sustainability as well as possible avenues of fundraising for both bricks and mortar activities as well as for sustainability toward an open-air museum.

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1.1 Statement of Purpose

The purpose of this report is to provide the Borough of Wharton with a Historic Site Master Plan & Feasibility Study for Lock 2 East that documents the existing site and its components, and provides recommendations for its preservation and interpretation. The site is to become an integral part of the Borough's historic and cultural tourist attractions, as a physical reminder of the Morris Canal and as a representation of the Borough's rich history in iron mining. Prior to proceeding with this restoration and transformation of such an important cultural resource, the Borough of Wharton has wisely chosen to obtain a planning document that will serve as the starting point for guiding the development of this historic site. As a Master Plan and Feasibility Study it serves as the first step to a long-term process involving additional planning, design development and ultimately the possible restoration of the site, the lock and its components.

The Morris Canal, constructed between 1825 and 1831, was a technological innovation for its time. It traveled 102 miles from Phillipsburg to Jersey City and had a cumulative rise and fall of 1,674 feet. One of the canal's greatest technological achievements was its use of inclined planes to overcome the large elevation changes. The use of a traditional system of locks remained an important element of canal transportation, though, with 23 locks included within the Morris Canal to overcome changes in elevation less than twelve feet. Lock 2 East covered an 8 foot change in elevation. Although traffic on the Morris Canal had diminished by the 1880s due to an increase in the reliance upon the railroad to transport goods between the coal mines in northeastern Pennsylvania, the forges, mines and foundries of northwest New Jersey, and the industrial plants in northeast New Jersey cities such as Paterson and Newark, the canal was not officially abandoned until 1924. Upon its abandonment, the State of New Jersey systematically drained the canal and dismantled many of the buildings and structures that were used for the functioning of the planes and locks. Much of what was the canal route is either in ruin, has been removed from the landscape due to development, or is in some other manner unrecognizable as a remnant of the canal. Lock 2 East, as one of the best-preserved sections of the Morris Canal and featuring a rare portion still partially filled with water, serves as an exception.

In the past, the site was initially maintained by the Bird family, whose members had a long history with the Morris Canal. Lock 2 East has traditionally been known as "Bird's Lock," with several generations of the family, beginning with Welch Bird² in the 1860s, acting as lock tender at the site. After canal operations ceased, Sarah H. Bird, the daughter of Welch, and her son, Theodore, lived in the lock tender's house for several years. Between 1926 and 1929, the Borough of Wharton purchased the site of Lock 2 East from the Morris Canal and Banking Company, and has retained possession of the site since. The canal bed itself looks much as it did in the days of its operation, with the remains of the lock tender's house, which burned in 1970, also in existence. The existing condition of the site provides the Borough of Wharton with an opportunity to develop a long-term approach to preserve its historic resources and artifacts and to interpret them for the public, while also better incorporating the site into its surroundings in Hugh Force Park.

The Master Plan recognizes this site's long history and its relationship to the history and development of both the Morris Canal and the Borough of Wharton itself. It makes recommendations that will address both the preservation and interpretation of the site with

² This family name is variously spelled "Burd" or "Bird" depending on the source; even within the family, members varied in their spelling of the name. It appears that the "Burd" spelling was more common in the region in the earlier 18th and 19th centuries, while "Bird" became more popular at the end of the 19th century. For the purposes of clarity within this report, the "Bird" spelling will be used at all times, except within quotations from other sources.

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respect to the Canal and its historic resources while also incorporating the recreational and scenic components of the surrounding Park.

The Master Plan is a study, therefore it does not generate the documents required to execute the preservation of the existing resources. The study is also broad in its recommendations for the individual components of the site, and as a tool these recommendations will call for further study prior to the execution of any specific items of work. It is a summary of the existing conditions of the site including the canal bed and the remains of the lock tender's house; a review of archaeological findings; and an evaluation of the existing landscape features. This report establishes a preservation philosophy that will guide the recommendations for use and interpretation. The recommendations are based on the appropriateness to the site's history and integrity, viability and public benefit, and are supplemented by projections of conceptual cost. The implementation of the recommendations is outlined in possible phases over an approximate five year period depending on the availability of funds. With this report and the information it contains, the Borough of Wharton can order its priorities and establish work programs.

The Master Plan provides the necessary documentation of this historic site, an analysis of the current conditions, recommendations for preservation and interpretation, and a phased approach to site development as well as budgetary considerations that will enable the Borough to commence with further studies while pursuing funding for both future planning and capital improvements. The Master Plan encourages immediate investment into the site and its preservation in order to garner public support for its long-term plans. It also encourages the Borough to establish a nonprofit organization that will assist the Borough with implementation of its plans for the site. The report addressed certain considerations with regard to the problems associated with sustainability including development of a strong operating organization and fundraising.

The report is only the first step in a long arduous process of planning, restoration, implementation and sustainability. Many more professional, experts, volunteers, the Borough, and other interest groups and individuals need to embrace and become excited about this project and the site's potential role in educating the greater public about the history of Wharton, Morris County, locks as an integral component of any canal and the Morris Canal specifically. Construction of the Morris Canal was no small feat with numerous ups and downs in its 100 year history. However, with almost 100 years passed since its abandonment it continues to evoke a sense of pride and accomplishment in its nineteenth century ingenuity; the same ingenuity that sparked the Industrial Revolution which dramatically altered the landscape of America. It is with this inspiration, the appreciation for the wonders of the Morris Canal and its role in shaping New Jersey, the lock's restoration should proceed.

It should be noted that there are distinct limitations in the evaluation of the site which may impact implementation of the recommendations. Namely, the evaluations focused on the existing physical conditions of the site, but did not include a property survey with topography or the marking of the elevations of elements of the site; this is recommended as part of the schematic design phase. In addition, a hydraulic analysis was not undertaken to determine the amount and direction of water flow between the elements of the site either as they currently exist or as proposed for the operation of the lock. Lastly, there are environmental considerations, discussed in the report, which will have to be more specifically addressed during the schematic design process such as wetlands, stream encroachment and possibly endangered species provisions. The findings of each of the future studies may impact implementation and as such, an alternative

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treatment approach has been provided which may help not only in addressing future stumbling blocks but may help to spark greater interest and support for the project in the short term.

1.2 Study Area

The study area is strictly limited to the area of land historically known as “Bird’s Lock” which includes the canal prism, the buried remains of the lock, basin, and the ruins of the lock tender’s house (refer to the Study Area Diagram after this section). This area includes Morris Canal tracts designated on Weir Maps³ as tracts 464, 467, 468, 469, 470 and 471 in the Borough of Wharton (refer to the Study Area Diagram following this section). The scope of this study of Lock 2 East is inclusive of the structures, landform and archaeological features within the study area. Adjacent conditions to the core site were noted for context but they were not documented or thoroughly examined. The assessment of the core study area components were of readily accessible conditions as well as findings of archaeological excavations conducted by Hunter Research.

The core study area is defined as the precinct that encompasses the buried remains of the lock and the ruins of the lock tender’s house which is basically the area bounded by the railroad embankment located to the south, the basin to the west, Stephens Brook to the north and the canal prism to the east. These are the properties that are owned and operated by the Borough of Wharton with a maintenance agreement with the Morris County Park Commission. Three of the four agencies (basin, prism and brook) mentioned are included in the core study area as the lock historically relied upon these features for operation. This is the area of intensive study, and the focus of the planning, preservation and interpretive recommendations.

There are adjacent conditions that will impact the core site which have been examined due to their proximity and relationship to the core site. These adjacent features include the adjoining parking lots, the surrounding Hugh Force Park, the railroad embankment and the vacant lands lying behind the canal basin. These have been considered as part of this study for their peripheral impact and their connection to this public right-of-way. However they remain out of the core study area.

The Master Plan summarizes the history and evolution of the Morris Canal and Lock 2 East based on readily available historical documentation. Due to the previous extensive documentation on the Canal, the historical summary focuses on those events and changes to the site pertinent or relevant to Wharton specifically, and to the recommendations presented in this report for future use and interpretation.

The report also addresses the conditions of the remains of the lock tender’s house. The assessment considers the building materials and any conditions that are detrimental to their long-term viability. Investigation of the site utilities is limited to readily observed conditions and for their future use or upgrade. An assessment of below ground cultural resources was conducted, determining the physical subsurface condition of the lock and other archaeological features, including those beyond the fenced boundaries of the lock tender’s house.

Based on the history and evolution of the site, and the review of the existing cultural resources, determinations for the period of significance and the period of interpretation have been

³ Weir Maps are the transit survey maps of the Morris Canal alignment across New Jersey commissioned by the Morris Canal & Banking Company in the 1890s. These maps are accompanied by manuscript field books. The maps and books are available at the New Jersey State Archives.

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established. Coupled with the findings of the conditions survey and archaeological investigation, the report establishes a preservation philosophy upon which to base planning recommendations, and recommendations for use and interpretation.

The recommendations made for each individual resource include both its existing conditions and its potential for contribution to the overall proposed plan for use and interpretation. As such, the recommendations consider whether the resource is significant and should be retained as part of the vision for the site.

The use and interpretation recommendations are presented in both narrative and graphic form and address the site's potential for both recreational use and as a resource for historical interpretation. The components of the use recommendations include access to the site, the site's connection with adjacencies, programming, visitor circulation and interpretation.

1.3 Methodology

Mapping the Site

The Lock 2 East Master Plan began with the generation of a base map. The Canal Society of New Jersey provided copies of both the Weir maps and the abandonment plans prepared in the 1920s by Cornelius Vermeule. These documents were then supplemented by other historical documentation including historic photographs, many of which were also provided by the Canal Society of New Jersey, and field documentation by the Project Team. Each Project Team member received a package of information including an overview of the history, and a copy of the base map before visiting the site. Each team member then conducted an on-site investigation.

Documentary Research

HJGA Consulting took the lead in the documentary research; however, Hunter Research supplemented that research in order to undertake their specific scope of work. Due to previous investigations of the Morris Canal at Inclined Plane 9 West and Lock 7 West (the "Bread Lock"), the Project Team had many source materials within their research files. This information included general historical data on the canal and its contributions, notes on locks and their operations relating to other archaeological investigations, and other cultural resource surveys. HJGA Consulting enhanced the Lock 2 East data with investigations of the Morris Canal and Banking Company Records found at the Division of Archives and Records Management, Trenton, New Jersey. Further research was conducted at local archives and repositories and the New Jersey State Archives to gain an understanding of the evolution of this site before, during and after use by the Morris Canal Company and to gain historical information on the development of the Borough of Wharton. The Canal Society of New Jersey made their photo archive available and the Borough of Wharton opened their deed information on the properties within their ownership as well as documentation on the work undertaken in 1976 to restore the canal prism. Kathryn Ritson and Margaret M. Hickey were the primary documentary researchers.

Field Investigations

The field research project team consisted of the following individuals:

Thomas B. Connolly, R.A., Principal Architect
Margaret M. Hickey; Historic Preservation Specialist
Katherine E. Cowing; Architectural Conservator
Kathryn Ritson, Historian
Richard Hunter, PhD; Principal Archaeologist
James Lee, Investigating Archaeologist

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James B. Huffman, P.E., Structural Engineer

The survey phase consisted of four site visits, beginning September 2006 through October 2006 by HJGA Consulting and their Structural Engineer. Margaret M. Hickey and Thomas B. Connolly were the primary field surveyors. In addition, Hunter Research undertook two weeks of archaeological investigations between September 25 and October 6, 2006.

On-site evaluations included: the overall site and existing site features; the exterior from the ground level of each extant building and structure. The on-site evaluations consisted of visual examinations, and graphic, narrative and photographic recordings of key components of the property.

Hunter Research and their team of archaeologists and field investigators conducted intensive investigations of the site focusing on the lock, the areas around the lock and the lock tender's house and other site features. The work included excavation of two trenches, one at each end of the lock in the area of the lock gates to a level of approximately ten (10) or more feet below existing grade leaving in place any original canal fabric (such as the side wall masonry and timbering, parts of the lock gates and related mechanisms, and the lock floor). This work was assisted by the Borough of Wharton Department of Public Works who provided the necessary heavy machinery for excavations and the de-watering equipment. In addition, Hunter Research undertook the following: excavated a trench across the upstream end of the waste weir passing to the south of the lock; conducted between 75 and 100 shovel tests in the area around the lock, mostly to the south of the lock; conducted additional tests in locations where buried remains of interest were encountered through the shovel tests; and dug three three-foot-square excavation units. No testing was conducted within the fenced-in area that contains the ruins of the lock tender's house due to the instability of the structure.

James B. Huffman, P.E. visited the site once during the first week of Hunter Research's investigations after the two main excavations were conducted at the lock. Huffman examined both the buried remains of the lock as well as the ruins of the lock tender's house. His focus was the structural evaluation of both of these features in order to determine a feasible approach to the stabilization of the lock tender's house and possible restoration of the lock and its features to a functioning condition. Examinations by Huffman also included the basin, the adjacent conditions of the canal prism and other site components that would impact future restoration measures.

Report Development and Presentations

The report was developed in three phases. The first draft focused on presenting the findings of the field investigations by both the architectural and archaeology teams. This also included preparation of the developmental history and a determination of the period of significance. A preservation philosophy was developed upon which preliminary recommendations for preservation and restoration, and use and interpretation were made. HJGA Consulting presented the findings on two occasions. The first was to the Canal Society of New Jersey and the second to the Council Members of the Borough of Wharton. The presentation to the Borough included an outline of the estimates of probable cost. The second draft of the report focused on solidifying the recommendations, taking into consideration the concerns of the Borough and addressing some broad reaching comments made by the general public to date. The third and final phase included further development of the feasibility part of the report incorporating the findings of the Community Focus Group presentation which took place on April 25, 2007.

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Analysis

The analysis focused on the adaptation of the site for use as a cultural outdoor museum and recreational area interpreting the history of Lock 2 East and the Morris Canal. The Project Team assessed the attributes of the both the site and the extant structures for their relationship to continuing the existing recreation use while overlaying a new use, an outdoor museum. Using the historical documentation and the base map, the Project Team overlaid the attributes of the existing property with those of the site as it existed historically. This generated an understanding of the current integrity of the site. It provided a framework for how the site and the Morris Canal can be interpreted utilizing both the existing historical features and any modern facilities that are present. The Master Plan also addresses issues of feasibility with regard to the potential of the site to attract an audience and to sustain itself in the long-term. Therefore any work undertaken to restore the lock to its former operating condition would be cost beneficial.

Limitations

As previously mentioned, there were certain limitations in the scope of the investigation which may impact implementation of the recommendations. There are therefore initial recommendations, such as a property survey with detailed topography and benchmarks, conducting hydraulic analysis and undertaking environmental surveys to determine such impacts, which must be implemented prior to developing design documents for the lock's restoration. These were not conducted during this phase of the project as the Project Team and representatives of the Borough determined during the initial scoping of the project to focus the study on the buried features of the lock to determine the extent of buried remains and their integrity. As such, this Master Plan presents broad-reaching recommendations for the site upon which to build a more detailed scope and implementation plan.

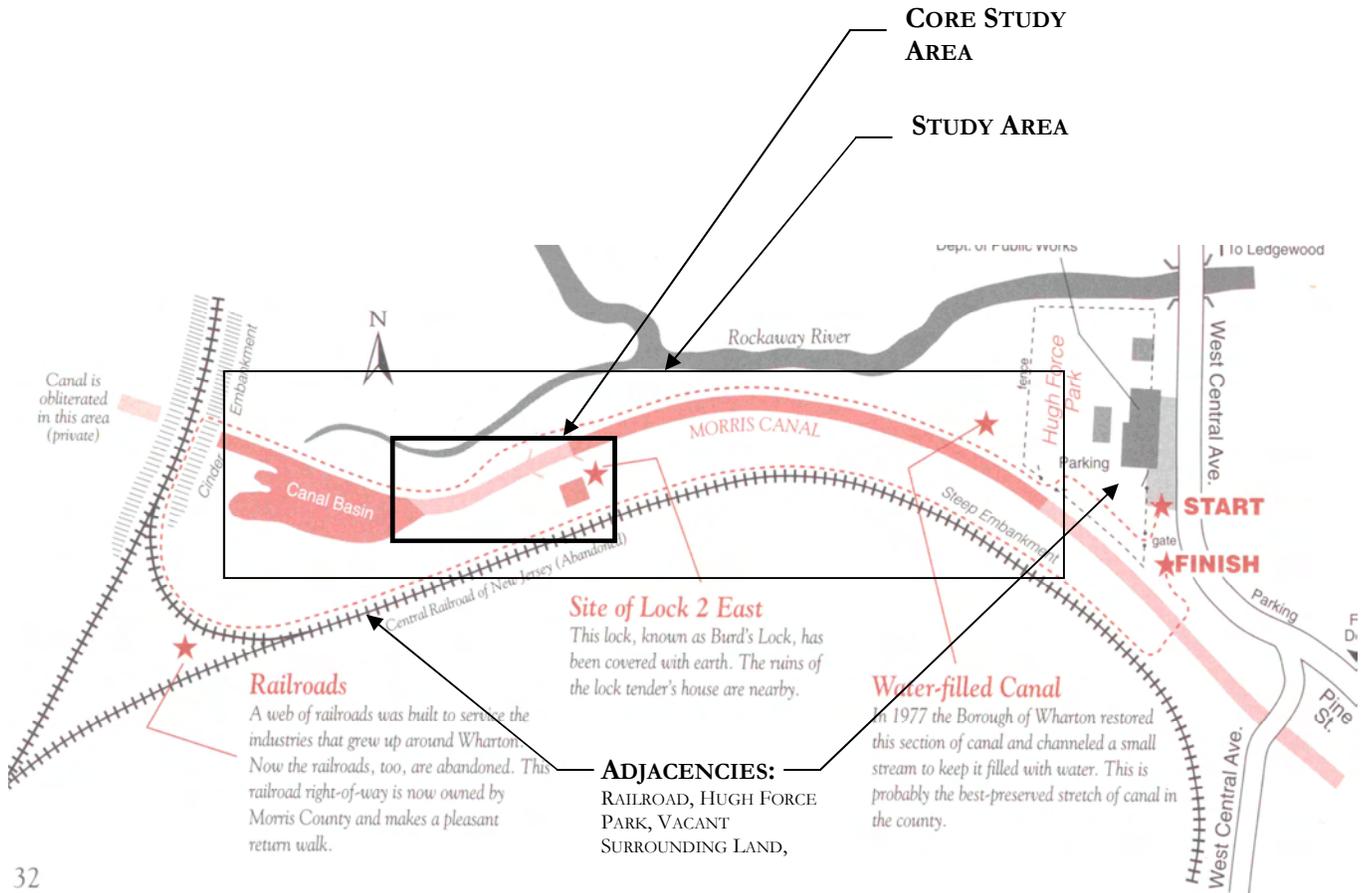
Acknowledgements

HJGA Consulting would like to acknowledge the assistance of the Borough of Wharton including but not limited to John Reinhardt, Borough Administrator, Sue Best, Clerk, and Brian Gillen, Councilman, in the preparation of this report. John Manna, a Wharton resident, also provided valuable insight and served as the primary liaison between the firm and the Borough. The Public Works Department assisted Hunter Research in the excavation of the lock, and this work is greatly appreciated. Several members of the Canal Society of New Jersey opened their archives to our firm providing us with maps, plans and historic photographs of the site making the preparation of the developmental history a more fluid process. These members also provided valuable knowledge about this site as well as the proposed activities at other Morris Canal sites including the development of the Morris Canal Greenway.

Historic Site Master Plan and Feasibility Study

Lock 2 East has the potential to be a premier site in western Morris County tying the interpretation of the Morris Canal with other efforts along the Canal route in not only Morris County but other adjacent counties. The development of the site will take place over time and it is envisioned that this will be a phased approach. As such the Historic Site Master Plan and Feasibility Study essentially envisions the site in a state that achieves the goals of public access, historic preservation and interpretation. As more resources become available, the site can evolve even further as user-ship dictates and as the public demands.

HISTORIC SITE MASTER PLAN & FEASIBILITY STUDY
 LOCK 2 EAST OF THE MORRIS CANAL
 BOROUGH OF WHARTON, MORRIS COUNTY, NEW JERSEY



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Study Area Diagram



Diagrammatic map prepared for the *Guide to the Morris Canal* which provides a general overview of the size of the property encompassing the former canal basin, site of the lock ruins including the tender's house and the canal prism. This map is provided for general orientation purposes.

Credit: Joseph J. Macasek, *Guide to the Morris Canal in Morris County*, A publication of the Morris County Heritage Commission. West Orange: Midland Press, 1996, 32.

1 INTRODUCTION

1.4 Location

The Borough of Wharton is located centrally in northern New Jersey in Morris County. The Borough is situated within the Highlands physiographic province of New Jersey, which adjoins the Piedmont region to the southeast. The Highlands extend across northwestern Passaic, Morris and Hunterdon Counties and southeastern Sussex and Warren Counties in a northeast to southwest direction. The province is composed of primarily metamorphic rocks with deep valleys of tightly infolded and unfaulted Paleozoic rocks. The Borough of Wharton is an area of the Highlands bordering the Triassic Lowlands which is composed of gently rolling forested hills giving the region a picturesque quality.

Wharton Borough, with a total area of 2.2 square miles, is a densely populated borough that lies approximately 47 miles west of New York City. It is bordered by Mine Hill Township and Dover to the south, Rockaway Township to the northeast, Jefferson Township to the north, and Roxbury Township to its west. The Borough is readily accessible by both automobile and railroad from New York City and surrounding areas, both means of transportation having an impact on its development beginning in the late nineteenth century. Today, the Borough is accessible by automobile by way of Interstate 80 to Route 15, as well as by train, today provided by NJ Transit.

Within the Borough of Wharton, Lock 2 East of the Morris Canal is located in Hugh Force Park on West Central Avenue, one-half mile west of Main Street. The Wharton Department of Public Works and a public parking lot currently border the site. The canal bed itself, 60 feet wide, is also bordered by the backyards of residences along Pine Street and West Central Avenue through which it cuts. Tool sheds and other small structures belonging to the residents have been placed on the canal's berm.

This section of the canal stretches one half mile through the Borough and travels on the south side of the Rockaway River from east to west. West of the remains of Lock 2 East lay the remains of the canal basin. East of the lock, about one quarter of a mile of the canal remains, fed by Stephens Brook.⁴ The site also contains the ruins of the lock tender's house, located south of the lock. Behind the lock lies an embankment where the abandoned tracks of the Central Railroad of New Jersey can be found.

Today, the site is owned by the Borough of Wharton, and is located within the Borough owned and Morris County Parks Commission maintained Hugh Force Park. The site is often enjoyed by local residents. As part of the local park, the site is a popular destination for recreational activities such as walking and hiking.

⁴ Robert R. Goller, *Images of America: The Morris Canal, Across New Jersey by Water and Rail* (Charleston, S.C.: Arcadia Publishing, 1999), 68.



Figure No. 1



Physiographic Location Map

Credit: Geographical Department, Rutgers University. *Physiographic Provinces of New Jersey*. New Brunswick, New Jersey.

FIGURE NO. 1

HISTORIC SITE MASTER PLAN & FEASIBILITY STUDY
LOCK 2 EAST OF THE MORRIS CANAL
BOROUGH OF WHARTON, MORRIS COUNTY, NEW JERSEY

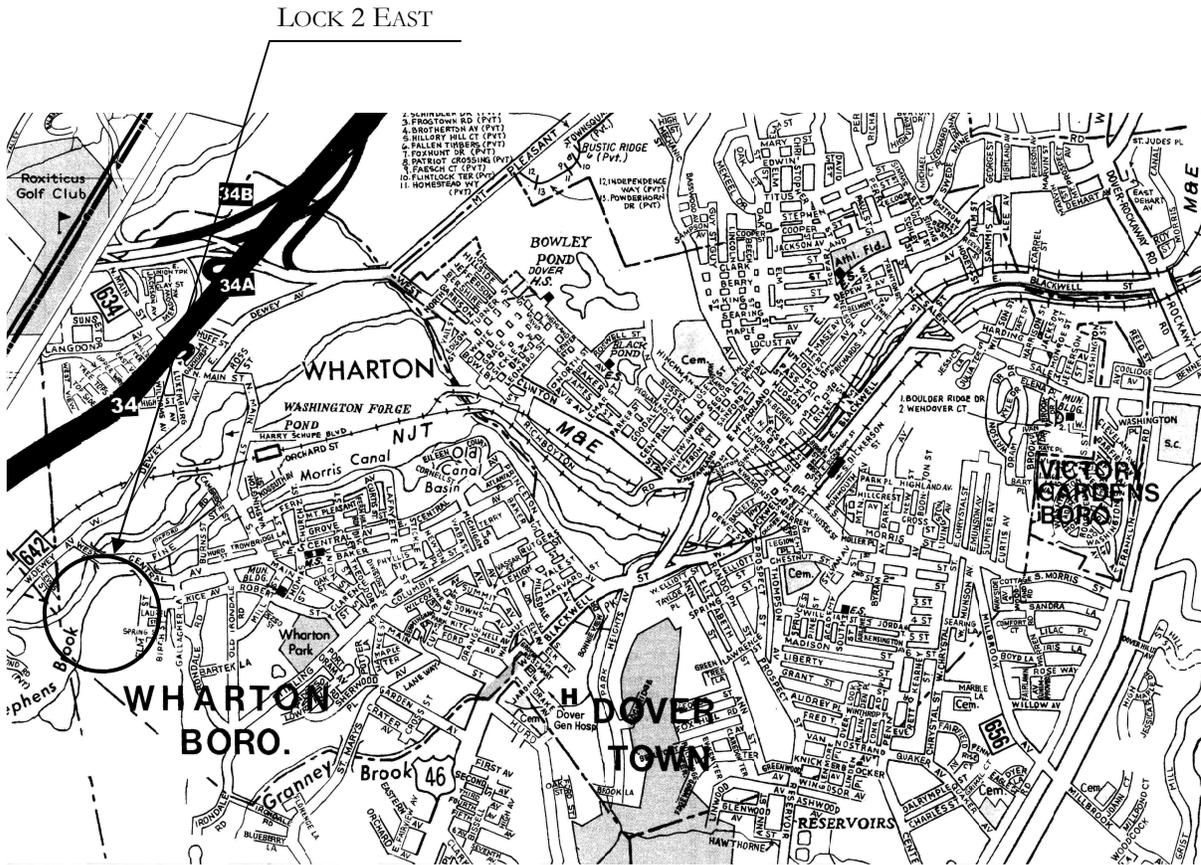


Figure No. 2

Location Map

Credit: Hagstrom Map Company, *County of Morris* (Masbeth, NY: Hagstrom Map Co., Inc., 1998).

FIGURE NO. 2

HISTORIC SITE MASTER PLAN & FEASIBILITY STUDY
LOCK 2 EAST OF THE MORRIS CANAL
BOROUGH OF WHARTON, MORRIS COUNTY, NEW JERSEY

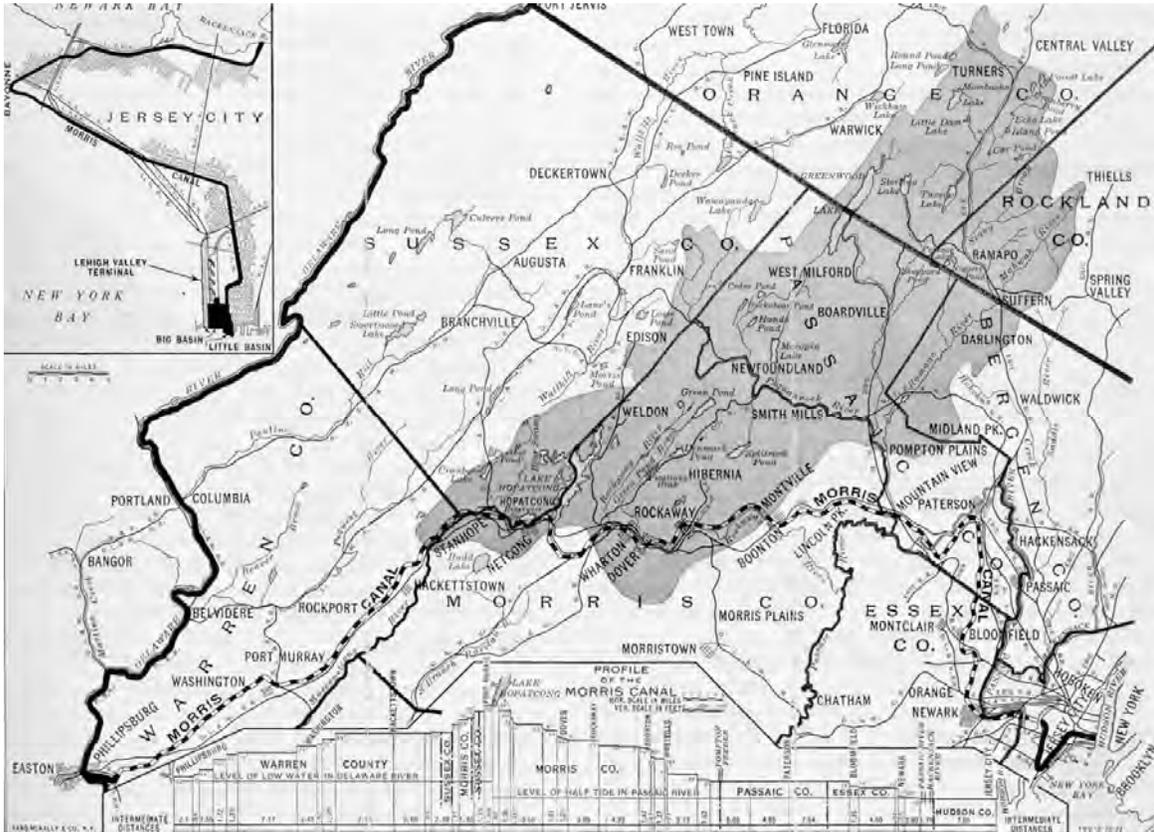


Figure No. 3

Map Showing Route of the Morris Canal and Elevation Profiles

Credit: Rand McNally & Co., New York; James Lee, *The Morris Canal: A Photographic History* (Bethlehem, PA: Lehigh Litho, 1979), 3.

FIGURE NO. 3

2. DEVELOPMENTAL HISTORY

2.1 Historical Overview

2.1.1 Borough of Wharton

This history of the Borough of Wharton is not meant to be all inclusive, but to look at the historical trends of the area, and how Wharton developed based on these influences.

Unquestionably, the most important effect on the development of the Borough was its significant involvement in the iron industry, and the growing transportation networks which connected this industry to outlying areas. It is on these influences that this brief history of Wharton will focus.

The Morris County area as a whole has had a long tradition of iron mining that dates to the first years of its settlement. Native American inhabitants named the region “Suckasuna,” which means “black” or “heavy” stone, because of the ore which they found in its surrounding mountains. As one source states, it is likely the presence of iron ore that first attracted settlers to the area. It has been noted, based upon examination of the records of the East Jersey proprietors, that the first land to be purchased in the northern part of the county was that containing veins of ore.⁵ Tradition holds that the first forge within the present boundaries of Morris County was erected as early as 1710 at the Whippany River (known as the Whippanong River at the time). Circa 1714, a tract of land containing the Dickerson mine was purchased by John Reading from the proprietors of West Jersey. Reading sold the land to a Joseph Kirkbridge in 1716.⁶ Located in what is now Mine Hill Township, the Dickerson mine is one of the oldest mines in not only Morris County but the entire United States.

The Wharton area, positioned where a major vein of iron ore crosses the Rockaway River, was a prime point for mining activity⁷ and its history from the eighteenth through the twentieth centuries is strongly connected to this activity. So much so, that since its earliest settlement its names have reflected the dominant economic interest at the time: first, Washington Forge and later Irondale Docks in the eighteenth century, then Port Oram in the nineteenth, and finally, Wharton in the twentieth century.⁸ The area’s evolution through these times is presented in the following.

As evidenced by its early settlement, the area today known as “Wharton” has been greatly influenced by its economic interests throughout its history. By the eighteenth century, mining activity was well underway. Within the current Wharton boundaries, specifically, John Jackson purchased 527 acres in 1722 “on the edge of which was a brook where, at the point just above its junction with the Rockaway River, he erected a charcoal fired forge using ore from a location some two and a half miles to the west that later developed into the Dickerson mine.”⁹ The tract, consisting of much of the land west of Dover, was purchased from Joseph Latham. Due to

⁵ *Munsell's History of Morris County New Jersey, with Biographical Sketches of Prominent Citizens and Pioneers* (New York, New York: W.W. Munsell and Co., 1882), 39-48.

⁶ *Munsell's History*, 39-48.

⁷ Kenneth R. Hanson, *Port Oram Circa 1882: a New Jersey Iron Town* (Scotch Plains, New Jersey: Hanson Press, 1995), 1.

⁸ There are two lines of iron ore deposits that run through Wharton which were mined heavily in the nineteenth and twentieth centuries. One line ran northeast into today’s business section. The other line, the Rockaway River Fault, held three deposits- the Corwin, the Sterling, and the Mt. Pleasant. In total, the Wharton mines would yield over 2,500,000 tons of iron ore. Source: *Abandoned iron mines of Wharton Borough, Morris County, New Jersey*. (Trenton, N.J.: State of New Jersey, Dept. of Labor and Industry, Division of Workplace Standards, Office of Safety Compliance, 1983), 3-4.

⁹ Hanson, 3 and *Munsell's History*, 39-48.

2. DEVELOPMENTAL HISTORY

financial troubles partially induced by England's attempt to prohibit iron manufacturing within its colonies, Jackson soon lost his forge.¹⁰

On August 15, 1753, the local sheriff sold Jackson's holdings in order to satisfy judgments obtained by the estate of Edward Fitz Randolph, a practicing Quaker from Monmouth County. Hartshorn Fitz Randolph, the principal heir to the estate, purchased most of Jackson's land, plus enough to total 900 acres. At the time, Hartshorn Randolph was a farmer and also well known as the founder of the Quaker Meeting in Randolph Township.¹¹ Among the members of this Meeting was a Hollander by the name of Jacob Honz; years later, his grandson, John Hance, would go on to develop mines on family land and become one of the founders of what was by then known as Port Oram.¹²

At this same sheriff's sale, Jackson's forge was sold to Josiah Beman and continued its operations. In 1757, Beman expanded, buying 100 acres on the river. Housing was soon built around each major mine by its workers, and before long small settlements grew around each, including Port Oram, Mine Hill, Irishtown and Teabo.¹³ Later in its history, the Port Oram settlement would have a particularly beneficial placement on the area's transportation networks, and grew to become the largest of these satellite towns, surviving when the rest had long disappeared.

The men who worked the area mines and filled the small settlements were mainly of British origin. The settlements were devoted to the iron industry around which they had first formed, and most immigrants were people who had been attracted to the area due to its need for their specific skills.¹⁴ For example, there were Cornish and Welsh miners, Irish laborers and English iron workers, and as a result, it followed that chiefly British "customs and mores" remained predominant in the region throughout the first centuries of its settlement.¹⁵

Mining activity had continued to expand in the late eighteenth century with the opening of what became known as the "Washington Forge". In 1795, Charles Hoff Jr. and Joseph DeCamp broke ground on the west branch of the Rockaway River in order to build the Washington Forge, which sent iron bars to rolling mills in Dover. According to some sources, this marked the beginnings of what would become present-day Wharton. At this point, the greater area became known as "Washington Forge". In 1808, Hoff sold his half of the business to Joseph Hurd, and in 1828 DeCamp's heirs sold their half to Joseph Dickerson.¹⁶

In order for the growing iron industry to succeed, it was necessary for expeditious means of transportation to be in place. In fact, the area's survival to the present time as "Wharton" is credited to its location along a natural transportation route, the valley of the Rockaway River. It has been noted that this same valley which once contained the Morris Canal and the Morris &

¹⁰ In 1750, an Act of Parliament was passed that was entitled "'an act to encourage the importation of pig and bar iron from his Majesty's colonies in America, and to prevent the erection of any mill or other engine for slitting or rolling of iron, or any plating forge to work with a tilt hammer, or any furnace for making steel, in any of the said colonies.'" The title of the act fully explains its purpose, stating that while the colonists were permitted to manufacture iron and send it to Britain, they were not allowed to form the mined iron into any specific tool or item for use (*Munsell's History*, 39-48).

¹¹ Hanson, 3.

¹² Hanson, 3.

¹³ Hanson, 3-4.

¹⁴ Hanson, 5.

¹⁵ Hanson, 5.

¹⁶ Charlotte Kelly and Alan Rowe Kelly, *Images of America: Wharton, New Jersey* (Charleston, SC: Arcadia Publishing, 2004), 11.

2. DEVELOPMENTAL HISTORY

Essex Railroad is now home to the busy truck and automobile traffic of Interstate Route 80.¹⁷ The transportation networks that grew alongside the iron industry had a significant impact on the region, expanding both the industry itself and the small communities that had grown around it.

In the early years goods were generally carried by way of ground transportation, usually by wagon. Before 1800, horse drawn wagons remained the predominant means of transporting iron. Soon after the year 1800, improved roads in the form of privately owned turnpikes were built, the first being the Morris Turnpike, chartered in 1801.¹⁸ Several years later, in 1804, the Union Turnpike was incorporated to build a road from Morristown to Dover and then through Mount Pleasant to Sparta. An *Iron Era* letter from 1882 described its extremely poor conditions and the complaints of drivers¹⁹; this is representative of the many flaws in ground transportation at this time. Land transportation was usually inefficient for several reasons including the difficulty and time expended in transport, the number of wagons needed to carry goods, and the cost for labor for each wagon, all of which combined for a high cost of transportation.²⁰

By the early to mid-nineteenth century, it was generally accepted that overland transportation, such as along stage coach routes or by wagon, was inferior to that of waterways, and more regions began to rely on the technology of canal systems in the hopes of reducing both time and cost of transportation.²¹ Businessmen in the northern New Jersey area recognized the success of canals elsewhere, and began to plan for such technology in order to better transport the anthracite and iron products of their region. The first major transportation advance in the area, then, came with the creation of the Morris Canal which began construction in 1825. Throughout its existence, the Canal carried anthracite coal from Pennsylvania and the iron ore from the hills of northwestern New Jersey, mainly from iron mines in Morris County, specifically.²²

In fact, in New Jersey, the need for a canal system “grew out of the need to move anthracite coal from the mines to its consumers.”²³ DeWitt Clinton, President of the Board of Canal Commissioners of the State of New York suggested at the time that the State of New Jersey “should be motivated to undertake the construction of the canal if for no other reason than the enormous potential to be realized through increased industrial activity, based on an abundance of cheap, available fuel. It was, he thought, humiliating to tour New Jersey and see ‘foreign iron worked by foreign coal’ when the state’s own mountains were full of ore, and the coal supply lay but a day’s journey away.”²⁴ It was as a result of such factors that the Morris Canal was born, officially opening its complete line in 1831.

The opening of the Canal had a major impact on the small iron mining settlements in the North Jersey area. One source states that “The regional or local impact of canals has been the most critical impact to consider. Canals displayed their most dramatic role in interior wilderness areas,

¹⁷ Hanson, 39.

¹⁸ Hanson, 39.

¹⁹ Hanson, 39.

²⁰ Spiro G. Patton, “Canals in American Business and Economic History: A Review of the Issues.” *Canal History and Technology Proceedings*: Volume VI March 28, 1987, ed. Lance E. Metz, 4-6.

²¹ Patton, 5 and 7.

²² Robert Geelan, “Iron on the Water.” *Canal History and Technology Proceedings*, Volume X, March 23, 1991, ed. Lance E. Metz, 48.

²³ Barbara N. Kalata, *A Hundred Years, a Hundred Miles, New Jersey’s Morris Canal* (Morris County, New Jersey: Morris County Historical Society, 1983), 13.

²⁴ Kalata, 45-46.

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helping to transform these areas into thriving settlements and even into towns.”²⁵ The settlement in and around present-day Wharton was just such an area. In fact, as late as 1853, a map of Morris County “shows Wharton as it always had been- a hinterland northwest of Dover.”²⁶ With the increased use of the Canal, though, the area became further transformed by the iron ore industry and the men who controlled it. Several Morris Canal sites had been constructed in the area including Plane 5 East, Plane 4 East, and Lock 2 East. Wharton was in fact the central point on the canal for the shipment of iron ore.²⁷

The year 1840 marked both an increase in iron ore production in Morris County and a greater utilization of the Morris Canal’s capabilities.²⁸ The next decade saw the founding of a number of new iron companies and mines, as well as the rise of several important individuals within the industry. One source states that “The rise in the price of iron attracted ‘the attention of Capitalists to the rich ore beds along the line of the Canal, and very large sums were spent in the purchase of mines, and in the preparation to mine and to send to market large quantities of iron and other ore.’”²⁹ Among the first major figures in the area was Robert F. Oram. Born on October 28, 1824, in Breage Parish, Cornwall, England, Oram was the son of a tin assayer father.³⁰ In 1845 Oram first came to the United States, having previously worked the tin mines of Cornwall, England. In 1848, the New Jersey Iron Mining Company purchased the Mount Pleasant Mine, and in 1849 bought the Burrill farm site, where the Orchard mine would be located. Robert Oram and his brother, Thomas, were hired to supervise the Mt. Pleasant Mine, and began this management on August 16, 1848. The next year, Robert Oram purchased John Hance’s cabin as well as the Burrill farm site it was located on. In 1850, he began supervision of the adjacent Orchard Mine.³¹ The Orchard Mine soon became the area’s premier mine.³² Orchard, as a newly founded mine, had to be developed, and “In 1858 Robert Oram purchased from his employers portions of the farm not needed for mining and started real estate development”³³ Today, much of downtown Wharton is located over the Orchard mine.³⁴

Most mines in New Jersey, including in this region, were vertical mine shafts, described thus: “A shaft, heavily timbered against collapse and lined with planks, was dug straight down to rock. Through this ore and water were hoisted and miners climbed on ladders”³⁵ On January 14, 1854, the Thomas Iron Company was organized and purchased land across the Lehigh River from the Crane works, erecting two furnaces.³⁶ On April 9, 1867, the New Jersey Legislature passed an act incorporating the New Jersey Iron Mining Company, with John Hance among its incorporators. The company purchased the Irondale complex; because it did not actively operate its properties

²⁵ Patton, 18.

²⁶ Morris County Heritage Commission, *Morris County Historic Sites Survey*. 39 vols. “Borough of Wharton” (Morristown, NJ: Morris County Heritage Commission, 1987), 1.

²⁷ *Munsell’s History*, 309.

²⁸ Geelan, 43.

²⁹ Kalata, *A Hundred Years, a Hundred Miles*, 434.

³⁰ Hanson, 61.

³¹ Kelly, 15.

³² “Its workings were 400 feet long and reached 750 to 850 feet deep, with the addition of adits. The only way up and down was by ladder at 13 levels. By 1868, the Orchard mine had produced more than 50,000 tons of ore. By the mid-1890s, its resources were exhausted, with an aggregate yield of 375,000 tons. It closed in 1910.” Source: Kelly, 49.

³³ Hanson, 57.

³⁴ *Abandoned iron mines of Wharton Borough, Morris County, New Jersey*. (Trenton, N.J.: State of New Jersey, Dept. of Labor and Industry, Division of Workplace Standards, Office of Safety Compliance, 1983), 2.

³⁵ Hanson, 12.

³⁶ Hanson, 23.

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the Irondale mines were leased to the Thomas Iron Company of Hockendauqua, Pennsylvania.³⁷ “Irondale mines” was the collective name for a group of mines southeast from Port Oram to Mine Hill; as a result “Irondale Docks” soon became the collective name for the settlements within the area. An 1866 book entitled *Coal Iron and Oil, or the Practical American Labor*, stated that at the time there were a half dozen Irondale mines, with 70 employees and John Hance acting as their superintendent.³⁸ Hance remained as supervisor after the 1867 purchase.

John Hance was additionally in charge of the Randall Hill mine, also in the Port Oram area. This mine was located on the old Hance farm, south of the Irondale mines. The mine had been purchased from Hance, a former farmer, by the Lehigh Crane Company, and he was hired to supervise mining activity. In its beginning years, “ore was shipped from New Jersey to the Crane furnaces by canal. Barges were loaded at Irondale Docks, pulled west to Phillipsburg on the Morris Canal, transferred across the Delaware River to the guard lock of the Lehigh Canal at Easton and hauled to the Crane works on the canal”.³⁹

The Port Oram Iron Company was incorporated on March 31, 1868, by Robert Oram and seven other businessmen.⁴⁰ In 1882, the *Directory to the Iron and Steel Works of the United States* provided basic information on the Port Oram Furnace, reporting: “Port Oram Furnace, Joseph Wharton, P.O. Box 2786, Philadelphia. Works at Port Oram, Morris County. One stack, 60x16, built in 1868 and first blown in 1869; bought by Joseph Wharton in 1881, and by him put in thorough order; closed top; ores, local magnetites; product, high grade mill pig iron; annual capacity, 16,000 net tons”.⁴¹

Aside from the iron industry, development of the newly settled area had continued when in 1857, John Hill, an active local politician, opened a general store under the name of John Hill & Co. He retired the next year and the store came under the new ownership of Robert Oram, John Hance and William G. Lathrop. The owners renamed their establishment Oram, Hance & Co.⁴² The store was located near the Plane 4 East and Lock 2 East sites along the Morris Canal, on what is now Main Street in Wharton. The canal store was a long, gable-roofed structure, built to face the nearby canal that today survives in a “much altered form” at #42 North Main Street.⁴³ The store was directly connected to the canal, which ran parallel to the building, with an unloading dock for merchandise that was carried by boat. In addition, the general store also acted as a post office location, beginning on January 31, 1867, with Hance acting as the first postmaster, personally appointed by President Abraham Lincoln, to be succeeded by Oram. It was about this time that the settlement came to be known as “Port Oram,”⁴⁴ as local social and business activity began to center itself around the Canal and this first community store.

After the Civil War, the area grew into a mercantile center, as stores and services multiplied to serve mine oriented industrial development.⁴⁵ Soon after the beginning of operations at his general store, Oram built 4 houses nearby and began to add others regularly. His 1899 obituary

³⁷ Hanson, 22.

³⁸ Hanson, 22.

³⁹ Hanson, 22-23.

⁴⁰ Hanson, 30.

⁴¹ Hanson, 32.

⁴² Hanson, 57.

⁴³ Morris County Historic Sites Survey, 1.

⁴⁴ “Hugh Force Park (Morris Canal Site)”; available from <http://nynjctbotany.org/njhltofc/hugeforc.html>; Internet; accessed October 2006.

⁴⁵ Hanson, 59.

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states that he was the owner of 75 houses in Port Oram, Dover and Rockaway.⁴⁶ Munsell's History of Morris County, printed in 1882, reveals that "From 1864 to 1868 over 40 buildings were erected, and the population increased from four to 64 families, making nearly 400 persons. The increase continued until the paralysis of the iron industry, 1872-1880. Since then business has revived, and the population may be over 600. Almost all the inhabitants are English miners, and employed by the Boonton Iron Company"⁴⁷ A Morris County Historic Sites Survey, conducted in 1986, points out that though such figures are cited in almost any written history of Wharton, they mostly likely are not accurate. The Survey goes on to report, though, that historic maps do reveal large scale growth between 1853 and 1868. In these years, the area evolves from open fields to a new village (Port Oram), with settlement throughout the area.⁴⁸

As the population grew, so did services and the settlement soon had establishments including groceries, a meat market, saloons, a hotel, a barbershop and so on.⁴⁹ The 1874 *New Jersey Directory* listed only seven businesses in the Port Oram area, but by the time Boyd's *Morris County Directory* was published in 1882-84 over 30 businesses were named.⁵⁰ The Morris County Historic Sites Survey reveals that by 1887 the "entire length of Main Street" was filled with houses. It also states that the most notable expansion was at the village center which had grown into a fully formed town with commercial enterprises, a hotel, a church, and so on.⁵¹ Despite this concentration, town development was unplanned with homes and buildings simply built where and when they were needed. According to an 1887 map, most of the land and buildings belonged to four men: Oram, Hance, J. Cooper Lord, and Joseph Wharton. According to the Survey, as of 1986, many of the dwellings still remained, including homes on West Central Avenue and Main Street.⁵²

By this time in the late nineteenth century, several factors had begun to lead to a period of decline in mine production. First, new iron sources were found in other parts of the country, causing a westward shift in the industry. One of the casualties of this shift was the Port Oram Furnace. Incorporated in 1868, the furnace did not operate successfully until late 1870 or early 1871. It was soon inactive again due to a scarcity of coal, and when started up again it was soon idled about 1880.⁵³ In addition, the "Panic of 1873" had a direct impact on the decline in mining productivity. The Panic was a devastating financial collapse that had several sources, including excessive land speculation. As the country's financial capital, New York and its surrounding areas such as Morris County felt the worst of the effects. By 1876 the mines and furnaces of the New Jersey Highlands had temporarily shut down.

In 1881, Joseph Wharton, a native of Philadelphia born in 1826⁵⁴, bought the Port Oram Furnace, hoping to turn the area into the center of his expanding iron industry, and helping to revive the industry. Much of the ore for these furnaces came from Morris County, the Hibernia Range in particular. Wharton began his operations by modernizing the original Port Oram furnace. By 1890

⁴⁶ Hanson, 59.

⁴⁷ Hanson, 59.

⁴⁸ Morris County Historic Sites Survey, 1.

⁴⁹ Hanson, 59.

⁵⁰ Hanson, 59-60.

⁵¹ Morris County Historic Sites Survey, 2-3.

⁵² Morris County Historic Sites Survey, 3.

⁵³ Kalata, *A Hundred Years, a Hundred Miles*, 509.

⁵⁴ Wharton, a well-known businessman, is also famous as the founder of the Wharton School at the University of Pennsylvania. In addition to his involvement with New Jersey's iron industry, Wharton's legacy in the state also includes his vast landholdings in south Jersey, which now form the center of Wharton State Forest, a New Jersey state park. Source: W. Ross Yates, *Joseph Wharton: Quaker Industrial Pioneer* (Bethlehem, PA: Lehigh University Press, 1987).

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his business consisted of the Hibernia, Baker and Willis mines and the Wharton Furnace in Port Oram.⁵⁵ The Furnace had been incorporated as the Port Oram Blast Furnace by the Port Oram Iron Company in 1868. “The largest furnace in the country, it had a yearly capacity of 150,000 tons. The furnace operated until it was forced into bankruptcy during the 1873 depression. It was reorganized in 1877 under the name Port Oram Furnace company. Later purchased by Joseph Wharton, the facility was enlarged and operated at an extensive scale until February 1911.”⁵⁶ Eventually, there were three furnaces, with a total capacity of 600,000 tons per year.⁵⁷

On June 28, 1895, voters from the settlements of Port Oram, Irondale, Luxemborg, Maryville and Mount Pleasant gathered at the local Hance Hotel, and voted 143 to 51 to incorporate as an official town. The settlements incorporated under the name of Port Oram, the largest member of the group. As previously described, each of these localities was basically a small mine camp for blast furnace or silk mill workers. A mayor, six councilmen, an assessor and a collector were elected as officials, and included among them were mine and railroad superintendents.

Transportation improvements had continued with the construction of railroad lines throughout the nineteenth century. It was the town’s connection to the iron industry and transportation networks that truly spurred its growth. One source states that although its real growth did not begin until after the Civil War, Port Oram rapidly became the transportation hub of the iron district. It was served by the Morris Canal (hence the Port in its name), DL&W Railroad, Mount Hope Mineral Railroad, Chester Railroad (DL&W branch), the Longwood Valley and Dover & Rockaway, which composed the CNJ High Bridge Branch, and later the Wharton & Northern Railroad.⁵⁸ Construction of the Delaware, Lackawanna and Western Railroad had begun in 1835 and was completed in 1848.⁵⁹

The Morris & Essex Railroad line was completed to Dover and connected to the iron region in the same year. By 1855, rail connections to the Morris Canal were beginning.⁶⁰ The effect of rail transportation on the Canal was not immediate, “But once their tracks had penetrated the iron mining district the handwriting was on the wall.”⁶¹ The railroad’s connection to the iron industry continued when in 1867, a group of businessmen, including Robert Oram and John Hance, obtained a charter to build a railroad from the Dickerson mine to the Morris & Essex Railroad and the Morris Canal.⁶² In 1876, the Central Railroad arrived in Port Oram⁶³ and in the same year attached a branch to the Port Oram Furnace. Later, in 1882, the Central Railroad built a track right into the furnace to carry off hot cinders.⁶⁴ By 1915, the Central Railroad had “4883 feet of siding outside the ‘main stem’ in Wharton”.⁶⁵ As the railroad lines expanded, many additional iron mines, furnaces and forges were opened, with accompanying population growth and development soon following.⁶⁶

⁵⁵ Yates, 315.

⁵⁶ Charlotte Kelly and Alan Rowe Kelly, 22.

⁵⁷ Hanson, 93.

⁵⁸ Larry Lowenthal, *Iron Mine Railroads of Northern New Jersey* (Dover, N.J.: Tri-State Railway Historical Society, 1981), 44-45.

