30 June 2022

Study for Certification of Deferred Maintenance Project

DCR Ellis Stone Storehouse
Hemlock Gorge Reservation
Newton, MA 02494

State Project #, Phase: P22-3481-S1A
CAMIS 'J' #: 601MDC9503
Agency Project #: P22-3481-S1A

Prepared For:

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The Commonwealth of Massachusetts
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Section 1 – Study Summary

The Ellis Stone Storehouse was likely constructed circa 1808, although various architectural historians attribute its construction to sometime between 1750 and 1808. The building served as storage for Rufus Ellis's Newton Iron Works Company. Since its construction, the Ellis Storehouse has reportedly served as a nail factory, paper manufacturing facility, and project office during the reconstruction of the Boylston Street Bridge over the Charles River in the early 1900s. Since, the Ellis Storehouse has been used as a storage facility and continues in that use today.

The Ellis Storehouse is a two-story building with walls constructed of rubble stone mass masonry bearing directly on a Roxbury puddingstone ledge rock outcropping. At the west elevation and a portion of the north elevation, the puddingstone ledge outcropping serves as the below-grade wall. The majority of the window openings have been infilled with brick masonry, with only the attic openings on the north and south elevations, and the second-floor openings on the east elevation remaining. We understand the second-floor windows and door on the east elevation were recently replaced. We also understand the roofing was recently replaced with cedar shingles. The interior consists of a concrete floor, with a wood-framed second floor. The northern half of the second floor and the attic framing were previously removed. The interior faces of the stone masonry walls are partially parged with mortar.

In May 1989, the Metropolitan District Commission (MDC) assessed the condition of the Ellis Stone Storehouse and provided recommendations. These recommendations included an extensive restoration consisting of removing the wood framing, interior plaster/parge coat, and virtually all non-stone features and restoring the building following the Secretary of the Interior's Standards for the Treatment of Historic Properties. We understand this work was not completed.

On 5 April, 4 May, and 11 May 2022, Simpson Gumpertz & Heger Inc. (SGH) surveyed the interior and exterior of the Ellis Stone Storehouse. On 5 April and 11 May 2022, DHK Architects (DHK) surveyed the interior of the Ellis Stone Storehouse. Our observations and recommendations are summarized herein.

Purpose Statement from Massachusetts Department of Conservation and Recreation

This study was prepared for the Office of Programming, Division of Capital Asset Management, Executive Office of Administration and Finance, Commonwealth of Massachusetts, as required by Mass. General Laws C.7 and C.29.

The purpose of this study is to develop schematic restoration plans and cost estimates to better understand the range of feasible options to restore the historically significant Ellis Storehouse. We understand the building will continue to be used as storage, and there is no intent to modify or adapt the building for a different purpose. The study is intended to investigate agency needs, evaluate alternatives and define a preferred solution to the building project before final design begins and before a decision is made to appropriate funds for implementation. After appropriation, if any, this study must be certified and thereafter no substantial changes can be made to the study solution during the implementation process. Such deviations are limited by statute to no more than 10% of the total square feet, if applicable, although a redistribution of areas can occur within the total figures for this project.

The study culminates in a final program which defines the preferred solution in terms of its content, time, and cost so that it provides a clear and detailed frame of reference for the design and implementation process. A study schematic design has been included in the study for purposes of illustrating the preferred solution and for developing accurate cost estimates. The form of the schematic design is not intended to constrain the final designer, but the codes and standards must be followed in implementation.

The final designer should review the study and satisfy themself as to the accuracy of the contents before proceeding into design. However, it is expected that the study should save time and expense by avoiding unnecessary duplication of pre-design activities.

The Need

The team of DHK and SGH was retained by the Department of Conservation and Recreation to perform a condition assessment and certified study of the Ellis Storehouse. The Ellis Storehouse building envelope is deteriorated, apart from the recently replaced roofing and second-floor windows and door. At the west and north elevations, water enters the building at the Roxbury puddingstone below-grade walls. The building requires restoration to stabilize the building envelope and load-bearing mass masonry walls to mitigate further deterioration. The Ellis Storehouse is listed on the State Register of Historic Places (Mass Historical Commission Inventory number WEL.20) by virtue of its listing as a contributing feature within the Newton Upper Falls Historic District (Mass Historical Commission Inventory number NWT.R), thus any work on the property should conform with the Secretary of the Interior's Standards for Treatment of Historic Properties.

The Findings

The rubble stone masonry itself is generally in good condition, but in many locations the mortar is severely eroded or has been poorly repointed, or the chinking is missing. In localized areas, the rubble stone is stained with graffiti, biological growth, or efflorescence. At the southeast corner, the cornerstone is missing, resulting in cracking and reduced gravity support for the load-bearing masonry walls of the building. Multiple stone lintels are cracked. The puddingstone ledge outcropping at the west and north elevations, which directly supports the west wall and a portion of the north wall of the building, is deteriorated and water seepage through and atop the puddingstone ledge outcropping is evident, with one location where the rubble stone wall atop the ledge appears to have settled.

Many of the character-defining features, such as the windows, have been removed, and the addition of conduits and antennas to the exterior of the building has adversely altered the building's historic appearance. The second-floor windows and door at the east elevation have recently been replaced with windows and a door generally matching the historical appearance in operability type and muntin configuration, but the window material and the full-height exterior insect screens over these replacement windows and door are not historically appropriate.