⁵⁹ Charlotte Kelly and Alan Rowe Kelly, 30.

⁶⁰ Geelan, 45.

⁶¹ Geelan, 45.

⁶² Hanson, 45.

⁶³ Hanson, 45.

⁶⁴ Lowenthal, 44-45.

⁶⁵ Lowenthal, 45.

⁶⁶ Kemble Widmer, *The Geology and Geography of New Jersey* (Princeton, NJ: Van Nostrand Co., 1964), 159.

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By 1899, Joseph Wharton had become the “undisputed largest miner of iron ore in New Jersey.”⁶⁷ While only a handful of mining operations were left in New Jersey by the 1890s, Wharton actually continued to expand his north Jersey mining operations.⁶⁸ Wharton improved his business operations by providing his own transportation. In order to better transport ore to his furnaces, Wharton put together his own railroad system by purchasing existing small lines and constructing new lines.⁶⁹ He built multileveled steel bridges and tracks that led directly to his blast furnaces.⁷⁰ A deed from 1901 shows that Wharton built a small railroad from “the Morris County Connecting Railroad Company” to convey both person and property. The petition for construction was made on September 3, 1901. The total length would be 1 ¾ miles, located solely in Morris County. The detailed description states: “beginning point in the line of the Morris County Railroad, distant one and one quarter miles north-easterly from the junction of said Morris Canal Railroad with the Lake Hopatcong branch of the Central Railroad in the Township of Rockaway...to its terminating point in the line of the Port Oram Railroad in the Borough of Port Oram...at a point a short distance south-easterly from Port Oram station of the Central Railroad Company of New Jersey.”

Between 1901 and 1906, Wharton’s number of employees grew from 250 to 800.⁷¹ Wharton’s revival of the Port Oram works was so successful that in 1902 the Town Council voted to honor Wharton by changing the town’s name from Port Oram to Wharton.⁷² By this time, nearly all of the citizens of the newly christened “Wharton” and the surrounding areas were dependent on him for employment.⁷³ Wharton himself wrote that “I own 4830 acres of land in the iron mine region about Wharton, etc., including mining lands, furnace tract, Wharton town lots, site for steel works etc. On these lands are dwellings for 247 families.”⁷⁴ When he acquired the New Jersey Iron Mining Company in the early 1900s, he was producing at least 50% of iron ore mined in the state.⁷⁵ In 1908, Wharton created the Wharton Steel Company, giving his New Jersey mining and smelting operations a common name.⁷⁶

While the popularity of the railroad would continue for some time, the successes of the Morris Canal and the iron industry began to falter in the early twentieth century. Gradually, the demand for iron in the area dwindled as superior sources were found elsewhere in the country. In 1917, silk became the principal industry after the closing of the iron mines, providing industrial activity well into the 1920s. ⁷⁷ In 1932, the furnaces at the former Port Oram Furnace Company were dismantled,⁷⁸ marking the end of an era for the Borough of Wharton.

⁶⁷ Yates, 319.

⁶⁸ Yates, 320.

⁶⁹ Hanson, 93.

⁷⁰ Charlotte Kelly and Alan Rowe Kelly, 31.

⁷¹ Hanson, 95.

⁷² Kalata, 509.

⁷³ Yates, 320.

⁷⁴ Yates, 321.

⁷⁵ Yates, 320.

⁷⁶ Yates, 319.

⁷⁷ Tammy Scully, “A Silk Purse,” *Historic Silk Mills in New Jersey Northwest Skylands*; available from <http://www.njskylands.com/hssilk.htm>; Internet; accessed October 2006.

⁷⁸ “History of Wharton Borough”; available from <http://nynjctbotany.org/njhltofc/whartonboro.html>; Internet; accessed October 2006.

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2.1.2 *The Morris Canal*

Introduction

The Morris Canal was constructed between Phillipsburg and Newark beginning in 1825 and was completed in 1831. The Canal was extended to Jersey City in 1836. The Canal navigated a vertical rise and fall of 1,674 feet between western and eastern New Jersey over 109 miles of canal, locks and inclined planes. Integral to the Morris Canal were the many houses, structures and outbuildings, which were constructed to support the Canal's operations. These included the lock and plane tender houses, the structures that housed the waterwheels, the locks, stores, stables, barns and blacksmith shops.

The Canal underwent several changes during its lifetime including the enlargement of the canal prism, modifying the size of the locks, and size and configuration of the planes, and changing the mechanism for pulling the boats along the incline planes. The Canal initially carried boats of ten gross tons, but the tonnage was gradually increased to a capacity of sixty-five to seventy tons. The most prosperous period for the Morris Canal was between 1855 and 1870. However, the advances in railroad transportation impeded on the Canal's prosperity causing a steady decline in cargo transported along the Canal in the late nineteenth century. The Canal, after years of struggling, was taken over by the State of New Jersey and systematically abandoned between 1922 and 1929. The bulk of the Lock 2 East property was purchased from the Morris Canal and Banking Company in 1926 by the Borough of Wharton, with the balance of land purchased in 1929.

Context and Creation

Prior to the American Revolution, the Colonies depended on Britain for many of their mass-produced goods, were focused on the production of agricultural products for local use, and often relied on locally based industrial enterprises. Limitations on transportation were also a factor in isolating communities and in their frequent reliance upon homespun industry. The results of the American Revolution- an independent nation- forced the country to reevaluate its role in the production of goods and services, and to develop a national economy; Americans had to become more self-reliant for the production of goods. The foundations were laid between 1790 and 1840 for New Jersey's participation in the industrial revolution through improvements or inventions in transportation. This included the building of improved road systems, and the construction of the Delaware and Raritan Canal in 1830, the Morris Canal in 1831 and the Camden and Amboy Railroad in 1834. As a result, business and industry were created and expanded during the late eighteenth and early nineteenth centuries. Such industries and businesses included those producing iron, glass, pottery and cotton products, all of which relied on a better utilization of water power, and banking and insurance companies.⁷⁹

The early road systems included the establishment of turnpikes. Chartered in 1811, the Morris Turnpike was one of the earliest turnpikes established in the State and linked the Morris County iron mines with Newark, bringing goods and services to New York City markets. Prior to this, the farms and mines in Western New Jersey were primarily shipping their goods down the Delaware to Philadelphia. The construction of twenty-five turnpikes prior to 1829 as well as the numerous bridges and other improved roads established the understanding that better transportation helps to spur economic growth and development.⁸⁰ Between 1815 and 1834 there was a focus in the eastern states, particularly New York, Pennsylvania and New Jersey to build

⁷⁹ James P. Johnson, *New Jersey: History of Ingenuity and Industry* (Northridge, CA: Windsor Publications, 1987), 61-133.

⁸⁰ Johnson, 72.

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canals. One of the more important transportation enhancements of the early nineteenth century was the canal. One of the most successful, the Erie Canal, which linked the Hudson River with Lake Erie in New York, reduced the cost of transportation between Buffalo and Albany by ten percent.⁸¹ Two canals constructed in New Jersey were the Delaware and Raritan Canal completed in 1830 between New Brunswick and Bordentown, and the Morris Canal completed between Phillipsburg and Newark in 1831.⁸²

The iron mines, forges and furnaces located within northwestern New Jersey, particularly the New Jersey Highlands, were near closing after the American Revolution due to a want for a market. The discovery of anthracite coal in northeastern Pennsylvania in the 1790s would later resurrect the iron industry in New Jersey. Coal proved a far superior fuel source to charcoal and was more readily available. However, a productive and economical means of transporting the coal to the iron industries in New Jersey had yet to be established. The success of the Erie Canal in New York and the construction of a canal along the Lehigh River are considered strong influences for George P. McCulloch⁸³ of Morristown to pursue a navigable route between the Delaware and Passaic Rivers.⁸⁴ McCulloch's initial idea consisted of damming Lake Hopatcong in order to deepen it and then connect it via canals along the Musconetcong River to the west, and the Rockaway River Valley and the Passaic River to the east.⁸⁵

In 1822, McCulloch assembled a number of businessmen, including New Jersey Governor Isaac Williamson, to propose his idea for the canal. After garnering support, the New Jersey State Legislature passed an act on November 15, 1822 authorizing the appointment of a canal commission. The commission was to determine the feasibility of a canal, its possible route and estimate of cost. McCulloch's initial concept included the State financing the project. He also estimated that the summit level at Lake Hopatcong was 185 feet above tide at Newark and 115 feet above the Delaware River.⁸⁶

The survey of the proposed canal route showed that the summit level was 914 feet above mean tide at Newark and 760 feet above low tide at the Delaware River in Phillipsburg, over four times greater than McCulloch's initial estimates at Newark and six times at Phillipsburg. Pressures exerted by local businesses and other financial interests impacted the final route proposed for the canal.⁸⁷ In the end, the canal passed through Warren and parts of Sussex, Morris, Passaic, Essex and Hudson Counties. Despite the dramatic change in elevation, a total of 1,674 feet of vertical rise and fall in 102 miles, and the circuitous route proposed, the Morris Canal and Banking Company was incorporated as an act of the State Legislature on December 31, 1824.⁸⁸ The company was to create an artificial waterway between the Passaic and Delaware Rivers that would be capable of navigation. To finance the initiative through private investment, twenty thousand shares at one hundred dollars a share were issued. This provided one million in capital for the construction of the canal and one million for banking privileges.⁸⁹

⁸¹ Johnson, 95 – 96.

⁸² Johnson, 96.

⁸³ McCulloch was born in 1775 in Bombay India, educated at the University of Edinburgh in Scotland and settled in Morristown in 1810. Source: Goller, *Images of America*, 12.

⁸⁴ Barbara Kalata, "National Register of Historic Places Inventory – Nomination Form: The Morris Canal" (Trenton, NJ: State of New Jersey – Department of Environmental Protection, 1973), 16.

⁸⁵ Johnson, 96.

⁸⁶ James Lee, *The Morris Canal: A Photographic History* (Bethlehem, PA: Lehigh Litho, 1979), 4.

⁸⁷ Kalata, "National Register Nomination," 17.

⁸⁸ Lee, *The Morris Canal: A Photographic History*, 4.

⁸⁹ Lee, *The Morris Canal: A Photographic History*, 4.

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Important provisions in creating the Morris Canal and Banking Company were that the State could take over the canal without cost after ninety-nine years, or if not desired, after a subsequent fifty years, and banking privileges, which included issuing their own currency. The banking privileges were limited to thirty-one years.⁹⁰

Construction and Use

By July 1825, the Morris Canal and Banking Company had sold enough stock to finance the construction of the canal.⁹¹ The estimate for construction was \$817,000.⁹² On October 25, 1825, the groundbreaking ceremonies were held at Lake Hopatcong. Three important individuals who helped to shape and design the Morris Canal were James Renwick, a prominent engineer and professor at Columbia College, Ephraim Beach, a canal engineer, and David Bates Douglass, an instructor at West Point. All were prominent leaders in their fields.⁹³

The construction technology employed included the use of both traditional locks and innovative inclined planes to cover larger changes in elevation. While more attention is often given to the use of inclined planes on the Morris Canal, the use of locks remained an important component of Canal technology. Ephraim Beach, first employed for the initial survey of the canal route, later became its chief engineer. He guided the construction of the canal prism and locks, and served as chief engineer between 1825 and 1836.⁹⁴ David Bates Douglass was hired to consult on the construction of the inclined planes. He served in this capacity between 1829 and 1832.⁹⁵

The Morris Canal and Banking Company hired approximately 1,000 workmen to construct the canal. The canal was completed in 1831 and cost approximately two million dollars. The first full canal season was in 1832.⁹⁶ The construction of the canal included building a dam at Lake Hopatcong to raise the water level five feet, the construction of aqueducts, bridges and tunnels, as well as the twenty locks and twelve inclined planes between Lake Hopatcong and Newark, and ten locks and eleven inclined planes between Lake Hopatcong and Phillipsburg. The length of the canal was increased in 1836 to Jersey City, a major terminus and port, increasing the total length of the canal to 109 miles, including all feeders.⁹⁷

The prism of the original canal held 4 feet of water, was 32 feet wide at the top and 20 feet wide at the bottom. While in the canal prism, the boats were pulled by a team of two mules led by one person along the towpath while at least one person steered the boat. The boats were constructed by the Canal Company and were often fitted so that the boatman and his crew, or in most cases, his family could live on the boat during the canal season. The canal was originally built to carry boats of ten gross tons.

The traditional locks employed averaged a 10-foot elevation change, however, there were also guard and tidal locks. All of the locks, except the tidal locks, were constructed of stone with

⁹⁰ Lee, *The Morris Canal: A Photographic History*, 4.

⁹¹ Kalata, "National Register Nomination," 17.

⁹² Lee, *The Morris Canal: A Photographic History*, 4.

⁹³ Barbara Kalata's Book, *A Hundred Years A Hundred Miles New Jersey's Morris Canal*, as well as other books and articles on the Morris Canal provide brief histories of each of these men and their other important contributions throughout their professional lives.

⁹⁴ Goller, *Images of America*, 12.

⁹⁵ Goller, *Images of America*, 12.

⁹⁶ Lee, *The Morris Canal: A Photographic History*, 4.

⁹⁷ Lee, *The Morris Canal: A Photographic History*, 4.

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wood gates. The tidal locks were constructed of wood to combat the corrosive action of the salt water.⁹⁸ In all, 23 traditional locks were used throughout the Canal. The original locks were 75 feet long by 9 feet wide at their initial construction and could accommodate boats of 16 to 18 tons.

The twenty-three inclined planes overcame 1,450 feet of the 1,672 feet of vertical rise and fall along the canal. The planes averaged 63 feet in vertical lift. The first planes were the Lock plane types where the water of the upper canal was controlled by a lock structure. Water from the upper canal also powered a wooden waterwheel that drove a sheave wheel under the lock floor around which wound a chain that connected to the cradle cars. The cradle cars carried the canal boats up and down the plane.

One of McCulloch's intentions behind the construction of the Morris Canal was to transport agricultural products to eastern New Jersey and New York City markets as well as to help the ailing iron industry. Various other goods were also transported along the canal such as grain, wood, bricks, hay, hides, iron and other products, but the primary cargo during the lifetime of the canal was coal.⁹⁹ The cargo also included passengers, but this was of a limited capacity. The construction of the Morris Canal influenced more than the shipping of goods. It also helped to bring about a real estate boom to various towns and cities along the route including Newark, Paterson, Phillipsburg, Dover and Little Falls, attracting industry and people.

Modification to the Canal

The Morris Canal and Banking Company undertook an improvement program in 1840-1841 that included enlarging the locks to 95 feet long by 11 feet wide and widening the planes by two feet to accommodate boats of 45 tons.¹⁰⁰ The plane was unable to accommodate this heavier cargo so the use of sectioned boats was instituted in 1845, enabling the boats to pass over one section at a time. In order to finance these improvements, the Company issued notes of varying denominations that could be redeemed after twelve months. However, a mortgage taken out in 1830 could not be repaid and the Company failed.¹⁰¹ The Canal was leased out for a number of years until the Company was reorganized in 1844 as the Morris Canal and Banking Company of 1844. The newly created company operated the Canal during its most successful time, and although their banking privileges had not been utilized since the initial company failed, they officially ceased in 1849.¹⁰²

The Canal was rebuilt between 1845 and 1860 to respond to the need for increased cargo and advances in technology. Daniel Tyler, a civil engineer educated at West Point, became president of the Company in 1844 and oversaw the enlargement program.¹⁰³ The canal prism was enlarged to 40 feet wide at the top, 25 feet wide at the bottom and 5 feet deep, which better accommodated the larger sectioned boats being used.¹⁰⁴ All of the inclined planes were dramatically altered by 1860. The lock-type planes were converted to summit type planes, the overshot wood water wheel was abandoned for the "Scotch motor", or cast iron turbine, and the

⁹⁸ Kalata, "National Register Nomination," 5.

⁹⁹ Johnson, 114.

¹⁰⁰ Kalata, "National Register Nomination," 5-6.

¹⁰¹ Goller, *Images of America*, 16.

¹⁰² Goller, *Images of America*, 17.

¹⁰³ Goller, *Images of America*, 17.

¹⁰⁴ Kalata, "National Register Nomination," 6.

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mechanisms and rails were also modified. These changes permitted an increase in cargo to between 65 and 70 tons. The enlargement program cost 1.7 million dollars.¹⁰⁵

Height of Use, Decline and Abandonment

Cargo totals for 1846 were 58,259 tons and for 1850 were 239,682 tons. The combination of the improvement program with the advances in industry within the State helped to contribute to the steady increase in cargo transported along the Morris Canal between 1850 and 1866; 1866 was the height of the canal, carrying 889,220 tons of cargo. As late as 1870 cargo loads were still significant but by 1875 had dropped precipitously to 491,816, about half of what it was ten years previous.¹⁰⁶ The major factor in the decline of the Morris Canal was the increased reliance on the railroad for the transportation of goods and passengers through much of the State. From 1870, most coal was shipped on the Morris and Essex Railroad, which had been leased to the Delaware, Lackawanna and Western Railroad in 1868. The Ogden Mine Railroad carried iron ore from Jefferson Township to Lake Hopatcong where the ore was then transferred to the canal, until 1881 when the Central Railroad of New Jersey took over the Ogden Mine Railroad and all ore was then transported along their High Bridge Branch.¹⁰⁷ The railroad was simply a more efficient means of transportation in the late nineteenth century. For example, the Lehigh Valley Railroad could carry coal shipments the same distance in five to eight hours that took three days on the Morris Canal.

In December of 1870, the New Jersey Legislature permitted the Morris Canal and Banking Company of 1844 to lease the canal. The Lehigh Valley Railroad leased it in 1871 for a period of 99 years. However, the Railroad Company never made a profit and by 1903, the Legislature resolved to investigate whether the canal should be abandoned. Although there was a recommendation for abandonment and a plan for such was submitted to the State in 1905 and again in 1912, the legislature failed to act. It was not until the Morris Canal and Banking Company and the Lehigh Valley Railroad won an injunction to stop the North Jersey District Water Supply Commission from building the Wanaque Reservoir (which would have diverted feeder streams to the water supply authority and away from the canal) that a successful effort was made to abandon the canal.¹⁰⁸ In 1922, a majority of the Morris Canal was taken over by the State of New Jersey and in 1923, Cornelius Clarkson Vermeule, Sr., a consulting engineer, was retained to oversee the abandonment of the canal. Abandonment was a major undertaking and included documenting the canal and its features, removing all of the flumes, powerhouse structures and other buildings where deemed necessary, and cutting and filling at the canal prism, locks and planes. The sites were made safe in order to reduce public liability. The work took place between 1924 and mid-1929.¹⁰⁹ The State retained Lake Hopatcong, Lake Musconetcong, Cranberry Lake, Bear Pond, Saxton Falls and Greenwood Lake for public use and all remaining property was sold. The terminuses at Phillipsburg and Jersey City remained in the possession of the Lehigh Valley Railroad.

Use of Locks

Locks were utilized along the Morris Canal to overcome changes in elevation less than 12 feet; inclined planes were used for elevation changes greater than 12 feet. Along the full length of the

¹⁰⁵ Lee, *The Morris Canal: A Photographic History*, 4.

¹⁰⁶ Dan Clement, "Historic American Engineering Record, NJ-30: Morris Canal" (Washington, DC: US Department of the Interior, National Park Service, 1983), 6.

¹⁰⁷ Lee, *The Morris Canal: A Pictographic History*, 4-5.

¹⁰⁸ Lee, *The Morris Canal: A Pictographic History*, 5.

¹⁰⁹ Goller, *Images of America*, 115.

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Morris Canal from Jersey City to Phillipsburg, the Morris Canal utilized 23 traditional locks and 23 inclined planes to overcome a total vertical rise and fall of 1,674 feet in 109 miles.

Most of the locks were traditional locks averaging a ten-foot elevation change, however, there were also guard and tidal locks. All of the locks, except the tidal locks, were constructed of stone with wood gates. The tidal locks were constructed of wood to combat the corrosive action of the salt water.¹¹⁰ The locks were built on a level wooden plank floor supported by timber cribbing. The original locks were 75 feet long between the miter sills by 9 feet wide when initially constructed and could accommodate boats of 16 to 18 tons. Only about 225 feet of the 1,674 feet of level change between Jersey City and Phillipsburg was overcome by ordinary locks, seven of those were located west of the summit and sixteen east of the summit at Lake Hopatcong, including Lock 2 East at Wharton.

When initially constructed, the locks were 9 feet wide and 75 feet long between miter sills. The walls of the locks, except tidal locks, were constructed of stone and lined with light planking. The entire structure was built on a single heavy plank floor. Both gates used on the original locks were miter gates. However, when the locks were enlarged in 1841, two different types of gates were employed at either end. Drop gates were utilized at the higher end of the lock and the lower end was fitted with miter gates. Each type had much smaller wicket gates built into the larger wooden gates. If a canal boat was to enter at the high end of the lock, the wicket gates in the low end would be closed and the wicket gates in the drop gate would be opened allowing water to fill the lock. The drop gate would then be opened and the boat would enter the lock. At that time, the wicket gates would be closed on the drop gate and opened on the miter gates. Water was then allowed to drain from the lock, thus lowering the boat. The miter gates would next be opened and the boat was released to continue its passage on the canal. The reverse would happen if the canal boat were to enter the lock at its low end. No pumping was therefore required to execute the operation. A splayed stone retaining wall was located at the low end of the lock. Basins were typically located along the canal, allowing the canal boats to either temporarily queue up for the lock or let boats pass each other.

Maps and other documents indicate that support structures, such as the lock tender's house, stables and other buildings were not constructed until a few years after the canal was complete and operational. At Lock 2 East, a stone lock tender's house and shed were located south of the lock.

As stated previously, improvements made to the canal before 1860 included enlarging the locks in 1841 to an 11-foot width and a 95-foot length to allow the boats to carry more tonnage. No additional changes were made to the locks after 1841 although the planes and canal prism were modified.

2.1.3 Lock 2 East

Lock 2 East is currently located within Hugh Force Park in the Borough of Wharton, Morris County, New Jersey. The lock was located between Plane 5 East and Plane 4 East to the northwest of Dover. Lock 2 East covered an 8 feet change in elevation. During its period of use, the lock site also contained a stone lock tender's house, now in ruins, located adjacent to the lock, at its south side, and an adjacent shed, no longer extant.

¹¹⁰ Kalata, "National Register," 5.

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The land used for this portion of the Canal was assembled over a period of several years in the 1820s and 1830s by the Morris Canal and Banking Company. Correspondence between Henry B. Kummel, General Manager of the Morris Canal and Banking Company in the 1920s, and C. Stanley Smith, attorney for the Borough of Wharton at that time, reveals the process by which the land came to be held by the Canal, and later transferred to the Borough. In a letter to J.R. Sweet, an engineer with the Warren Foundry and Pipe Corporation,¹¹¹ Henry Kummel notes that “As an actual fact, the lines of the canal were never actually surveyed and marked in the field. The original canal map located the center line of the canal and the Canal Company took and paid for as much land as was necessary for the canal towpaths, and embankments and after the canal was constructed its engineers calculated approximately the number of acres for each owner, which had been occupied, and compensation was made accordingly.” In fact, one source states that it was canal construction during this time period that set the precedent for the use of eminent domain.¹¹² The total land area for the lock section was acquired from five private owners, by varying means including condemnation and agreement. The tracts of land included were part of Weir map tract 464, and then all of tracts 467, 468, 469, 470 and 471.

Part of tract 464, totaling 1,980 square feet, was held by occupancy against McFarlan and Company. While no conveyance is on file regarding this transfer of land, in 1856 McFarlan recognized the Canal company’s ownership in a deed to property in Dover at Tract 466. Tract 467, which was 660 square feet, was acquired from David Dunham by agreement on July 15, 1825, with Dunham receiving thirty dollars. This was the land on which the lock tender’s house would be built. Tract 468, with an area of 739 feet, belonged to Joseph Dickerson and was condemned on July 14, 1825. This land was that which would be used for the canal’s basin. Tract 469 had belonged to Ephraim Burwell, who faced condemnation on July 15, 1825. Tract 470 was also the property of McFarlan & Co., condemned on July 14, 1831. Tract 471 was taken by agreement from Dunham on July 15, 1825.

In total, the land area covered 9,326 square feet, with the total area 14.82 acres as shown by deeds and field books. This total excludes the land purchased for enlargement of the lock in 1845, and with this land included, the grand total equaled 15.66 acres. In written notes, Henry Kummel states that 1.59 acres were taken by condemnation, 13.23 by absolute agreements to convey, and 84 acres unknown, probably by occupancy.

In the 1920s, when the Morris Canal and Banking Company began dismantling the canal sites and selling them off, Henry B. Kummel posted an advertisement for the sale of the Lock 2 East site, dated March 22, 1926. The ad announced: “Property to be sold consists of the two canal houses and land appurtenant thereto at Plane No. 5 East and the Canal House and land appurtenant at Plane¹¹³ No. 2 East, known as Bird’s Lock.” It appears as though the Borough of Wharton purchased the property in several stages, first in 1926, and then additional land between 1928 and 1929. The land advertised in the 1926 ad was transferred to the Borough of Wharton on October 13, 1926.¹¹⁴ A letter dated April 14, 1928 from Smith to Kummel states that the Borough was

¹¹¹ “Around 1890 Joseph Wharton began a program of consolidation and in 1901 secured control of the entire Hibernia mines which resulted in one of the most important magnetite ore properties in the state. The property was passed on to Warren Foundry & Pipe Corp. and the Shamoon Industries.” Source: www.gti.net/rocktwp/rthist.html.

¹¹² James E. Held, “The Canal Age,” *Archaeology*; available from <http://www.archaeology.org/online/features/canal/>; Internet; accessed October 2006.

¹¹³ It appears that Kummel meant “Lock” 2 East.

¹¹⁴ From the Correspondence Records of the NJ State Archives, Trenton.

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interested in acquiring rights in Stephens Brook, which fed into the Canal. In another letter, dated June 9, 1928, Smith writes: “I return herewith proposed agreement between your company and the Borough of Wharton, for the purchase of the balance of the Canal property within the Borough, for \$150.” Correspondence from August of the same year indicates that the Borough was also interested in acquiring a “portion of the canal property outside the Borough limits immediately adjoining Burd’s lot...”¹¹⁵ A letter dated September 18, 1928, better describes the land in question. Smith writes: “The Borough is interested in purchasing the basin above Burd’s Lock, immediately west of the Borough line, as far at least as the foot of the plane, together with all rights of the company in the stream which now runs through that basin, and any right, title and interest that your company may have in Stephens Brook.” This property was conveyed in January, 1929.

A conveyance dated March 13, 1929, between the Morris Canal and Banking Company and the Borough of Wharton conveys the right, title and interest of further canal property to the Borough. The property is described as “located in the Township of Roxbury, County of Morris, State of New Jersey...All that part of the Morris Canal, its bed, banks, towpath and embankments beginning where the line of the Borough of Wharton and of the Township of Roxbury, as now laid out, crosses said canal at or near Lock No. 2 East, commonly known as Bird’s Lock, and extending thence westwardly to the easterly line of the right of way of the Ogden Mine Branch of the Central Railroad of New Jersey, a distance of Nine-Hundred Twenty-five feet (925 feet) more or less and having an average width of Sixty-three (63 feet) measured from the northerly side of the towpath embankment, which property David Dunham by instrument dated July 15, 1825, signed and witnessed, but not recorded, agreed to convey to the Canal Company...” The deed goes on to further describe this Roxbury property as “more particularly described in a deed John D. King and Eliza his wife and Fanny Bailey to the Morris Canal and Banking Company, dated September 17, 1859, and recorded in the office of the Clerk of Morris County, in Book T5 of Deeds, Page 501.” This March 1929 deed conveyed to the Borough all the property in the “lands and waters formerly used for the purposes of the Morris Canal, between the westerly line of the canal property heretofore conveyed to the party of the second part and the easterly line of the right of way of the aforesaid railroad.”

In June 1929, C.C. Vermeule, Jr., hired as an engineer by the Canal company, recorded his final inspection notes on the Morris Canal sites. In reference to the Lock 2 East site he noted that “The fill is in good condition. The level to the eastward is full, the water being higher than normal bearing level and in places only 12 inches below the towpath. Drainage cuts at this section was omitted and responsibility assumed by Wharton.”¹¹⁶

Aside from the land through which the Canal ran and on which the lock was built, several structures were also constructed on or near the site. First would have been the lock tender’s house. In this case, the structure was a stone house that at some point had been reinforced “with a double ‘collar’ made up of sections of inclined-plane rail across the front and back of both floors, pulled tight by lengths of plane cable.”¹¹⁷ Another source verifies this statement, saying that the deteriorating house was “reinforced by old plane cables, drawn taut, and fastened to old inclined plane rails which stretched across opposite ends of the house.”¹¹⁸ According to maps, a shed was also located at the site, adjacent to the house.

¹¹⁵ August 27, 1928 letter; from the Correspondence Records of the NJ State Archives, Trenton.

¹¹⁶ Vermeule, 13.

¹¹⁷ Goller, *Images of America*, 68.

¹¹⁸ Lee, *The Morris Canal: A Photographic History*, 78.

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As has been noted throughout Kummel's correspondence and elsewhere in this report, Lock 2 East was well-known as "Bird's Lock" throughout its period of use and for many years after. It was very common for locks to be unofficially named after a long-time resident lock tender who worked and lived at the site.¹¹⁹ What makes "Bird's Lock" unique is that the site was tended by several generations of the Bird family, covering an extensive period of the Canal's existence, likely from the 1860s through to the dismantling of the Morris Canal. One source states that "Like Lock 4 West, Lock 2 East was known as Bird's Lock. Welch Bird came from Guinea Hollow with his family and belongings on a canal boat in the 1860s to tend this lock. His son, George S. Bird, tended this lock after him, as did George's brother Stewart and, in 1908, George's son, Charles M. Bird."¹²⁰ Research shows that the extended Bird family also had a rich history of lock tending at various other sites across the Morris Canal.¹²¹

While Welch Bird is often cited as first in the long line of lock tenders from the Bird family, it appears as though he may actually have been following the tradition of his own father, extending the history of the Bird's involvement with the Canal even further than previously thought. His father, Joseph, born September 16, 1803, in Hackettstown, is cited in Morris County Deed Book 56 page 388 for buying 30 acres of land on the Morris Canal berm adjoining the land of Andrew Best in the 1860s. On April 16, 1869, the Hackettstown Gazette posted a death notice for Joseph, stating "Near the Guard Lock on Friday, 16th inst. Joseph Bird, aged about 60 years."¹²² An inventory of his property dated shortly after his death on May 18, 1869, shows that he did serve in some capacity on the Morris Canal. The inventory lists "Cash in hand for lock tending," along with other household items. In addition, a record of the Morris Canal and Banking Company which lists plane and lock tenders from 1869 and onward, lists Joseph as lock tender of Lock 4 West in 1869.¹²³ Joseph Bird was married to Amy Shriner, and had several sons who followed in his profession.

Joseph's son, Welch B. Bird, was born on August 31, 1828, in Independence Township, New Jersey. He held several positions on the Morris Canal, including that of lock tender at Lock 2 East, circa 1863. On the birth record of his son, Stewart E. Bird, born 1858, Welch is listed as a lock tender. He also served as lock tender for Lock 2 West (later 4), from about 1860 to 1863. The 1860 Census of Independence Township, Warren County, taken on June 27, also lists Welch as a lock tender, on page 687. He was married to Christiann Seals, and they had five children: George Seals, Sarah H., Stewart E., Ira Seemore, and Mary Alice. Welch died of consumption at the age of 45, on August 19, 1873 in Port Oram.

Welch's brother, Woodhull C. Bird, born October 3, 1824, also worked on the Canal including at Waterloo, Plane 3 West, and Plane 1 West, in various positions as brakeman, boatman and plane tender.

¹¹⁹ Lee, *The Morris Canal: A Photographic History*, 21.

¹²⁰ Goller, *Images of America*, 67.

¹²¹ The following information on the Bird family was found at: "Ancestors of Emily Burd"; available from <http://familytreemaker.genealogy.com/users/e/b/n/Grace--Ebnetter/PDFGENE5.pdf>; Internet; accessed October 2006.

¹²² "Ancestors of Emily Burd"; available from <http://familytreemaker.genealogy.com/users/e/b/n/Grace--Ebnetter/PDFGENE5.pdf>; Internet; accessed October 2006.

¹²³ Robert R. Goller, "A Little About Bird Watching II," *Reflections on the Morris Canal*, Fall 1998, p. 2.

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Another brother, William, is cited in a Sussex County newspaper obituary which recounts his death by drowning in the Canal. At the age of 21, he fell into Bagot's Lock, between Waterloo and Hackettstown. The accident occurred when along with his brothers, John and Welch, he tried to cross the canal on a foot bridge near his father's house, and slipped and fell into the lock. While it only held 6 feet of water, the boy could not get out of the lock by climbing, as it was smoothly planked on all sides. By the time help arrived, he had lost all strength.

The Bird family's Morris Canal tradition continued with Welch's son, Stewart E. Bird, who served as lock tender at Lock 2 East in 1880. Another son, George Seals Bird, also grew up to be a lock tender. Born to Welch and his wife, Christiann, on April 27, 1855, in Bartleyville, New Jersey, George also grew up to be a lock tender. George's son, Charles Melvin Bird, appears to be the last of the Bird family to actually tend Lock 2 East, for one year in 1908, when he was 14 years old.¹²⁴ His sister, Sarah H. Bird, born on October 2, 1856, lived in the lock tender's house at Lock 2 East after canal operations ceased. She was first married to Joel Andrews and later to Charles Tunis, whose last name she retained and appears on later deeds concerning the property. Sarah had one son with Joel Andrews named Theodore. She passed away on September 30, 1935.

The son of Stewart E. Bird, Stewart E. Bird, Jr., was born on June 21, 1881 in Wharton. He too served as lock tender at Lock 2 East. Bird, Jr. was one of the first of his family to utilize the "Bird" spelling, an example which was followed by several other family members and is often used in reference to the family today.

The use of the lock tender's house and its land after the dismantling of the Morris Canal is somewhat unclear. According to deeds from the 1920s through the 1970s provided by the Borough of Wharton, the lock tender's property is described as located adjacent to the Morris Canal on West Central Avenue with a lot size of 44.65 x 173.3 x 99.65 x 182, or .28 acres at Block 26 B-2. Another description states:

"Canal dwelling on southerly side of Canal at Lock 2 East and land appurtenant thereto. Beginning at an iron bolt, which bolt is 27.7 feet from the northwest corner of a former power house now used as a garage, and North 15 degrees 25 mines West therefrom and 81.1 feet North 83 degrees West from the northwest corner of the lock tender's house; thence 1) North 77 degrees 30 minutes East in a course parallel to the south wall of the lock and 20 feet distant therefrom 173.3 feet more or less to an iron bolt distant 5.3 feet in a southerly direction from three small elms, and also distant 83.7 feet North 60 degrees East from the northeast corner of the lock tender's house; thence 2) At right angles South 12 degrees 30 minutes East 44.65 feet more or less to a stake in the right of way line of the Central Railroad of New Jersey and distant 50 feet from the centerline of said tracks; thence 3) Along said right of way in a southwesterly direction 182 feet more or less to a stake also in said right of way line and distant 50 feet from the center of said tract; thence 4) North 12 degrees 30 mines West 99.65 feet more or less to the place of Beginning."

¹²⁴ Goller, *Reflections on the Morris Canal*, 2.

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This land, originally occupied by the lock tender of the Lock 2 East site, eventually passed into other hands. After canal operations ceased a member of the Bird family remained in the house. Sarah H. Tunis (formerly Bird) lived in the house until 1929. It appears that she lived in the house with both her first and second husbands, and one source also states that her son, Theodore, lived in the house after canal operations ceased.¹²⁵ On July 3, 1929, a deed from Sarah Tunis (listed as “single,” apparently widowed at this point) granted the land to Cecil Carper, as recorded on March 3, 1931, in Deed Book D32 page 100. It appears that the land remained in the possession of Carper until his death on February 18, 1971. At this time, under the terms of his last Will and Testament, probated on May 18, 1971, in Will Book W12 page 549, the house and land were passed to his wife, Delmah B. Carper. Delmah Carper was named as Executrix of his estate with the full power to sell and so on.

A May 21, 1973, appraisal of the property for Carper showed that the building, zoned in an I-2 General Industrial District, was 90% demolished. The building had burned in 1970 and today remains in a state of ruins. In the opinion of the surveyor the present day value of the property at that time (1973) was \$2,600. The survey further states that “The property cannot be used for dwelling purposes unless a variance is granted. The property is too small for industrial use.” The survey also states that “Consideration was given to the cost of obtaining a variance, obtaining a percolation test, construction of a septic tank and the fact that the present road is not paved and in fact is in poor condition.”

Some confusion arises with the finding of a deed dated January 2, 1974. Said deed transfers the previously described lock tender’s site from Delmah Carper Schiller, and her second husband, Paul Schiller, to the Borough of Wharton for \$3,000. The Deed, recorded in Book 2283 page 837, states that these were “the same premises conveyed to Delmah B. Carper by deed from Ruby Mae Drake and Thomas Drake, her husband, dated March 22, 1973, recorded March 28, 1973, in Book 2247, at pages 627c, in the office of the Clerk of Morris County.” No deed explaining the transfer of land *to* the Drake’s has been found.

It appears that at least some of the land for surrounding Hugh Force Park was purchased by the Borough of Wharton from the Alan Wood Steel Company on February 28, 1950. The deed states:

“Beginning at an iron rail distant Northeasterly fifty feet from and at right angles to the center line of the Longwood Valley Railroad Company as conveyed by John D. King and wife by deed dated February 1, 1876, recorded in Morris County Clerk’s Office in Book K-9-533, said point being fifth line described in the above deed, thence (1) North sixty-one degrees twenty-two minutes East eighty and five one-hundredths feet to a spike in the center line of West Central Avenue, formerly Poppenhusen Street, thence (2) along the center line of West Central Avenue, North thirty degrees five minutes West, ninety-four and twelve hundredths feet to an iron spike, thence (3) continuing along West Central Avenue, North twenty-seven degrees twenty-two minutes East, twenty-six and fifty hundredths feet to an iron spike, thence (4) in a Northwesterly direction along the Southerly side of the Morris Canal four hundred and thirty feet to a point where the Southerly side of said canal intersects the Northerly side of the right-of-way of the CRR of N.J., thence (5) parallel to and distant fifty feet fifty feet from the center line of the CRR of N.J. right-of-way, Southeasterly

¹²⁵ Goller, *Reflections on the Morris Canal*, 2.

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five hundred and eighty-three feet, more or less to the point or place of beginning. Containing 26, 919 square feet of land, more or less.”

It then says that “This conveyance is made to the Borough of Wharton on the express representation and covenant that the property will be used only as a playground or for recreational purposes...” The land, then, became the current site of Hugh Force Park, containing not only the site of Lock 2 East but open space provided for the recreational purposes of area residents and visitors.¹²⁶

¹²⁶ All above deed information concerning the site of the locktender’s house and Hugh Force Park was obtained from the Morris Canal files provided by the Borough of Wharton.

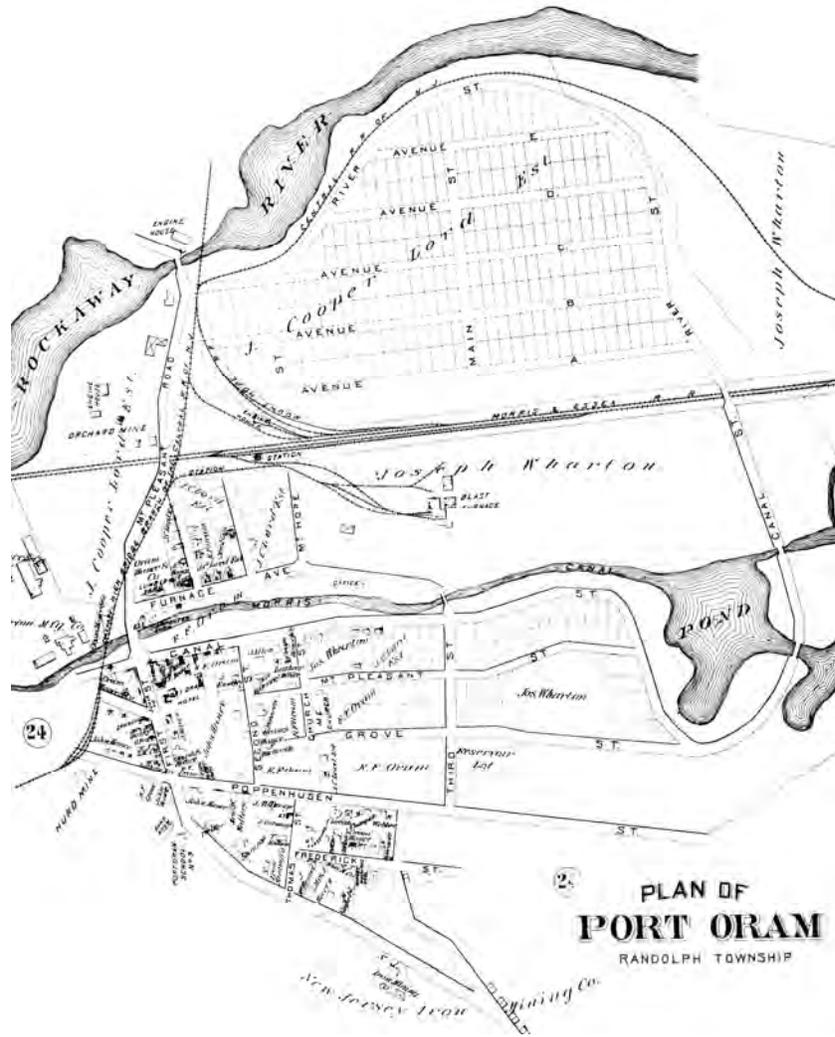


Figure No. 4

Map Showing Plan of Historic Port Oram

The route of the Morris Canal is visible, as well as various furnaces including Joseph Wharton's Blast Furnace. Port Oram's inclusion in Randolph Township indicates that this map was drawn pre-1895, the year in which Port Oram and other surrounding settlements officially incorporated as the municipality of "Port Oram".

Credit: Canal Society of New Jersey.

FIGURE NO. 4

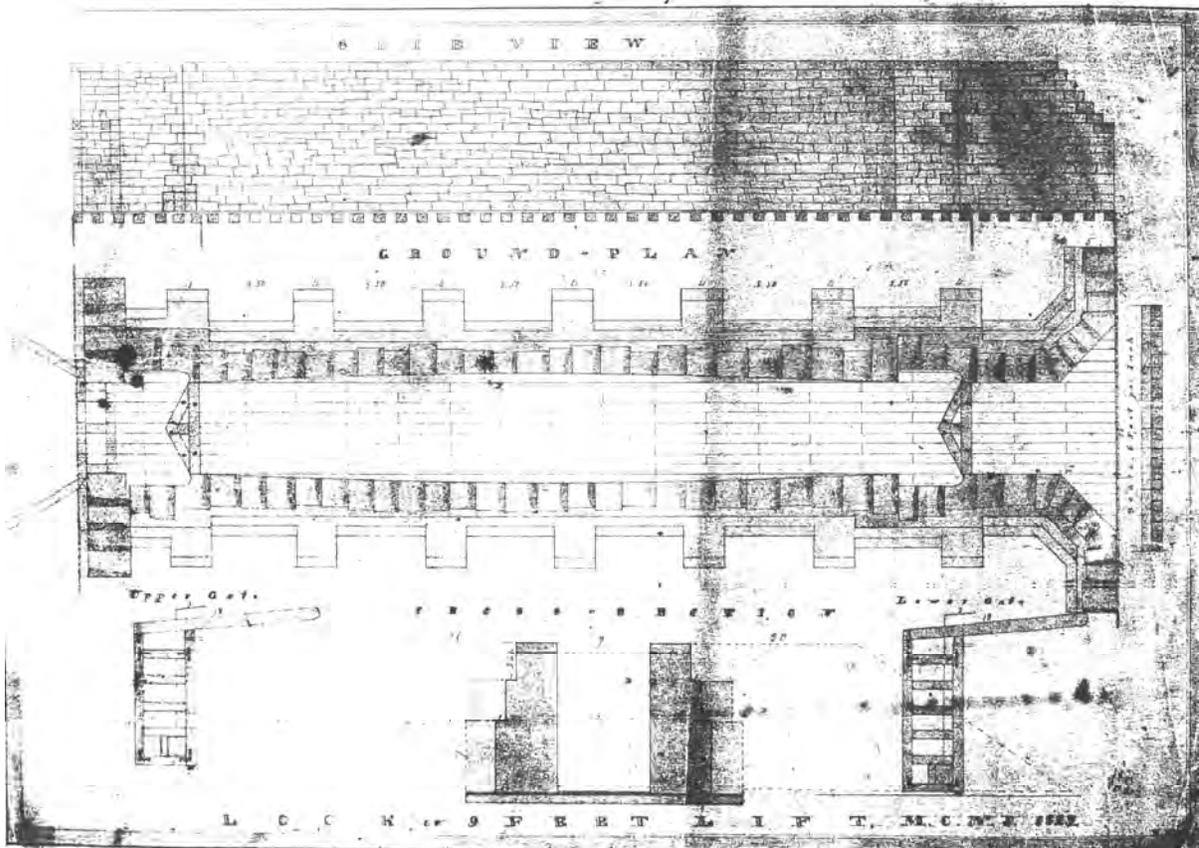


Figure No. 5

1823 Plan, Elevation and Sectional Diagram of Original Lock Construction, 1823.

This series of drawings show the original locks along the Morris Canal in section, ground plan and elevation.

Provided By: The Canal Society of New Jersey.

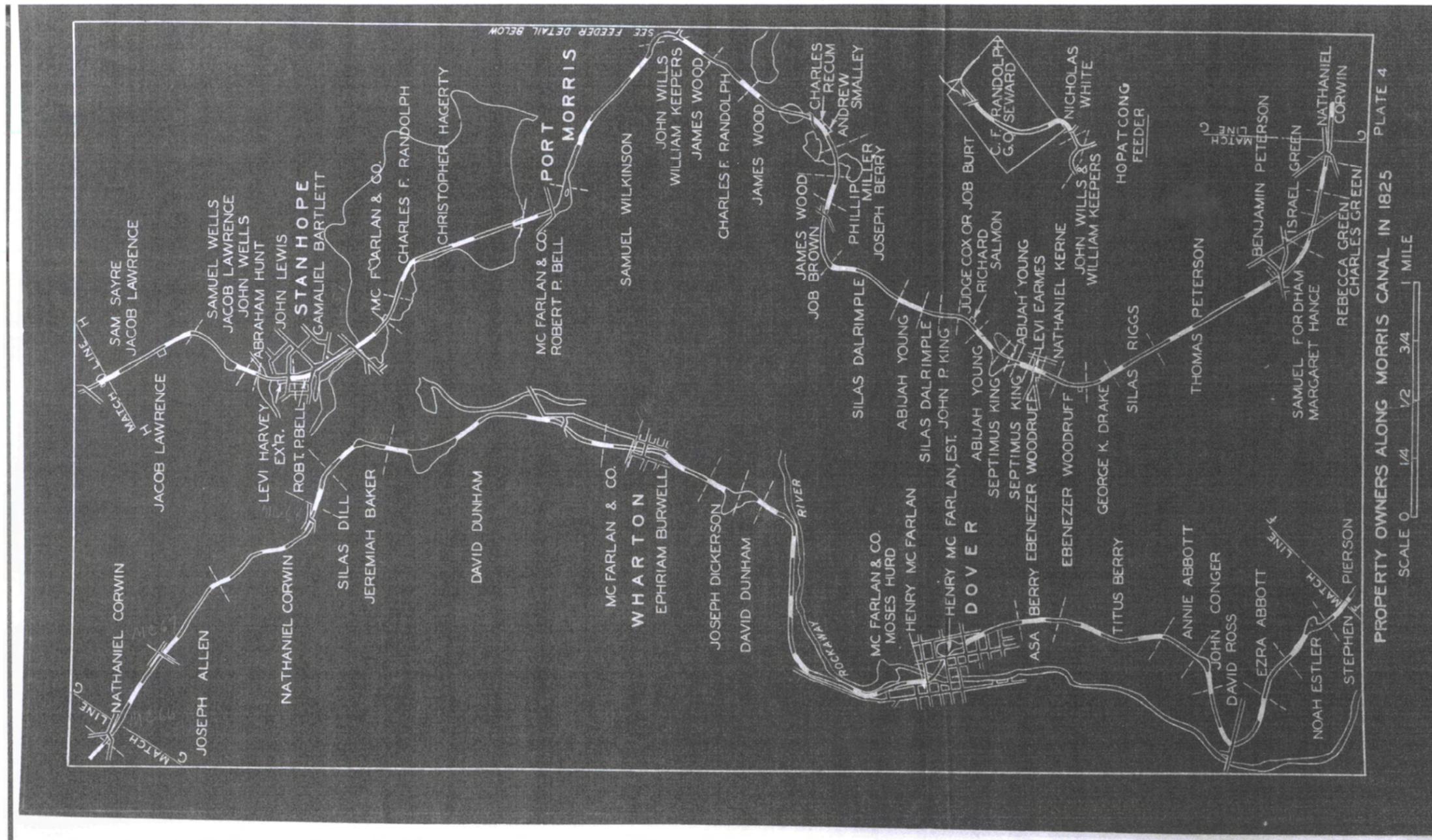


Figure No. 6

Property Owners Along Morris Canal in 1825

Diagram of the Morris Canal showing properties along the Canal. This is one map in a series showing such detail along the entire length of the Canal.

Credit: "The Morris Canal Collection," New Jersey Division of Archives and Records Management.

FIGURE NO. 6

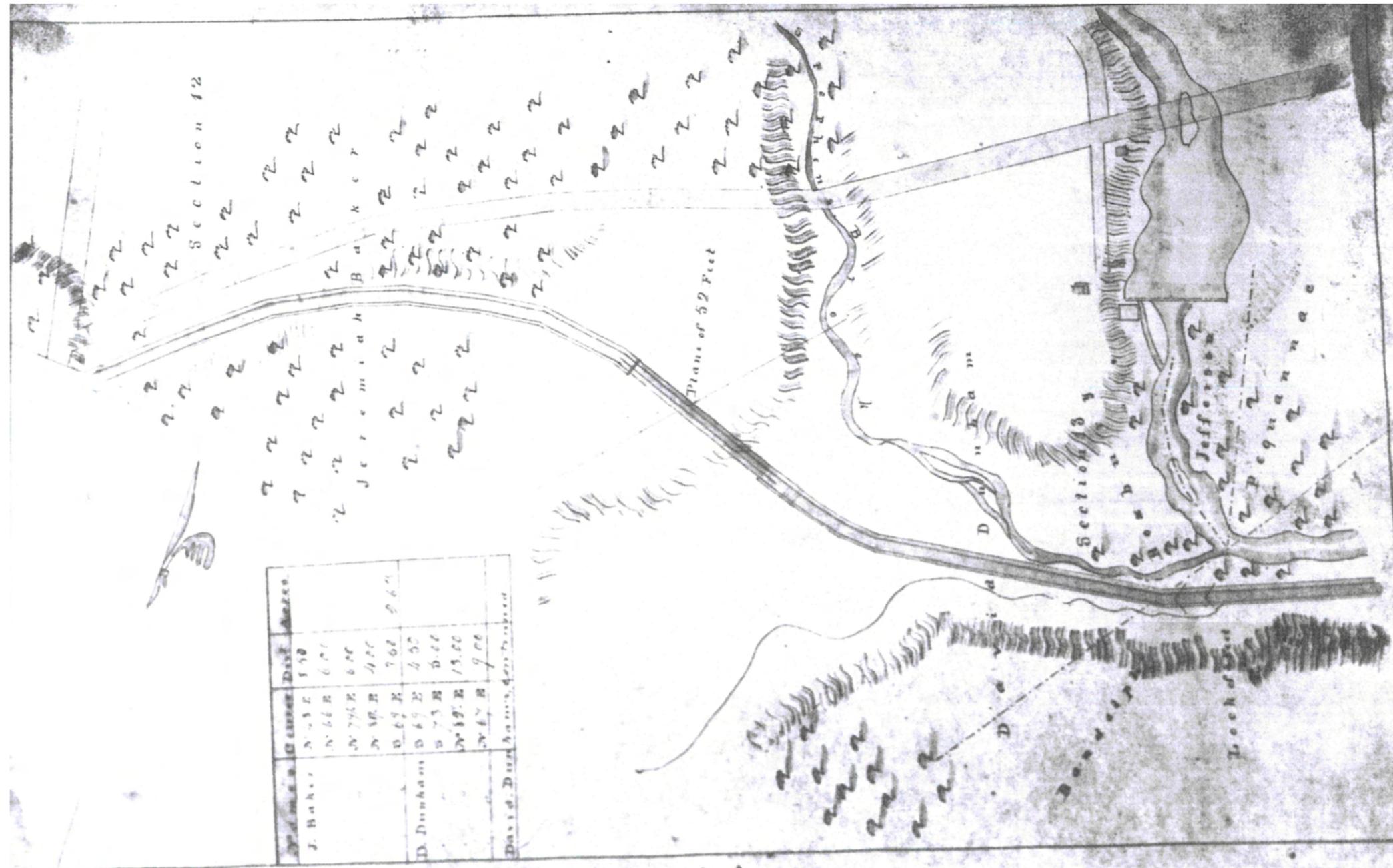


Figure No. 7



1828 Land Survey

Survey of the land at Lock 2 East and surroundings prepared in 1828 by the Morris Canal and Banking Company as a means of estimating the value of the land acquired for the construction of the canal. Note that the canal basin had not yet been created.

Credit: "Maps, Field Notes, Estimates and Appraisals, 1828-1834 Morris Canal and Banking Company Records", microfilm New Jersey Division of Archives and Records Management, Trenton, NJ.

FIGURE NO. 7

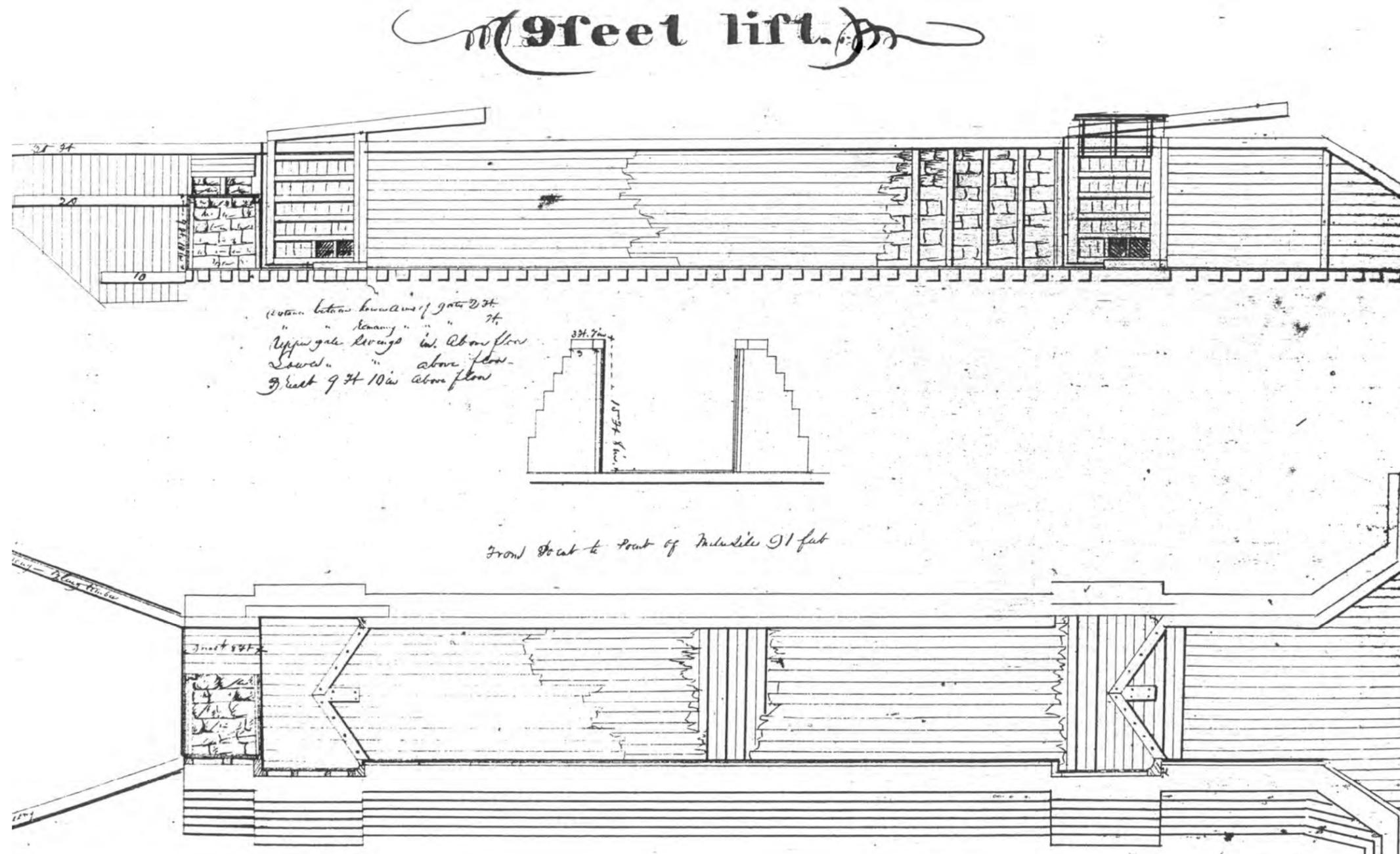


Figure No. 8

Plan, section and elevation Diagram of Lock Construction after 1845

This series of drawings shows the original locks along the Morris Canal in plan and elevation with a sketch of the section after the locks were widened and lengthened.

Credit: "The Morris Canal Collection," New Jersey Division of Archives and Records Management.

FIGURE NO. 8

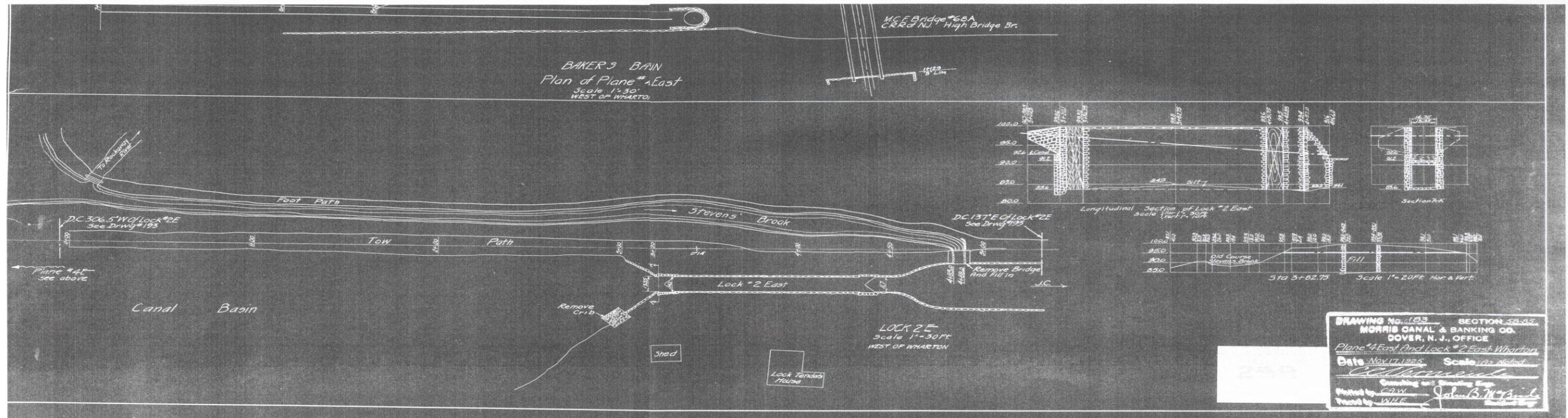


Figure No. 9

1925 Dismantling Plans prepared by C. Vermeule of Lock 2 East

Ground with sectional details of lock at Lock 2 East prepared for the dismantling of the Morris Canal.

Credit: "The Morris Canal Collection," New Jersey Division of Archives and Records Management.

FIGURE NO. 9



Figure No. 11

View of Lock 2 East Looking West

Historic photograph showing the approach to Lock 2 East. To the south (left side of the photograph), the stone lock tender's house is visible. The canal's tow path is visible to the north.

Credit: Canal Society of New Jersey.

FIGURE NO. 11



Figure No. 12

View of Lock 2 East Looking West

Another historic photograph of the approach to the lock with the lock tender's house to the south. The house is more visible in this photograph, including the front façade and the kitchen wing.

Credit: Canal Society of New Jersey.

FIGURE NO. 12



Figure No. 13

Detail View of Lock Tender's House

Detail view of the stone lock tender's house. During the period of the canal's use, the house was occupied for a time by the Bird family who had a long history of working on the canal. Later, the house was reinforced with sections of inclined-plane rail and cables across the front and back of both floors. The building eventually burned in 1970 and its remains are present today.

Credit: Canal Society of New Jersey.

FIGURE NO. 13



Figure No. 14

View of Lock 2 East: August 29, 1904

An empty canal boat stopped at Lock 2 East. Note the wood planking and bumpers that lined the lock walls. The boat was articulated at its center in order to transfer from the inclined planes into the canal basins/prisms.

Credit: Canal Society of New Jersey.

FIGURE NO. 14



Figure No. 15

View of Lock 2 East Looking East

View of a canal boat headed east toward Lock 2 East. A source identifies the objects at the hinges in the boat as a water barrel, a tool box, feed boxes and the top of a cylinder stove. Also note the landscape features at the edge of the canal basin.

Credit: James Lee, *The Morris Canal: A Photographic History* (Bethlehem, PA: Lehigh Litho, 1979), 67.

FIGURE NO. 15



Figure No. 16

View of Lock 2 East Looking East

Here, portions of the tow path are visible to the left of the picture, as well as the berm side of the canal on the opposite banks. Today, this portion of the canal continues to be filled with water directed from Stephens Brook and retains an almost identical visual appearance to this historic photograph.

Credit: Canal Society of New Jersey.

FIGURE NO. 16



Figure No. 17

View of Lock 2 East Looking East

View of the canal as it reached Lock 2 East; this photograph shows an empty canal boat sitting high in the lock. Note the operator's shed on the right side of the lock.

Credit: Robert R. Goller, *Images of America: The Morris Canal, Across New Jersey by Water and Rail* (Charleston, SC: Arcadia Publishing), 67.

FIGURE NO. 17



Figure No. 18

Canal Store in Wharton Near Lock 2 East

Historic photograph of Robert Oram's general store, which served both the community and canal families and workers. The general store faced the canal and had a loading dock to transfer cargo from the canal boats.

Credit: James Lee, *The Morris Canal: A Photographic History* (Bethlehem, PA: Lehigh Litho, 1979), 67.

FIGURE NO. 18

2. DEVELOPMENTAL HISTORY

2.2 Architectural Description

2.2.1 Historic Appearance and Operation of the Lock

The property as owned by the Morris Canal and Banking Company was a long narrow corridor that generally followed the canal and its towpath and ran from west to east. At the Lock 2 East site the property broadened to the south to include the lock tender's house, a waste weir and a small operator's shed. The narrow canal prism located east of the lock was the low side and the canal basin located to the west was the high side of the Canal. The lock raised and lowered boats within the Canal 8 feet. The tow path at this part of the Canal ran along the north edge of the canal prism, the lock and the basin. A small wood frame tender's shed was sited approximately half the distance of the lock on its south side a few feet from its stone lined walls. The stone lock tender's house was located approximately fifty feet south of the lock on its east end. Separating the lock tender's house from the lock was a narrow waste weir that diverted water from the canal basin to the canal prism. The composition of the waste weir, i.e. whether it was stone lined or not, is unknown. A small footbridge was located in front of the house to the east which crossed the waste weir and connected the house with the lock. To the north of the lock and tow path ran Stephens Brook which provided an additional water source for the canal, feeding into the canal prism on its north side just east of the head walls of the lock. A small wooden footbridge was located over the connection between the brook and the canal along the tow path.

The available data on the appearance of the lock and its features is currently based on various plans prepared of the site during its operation and abandonment, the historic photographs, and the extant physical remainders. The following description of the features of the lock site is based on these documents and documentation of the existing features. For a more in-depth description of the remains of the lock, refer to the archaeological investigations in Section 3.

The canal prism and probably the basin were artificially made bodies of water created to facilitate the operation of the Morris Canal. The canal prism in its final incarnation was 40 feet wide at the top, 25 feet wide at the bottom and 5 feet deep. It was stone and earthen-lined, and transitioned with the lock at the splayed head walls of the lock. The lock walls at the east end rose from the level of the canal over twelve feet. The land on either side of the lock was set to the level of the top of the lock walls; as a result the tow path rose up to the level of the lock on the north side of the canal. The tow path continued along the north side of the lock but also forked to connect with a small footbridge that crossed over the east end of the lock to the north. To the south of the lock was a narrow waste weir with its outlet set between the lock and the earthen embankment of the north wall of the canal prism.

The lock measured 11 feet wide from interior plank wall to interior plank wall, 91 feet long between gates and approximately 15 feet in height. Its structural framework was constructed of rubble stone masonry laid in a coursed pattern, the walls being over two feet thick at the top and increasing in size to approximately twelve feet at their base. The walls of the lock sat on top of heavy wood planking that lined the bottom of the lock and continued under the lock walls becoming integral to the lock's structural integrity. At least three layers of wood planking also lined each side of the lock walls. The planking was laid horizontally over heavy wood timbers which were set vertically and spaced equal distance apart and attached to the stone walls of the lock. The third layer was shallow wood timbers laid on top of the planking spaced apart and appears to have served as bumpers on either side of the lock. The east end of the lock walls were splayed at their connection with the canal prism and set perpendicular at the west end where it met the canal basin. Inset from the end walls were located the gates which controlled the flow of

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water from the basin to the lock and the lock to the canal. The gates, based on the archaeological investigations, appear to have been a drop gate at the west end and a miter gate at the east end.¹²⁷ Each gate would have been constructed of wood with iron hardware including hinges, attachments and wickets; the wickets controlled the flow of water by either slowly filling the lock with water from the basin to allow the boats to float into the lock at the west end, or allowing water to flow back into the canal prism lowering the boat in the lock and thereby bringing it to the level of the canal and out of the lock at the east end. The stone walls were adjusted at either end to allow for the gates to be recessed and allow for clear passage of the canal boat. The control for the east gate was located at the footbridge that spanned the lock. The control for the west gate was located at the southwest corner of the lock. The tow path continued along the lock heading west sloping slightly down to connect with the tow path to the north of the basin.

The two primary supporting structures documented by Vermeule and seen in historic images include the small wood shed which appears to have served as the tender's operating house, and the stone lock tender's house. The wood frame shed was approximately rectangular in plan, its exact measurements are unknown, but appears to have been no greater than twenty feet long by twelve feet wide. It was topped by a gable roof with its ridge running east/west, the long side of the building. It was set just a few feet south of the lock walls at its west end. It had a shallow overhang on its north side and appears to have been clad with vertical wood boards at its walls and wood shingles at its roof. The interior configuration and its foundation are unknown.

The lock tender's house was one of a handful of stone masonry tender's houses located along the path of the Morris Canal; the majority of tender's houses were wood frame and each varied in size, shape and configuration. There were single family and multi-family residences as well as multiple houses for tenders and brakemen at the inclined plane sites. Most of the locks and inclined planes had other supporting structures including barns to house mules while the boats were docked for overnight stays. The tenders also had more than one occupation so there were in some instances outbuildings which supported other activities on-site.

The lock tender's house at Lock 2 East was a rubble stone masonry structure measuring approximately 26'-6" x 18'-0" with an attached stone building (which appears to have been the kitchen wing) to the east measuring approximately 24'-3" x 15'-0". The whole house therefore is shaped like an inverted L with the long leg serving as the main house and the short leg as the kitchen wing. The house was built into the embankment located to the south up to the level of the first floor; the main house appears to have had a partial basement at its north end and is one and one-half stories in height. The kitchen wing is a single story. Both buildings were finished with stucco. Each section of the house had a gable roof, the ridge of the main house ran north/south and of the kitchen wing east/west. Each roof appears to have been clad with wood shingles. The east gable end of the kitchen wing was framed with wood and clad with vertical wood boards with wood battens. A brick chimney was located at the east end centered on the gable of the kitchen wing and a second brick chimney was located at the south end center on the gable of the main house.

The existing historic photographs of the house focus on the north and west sides of the main house, small portions of the east side of the main house and kitchen wing, and small portions of the north side of the kitchen wing. The east façade of the main house appears to have served as the primary entrance with a door set at the first floor level located approximately center. There

¹²⁷ This configuration differs from that which is shown in the Vermeule abandonment plans and what has been said in the historical documentation on the appearance of the lock structures.

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was one multi-paned window located to the north of the door with possibly a window set at the basement level located below this window. The north façade of the main house had a door to the basement located at its east end, a multi-paned window centered at the first floor and two small windows located at the gable end. There appears to have been a single window located at the south end on the west elevation at the first floor level. At some point during its history a combination of cables and rails was used to tie the main house together. These ties were placed at the transition between the basement and first floor levels and the first floor and attic levels the perimeter of the building. The kitchen wing appears to have had a single door and a window located to the east and west respectively in its north elevation. There was also a single window in the north bay on the east elevation. A well or cistern was placed a distance away from the house to the northeast.

2.2.2 *Current Appearance of the Lock Site*

Lock 2 East and its surrounding environs have been altered as a result of the abandonment of the Morris Canal in the early twentieth century and due to changes made since that time. The most significant alteration was the removal of the top two to three feet of the lock and the filling in of the lock to create a level area. These alterations therefore also eliminated the tow path north of the lock, changed the relationship of the lock to the basin and the remains of the canal prism as well as the relationship between the lock tender's house and the lock. The waste weir was removed from the landscape and level ground was created between the house and the lock. Although the canal prism was cut and filled circa 1929, it was restored in part by the Borough of Wharton in 1976. However, it appears the earth removed from the canal was transported to the banks of the former canal basin creating a berm between the basin and the lock site. In addition, portions of the canal basin have been filled with earth modifying the configuration of the basin at the former transition with the lock. These modifications visually cut the lock from the basin further changing the appearance of the site prior to the Canal's abandonment. The lock tender's house remained inhabited until the 1970s but suffered a fire which collapsed its roof and left the building open to the effects of natural elements. As a result, the lock tender's house is currently in a state of ruin.

Although the top portions of the lock walls were removed, some of the tops of the stones from the remaining lock are visible in the existing landscape and show the overall outline of the lock. In addition, the splayed headwall at the east end of the lock remains below where it was cut with the area between filled with earth. A path has been created along the north wall of the lock to connect with the remaining portions of the tow path at the canal prism and basin. Stephens Brook also remains below the level of the tow path to the north. The brook still connects with the canal prism to the northeast of the splayed lock walls under the tow path via a concrete viaduct. As previously mentioned a four to five foot high berm of earth separates the remains of the lock from the canal basin impacting both the physical and visual connection between these two features. The berm has a heavy line of bushes and undergrowth. The wood operator's shed has been removed. It appears an underground drainage feature was installed as part of the abandonment plans and is located southwest of the lock remains. It is unclear what its function or whether it's operational; the only indication of such a feature is the top of a cast iron pipe.

The lock tender's house is an extensive ruin and encompasses both the main house and the kitchen wing. Very little of the exterior stone walls remain and there is no clear indication what the interior configuration of each section may have been. One clue to the interior's configuration is the possible location of the basement which may have occupied only the north half of the main building. The northwest corner of the house is partially intact at the main house from the basement to the first floor level but is un-braced. The opposing corner on the north side has

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recently been pushed over and fallen into ruin. Portions of the first floor and the basement level remain in a disjointed pattern along its west, east and south sides. Some of the fenestrations are visible in the ruins. The supports for a fireplace on the first floor below the location of the chimney are seen in brick masonry arches that remain at the transition between the basement (crawl space in this location) and first floor levels. The north wall of the kitchen wing is gone which may be an indication that it was wood frame versus stone masonry. The remaining walls are partially intact with the one opening on the east wall seen in historic photographs intact. The roof and its framing at both sections of the house have been completely removed as is most of any other type of wood framing; the wood lintel to the basement door on the north wall appears to be lying on the ground next to the building. In addition, small sections of the cable and rails which once held the building together are scattered in the remains. The top of a stone well or cistern is discernable amongst the debris to the northeast of the house. There are also remnants of concrete stairs and patios that appear to have been added after the waste weir was removed and the landscape around the house and the lock modified for its new configuration.

The entire site around the lock tender's house is overgrown with weeds, poison ivy and small trees making navigation and identification difficult. The remaining stone walls also appear unstable; and therefore present an unsafe environment. The entire site around the house is surrounded by a high chain link fence; unfortunately this fence did not prevent vandals from knocking down a portion of the stone wall and spray painting graffiti on one wall that was partially intact.

2.3 Period of Significance

The study evaluated the Lock 2 East in association with the history and significance of the Morris Canal including an examination of the physical evidence as well as available research. Based on the findings of this evaluation, the appropriate Period of Significance for the Lock 2 East property inclusive of potential future archaeological discoveries is 1825 to 1926.

This master plan study is to make recommendations for the restoration and reconstruction of features, structures, buildings and other components including potential for future archaeological discoveries based on the history and evolution of the Lock 2 East site, its physical condition, and period of significance. The following analysis establishes the period of significance based on the findings of this study, the application of the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (Revised 1995) and relevant guidelines for the evaluation of historic properties.

The following is the generally accepted definition of a Period of Significance:

“... the length of time when a property was associated with important events, activities, or persons, or attained the characteristics which qualify it for National Register listing. Period of significance usually begins with the date when significant activities or events began giving the property its historic significance; this is often a date of construction...”¹²⁸

The Secretary of the Interior's *Guidelines for Selecting the Periods of Significance* further outline the Period of Significance for each of the National Register evaluation criteria and should be considered within the statewide historic contexts as identified by the New Jersey Historic Preservation Office:

¹²⁸ U.S. Department of the Interior, “National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.” (Washington, DC: US. Department of the Interior, National Park Service, 1990; rev. 1991), 39.

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Criterion A: "... For properties associated with historic trends, such as commercial development, the period of significance is the span of time when the property actively contributed to this trend."

Criterion B: "... the period of significance... is usually the length of time the property is associated with the important person."

Criterion C: "For architecturally significant properties, the period of significance is the date of construction and/or the dates of any significant alterations and additions."

Criterion D: "The period of significance for an archaeological site is the estimated time when it was occupied or used for reasons related to its importance..."

Evaluation under National Register Criteria A

Periods of Significance established under the Statewide Historic Contexts are generally related to historical significance under Criterion A. Criterion A establishes significant patterns of events in which the development or history of the Lock 2 East property is most relevant. Based on the available research, the statewide historic contexts that are most applicable are **#8 Early Industrialization, Urbanization and Agricultural Development, A.D. 1690-1860**, and **#10 Immigration and Agricultural, Industrial, Commercial and Urban Expansion, A.D. 1850 – 1920**.

Context #8 defines this period as New Jersey's transition from an emphasis on homespun industry to one where manufactured products or natural resources were made available for the broader market. The first manufacturing often occurred within small factories employing only a dozen or so workers. However, by the 1860s, larger factories employing thousands of workers were becoming more common in such growing urban communities as Jersey City, Newark and Paterson. The Industrial Revolution in New Jersey depended on the development of transportation systems. The canals, railroads, steamboat, the improvement of roads and building of bridges were the first facilitators of laying the groundwork for industrial expansion. The construction of the canals had a tremendous impact on the landscape by contributing to the growth of small hamlets within the rural countryside as well as the already established industrial centers.

Conclusion: The change from the home-spun industries to one of a more mass-produced industrial nature utilizing the existence of natural resources and the advances in transportation are directly related to the construction of the Morris Canal in 1825. The construction of the canal brought anthracite from Pennsylvania to the forges, furnaces and mines of western New Jersey spurring a lagging iron-making industry in this region. The use of coal in the production of iron products as well as to power other industries contributed to the Industrial Revolution. It also brought other products to eastern New Jersey and New York City markets helping to bring the state to the forefront of a changing economy in America. The construction of the Morris Canal in 1825 marks the beginning of the period of significance for Lock 2 East under Criterion A.

Context # 10 defines this period as the point where New Jersey makes the full transformation into a modern industrial state. The advances in transportation and technology in the early nineteenth century were further enhanced during the late nineteenth and early twentieth centuries. Established and expanding transportation networks and industrialization fostered commercial

2. DEVELOPMENTAL HISTORY

expansion in New Jersey, so that there was a growth in the shipping and port trade along its many waterfronts. The increase in immigrants during this period also provided the needed labor force as well as spurred the demand for goods and services. During this period, there was also an increase in the importance of the railroad that helped to further open outlying areas of the state for the exploitation of raw materials and more trade options.

One of the state's leading industries was the iron industry, ranking third in the nation in 1860. The focus of the iron industry was in northwestern New Jersey with Wharton Borough being home to one of the most successful iron mining enterprises owned and operated by Joseph Wharton. During his tenure, three furnaces were in operation providing a total capacity of 60,000 tons per year. However, the railroad increasingly became the leading facilitator for transporting anthracite from Pennsylvania to these iron furnaces and forges, and to the industrial enterprises located in the major eastern cities and New York.

Conclusion: The full transformation of New Jersey into a modern industrial state occurs in the latter half of the nineteenth century. The Morris Canal had responded to the advances in modern technology and the need for increased cargo capacity by rebuilding the canal between 1845 and 1860. Several years earlier, the Canal Company had first begun improvements by enlarging the canal's locks and planes. The canal had also contributed to the transportation of raw materials and manufactured goods during the height of its use between 1850 and 1870. However, the railroads clearly made leaps and bounds beyond what the canal could accomplish; the railroads reached broader markets in less time. The rise of the railroads played a significant role in the abandonment of the Morris Canal by the State in 1924. By the late nineteenth century the Canal had lost much of its viability as its two most important cargos, iron and coal, were by then being transported by the railroad. The site of Lock 2 East was officially sold off by the Morris Canal and Banking Company in 1926, therefore this date marks the end of the period of significance for Lock 2 East under Criterion A.

Evaluation under National Register Criteria B

Establishing significance under Criterion B (associations with persons significant to history) is not possible at this time. There is some evidence directly relating contributions by individuals to the creation and evolution of the Morris Canal, however their level of influence in the development of the Canal does not necessitate establishing significance under Criterion B.

Lock 2 East, specifically, was tended by the Bird family, a traditional "canaler" family whose members tended the Canal through many generations. While this family's connection does not warrant significance for the site under Criteria B, the connection is nonetheless important, and serves as an interesting interpretive angle that will be discussed further in the section "Interpretation and Use".

Evaluation under National Register Criteria C

Establishing significance under Criterion C (architecturally significant properties) is not possible at this time. Although there is photographic evidence that the lock and the tender's house reflected their function and therefore embodied architectural characteristics of the vernacular, there is little architectural fabric remaining. While the configuration of the site remains intact, the lock itself has been filled in and the lock tender's house lies in ruins. A property is significant under Criteria C if the property is both important for its expression of architectural design and construction technology, and if the principle features of its design and construction are sufficiently intact to convey that significance. As a result, establishing significance for these structures is best

2. DEVELOPMENTAL HISTORY

established under National Register Criteria D, where the significance of the properties will be better revealed through archaeological evaluation and investigation.

Evaluation under National Register Criteria D

Significance for Lock 2 East can be established under Criterion D. Properties are significant under this Criterion if they have yielded, or may be likely to yield, information important in prehistory or history. The period of significance for an archaeological site is the estimated time it was occupied or used for reasons related to its importance. Hence, the period of significance for the Lock 2 East site would be between 1825, when land was first acquired for construction and 1926, the time at which the property passed out of the hands of the Morris Canal and Banking Company and officially ceased Canal related activity.

Presently, the Lock 2 East site exists largely as an industrial archaeological ruin, although much of the historic configuration associated with its last period of operation can be seen in the landscape today. The only visible remains of an above ground structure are that of the lock tender's house, where the members of the Bird family would have resided.

Through the recent archaeological investigations, much about the configuration and integrity of the lock have been discovered but much more still needs to be unearthed particularly in the areas surrounding the ruins of the lock tender's house. Features associated with the dwelling of the lock tender and his family could also be present. Local townspeople often spent their weekends around the canal, walking to the lock to watch the boats lock through, while passing the time with their neighbors.¹²⁹ It is probable that remains associated with their activities might still be present.

The archaeological resources of Lock 2 East could also yield valuable information pertinent to the operations of the historic lock complex. Although the documentary record of the lock site and the Morris Canal in general is rich, it is incomplete and not always accurate. The information that these resources could yield would be definitive (ground truth) and could augment the historic record including additional remains of the gates and other mechanisms associated with the lock's operation beyond those that have already been discovered.

These resources are likely to yield knowledge about the technology that was utilized on the locks and canal throughout the various periods of the lock's use. Dates, methods, and materials of construction of the various components of the lock could be determined. In addition, insights into the daily lives of the inhabitants who lived and worked at the lock site could be realized by analyzing any of their discarded cultural material that might present.

During the period of the Canal's use, the landscape surrounding Lock 2 East changed from a relatively unpopulated rural area to one that developed to serve a growing population that had arrived to serve the canal and the local iron mines. As a result of the canal, towns such as Wharton also became tied to distant urban markets by the Morris Canal. Such changes would have impacted not only the local landscape but also the daily way of life of the town's individual residents. For instance, people at this time went from dressing in homespun made at home to wearing cloth manufactured in urban factories. The archaeological resources of Lock 2 East could yield information that exemplifies these changes.

¹²⁹ Lee, *The Morris Canal: A Photographic History*, 21.

2. DEVELOPMENTAL HISTORY

Conclusion: The Lock 2 East site is essentially an industrial archaeological ruin that could yield valuable information pertinent to its history from 1825 to 1926. Although the documentary record of the lock site is adequate, it is incomplete and not always accurate. The information that the lock's archaeological resources could yield would be definitive (ground truth) and could augment the historic record. This information could illustrate the changes that occurred in canal engineering technology, as well as illustrate the cultural changes that influenced the lives of the people who lived and worked at the Lock 2 East site.

3 ARCHAEOLOGICAL INVESTIGATION & ASSESSMENT

**ARCHAEOLOGICAL INVESTIGATIONS AND
MANAGEMENT PLAN
MORRIS CANAL LOCK 2 EAST**

**BOROUGH OF WHARTON
MORRIS COUNTY, NEW JERSEY**

Prepared For:

Borough of Wharton

HJGA Consulting, Architecture & Historic Preservation, Inc.

Prepared By:

James Lee, M.A.

JANUARY 2007 (REVISED NOVEMBER 2007)

MANAGEMENT SUMMARY

The following technical report describes and interprets archaeological investigations carried out at Morris Canal Lock 2 East, in Wharton Borough, Morris County, New Jersey. The lock was built between 1825 and 1831 and enlarged in the early 1840s. The stone lock tender's house was likely built a few years after the lock's initial construction. The lock was partially dismantled and the project site substantially graded when the canal was abandoned in the 1920s. After it was abandoned, the State of New Jersey sold the property to the Borough of Wharton.

This document also broadly defines areas of likely archaeological sensitivity within the property and includes recommendations for archaeological resource management procedures in the event of planned alterations and modifications to the property that may entail ground disturbance. This report is intended as a supplement to the Historic Site Master Plan created for the project by HJGA Consulting, Architecture & Historic Preservation, Inc., which contains a detailed history of the project site.

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Overall direction for this study was provided by Richard Hunter. Archaeological fieldwork was carried out by Joshua Butchko, Marjan Osman and Seth Gartland under the direction of James Lee. Artifacts were cataloged by Rebecca White. The report graphics were drafted by Frank Dunsmore under the supervision of James Lee. Final report coordination and assembly was undertaken by James Lee. This report was authored by James Lee.

James Lee, M.A.
Principal Investigator

**ARCHAEOLOGICAL INVESTIGATIONS AND MANAGEMENT PLAN
MORRIS CANAL LOCK 2 EAST**

**BOROUGH OF WHARTON
MORRIS COUNTY, NEW JERSEY**

1. INTRODUCTION

The following technical report describes and interprets archaeological investigations carried out at Morris Canal Lock 2 East, in Wharton Borough, Morris County, New Jersey (Figures 1 and 2; Plates 1 and 2). The document also broadly defines areas of likely archaeological sensitivity within the property and includes recommendations for archaeological resource management procedures in the event of planned alterations and modifications to the property that may entail ground disturbance. This report is intended as a supplement to the Historic Site Master Plan created for the project by HJGA Consulting, Architecture & Historic Preservation, Inc., which contains a detailed history of the project site.

The Lock 2 East project site occupies an approximately 1-acre parcel at the western end of Hugh Force Park, a municipal park along the stretch of the Morris Canal within Wharton Borough. The lock was built between 1825 and 1831 and enlarged in the early 1840s. The stone lock tender's house was likely built a few years after the lock's initial construction. Prior to the construction of the canal, the northern half of the site was part of the floodplain of Stephens Brook set against a steep hillside to the south. Much of the current topography was likely built up when the lock was installed, added to

historically as the site was used. A survey of the canal done in the 1890s and several historic views of the property roughly show the layout of buildings at the site in the late 19th and early 20th centuries (Figure 3; Plates 3 through 13). The lock was partially dismantled and the project site substantially graded when the canal was abandoned in the 1920s (Figures 4, 5 and 6). After it was abandoned, the State of New Jersey sold the property to the Borough of Wharton. The Morris Canal Historic District, which includes the Lock 2 East site, was listed in the New Jersey and National Registers of Historic Places on November 26, 1973 and October 1, 1974, respectively.

The canal to the east of the project site has been partially restored and rewatered. To the west of the project site, the canal has been partially filled along the eastern edge of a pond. The property slopes slightly down to the north with the lock house ruin occupying the higher ground in the southern portion of the site and the minimal surface remains of the lock crossing the northern half of the site.

The archaeological investigation described here was performed as part of the proposed restoration of the site, which is being funded by the Morris County Historical Preservation Trust Fund. Since public funding assistance is involved and Lock 2 East is listed in the New

Jersey Register of Historic Places, archaeological investigations and assessment are required to ensure project compliance with the New Jersey Register of Historic Places Act. All archaeological work was performed in conformance with the guidelines and standards of the New Jersey Historic Preservation Office.

The scope-of-work for these investigations involved four main tasks: limited background research; archaeological fieldwork; analysis of the results of research and fieldwork; and preparation of this report. Background research largely entailed a thorough review of historical materials relating to the decommissioning of the canal and cultural resource surveys conducted on other locks of the Morris Canal and Delaware and Raritan Canal (specifically Historic Conservation & Interpretation, Inc. 1980 and Louis Berger & Associates 1996). Archaeological field investigations involved: 1). shovel testing the entire project site at a 25-foot interval; 2). the digging of excavation units in the yard of the lock tender's house and 3). the excavation of test trenches in and around the lock to both examine this feature archaeologically and to expose it for assessment by a professional engineer.

2. ARCHAEOLOGICAL FIELDWORK

A. Overall Approach

The field investigations entailed the following three components: the excavation of 64 shovel tests spaced at 25-foot intervals across acces-

sible portions of the property; excavation of a three excavation units in areas of interest; and the investigation of the lock with three mechanically excavated trenches (Figures 7 and 8). All shovel tests and excavation units were excavated by hand by qualified field archaeologists (except for the few supervised shovel tests excavated by the volunteer school group). Cultural stratigraphy was recorded on standardized forms and artifacts were recovered and tracked according to their stratigraphic provenience. Artifacts were processed (washed, sorted and stored), identified and cataloged and will be retained by Hunter Research, Inc. until the conclusion of the project at which time they will be returned to the Borough of Wharton.

B. Shovel Testing

A total of 64 shovel tests were excavated at the Lock 2 East project site (Figure 7). The purpose of the shovel tests was to examine the stratigraphy of the site, identifying areas of modern disturbance and fill, and areas where historic archaeological deposits survive. A 25-foot-interval grid was surveyed on the project site, aligned with the orientation of the visible southern wall of the lock. Shovel tests were numbered 1 through 60 from west to east then north to south. Additional shovel tests were excavated by school groups. These tests were laid in at 12.5-foot-intervals between the existing shovel tests between the house ruin and the lock. The additional tests were num-

bered 61-78, although not all of these tests were excavated because of the variables involved in training and excavating with volunteers.

Generally shovel testing confirmed what is visible on the ground surface. Much of the site was graded away when the lock was filled (Figure 5). Soils in these areas exhibit a truncated profile with a shallow sandy loam over a mottled, compact historic fill soil, which overlies a rocky fill at normally less than two feet below the ground surface. These lower soils were probably brought in during the construction and/or enlargement of the lock and used to fill in around the lock structure after it was built. No shovel tests were excavated within the lock itself. Very few artifacts are present in these soils, beside the occasional iron hardware or bottle glass fragment.

Also, since the closure of the canal, a substantial amount of fill has been brought to the site and dumped into the basin and canal at the western end of the lock, moving the edge of the basin to the west and leaving piles of fill material (Figure 7; Plate 14). No pre-1920s ground surfaces were identified within this area. The few artifacts recovered from this area are likely derived from the fill and do not relate to the occupation of the site. This fill and associated disturbance extends into the southwestern corner of the project site where a few outbuildings are visible in historic photographs (Plates 7 and 8). Because of the apparent surface disturbance the former location of these structures could not be ascertained through inspection or shovel testing.

A ditch that acted as a waste weir to accommodate overflow when the lock was closed is just visible in historic photographs running between the house ruin and the lock. This ditch was likely filled and leveled at the same time as the lock. Shovel Test 67 seems to have been excavated within this ditch, as the only context found in this shovel test extended to at least 2.1 feet below the ground surface.

The areas with intact historic archaeological deposits relating to the occupation of the project site are located west of the house near the former location of an outbuilding, north of the lock tender's house in a strip of land along the fence that surrounds it and likely all around the house within the fence. Due to the potential dangers of excavating close to the unstable structure, no tests were excavated within the fenced-off area. The stratigraphy in this area was generally a sandy loam to approximately 0.5 foot below the ground surface, over a mottled silty loam, underlain by impassable rocky soils at around 2 feet below the ground surface. These soils were not as compact as those identified in other parts of the project site and yielded a wealth of artifactual material. The artifacts recovered were dominantly related to the occupation of the lock tender's house. While there were a few building materials such as nails and window glass, domestic artifacts including earthenwares, stonewares, ironstone and glass vessels predominated, all consistently dating to the second half of the 19th century or the very early 20th century. This fits well with the history of the site.

Finally, during the public outreach program, Shovel Test 61 was excavated by a school group (Plate 15). The deteriorating base of a snubbing post was uncovered during the excavation. The shovel test was enlarged and the post was documented (Figure 8; Plate 16).

C. Excavation Units

Excavation Unit 1

Excavation Unit 1 was placed adjacent to the western end of the southern wall of the lock (Figure 8). The purpose of this unit was to determine exactly how wide the walls of the lock were, to examine their integrity and to see if any archaeological trace of the lock tender's shelter was still present on site. It is known from the abandonment report that at least two feet of the lock walls and surrounding soil was removed at this end of the lock in order to grade the property. With this in mind, very little evidence of the shelter was expected. The stratigraphy of the six-by-three-foot unit was very simple (Figure 9; Plate 17). Context 2, the southern lock wall, was filled over with Context 3, a sandy loam with gravels and stones. These were both capped by a thin modern silty loam topsoil, Context 1. Context 3, likely a fill placed next to the lock after its construction, yielded 15 artifacts dominated by corroded metal fragments, a few bottle glass fragments, a single sherd each of redware and whiteware and a porcelain button. The mortared, dressed-fieldstone lock wall was four feet wide at the top and stepped out another two

feet to the south at three feet below the existing ground surface. Excavation was discontinued at approximately 3.5 feet below the ground surface. Context 3 continued beyond the extent of excavation.

Excavation Unit 2

This unit was placed southwest of Shovel Test 29, in front and slightly to the east of the house, which yielded a substantial amount of artifactual material (Figure 8). The bottom context [7] consists of boulders interspersed with silty sand at a depth of approximately 3.5 feet below the ground surface (Figure 10). This is likely the natural glacial till similar to the boulder fields visible outside of the project site in the low areas around Stephens Brook. Above this are three level strata of sandy silty loams [4, 5, 6], overlain by two strata that slope down to the east [2, 3], with a leveling stratum capping the profile [1] (Plate 18). Context 3 is a thick layer of mottled silty loam and Context 2 is largely comprised of coal ash and cinders interspersed with artifacts. Context 1 may have been leveled when the property was graded and at the time the canal was abandoned. Although the top strata slope eastwards, there is no depression visible to the east of the unit. All of these contexts [1-6] are interpreted as a series of domestic trash middens that accumulated through time at the edge of the yard and the small pasture visible in some historic photos. Context 8 is a tightly packed group of unmortared stones in the northwest corner of the unit that abuts Context 3-6. It does not appear to be

a formal stone wall. It may be part of a stone boundary between the yard and the ditch that ran between the house and lock.

A total of 750 artifacts were recovered from Excavation Unit 2. While the majority of artifacts (294) came out of Context 3, all contexts except for 7 and 8 yielded significant quantities of artifacts. The assemblage is also very similar between contexts with no apparent difference in the dates for artifacts from each context. The assemblage is typically 19th-century domestic, dominated by ceramic sherds and bottle glass, followed by architectural items such as nails and windows glass and finally personal items such as clay-pipe stems and ceramic toy parts (Table 1) (see Appendix D). The ceramics generally date to the second half of the 19th century into the very early 20th century with redwares, ironstone, whitewares and porcelains predominating. A few stoneware and yellowware sherds were also recovered. The architectural materials conform to the same time period. Cut nails and wire nails are both present. This assemblage fits perfectly with a

domestic site occupied from the mid-1830s up into the early 20th century. While the house is known to have been occupied into the middle of the 20th century, no obviously modern artifacts are included with this assemblage. This midden deposit likely continues to the west, south and east.

Excavation Unit 3

The stratigraphy of Excavation Unit 3 is probably the most representative of the historic profile of the yard prior to the grading of the property in the 1920s (Figure 11; Plates 19 and 20). A silty sandy loam with large rocks is present at the extent of excavation [3] (3 feet below the ground surface). This is overlain by a silty loam, also with many rocks [2]. Capping the profile is a thin topsoil of silty loam with pockets of charcoal [1]. Contexts 2 and 3 are probably historic fill brought in during the construction of the lock and lock tender's house to level the area. The charcoal present in Context 1 may relate to the house burning down around

Cutlery	1
Clothing Related	4
Manufacturing	3
Furnishings	3
Recreation/Activities	12
Glass Vessel Fragments	132
Tools/Hardware	33
Energy	10
Unidentified	36
Ceramic Vessel Sherds	359
Building Materials	138
Total	731

1970. Context 2 contains artifacts relating to the occupation of the site, and possibly to the presence of an outbuilding nearby. The artifacts recovered from Contexts 1 and 2 consist of largely of nails and bottle glass with a few sherds of ironstone, porcelain and redware flowerpot. Architectural materials dominate this assemblage, a contrast to the domestic assemblage recovered from Excavation Unit 2.

D. Trenches

Trench 1

This trench was mechanically excavated at the eastern end of the lock, far enough from the existing watered section of the canal that runs through Hugh Force Park to slow the inflow of water into the open excavation (Figure 8; Plate 21). Water began flowing into the Trench at a depth of approximately 4 feet despite the use of a gasoline-powered water pump. According to the dismantling drawings, the base of the lock lies another six feet below this level, for a total intact depth of 10 feet below the ground surface. This fill of the lock consisted of fairly homogenous dark brown loamy soils with large cut stones. Many of these stones appeared to be large flat brownstones visible in several historic photographs (especially Plate 12) as having been used as coping stones atop the lock walls.

Twelve-foot-long sections of the south and north walls of the lock were cleaned and documented (Figure 12; Plates 22 through 24). Both

of these sections included recesses set 0.5 feet into the walls to accommodate the miter gates that would have been used at the downstream end of the lock (Plate 25). Also apparent on both walls were a series of one-inch-square iron spikes, likely used to attached the horizontal timber sheathing to the lock walls. Some of this sheathing was exposed at the base of excavation of the southern lock wall (Plate 26). The walls also showed evidence of several repairs. The original stonework, visible in the recesses for the gate on both the south and north walls, is made of well-trimmed stone blocks. On the southern wall, this masonry is faced with a mixed of concrete and rubble, obviously poured behind the timber sheathing. The impressions of the timbers are still visible in the concrete (Plate 27). On the northern wall, repairs have been made using a rougher fieldstone in random courses. A vertical timber is also still in place on this wall. This probably supported the horizontal timber sheeting (Plate 28).

Excavation was not continued below water level. It was discontinued so that any surviving timber members below the water level would not be damaged by blind excavation. Also, the consulting engineer had an opportunity to view the walls and was satisfied with the condition of the visible portions. Several large iron spikes and straps were recovered from this excavation.

Trench 2

Trench 2 was excavated at the western end of the lock (Figure 8; Plate 29). As with Trench 1, water flowed into the excavation below approximately four feet below the ground surface. According to plans made during the abandonment, the lock continues for another 10 feet below ground for a total remaining depth of 14 feet. The original lock was approximately 16.5 feet deep. Fill consisted of a clayier loam than in Trench 1 with more iron hardware and large coping stones present.

A 10-foot section of the southern lock wall and a 14-foot-long section of the northern lock wall were cleaned and documented to a depth of four feet (Figure 13; Plates 30 through 34). The masonry that comprised both of these walls resembled the original masonry seen in the gate recesses in Trench 1, with larger, trimmed stones in more formal courses. Unlike the masonry in Trench 1, very little mortar was left between the stones and there was no obvious patching. In the southern wall, a five-foot-long recess was set 1.1 feet into the wall (Plate 31). This recess would have accommodated the lever mechanism for the drop gate and wicket gates. There is no recess in the northern wall, although more of the northern wall was exposed to the west, revealing a flared wing-wall (Plate 33).

At the base of the southern wall in Trench 2, a stone ledge was visible inline with the western end of the recess for the drop gate lever. This ledge was just under the water level but

appeared to extend across the lock and is likely the beginning of the upper level of the canal as it extends westwards out of the lock. To the east of this step, underwater, timbers were identified with the backhoe, but not removed. These underwater timbers are likely part of the wicket gate superstructure that would have allowed for the filling of the lock while the gate was closed (Figure 6). In addition to the iron spikes and straps recovered from the trench excavation, a piece of iron wicket valve hardware, a length of chain (which was used to operate the wicket gates), and what appears to be a very large iron hinge pin were also recovered. As with Trench 1, excavation was discontinued below water level to avoid damaging features of the lock, especially timbers, through blind digging.

Trench 3

This 40-foot-long trench was mechanically excavated perpendicular to the lock, extending south from its southern wall in order to examine the condition of the exterior of the wall and to look for evidence of the ditch/waste weir that ran between the lock and the lock tender's house (Figure 8; Plate 35). The stratigraphy of the northern end of the trench is dominated by the southern wall of the lock [2], which, as in Excavation Unit 1, is a largely intact, mortared, dressed-fieldstone wall. Just below the topsoil the wall is four feet wide (Figure 14; Plate 36). At approximately 2.5 feet below the ground surface the wall doubles in thickness to eight feet. Contexts 18 and 17 lie against the wall and are likely historic fill placed immediately

after the construction or enlargement of the lock. These contexts are cut by Context 5, which appears to be the waste weir channel that is now filled [4] (Plate 37). This fill was in turn cut by a small utility trench [8] that contained electrical wire [10]. Near what was likely the bottom of the ditch/waste weir is a lens of sand and pebbles [19], characteristic of a water channel. Several contexts fill the ditch/waste weir at the southern end of Trench 3 (Plate 38). These fill contexts are separated by lenses of coal ash and cinders and probably represent the episodic filling of the ditch, interspersed with waste from coal-furnace cleaning events. These contexts likely accumulated after the lock was abandoned, while the lock tender's house was still occupied. No artifacts were retained from this excavation.

3. CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

A. The Lock Tender's House and Environs

The historic ground surface at the Lock 2 East site has been greatly disturbed by the 20th-century demolition and abandonment of the lock. As shown on drawings made at the time (Figures 5 and 6), between two and seven feet of soil and the top few courses of the lock walls were removed from the site of the lock in order to fill it and make the grade more even. This activity also included filling the ditch/waste weir that ran between the lock and the house. Also, at the western end of the lock, a large

amount of fill was put into the canal, moving the edge of the basin much further west. Piles of fill are still visible that cover the western end of the project site, covering over the former location of several outbuildings and possibly capping the historic ground surface. The only historic ground surface that seems to be relatively untouched extends in a narrow strip along the northern side of the house to the area east of the house. The area east of the house appears to have been used as a small pasture, and is positioned directly outside of the doorway to the house and kitchen addition, making it a prime waste disposal area for the buildings occupants. Shovel tests and an excavation unit excavated in this area confirmed the presence of this historic ground surface and related artifactual deposits, while artifact concentrations lessened as tests were excavated away from this area, in increasingly truncated stratigraphy.

It is also likely that shaft features are still present on the site, particularly to the west of the house where several outbuildings are visible in historic photographs (Plates 7 and 8). These features were probably filled and capped during the filling of the western end of the site. The extent of fill piles at this end of the site hampered archaeological testing in this area.

Another potential source of archaeological information relating to the occupation of the house is the ditch/waste weir that ran between the lock and house. This feature is just visible on several historic photographs (Plates 3 and 9). This type of feature probably attracted a great deal of domestic waste, which may be

spread along its length extending downstream (east) from the house, although Trench 3, excavated through the ditch northwest of the house, did not identify substantial archaeological deposits within it.

Outside of the area available for archaeological investigation but within the project site, is the location of the house itself and its immediate environs (within the chain-link fence). There is little doubt that archaeological deposits encircle this ruin, including its kitchen addition, likely in relatively undisturbed contexts given the lack of 20th-century development of the property. Unfortunately the deteriorated condition of the house precluded excavation adjacent to the ruins for both the safety of the ruin and the excavators. Also within this (fenced) area, a small dry-laid stone shaft feature lies just northeast of the foundation and is visible at the time of writing. This may have been a privy. The outhouse above it is visible in a single historic photograph (Plate 9), but not in several others.

Finally, a man-made steam channel runs parallel to the lock, just north of the towpath. This channel carries water from a dam 300 feet west of the project site on Stephens Brook and feeds it into the canal just east of the lock. A small outbuilding and timber footbridge is apparent in Plate 6 at the location where this channel empties into the canal. The abandonment drawings show that the small bridge that carried this channel under the towpath was to be removed and filled. A concrete pipe currently carries water via this channel into the restore section of

the canal east of the project site. There is some potential that archaeological evidence that may shed light on this structure's purpose remains at this location.

B. The Lock

Despite the removal of the top portion of the lock in the 1920s, the remaining sections of the structure appear to be in very good condition. It is assumed that the sections below water are in a similar condition. Excavation within and outside of the lock showed that the substantial walls of the lock, at least six to eight feet thick at three feet below the ground surface, survive as buried. Evidence in Trench 1 of early 20th-century repair work may explain why. Some timbers remained intact at the water level, suggesting that below the water level more substantial timbers, including the sheathing on the walls of the lock and the timber floor of the lock, likely exist intact. Iron gate hardware recovered during the excavation also suggests that the timber gates were left in place may lie below the water level along with the drop gate superstructure that contained the wicket gates.

C. Management Recommendations

The entire project site retains archaeological potential; accordingly, archaeological investigation must be incorporated into any ground disturbing activities planned for the property.

A site plan summarizing the following archaeological recommendations has been developed (Figure 15).

All excavation conducted in and around the lock should be conducted with an archaeological monitor present. Also, given the wet conditions of the site, dewatering should precede excavation in order to avoid “blind” digging which could easily damage submerged features of the lock (particularly timbers). Provisions will need to be made for work stoppages during excavation that will allow archaeologists to thoroughly document the lock with drawings, photos and laser transit surveying. Also, because of the waterlogged nature of the lock, consideration should be made for the conservation of wet artifacts and structural elements recovered from the lock, as their preservation is dependent on quick and often expensive conservation treatments.

Another area where archaeological monitoring may be appropriate is west of the house, where debris piles likely cap the historic ground surface. If this area is landscaped, an archaeological monitor should be present to document and assess any archaeological discoveries.

Any ground disturbance planned for the area around the house and to the east of it should be preceded by archaeological excavation of units, provided effective measures are taken to stabilize the ruin prior to excavation. The smaller, finer, archaeological deposits within this area are more effectively examined through excavation units, as opposed to monitoring.

If any of the prescribed archaeological activities are carried out in the future they should be conducted under the direction of a qualified historical archaeologist in accordance with the procedures and guidelines of the New Jersey Historic Preservation Office. If they are conducted using public funding they will be subject to review by the State of New Jersey under the New Jersey Register of Historic Places Act (N.J.S.A. 13:1B-15.128 et seq.). Artifacts should be processed, cataloged and treated in accordance with current professional standards. The results of future archaeological work at the site should be reported in a professional manner in accordance with current technical reporting standards.

As a Borough-owned and managed site, Morris Canal Lock 2 East offered some opportunity for archaeological public outreach in the local community. Two sessions of archaeological shovel testing were conducted with a local school group. However, the remaining archaeology on the site may prove too hazardous to conduct with volunteer help. This includes the dewatering and mechanical excavation of the lock, mechanical excavation west of the house and excavation in and around the house foundations. The area in front of the house has already been tested at a very close shovel interval (12.5 feet) and could bear very little additional volunteer excavation. The only other area with some possibility for public participation is the area east of the house. The area is not of such extreme sensitivity that all archaeological deposits, even those in high sensitivity areas, should necessarily be preserved in place. With

appropriate guidance from a trained archaeologist, this type of site may lend itself to another session of archaeological education and training for area school groups. Students could be trained on a site such as this in the basic methods and approaches of excavation, recording and artifact recovery and processing. Any archaeological program developed with public or student participation in mind, however, should be directed by a professional archaeologist, conducted with reference to an established research design and supported with a sufficient budget or staff/volunteer commitment to complete any excavations that are started, properly process artifacts and produce a site report.

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Vermeule, Cornelius C., Jr.

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1929 State of New Jersey Morris Canal and Banking Company Final Report of Consulting and Directing Engineer. Morris Canal and Banking Co., Trenton, New Jersey.

Weir Maps

c. 1890 Original transit survey map of the Morris Canal alignment across New Jersey commissioned by the Morris Canal & Banking Company. On file, New Jersey State Archives.

Appendix A
FIGURES

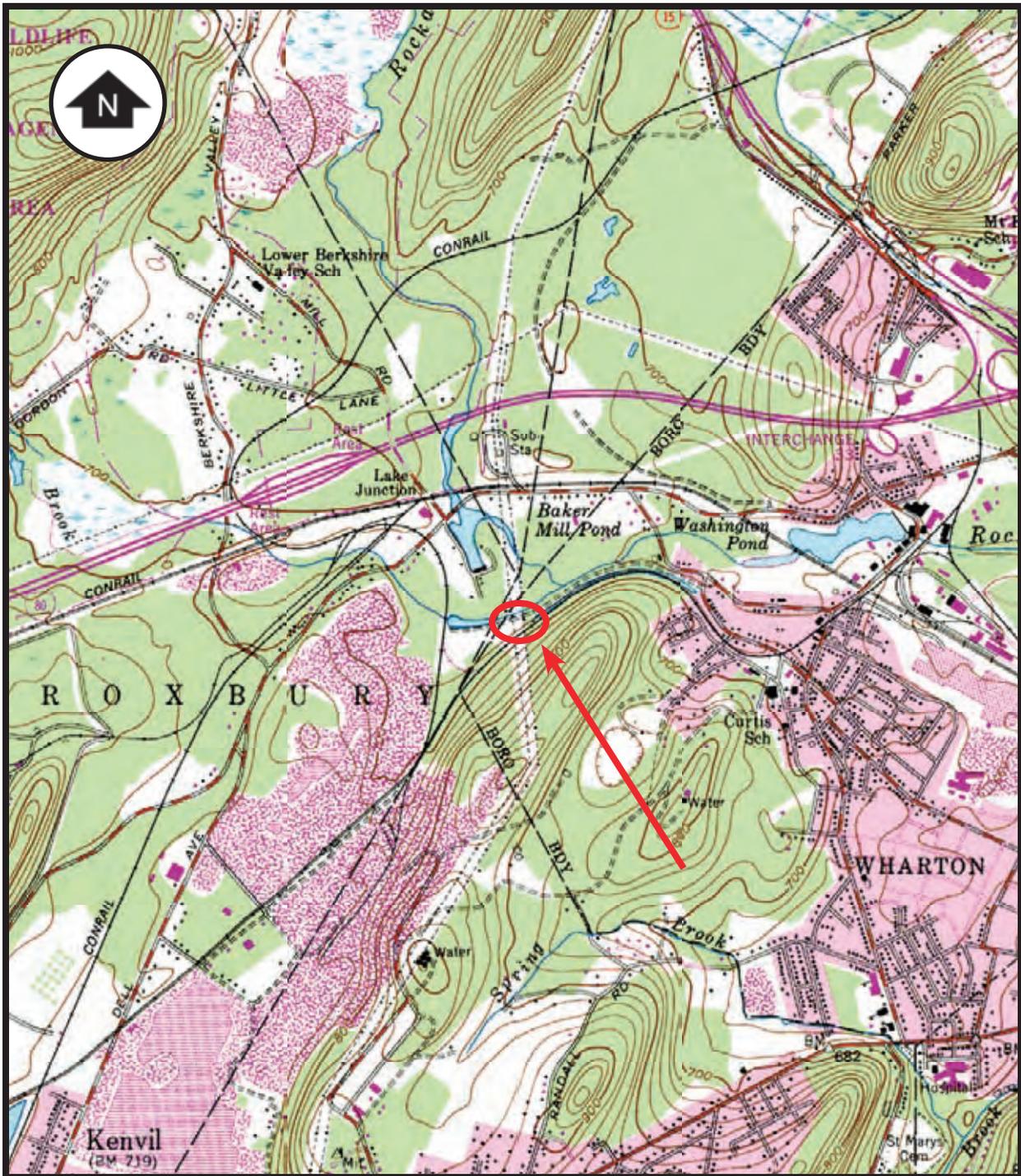


Figure 1. Location of Project Site (indicated with an arrow). Source: USGS 7.5' Dover, N.J. (1954 [Photorevised 1981]) Quadrangles. Scale: 1 inch= 2,000 feet.

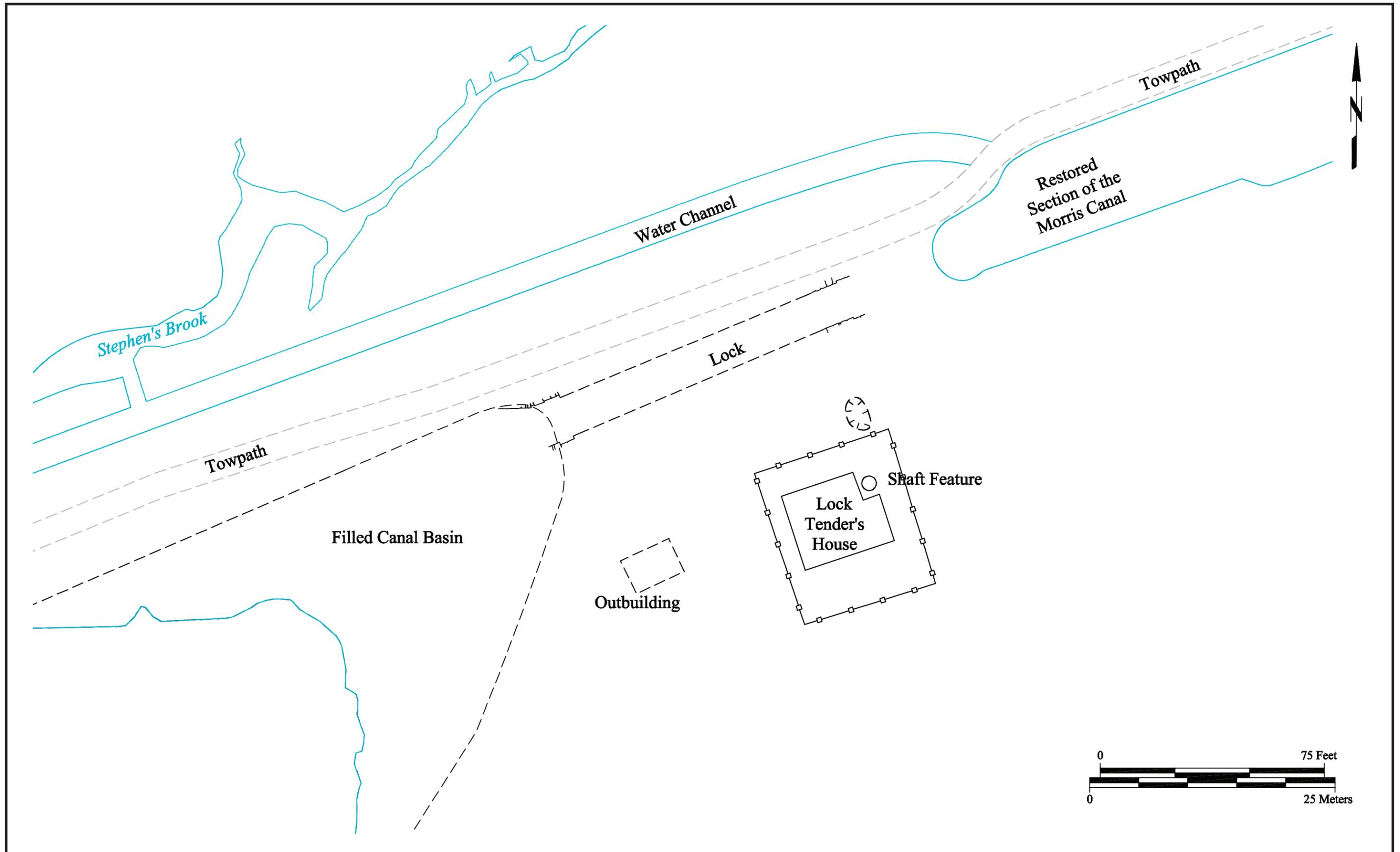


Figure 2. Project Site Plan.

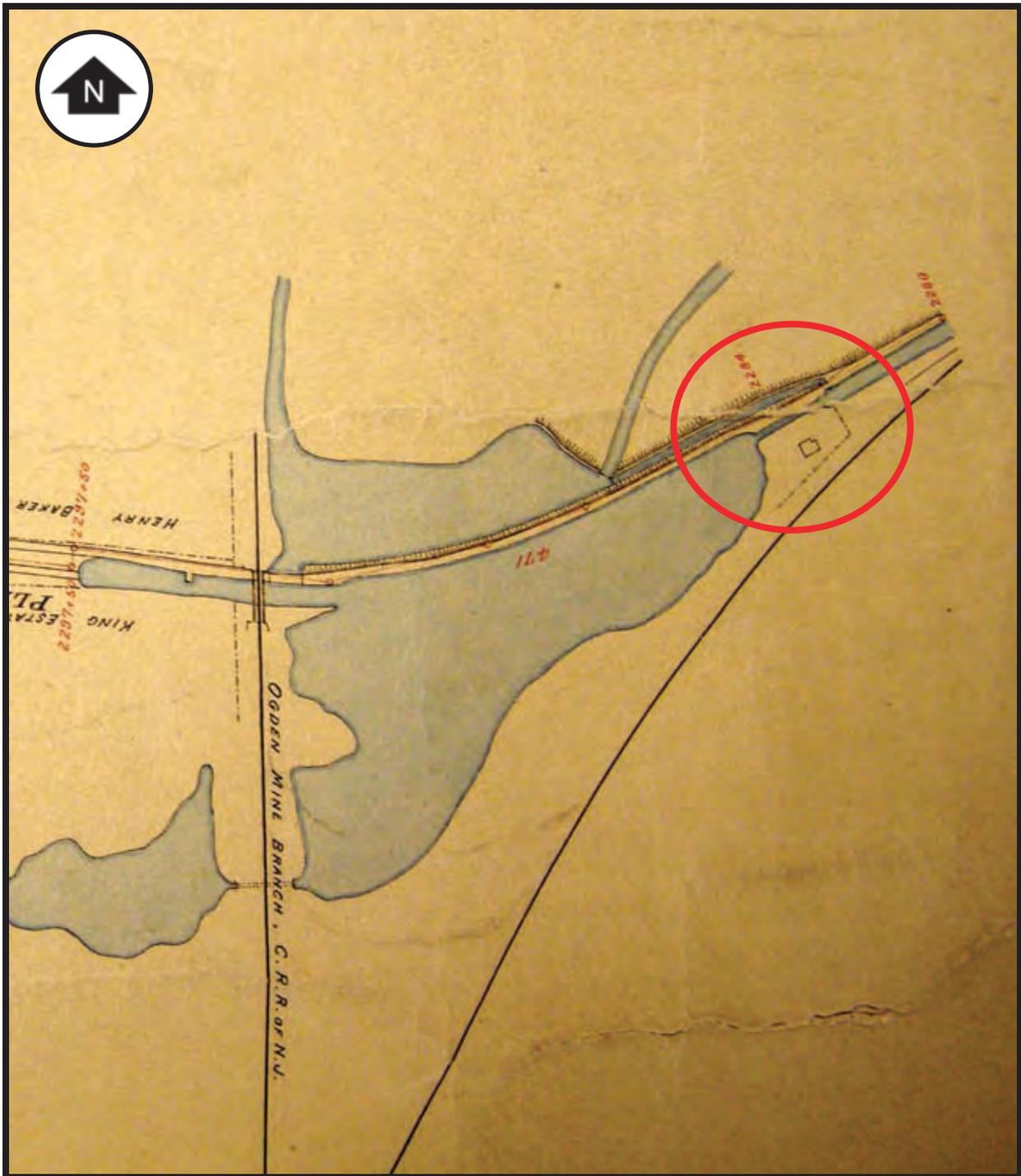


Figure 3. Weir Transit Survey Map of the Morris Canal *circa* 1890. Scale: 1 inch = 300 feet.

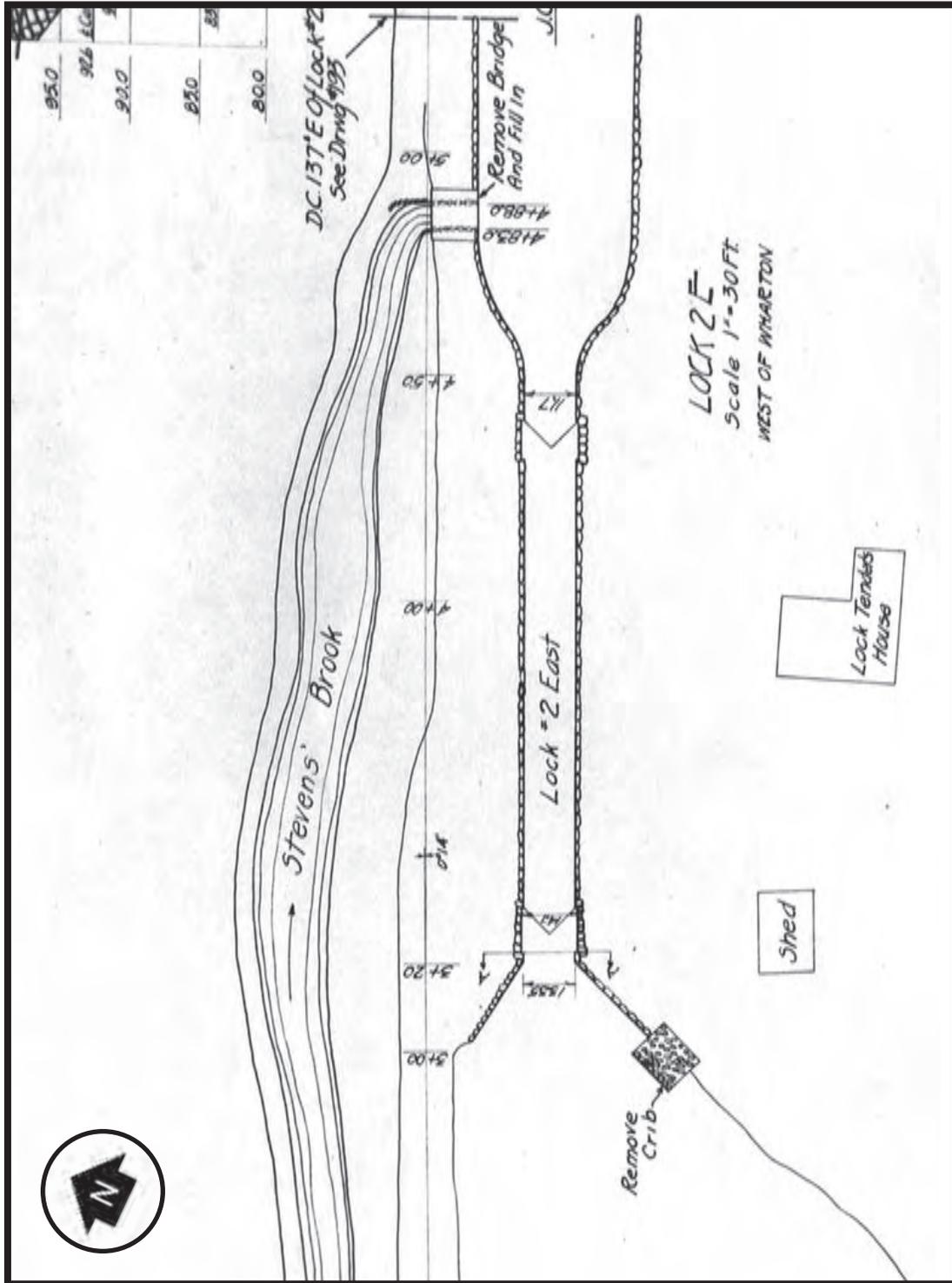


Figure 4. Vermeule, C. Jr. Plan View. "Plane #4 East and Lock #2 East – Wharton, Drawing No. 183." 1927.
Scale: 1 inch = 36 feet.

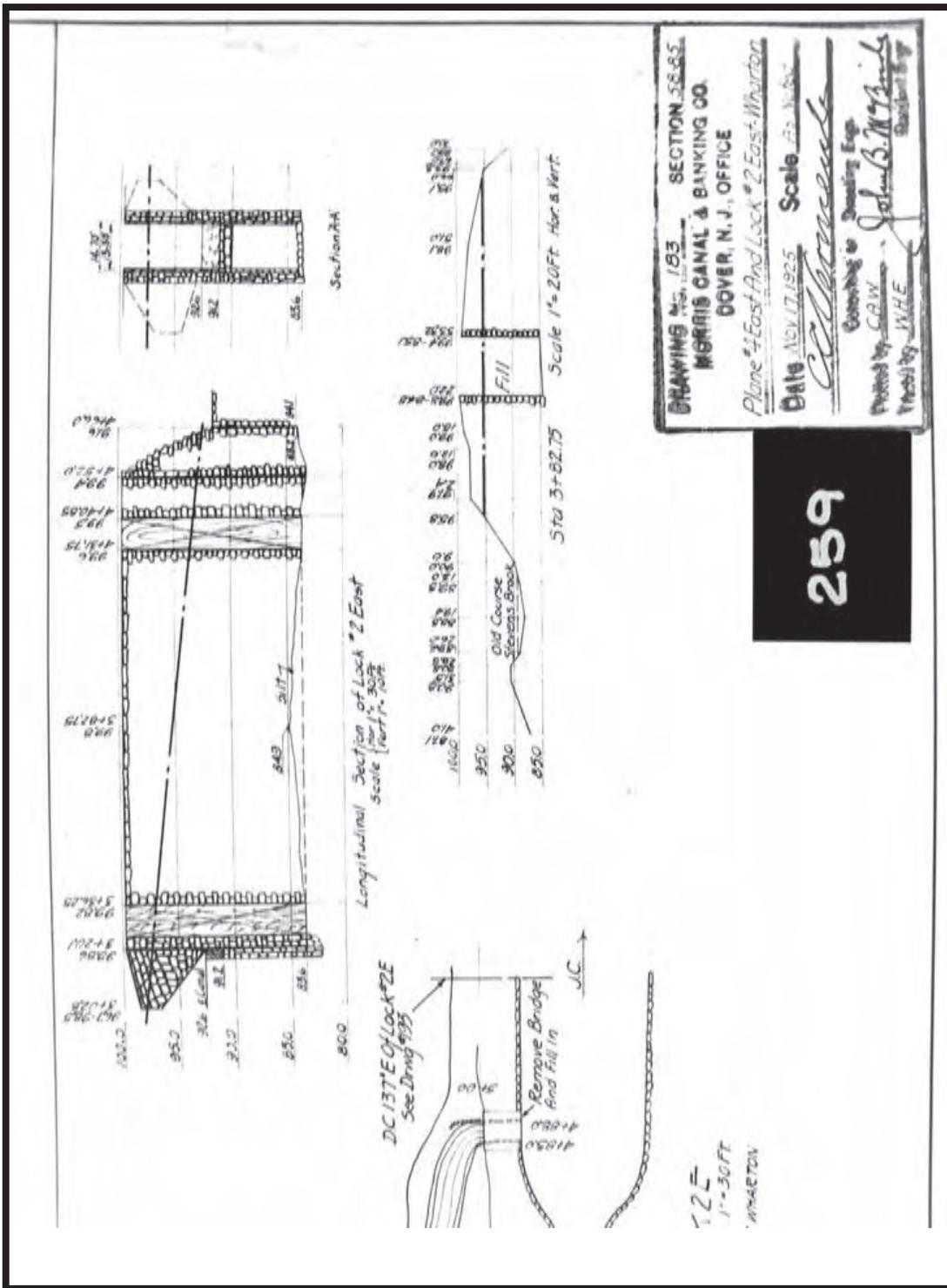


Figure 5. Vermeule, C. Jr. Profile View. "Plane #4 East and Lock #2 East - Wharton, Drawing No. 183." 1927. Vertical scale: 1 inch = 15 feet.

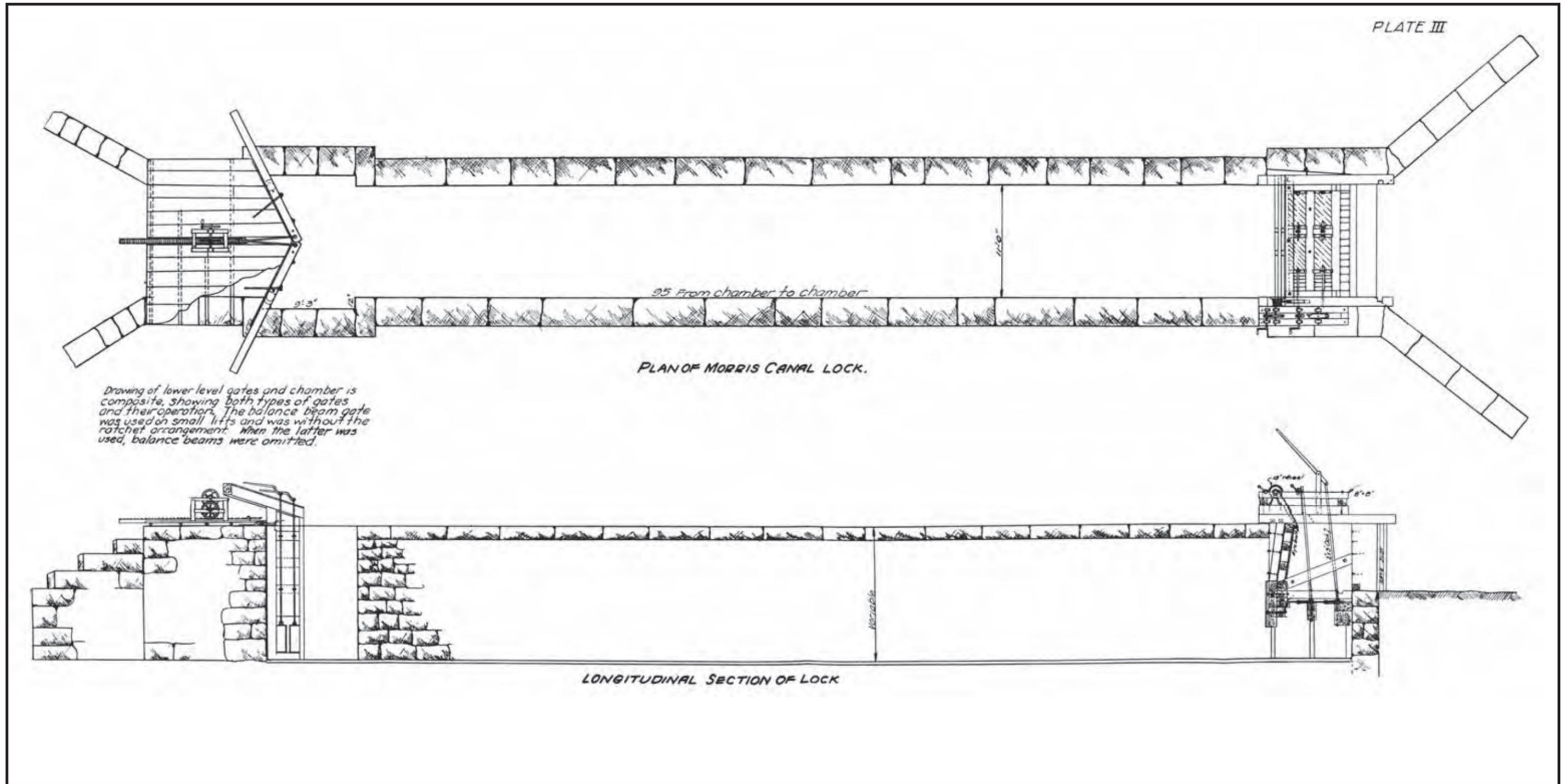


Figure 6. General Plan of a Morris Canal Lock. Source: Cornelius C. Vermeule, Jr 1929.

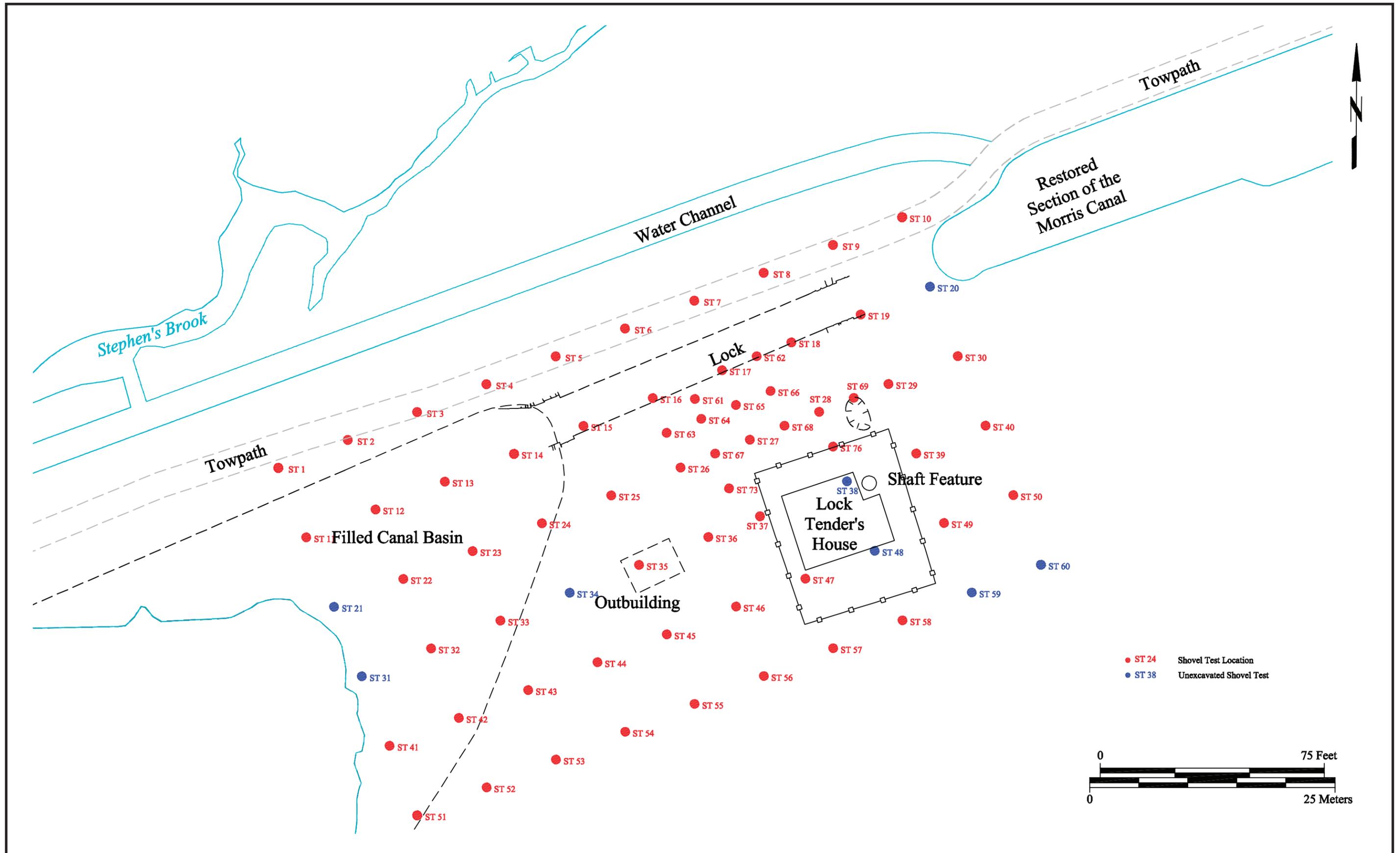


Figure 7. Site Plan Showing the Locations of Shovel Tests.

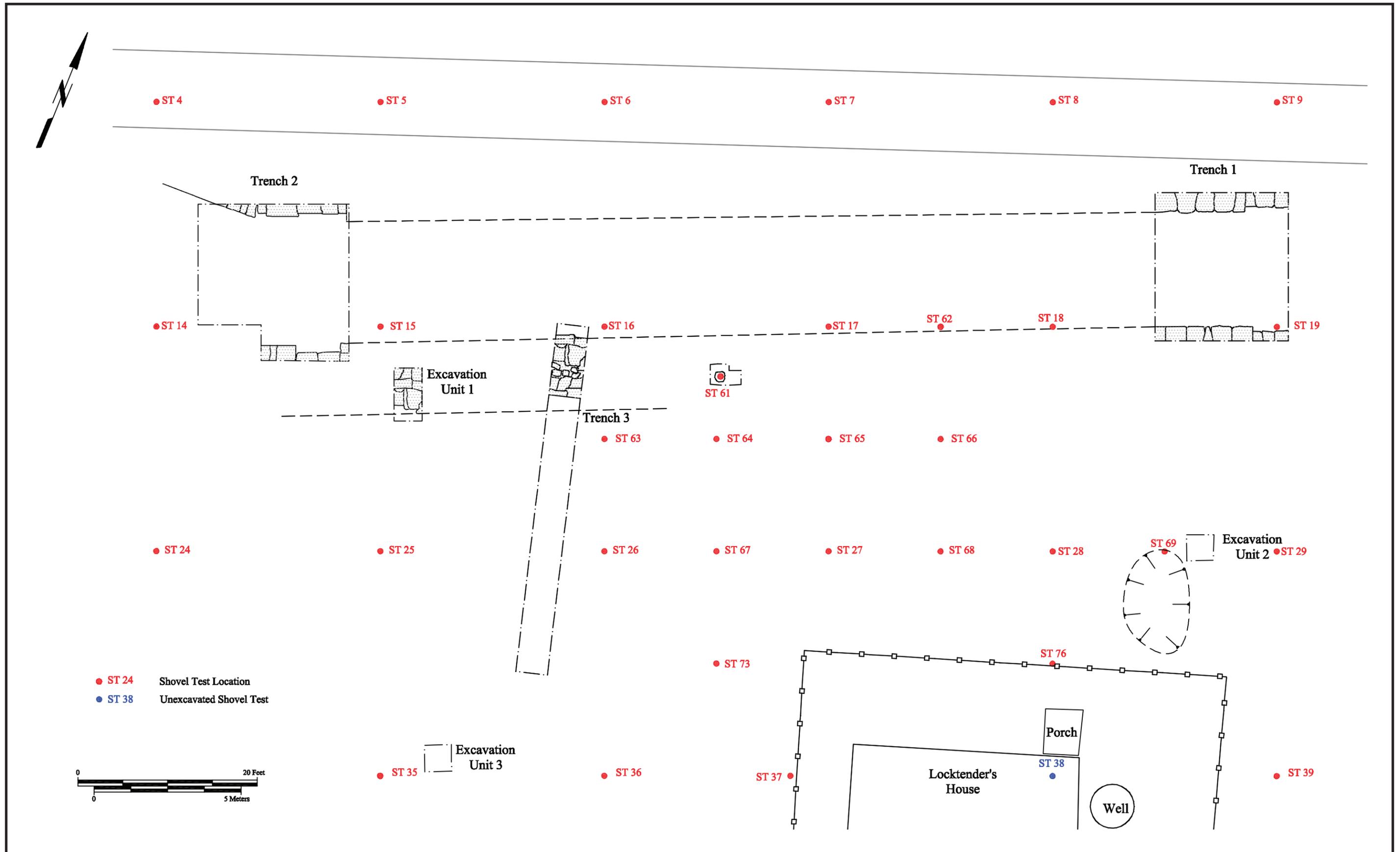


Figure 8. Site Plan Showing the Locations of Excavation Units and Trenches.

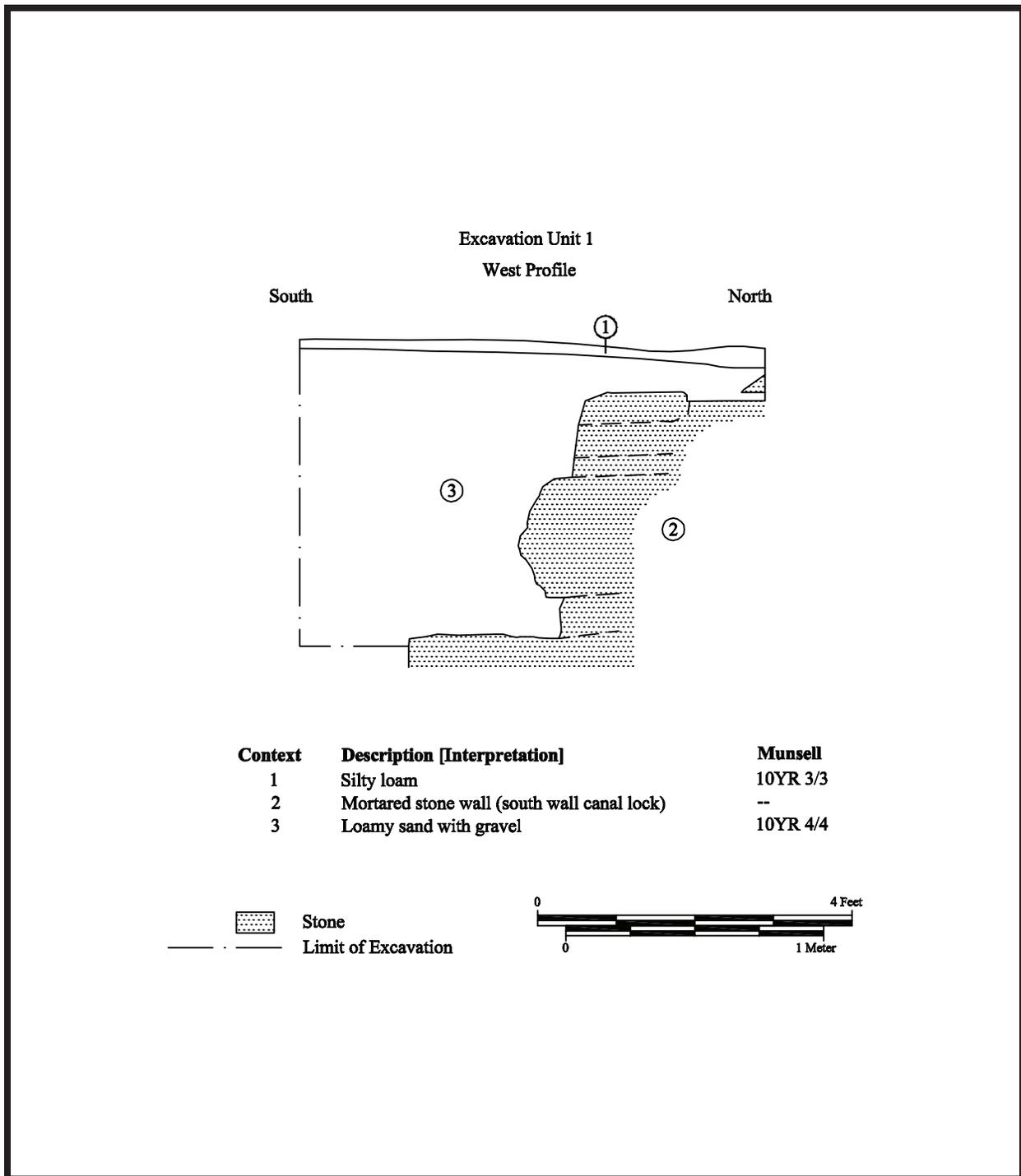


Figure 9. Excavation Unit 1, West Profile.

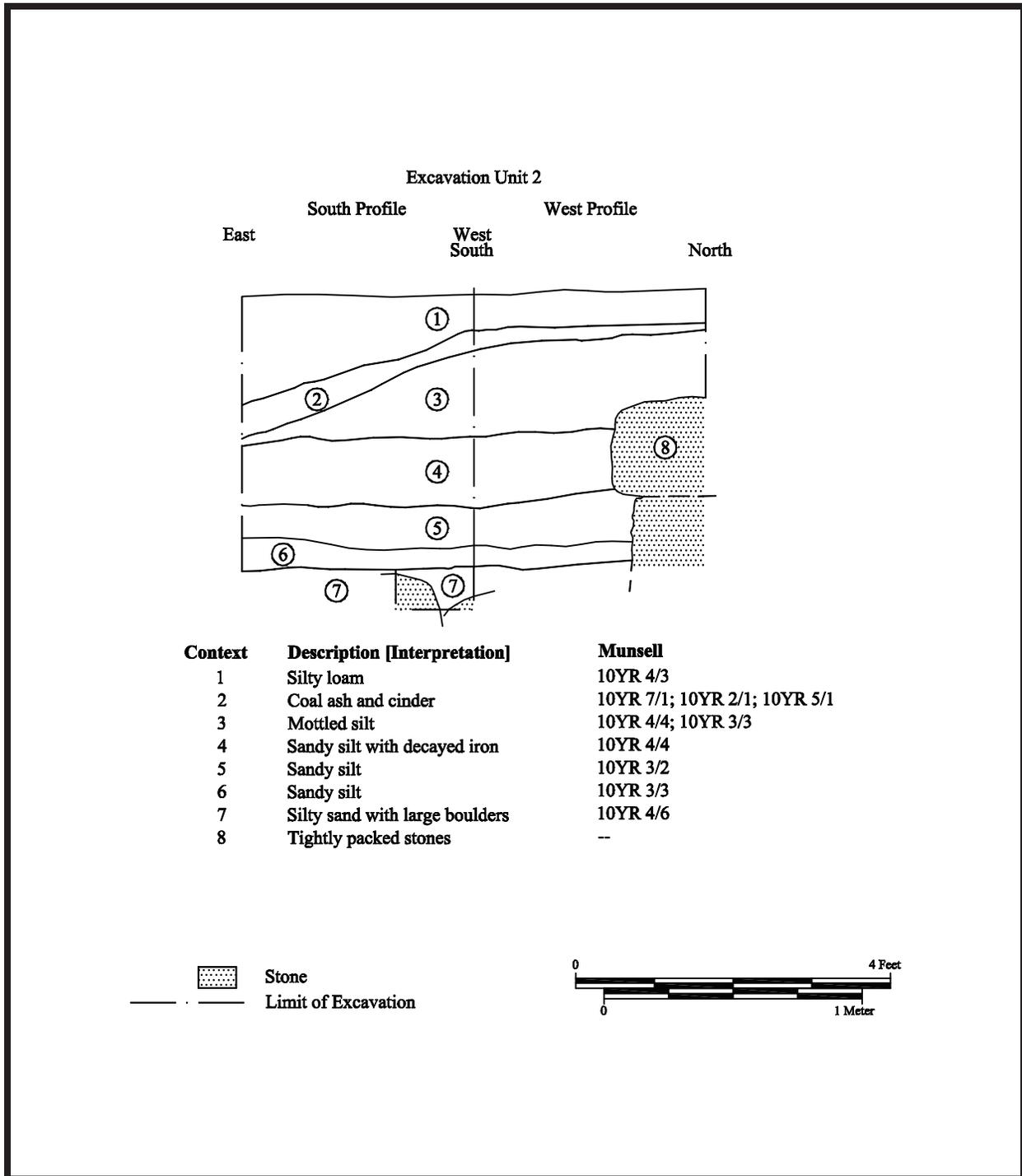


Figure 10. Excavation Unit 2, South and West Profile.

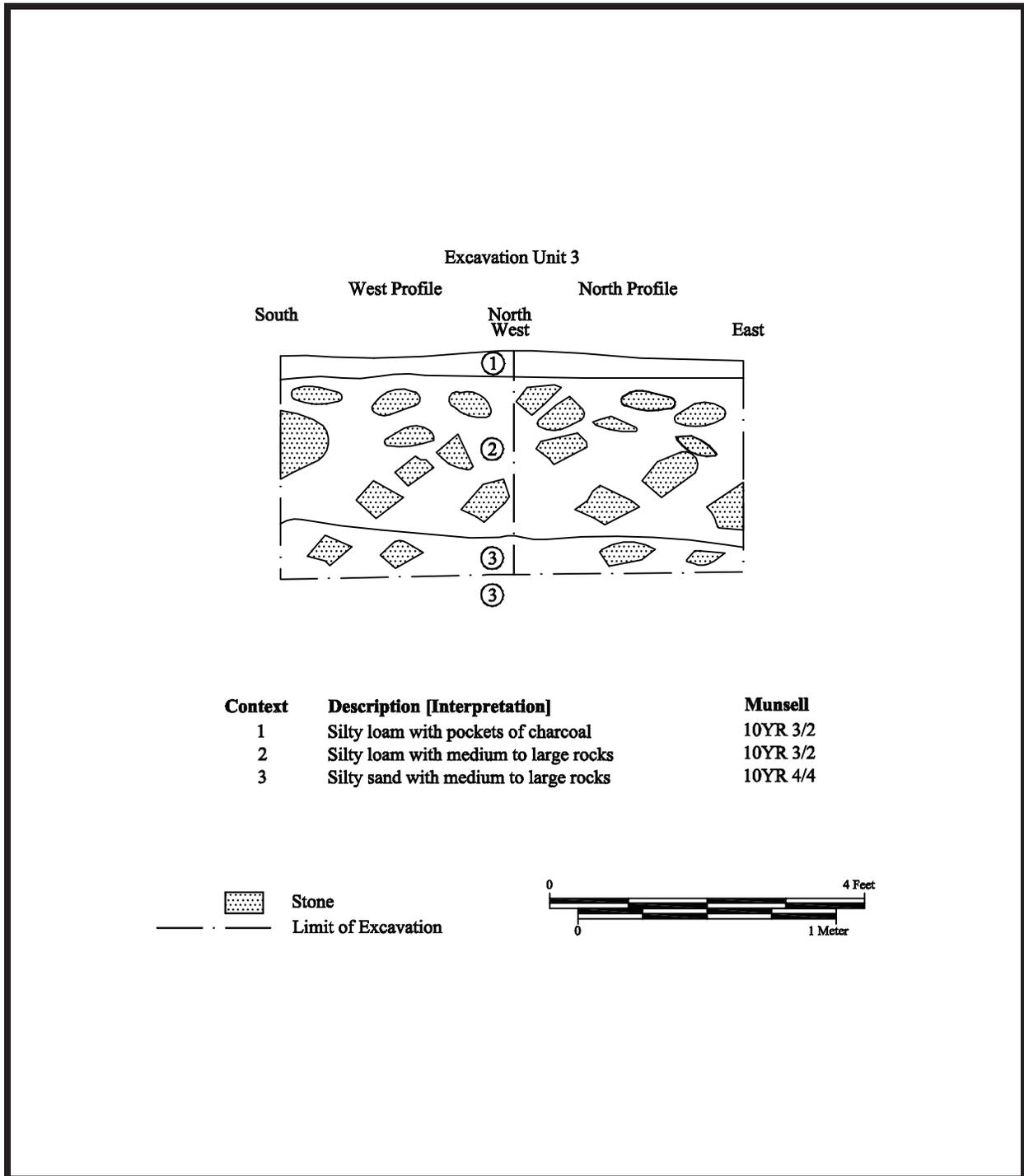


Figure 11. Excavation Unit 3, West Profile.

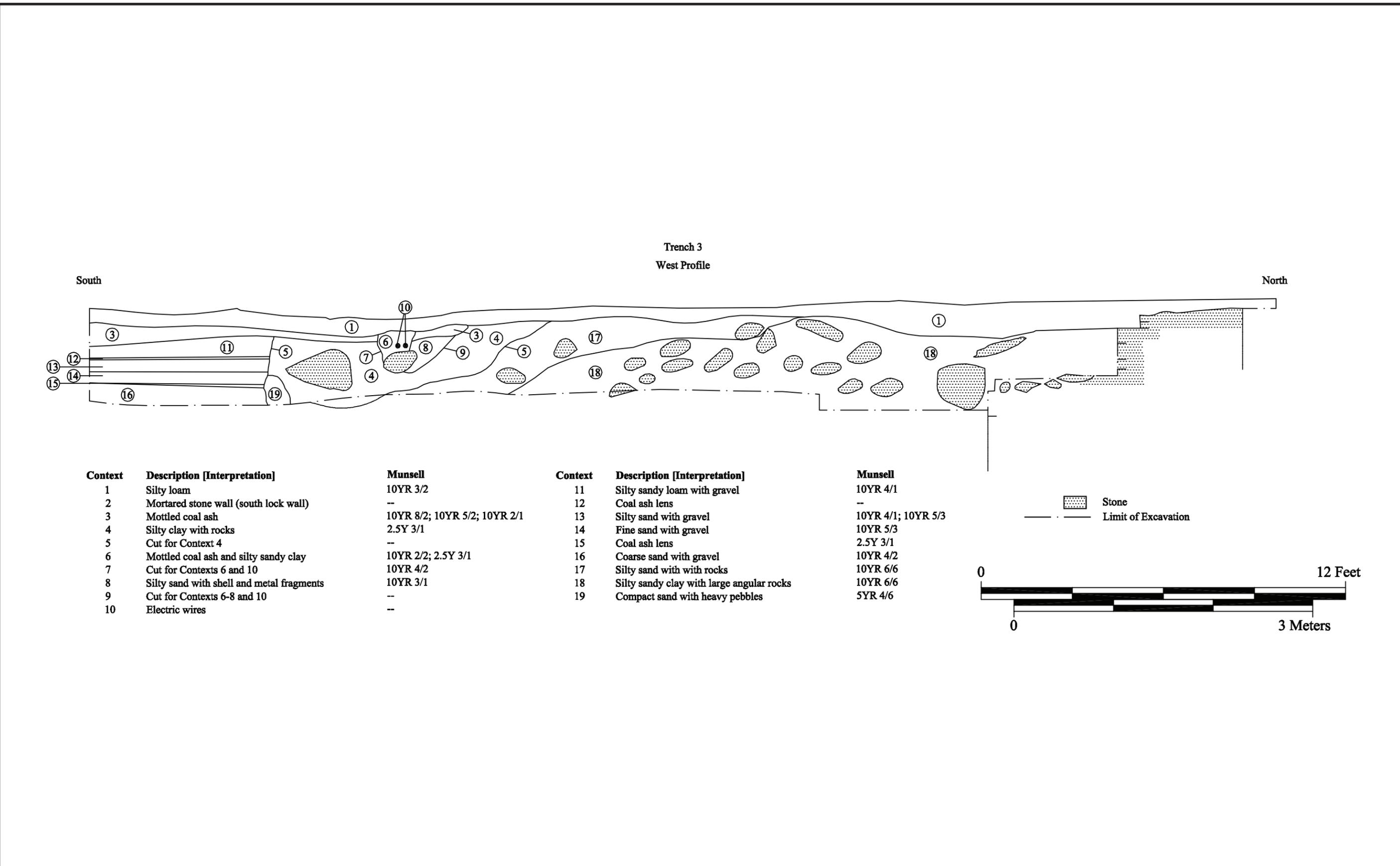


Figure 14. Trench 3, West Wall Profile.

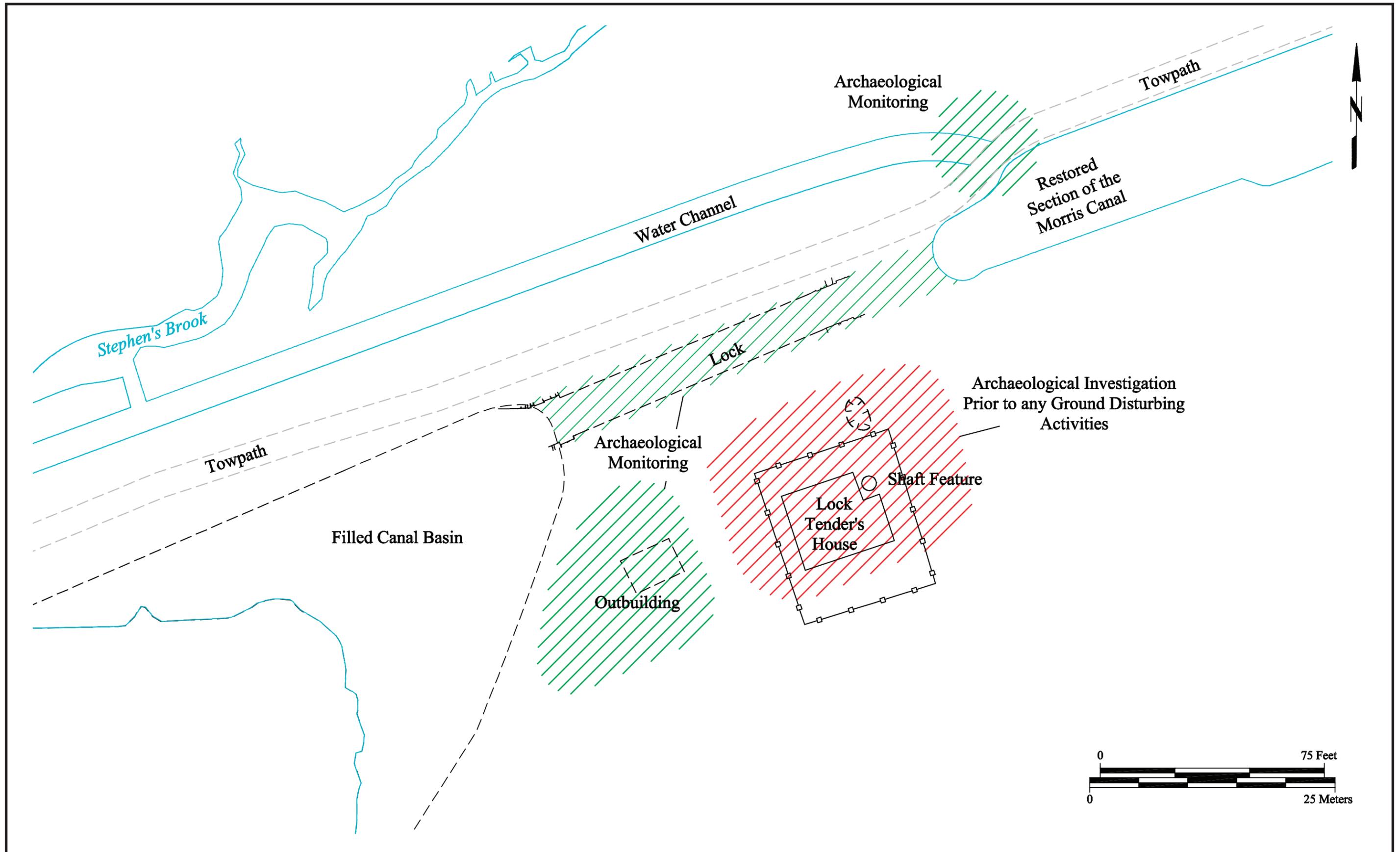


Figure 15. Archaeological Sensitivity Plan.

Appendix B
PLATES



Plate 1. View looking east of the project site; the buried lock extends from the foreground to the left and the lock tender's house ruin is visible at the top right (Photographer: James Lee, January 2007) [HRI Neg.#06052:D5:17].



Plate 2. View looking south of the lock tender's house ruin (Photographer: James Lee, January 2007) [HRI Neg.#06052:D5:57].

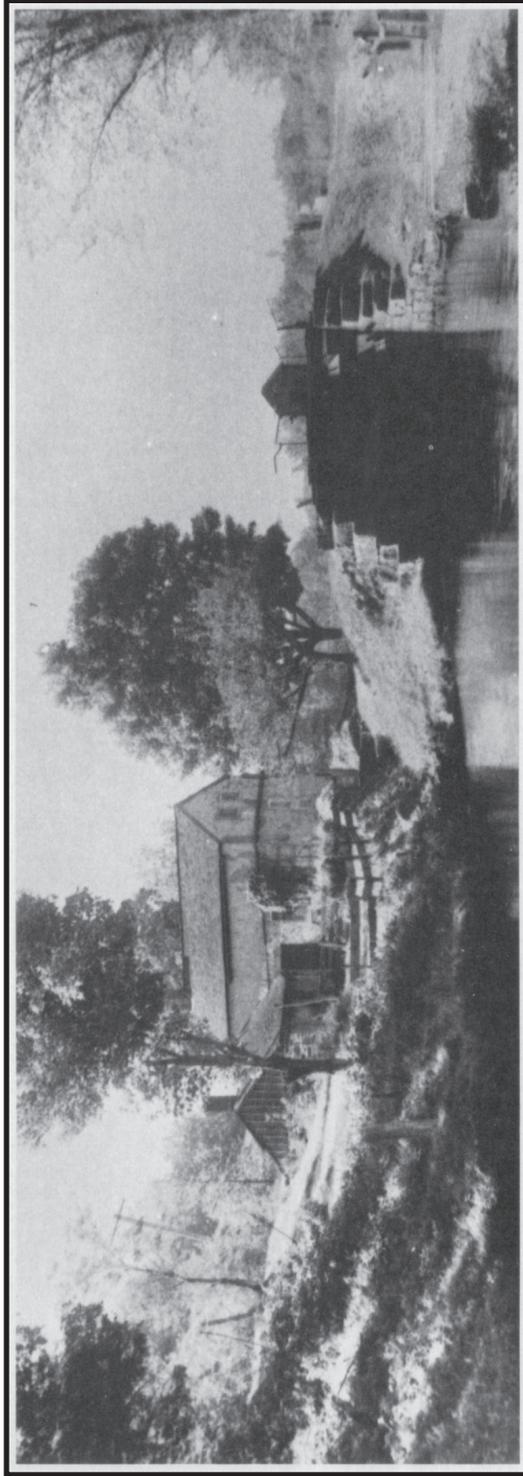


Plate 3. Historic photograph of Lock 2 East looking west. N.d. Source: Lee 1979.



Plate 4. Historic photograph of Lock 2 East looking west. N.d. Source: Goller 1999.



Plate 5. Modern view looking west of the Lock 2 East project site (Photographer: James Lee, January 2007) [HRI Neg.#06052:D5:77].



Plate 6. Historic postcard view of Lock 2 East looking west. N.d. Source: Collection of James Lee.

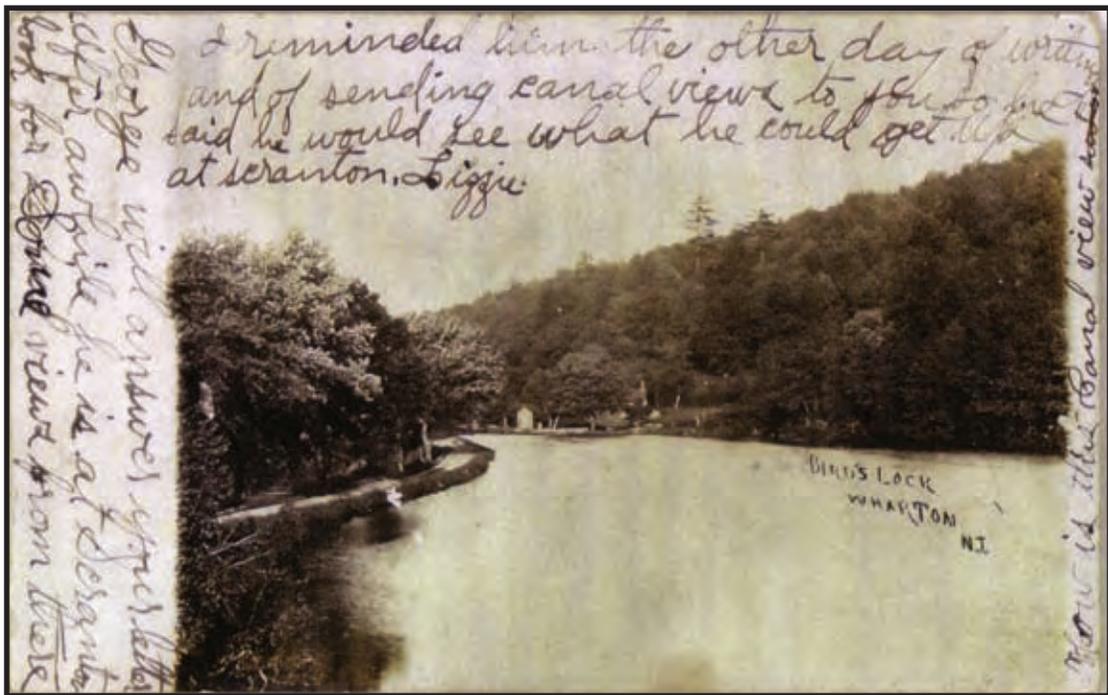


Plate 7. Historic postcard view of Lock 2 East looking east. N.d. Source: Collection of James Lee.



Plate 8. Historic photograph of a canal boat approaching Lock 2 East looking east.
N.d. Source: Lee 1979.

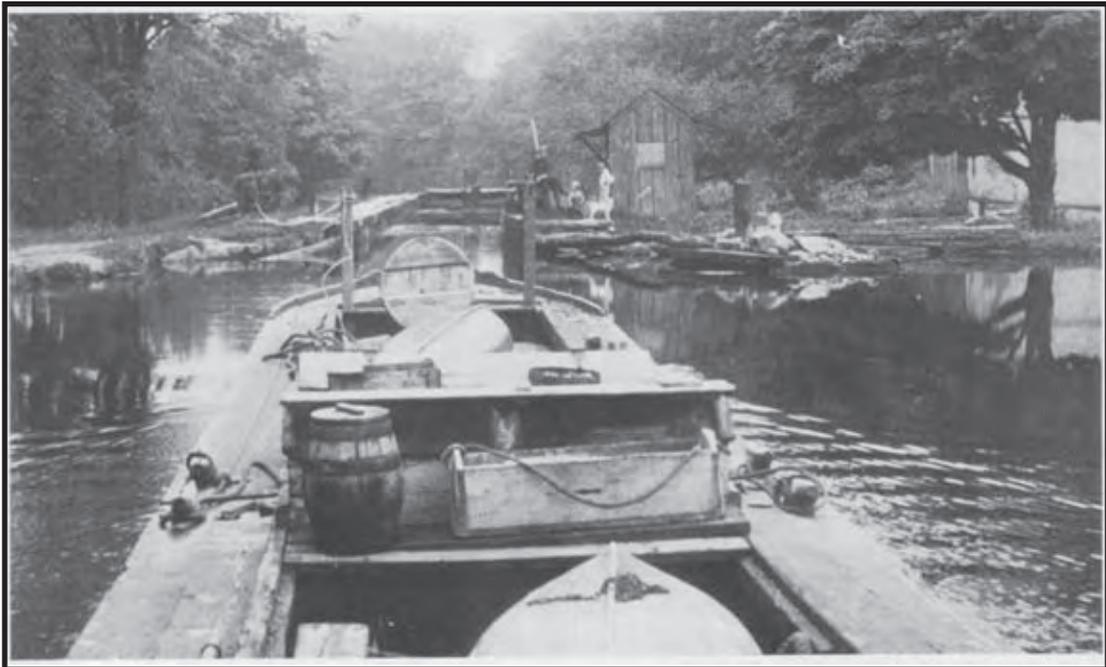


Plate 9. Historic photograph Lock 2 East from a canal boat approaching the lock from the east. N.d. Source: Lee 1979.



Plate 10. Historic photograph of a canal boat in Lock 2 East looking east. N.d.
Source: Goller 1999.



Plate 11. Historic photograph looking east of a mule team resting as their boat is locked through Lock 2 East. N.d. Source: Lee 1979.



Plate 12. Historic photograph of a canal boat in Lock 2 East looking west. August 29, 1904. Source: Lee 1979.



Plate 13. Historic photograph of the lock tender's house looking southeast. N.d. .
Source: Goller 1999.



Plate 14. View looking west of an archaeologist shovel testing along the western edge of the project site (Photographer: Joshua Butchko, October 2006) [HRI Neg.#06052: D2:21].



Plate 15. View looking southeast of a school volunteer group excavating shovel tests in front of the lock tender's house ruins (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:49].



Plate 16. View looking southwest showing the base of a snubbing post identified in Shovel Test 61 (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:44].



Plate 17. View looking north of Excavation Unit 1 showing the outside of the southern lock wall (Photographer: James Lee, October 2006) [HRI Neg.#06052:D2:29].



Plate 18. View looking north of Excavation Unit 2 (Photographer: Joshua Butchko, October 2006) [HRI Neg.#06052:D2:34].



Plate 19. View looking east of Excavation Unit 3 in progress (Photographer: Joshua Butchko, October 2006) [HRI Neg.#06052:D2:48].



Plate 20. View looking north of Excavation Unit 3 (Photographer: Joshua Butchko, October 2006) [HRI Neg.#06052:D2:51].



Plate 21. View looking east towards the location of Trench 1 at the eastern end of the lock (Photographer: James Lee, October 2006) [HRI Neg.#06052:D2:17].



Plate 22. View looking south of the south wall of the lock exposed in Trench 1; note the recess for the miter gate (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:50].



Plate 23. View looking north of the north wall of the lock exposed in Trench 1; note the upright timber still in place alongside of the scale rod (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:10].



Plate 24. View northwest of the north wall of the lock in Trench 1. The recess for the miter gate is visible in the foreground and the surviving vertical timber from Plate 26 is visible next to the upright scale rod. Approximately three to four feet of the top of this wall was removed when the lock was dismantled (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:11].



Plate 25. View south of the recess for the miter gate on the southern wall of the lock in Trench 1. Note the change from stone within the recess to concrete extending to the right. This concrete has horizontal timber impressions possibly indicating that concrete was added as a repair behind the timbers (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:12].



Plate 26. View south along the bottom edge of the trench against the south wall of the lock in Trench 1. A surviving horizontal timber with concrete poured behind it. The large, square spikes held the timber sheeting to the lock walls (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:15].



Plate 27. View looking southwest of the south wall of the lock in Trench 1 showing the mortar repairs poured behind the locks missing timber sheeting; note the horizontal timber sheeting visible along the wall at the base of excavation (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:14].



Plate 28. View north showing a surviving timber recessed into the north wall of the lock in Trench 1. This timber likely a nailer that anchored the horizontal timber sheeting that lined the lock (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:16].



Plate 29. View looking southwest towards the location of Trench 2 at the western end of the lock (Photographer: James Lee, October 2006) [HRI Neg.#06052:D2:19].



Plate 30. View looking south of the south wall of the lock exposed in Trench 2; note the recess for the drop gate mechanism (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:29].



Plate 31. View south of the recess in the south wall of lock to accommodate the lever for the drop gate that was located just below the bottom of this trench (now below the water line) (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:31].



Plate 32. View south of the south wall of the lock showing an iron tie-rod that probably held timber bumpers used to guide the boat into the lock (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:33].



Plate 33. View looking north of the north wall of the lock exposed in Trench 2. The flaired, upstream headwall of the lock is visible at the left end of this section. Unlike the wall opposite this one (Plate 30), there is no recess to accommodate the drop gate mechanism, which is only necessary on one side. Also, the original top of this wall was removed when the lock was dismantled. The large flat coping stones which had run along the top of this wall were found in the lock and are visible lying on the ground above this wall (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:24].



Plate 34. View north of the north wall of the lock in Trench 2 showing the mortar patching (Photographer: James Lee, October 2006) [HRI Neg.#06052/D3:27].



Plate 35. View looking southwest of Trench 3 (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:36].



Plate 36. View looking northwest showing the exterior of the southern wall of the lock exposed in Trench 3; note the step out at the bottom of the trench where the wall widens (Photographer: James Lee, October 2006) [HRI Neg.#06052:D2:09].



Plate 37. View looking west of the profile of Trench 3 showing the filled ditch that ran between the lock and the house (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:38].



Plate 38. View looking northwest of the profile of Trench 3 showing the stratified yard deposits that post date the filling of the ditch (Photographer: James Lee, October 2006) [HRI Neg.#06052:D3:41].

Appendix C

SUMMARY OF SUBSURFACE TESTING

APPENDIX C
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	1	1	0 - 0.4ft	sand loam	10YR 4/4	--
		2	0.4 - 1.6ft	compact sand with medium to large rocks	10YR 4/6	--
		3	1.6 - ft	rock impasse	--	--
Shovel Test	2	1	0 - 0.2ft	sand loam	10YR 4/4	--
		2	0.2 - 1.5ft	compact sand with medium to large rocks	10YR 4/6	--
		3	1.5 - ft	rock impasse	--	--
Shovel Test	3	1	0 - 0.4ft	sand loam	10YR 4/4	--
		2	0.4 - 1.2ft	mottled silty sand with medium to large rocks	10YR 3/3, 10YR 4/1	Historic Building Materials
		3	1.2 - 1.6ft	fine. silty sand with medium to large rocks	10YR 5/4	--
		4	1.6 - ft	rock impasse	--	--
Shovel Test	4	1	0 - 0.35ft	compact sand loam	10YR 3/3	--
		2	0.35 - 1.6ft	compact silty loam with medium to large rocks	10YR 5/6	--
		3	1.6 - ft	rock impasse	--	--
Shovel Test	5	1	-	inaccessible due to backdirt and boulders	--	--
Shovel Test	6	1	0 - 0.3ft	compact sand loam	10YR 3/3	--
		2	0.3 - 1.4ft	compact silty sand with medium to large rock	10YR 5/6	--
		3	1.4 - ft	rock impasse	--	--
Shovel Test	7	1	0 - 0.5ft	compact sand loam with gravel and medium rock	10YR 3/3	--
		2	0.5 - ft	mortared stone wall impasse	--	--
Shovel Test	8	1	0 - 0.2ft	mottled compact silty sand with gravel	10YR 3/3, 10YR 6/1	--
		2	0.2 - ft	mortared stone wall impasse	--	--
Shovel Test	9	1	0 - 0.3ft	sand loam	10YR 3/3	--
		2	0.3 - 1.8ft	mottled sand. loam with medium rock and mortar chunks	10YR 4/2, 10YR 5/4	Historic Ceramic Vessel Sherds
		3	1.8 - ft	stone impasse	--	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	10	1	0 - 0.4ft	sand loam	10YR 3/3	Historic Glass Vessel Fragments
		2	0.4 - 1.3ft	mottled sand loam with medium rock and mortar chunks	10YR 4/2, 10YR 5/4	Historic Ceramic Vessel Sherds
		3	1.3 - ft	rock impasse	--	--
Shovel Test	11	1	0 - 1.2ft	wet silty loam	10YR 2/1	--
		2	1.2 - ft	water impasse	--	--
Shovel Test	12	1	-	write-off; falls on modern fill berm	--	--
Shovel Test	13	1	0 - 0.6ft	sand loam with pebbles	10YR 4/2	--
		2	0.6 - 1.3ft	silty sand with gravel	10YR 4/3	Historic Ceramic Vessel Sherds Historic Clothing Related Historic Tools/Hardware Historic Unidentified
		3	1.3 - 1.6ft	mottled silty sand with medium rocks	10YR 4/4, 10YR 5/8	--
Shovel Test	14	1	0 - 0.5ft	sand loam	10YR 4/4	Historic Ceramic Vessel Sherds Modern Recreation/Activities
		2	0.5 - 0.8ft	compact sand loam	10YR 3/3	--
		3	0.8 - 1.6ft	sandy silt with small rocks	10YR 4/3	--
		4	1.6 - ft	wire impasse	--	--
Shovel Test	15	1	-	write-off; falls in Trench 2	--	--
Shovel Test	16	1	0 - 0.6ft	compact sand loam	10YR 4/4	Historic Building Materials Historic Tools/Hardware Modern Tools/Hardware
		2	0.6 - 2ft	mottled compact sand loam	10YR 4/2, 10YR 5/6	--
		3	2 - ft	rock impasse	--	--
Shovel Test	17	1	0 - 0.4ft	sand loam	10YR 3/3	--
		2	0.4 - 1.8ft	mottled sand loam with medium rocks	10YR 4/2, 10YR 5/4	--
		3	1.8 - ft	rock impasse	--	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	18	1	0 - 0.6ft	sand loam	10YR 3/3	--
		2	0.6 - 1.7ft	mottled sand loam with medium rock and mortar chunks	10YR 4/2, 10YR 5/4	Historic Building Materials Modern Glass Vessel Fragments
		3	1.7 - 1.9ft	mortar	10YR 6/2	--
		4	1.9 - ft	mortared stone impasse	--	--
Shovel Test	19	1	-	write-off; falls in Trench 1	--	--
Shovel Test	20	1	-	write-off; falls in canal	--	--
Shovel Test	21	1	0 - 0.5ft	wet silty loam	10YR 2/1	--
		2	0.5 - ft	water impasse	--	--
Shovel Test	22	1	0 - 0.7ft	wet silty loam	10YR 2/1	--
		2	0.7 - 1.6ft	wet mottled silty loam	10YR 2/1, 10YR 4/1	--
		3	1.6 - 1.8ft	wet silty. loam	2.5Y 6/2	--
Shovel Test	23	1	0 - 2ft	loose silty loam	10YR 3/2	Historic Glass Vessel Fragments Historic Tools/Hardware
Shovel Test	24	1	0 - 0.2ft	silty sand loam	10YR 4/4	--
		2	0.2 - 1ft	silty loam	10YR 4/2	Historic Unidentified
		3	1 - 1.5ft	mottled coarse sand with medium rocks	10YR 6/4, 10YR 5/2	--
		4	1.5 - ft	rock impasse	--	--
Shovel Test	25	1	-	write-off; under Trench 2 backdirt	--	--
Shovel Test	26	1	0 - 0.7ft	silty sand loam	10YR 4/4	--
		2	0.7 - ft	concrete sidewalk impasse	--	--
Shovel Test	27	1	0 - 0.4ft	sand loam	10YR 4/4	--
		2	0.4 - 1.2ft	mottled silty sand loam	10YR 4/2, 10YR 5/6	--
		3	1.2 - ft	mortared stone impasse	--	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	28	1	0 - 0.6ft	sand loam	10YR 4/3	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments
		2	0.6 - 1.3ft	mottled silty loam with small to medium rocks	10YR 4/3, 10YR 3/2	--
		3	1.3 - ft	compact coal impasse	--	--
Shovel Test	29	1	0 - 0.6ft	sand loam	10YR 4/3	Historic Glass Vessel Fragments
		2	0.6 - 1.8ft	mottled silty sand loam	10YR 4/3, 10YR 3/3	Historic Building Materials Historic Ceramic Vessel Sherds Historic Clothing Related Historic Furnishings Historic Glass Vessel Fragments Indeterminate Fauna
		3	1.8 - ft	rock impasse	--	--
Shovel Test	30	1	0 - 0.2ft	sand loam	10YR 4/3	--
		2	0.2 - 1.8ft	sand. loam	10YR 4/2	Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments
Shovel Test	31	1	-	write-off; falls in water	--	--
Shovel Test	32	1	0 - 2.2ft	wet silty loam with brick flecking	10YR 2/1	Historic Building Materials
		2	2.2 - ft	water impasse	--	--
Shovel Test	33	1	0 - 1.1ft	silty loam	10YR 2/1	--
		2	1.1 - 1.6ft	mortared stone	--	--
		3	1.6 - ft	mortared stone impasse	--	--
Shovel Test	34	1	-	write-off; falls on modern debris berm	--	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	35	1	0 - 0.4ft	sand loam	10YR 4/3	--
		2	0.4 - 1ft	sand. loam	10YR 3/1	Historic Building Materials Historic Glass Vessel Fragments Historic Tools/Hardware Historic Unidentified
		3	1 - ft	rock impasse	--	--
Shovel Test	36	1	0 - 0.2ft	silty loam	10YR 3/3	--
		2	0.2 - 0.8ft	silty. loam	10YR 4/3	--
		3	0.8 - ft	rock impasse	--	--
Shovel Test	37	1	0 - 0.3ft	sand loam	10YR 4/3	--
		2	0.3 - ft	building rubble impasse	--	--
Shovel Test	38	1	-	write-off; falls in fenced-in ruins area	--	--
Shovel Test	39	1	0 - 1.5ft	fine silty sand	10YR 4/1	Historic Building Materials Historic Ceramic Vessel Sherds
		2	1.5 - ft	boulder impasse	--	--
Shovel Test	40	1	0 - 0.8ft	sand loam	10YR 4/3	--
		2	0.8 - ft	large root impasse	--	--
Shovel Test	41	1	0 - 1ft	wet silty loam	10YR 2/1	Historic Ceramic Vessel Sherds
		2	1 - 1.7ft	mottled wet clay	10YR 5/4, 10YR 3/1	--
		3	1.7 - 2.2ft	wet clay	10YR 4/1	--
Shovel Test	42	1	0 - 1.5ft	silty loam	10YR 4/1	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Tools/Hardware
		2	1.5 - 2.6ft	silty loam with gravel	10YR 4/2	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	43	1	0 - 0.2ft	silty loam	10YR 2/2	--
		2	0.2 - 0.9ft	silty. loam	10YR 3/2	Historic Ceramic Vessel Sherds
		3	0.9 - 2ft	compact silt	10YR 5/6	--
Shovel Test	44	1	0 - 0.5ft	silty loam	10YR 3/2	Modern Glass Vessel Fragments
		2	0.5 - 1ft	mottled sandy silt	10YR 4/3, 10YR 3/2	--
		3	1 - 2ft	sandy. silt	10YR 4/2	--
Shovel Test	45	1	0 - 0.3ft	silty loam	10YR 3/2	--
		2	0.3 - 2ft	sandy silt	10YR 4/3	--
Shovel Test	46	1	0 - 0.3ft	silty loam	10YR 4/3	Historic Building Materials
		2	0.3 - 1.3ft	sandy silt	10YR 4/2	--
		3	1.3 - 2ft	silty sand	10YR 5/6	--
Shovel Test	47	1	0 - 1.1ft	silty loam	10YR 3/1	--
		2	1.1 - 1.9ft	mottled silt	10YR 3/1, 10YR 5/6	--
		3	1.9 - ft	rock impasse	--	--
Shovel Test	48	1	-	write-off; falls in fenced-in ruins	--	--
Shovel Test	49	1	0 - 0.3ft	silty loam	10YR 4/3	--
		2	0.3 - 1.1ft	sandy silt	10YR 4/2	Historic Ceramic Vessel Sherds
		3	1.1 - 2ft	silty sand	10YR 5/6	--
Shovel Test	50	1	0 - 0.3ft	silty loam	10YR 4/3	--
		2	0.3 - 1.5ft	sandy silt	10YR 4/2	--
		3	1.5 - ft	rock impasse	--	--
Shovel Test	51	1	0 - 1.9ft	sandy silt	10YR 3/1	--
		2	1.9 - 2.5ft	wet mottled sandy clay	10YR 5/4, 10YR 5/8	--
Shovel Test	52	1	0 - 2.2ft	sandy silt with coal	10YR 4/2	--
Shovel Test	53	1	0 - 0.8ft	silty loam with coal	10YR 3/2	Historic Glass Vessel Fragments
		2	0.8 - 2ft	sandy silt with coal	10YR 3/4	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	54	1	0 - 0.3ft	silty loam with coal	10YR 3/2	--
		2	0.3 - 0.9ft	sandy silt with coal	10YR 3/4	--
		3	0.9 - 1.3ft	sandy. silt	10YR 5/6	--
		4	1.3 - 2.1ft	sandy silt.	10YR 3/3	--
Shovel Test	55	1	0 - 0.2ft	silty loam	10YR 4/3	--
		2	0.2 - 1.1ft	sandy silt	10YR 4/2	--
		3	1.1 - 1.8ft	silty sand with large rocks	10YR 5/6	--
		4	1.8 - ft	rock impasse	--	--
Shovel Test	56	1	0 - 0.3ft	silty loam	10YR 4/3	Historic Arms and Armor
		2	0.3 - 1ft	sandy silt	10YR 4/2	--
		3	1 - 1.6ft	silty sand with large rocks	10YR 5/6	--
Shovel Test	57	1	0 - 0.2ft	silty loam	10YR 4/3	--
		2	0.2 - 1ft	sandy silt	10YR 4/2	--
		3	1 - 1.6ft	silty sand with large rocks	10YR 5/6	--
		4	1.6 - ft	rock impasse	--	--
Shovel Test	58	1	0 - 0.3ft	silty loam	10YR 4/3	--
		2	0.3 - 1.3ft	sandy silt	10YR 4/2	--
		3	1.3 - ft	root and rock impasse	--	--
Shovel Test	59	1	0 - 0.2ft	silty loam	10YR 4/3	--
		2	0.2 - 1.2ft	sandy silt	10YR 4/2	--
		3	1.2 - 1.4ft	silty sand	10YR 5/6	--
		4	1.4 - ft	root and rock impasse	--	--
Shovel Test	60	1	-	write-off; falls on boulder covered slope	--	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	61	1	0 - 0.5ft	silty loam	10YR 3/3	-- Historic Arms and Armor Historic Building Materials Historic Commerce Historic Glass Vessel Fragments Historic Manufacturing Historic Unidentified Modern Furnishings Modern Glass Vessel Fragments Modern Unidentified
		2	0.5 - 1.8ft	silt with small to medium rocks	10YR 4/4	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Tools/Hardware Modern Glass Vessel Fragments
Shovel Test	62	1	0 - 0.7ft	silty loam with medium rock, coal ash, coal	5YR 3/1	Historic Building Materials Historic Energy Historic Glass Vessel Fragments Historic Tools/Hardware Historic Unidentified
		2	0.7 - 1.75ft	sand loam with demolition debris	10YR 4/3	Modern Glass Vessel Fragments Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Modern Glass Vessel Fragments

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	63	1	0 - 0.7ft	silty sand loam	10YR 3/3	Historic Arms and Armor Historic Building Materials Historic Tools/Hardware
		2	0.7 - 1.3ft	sandy silt with medium rocks	10YR 3/3, 10YR 5/6	Modern Glass Vessel Fragments Historic Energy
		3	1.3 - 1.7ft	silty sand with medium rocks	10YR 5/6	Historic Glass Vessel Fragments --
Shovel Test	64	1	0 - 0.5ft	silty sand loam	10YR 3/3	Historic Building Materials Historic Ceramic Vessel Sherds Historic Recreation/Activities
		2	0.5 - 1.5ft	mottled sandy silt with large rocks	10YR 3/3, 10YR 5/6	Modern Glass Vessel Fragments --
		3	1.5 - ft	rock impasse	--	--
Shovel Test	65	1	0 - 0.6ft	silty sand loam with coal	10YR 3/3	Historic Arms and Armor Historic Energy
		2	0.6 - 1.5ft	sand. loam	7.5YR 4/4	--
		3	1.5 - ft	concrete impasse	--	--
Shovel Test	66	1	0 - 0.4ft	silty loam	10YR 3/3	Historic Glass Vessel Fragments
		2	0.4 - 1.5ft	compact silt with medium rocks	10YR 3/6	Historic Building Materials
Shovel Test	67	1	0 - 2.1ft	sand loam with medium rocks	10YR 4/2	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Recreation/Activities

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	68	1	0 - 0.85ft	sand loam with building rubble	10YR 3/3	Historic Building Materials Historic Ceramic Vessel Sherds
		2	0.85 - 1.9ft	sand. loam	7.5YR 4/4	Historic Building Materials Historic Energy Historic Glass Vessel Fragments
Shovel Test	69	1	0 - 0.4ft	silty loam	10YR 3/2	-- Historic Building Materials Historic Ceramic Vessel Sherds Historic Commerce Historic Glass Vessel Fragments Historic Unidentified
		2	0.4 - 1.4ft	compact silt with medium to large rocks	10YR 4/4	Historic Arms and Armor Historic Ceramic Vessel Sherds Historic Unidentified

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	73	1	0 - 0.35ft	sand loam	10YR 4/2	--
		2	0.35 - 0.8ft	coal ash	10YR 2/1, 10YR 7/1	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Unidentified Modern Glass Vessel Fragments Modern Unidentified
		3	0.8 - 1.7ft	mottled silty sand	10YR 4/2, 10YR 5/6	Historic Building Materials Historic Ceramic Vessel Sherds Historic Clothing Related Historic Glass Vessel Fragments Historic Manufacturing Historic Tools/Hardware Historic Unidentified
		4	1.7 - 2ft	coal ash	10YR 2/1, 10YR 7/1	--
		5	2 - 2.3ft	silty sand	10YR 5/6	--
Shovel Test	74	1	0 - 1ft	sand loam with coal ash	10YR 3/2	Historic Arms and Armor Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Tools/Hardware Historic Unidentified
		2	1 - 1.2ft	mottled sand loam	10YR 3/4, 10YR 4/3	Historic Building Materials Historic Ceramic Vessel Sherds Historic Glass Vessel Fragments Historic Tools/Hardware
		3	1.2 - 2.1ft	sand loam. with coal ash	10YR 4/6	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Shovel Test	78	1	0 - 0.5ft	silty loam	10YR 3/1	--
		2	0.5 - 1.5ft	sandy silty loam	10YR 3/3	Historic Building Materials Historic Glass Vessel Fragments Modern Unidentified
		3	1.5 - 2.3ft	sandy silt with small rocks	10YR 4/4	--
Trench	1	1	-	silty loam	10YR 3/2	--
		2		mortared stone wall	--	--
		3				--
Trench	2	1	-	silty loam	10YR 3/2	--
		2		mortared stone wall	--	--
		3				--
		4		silty sand with small rocks	10YR 5/6	--
		5		wet silt with heavy gravel	2.5Y 3/1	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Trench	3	1	-	silty loam	10YR 3/2	--
		2		mortared stone wall	--	--
		3		mottled coal ash cut by context 7	10YR 8/2, 10YR 5/2, 10YR 2/1	--
		4		silty clay with small to large rocks , fill of context 5; cut by context 7	2.5Y 3/1	--
		5		cut filled by context 4 and 19 filled by contexts 4 and 19; cuts contexts 11-17	--	--
		6		mottled coal ash fill of context 7	10YR 8/2, 2.3Y 3/1	--
		7		cut filled by contexts 6 and 10 cuts contexts 3,4,8,9	--	--
		8		silty sand with shell and iron frags , cut by context 7	10YR 2/1	--
		9		cut filled by context 8 filled by context 8; cuts context 4; cut by context 7	--	--
		10		rubber electric cables fill of context 7		--
		11		silty sand loam with gravel , cut by context 5	10YR 4/1	--
		12		coal ash cut by context 5	10YR 6/1, 10YR 3/1	--
		13		mottled silty sand with gravel , cut by context 5	10YR 4/1, 10YR 5/3	--
		14		fine sand with gravel , cut by context 5	10YR 5/3	--
		15		coal ash cut by context 5	10YR 6/1, 10YR 3/1	--
		16		coarse sand with gravel , cut by context 5	10YR 4/2	--
		17		silty sand with small angular rocks , cut by context 5	10YR 6/6	--
		18		silty sandy clay with large angular rocks		--
		19		compact sand with heavy pebbles , fill of context 5	5YR 4/6	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Excavation Unit	1	1	-	silty loam	10YR 3/3	Historic Building Materials Historic Ceramic Vessel Sherds Historic Clothing Related Historic Glass Vessel Fragments Historic Unidentified Modern Glass Vessel Fragments Modern Tools/Hardware
		2		mortared stone wall	--	--
		3		sand loam with gravel	10YR 4/4	--

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Excavation Unit	2	1	-	sand loam	10YR 4/3	Historic Arms and Armor Historic Building Materials Historic Ceramic Vessel Sherds Historic Cutlery Historic Glass Vessel Fragments Historic Tools/Hardware Modern Glass Vessel Fragments
		2		coal ash and cinder lens	10YR 2/1, 10YR 6/1	-- Historic Building Materials Historic Ceramic Vessel Sherds Historic Clothing Related Historic Energy Historic Glass Vessel Fragments Historic Tools/Hardware Historic Unidentified Indeterminate Fauna
		3		mottled silt with coal ash	10YR 4/4, 10YR 3/3	-- Historic Historic Building Materials Historic Ceramic Vessel Sherds Historic Clothing Related Historic Energy Historic Furnishings Historic Glass Vessel Fragments Historic Manufacturing Historic Recreation/Activities Historic Tools/Hardware Historic Unidentified Indeterminate Fauna

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Excavation Unit	2	3	-	mottled silt with coal ash	10YR 4/4, 10YR 3/3	Modern Building Materials
		4		sandy silt with iron rust pockets	10YR 4/4	--
	5			sandy. silt	10YR 3/2	Historic
						Historic Building Materials
	6			sandy silt.	10YR 3/3	Historic Building Materials
						Historic Ceramic Vessel Sherds
						Historic Clothing Related
						Historic Glass Vessel Fragments
7		silty sand	10YR 4/6	Historic Manufacturing		
				Historic Recreation/Activities		
8		dry-laid stone	--	Historic Unidentified		
					Modern Glass Vessel Fragments	
					Historic Ceramic Vessel Sherds	
					Historic Glass Vessel Fragments	
					Historic Manufacturing	
					Historic Unidentified	
					Historic Ceramic Vessel Sherds	
					--	

APPENDIX C (Cont.)
SUMMARY OF SUBSURFACE TESTING

Unit Type	No.	Context	Depth	Soil Description/Interpretation	Munsell	Cultural Materials
Excavation Unit	3	1	-	silty loam with charcoal	10YR 3/2	Historic Building Materials*
		2		silty. loam with medium to large rocks		Historic Ceramic Vessel Sherds
		3		silty sand with medium to large rocks	10YR 4/4	Historic Glass Vessel Fragments Modern Arms and Armor Modern Glass Vessel Fragments Historic Building Materials Historic Ceramic Vessel Sherds Historic Energy Historic Glass Vessel Fragments Historic Recreation/Activities Historic Tools/Hardware Historic Unidentified

* Discarded

Appendix D
ARTIFACT CATALOG

APPENDIX D

ARTIFACT CATALOG

Excavation Unit 1 Context 1	Catalog #	48
1 Historic Building Materials, Coarse Earthenware, brick, fragment	Row #	12
1 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	8
1 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	7
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead	Row #	11
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, body, dipped/annular, narrow blue bands on white ground, 1815 - 1900	Row #	10
1 Historic Clothing Related, Porcelain, button, four hole sew through, whole, 0.4" diameter	Row #	9
1 Historic Glass Vessel Fragments, Glass, container, lid liner, rim, opaque white, embossed lettering "...N..."	Row #	1
2 Historic Unidentified, Ferrous metal, fragment, corroded, thin, flat amorphous fragments	Row #	5
3 Historic Unidentified, Ferrous metal, whole, corroded, thin, flat, rectangular plates	Row #	4
1 Historic Unidentified, Ferrous metal, strap, fragment, corroded, remnant of two perforations	Row #	6
1 Modern Glass Vessel Fragments, Glass, bottle, base and body, brown, stippled base	Row #	2
1 Modern Tools/Hardware, Ferrous metal, clamp, whole, corroded, alligator battery type	Row #	3

Total Artifacts in Context 1: 15

Total Artifacts in Excavation Unit 1 : 15

Excavation Unit 2 Context 1	Catalog #	50
1 Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, 0.22" diameter, rim fired	Row #	21
1 Historic Building Materials, Earthenware, tile, fragment, unglazed	Row #	12
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded, unidentified disk shaped fastener attached	Row #	25
2 Historic Building Materials, Ferrous metal, nail, whole, cut-late machine headed (late 1830's to Present), corroded	Row #	26
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	24
8 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	23
4 Historic Building Materials, Glass, window, fragment, light aqua	Row #	3
1 Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, fragment, transfer printed, red and green indeterminate motif	Row #	15
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment	Row #	16
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, rim, stenciled, polychrome, burned, narrow green band interior rim, yellow, blue and red stenciled floral motif with green leaves, 1870-Present	Row #	18
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, rim, scalloped, molded decoration interior rim, 1870-Present	Row #	17
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, transfer printed underglaze, blue indeterminate motif, 1870-Present	Row #	19
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, foot ring, sherds mend, 1870-Present	Row #	20
1 Historic Cutlery, Composite, knife, handle, corroded, fragment of ferrous metal blade, remnant of wood plates attached with copper alloy rivets, remnant of pewter mounts (c. 1850-1880) [Hume 1970:182]	Row #	22
1 Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, patent finish, clear/uncolored	Row #	11
2 Historic Glass Vessel Fragments, Glass, container, lid liner, fragment, opaque white	Row #	14
3 Historic Glass Vessel Fragments, Glass, container, unidentified, body, paneled, clear/uncolored	Row #	9
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, blue/green	Row #	4
2 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	2
5 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, opaque white	Row #	13
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, unidentified press molded decoration exterior	Row #	10
8 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	8
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, olive green	Row #	7

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, remnant of embossed lettering "...E..."	Row #	6
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, unidentified embossed mark exterior surface	Row #	5
2	Historic Tools/Hardware, Ferrous metal, spike, unidentified, fragment, corroded	Row #	27
4	Modern Glass Vessel Fragments, Glass, container, fragment, brown	Row #	1

Total Artifacts in Context 1: 58

Excavation Unit 2 Context 2		Catalog #	51
4	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	26
1	Historic Building Materials, Ferrous metal, nail, fragment, wire, corroded	Row #	24
3	Historic Building Materials, Ferrous metal, nail, whole, cut-late machine headed (late 1830's to Present), corroded	Row #	25
18	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	23
3	Historic Building Materials, Glass, window, fragment, light aqua	Row #	17
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, unglazed exterior, interior surface missing	Row #	3
1	Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, fragment, hand painted underglaze, polychrome, wide pink band and narrow gold band interior surface	Row #	7
1	Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, fragment, transfer printed overglaze, polychrome, Maker's Mark, red printed oriental figure clobbered in-filled, black printed maker's mark "MADE IN" over, "JAPAN"	Row #	8
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	5
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, saucer, rim, 1870-Present	Row #	6
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, Shell Edge-Impressed (1775-1875), blue, exterior surface missing	Row #	4
1	Historic Ceramic Vessel Sherds, Stoneware, buff body, large hollow ware, base and body, salt glaze exterior, 7" diameter, Albany slip interior	Row #	1
1	Historic Ceramic Vessel Sherds, Stoneware, grey body, lid, fragment, Bristol slip, cobalt blue, 4" diameter, unidentified hand painted decorative motif	Row #	2
1	Historic Clothing Related, Porcelain, button, four hole sew through, whole, 0.4" diameter	Row #	9
3	Historic Energy, Coal, fragment	Row #	30
2	Historic Energy, Coal ash, fragment	Row #	10
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, base and body, brown, patination, embossed letter "S" exterior base	Row #	14
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, finish, neck and body, folded rim, light aqua, patination	Row #	13
1	Historic Glass Vessel Fragments, Glass, container, unidentified, whole, clear/uncolored, 1.8" diameter, Ht: 2.8", wide mouth, rounded finish, cylindrical container	Row #	12
3	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	18
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, paneled, clear/uncolored	Row #	15
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination	Row #	19
2	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, paneled, light aqua, patination	Row #	20
1	Historic Glass Vessel Fragments, Glass, tableware, stemware, foot, clear/uncolored	Row #	16
1	Historic Tools/Hardware, Ferrous metal, whole, cut-late machine headed (late 1830's to Present), corroded, large nail/spike	Row #	28
1	Historic Tools/Hardware, Ferrous metal, nut, whole, corroded, large square nut	Row #	29
4	Historic Tools/Hardware, Ferrous metal, spike, fragment, corroded	Row #	27
3	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous fragments	Row #	21
5	Historic Unidentified, Ferrous metal, fragment, corroded, thin, flat fragments	Row #	22
1	Indeterminate Fauna, Bone, mammal, limb, fragment	Row #	11

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Total Artifacts in Context 2: 69

Excavation Unit 2 Context 3	Catalog #	52
6 Historic Building Materials, Coarse Earthenware, brick, fragment	Row #	35
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	91
1 Historic Building Materials, Ferrous metal, nail, whole, cut-late machine headed (late 1830's to Present), corroded	Row #	93
1 Historic Building Materials, Ferrous metal, nail, lath, fragment, corroded	Row #	89
1 Historic Building Materials, Ferrous metal, nail, lath, whole, corroded	Row #	90
30 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	52
3 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	92
23 Historic Building Materials, Glass, window, fragment, light aqua	Row #	12
2 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, base, unglazed	Row #	37
3 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, fragment, unglazed, exterior surface missing	Row #	38
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, rim and body, collared rim	Row #	39
8 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, fragment, unglazed, interior surface missing	Row #	36
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, hollow ware, fragment, glazed, lug handle, brown manganese	Row #	41
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, hollow ware, fragment, glazed both surfaces, clear lead, reduced	Row #	44
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, both surfaces missing	Row #	40
3 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead	Row #	42
7 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead, exterior surface missing	Row #	43
1 Historic Ceramic Vessel Sherds, Porcelain, hard paste, hollow ware, rim	Row #	79
1 Historic Ceramic Vessel Sherds, Porcelain, hard paste, toy dish, rim, burned, molded decoration exterior surface, possible pouring lip	Row #	80
7 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, bowl, rim to base, hand painted overglaze, scalloped, gold banded, sherds mend, 7" diameter, ribbed interior, 1850-Present	Row #	71
3 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, cup, rim to base, sherds mend, 4" diameter, remnant of handle attachment, 1840-Present	Row #	57
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, cup, handle and rim, part of a set, each sherd with same molded handle, 1840-Present	Row #	63
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, transfer printed flow, slightly everted rim, blue indeterminate motif, 1840 - 1910	Row #	78
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim and cavetto, sherds mend, 9" diameter, 1840-Present	Row #	62
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim and cavetto, sherds mend, 1840-Present	Row #	60
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, saucer, rim and body, sherds mend, 6" diameter, 1840-Present	Row #	61
4 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, rim, multiple vessels, 1840-Present	Row #	59
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, sherds mend, 1840-Present	Row #	58
13 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, multiple vessels, surface missing, 1840-Present	Row #	55
3 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, multiple vessels, 1840-Present	Row #	54
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, surface missing, unidentified molded decoration, 1840-Present	Row #	53
2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, body, transfer printed flow, blue indeterminate motif, 1840 - 1910	Row #	77

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

5	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, multiple vessels, interior surface missing, 1840-Present	Row #	56
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Pearlware, hollow ware, body, dipped/annular, London shape, blue banded, 1790 - 1890	Row #	65
4	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, rim, multiple vessels, 1870-Present	Row #	75
3	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, saucer, rim to base, sherds mend, 6" diameter, 1870-Present	Row #	72
12	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, multiple vessels, surface missing, 1870-Present	Row #	74
4	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, multiple vessels, 1870-Present	Row #	73
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, transfer printed overglaze, unidentified color, surface missing, faded/ghost image floral motif, 1870-Present	Row #	76
1	Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, hollow ware, fragment, dipped/annular, grey, interior surface missing	Row #	64
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, body, dipped/annular, grey banded, 1815 - 1900	Row #	68
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, rim, dipped/annular, blue banded, 1815 - 1900	Row #	67
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, body, dipped/annular, London shape, blue banded, 1815 - 1900	Row #	66
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, plate, rim, Shell Edge-Imprinted (1775-1875), blue	Row #	70
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, rim, hand painted underglaze, green, exterior surface missing, 1815-Present	Row #	69
2	Historic Ceramic Vessel Sherds, Stoneware, buff body, hollow ware, body, Albany slip interior, multiple vessels, salt glazed exterior surface	Row #	83
2	Historic Ceramic Vessel Sherds, Stoneware, buff body, hollow ware, body, Albany slip interior, same vessel, salt glazed exterior surface	Row #	82
2	Historic Ceramic Vessel Sherds, Stoneware, buff body, hollow ware, base, Albany slip both surfaces, sherds mend, molded, raised foot pad, molded horseshoe mark on exterior base, possibly unidentified maker's mark	Row #	81
1	Historic Ceramic Vessel Sherds, Stoneware, buff body, unidentified form, fragment, Albany slip interior, exterior surface missing	Row #	84
1	Historic Clothing Related, Porcelain, button, four hole sew through, whole, 0.35" diameter	Row #	5
1	Historic Energy, Coal, fragment	Row #	4
2	Historic Energy, Coal ash, fragment	Row #	3
2	Historic Furnishings, Glass, lamp chimney, fragment, clear/uncolored, lead glass	Row #	11
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, recessed panel, blue/green	Row #	15
2	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, brown	Row #	19
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, recessed panel, light aqua, patination	Row #	25
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, neck, brown	Row #	20
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, patent finish, light aqua, patination	Row #	23
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, finish, rounded finish, brown, melted	Row #	21
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, finish, down-tooled finish, light aqua, patination	Row #	22
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, neck, light aqua	Row #	29
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, rounded finish, light aqua	Row #	31
1	Historic Glass Vessel Fragments, Glass, container, lid liner, fragment, opaque white, remnant of embossed lettering "...CO..."	Row #	33
1	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, paneled, light aqua	Row #	24
1	Historic Glass Vessel Fragments, Glass, container, unidentified, base, light aqua, embossed numbering on base "26" "B"	Row #	17
4	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, cobalt blue	Row #	14
1	Historic Glass Vessel Fragments, Glass, container, unidentified, shoulder, light aqua	Row #	30

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, light aqua, remnant of embossed lettering "...ON..."	Row #	27
1	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, paneled, clear/uncolored	Row #	8
1	Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, light aqua	Row #	18
4	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	7
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, remnant of embossed lettering "...B..."	Row #	28
16	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	13
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, olive green, patination	Row #	16
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination, unidentified embossed design on exterior surface	Row #	26
2	Historic Glass Vessel Fragments, Glass, tableware, unidentified, base and body, ribbed, clear/uncolored, pieces mend, press molded beaded motif exterior base	Row #	10
3	Historic Glass Vessel Fragments, Glass, tableware, unidentified, fragment, clear/uncolored, unidentified press molded decorative motif	Row #	9
1	Historic Manufacturing, Slag, fragment, opaque white and brown glass-like slag	Row #	34
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 5/64"	Row #	49
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, burned, 4/64", mouth piece fragment	Row #	45
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 4/64", remnant of stamped lettering "...McDOUGALL...", opposite side "...GLASCOW..."	Row #	47
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, charred interior, 5/64"	Row #	48
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 4/64"	Row #	46
1	Historic Recreation/Activities, Porcelain, doll part, fragment, hand painted, polychrome, doll leg molded groove for attachment to cloth body, molded "6" at top of leg, faded green on remnant of molded boot, faded red band below knee possible garter	Row #	85
1	Historic Recreation/Activities, Slate, pencil, whole, tapered both ends	Row #	6
1	Historic Tools/Hardware, Ferrous metal, strap, fragment, flat rectangular fragment, heavily corroded	Row #	51
1	Historic Tools/Hardware, Ferrous metal, spike, fragment, corroded, heavily corroded, possible railroad spike	Row #	87
1	Historic Tools/Hardware, Ferrous metal, spike, whole, corroded, bent into hook shape	Row #	88
16	Historic Tools/Hardware, Ferrous metal, spike, unidentified, fragment, corroded, some heavily corroded	Row #	86
21	Historic Unidentified, Ferrous metal, fragment, corroded	Row #	50
5	Indeterminate Fauna, Shell, oyster, fragment	Row #	1
2	Indeterminate Fauna, Shell, oyster, whole	Row #	2
1	Modern Building Materials, Glass, fragment, light aqua, plate glass	Row #	32

Total Artifacts in Context 3: 294

Excavation Unit 2 Context 4

Catalog # 53

3	Historic Building Materials, Coarse Earthenware, brick, fragment	Row #	87
1	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	30
2	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	31
2	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	29
9	Historic Building Materials, Glass, window, fragment, light aqua	Row #	7
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, hollow ware, base and body, glazed both surfaces, clear with brown mottling, 7" diameter	Row #	39
2	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, body, glazed interior, brown manganese, sherds mend	Row #	40
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead, exterior surface missing	Row #	38
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, base, unglazed exterior	Row #	37

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, unglazed exterior, interior surface missing	Row #	36
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, cup, handle and rim, 1840-Present	Row #	65
7	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, multiple vessels, 1840-Present	Row #	57
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, base and body, 1840-Present	Row #	66
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, fragment, transfer printed overglaze, ribbed, polychrome, faded red and green large scale floral motif interior surface, 1880 - 1950	Row #	62
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, 6" diameter, 1840-Present	Row #	59
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, 4" diameter, 1840-Present	Row #	58
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, transfer printed flow, blue indeterminate motif, interior surface missing, 1840 - 1910	Row #	79
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim and body, scalloped, ribbed exterior body, 1840-Present	Row #	55
3	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, multiple vessels, molded decoration exterior surface, 1840-Present	Row #	54
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, shoulder, transfer printed flow, blue floral motif, 1840 - 1910	Row #	81
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, body, molded decoration exterior surface, 1840-Present	Row #	53
5	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, 30-40% complete, sherds mend, 8" diameter, Maker's Mark, remnant of black printed maker's mark British Royal Arms mark crown atop oval shield flanked by lion and unicorn, entwined letters in shield "ID", lettered beneath mark "T. POTTERY WORKS" over, "WARRANTED", I. Davis Trenton, NJ mark 1875-1887	Row #	67
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim and cavetto, 1840-Present	Row #	56
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim, 1840-Present	Row #	60
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim to base, sherds mend, 8.5" diameter, 1840-Present	Row #	52
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim, paneled, 1840-Present	Row #	61
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, saucer, rim to base, 6" diameter, 1840-Present	Row #	64
5	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, teacup, handle and rim, sherds mend, molded handle, 1840-Present	Row #	42
9	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, multiple vessels, 1840-Present	Row #	45
11	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, multiple vessels, surface missing, 1840-Present	Row #	46
5	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, multiple vessels, interior surface missing, 1840-Present	Row #	49
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base, Maker's Mark, remnant of black printed maker's mark "JAN. 27, 1885." arched over maltese cross with wreath	Row #	63
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, transfer printed flow, blue indeterminate motif, 1840 - 1910	Row #	80
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, 1840-Present	Row #	50
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, rim, 1870-Present	Row #	69
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, base and foot ring, 1870-Present	Row #	71
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, plate, rim to base, transfer printed overglaze, polychrome, faded/ghost image blue and green large scale floral motif, 1870-Present	Row #	78
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, plate, rim to base, scalloped rim, sherds mend, 8.5" diameter, 1870-Present	Row #	43
5	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, saucer, 20-30% complete, sherds mend, 6" diameter, remnant of black printed maker's mark "SE...ITE" arched over large circle with star at center, lettering inside circle "...B. BEERBOWER..." L.B. Beerbower & Co. Elizabeth NJ 1816-1902 [Kovel 1986:45]	Row #	68

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, saucer, rim, sherds mend, 6" diameter, 1870-Present	Row #	44
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, sherds mend, 1870-Present	Row #	48
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, base and foot ring, 1870-Present	Row #	51
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, rim, exterior surface missing, unidentified molded motif interior rim, 1870-Present	Row #	70
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, base, Maker's Mark, remnant of impressed maker's mark lettered "...T. PO..." arched over unidentified symbol, 1870-Present	Row #	72
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, rim and body, sherds mend, 1870-Present	Row #	73
1	Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, fragment, both surfaces missing	Row #	47
1	Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, fragment, unidentifiable decoration, light blue, interior surface missing	Row #	82
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, body, dipped/annular, blue banded, 1815 - 1900	Row #	75
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, body, dipped/annular, polychrome banded, light blue and dark brown bands on white ground, 1815 - 1900	Row #	76
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, rim, hand painted underglaze, polychrome, red, green and black large scale floral motif, 1815-Present	Row #	77
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, plate, rim, Shell Edge-Unscaloped + Impressed (1840-1875), blue	Row #	74
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Yellowware, hollow ware, fragment, Rockingham-type glaze, brown mottled, exterior surface missing, 1812 - 1920	Row #	35
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Yellowware, hollow ware, fragment, exterior surface missing, 1827 - 1940	Row #	34
1	Historic Ceramic Vessel Sherds, Stoneware, buff body, unidentified form, fragment, salt glaze exterior, Albany slip interior	Row #	41
1	Historic Clothing Related, Glass, button, four hole sew through, whole, opaque white, 0.4" diameter, band of narrow molded ribs outer edge	Row #	26
2	Historic Energy, Glass, insulator, fragment, aqua, pieces mend	Row #	2
1	Historic Furnishings, Glass, lamp chimney, fragment, clear/uncolored, lead glass	Row #	24
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, rounded finish, light aqua, patination	Row #	20
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, down-tooled finish, light aqua, patination	Row #	19
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, patent finish, light aqua	Row #	18
2	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, recessed panel, light aqua	Row #	17
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, paneled, light aqua, remnant of embossed lettering "R..." over, "...NDIAN..."	Row #	12
2	Historic Glass Vessel Fragments, Glass, bottle, unidentified, neck, light aqua	Row #	10
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, paneled, cobalt blue, remnant of embossed lettering "...EMIC..."	Row #	4
1	Historic Glass Vessel Fragments, Glass, container, ink/mucilage, body, paneled, light aqua	Row #	21
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, opaque white, press molded diamonds, possible vase fragment	Row #	25
1	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, paneled, clear/uncolored	Row #	22
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, light aqua, remnant of embossed cross symbol	Row #	13
1	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, light aqua, remnant of embossed lettering "WILL..." arched over, "BO..." over, "E..." reverse arched beneath	Row #	11
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, light aqua, remnant of embossed lettering "...TO..."	Row #	14

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, curved, unidentified, rim, clear/uncolored, un-fire polished rim, possibly lamp glass	Row #	23
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light green	Row #	16
5	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination	Row #	8
6	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	9
4	Historic Glass Vessel Fragments, Glass, tableware, pitcher, rim and body, pouring lip, clear/uncolored, pieces mend, opaque white glass rim, large molded beads exterior body	Row #	1
3	Historic Glass Vessel Fragments, Glass, tableware, unidentified, base and body, clear/uncolored, pieces mend, press molded star motif exterior surface	Row #	5
1	Historic Glass Vessel Fragments, Glass, tableware, unidentified, fragment, clear/uncolored, press molded star and diamond motif exterior surface	Row #	6
1	Historic Glass Vessel Fragments, Glass, unidentified, fragment, light aqua, melted, drip	Row #	15
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 5/64"	Row #	85
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 4/64"	Row #	84
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 4/64", mouth piece fragment	Row #	83
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem with spur, fragment, 5/64"	Row #	86
1	Historic Tools/Hardware, Ferrous metal, whole, corroded, collar/coupling threaded on exterior surface	Row #	33
4	Historic Tools/Hardware, Ferrous metal, fragment, corroded, large nail/spike fragments	Row #	28
1	Historic Tools/Hardware, Ferrous metal, saw, fragment, corroded	Row #	32
2	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous fragments	Row #	27
1	Modern Glass Vessel Fragments, Glass, bottle, base and body, brown, remnant of embossed lettering "...RETURN..."	Row #	3

Total Artifacts in Context 4: 169

Excavation Unit 2 Context 5

		Catalog #	54
1	Historic Building Materials, Coarse Earthenware, brick, fragment	Row #	24
1	Historic Building Materials, Ferrous metal, nail, fragment, cut-early machine headed (c. 1813-1830's), corroded	Row #	2
2	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	3
2	Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	4
3	Historic Building Materials, Glass, window, fragment, light aqua	Row #	9
3	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, brown manganese	Row #	16
2	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, body, glazed interior, clear lead, sherds mend, charred exterior surface	Row #	22
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, both surfaces missing	Row #	15
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead, exterior surface missing	Row #	20
2	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, rim, unglazed, interior surface missing	Row #	19
3	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, rim, glazed interior, piecrust rim, clear lead, sherds mend, charred exterior surface	Row #	21
2	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, brown manganese, exterior surface missing	Row #	17
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, body, glazed interior, brown manganese, charred exterior	Row #	23
5	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, unglazed exterior, interior surface missing	Row #	14
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, rim, glazed interior, brown manganese	Row #	18
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, scalloped, 1840-Present	Row #	33
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim, 1840-Present	Row #	34

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim to base, transfer printed overglaze, ribbed, polychrome, square/rectangular dish, faded red printed botanical motif with green clobbered in-filling, 1840-Present	Row #	39
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim and cavetto, 8" diameter, 1840-Present	Row #	35
4	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, saucer, rim to base, sherds mend, 1840-Present	Row #	25
3	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base, sherds mend, Maker's Mark, remnant of impressed maker's mark anchor symbol, lettering arched over "...NPORT", lettering in reverse arch beneath "IRONSTONE CHINA" 1805-1820 [Godden 1964:189]	Row #	26
18	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, surface missing, 1840-Present	Row #	29
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, interior surface missing, 1840-Present	Row #	30
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, rim, surface missing, 1840-Present	Row #	31
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, sherds mend, surface missing, 1840-Present	Row #	32
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base and foot ring, transfer printed underglaze, blue Chinoiserie, 1840 - 1915	Row #	38
6	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	28
7	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, plate, 20-30% complete, scalloped, sherds mend, 8" diameter, Maker's Mark, red printed maker's mark crown atop globe, lettering arched over "SEMI-PORCELAIN", lettering in reverse arches beneath "JOHNSON BROS." over, "ENGLAND" 1883-1913 [Godden 1964:355]	Row #	27
11	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	36
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, rim, 1870-Present	Row #	37
3	Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, fragment, both surfaces missing	Row #	41
5	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, plate, rim, Shell Edge-Unscalloped + Impressed (1840-1875), blue, sherds mend	Row #	44
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, handle, hand painted underglaze, blue, unidentified molded motif, 1815-Present	Row #	42
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, dipped/annular, blue, interior surface missing, 1815 - 1900	Row #	43
6	Historic Ceramic Vessel Sherds, Refined Earthenware, Yellowware, teapot, rim and body, Rockingham-type glaze, brown mottled, sherds mend, 1812 - 1920	Row #	40
1	Historic Clothing Related, Porcelain, button, four hole sew through, fragment, 0.45" diameter	Row #	45
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, neck and shoulder, light aqua, patination	Row #	10
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, paneled, light aqua, patination, remnant of embossed lettering "...NIC..."	Row #	13
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, light aqua, remnant of embossed lettering "...PA..." over, "NOV..."	Row #	12
3	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	11
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, lead glass	Row #	7
1	Historic Glass Vessel Fragments, Glass, tableware, unidentified, lid, clear/uncolored, unidentified press molded beaded motif interior surface with decorative finial	Row #	8
1	Historic Manufacturing, Slag, fragment	Row #	5
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 5/64"	Row #	46
3	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous fragments	Row #	1
1	Modern Glass Vessel Fragments, Glass, fragment, brown, curved	Row #	6

Total Artifacts in Context 5: 122

Excavation Unit 2 Context 6

Catalog # 55

1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, hollow ware, rim and body, glazed interior, clear lead	Row #	14
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**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, both surfaces missing	Row #	13
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead, surface missing	Row #	15
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, brown manganese, surface missing	Row #	16
13	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed interior, clear lead, same vessel	Row #	12
4	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, rim and body, sherds mend, 1840-Present	Row #	5
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, hollow ware, fragment, molded ribs exterior surface, 1840-Present	Row #	8
3	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, surface missing, 1840-Present	Row #	6
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	7
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, transfer printed underglaze, blue indeterminate motif, surface missing, remnant of unidentified impressed mark, 1840-Present	Row #	9
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	10
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, transfer printed underglaze, blue indeterminate motif, 1815 - 1915	Row #	11
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Yellowware, hollow ware, rim and body, 1827 - 1940	Row #	4
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, blob finish, light aqua	Row #	17
1	Historic Manufacturing, Slag, fragment	Row #	3
1	Historic Unidentified, Ferrous metal, fragment, corroded, large amorphous fragment with coal and two pieces clear lead glazed redware adhered by corrosion	Row #	2
1	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous fragment	Row #	1

Total Artifacts in Context 6: 35

Excavation Unit 2 Context 7		Catalog #	56
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	2
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	3
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, transfer printed flow, blue indeterminate motif, 1835 - 1910	Row #	1

Total Artifacts in Context 7: 3

Total Artifacts in Excavation Unit 2 : 750

Excavation Unit 3 Context 1		Catalog #	57
1	Historic Building Materials, tile, fragment, asbestos *	Row #	13
1	Historic Building Materials, Ferrous metal, hinge, strap, whole, corroded, some bolts with washers and nuts intact	Row #	1
2	Historic Building Materials, Ferrous metal, nail, fragment, wire, corroded	Row #	12
21	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	11
1	Historic Building Materials, Glass, window, fragment, light aqua	Row #	5
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, rim, unglazed	Row #	9
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, rim, beaded, surface missing, 1840-Present	Row #	10
1	Historic Glass Vessel Fragments, Glass, bottle, base and body, clear/uncolored, remnant of embossed lettering lower body "...TD" over, "...RED" over, "...PORTION" over, "...GE", embossed "I" within diamond symbol exterior base	Row #	3
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, solarized	Row #	6

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	4
1	Modern Arms and Armor, Composite, shotgun shell, fragment, corroded ferrous metal and copper alloy cap, black plastic cartridge	Row #	7
1	Modern Arms and Armor, Plastic, shotgun shell, fragment, white plastic, lettered "REM-PET" over "PATENTED"	Row #	8
2	Modern Glass Vessel Fragments, Glass, bottle, base and body, brown, stippled exterior base, pieces mend	Row #	2

Total Artifacts in Context 1: 35

Excavation Unit 3 Context 2		Catalog #	58
1	Historic Building Materials, Ferrous metal, hasp, whole, corroded, keyhole shaped opening	Row #	15
2	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	19
7	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	17
2	Historic Building Materials, Ferrous metal, nail, whole, cut-late machine headed (late 1830's to Present), corroded	Row #	20
4	Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	18
12	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	16
2	Historic Building Materials, Glass, window, fragment, light aqua	Row #	6
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, plate, rim and cavetto, sherds mend, 1840-Present	Row #	10
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified, fragment, multiple vessels, surface missing, 1840-Present	Row #	9
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, fragment, hand painted underglaze, black banded, 1870-Present	Row #	11
1	Historic Energy, Composite, insulator, fragment, corroded, porcelain insulator remnant of embossed lettering "B & D" over, "2" over, "T. SEPT. 307...", ferrous metal screw	Row #	1
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	2
3	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, blue/green	Row #	7
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, blue/green, remnant of embossed lettering "...N.P..."	Row #	8
1	Historic Glass Vessel Fragments, Glass, jar, lid liner, fragment, opaque white	Row #	5
1	Historic Glass Vessel Fragments, Glass, tableware, tumbler, base and body, paneled, clear/uncolored	Row #	4
1	Historic Glass Vessel Fragments, Glass, tableware, unidentified, body, paneled, clear/uncolored	Row #	3
9	Historic Glass Vessel Fragments, Glass, tableware, unidentified, fragment, light green, press molded botanical motif	Row #	12
1	Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 6/64"	Row #	13
2	Historic Tools/Hardware, Ferrous metal, whole, corroded, possible spike/large nail	Row #	22
3	Historic Tools/Hardware, Ferrous metal, fragment, corroded, possible spike/large nail	Row #	21
1	Historic Unidentified, Ferrous metal, fragment, corroded, thin, flat rectangular fragment	Row #	14

Total Artifacts in Context 2: 60

Total Artifacts in Excavation Unit 3 : 95

Trench 1 Surface Collection		Catalog #	1
1	Historic Building Materials, Composite, fragment, large section of unidentified timber with 1 large ferrous metal spike/nail intact, spike round in section	Row #	1
1	Historic Building Materials, Ferrous metal, hardware, fragment, corroded, L 38in, barstock square in section, 3" at ends bent (opposite directions)	Row #	4
1	Historic Building Materials, Ferrous metal, spike, whole, corroded, L 14in, 0.75" diameter, bent into "L" shape	Row #	2
1	Historic Building Materials, Ferrous metal, spike, whole, corroded, L 12in, upper portion of shaft round, flattened end 0.75" x 0.5" diameter	Row #	3

Total Artifacts in Context 0: 4

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Total Artifacts in Trench 1 : 4

Trench 2 Surface Collection	Catalog #	2
1 Historic Building Materials, Composite, fragment, large piece of structural timber with remnant of two large bolts intact	Row #	4
1 Historic Building Materials, Ferrous metal, bolt, whole, corroded, L 4.75in, nut attached	Row #	8
2 Historic Building Materials, Ferrous metal, brace, whole, corroded, large brace/bracket L: 24", W: 4", with shorter brace attached near center (L: 9"), three large bolts intact	Row #	7
1 Historic Building Materials, Ferrous metal, hardware, whole, corroded, L 84in, 1" diameter, tie bar, possible waling, rod curved "L" shaped bend 7" from one end with two thin square plates and two square nuts intact, other end 1 square nut intact	Row #	1
1 Historic Building Materials, Ferrous metal, hardware, fragment, corroded, possible tie bar, thin square plate with (loose) large square nut (2.2") and small square nut (1.5") attached to unbroken end	Row #	2
1 Historic Building Materials, Ferrous metal, hardware, fragment, corroded, large "L" shaped section, pipe end L: 26" D:3.2", large cap/head D: 5.5", other section L: 19"	Row #	9
1 Historic Building Materials, Ferrous metal, hardware, fragment, corroded, heavily corroded rod with (54") heavy chain attached, whole spike through other end of chain, each link 2.5"-3" in length	Row #	5
1 Historic Building Materials, Ferrous metal, hardware, fragment, corroded, L 25in, pipe, 3.5"-3.2" diameter, tapers slightly at threaded end	Row #	6
1 Historic Building Materials, Wood, unidentified, fragment	Row #	3

Total Artifacts in Context 0: 10

Total Artifacts in Trench 2 : 10

Shovel Test 3 Context 2	Catalog #	3
1 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	1

Total Artifacts in Context 2: 1

Total Artifacts in Shovel Test 3 : 1

Shovel Test 9 Context 2	Catalog #	4
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, rim, transfer printed underglaze, scalloped, brown floral motif, beaded band interior rim, 1840 - 1915	Row #	1

Total Artifacts in Context 2: 1

Total Artifacts in Shovel Test 9 : 1

Shovel Test 10 Context 1	Catalog #	5
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, body, clear/uncolored, molded ribbed motif exterior surface	Row #	1

Total Artifacts in Context 1: 1

Shovel Test 10 Context 2	Catalog #	6
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, base and foot ring, sherds mend, 1870-Present	Row #	1

Total Artifacts in Context 2: 2

Total Artifacts in Shovel Test 10 : 3

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Shovel Test 13 Context 2	Catalog #	7
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, rim, transfer printed underglaze, pink and green floral motif, 1870-Present	Row #	1
1 Historic Clothing Related, Copper alloy, button, four hole sew through, whole, 0.55" diameter, unidentified stamped decoration	Row #	2
1 Historic Tools/Hardware, Composite, handle, unidentified, fragment, corroded, ferrous metal rod, square in section with copper alloy handle	Row #	7
1 Historic Tools/Hardware, Ferrous metal, bolt, whole, corroded, hexagonal nut corroded in place	Row #	5
1 Historic Tools/Hardware, Ferrous metal, bolt, unidentified, whole, corroded	Row #	4
1 Historic Tools/Hardware, Ferrous metal, spike, whole, corroded	Row #	3
1 Historic Unidentified, Ferrous metal, unidentified, plate, fragment, corroded, unidentified square/rectangular flat plate	Row #	6

Total Artifacts in Context 2: 7

Total Artifacts in Shovel Test 13 : 7

Shovel Test 14 Context 1	Catalog #	8
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, transfer printed underglaze, red and green indeterminate motif, sherds mend, 1870-Present	Row #	1
4 Modern Recreation/Activities, Plastic, toy, fragment, blue, pieces mend, "Winnie the Pooh" figure c. 1960-1970	Row #	2

Total Artifacts in Context 1: 6

Total Artifacts in Shovel Test 14 : 6

Shovel Test 16 Context 1	Catalog #	9
1 Historic Building Materials, Ferrous metal, nail, whole, wrought, corroded	Row #	1
1 Historic Tools/Hardware, Ferrous metal, unidentified, whole, corroded, "U" shaped fold, bent into handle oval perforations at both ends for attachment'	Row #	2
1 Modern Tools/Hardware, Composite, fragment, corroded, ferrous metal plate, partially wrapped in thick formed rubber, unidentified mark, possible vehicle pedal	Row #	3

Total Artifacts in Context 1: 3

Total Artifacts in Shovel Test 16 : 3

Shovel Test 18 Context 2	Catalog #	10
1 Historic Building Materials, Ferrous metal, nail, whole, cut-late machine headed (late 1830's to Present), corroded	Row #	1
2 Modern Glass Vessel Fragments, Glass, container, unidentified, fragment, clear/uncolored, unidentified press molded motif exterior	Row #	2

Total Artifacts in Context 2: 3

Total Artifacts in Shovel Test 18 : 3

Shovel Test 23 Context 1	Catalog #	11
1 Historic Glass Vessel Fragments, Glass, bottle, unidentified, base and body, light aqua	Row #	1
1 Historic Tools/Hardware, Ferrous metal, strap, fragment, corroded, long strap "C" shape in section, round perforation at one end	Row #	2

Total Artifacts in Context 1: 2

Total Artifacts in Shovel Test 23 : 2

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Shovel Test 24 Context 2	Catalog #	12
1 Historic Unidentified, Ferrous metal, fragment, corroded, curved, possible pipe fragment	Row #	1
<i>Total Artifacts in Context 2: 1</i>		
<i>Total Artifacts in Shovel Test 24 : 1</i>		

Shovel Test 28 Context 1	Catalog #	13
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	1
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, surface missing, unidentified molded decoration, 1840-Present	Row #	7
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	8
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, 1870-Present	Row #	9
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	10
1 Historic Glass Vessel Fragments, Glass, container, stopper, whole, clear/uncolored	Row #	6
1 Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, clear/uncolored	Row #	3
7 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	2
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	5
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, ribbed	Row #	4
<i>Total Artifacts in Context 1: 17</i>		
<i>Total Artifacts in Shovel Test 28 : 17</i>		

Shovel Test 29 Context 1	Catalog #	14
2 Historic Glass Vessel Fragments, Glass, tableware, dish, rim and body, clear/uncolored, pieces mend, unidentified molded motif	Row #	2
3 Historic Glass Vessel Fragments, Glass, tableware, unidentified, lid, clear/uncolored, molded beads exterior surface	Row #	1
<i>Total Artifacts in Context 1: 5</i>		

Shovel Test 29 Context 2	Catalog #	15
1 Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	10
3 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	9
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, fragment, unglazed	Row #	7
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, rim, unglazed	Row #	8
1 Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, rim and cavetto	Row #	3
7 Historic Ceramic Vessel Sherds, Refined Earthenware, hotel china, cup, rim to base, transfer printed underglaze, blue floral motif, sherds mend, Maker's Mark, remnant of handle attachment, unidentified blue printed maker's mark, 1860-Present	Row #	2
9 Historic Ceramic Vessel Sherds, Refined Earthenware, hotel china, dish, 80-90% complete, transfer printed underglaze, blue, sherds mend, square dish, rounded corners, flared rim, large scale floral motif, unidentified maker's mark, 1860-Present	Row #	6
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	4
2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, rim, 1870-Present	Row #	5
1 Historic Clothing Related, Copper alloy, fastener, whole	Row #	16
1 Historic Furnishings, Glass, lamp chimney, rim, scalloped, clear/uncolored	Row #	13
3 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	12
3 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	11

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

5	Historic Glass Vessel Fragments, Glass, tableware, dish, 60-70% complete, clear/uncolored, 6" diameter, dish with fragment of domed lid molded decorative knob, unidentified molded decorative motif	Row #	15
6	Historic Glass Vessel Fragments, Glass, tableware, unidentified, rim and body, scalloped, clear/uncolored, molded beads exterior surface, possible lid	Row #	14
1	Indeterminate Fauna, Bone, mammal, rib, fragment	Row #	1

Total Artifacts in Context 2: 47

Total Artifacts in Shovel Test 29 : 52

Shovel Test 30 Context 2 **Catalog # 16**

3	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, rim and body, same vessel, 1870-Present	Row #	2
1	Historic Glass Vessel Fragments, Glass, container, unidentified, body, clear/uncolored, unidentified molded decoration exterior surface	Row #	1

Total Artifacts in Context 2: 4

Total Artifacts in Shovel Test 30 : 4

Shovel Test 32 Context 1 **Catalog # 17**

2	Historic Building Materials, Coarse Earthenware, tile, fragment, unglazed, pieces mend, pink body, possible drain tile	Row #	1
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Total Artifacts in Context 1: 2

Total Artifacts in Shovel Test 32 : 2

Shovel Test 35 Context 2 **Catalog # 18**

2	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	4
1	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	3
11	Historic Glass Vessel Fragments, Glass, container, jar, rim, body and base, aqua, some pieces mend, molded ribs exterior rim with D-shaped lugs for attachment of wire bale, embossed lettering on exterior neck "WIRE SIDE", remnant of script lettering on body "Ba..." over "...PATD JULY 14...", embossed "2" exterior base	Row #	2
1	Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, clear/uncolored, embossed mark exterior base large "H" with "A" inside over, "10-K-861"	Row #	1
1	Historic Tools/Hardware, Ferrous metal, bolt, square head, whole, corroded	Row #	5
1	Historic Unidentified, Ferrous metal, container, fragment, cast, corroded, large decorative ferrous metal cup with remnant of decorative arm attached to underside, possible fragment of flower pot bracket [Sears 1897:88]	Row #	6

Total Artifacts in Context 2: 17

Total Artifacts in Shovel Test 35 : 17

Shovel Test 39 Context 1 **Catalog # 19**

1	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	2
1	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, wire, corroded	Row #	1
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, fragment, unglazed	Row #	3
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed, brown manganese, surface missing	Row #	4
3	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, multiple vessels, surface missing, 1840-Present	Row #	5
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, 1870-Present	Row #	6

Total Artifacts in Context 1: 8

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Total Artifacts in Shovel Test 39 : 8

Shovel Test 41 Context 1	Catalog #	20
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Red bodied slipware, unidentified form, fragment, slip trailed, clear lead, 1670 - 1850	Row #	1

Total Artifacts in Context 1: 1

Total Artifacts in Shovel Test 41 : 1

Shovel Test 42 Context 1	Catalog #	21
1 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	3
1 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	4
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	1
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	2
1 Historic Tools/Hardware, Ferrous metal, rod, fragment, corroded, bent into "L" shape	Row #	5
1 Historic Tools/Hardware, Ferrous metal, rod, fragment, corroded, round eye at one end	Row #	6

Total Artifacts in Context 1: 6

Total Artifacts in Shovel Test 42 : 6

Shovel Test 43 Context 2	Catalog #	22
1 Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, fragment, both surfaces missing	Row #	1

Total Artifacts in Context 2: 1

Total Artifacts in Shovel Test 43 : 1

Shovel Test 44 Context 1	Catalog #	23
1 Modern Glass Vessel Fragments, Glass, bottle, beverage, body, green, remnant of embossed lettering "7-U..."	Row #	1

Total Artifacts in Context 1: 1

Total Artifacts in Shovel Test 44 : 1

Shovel Test 46 Context 1	Catalog #	24
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	3
1 Historic Building Materials, Ferrous metal, nail, cut type, whole, corroded	Row #	2
1 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	1

Total Artifacts in Context 1: 3

Total Artifacts in Shovel Test 46 : 3

Shovel Test 49 Context 2	Catalog #	25
1 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present	Row #	1

Total Artifacts in Context 2: 1

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Total Artifacts in Shovel Test 49 : 1

Shovel Test 53 Context 1	Catalog #	26
1 Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, olive green	Row #	1
1 Historic Glass Vessel Fragments, Glass, bottle, unidentified, shoulder, clear/uncolored, remnant of embossed lettering "...UAR..."	Row #	3
1 Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, clear/uncolored	Row #	2
<i>Total Artifacts in Context 1: 3</i>		
<i>Total Artifacts in Shovel Test 53 : 3</i>		

Shovel Test 56 Context 1	Catalog #	27
1 Historic Arms and Armor, Copper alloy, shotgun shell, fragment, corroded, stamped lettering "U.M.C. CO. No. 12 NEW CLUB"	Row #	1
<i>Total Artifacts in Context 1: 1</i>		
<i>Total Artifacts in Shovel Test 56 : 1</i>		

Shovel Test 61 Context 1	Catalog #	28
1 Historic Arms and Armor, Copper alloy, bullet, fragment, 0.22", stamped "U"	Row #	7
3 Historic Arms and Armor, White Metal, bullet, fragment, 0.38", stamped "REM-UMC" "38 SPL"	Row #	9
1 Historic Arms and Armor, White Metal, bullet, fragment, 0.38", stamped "R-P" "38 SPL"	Row #	8
1 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	1
5 Historic Building Materials, Glass, window, fragment, light aqua	Row #	14
1 Historic Commerce, Copper alloy, coin, Lincoln head penny, whole, 1978	Row #	6
1 Historic Commerce, Copper alloy, coin, Lincoln head penny, whole, 1946	Row #	5
1 Historic Glass Vessel Fragments, Glass, bottle, unidentified, fragment, two-part finish, brown	Row #	20
9 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, green	Row #	15
10 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	12
2 Historic Glass Vessel Fragments, Glass, tableware, unidentified, handle, green, pieces mend, large molded handle	Row #	16
1 Historic Manufacturing, Slag, fragment	Row #	4
4 Historic Unidentified, Ferrous metal, unidentified, fragment, corroded, thin flat fragments	Row #	3
2 Historic Unidentified, Ferrous metal, wire, fragment, corroded	Row #	2
1 Modern Furnishings, Composite, light bulb, fragment, copper alloy and glass	Row #	10
1 Modern Glass Vessel Fragments, Glass, bottle, unidentified, neck, brown	Row #	19
1 Modern Glass Vessel Fragments, Glass, container, unidentified, base, stippled, brown	Row #	18
1 Modern Glass Vessel Fragments, Glass, container, unidentified, base, stippled, clear/uncolored	Row #	13
22 Modern Glass Vessel Fragments, Glass, curved, unidentified, fragment, brown	Row #	17
1 Modern Unidentified, Plastic, fragment, white	Row #	11
<i>Total Artifacts in Context 1: 69</i>		

Shovel Test 61 Context 2	Catalog #	29
1 Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	1
1 Historic Building Materials, Glass, window, fragment, light aqua	Row #	6
1 Historic Ceramic Vessel Sherds, Refined Earthenware, fragment, unidentifiable decoration, yellow and brown, surface missing	Row #	7

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, remnant of embossed lettering "...DO NO..."	Row #	5
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light green	Row #	4
5	Historic Glass Vessel Fragments, Glass, flat, unidentified, fragment, clear/uncolored	Row #	3
1	Historic Tools/Hardware, Ferrous metal, spike, unidentified, fragment, corroded	Row #	2
13	Modern Glass Vessel Fragments, Glass, fragment, brown, curved	Row #	8

Total Artifacts in Context 2: 24

Total Artifacts in Shovel Test 61 : 93

Shovel Test 62 Context 1

		Catalog #	30
1	Historic Building Materials, Ferrous metal, nail, fragment, wire, corroded	Row #	2
1	Historic Building Materials, Glass, window, fragment, light aqua	Row #	9
1	Historic Energy, Carbon, battery part, fragment	Row #	1
23	Historic Glass Vessel Fragments, Glass, bottle, beverage, 80-90% complete, crown finish, light aqua, embossed lettering "REGISTERED" over, "THE W. CAWLEY, CO." arched over, "SOMERVILLE" over, "DOVER" over, "FLEMINGTON" over, "N.J." over, "THIS BOTTLE" over, "NOT TO BE SOLD", embossed "C" exterior base	Row #	10
1	Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, recessed panel, clear/uncolored	Row #	8
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, olive green, narrow contact molded ribs	Row #	6
4	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	7
1	Historic Tools/Hardware, Copper alloy, washer, whole, corroded	Row #	4
1	Historic Unidentified, Ferrous metal, fragment, corroded, thin, flat fragment	Row #	3
1	Modern Glass Vessel Fragments, Glass, curved, unidentified, fragment, brown	Row #	5

Total Artifacts in Context 1: 35

Shovel Test 62 Context 2

		Catalog #	31
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Yellowware, unidentified form, fragment, Rockingham-type glaze, brown mottled, surface missing, 1812 - 1920	Row #	3
2	Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, clear/uncolored	Row #	2
3	Modern Glass Vessel Fragments, Glass, fragment, brown, curved	Row #	1

Total Artifacts in Context 2: 6

Total Artifacts in Shovel Test 62 : 41

Shovel Test 63 Context 1

		Catalog #	32
2	Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, 0.22", rim fired, stamped script "W"	Row #	5
1	Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, 0.38", center fired, lettered "BROWNING" over, "380 AUTO"	Row #	6
1	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	4
1	Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	3
3	Historic Tools/Hardware, Ferrous metal, chain, fragment, corroded	Row #	1
1	Historic Tools/Hardware, Ferrous metal, unidentified, fragment, corroded, unidentified large rod, round section at one end, square at opposite end	Row #	2
1	Modern Glass Vessel Fragments, Glass, bottle, base, brown, stippled	Row #	7

Total Artifacts in Context 1: 10

Shovel Test 63 Context 2

		Catalog #	33
1	Historic Energy, Carbon, battery part, fragment	Row #	1

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1 Historic Glass Vessel Fragments, Glass, curved, unidentified, base, brown, remnant of embossed number "...L-1207" over "9..." over "...9" Row # 2

Total Artifacts in Context 2: 2

Total Artifacts in Shovel Test 63 : 12

Shovel Test 64 Context 1 **Catalog # 34**

1 Historic Building Materials, Glass, window, fragment, light aqua Row # 3

2 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, stenciled, polychrome, interior surface missing, red, blue and green decoration exterior, 1815-Present Row # 2

1 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, rim, transfer printed underglaze, blue indeterminate motif, 1815 - 1915 Row # 1

1 Historic Recreation/Activities, Ball Clay, smoking pipe, stem, fragment, 5/64" Row # 6

1 Modern Glass Vessel Fragments, Glass, fragment, brown Row # 4

1 Modern Glass Vessel Fragments, Glass, fragment, clear/uncolored, unidentified press molded motif, remnant of embossed lettering "...TOP..." Row # 5

Total Artifacts in Context 1: 7

Total Artifacts in Shovel Test 64 : 7

Shovel Test 65 Context 1 **Catalog # 35**

1 Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, 0.22", rim fired, stamped lettering "...UPER" Row # 2

2 Historic Energy, Coal, fragment Row # 1

Total Artifacts in Context 1: 3

Total Artifacts in Shovel Test 65 : 3

Shovel Test 66 Context 1 **Catalog # 36**

1 Historic Glass Vessel Fragments, Glass, container, unidentified, body, clear/uncolored, remnant of embossed script lettering "...all..." Row # 2

1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored Row # 1

Total Artifacts in Context 1: 2

Shovel Test 66 Context 2 **Catalog # 37**

1 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded Row # 1

Total Artifacts in Context 2: 1

Total Artifacts in Shovel Test 66 : 3

Shovel Test 67 Context 1 **Catalog # 38**

1 Historic Building Materials, Ferrous metal, nail, fragment, wire, corroded Row # 2

2 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded Row # 1

1 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded Row # 3

2 Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present Row # 10

3 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, 1870-Present Row # 11

2 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, base and foot ring, interior surface missing, 1870-Present Row # 13

4 Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, fragment, surface missing, 1870-Present Row # 12

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Ceramic Vessel Sherds, Refined Earthenware, unidentified, rim, unidentifiable decoration, blue indeterminate motif	Row #	9
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, rim, transfer printed underglaze, blue indeterminate motif, 1815 - 1915	Row #	8
1	Historic Glass Vessel Fragments, Glass, bottle, unidentified, body, recessed panel, clear/uncolored, solarized, remnant of embossed lettering "AUSTIN..." over, "MONARCH..." over, "...NEW..."	Row #	7
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination	Row #	5
2	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	6
1	Historic Recreation/Activities, Graphite, clay pigeon, fragment	Row #	4

Total Artifacts in Context 1: 22

Total Artifacts in Shovel Test 67 : 22

Shovel Test 68 Context 1

Catalog # 39

1	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	3
1	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	2
1	Historic Building Materials, Glass, window, fragment, light aqua	Row #	1
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, fragment, unglazed exterior, interior surface missing	Row #	4
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Pearlware, unidentified form, base and foot ring, interior surface missing, 1775 - 1840	Row #	6
2	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, fragment, molded floral motif exterior surface, 1870-Present	Row #	5
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, unidentified form, base and foot ring, interior surface missing, 1870-Present	Row #	7

Total Artifacts in Context 1: 8

Shovel Test 68 Context 2

Catalog # 40

1	Historic Building Materials, Ferrous metal, nail, lath, whole, corroded	Row #	1
1	Historic Building Materials, Glass, window, fragment, light aqua	Row #	3
1	Historic Energy, Coal, fragment	Row #	2
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination, remnant of embossed lettering "...PA..."	Row #	5
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua, patination	Row #	4

Total Artifacts in Context 2: 5

Total Artifacts in Shovel Test 68 : 13

Shovel Test 69 Context 1

Catalog # 41

1	Historic Building Materials, Ferrous metal, nail, fragment, cut-late machine headed (late 1830's to Present), corroded	Row #	10
1	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	8
1	Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	9
1	Historic Building Materials, Glass, window, fragment, light aqua	Row #	1
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, plate, rim, unidentifiable decoration, scalloped, green, 1870-Present	Row #	6
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, hand painted underglaze, polychrome, surface missing, red, black and green floral motif, 1815-Present	Row #	5
1	Historic Commerce, Copper alloy, coin, Lincoln head penny, whole, 1963	Row #	4
1	Historic Glass Vessel Fragments, Glass, container, unidentified, base and body, clear/uncolored	Row #	3

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored, unidentified contact molded motif	Row #	2
1	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous	Row #	7

Total Artifacts in Context 1: 10

Shovel Test 69 Context 2 **Catalog # 42**

1	Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, 0.22", rim fired	Row #	4
1	Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, glazed, brown manganese, surface missing	Row #	2
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, exterior surface missing, 1840-Present	Row #	3
2	Historic Unidentified, Ferrous metal, fragment, corroded, amorphous fragment	Row #	1

Total Artifacts in Context 2: 5

Total Artifacts in Shovel Test 69 : 15

Shovel Test 73 Context 2 **Catalog # 43**

1	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	2
1	Historic Building Materials, Ferrous metal, nail, unidentified, whole, corroded	Row #	3
2	Historic Building Materials, Glass, window, fragment, light aqua	Row #	9
2	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, rim, sherds mend, 1815-Present	Row #	5
2	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	8
1	Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light green, unidentified design exterior surface	Row #	7
1	Historic Unidentified, Ferrous metal, fragment, corroded, possible spike fragment	Row #	4
1	Historic Unidentified, Ferrous metal, container, fragment, corroded, possible can fragment	Row #	1
2	Modern Glass Vessel Fragments, Glass, container, unidentified, fragment, stippled, brown, remnant of embossed lettering "...FILLED..."	Row #	6
1	Modern Unidentified, Plastic, fragment, red, possible reflector	Row #	10

Total Artifacts in Context 2: 14

Shovel Test 73 Context 3 **Catalog # 44**

2	Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	15
1	Historic Building Materials, Ferrous metal, nail, fragment, wire, corroded	Row #	14
11	Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	13
5	Historic Building Materials, Glass, window, fragment, light aqua	Row #	9
1	Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, fragment, unidentified molded motif exterior surface	Row #	8
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, base, interior surface missing	Row #	6
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, 1840-Present	Row #	5
4	Historic Ceramic Vessel Sherds, Refined Earthenware, Ironstone, unidentified form, fragment, surface missing, 1840-Present	Row #	4
1	Historic Ceramic Vessel Sherds, Refined Earthenware, semi-porcelain, hollow ware, base and foot ring, 1870-Present	Row #	7
1	Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, 1815-Present	Row #	3
1	Historic Clothing Related, Porcelain, button, four hole sew through, whole, 0.4" diameter	Row #	2
1	Historic Glass Vessel Fragments, Glass, flat, unidentified, fragment, clear/uncolored	Row #	10
1	Historic Glass Vessel Fragments, Glass, tableware, unidentified, body, clear/uncolored, large press molded beads exterior surface	Row #	11
1	Historic Glass Vessel Fragments, Glass, tableware, unidentified, fragment, opaque white, unidentified molded decoration exterior	Row #	12

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

1 Historic Manufacturing, Slag, unidentified, fragment	Row #	17
1 Historic Tools/Hardware, Copper alloy, fragment, possible furniture hardware, thin, flat unidentified strip with round perforation one end	Row #	1
1 Historic Unidentified, Ferrous metal, fragment, corroded, thick, curved fragment, possible kettle fragment	Row #	16

Total Artifacts in Context 3: 35

Total Artifacts in Shovel Test 73 : 49

Shovel Test 74 Context 1	Catalog #	45
1 Historic Arms and Armor, Copper alloy, bullet, fragment, corroded, rim fire	Row #	1
3 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	11
1 Historic Building Materials, Ferrous metal, spike, unidentified, whole, corroded	Row #	10
1 Historic Building Materials, Glass, window, fragment, light aqua	Row #	2
1 Historic Ceramic Vessel Sherds, Porcelain, hard paste, unidentified form, fragment, transfer printed overglaze, unidentified color indeterminate motif, black printed, red clobbered in-filling	Row #	8
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, hollow ware, rim, transfer printed underglaze, blue indeterminate motif, burned, 1815 - 1915	Row #	6
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, fragment, surface missing, 1815-Present	Row #	5
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Whiteware, unidentified form, rim, transfer printed underglaze, blue indeterminate motif, 1815 - 1915	Row #	7
2 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	3
7 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	4
1 Historic Tools/Hardware, Ferrous metal, screw, whole, corroded	Row #	12
1 Historic Unidentified, Porcelain, hard paste, figurine, fragment, hand painted overglaze, gold, horse/mule head, faded gold highlights	Row #	9

Total Artifacts in Context 1: 21

Shovel Test 74 Context 2	Catalog #	46
1 Historic Building Materials, Ferrous metal, nail, whole, wire, corroded	Row #	9
4 Historic Building Materials, Ferrous metal, nail, unidentified, fragment, corroded	Row #	10
1 Historic Building Materials, Glass, window, fragment, light aqua	Row #	5
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, flower pot, rim, unglazed	Row #	3
1 Historic Ceramic Vessel Sherds, Coarse Earthenware, Redware, unidentified form, fragment, both surfaces missing	Row #	2
1 Historic Ceramic Vessel Sherds, Refined Earthenware, Pearlware, hollow ware, rim, dipped/annular, blue banded, blue bands on white ground, 1790 - 1890	Row #	1
1 Historic Glass Vessel Fragments, Glass, container, unidentified, fragment, clear/uncolored, contact molded rib	Row #	7
1 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, clear/uncolored	Row #	6
2 Historic Glass Vessel Fragments, Glass, curved, unidentified, fragment, light aqua	Row #	4
1 Historic Tools/Hardware, Ferrous metal, screw, whole, corroded	Row #	8

Total Artifacts in Context 2: 14

Total Artifacts in Shovel Test 74 : 35

Shovel Test 78 Context 2	Catalog #	47
2 Historic Building Materials, Glass, window, fragment, light aqua	Row #	1
1 Historic Glass Vessel Fragments, Glass, tableware, unidentified, fragment, pink	Row #	2
1 Modern Unidentified, Plastic, fragment, white	Row #	3

**APPENDIX D (Cont.)
ARTIFACT CATALOG**

Total Artifacts in Context 2: 4
Total Artifacts in Shovel Test 78 : 4

Total Number of Artifacts: 1315

*** Item Discarded in Laboratory**

Appendix E

NEW JERSEY STATE MUSEUM SITE REGISTRATION FORM



NEW JERSEY STATE MUSEUM
 ARCHAEOLOGICAL SITE REGISTRATION PROGRAM
 BUREAU OF ARCHAEOLOGY & ETHNOLOGY
 PO BOX 530, TRENTON, N.J. 08625-0530
 Ph.(609) 292-8594; Fx.(609) 292-7636

Site Name: Morris Canal Lock 2 East

SITE NO.: 28- Mr-320

NJ State Atlas Coordinates:

USGS 7.5 Minute Series Quad. Name:

UTM Coordinates (required): 18 05 34 004 E / 45 27 823 N

County Morris Township: Borough of Wharton

Location (descriptive): Western end of Hugh Force Park

Period of Site: 19th through 20 century

Type of Site (historic/prehistoric): Historic

Cultural affiliation(s) (if known): Historic

Owner's (Tenant's) Name: Borough of Wharton

Address

Phone:

Attitude Toward Preservation: Restoration in progress

Surface Features: Lock and lock tender's house ruin

Prominent Landmarks: Lock tender's house ruin

Vegetation Cover: Lawn

Nearest Water Source: Stephen's Brook Distance: Adjacent to site

Soil Type: Historic fill Erosion: Low

Stratified (if known): Yes

Threat of Destruction (if known): Low

Previous Work (list below):

	By Whom	Date	Collection Stored	Previous Designation
1.				
2.				
3.				

(attach additional sheets if necessary)

Recorder's Name: James Lee – Hunter Research, Inc.

Address: 120 West State Street, Trenton, NJ 08608

Phone: 609 695 0122

Collection Stored: Hunter Research, Inc., Trenton, NJ

Date Recorder at Site: September – October 2006

Sketch Map of the Site:

Indicate the chief topological features, such as streams, swamps, shorelines, and elevations (approx). Also show buildings and roads. Indicate the site location by enclosing the site area with a dotted line. Use a scale (approx) to indicate distance and dimensions.



See Attached USGS Quadrangle

Scale: 1 inch = 2000 feet

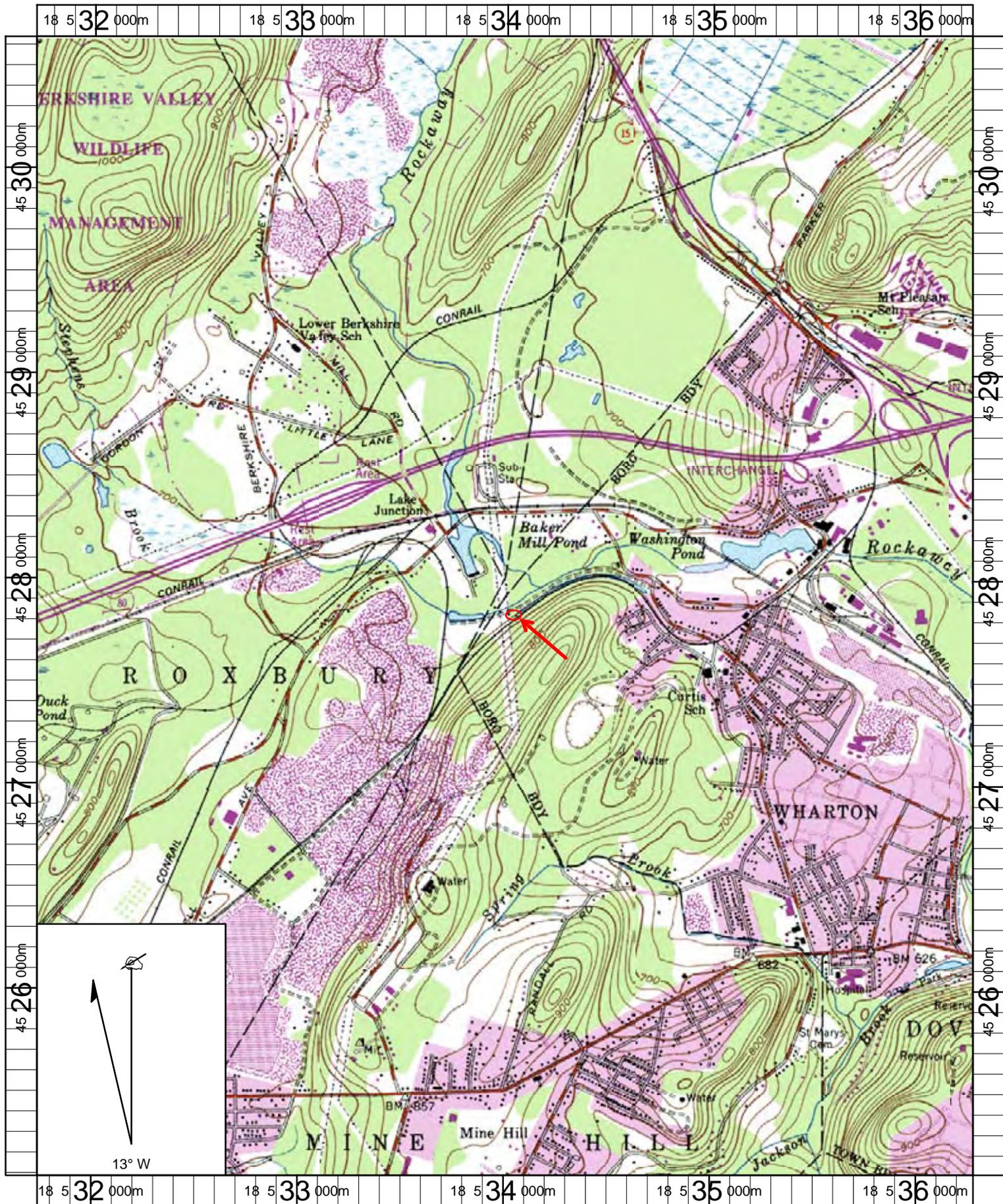
Observations, Remarks, or Recommendations:

The site of a lock on the Morris Canal. The top few feet of the lock has been removed but the remainder of the lock appears to remain intact below ground. The lock tender's house is in ruins on the site and archaeological testing has shown that historic deposits remain on site.

References:

	Unpublished	Approx. Date		Published	Date
1.	Archaeological Investigation and Management Plan, Morris Canal Lock 2 East, Borough of Wharton, Morris County, New Jersey	January 2007	1.	On file, Morris County	January 2007
2.			2.		
3.			3.		
4.			4.		

(attach additional sheets if necessary)



Name: DOVER
 Date: 1/2/2007
 Scale: 1 inch equals 2000 feet

Location: 18 0533996 E 4527872 N
 Caption: Morris Canal Lock 2 East

Appendix F
RESUME

1997-2000 Laboratory Supervisor
Cultural Resource Consulting Group, Highland Park, New Jersey

Technical and managerial responsibilities for laboratory components of archaeological projects. Participation in:

- management of laboratory operations
- supervision of laboratory personnel
- computerization of artifact data
- prehistoric and historic ceramic analysis
- preparation of artifact inventories
- writing artifact section of reports

1996-1997 Field Technician
Cultural Resource Consulting Group, Highland Park, New Jersey

PROFESSIONAL AFFILIATIONS

Archaeological Society of New Jersey, Recording Secretary
Society for Pennsylvania Archaeology (Chapter 14 Board Member)
New York State Archaeological Association
Canal Society of New Jersey
Warren County Morris Canal Committee

Appendix G

**NEW JERSEY HISTORIC PRESERVATION OFFICE
BIBLIOGRAPHIC ABSTRACT**

APPENDIX G
New Jersey Historic Preservation Office
Bibliographic Abstract

HUNTER RESEARCH, INC.

Location: Morris Canal Lock 2 East, Wharton, Morris County, NJ

Drainage Basin: Stephen's Brook

U.S.G.S. Quadrangle: Dover, N.J.

Project: Archaeological Investigations and Management Plan, Morris Canal Lock 2 East, Wharton Borough, Morris County, New Jersey

Level of Survey: II

Cultural Resources: 28Mr320

Appendix H

PROJECT ADMINISTRATIVE DATA

APPENDIX H

Project Administrative Data

HUNTER RESEARCH, INC. PROJECT SUMMARY

Project Name: Archaeological Investigations and Management Plan, Morris Canal Lock 2 East, Wharton Borough, Morris County, New Jersey

Level of Survey: II

HRI Project Reference: 06052

Date of Report: January 2007 [Revised November 2007]

Client: HJGA Consulting, Architecture & Historic Preservation, Inc.

Address:

Review Agency: Morris County Historic Preservation Program

Agency Reference:

Artifacts/Records Deposited:

PROJECT CHRONOLOGY

Date of Contract Award: 7/7/2006

Notice to Proceed: 7/7/2006

Background Research: August-September 2006

Fieldwork: September-October 2006

Analysis: October 2006

Report Written: November 2006-January 2007

PROJECT PERSONNEL

Principal Investigator(s): Richard Hunter, James Lee

Background Researcher(s): James Lee

Field Supervisor(s): Joshua Butchko

Field Assistant(s): Seth Gartland, Marjan Osman

Analyst(s): Rebecca White

Draftperson(s): Frank Dunsmore

Report Author(s): James Lee

4 ANALYSIS

The following **Analysis** section summarizes the results of a survey-level assessment with regard to the existing buildings and site features of the Lock 2 East site. This section also identifies the significant features, and analyzes the potential for use and interpretation. This analysis therefore helps to guide the long-term recommendations for the restoration of Lock 2 East.

4.1 Identification of Significant Features

- Existing open space surrounding the lock site provides a context that evokes the site's historic appearance albeit more overgrown than during operation of the canal and lock.
- The watered portion of the canal prism from the lock site east to the existing parking facilities at Hugh Force Park creates a pristine setting and a near accurate appearance of the canal during its operation.
- The existing pond which formerly served as the canal basin is extant and its proximity to the lock site also evokes a sense of the relationship between the lock and basin during the operation of the Morris Canal.
- The existing tow path at the canal prism and the canal basin.
- The relationship of Stephens Brook to the basin, the prism and the lock site. Stephens Brook continues to serve as a water source for the canal prism as fed by the pond and other sources.
- The ruins of the lock tender's house are in a state of preservation that shows the relationship of the house to the lock and its role in the operation of the lock and canal system. It is a rare surviving stone lock tender's house even in its current state of ruin.
- The railroad embankment of the Central Railroad of New Jersey set along the south end of the lock site provides context to the site's historic appearance in the late nineteenth century and shows the relationship of the railroad to the canal during this latter period of operation.
- The archaeological remains of the lock including the lock walls, timber flooring, the loose components of the top of the lock, select wrought iron mechanisms and other features.
- The visible remains of the lock including the tops of the lock walls, and the splayed headwalls at the east end of the lock.
- The potential archaeological features of foot bridges, the tender's shed, privies and other features.
- Possible prehistoric archaeological resources that could be present near the natural brook.
- Potential for the site to continue to yield additional cultural material related to the use and function of the lock and its inhabitants.

4.2 Site Analysis

General Description

The study area is basically a linear path that expands at the lock site. The site runs from the parking lot located off Pine Street and travels west along the canal prism to the lock site and to the former canal basin beyond. The overall site is readily accessible from Route 80 via Route 15. The site is also part of the proposed Morris Canal Greenway in Morris County connecting other sites along the Morris Canal for recreational and historical interpretation purposes. The lock, the canal prism and basin are generally oriented in an east/west direction while the lock tender's house is oriented in a north/south direction.

The majority of the site is relatively flat particularly the area at the lock, between the lock tender's house and the lock, and the connecting tow paths at the basin, lock and canal prism. The ground slopes significantly up toward the railroad embankment, the edge of the prism and at the house. There is a mound of soil piles along the west and north edges of the canal basin creating a visual and physical cutoff between the lock site and the basin. Stephens Brook, an associated water

4 ANALYSIS

channel which feeds the canal prism, is located to the north of the tow path and set a few feet below the level ground of the lock site. The Brook flows in a general west to east direction.

Vehicular Access

The parking lot located at the east end of the site provides vehicle access from Pine Street and room for approximately fifty or more vehicles. Access between the parking area and the tow path is completely unobstructed and promotes use of the site for recreational purposes on a year-round basis.

The parking is not structured and the lot is rough gravel. There is no designated barrier-free parking space. A port-o-john is provided for visitors' convenience. There is easy access to the canal and lock site, and relatively easy access to the former railroad right of way which is located at the embankment above; this embankment is also used for recreational purposes. The canal, lock and railroad embankment are part of a walking tour prepared by the Morris County Heritage Commission that is basically a circular route between all three components. Unfortunately, the canal to the west of the basin has been obliterated and ends at a salvage yard.

Pedestrian Access

It is an approximately quarter mile trek from the parking area to the lock site along the canal prism. It is a picturesque walk as there is a canopy of trees that lines the north side of the tow path and the south edge of the canal prism. The abundance of trees and natural growth differs from the canal's historic appearance where the amount of trees would have been much less and would not have been set as close to the prism as currently. The continuous tow path from the parking area along the lock site and beyond the canal basin along with the relatively open path along the railroad right of way promotes recreational use of the site for walking, hiking and nature observation. There is wildlife in the marshy land north of the lock site and within the canal basin.

The historic configuration of the tow path differs from what is present today. There was a more significant change in grade from the canal prism up to the level of the lock and a more shallow change down to the level of the path at the basin. When the lock was dismantled, the tow path at the lock was obliterated while it remains essentially intact at the restored canal prism and along the canal basin to the west. There were also at least three wooden footbridges, one that traversed over the water channel that is fed by Stephens Brook along the tow path, one over the east end of the lock and a third between the lock site and the lock tender's house over the former waste weir. The one over Stephen's Brook was created during the dismantling and appears to be smaller while the two other have been removed from the landscape.

Although not an official part of the lock site, the railroad right of way is a key component of the current recreational use of the site. Visitors often extend their walks of the site by taking an angled path to the east of the lock tender's house or via a path located west of the canal basin. This right of way is relatively clear except in the vicinity of the lock tender's house where there are piles of railroad ties obstructing both the path and view. From this vantage point is an amazing view of the entire lock site which shows clearly the relationship between the canal basin and the lock, and the lock and the lock tender's house.

4.3 Architectural and Archaeological Condition Assessment

The focus of the condition assessment of the architectural and archaeological fabric is on two elements of the site, the ruins of the lock tender's house and the revealed portions of the lock. The lock conditions are presented in general terms with assumptions made as to conditions of the

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remaining concealed portions of the lock based on those portions made visible through archaeological investigations. The ruins of the lock tender's house are unstable and therefore the evaluators traversed this portion of the site with caution and were unable to reach all sections.

Lock 2 East

The west and east ends of the lock were revealed during archaeological investigations. For a more complete analysis of the findings of the archaeological investigations refer to Section 3 of this report. However, certain architectural and structural conditions were revealed which will provide insight into the possible repairs that will be required to return the lock to a functioning condition.

Lock Walls: The stone walls of the lock were revealed at the west and east ends; these were the locations of the gates which controlled the flow of water and entry and exit of the boats into the lock and back into the canal. As such, these conditions are typical from the center portion of the lock which would be flush stone walls where there are recesses in the stone at the east and west end. The top two to three feet of stone of the lock walls were removed as part of the abandonment. Based on the debris found within the lock excavations it appears the stone from the tops of the lock was discarded in this location. The existing stone appears in overall good condition exhibiting mortar loss throughout as well as localized repairs that were conducted prior to the abandonment of the canal. This is particularly evident at the east end of the lock where it appears concrete was poured at deteriorated sections. It also appears that the stone had been repointed during its lifetime on at least one occasion but possibly more. The mortar is loose and mud-like in many locations.

Of course, the wood planking which lined the walls is no longer extant but there remains evidence of the attachments between the planking and the stone walls. The excavations also revealed the pockets for the gates at each end of the lock. The stone in these locations is in very good condition and will help to confirm the dimensions and other features of the gates when being restored.

Lock Features: The archaeological investigations did not extend to the bottom of the lock as a precautionary measure in order to not damage the possible extant plank flooring. Even though these features were not revealed, based on the findings of the investigations it is anticipated that the plank flooring is extant in total or in part. Given that the flooring has remained in a wet or moist condition since its installation it is possible it is in good condition. However, there is the potential it sustained some damage when the large stones framing the top of the lock were dumped into the lock. This cannot be determined until the lock is fully excavated.

The archaeologists also revealed metal components of the gates including hinges and a portion of a wicket through their investigations. These are critical components in understanding the operation of the gates and will provide valuable insight when reconstructing the gates for operation.

As previously stated, the landscape surrounding the lock site has been cut back thereby changing the relationship of the lock to the remaining features. This is not a detrimental condition as it appears the ground slope, drainage and other features are in functioning order. Stephens Brook has been compromised to the west of the lock site which is lessening the flow of water into the canal prism. As a result, the water in the prism is lower than desired and the water can become stagnant. Water flow from Stephens Brook has not stopped but has diminished. In addition,

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damming west of the canal basin by beavers also impacts the water flow in the area between the various brooks and tributaries and also contributes to the stagnated water in the pond.

Lock Tender's House

The lock tender's house is in a state of ruin and presents precarious conditions at many areas. The house had a fire in the 1970s and therefore has been subjected to the weather for over twenty-five years. Nothing remains of the roof, the floor structures or other wood framing elements including windows and doors. The majority of the remains are the stone masonry walls at both the main house and the kitchen wing.

The main house has portions of all four of its exterior walls in a ruined state of preservation. As such, the walls that do remain are in overall poor condition and continue to deteriorate without any protection. The walls, which were originally finished with stucco on the exterior, retain portions of the stucco and whitewash finish. All interior finishes have been lost and the exposed face of the masonry is present at the interior. The tops and exposed sides of the masonry walls are not level or plumb exhibiting a jagged edge where exposed.

The northwest corner of the main house retains the most historic material fabric and stands from basement level to approximately the level of the attic floor. The former first floor window is evident in the north exterior wall as seen in the west edge of the rough opening. The basement opening is no longer evident as the walls at the first floor level at the northeast corner have collapsed. The wood lintel to this basement opening lies on the ground next to the rubble of this collapsed wall.

The west exterior wall is partially extant at the north corner and at the south corner with large sections missing in between. A window opening at the first floor at the south end is evident in a portion of the south edge of the rough opening. The south wall has been almost completely removed above the level of the first floor except at the west corner. Approximately center of the remaining portion of the south wall is a brick and stone arch which correlates with the chimney seen in historic pictures at the south gable end. The majority of the east exterior wall has also collapsed with only the basement level partially intact. There is evidence of an opening to the basement at the north end of the wall.

The majority of the stone from the collapsed walls can be found within the interior of the ruins and at the northeast corner. The amount of stone is significant and completely hides any evidence of the basement as it is filled with stone rubble. It is possible that other remains are located below the extensive collection of stone.

The stone wall remains of the kitchen wing include portions of the east, south and west walls. The front wall has been completely removed and as stated previously may be an indication it was wood frame rather than stone. It is difficult to traverse the site in this location and removal of ruined material would be needed to determine definitively whether the front wall was frame or stone. The remaining stone walls are in overall fair condition but are subject to weathering as the top of the masonry is exposed. The exterior stucco is present in some locations, there are some repairs made with concrete along the tops of the wall and the interior finishes have been removed. One window opening in the east wall is clearly evident including stucco finishes. The floor and roof framing is no longer extant but some components may be buried on site within the interior footprint of the kitchen wing.

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The remains of a stone lined well or cistern is evident at the southeast corner of the lock tender's house site. The stone surrounding the circular opening is in overall fair condition. The top two and a half feet of the opening are covered with debris and soil filling the opening below. There are galvanized pipes within the opening which appear to lead to the main house. In close proximity to this well are the remains of concrete stairs and patio. These are in poor condition having been displaced over time by the elements.

The grounds surrounding the lock tender's house as well as within the interior footprint of both sections have many small trees, various weeds and ground cover including poison ivy; the extent of growth depends on the season. There are a few sections of rail and cable that were used to hold the house together located within the ruined remains of the house. There is one graffiti marking on the north wall of the main house. The fence which surrounds the house is in good condition and remains locked at all times.

Auxiliary Features

The condition of such features of the lock site as the canal prism, canal basin and the tow path warrant discussion. As with other features of the site, further analysis may be necessary as the plans for restoration are undertaken, but there are certain considerations that should be brought to light now in order to adequately plan for the site's future use and restoration.

Canal Prism

The canal prism was dismantled and filled when the Morris Canal was abandoned; however, the Borough restored the prism adjacent to the lock in the 1970s for recreational purposes. The plans for the restoration are available in the Borough's offices. However, thirty years have passed and the waterway has changed. As previously stated, the extent and proximity of trees is more overgrown than it would have been historically. However, the existing conditions enhance the appreciation of the site for its natural beauty.

Canal Basin

The canal basin which is now a pond has changed not only since the abandonment of the Morris Canal but also changed during the operation of the canal, probably to respond to the changes in configuration and operation of the Canal during its lifetime. It appears, based on the archaeological investigations, the berms located the east side of the basin primarily came from the fill removed to restore the prism. The water level of the basin in relation to historic level is unknown. In addition, the water sources to maintain the level of the basin have changed and no analysis has been conducted on rate of flow, etc. The basin also appears quite stagnant during certain seasons. Stagnation, water flow and other factors impact the flow rate from the basin to the prism via Stephen's Brook currently. These require engineered analysis. The vegetation the perimeter of the basin would have been different historically as well. Today, the area has a more natural and overgrown appearance than would have been during the period of the canal.

Tow Path

The tow path at the prism and basin area appear relatively intact although their elevations have probably changed from the period of the Canal's operation. However, the path adjacent to the remains of the lock has been removed from the landscape. Although there is currently a path, this is not the historic tow path. Historically, there was a fairly dramatic rise and fall up from the prism along the lock and down toward the basin which reflects the elevation relationships between the prism and the canal and therefore the role of the lock.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Preservation Philosophy

The archaeological ruins of the Lock 2 East site including the lock, the tender's house, and other remains such as the extant canal prism, tow path, basin and drainage features are the key components of the Morris Canal at this location. As previously mentioned, the Morris Canal was an important means of transportation in the nineteenth century that helped to facilitate the Industrial Revolution in New Jersey. Constructed in 1825, expanded during its lifetime as a means of responding to demand and completely abandoned and dismantled by 1929, Lock 2 East was an integral part of the history and development of the Morris Canal. Through the efforts of the Canal Society of New Jersey and the Morris Land Conservancy, in concert with local municipalities, including the Borough of Wharton, plans are underway to establish a Greenway in Morris County. As such, Lock 2 East would become one of a number of key sites along the Greenway. The goal therefore is to provide a site that evokes the history and importance of the Morris Canal; however, at this particular site there is an opportunity to portray this rich history including one of its key engineering components through active demonstrations of the lock's operations. This may go as far as providing boat rides from the canal basin via a restored lock to the canal prism. The site would therefore transform into a major milestone along the Greenway while also maintaining and enhancing its current recreational and open space components.

Lock 2 East was dismantled as part of the State's abandonment between 1924 and 1929, all property having been sold to the Borough of Wharton between 1926 and 1929. The archaeological investigations conducted as part of this project revealed extensive buried remains of the lock as well as other cultural remains associated with the operation of the lock during its period of significance. Based on this limited archaeological investigation there is great potential for additional buried features at the lock site, the lock tender's house and environs. As has been found at this site as well as other sites along the canal route, the buried features tend to be in a better state of preservation than the exposed features. Research into the history and evolution of the Morris Canal and Lock 2 East coupled with the archaeological investigations and the condition of both buried and exposed features have helped to determine that the period of significance for Lock 2 East, inclusive of future archaeological discoveries, is 1825 to 1926.

The overriding preservation philosophy guiding any future work at Lock 2 East is preservation and restoration (with elements of rehabilitation and reconstruction) in order to appropriately interpret the site to the visiting public by making it an open museum and to safely incorporate it into the Morris Canal Greenway. As such, the goal for the site will be to preserve and stabilize some elements while applying restoration to other elements. The site today currently exists as part of the landscape not discernable from a distance and not easily identifiable up close without some explanation. The immediate preservation goal will be to bring forth the objects of the lock site so that they are visible in the landscape and easily identifiable with some signage to the visiting public while also stabilizing those components that are a public danger. The long-term preservation goal is to restore the lock and all of its features with the hope of making the lock function once again in order to sustain a more active interpretation of the site beyond static signage and museum objects.

The work to accomplish these goals will be extensive and therefore will require adequate planning and design, skilled implementation, and careful undertaking in order not to destroy buried cultural features, to not disrupt the balance of nature that currently exists at the site and serves as a draw for passive recreational activities, and to present to the public an accurate presentation of the lock's operations verses one that is a more-Disneyland type representation. In addition, due to the nature of archaeology, a careful and methodical approach must be undertaken at every stage

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of any proposed work program. Understanding the parameters of the site and the historical significance of the site, drafting a clear and thoroughly researched project approach as well as documenting each step in the preservation process will help to mitigate any disturbance of remaining historic fabric and can be used as a teaching tool for future interpretation of the site.

Since the Lock 2 East site is owned by the Borough of Wharton, compliance with the New Jersey Register Act is required. Ultimately, this means the preservation of Lock 2 East should be planned, undertaken and supervised in compliance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (Revised 1995). Due to the nature of the site, and the interpretive and use plan, various treatment approaches as defined by the *Standards* are required in order to achieve the goals set forth in the preservation philosophy.

Preservation, restoration with an element of reconstruction, and rehabilitation are all recommended treatment approaches for any future work at Lock 2 East. **Preservation**, according to the *Standards*, is the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. This includes taking measures to protect and stabilize, generally focusing upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement or new construction. This was and will continue to be of particular importance with the archaeological remains of Lock 2 East as well as with the ruins of the lock tender's house. The ruins of the lock tender's house are currently in a precarious condition and require stabilization in order to keep what remains intact. Short of building a shelter for the remains, stabilization work will have to be undertaken in the near future. This work should aim to protect the existing walls that stand, salvage the components that have fallen and store for possible reinstallation in the future, and leave the site in a safe condition.

Restoration is the act or process of accurately depicting the form, features and character of a property as it appeared at a particular period of time by means of restoring existing features and removal of other features not from its period of significance. Restoration also allows for the reconstruction of missing features from the restoration period. Restoration is the key for the project approach to the entire site in the long-term, inclusive of the restoration of the lock, the connection with the canal basin and prism, the tow path, the waste weir, and other significant features that will help to inform the public of the lock's history and operation, and to ultimately have the lock operate. Establishing a goal to restore the lock tender's house at this point in the planning process is premature, however, it should not be discounted as this feature too played an important role during the site's period of significance and will aid in the interpretive value of the site. Therefore any work performed to stabilize the lock tender's house should not diminish the ability to restore the exterior of the house in the future.

Rehabilitation is the act or process of making possible a compatible use for a property through repair, alteration and additions while preserving those portions or features that convey its historical, cultural or architectural values. An element of rehabilitation may be required to facilitate operation of the lock once restored including providing mechanical back-ups for the lock's operation as well as the installation of safety precautions that were not available or required during the canal's operation. In addition, if the goal in the future is to restore the exterior of the lock tender's house, the interior could be used to support museum purposes. The interior should reflect the combination of a general museum use while restoring interior features whose appearance is generally known either through photographs or physical evidence. However, the risk is to infer too much into either and presenting a false view of history. Fortunately, Robert Goller, a member of the Canal Society and a leading advocate in the preservation of this site and the Morris Canal, documented parts of the tender's house shortly after the fire through sketches

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and photographs. Both of these will be very useful when determining the approach for the restoration and rehabilitation of the lock tender's house. It is important to note that in order to accommodate visitor needs and provide appropriate interpretive tools to facilitate the use and interpretation of the lock site, some new features, such as signage, and other modern accretions may be necessary. Once again, it is important that the site not try to portray a false sense of history distinguishing those items that are restorations, reconstruction and rehabilitations through signage, interpretive materials and where appropriate the use of materials.

5.2 Interpretation and Use

The preservation and restoration of the Lock 2 East site should aim to build upon the unique character of the Borough of Wharton and its relationship to the history and development of the Morris Canal and the iron industry. The history of Wharton is directly linked to the creation, use and development of the Morris Canal throughout the nineteenth century into the early twentieth century, and as such from its inception was a small industrial settlement that relied heavily upon the extraction and processing of iron ore deposits located along the banks of the Rockaway River and in the rolling hills of the Highlands. It is this history and the interconnection with the Industrial Revolution and advances in transportation that will become the essence of the interpretation of Lock 2 East.

Today, buried for over 75 years, the well-preserved remains of a stone lift lock and a plethora of historic documentation of the lock's appearance and operation during the years the Morris Canal exist. Lock 2 East was just one cog in the wheel of mechanisms that formed the Morris Canal system of locks and inclined planes; it is one that is well-preserved adjacent to a rare watered section of the canal and adjacent also to the remains of its canal basin. There are currently no operating locks preserved along the Morris Canal route. It is the operation of the lock that will become the essence of the use of Lock 2 East as an interpreted historic site, or more simply termed, an outdoor museum.

The Lock 2 East site is located approximately a half mile from the Borough's central business district and is used year-round for passive recreation. The existing setting and scenery provide a pristine and picturesque atmosphere during every season. This setting was once part of the bustling activities surrounding not only the operation of the Morris Canal but the mining activities that took place in the Borough and surrounding Highlands region. These two operations as well as that of the adjacent railroads influenced the development of Wharton. Through the restoration of the lock there is opportunity to not only portray the role of the Morris Canal but of the mining industry, the railroads, and the economic, social and cultural influences that created and sustained the Borough of Wharton. It will be critical in the interpretation of the lock to go beyond the boundaries of the site to portraying this bigger picture.

The Highlands region has a rich history whose natural origins helped to create a unique environment that influenced settlement patterns beginning with Native Americans. The varied topography and geological attributes of the region, which occupies approximately 859,000 acres of the northwest part of the State and covers a geographic area including parts of Warren, Morris, Hunterdon, Passaic, Sussex and Bergen counties, contributed to how parts of these counties developed. This region includes rolling hills, pastoral valleys, diverse forest, wildlife habitats and historic sites making it an attractive area for recreational opportunities. It also has a rich history based largely on exploitation of its diverse resources which influenced not only the development of Wharton but surrounding towns, villages and hamlets. Because of the richness of the region in many aspects, there are efforts across the region to develop a variety of recreational and tourism

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opportunities that reflect its history and scenic beauty. It will be critical for the successful use and long-term viability of this proposed outdoor museum to tie it into other recreational and heritage tourism initiatives; the site should be able to stand out on its own as well as to partner with other regional initiatives to attract visitation and financial support.

One of the critical tourism initiatives currently being developed and enhanced is the Morris Canal Greenway. This Greenway is proposed to provide interpretation of the Morris Canal through preservation and passive recreational activities. The vision for Lock 2 East should be to not only be an integral part of the Greenway but to be one of the key attractions. Visitors should make the trip for the site, and stay to do more exploring or to undertake other activities either along the Greenway or other sites and attractions (historic or otherwise).

The Borough of Wharton has great interest in the redevelopment of its downtown to attract businesses and tourists thereby spurring economic growth and prosperity. The restoration of the Lock 2 East site is seen as one means of bringing visitors from out of town to the Borough; therefore the activities at the lock have the potential to influence redevelopment of the downtown. However, it is also vital to see the downtown and its amenities as being beneficial to the use and interpretation of the lock. Heritage tourists seek more than just history; they arrive to be educated and stay to be entertained. As such, dining establishments, shopping destinations and other cultural, recreational and historic attractions are sought after thereby making the trip more worthwhile.

The focus of the use and interpretation of the site will be multi-faceted: continuing and expanding the site's recreational qualities while adding two critical components, the first is the operation of the lock and the second the ability to take visitors on a boat ride from one section of the canal through the lock to the other side and back again. There are several aspects to this use and interpretation including historical accuracy, education, and active participation, which will require several long and hard steps in order to achieve these goals.

The Lock 2 East site is currently used primarily for passive recreation such as hiking, walking, dog-walking, bird-watching and other aspects of the appreciation of nature. The former basin and prism are also used for fishing and miniature boat races. Wharton holds a yearly Canal Day where the center of activity in the parking lot to the east of the prism and along the prism to the lock site. Currently, there is no active interpretation of the history of the Morris Canal on site, such as signage; however, the site has been incorporated into the Morris Canal Greenway and other history and nature trails. The site is mostly used by the local community with more recent promotion of its merits to a broader audience.

The first goal in expanding the use and interpretation of the site should be the accurate restoration of the lock and surroundings. The restoration of the lock should utilize traditional building materials and techniques which would include but not necessarily be limited to the restoration of the extant lock features such as the walls, flooring and reestablishment of the conditions between the lock and the basin and prism. Other features, such as drainage, including the waste weir and Stephen's Brook, will also be critical because these elements served a definitive purpose; they were not present in the landscape for appearances sake. Other features of the site including landscaping, outbuildings, paths, bridges, and other features should also be restored based not only on the historic photographs but documentation found at other Morris Canal lock sites which may provide more in-depth details through drawings, photographs and extant features. Restoration of the lock tender's house, as previously mentioned, can be delayed and its presence in a ruined but stabilized condition would provide valuable context and permit interpretation of

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the domestic aspects of the canal's operation. Radiating further beyond the immediate surroundings, the railroad embankment serves as a visual reminder of the role of the railroad with not only the operation of the Morris Canal but in the development of Wharton and the waxing and waning mining industries in the region.

There are, however, certain realities that cannot be changed either immediate to the site or within the region. The overhead power lines which run in a general southeast to northwest direction just west of the lock site are not going away and show as an adjacency that society has continued to evolve, and technology is ever present. The other consideration is the amount of development, most especially impervious surfaces which have probably increased one hundred fold since the early twentieth century and therefore have changed the drainage conditions not only at this site but the immediate region. As a result, the flow of water at and around the site is different and could impact how the lock is operated on a regular basis, and how the site will perform during a heavy storm event. Another reality to the use and interpretation of the site is that this lock will require constant maintenance and upgrade, the periodic replacement of major elements, such as the lock gates, and major repairs after significant storm events. This continual maintenance, in actuality, would be historically accurate as it is seen in the visible repairs of the lock when viewed as part of the archaeological investigations. In addition, the constant cyclical wet/dry conditions of the lock gates required their replacement on a regular basis because wood, no matter the type used, does not perform well under these conditions.

The role of the Lock 2 East site once the lock is restored will be active interpretation with the goal of educating the visiting public on the role of the Morris Canal, the development of the Borough, the role of industry, mining, transportation and immigration on the social and economic development in not only the region but northern New Jersey, and the domestic and commercial activities associated with the operation of the Morris Canal and this lock in particular. The Canal, the Borough, industry, mining and transportation and the information relating to these educational components are well-documented and there is much material culture associated with these interpretative themes to supplement the active demonstrations of the lock. Further research and development is required while preparing the programming for the site. There are two basic things to consider: the narrower the topics the more concise and cohesive the interpretive materials to portray the history; and the broader the topics the more variety is available for interpretation when developing the programming. The key to success is striking a delicate balance, beginning small and narrow and slowly expanding to broader topics that are concise and cohesive in their portrayal. It is the relationship of domestic life to the operation of the Canal which will provide a separate but important interpretive avenue as programming for the site is developed. The fact that several generations of the Bird family operated this lock and that other family members played a role in the operation of the canal system at other sites could be the jumping off point for this interpretive avenue. There was an entire micro system of domestic activity associated with the Canal's operation including the boatmen and their families, their interaction with the tenders and the local merchants, the seasonal nature of this activity, etc. The opportunities for interpretation and programming are boundless, the key will be in how it is accomplished.

As wonderful as it will be to restore the lock and the site and to bring visitors for the educational value, the ultimate use of the site will be to take visitors through the lock from the canal prism to the basin and back again. It will be exciting to both witness the operation of the lock and to partake of the experience. These experiences will provide a new and varied viewpoint on the Canal providing visitors with a real experience of one of the elements of canal life. The more accurate the experience the more educational and realistic the experience is. However, accuracy,

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that is the type of boat, the use of mules, and other elements (other than the operation of the lock) can be a gradual process that expands and is refined as the site is utilized.

It will be critical for sustainability to develop the historical aspects of the site as well as the recreational and entertainment aspects understanding, however, that as an outdoor museum it will face different obstacles than a house museum or a recreational trail. Development of the site as a whole therefore should be incremental.

5.3 Strategy and Treatments

The use of the Lock 2 East site for active interpretation as an outdoor museum, can be broken into three distinct components: planning, restoration and implementation including refinement over time. Although these are named in this context as separate components they are in essence a continual process which in some cases may have to be revisited at various points during the process. Some elements can stand alone while other must follow a sequence. The Project Team sees the development of the site as a fluid process; however, this is highly dependent upon available funding, available personnel, and a desire and enthusiasm for a successful project.

Prior to embarking on discussions of planning, restoration and implementation¹³⁰, it is important at this juncture to briefly identify some of the obstacles that must be overcome in for a viable project. These are only a few of the concerns or obstacles provided for context when considering the planning, restoration and implementation of the overall project goals. Additional requirements and concerns will be addressed in more detail later in the report.

The change from a passive to an active site with historical interpretation comes with a full set of issues or concerns. In addition, restoration of an essentially buried ruin into a functioning “museum object” subject to the tides of nature comes with a whole other set of issues or concerns. Some are identified here and others will not be identified until the process of restoration and implementation are further along in the development. Based on the findings of the Master Plan such concerns include sustainability as a viable historic site competing for very limited funding for historic sites. Staffing such a site with either paid employees or volunteers will be a constant uphill battle due to funding limitations (or the need to constantly fundraise) and the constant process of garnering, training and retaining volunteers who are often limited in number and amount of time they might have to give toward museum efforts. Historical interpretation which attracts and maintains an audience requires good planning, ingenuity and constant self-discovery on the part of the managing organization. These are just a few of the broader issues regarding historical interpretation.

With regard to the operation of the lock, some of the larger concerns are site safety and limiting liability while also presenting a viable historic site that can be both enjoyable and informative. There is also an overriding concern regarding how water is going to flow not only on site but how changes to the landscape may impact adjacencies. The engineers chosen to carry out the restoration will have to address these issues but the Borough may need to be responsible for coordinating efforts with adjacent municipalities given how a number of them converge in this one locale. The responsibility for maintenance will also have to be addressed. Maintenance goes beyond just day-to-day care but who will be responsible for damage due to storm events or for

¹³⁰ Implementation, in the context of this report, is identified as using the site for both passive recreation and active historical interpretation.

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large-scale maintenance operations where elements of the lock or site reach the end of their useful life and therefore possibly requiring the involvement of outside professionals, construction contracts, etc. Once again, this is only an overview of what is to be a very complex historic site once restored.

Planning

The development of the Master Plan is only the first step in the entire planning process with regard to the restoration and use of Lock 2 East for educational and recreational purposes. This plan serves as the footing while the development of the organization, the preparation of the construction documents, and the development of the educational materials are the foundation for a well-ordered and planned approach to the site as a whole. Some of this planning work may be of value for a short duration, such as the preparation of contract documents, while other components are initial steps which will grow into broader aspects of the project over time, such as the development of a nonprofit organization to manage the site.

It should be noted that if a nonprofit exists that has a similar focus to the one desired, it may be prudent to pursue this nonprofit, such as a local historical society, to serve as the nonprofit who manages the site rather than try to start from scratch. This may require some reorganization of the nonprofit to incorporate the restoration of the lock site as part of their mission, the restructuring of their Board to incorporate members with a special interest in the restoration of the lock site, as well as other incremental changes. All of the following recommendations for creating and sustaining a viable nonprofit should be applied if an existing nonprofit steps into the role of site manager or other support mechanism of the efforts of the Borough.

- One of the first steps is to determine who will be responsible for the everyday management of the site once all goals are implemented. Since the site is owned by the Borough of Wharton with a managing agreement with the Morris County Park Commission the brunt of the responsibilities appears to lie with the Borough. However, the Borough could readily transfer some of the responsibility to another organization such as a nonprofit incorporated specifically to develop, manage and sustain the site. There are two basic options for a nonprofit organization, membership and non-membership. A non-membership nonprofit is composed of a board and possibly a paid staff member who are primarily responsible for the aspects of the site as agreed to with the Borough. A membership organization consists of a board, possibly paid staff as well as individuals who financially support the organization and its activities through membership fees and volunteer efforts. A non-membership organization is beholden to the Borough and the site. A membership organization is beholden to the Borough, the site and its members thereby requiring more accountability. A membership organization is the recommended approach as there is a better chance that the organization will grow more readily to meet the needs of the site taking advantage of a growing membership base to develop and sustain a strong board, to broaden outreach goals and to develop sustainable programming.

There are a number of first steps in developing a non-profit organization and if this approach is desired, the Project Team recommends the Borough and potential Board members for the organization contact a lawyer to discuss the legal procedures for establishing such a nonprofit. (Refer to Appendix E for additional information on the creation of a nonprofit.) A nonprofit could be responsible for fundraising, operation, developing the educational programming, and other site and museum related activities relieving the burden from the Borough.

- The nonprofit should be a 501(c) 3 organization which is a charitable nonprofit and therefore has greater fundraising opportunities. A nonprofit will be able to fundraise on

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behalf of the site and may be eligible for more grants than the Borough can partake. However, there are site control requirements for some funding agencies that may have to be met. It is advisable that the nonprofit begin solely as an organization with an interest in the restoration and development of the site. In the meantime, where a grant program requires site control and the Borough is an eligible applicant, the Borough should apply for the funding. If a major source of capital becomes available that the Borough cannot apply for and control of the site must be with the nonprofit, a lease agreement can be implemented. The Borough should be aware to proceed with caution and not relinquish control of the site too hastily to a newly developed entity.

- Develop a Board of Trustees (number of members, terms, etc. must be developed through the organization’s by-laws). It is also advisable that the Borough recommend two Council Members be part of the Board to serve as liaisons during this initial development stage for the organization and the site. The Board should be well-rounded and the types of members should reflect the stage in the nonprofit’s development. For instance, the Board may initially be composed more of lawyers, fundraisers, those knowledgeable in museum operations, and enthusiastic members of the Borough in order to best garner both financial and public support for the project and to develop a strong membership base. As work on the site progresses and programming is developed and implemented, the make-up of the Board may turn toward educators, canal enthusiasts and the like while continuing a strong presence in museum operations and fundraising. It is critical the nonprofit have a mission statement so that the developed approach is promoted by both the Board and members with a single voice.
- Develop a membership base of local and regional citizens, canal enthusiasts, historians, environmentalists, engineers, archaeologists, and other related fields of interest. This base will ultimately grow to include a broader audience as the site is developed and programming implemented. Membership, when properly maintained, provides a steady flow of income and has the potential to provide a steady flow of able and willing volunteers. Well-run organizations that offer their members many activities to partake in and opportunities for involvement in the day-to-day operations of the site tend to be more successful than those that rest on their laurels and allow only a few to implement plans. Members want to be involved (this is why they are members) and the more and varied opportunities for involvement, the stronger the organization overall and the greater chance for sustainability in the long-term. There will always be peaks and valleys in the capacity and capabilities of an organization but a strong membership base will help toward maintaining a constant level of operations.
- According to the Foundation Center (<http://foundationcenter.org>), an effective nonprofit organization “requires a full understanding of the key characteristics that will be important to future funders. They include a vital mission, clear lines of accountability, adequate facilities, reliable and diverse revenue streams, and high-quality programs and services.”¹³¹ A nonprofit should have “the ability to fulfill its mission through a blend of sound management, strong governance, and a persistent rededication to achieving results.”¹³² Two critical components for the initial steps in developing a nonprofit in order to support the goals of restoration and use of the site are to develop a fundraising plan and to develop a marketing plan. Each plan establishes different goals for the organization but they are interrelated. The fundraising and marketing plans will have to

¹³¹ Foundation Center, “*Establishing a Nonprofit Organization*”; available from <http://foundationcenter.org/getstarted/tutorials/establish/>; Internet; accessed March 2007.

¹³² Foundation Center, “*Establishing a Nonprofit Organization*”; available from <http://foundationcenter.org/getstarted/tutorials/establish/>; Internet; accessed March 2007.

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address planning both for the organization and the site, which have two different and distinct needs. As is often the case, many funders are interested in these types of plans in order to assess the nonprofit's organizational capacity to make sure they are a good bet, and to evaluate the value and feasibility of the project.

- Eventually, but not necessarily initially, the nonprofit may have the ability to hire part or full time staff to help implement the goals of the organization and/or to operate the site. However, this will initially be a volunteer effort so it is important to maintain momentum and enthusiasm and garner results. Capitalizing on the need of college students to undertake internships while attaining their degrees in such studies as history, anthropology, archaeology, historic preservation, engineering, etc. can be one of the first steps in developing positions for full or part-time staffing. Such learning opportunities for students can include the development of a special project or programming, developing an education plan, chronicling artifacts or gathering interpretive resources. The options are endless and will change as the organization's capabilities and educational and programming goals change and expand.

Once the nonprofit is established or a relationship has been established with an existing nonprofit, it will be critical to define the role of the nonprofit and the Borough (this too may include the Morris County Park Commission to their existing agreement with the Borough). Such responsibilities include but are not limited to maintenance, both day-to-day and large-scale improvements/repairs, fundraising, site staffing, programming, liability, and site security and safety. These are only a few concerns. It may also be prudent for the nonprofit and Borough to use as a reference other operating agreements established by other groups with a similar site or similar concerns either in New Jersey or neighboring states. Such groups can provide valuable insight and help the Borough and nonprofit overcome obstacles that these groups had to face.

- One of the first steps in planning for the restoration of the lock and its site components is the preparation of contract documents which outline the specific requirements for restoration and are designed to a level of detail where the Borough can obtain competitive bids and implement the plans. Individual sets of documents should be prepared for each phase of the project, they should be well-coordinated and at each stage in the process look to how one element may impact another. This is particularly important on this site given the drainage issues, and the close proximity of the site components to properties which lie outside the ownership and municipal lines of the Borough. The restoration of a lock is a rare occurrence particularly one that operates and is open for public enjoyment. As such, there are a number of specific considerations in the development and implementation of the contract documents.
 - Develop a project team that understands the history and significance of the site, that has experience in the restoration of lock structures and will respect not only the original architectural fabric but the unique qualities of such a structure and its operation, and has the ability to develop a project that will be undertaken in multiple phases requiring continued updating and modification of the plans through construction to ensure proper implementation. This last item would include developing bid documents that adequately take into consideration the several unknowns with regard to this site which will only be revealed as the lock is excavated.
 - Conduct a property survey; documenting topography, bench marks and other site features will help in the planning, design and development of the site. A new survey should be generated at the conclusion of each phase of construction and after the lock is restored.

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- Investigate other Morris Canal sites in more detail for specific clues to help in the restoration of this site. Investigate other operating locks particularly those that accommodate public visitation to help refine the approach for this site and to better understand the pros and cons of the approaches these sites took in the restoration of their locks. Create a network of scholars and individuals who would be willing to offer assistance/guidance.
 - Obtain the necessary approvals for the work. Approvals, in addition to building permits to be obtained through the Borough and New Jersey Register Act approvals through the New Jersey Historic Preservation Office include the Highland Water Protection and Planning Act, a Freshwater Wetlands General Permit and stream encroachment approvals. Each of these last three approvals must be garnered through the New Jersey Department of Environmental Protection (NJDEP). It will be critical to begin these permit processes early in order not to delay the project as the NJDEP approvals take considerable time and can be a great obstacle to overcome in implementation.
 - Hire qualified contractors who have an understanding of historic preservation practices and applicable experience. Finding a contractor, particularly one from New Jersey, who has restored a lock will be challenging; however, there are mechanisms in the public bidding process which would permit prequalification of contractors who have experience applying the Secretary of the Interior’s *Standards* prior to bidding. It may be necessary to broaden the search for qualified contractors to outside of the State.
 - Continually update the record of historic materials found on the site including cataloguing all archaeological discoveries, and keeping records at each point during the restoration process including the preparation of as-built documents. This will not only provide a record for future researchers, but it will help with maintenance of the site and lock and can augment the historic record for interpretation purposes.
- Planning should also include the first steps in developing the programming for the site. During the processes of stabilization and restoration, special events should be conducted two or three times during the spring through fall months which promote visitation to the site. The idea behind such events should be to draw attention to the site’s importance, to test interpretive programming, and to gain an understanding of just how much interest there is for this site. As is, the Project Team and those involved in the development of the Morris Canal Greenway believe the visitation potential is high for all Morris Canal sites that can tell the canal’s story; however, having concrete figures and a real sense of the interest would substantiate this hypothesis and help to validate such an investment in the site.

Restoration

The restoration of Lock 2 East and all of its site attributes is anticipated to be undertaken in several phases. There are many requirements and concerns that will have to be addressed. Some of these are outlined below but as is the case in many restoration projects some issues and concerns do not arise until the contract documents are being developed or construction work is underway. The following treatments and strategies are outlined in their approximate order, but phasing will be further addressed in Section 5.4. Following this section, there will also be an alternate approach outlined for consideration. The alternate approach has the same goals but approaches the project in a different sequence.

- Develop interpretive signage along various points of the canal prism, lock and basin in order to provide both a general history of the Morris Canal and of a typical lock’s operation. A specific history of the Lock 2 East including various images will help a visitor to understand

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the place they are visiting. This should be an initial step as it will bring public awareness to the importance of the site and possibly garner public support for the site's future restoration.

- The lock tender's house will be part of the first components of the site work to be undertaken. This work will be limited to stabilization to help ensure that the house continues to survive while more permanent plans are prepared for its restoration and/or rehabilitation if deemed feasible. The house helps to tell an important part of the story of Lock 2 East and is an important visual clue as to the historic appearance of the site. If the tender's house is never fully restored, maintaining it in a stabilized condition should remain a constant.

The existing condition of the lock tender's house is precarious. The initial step is stabilization of the extant features include providing temporary shoring, removing deleterious materials and storing them in a secured or semi-secured location for possible future reinstallation. Stabilization of the tallest sections of ruined walls may include a combination of structural bracing, repointing deteriorated sections of wall, and installing a mortar wash over the tops of the wall to prevent moisture migration to the extent practical. All work conducted should be easily reversible. All stone remaining from portions of the building that have fallen should be organized on-site to location and protected for possible restoration at a later date.

Archaeological monitoring will be required during the stabilization work. The site should be made safe to walk around, however; the Project Team is hesitant to recommend removal of the fence in order to prevent vandalism and to protect the visit public from possible injury. As such, the lock tender's house should only be open during special events and when there are docents or other personnel on site. The recommendations will also include extensive archaeological investigations once the house is secure. The archaeological team believes there is extensive buried material culture in the vicinity of the house based on the first stages of investigation. Future investigations concentrating on the vicinity of the house can be a wonderful educational opportunity (this will be a common theme throughout the recommendations). The findings at the house will provide greater insight into the lives of those who operated the lock, a different vantage point from the operation of the lock.

- Also part of the first phase construction project or the second phase in the overall scheme will be the restoration of the lock. This work shall include restoration and reconstruction of the lock to an operable condition including stabilization of the lock walls, lining the lock with appropriate wood planking, restoration of the lock floor, installation of new gates and other mechanisms to facilitate operation of the lock. A critical component of this phase will be the restoration of the connection of the lock to both the canal basin and the prism.

The construction work within a single project will have to be phased. The contract documents will outline in detail all of the requirements for the restoration of the lock based on the available materials including the findings of the historic research, archaeological investigations and observations made at other lock sites. However, it is anticipated that after the lock has been fully excavated and all of the contents removed the Project Team will have to take the necessary time to evaluate all of the contents to help fine-tune the requirements for restoration. This could be at any or all components of the lock from the floor to the walls to the gates and other peripherals. As such, the documents will have to be revised and the costs for the next phase adjusted. As such, an anticipated allowance for this type of adjustment should be part of the initial bid package.

The entire project will have to be both monitored and investigated by the archaeology team during any and all excavations. The monitoring and investigations will be critical for the

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analysis of the artifacts found within the lock and on site in general for not only restoration of the site components during this phase but in future phases of work. Through the excavations it is hoped that additional components of both gates will be found helping to provide more information for the reproduction of new gates.

The work of this component will include restoration of portions of the landscaping including the tow path as the restoration of the lock will bring it back to its original height where there has been significant cutting of the grade. It is also possible and should be anticipated during this work that the waste weir will have to be restored or at least the function of the waste weir (as a bypass for water overflow at the canal basin) reestablished. The problem with re-establishing the waste weir is it was a drainage ditch that could become a safety concern for visitors. As such, the first phase may be to install an underground pipe connecting the basin with the prism and later restoring the waste weir visually in the landscape if this feature is deemed necessary. The waste weir was a critical visual and historical component and has the ability to show the intricacies of how water was used to operate the locks and feed the canal on a continual basis.

The site will become dangerous to the casual visitor at various points along the project and may require fencing and other barriers. However, it will be important for the public to remain involved, to feel connected to the project and to understand the process of restoration. It is not everyday a lock is restored to an operating condition, as such every opportunity should be taken to hold special tours, events and other activities during the restoration process. Many of these can also be fundraising events to not only support restoration of the lock but its long-term operation.

- The following project components may be part of the first phase of restoration or the second phase depending on the requirements needed to support operation of the lock. If not required and the work items exceed the budget for phase one than this work can be allocated to phase two. Decisions, however, cannot be made until further development of the restoration documents.
 - Restore Stephens Brook where compromised to allow a free-flow of water to the canal prism.
 - Enhance the existing canal prism including select removal of overgrown trees at the canal to enhance the historical appearance, removing debris and overgrowth within the prism to allow a free-flow of water, stabilizing where required the sides of the canal prism to ensure its long-term preservation.
 - Undertaking further restoration of the configuration of the basin beyond which is needed to facilitate operation of the lock. Work shall include but may not be limited to widening the basin at its northeast corner, leveling the mounds of soil along the perimeter of the basin on its north and east sides, and installing some modern drainage features to help with site drainage during storm events.
 - Restore the tow path from the parking area to beyond the lock along the basin. Tie any improvements in this area with the proposed recommendation for the establishment of the Morris Canal Greenway and the West Morris Greenway in Morris County.
- The second phase of restoration will be restoring and reconstructing a number of the missing site components such as the footbridges which connected various parts of the site, reconstructing the operators shed and other outbuildings, restoration of the waste weir in

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both function and configuration, as well as the restoration of other site components which enhance the interpretation and understanding of the site for visitors.

- The third phase is a long-term recommendation that would be the restoration of the lock tender's house. Once the lock site has been restored and the use and interpretation of the site has had a successful number of seasons, it may be warranted to investigate and implement restoration and rehabilitation of the lock tender's house. The operation of the lock is going to be, in general, a fair-weather operation. In addition, visitors tend to like accommodations such as restrooms, a visitor center and other amenities. The lock tender's house has the potential to accommodate some of these amenities. However, the issue or concern will be balancing new with the old and preserving the historic appearance of the site overall. The lock tender's house, as it stands today, tells its own story about the Morris Canal, the story of abandonment. A decision will have to be made as to whether there are enough places along the canal route which tell this part of the story, and whether there is a need to provide these amenities. Time, implementation and visitor feedback will help to answer these and other critical questions.

Implementation

Critical to the long-term success and viability of the Lock 2 East site will be to strike a balance between passive recreation and active interpretation of the site. The ultimate goal of this project is for an operating lock which visitors can not only see work but can experience the event through boat rides. There are many ways this activity can be developed and the site can be operated; this development process would be the responsibility of the Borough and the nonprofit organization created to operate the site. There are a number of critical considerations for sustainability that are obvious at this point during the planning process but there will be others as the site is used. Therefore, this is only an initial list of considerations that must be understood before undertaking this project as it will not be cost effective to have undertaken this extensive restoration only to have the site lay idle due to any number of issues or potential problems.

- Once the lock is restored and ready for operation, the hard work begins. Getting visitors to the site will be easy in the beginning. The critical component will be sustaining visitorship and meeting the needs of visitors.
- Recommendations for use and programming of the lock include providing regular programming including lock operation with boat rides and other interpretive programming. To sustain an operation of weekly events is time-consuming, costly and draining on available resources. It is best to provide one monthly programming event from the onset and establish a schedule. Periodically, one to three times per year, special events should be held that would cater to larger crowds and include events and programming outside of a regular day's visit. Once the site is established, there is a strong core of volunteers and there is deemed a need for it, operation of the lock on a more regular basis may be deemed feasible and therefore implemented.
- If staffing and funding permits, weekday programs geared toward school-aged children should be conducted both during the school year as well as during the summer to cater to summer camp programs. Camp programs have become abundant in the last ten years; these programs look for day trips to entertain and educate the children.

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- Organizations catering to those over 55 and seniors are also more and more interested in day programs and events to keep seniors active. This is not an age group to be overlooked when developing programming and considering staffing for the site. These types of tour groups could be accommodated on either a weekday or weekend.
- It may be difficult to sustain personnel (paid or volunteer) for operations. It is critical to have a strong core of volunteers whose involvement, insight and hard work are appreciated.
- Historic sites with paid staff tend to be more successful than those without paid staff. There are a number of reasons for this and it should be the ultimate goal to have at least one full time and one part time staff member. Staff can help with fundraising, develop and implement the programming, conduct tours, help to maintain the site and operations, make sure the schedule of activities is full and followed, and coordinate all aspects of the site including developing promotional materials, and sending out notices of special events.
- Finding ways to attract new and varied audiences should be a continual process. The heritage tourist is becoming increasingly more discerning as their available free time is becoming less and less. They have more options for their entertainment and/or work and family obligations are consuming more of their free time.
- Fundraising for the site should also be a continual process. Fundraising will continue to be two-fold, one for the organization and one for the site. The lock will require continual maintenance; it will be critical to establish a substantial endowment that would help with these maintenance issues and sustainability.

5.4 Phasing Recommendations

The above, *Strategy and Treatments*, provides a basic outline for the work proposed including the order in which the work will be undertaken. The following is a summary of the work according to phase.

- Phase One: Preparation of contract documents including all necessary research and planning to stabilize the lock tender's house and to restore the lock and its associated components. The work shall include schematic design, design development and contract documents including technical specifications detailing the scope of the first phase of construction work. This part of the project would also include pre-qualification of contractors according to the NJ Department of Community Affairs requirements for pre-qualification of contractors, and bidding the project. Due to the size and nature of the project, the pool of qualified bidders may be limited and will require advertising the project outside New Jersey. This phase of the project also includes obtaining all necessary environmental permits which may include adjustments in the scope to accommodate environmental concerns.
- Phase Two: This part of the project would consist of the stabilization of the lock tender's house and the restoration of the lock. It is envisioned that the stabilization of the lock tender's house and the excavation of the lock would be the first part with modification of the contract documents between this part and the repair and restoration of the lock and its components. It is envisioned this project may take at least one full year to undertake depending on weather conditions during the excavation and restoration processes.

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- Phase Three: This phase will include both the preparation of the contract documents and the restoration and reconstruction of the remaining site features including paths, bridges, outbuildings, etc.
- Phase Four: Restoration and rehabilitation of the lock tender's house.

5.5 An Alternate Approach

During the review of the draft document, there was much discussion on how to approach what is essentially a very complex project that ultimately calls for a radical change to a rather pristine environment. Repeatedly, two major obstacles presented themselves: 1. there are significant unknowns despite the archaeological investigations undertaken to date; and 2. the potential impact to the surroundings by changing the flow of water between the pond and restored canal prism. Based on these two issues as well as other intricacies related to the project an alternate approach has been discussed between members of the project team, the Canal Society and Borough representatives.

This approach has the same goals as outlined earlier under *Restoration* within the **Strategy and Treatments** section but undertakes restoration of the lock in much smaller pieces or sections. Rather than excavate and restore the lock in its entirety, the idea is to restore the lock in three or four sections beginning first at the east end near the restored prism and gradually as financing permits continuing with the remaining sections of the lock.

This approach, at the outset, results in minimal impact to the environment with the idea that when the first section of the lock is restored the only change is to allow the prism water to fill the lock to its natural level. There would be no gates at this point and it doubtful the tops of the lock would be restored during this first phase due to the difference in height between the existing grade and the historic level of the reaches of the lock walls. It would not be the intention in this phase to restore the site to historic grade levels in order to minimize tripping hazards, and to avoid creating detrimental drainage conditions that would only be temporary. It is anticipated the excavations as part of this first phase will bring to the surface more buried components of the lock which can be utilized to guide the future full restoration, including elements of the gate.

None of the issues or concerns expressed earlier disappear with this alternate approach, however, it does allow for a more systematic and methodological approach to restoration whereby the lessons learned during this initial work can be readily applied to future work. These lessons help to take away some of the guesswork that is currently anticipated. Although there would be either three or four phases of work requiring repeated mobilizations by contractors and archaeologists as well as multiple phases of non-construction activities, these multiple phases would be more manageable projects. It is anticipated that with one large project, there will be extensive shut-downs requiring longer durations of more expensive dewatering activities and other expensive temporary facilities. These higher mobilization costs may offset the extra cost of multiple phases.

There are several technical conditions that must be addressed during the first phase restoration. The following may not be inclusive of all conditions, but are provided to give a sense of the potential complexity of the project.

- There must be adequate and effective dewatering operations during restoration and while investigating the remains of the lock both archaeologically and for architectural and engineering considerations. These dewatering activities will have to meet at least two criteria. The first is compliance with environmental considerations even though dewatering is a

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temporary condition. The second is dewatering must be effective to the level that allows work to be undertaken within the area of the excavated lock in a safe manner but also provides the least hindrance to investigations and restoration measures.

- Depending on the duration of the project and seasonal impacts, it is important to note that the lock will have to remain watered within the excavated portions during the winter months in order to maintain a balance of hydrostatic pressure during freeze/thaw cycles. The alternative is the design and installation of temporary bracing to overcome such pressures.
- The soil and material currently within the lock will have to be retained in the unexcavated portions of the lock through some type of temporary and reversible barrier. This barrier must be reversible so there is no precluding excavation and restoration of the full lock in subsequent phases.

Consideration of this alternate approach may also allow the start of restoration activities to begin sooner rather than later and allow for fundraising for small manageable sized work programs of reasonable costs helping with potential cash flow problems that would come with a much larger project. It is the equivalent of the approach for undertaking the restoration of a house where one begins first with the roof and progresses in phases to the exterior façade and then to the interior. With this approach, the Project Team recommends keeping the stabilization of the lock tender's house as part of the first phase project since this element of the site is the most at risk due to its material condition.

There are, of course, drawbacks to every scenario. It will be vital to make the site inviting throughout the construction processes and to have the site, to the extent practical, an open-air classroom for the visitor either through signage, special "hard hat" tours during each phase of construction, or other events. The site should remain open and accessible with fences only around areas of intense construction. The everyday visitor may grow tired of the construction so every effort should be made to continue to make the site an enjoyable area for passive recreation as well as attractive by maintaining its natural beauty.

One of the primary benefits of this approach beyond advancing the physical undertaking of restoring the lock, it shows the public and the funding agencies more immediate progress in the overall project. This approach would capitalize on the public interest and support for the overall project early in the process and will help to keep people's attention. One thing that has been discovered through the preparation of this Master Plan, in particular, the undertaking of the extensive archaeological investigations, is the amount of public interest in the site that had lain dormant.

6 FEASIBILITY STUDY

6.1 Findings of the Community Focus Group

HJGA Consulting presented the findings of the Lock 2 East project on three occasions to the Borough, to members of the Canal Society and to a group of concerned citizens organized by the Borough. The Project Team found these meetings to be beneficial as they gave us insight into others' visions of the site as it is used today as well as what they hope for in the future.

Ultimately, their visions did not differ much from that of the Project Team and most expressed complete support for the project. There were, of course, concerns regarding raising the necessary funds to undertake the project, and most understood the complexities of implementation and sustainability. It was clear from peoples' reactions that they understood the site will have to be utilized regularly and in an organized manner to justify such expenditure and that maintenance will not be easy or cheap. The Community understands not only the importance of the Morris Canal but also the role of this site in particular in portraying the history and significance of the canal. They also understand the level of integrity the site holds but also its pristine surroundings which make the site even more special.

It is the impact to the site's current condition, and its attraction to all those who use the site either regularly or on an interim basis that brought the most concerns and questions. As such, it will be vital throughout the process to maintain the level of serenity and beauty the site offers so that the restoration of the lock and its use only adds to this beauty and does not take away from it.

The Project Team has understood from the beginning of the project that the site is regularly used by walkers and hikers given the trails and surroundings but was not aware that it was also a fishing destination. This activity should be maintained. Community members also expressed interest in promoting kayaking and canoeing in the watered section of the canal as well as other light recreational activities. Some ideas include making the site a destination or point of beginning for fundraisers, bicycle tours/events, and other organized group activities.

The Project Team was heartened by the turn-out, insight and encouragement expressed during these three meetings and it is our hope that the Borough and its partners in this project capitalize on this in the development and implementation of the plan.

6.2 Implementation and Sustainability

Implementation of the overall plan and the long-term maintenance and operation may fall to the Borough of Wharton or with an operations agreement with the Morris County Park Commission. However, it is also feasible that implementation of the restoration plan may be the responsibility of the Borough with the long-term maintenance and operation falling to the Borough and a nonprofit organization. Since there are other entities involved at this site and each has an interest in its long-term preservation a certain level of coordination will be required from now and into the future amongst all interested parties.

The Borough of Wharton is a sustainable organization given its day-to-day role in the operation and management of the Borough. However, almost every municipality in the State of New Jersey has been impacted by rising costs associated with municipal operations and the struggle to keep property taxes to a minimum. Municipalities also receive minimal assistance from the State and the grant funds for special projects are continually more competitive. As such, garnering assistance from a nonprofit, such as a Friends of Lock 2 East or some other named organization,

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will be beneficial in not only raising funds for restoration but also in the long-term management and sustainability of the project. (As previously mentioned, utilizing an existing nonprofit organization that is will to modify its mission and include the Lock 2 East as part of their focus may also be an option.)

Many historic sites are owned by a municipal government and leased to a historical society. The lease typically includes the municipality being responsible for general maintenance and upkeep of the site including mowing lawns, removing debris and in many instances the costs associated with utilities. If major brick and mortar projects are required, the municipality and nonprofit often share in the responsibility of garnering the necessary funds with the municipality managing the contracts with consultants and contractors. These relationships tend to be successful if the nonprofit organization is strong. In some instances, the municipality will contribute a portion of their salary if the nonprofit has full or part-time staff. However, should the municipality not contribute, one of the more difficult operational costs to raise is salary expenses; quality staff, who could contribute to the success of a site's management and use, require a requisite salary. The Borough could also provide a yearly allocation for operational costs associated with maintenance, use and programming leaving it up to the nonprofit to determine how they will be applied.

The relationship between Borough and nonprofit does not have to be complex. The Borough should have an interest in having a strong organization be responsible for the site; if the nonprofit fails, the onus falls on the Borough.

The following information was garnered primarily from the Kresge Foundation's website: <http://www.kresge.org>, which provides sound advice for strong, sustainable and high-capacity organizations. Provided in Appendix E, there is also an outline of items needed for establishing a nonprofit organization prepared by the Foundation Center.

There are essentially four qualities of a strong, sustainable and high-capacity organization that meets these requirements: leadership, program, support and operations.

Leadership consists of a strong board which is effective and diverse and has an active role in the governance of the organization. They must be capable of obtaining gifts, have a visible profile in the community and be effective in communicating their ideas across a broad spectrum.

The *Program* is one where the organization has a clear, well-defined mission with programs that directly relate to this mission. These programs must respond accordingly to the demands of the public they serve.

Support is broad, deep and a growing base of private donors and volunteers, strong financial assets and a diverse revenue stream. These too must change to meet the demands of the site and the public the organization serves.

Operations is integrity in governance with a plan for continuous improvement. This could be two-fold, associated with the organization and associated with the management of the site.

The following is a list of attributes of a strong organization prepared by the *Kresge Foundation*. This is somewhat a reiteration of above with more specific means of accomplishing the goal of a

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strong, sustainable and high-capacity organization specific to the development of a capital campaign.

“Leadership. Everyone in your organization, including your board, your executives and volunteers, should thoroughly understand and subscribe to the building project and your organization's mission. Those in the spotlight should lead by example through service and personal giving; in doing so, they will attract attention, funding, and commitment to both your project and organization.

Commitment. A capital campaign lasts only so long. Your nonprofit organization should go on much longer. Use the campaign to secure commitments to the mission of your organization - not just to the building you plan to occupy. Cultivate relationships with donors of diverse giving capacities and nurture them. Make them believers in your organization's mission so that they become your most loyal supporters: future lead donors, board members, and key campaign volunteers.

Accountability. Show that your organization can act responsibly and effectively with what it is given. Set goals. Establish a reliable donor tracking system so you can stay up-to-date in your relationships. Measure and share results. Strive for continuous improvement. Show constituents that every asset counts toward the advancement of a worthy mission. A capital campaign may provide the first experience a donor has with your organization, so your ability to demonstrate accountability is critical.

Discipline. Make sure your facility plan is strategic and that it fits into your long-term plan for programs and operations. Put things into writing. Keep track of your committed resources. Have the campaign committee meet regularly to report on progress. Report campaign progress at every board meeting. Organizations that adopt a higher level of discipline will find that it serves them as long as they exist.”¹³³

The capital campaign for restoration of the lock and the subsequent use and interpretation of the lock is a long linear path and the success of the first will impact the success of the latter. Once again, the *Kresge Foundation* offers successful strategies for a capital campaign which have been modified below; however, these strategies will be useful for the length of the project and the sustainability of the site as a historic resource that is used by and interpreted to the visiting public.

A successful campaign includes many steps from planning through to fruition. The first is the development of a strategy including establishing the goals of the campaign, creating the message of the campaign in order to generate enthusiasm and excitement for the project yet showing the long-term proposed achievements. The first tier of involvement in the project are those with the greatest interest in the project such as board members, community leaders and major donors. If this group is enthusiastic about the project, they will spread the word. Talk about the project to the community outlining what are the goals and what is the plan; get feedback. From the onset, reach out to potential donors and do not focus solely on the large donors but the range from small to large. Those who support your efforts in the beginning, even if at modest levels, will provide funding later if there are clear indications of success.

The second is implementation which includes garnering the support through volunteer efforts and in this case building a strong membership base. Volunteers will be critical throughout the process and they must feel engaged with the project knowing that their efforts will be a major contributing

¹³³ The Kresge Foundation, “Attributes of Strong Organizations”; available from the Internet: <http://www.kresge.org/content/displaycontent.aspx?CID=39>

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factor to the project's overall success. Volunteering should be a positive and enjoyable experience but there should be respect for the volunteers' time and talents. Do not take advantage of these and do not rely upon the value of a few to bear the brunt of the responsibilities. As part of implementation, public relations is a large component. Announce the project in every avenue available. The Foundation notes that those who support the project should be made aware of every detail through the use of newsletters, personal letters, special events, etc. Engage your audience by celebrating victories but by also discussing the challenges. It is critical to create awareness as this builds upon long-term relationships.

The final item and the one that will have to be carried through perpetually is maintaining the relationships established and continuing the momentum gained during the capital campaign into the fruition of restoration and operation. The Foundations states: "Continue engaging volunteers by asking for and listening to their suggestions. You may have also learned a lot about the way people perceive your organization. Apply these lessons to the way you develop your general operating fund, the way you promote your organization, the way your leaders work together, and the way you manage volunteers."¹³⁴

6.3 Economic Benefits of Historic Preservation

There have been many studies conducted regarding the economic and other benefits of preservation including one conducted by the Center for Urban Policy Research at Rutgers University and published by the New Jersey Historic Trust, called *Economic Impacts of Historic Preservation* which was published in 1998. It was one of the first studies of its kind and it set out to confirm what was already obvious to those practicing in the field of historic preservation- it pays to preserve our historic resources and when doing so there are many who benefit. The report states that "Preservation is a pump-primer, an economic development tool, a smart investment. It is vital for a host of reasons—ones that speak to history, culture and quality of life. But at a purely dollars-and-cents level, historic preservation offers an excellent rate of return. Preservation makes sense."¹³⁵ Unfortunately, most studies on this topic focus on the preservation of historic districts, downtowns and hamlets with less focus upon individual sites and the impact the preservation of one site may have on a region or community. Fortunately for the preservation of Lock 2 East, it will not be just one site but it will be one site set within two establishing greenways whose goals are to incorporate heritage tourism as a key component and attraction.

Cultural or heritage tourism are the newly minted terms for a segment of the tourism industry that has always been strong but merely overlooked as a key catalyst for economic development. As restated in an article, *Cultural Tourism: An Economic Development Tool for The 21st Century?*, a survey in a popular travel and leisure magazine found "more than 80% of frequent personal travelers give high marks to visiting cultural, archaeological and historical sites"¹³⁶ Other studies have noted that heritage tourists "spend a half day longer and spend an average of \$62 more than other travelers."¹³⁷ Studies have also found that domestic travel to museum, historical places and cultural events are more popular than sporting events, night life and amusement parks.¹³⁸

¹³⁴ Kresge Foundation, "12 Steps to a Successful Campaign"; available from the Internet: <http://www.kresge.org/content/displaycontent.aspx?CID=38>

¹³⁵ New Jersey Historic Trust, "Partners In Prosperity: The Economic Benefits of Historic Preservation in New Jersey" (Trenton: 1998), 20.

¹³⁶ Roberts, David G., PP/AICP, CLA, "Cultural Tourism: An Economic Development Tool for The 21st Century?", New Jersey Planners' Journal Vol. 4, Summer 1998, 4.

¹³⁷ Roberts, 4.

¹³⁸ Roberts, 4.

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In 1998, when the New Jersey Historic Trust coordinated the economic analysis, New Jersey's tourism industry focused its energies on the shore and casinos as the main draws for tourists from both within and outside the state. The study noted New Jersey lagged behind significantly in effectively promoting our cultural and historic resources compared to other states, such as Pennsylvania, New York, Virginia and Massachusetts. Since that time, however, the State's Division of Travel and Tourism has come to realize not only the importance of promoting heritage tourism but just how much history New Jersey has to offer to visitors. As a result, trails have either been developed or better promoted, including the New Jersey Coastal Heritage Trail and the New Jersey Women's Heritage Trail. An even more pivotal and recent development is the Crossroads of the American Revolution Heritage Area which enables the entire story of New Jersey's critical role in the American Revolution to be fully understood and appreciated. This statewide effort and recognition has been a catalyst for local initiatives such as the development of local greenways and trailsides that involve the input and manpower of several organizations rather than one lone entity to garner the necessary support and capital to undertake these broad-reaching projects that not only provide the benefit of New Jersey's natural beauty but also link several historic and cultural resources.

Trails and greenways are key means of developing links between nature, history and culture, and provide a proven formula for success as they provide a "journey" of cultural identity. They also, through their use, promote historic preservation by bringing attention to places that may be lost or forgotten if no access was provided. The fact that there are two developing Greenways, West Morris Greenway and the Morris Canal Greenway, which incorporate the Lock 2 East site will attract visitation and interest in the site and ultimately will influence its level of success as a restored portion of the Morris Canal.

This increased traffic and interest in this particular site which will be enhanced through the operation and use of the lock for interpretation will impact adjacent factors such as the development of the Borough's central business district. As improvements are made in the business district, visitors will be tempted to stay longer and spend more, especially when there is a full story to tell that reaches beyond the Canal into the history of the town, industry, mining, culture, etc.

Using cultural tourism as a tool for revitalization is to find a "community's unique historic architecture, promoting a captivating story of its past, and creating a menu of cultural attractions that can be marketed together as a single tourist destination."¹³⁹ It is important there is both cooperation and coordination when developing a plan for cultural tourism and that all involved parties have input into the development process. When developing cultural and historic destination links it is always advisable to find the best means possible of promotion, providing the necessary infrastructure, developing public and private partnerships, and collectively using the resources available to promote the ideas and ideals.

6.4 Potential Funding Avenues

The following fundraising information is a broad overview of the possible grants or other types of assistance that may be available to the Borough of Wharton to help finance the proposed restoration and rehabilitation of the Morris Canal Lock 2 East. This is not intended to be a definitive list of possible donors or funding avenues, but a starting point from which the Borough

¹³⁹ Roberts, 6.

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can research the potential for funds and assistance as the project evolves. It should be noted that foundations often change their funding focus or may be open to projects that are not within their focus. In addition, due to changes in policy or the availability of funds, grants and loans available through government agencies may be suspended, change in amount each funding cycle or limited to a specific focus. Contacting the agency, foundation, corporation or other possible donor through letter or by telephone is encouraged before pursuing a grant or other type of assistance to confirm project eligibility, method of application, status of funds and application deadlines.

Due to the magnitude of the scope of not only restoring Lock 2 East but also maintaining, operating, and sustaining its long-term viability, it is advisable that the Borough of Wharton retain a professional fundraiser to assist in pursuing grants if one is not already on staff. A professional fundraiser can determine potential funding sources, write fundraising proposals and administer the grants once obtained. There is never any one good time to pursue grants, it is a continual process with various deadlines and requirements.

The Borough will need to pursue financial assistance for not only capital expenditures to make the physical improvements to the site, but also grants for planning, collection management, collection acquisition, museum development, museum personnel and other such expenditures related to the preservation and use of Lock 2 East as a cultural and recreational attraction situated within a Greenway. Each funding agency, whether it is a private foundation or a government entity, has specific fields of interests in which they will fund. Some organizations may also fund a project based on location. Some of the broad fields of funding that Lock 2 East relates include historic preservation, museum development and operation, New Jersey history, Morris County, national and regional history, history education, education, heritage tourism, transportation, environmental protection, greenway corridors, humanities, engineering (civil and mechanical), archaeology, and anthropology.

The Borough may face fundraising obstacles as a government entity. To overcome these obstacles as well as to create a possible means by which the museum facilities can be run on a day-to-day basis, the Borough may want to create a nonprofit organization whose mission is for the preservation and long-term management of Lock 2 East. A non-profit such as a friends group could be established at any point during the preservation and development process; such a group would have a level of control over the property as determined by the Borough. However, the sooner such an entity is developed the faster the fundraising begins. The following agencies and foundations represent possible fundraising avenues for the Borough or a nonprofit.¹⁴⁰

National Trust for Historic Preservation

National Preservation Endowment:

Preservation Funds: Two types of assistance are provided, matching grants for preservation planning and education and intervention funds for preservation emergencies. Matching grants can be used for such activities as archaeology, land-use planning, organizational development and fund raising.

National Trust Loan Funds: Consist of two revolving funds, including the National Preservation Loan Fund, which provides funding for projects such as rehabilitating buildings and sites.

¹⁴⁰ All web addresses provided in section 6.4, Potential Funding Avenues, are available as of March 2007.

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Website: <http://www.nationaltrust.org/funding/nonprofit.html>

National Park Service

Save America's Treasures Program:

Grants available for preservation or conservation work on nationally significant artifacts and historic structures and sites. Eligible activities do not include reconstruction of historic properties or construction of new buildings. The collection or property must be threatened or endangered, and the project must have a clear public benefit.

Website: <http://www.cr.nps.gov/hps/treasures/application.htm>

Land and Water Conservation Fund:

This program provides matching grants to state and local governments for acquisition and development of public outdoor recreation areas and facilities. The mission of the program is to create and maintain recreation areas and facilities and stimulate non-federal investments in recreation resources. There are a number of caveats to this program including: management of the site by the public entity with an adequate maintenance and operation budget, and all grants are funded based on an allocation formula per state.

Website: <http://www.nps.gov/ncrc/programs/lwcf/>

Institute of Museum and Library Services

Conservation Project Support:

This program awards matching grants to help museums identify their conservation needs and priorities and to perform the needed conservation activities as well as helps museums develop proper approaches to caring for their collections. The primary goal of the Conservation Project Support program is not collection management or maintenance but conservation care. Eligible conservation activities are listed as surveys, training, research, treatment and environmental improvements. The grant will not fund projects that are primarily aesthetic or educational, that upgrade or install security/fire systems, etc., or construction or building improvements, reconstruction or renovation of a historic site or landscape.

Website: <http://www.ims.gov/applicants/grants/conservProject.shtm>

Museum Assessment Program:

This program works to help museums plan for their future by assessing their present status. The program provides assistance for four assessment types: collections management, governance, institutional and public dimension. Collections Management supports the review of collections use, planning and procedure. Governance supports the examination of museum governing authorities and boards. Institutional assesses the management and operations of the museums. Public Dimension assesses how the museum serves the community through services such as exhibits.

Website: <http://www.ims.gov/applicants/grants/museumAssessment.shtm>

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Museums for America:

These grants can be used for ongoing museum activities, research, planning activities, new programs or activities, purchase of equipment or services, or other activities that will support the efforts of museums to upgrade and integrate new technologies into their activities and interpretation.

Website: <http://www.ims.gov/applicants/grants/forAmerica.shtm>

National Endowment for the Humanities

Interpreting America's Historic Places Implementation Grants:

Implementation grants for Interpreting America's Historic Places enable organizations to install new or enhanced interpretive programs at places of significance in American history or culture.

Interpreting America's Historic Places Planning Grants:

Interpreting America's Historic Places Planning Grants may be used by organizations to develop in detail the content, interpretive approach and specific components of projects prior to implementation. Applicants for planning grants should already have defined the appropriate humanities content and themes in consultation with scholars and programming advisers.

Preservation Assistance Grant for Smaller Institutions:

The National Endowment for the Humanities Preservation Assistance Grant (PAG) program awards grants of up to \$5,000 on a non-matching basis to support the preservation of materials in smaller libraries, archives, museums, and historical organizations.

Website: <http://www.neh.gov/grants/>

New Jersey Cultural Trust

Cultural Trust Capital Preservation Grants:

Eligible activities include stabilization, repair, restoration, adaptive reuse and improvements to cultural or historic properties, including adapting for increased accessibility. Criteria for evaluation includes nature and degree of threat to property; the archaeological, architectural, cultural/historical significance of the property, ability of the project to improve long term preservation of the property and the project's potential to serve as a model for other organizations. Organizations must first be designated "qualified" in order to be eligible to participate in the programs of the Trust.

Website: <http://www.state.nj.us/state/culturaltrust/guideline.html>

The Garden State Historic Preservation Trust Fund

Historic Site Management Grants:

For planning and non-construction activities related to historic preservation projects including conducting archaeological investigations. The program also funds developing museum and interpretive programs including audio and visual presentations, and will aid in hiring a fundraiser. The goal is to promote effective management at historic sites. Also provides some funding for development of interpretive materials such as signage and development of media or other devices to help the disabled visitor.

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Website: <http://www.njht.org/dca/njht/programs/gshptf/cpg.html>

Capital Grants:

For construction expenses related to stabilization, preservation and restoration work and associated architectural and engineering work. Also includes funding for non-construction activities that are directly related to the development and implementation of preservation projects.

Website: <http://www.njht.org/dca/njht/programs/gshptf/>

It should be noted that as of February 2008, there was only one year left to the Garden State Historic Preservation Trust Fund grant program and a stable source of funding was being sought by the New Jersey Legislature with no clear plan or initiative.

New Jersey Department of Environmental Protection

National Recreational Trails Program:

Provides funding for the maintenance and restoration of existing trails; the development and rehabilitation of trailside and trailhead facilities and trail linkages for trails; purchase and lease of trail construction and maintenance equipment; construction of new trails in existing parks or in a new right of way. Funds are available to public agencies at all levels, and nonprofit organizations including “Friends of P” groups. Maximum grant amounts are \$25,000.

Website: <http://www.state.nj.us/dep/parksandforestry/natural/njtrails.html>

Garden State Preservation Trust:

Dedicated to the preservation of parks, natural lands, farmland and historic sites. Disburses its funds for use by the DEP’s Office of Green Acres, the State Agriculture Development Committee’s Farmland Preservation Committee and the New Jersey Historic Trust.

NJDEP Green Acres Program: Preserves State’s historic, scenic and recreational resources for the public. The Program has four areas: State Park and Open Space Acquisition, Local Governments and Nonprofit Funding, Stewardship and Legal Services, and Planning and Information Management. In addition to acquisition, the Local Government and Non-profit Bureau helps to develop outdoor recreation facilities. The Bureau of Planning and Information Management provides open space and recreation planning guidance and technical assistance for acquisition and recreation development efforts. Lands that are acquired or developed with Green Acres funds must be used only for recreation and conservation purposes.

Website: <http://www.state.nj.us/gsp/>

New Jersey Department of Transportation

Transportation Equity Act (TEA-21) – Transportation Enhancement Fund:

Grant provides monies for projects that are designed to foster more livable communities, enhance the travel experience, and support new transportation investment partnerships. The Program focuses on transportation projects that will preserve and protect environmental and cultural resources, and help to promote alternative modes of transportation. There are several funding criteria including regional or community benefits, economic/tourism benefits, and

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value as a cultural/historic resource. There must be community support for the project. Grants have no maximum value and do not require a match; a minimum project value is \$250,000.

Website: <http://www.fhwa.dot.gov/tea21/index.htm>

New Jersey Historical Commission

General Operating Support Grants:

Assists historical organizations, museums, libraries, etc., with collections or programming relating to the history of New Jersey.

Projects:

Funds specific projects relating to New Jersey history. These projects might include conservation of materials, publication projects, education initiatives, exhibitions and public programs.

Minigrants:

Supports smaller projects of the types of activities named under “Projects”. Applicants can request support for planning but may not use minigrant funding for other types of operating support.

Website: http://www.state.nj.us/state/history/grants_t.html

New Jersey Historic Trust

Emergency Grant and Loan Fund:

Provides funding for emergency work to preserve endangered historic properties. Activities include emergency repair or stabilization; or for the planning or research necessary to preserve an endangered property. Criteria include the significance of the property; the nature and degree of threat to it; the plans for long term preservation of the property; and the benefit to the community.

Website: <http://www.njht.org/dca/njht/programs/egl/index.html>

Morris County Historic Preservation Trust Fund

Eligible activities include preparation of reports, acquisition, stabilization, restoration and preservation of resources by municipalities within Morris County, non-profit groups and the County itself.

Website: <http://www.morrispreservation.org/>

The 1772 Foundation, Inc.

The 1772 Foundation’s mission is to preserve and enhance American historical entities for future generations to enjoy with particular interest in farming, industrial development, transportation and unusual historic buildings. Applicants are welcome from anywhere in the United States and past projects have included lighthouses, the Battleship New Jersey, Prallsville Mills in Stockton, New Jersey and numerous other historic sites.

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Website: <http://www.1772foundation.org/1772/>

Carls Foundation

One of the principal purposes and missions of the Foundation, based in Detroit, is to support preservation of natural areas, open space and historic buildings and areas having special natural beauty or significance in maintaining America's heritage and historic ideals, through assistance to land trusts and land conservancies and directly related environmental educational programs.

Website: <http://www.carlsfdn.org/>

Getty Trust (J. P.)

Architectural Conservation Grants

Architectural Conservation Grants support organizations throughout the world in their efforts to preserve buildings or sites of outstanding architectural, historical, and cultural significance. Planning Grants assist in the initial development of an overall architectural conservation plan. Support is also available on a selective basis for the development of archaeological site management plans. Implementation Grants assist in the actual conservation of a building's historic structure and fabric.

Website: <http://www.getty.edu/grants/conservation/>

Tourism Cares for Tomorrow

As part of its mission, TCF distributes charitable grants to worthy nonprofit organizations worldwide. Grants are typically in the range of \$5,000 to \$20,000. The foundation seeks programs or projects with one or more of the following goals: To protect, restore and conserve sites of exceptional natural, cultural, or historic significance; to increase the traveling public's awareness of and involvement in conservation efforts; and to promote conservation education within local, host communities and to the traveling public. Tourism Cares for Tomorrow is based in Canton, Massachusetts.

Website: <http://www.tourismcaresfortomorrow.org>

F.M. Kirby Foundation

Foundation grants are awarded to a wide range of non-profit organizations. Areas of interest include education, civic and public affairs and so on. Grantees are often in geographic areas of particular interest to the Kirby family, and as the Foundation is based in Morristown, this includes the Morris County region. There is no required application format; recommended information to be included on solicitations is available on the Foundation's website.

Website: <http://www.foundationcenter.org/grantmaker/kirby/>

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Hyde and Watson Foundation

Supports capital projects such as purchase or relocation of facilities, building improvements and capital equipment. Broad fields include health, education, religion, social services, arts, and humanities. Grant support is focused primarily in the New York City Metropolitan area, and Essex, Union, and Morris Counties in New Jersey. The Foundation does not accept applications for operating support.

Website: <http://foundationcenter.org/grantmaker/hydeandwatson/>

The Charles Edison Fund

The Fund's contributions generally lie within the areas of medical research projects, science education and historic preservation. The organizations assisted are usually based within the New York-New Jersey metropolitan area. The Fund does not provide specific application forms, but requests should be detailed and include such information as the organization's background, an explanation of the project and its cost as well as the organization's present budget.

Website: <http://www.charlesedisonfund.org/thefund.html>

The Geraldine R. Dodge Foundation

The Foundation's areas of giving include environmental projects, education and local projects in Morris County. First time applicants should first submit a letter of inquiry. Foundation does not provide funding for capital programs, equipment purchases or indirect costs.

Website: www.grdodge.org

James J. Colt Foundation, Inc.

Based in Lyndhurst, this foundation funds organizations in such areas as historic preservation, cultural programs and education.

Website: Not available.

Blauvelt Demarest Foundation

The Foundation gives to institutions for the preservation of historic items as well as the study and research of historic data; includes museums, history and archaeology, preservation, cultural programs, etc. Grants usually range from \$100 to \$200 and include funds for general/operating support, renovation, and matching funds.

Corporate Donors

There are a number of Corporations that have in the past been advocates and donors for nation-wide preservation campaigns including those sponsored by the National Trust for Historic Preservation, The History Channel, and the Save America's Treasures Program. These include American Express, Target and Lowes Home Improvement Centers. It is also important to reach out to local businesses and major corporations for financial support as well as for donated services.

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Kodak American Greenways Awards Program

A grant program funded by Eastman Kodak Company, The Conservation Fund and the National Geographic Society which provides small grants to nonprofit organizations (public agencies may apply but community organization receive preference) to stimulate planning and design of greenways in communities throughout America. Grants may be used for mapping, ecological assessments, surveying, conferences, design activities, developing brochures, interpretive displays, audio-visual productions, public opinion surveys, hiring consultants, incorporating land trusts, building a footbridge, planning a bike path, or other creative project. These are small grants ranging from \$500 to \$1,500 with a maximum grant of \$2,500.

Website: <http://www.conservationfund.org>

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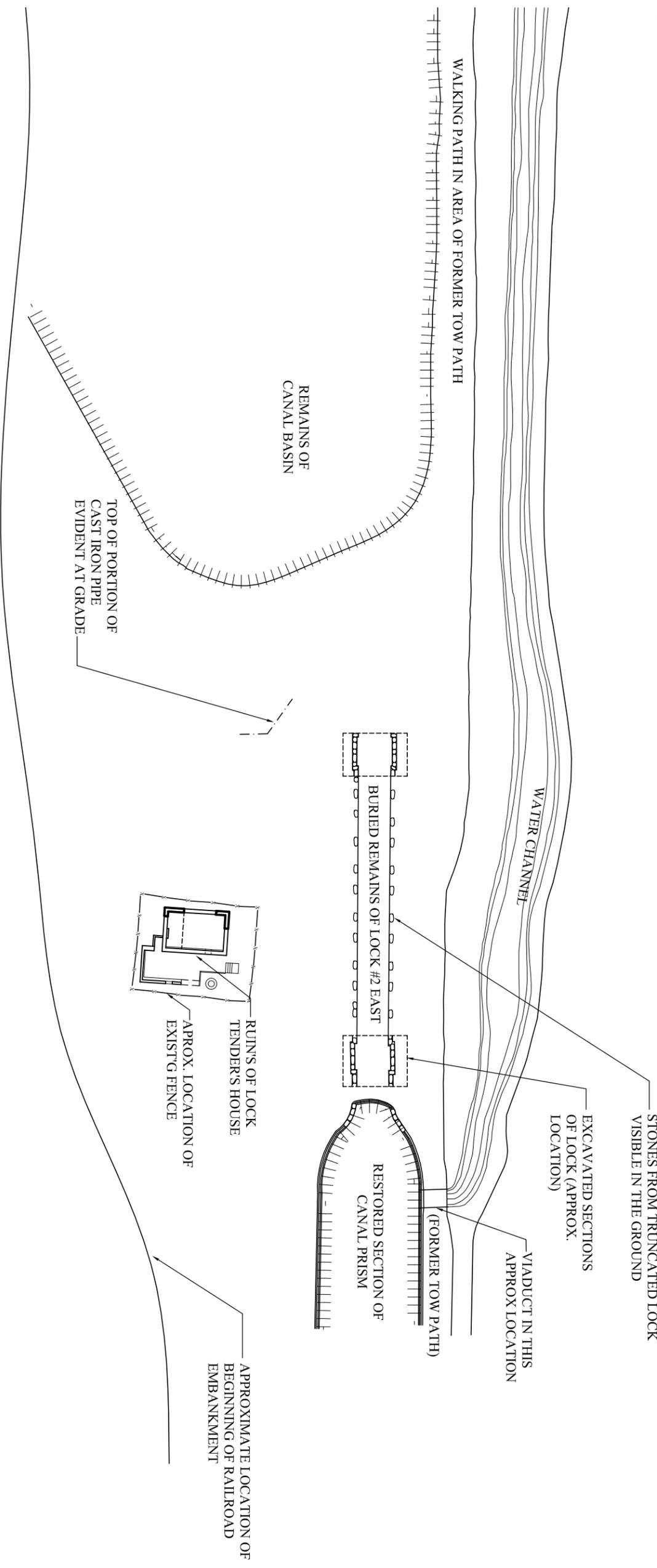
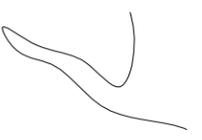
APPENDIX A

DRAWINGS OF EXISTING CONDITIONS

Prepared By:

HJGA Consulting, Architecture & Historic Preservation

(Drawings based on C. Vermeule Abandonment Plans and
in-field assessment of existing conditions)



LOCK 2 EAST - EXISTING CONDITIONS
NOT TO SCALE

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NY 0088141
PROJECT No.: 0616H
DATE: 4 FEBRUARY 2008

HISTORIC SITE MASTER PLAN
MORRIS CANAL LOCK 2 EAST
WHARTON, MORRIS COUNTY, NJ

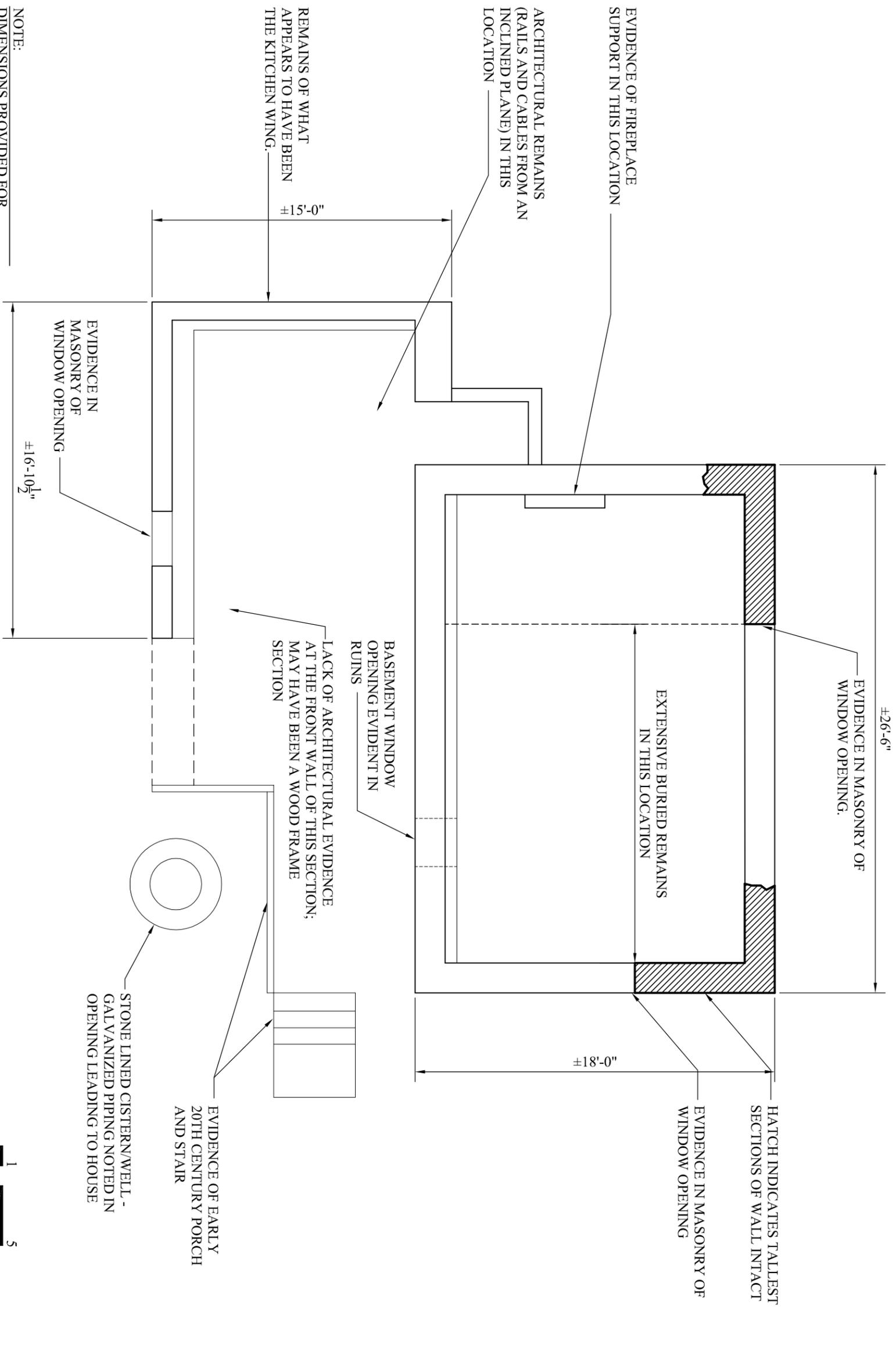


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WHARTON, MORRIS COUNTY, NJ

2



NOTE:
DIMENSIONS PROVIDED FOR
INFORMATIONAL PURPOSES ONLY



JOB
LOCK TENDER'S HOUSE RUINS - EXISTING CONDITIONS
3 / 16 " = 1 ' - 0 "

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APPENDIX B
PHOTOGRAPHS OF EXISTING CONDITIONS



Photo 1

View of watered section of the canal prism looking east. Note the tow path on the left side of the photograph and the railroad embankment on the right.

Credit: John Manna, Borough of Wharton

Photo 2

View of the watered section of the canal looking west.

Credit: John Manna, Borough of Wharton



PHOTOS 1 & 2



Photo 3

View of canal prism at the transition between the canal and remaining portions of the lock's splayed headwall at the east end of the lock.

Credit: John Manna, Borough of Wharton



Photo 4

View of Lock 2 East looking east from the remains of the lock toward the canal prism. The stones visible in the ground form the outline of the remains of the lock.

Credit: John Manna, Borough of Wharton

PHOTOS 3 & 4



Photo 5

View of the Lock 2 East site looking west towards the canal basin which is hidden by brush. The line of stone visible on the surface shows where the lock remains are buried. The top two to three feet of the lock were removed and the grade cut and leveled.



Photo 6

View of the Lock 2 East site looking east at the top of the lock walls. The path on the left connects the tow paths along the prism and basin.

PHOTOS 5 & 6



Photo 7

Overall view of the Lock 2 East site looking north. Beyond the line of vegetation along the path is Stephens Brook which feeds the canal prism.

Photo 8

Detail view of the remains of the splayed headwall at the east end of the lock at the connection with the canal prism.



PHOTOS 7 & 8



Photo 9

View of the brush separating the former lock from the location of the former canal basin beyond.

Photo 10

Overall view of the former canal basin, now a pond, to the west of the former Lock 2 East. The configuration of the basin has been modified since the canal abandonment. View taken from the railroad embankment above the lock tender's house.



PHOTOS 9 & 10



Photo 11

Detail view of one of the excavations of the lock. This is the east end showing some of the repairs to the stone walls with cast-in-place concrete.

Photo 12

View of the east excavation at the lock showing the stone walls including cast iron hardware attached to the side walls.



PHOTOS 11 & 12



Photo 13

Detail view of one of the west excavations of the lock; the south wall of the lock. Note the clear indication in the walls for the recess for the free operation of the miter gates in this location.

Photo 14

View of the north wall of the west lock excavation. Note the overall good condition of the stone composing the walls. Only four feet of the lock walls were revealed due to the presence of ground water in the bottom of the lock.



PHOTOS 13 & 14



Photo 15

View of a third excavation at the south side of the lock showing the gradual thickening of the lock walls from top to bottom.

Photo 16

View of iron spikes, hinges and other pieces of ironwork that appear to be associated with the miter gates located at the west end of the lock.



PHOTOS 15 & 16



Photo 17

View of coping stones removed from the filled in sections of the lock. These stone appear to be the top layers of the lock walls that were removed during the canal's abandonment. It will be critical to examine each stone for clues to their original location based on scarring, bedding joints, and other features prior to reinstallation.



Photo 18

Detail of iron spikes that appear to have been used to attach the timber sheathing to the lock walls.

PHOTOS 17 & 18



Photo 19

Overall view of the Lock 2 East site facing northeast, specifically showing the ruins of the lock tender's house and the surrounding brush. Photograph was taken from the railroad embankment above.

Photo 20

Overall view of the lock tender's house ruin looking southeast.



PHOTOS 19 & 20



Photo 21

Detail view of the ruins of the lock tender's house looking southwest at the northeast corner.

Photo 22

Partial view of the remaining south wall of the main building of the lock tender's house; the northwest corner is also visible beyond.



PHOTOS 21 & 22



Photo 23

View of the lock tender's house looking northeast at the kitchen wing.

Photo 24

View of the southeast corner of the kitchen wing. Note the well-preserved rough opening to the window in the east wall.



PHOTOS 23 & 24



Photo 25

View looking southwest at the ruins of the lock tender's house.
Note the former well/cistern to the left of the picture, as well as the
remains of the steps to the right.



Photo 26

View looking south at the west exterior wall of the
lock tender's house.

PHOTOS 25 & 26



Photo 27

View looking southwest showing the interior of the lock tender's house and the juxtaposition of the kitchen wing to the main house. Note the former well in the foreground.



Photo 28

Detail view of vandalism on the northwest corner of the lock tender's house. This is the tallest section still standing and therefore is highly unstable.

PHOTOS 27 & 28



Photo 29

Detail view of the ruins of the lock tender's house looking west. View shows vandalism of the crumbled north wall of the house, as well as overgrowth of brush around the site.

Photo 30

Overall view of the pile of stone rubble lying within the interior of the lock tender's house.



PHOTOS 29 & 30



Photo 31

Detail view of stone rubble and other debris behind the south elevation of the house.



Photo 32

Detail of the opening in the east elevation of the kitchen wing.

PHOTOS 31 & 32



Photo 33

Detail view of the brick and stone in the area of the former fireplace on the first floor in this location, the south exterior wall of the main house.

Photo 34

View of the exterior stone wall at the transition between the basement and first floor level showing the ledge where the first floor framing would have been placed.



PHOTOS 33 & 34



Photo 35

Detail view of the well/cistern in the northeast corner of the lock tender's house. Galvanized pipes leading to the house are seen in the opening .



Photo 36

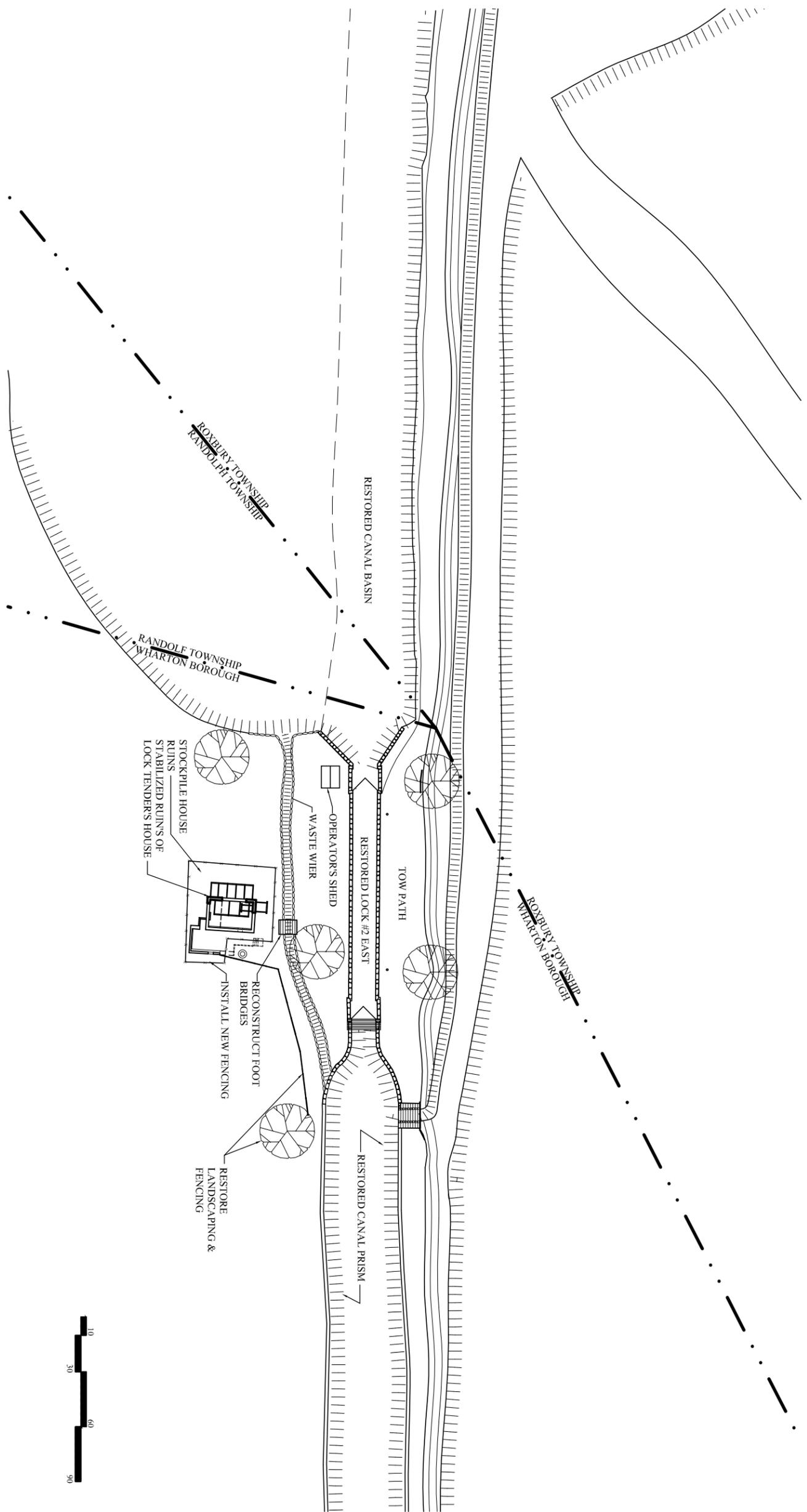
Detail view of debris within the lock tender's house, including portions of the rail and cables that were once used to brace the exterior walls of the main building.

APPENDIX C

DRAWINGS OF PROPOSED RECOMMENDATIONS



LOCK 2 EAST - PROPOSED RECOMMENDATIONS
NOT TO SCALE



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P1

APPENDIX D

MISCELLANEOUS SUPPORT MATERIALS

Excerpts from “Establishing a Nonprofit Organization”
The Foundation Center

Establishing a Nonprofit Organization

The following are excerpts from the article "Establishing a Nonprofit Organization" found at <http://foundationcenter.org/getstarted/tutorials/establish/>, the Foundation Center's website. According to their website, the Foundation Center is a leading authority on philanthropy, connecting nonprofits and the grantmakers supporting them with tools they can use and information they can trust. The Center maintains a comprehensive database on U.S. grantmakers and their grants as well as operates research, education, and training programs designed to advance philanthropy at every level.

What are the characteristics that define an effective nonprofit organization?

Grantmakers for Effective Organizations, an affinity group of the Council on Foundations, defines an effective nonprofit as one that has "the ability to fulfill its mission through a blend of sound management, strong governance, and a persistent rededication to achieving results." Establishing a nonprofit organization requires a full understanding of the key characteristics that will be important to future funders. They include a vital mission, clear lines of accountability, adequate facilities, reliable and diverse revenue streams, and high-quality programs and services.

As you embark upon the first steps of legally incorporating a nonprofit organization, drafting the bylaws, and building a board of directors, it is essential to keep these characteristics in mind.

This tutorial describes 12 tasks you will need to accomplish as part of the process of establishing a nonprofit organization: *(The highlighted tasks are the ones that have been provided below and most directly relate to the more complex tasks of creating a nonprofit)*

- *File the certificate of incorporation*
- *Select individuals to serve on the board of directors*
- *Develop vision and mission statements*
- *Establish bylaws and board policies*
- Obtain an employer identification number (EIN)
- Open a bank account and establish check signing procedures
- File for federal tax exemption
- Follow state and local nonprofit regulations
- Find office space and obtain office equipment
- Recruit staff and prepare a personnel manual
- Establish a payroll system and procure necessary insurance coverage
- *Develop an overall fundraising plan*

File the Certificate of Incorporation

In the United States, nonprofits can operate as unincorporated associations, charitable trusts, or corporations. There are fewer government reporting requirements for unincorporated associations, but they will find it more difficult to be recognized as tax-exempt, and they cannot receive grants from most foundations and corporations. Charitable trusts can be recognized as tax-exempt, but they do not offer their trustees the same protections from personal liability as those enjoyed by directors of not-for-profit corporations. While becoming and operating a nonprofit corporation requires considerable time and effort, the advantages of this form of legal organization make it the one most groups choose if they require substantial public support, and if they expect their operations to be ongoing.

The first step in becoming a corporation is drafting the legal incorporation document--the "certificate" or "articles" of incorporation--and filing the document with the appropriate office within your state government, usually the office of the Secretary of State or Attorney General. In some states, approval must first be obtained from any state agency that will be regulating the proposed programs of the nonprofit organization. State incorporation usually can be accomplished within a matter of weeks, although multiple or complex state agency reviews can considerably extend that period.

As you prepare the articles of incorporation, you will need to determine the name of the organization, where the organization will be headquartered, and its overall purpose. When preparing the "purposes clause," remember to state the goals of the organization broadly in order to provide program flexibility in the future, and do not include purposes that will trigger state agency reviews of the proposed incorporation unless your organization in fact plans to conduct those programs.

Prior to the incorporation process, you also will need to make a decision whether or not your nonprofit will be a membership organization. Members may have significant rights with respect to internal governance, such as the right to elect and remove directors, vote upon changes in the structure of the organization and amend bylaws. Becoming a membership organization can be beneficial. For example, prominent individuals from existing community groups affiliated with your organization may feel a strong sense of ownership in the effectiveness of the board of directors, and in the overall success of the nonprofit's mission if they are members. However, forming your corporation as a membership corporation also imposes legal obligations in preserving the rights of members to participate in the corporation's governance.

Select individuals to serve on the board of directors

The board of directors is the governing body of a nonprofit organization. The responsibilities of the board include discussing and voting on the highest priority issues, setting organizational policies, and hiring and evaluating key staff. Board members are not required to know everything about nonprofit management, but they are expected to act prudently and in the best interests of the organization. They approve operating budgets, establish long-term plans, and carry out fundraising activities.

Finding desirable board members can be a difficult task. A good board member is someone who is interested in the organization's purpose, willing to work within a group, and be in a position to make financial contributions to the organization, or to find others who will. Inviting prominent members of the community to join your board can attract interest, excitement and prestige to the organization. It is also desirable if board members are well known in the field in which the nonprofit organization functions, and it can be extremely beneficial if they have expertise in areas such as real estate, nonprofit law and accounting. For example, having someone on your board who is savvy on real estate matters can be quite helpful when complex issues arise down the road, such as negotiating leases or purchase contracts.

Important points during this process:

- It is essential that prospective board members be told what is expected of them before they are proposed for election. Asking people to join the board without providing a "job description" is sure to create an ineffective board.
- Build a board slowly. Proceeding carefully can provide the necessary time for learning why an individual wants to become a board member, and deciding whether his or her agenda is compatible with the organization's.

When building the board, it is important to recruit beyond your immediate circle of friends and acquaintances. Often, there is an assumption that professionals and businesspeople will not be sympathetic to the pursuits of a new grassroots organization. Despite these concerns, there are various strategies that can be employed to seek board candidates:

- Seek out the advice of local funders, such as foundation staff, and government officials who have an interest in your organization's mission
- Contact executive directors and board officers of large, established nonprofit institutions in your community for their suggestions
- Ask for volunteers at any canvassing efforts, open houses, special events, and benefits that your organization sponsors

Develop vision and mission statements

Vision and mission statements should articulate the essence of your organization's beliefs and values and define its place in the world. They establish the long-term direction that guides every aspect of an organization's daily operations.

To distinguish between the two, a vision statement expresses an organization's optimal goal and reason for existence, while a mission statement provides an overview of the group's plans to realize that vision by identifying the service areas, target audience, and values and goals of the organization.

In drafting appropriate statements for your organization, you might think about answers to the following questions to guide you:

Vision

- What are the values or beliefs that inform your work?
- What would you ultimately hope to accomplish as a result of your efforts?

Mission

- How do you plan to work toward this broad vision?
- For whose specific benefit does the organization exist?

Establish bylaws and board policies

Bylaws define how a nonprofit organization will be managed and how it will run. They determine which staff and board members have authority and decision-making responsibilities and how those responsibilities should be carried out. They create a framework for the organization, and aid in resolving internal disputes. They also describe the rules for calling board meetings, and how and when board members are elected.

In addition to bylaws, it is advisable to have something at a lower level of formality, such as board policies. You might, for instance, adopt a Conflict of Interest Policy and set up a procedure for board members and officers to disclose whether they, or people close to them, may be in a position to benefit from something the nonprofit is doing. Having such a policy in place will assure funders that the chief officers of the nonprofit organization understand the importance of handling charitable dollars prudently and responsibly.

Develop an overall fundraising plan

There are many different ways to maintain a viable, financially stable nonprofit organization. It is important to develop funding from a mix of individual and institutional sources, as well as earned income generated from special events, products, services and membership fees.

Individuals extend their support in a variety of ways: they make contributions and pledges in response to direct mail requests, phonathons, appeals on the Internet, door-to-door canvassing, and face-to-face solicitations. Institutions that provide both financial and in-kind support to nonprofits include foundations; businesses and corporations; local, state and federal governments; and religious institutions.

Today, diversification of support is vital, and no organization can hope to finance its work successfully from any one source. Even if it does succeed in obtaining that one large, elusive grant, there's no guarantee the grant will be renewed each year, and the organization's future will not be secure. Moreover, funders like to see that an organization's funding is diversified, for this shows broad-based agreement that its mission is important and worthy of support.

The whole document is available from the Internet: <http://foundationcenter.org/getstarted/tutorials/establish/>, Accessed March 2007.

HISTORIC SITE MASTER PLAN & FEASIBILITY STUDY
LOCK 2 EAST OF THE MORRIS CANAL
BOROUGH OF WHARTON, MORRIS COUNTY, NEW JERSEY

MORRIS CANAL AND BANKING COMPANY, Trustee	:Dated	March 13, 1929
To	:Acknowledged	March 13, 1929
BOROUGH OF WHARTON	:Recorded	March 23, 1929 P-31-232 &c.
	: Consideration	\$50.00
	:	

xx does give, grant, &c. to the party of the second part, its successors and assigns,

ALL the right, title, and interest of the party of the first part in the following described property located in the Township of Roxbury, County of Morris, State of New Jersey, more particularly described as follows: All that part of the Morris Canal, its bed, banks, towpath and embankments beginning where the line of the Borough of Wharton and of the Township of Roxbury, as now laid out, crosses said canal at or near Lock No. 2 East, commonly known as Burds Lock, and extending thence westwardly to the easterly line of the right of way of the Ogden Mine Branch of the Central Railroad of New Jersey, a distance of Nine Hundred Twenty-five feet (925 feet) more or less, and having an average width of Sixty-three (63 feet) measured form the northerly side of the towpath embankment, which property David Dunham by instrument dated July 15, 1825, signed and witnessed, but not recorded, agreed to convey to the Canal Company; and for and in consideration of the further sum of One Dollar (\$1.00) legal money of the United States of America to it in hand well and truly paid by the said party of the second part, at or before the sealing and delivery of these presents, the receipt whereof is acknowledged, has given, granted, bargained, sold, aliened, released, conveyed and confirmed and by these presents does give, grant,

Supplemental Materials 1

Deed for Canal Basin—Page 1

Credit: "Morris Canal Records", Borough of Wharton, NJ

bargain, sell, alien, release, convey and confirm unto the said party of the second part, its successors and assigns forever, whatever right, title, and interest the party of the first part may or does have in the property located in the Township of Roxbury, County of Morris, State of New Jersey, and more particularly described in a deed John D. King and Eliza his wife and Fannie Bailey to the Morris Canal and Banking Company, dated September 17, 1859, and recorded in the office of the Clerk of Morris County, in Book T 5 of Deeds, Page 501 et seq., it being the intent of this deed to convey to the party of the second part, all the property, property rights and privileges of whatever description, of the party of the first part, in and to the lands and waters formerly used for the purposes of the Morris Canal, between the westerly line of the canal property heretofore conveyed to the party of the second part and the easterly line of the right of way of the aforesaid railroad. TOGETHER with all and singular the rights, liberties, privileges, tenements, hereditaments and appurtenances to the same belonging or in any wise appertaining; and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and also all the estate, right, title, interest, property, claim and demand whatsoever, both at law and in equity, of the said party of the First part, of, in and to the said premises, and above mentioned and described premises, and every part and parcel thereof, with the appurtenances, unto the said party of the Second part, its successors and assigns, to the only proper use, benefit and behoof of the said party of the Second part, its successors and assigns, forever.

Approved:

MORRIS CANAL AND BANKING COMPANY

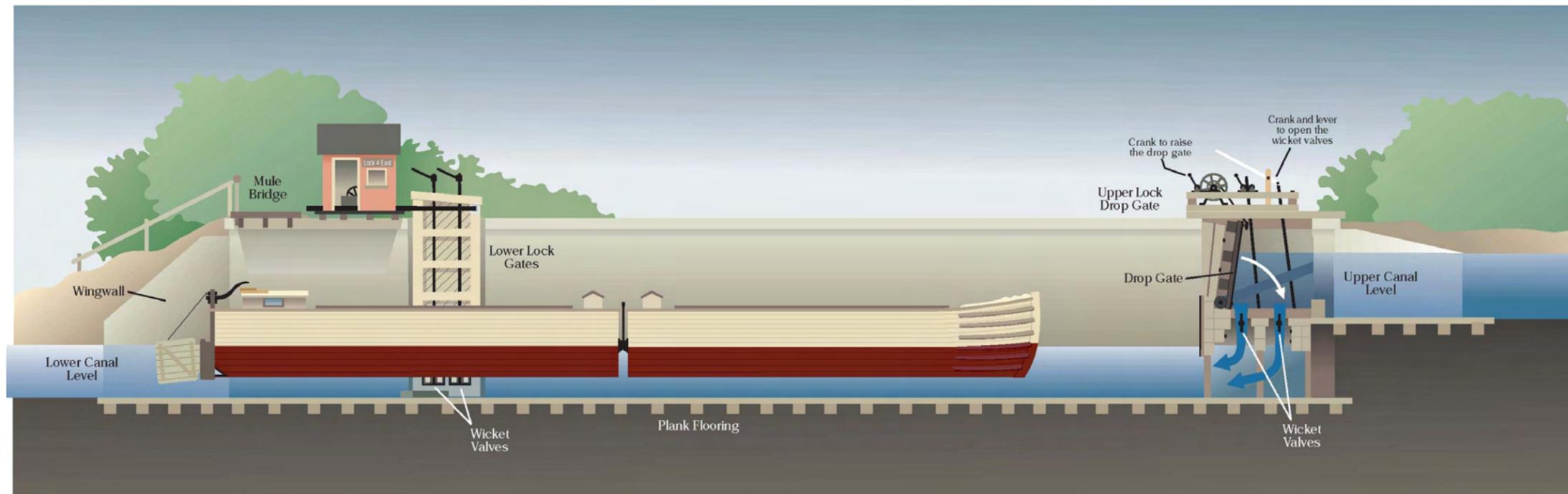
Morgan F. Larson
Governor

By Henry L. Moeller
Vice President

Supplemental Materials 2

Deed for Canal Basin—Page 2

Credit: "Morris Canal Records", Borough of Wharton, NJ



Supplemental Materials 3

Color diagram showing the operation of a lock.

Diagram is an excellent graphic representation of the operation of a lock. This type of graphic is very helpful as an educational tool in telling the story of the lock's operation to visitors.

Credit: Copy of Original Artwork by Joseph Macasek, Canal Society of New Jersey.