The northern portion of the second floor (i.e., storage loft) has been previously removed. Many of the second-floor framing members on the south side remain, but the floor sheathing and some of the framing members have been previously removed. The remaining framing members are checked, but generally in good condition. The rubble stone masonry at the framing pockets is often cracked or loose, reducing the gravity support for the wood framing members. Furthermore, the existing stairs have been partially removed at the bottom of the run to accommodate the concrete masonry unit (i.e., CMU, "concrete block") closet containing the water level monitoring instruments for the dam.

The Recommendation

We recommend that the Ellis Storehouse continue to be used for storage. We recommend undertaking exterior repairs and restoration of the Ellis Storehouse in accordance with the Secretary of the Interior's Standards for Treatment of Historic Properties. These repairs would include addressing the structural concerns posed by the cracked lintels, deteriorated puddingstone ledge outcropping, missing cornerstone, and deteriorated second-floor framing pockets at the interior as well as adding exterior site drainage along the west elevation to mitigate further water

seepage and resultant deterioration of the ledge outcropping supporting the west wall of the building. In addition, the restoration would include repointing the exterior walls and replacing missing chinking (i.e., the small stone shims between the larger stones). The restoration would also include removing the historically incompatible doors, windows, and brick infill in the window openings and installing new historically appropriate wood windows, shutters, and doors (as seen in the archival photos) to restore the building to a more historically appropriate appearance while continuing its use as a storage facility. Lastly, we recommend removing and rebuilding the existing stair structure, repairing the remaining second-floor framing, and installing a guardrail at the edge of the remaining second-floor loft area to maintain its use for light storage.

☐ *I acknowledge that the information provided by the House Doctor in this Study has been reviewed and approved by the User Agency for accuracy including investigation of existing conditions, applicability of building code and accessibility regulations, estimated construction cost, and schedule for design and construction.*

Signature of Agency Point of Contact: _____

Phone Number: 617-851-2241 E-mail Address: jeffrey.harris@state.ma.us

Section 2 – Existing Conditions Investigation

SGH and DHK performed a condition assessment of the Ellis Storehouse located in the Hemlock Gorge Reservation. We summarize our observations below.

Basic Building Data

Year of original construction	Between 1750 and 1808
Year(s) of recent renovations	No Renovations
Building occupancy type	Group S-1
Building square footage	Approx. 2368 sf
Building use/occupancy	Storage
Current CAMIS Value	$320,000
CAMIS 'J' Number	601MDC9503
CAMIS Site Code and/or Building Number	601MDC9503

2.1 Document Review

We reviewed the following documents:

- Historic American Building Survey (HABS) Drawings and Photographs dated 5 April – 30 May 1935. See Appendix A.
- Cultural Resource Inventory Evaluation of Significance Report dated 10 May 1989 by the Metropolitan District Commission (MDC), including early 20th century photographs. See Appendix B.
- Massachusetts Historical Commission Form B, prepared August 1985. This report includes as an appendix a Site Investigation Report prepared by Albert Swanson, Architectural Historian with the MDC, dated 1978. See Appendix C.

From our review of these documents, we note the following:

- The estimated date of construction varies. The HABS drawings indicate the building was constructed c. 1750, while the MDC report states the building was constructed in 1808. The Site Investigation Report prepared by Albert Swanson in 1978 states that the characteristics of the building have led various architectural historians to date it between 1750 and 1808.
- In the early 20th century, a wood-framed exterior stair and landing led to the second-floor doorway on the east elevation. By 1935, this stairway had been removed.
- At some point between 1935 and 1989, all openings apart from the main entrance were infilled with brick. Prior to the brick infill, the majority of the windows were 6/6 double hung, with fixed windows at the attic openings and casement windows at the first-floor openings on the west elevation.
- In 1935, the roofing consisted of wood shingles. By 1989, the roofing had been replaced with asphalt shingles. Currently, the roofing again consists of wood (cedar) shingles.

- In 1935, the interior floor was dirt. By 1989, a concrete floor had been installed.
- There were wood shutters at the large window openings. Based on our document review, it is unclear when the wood shutters were removed.
- By 1989, an approximately 5-ft-long portion of the west elevation wall had collapsed. This collapsed portion of the wall has since been rebuilt.
- Prior to 1989, there was a brick chimney on the western half of the building. At some point the chimney collapsed, leaving a large hole in the roof and collapsing the northern portion of the second floor. The roof has since been rebuilt, and the northern portion of the second floor was fully removed. The chimney was not rebuilt.
- The walls are laid in a soft, sandy lime mortar, portions of which show horsehair binder. The mortar was analyzed by McGinley Hart & Associates, who recommended using a mortar with 1 part white Portland cement, 2-1/2 parts lime, and 10 parts sand for repairs.

2.2 Field Observations

On 5 April, 4 May, and 11 May 2022, Matthew B. Bronski, Ellen M. Laase, and Tommaso Manetti of SGH performed a visual survey of the interior and exterior of the Ellis Storehouse, including the stone masonry, windows and doors, and roofing (Photo 1). On 5 April and 11 May 2022, DHK Architects (DHK) surveyed the interior and exterior. Appendix D shows the approximate locations of our observations.

Photo 1: Overview of east elevation

2.2.1 General Conditions

2.2.1.1 Site Conditions

The Ellis Storehouse is part of the Hemlock Gorge Reservation in Newton, Massachusetts. It is bordered to the north by Boylston Street and on the east by the Charles River (Figure 1). There is a small dirt and gravel parking lot adjacent to the east elevation of the building.

Figure 1: Site Map (Ellis Storehouse shaded red for clarity)

2.2.1.2 Accessibility

The interior of the Ellis Storehouse is accessed via the double outswing entry doors on the east elevation (Photo 2). The interior floor slab is several inches higher than the exterior grade, creating a vertical offset that is significantly greater than the 1/4 in. maximum allowed by accessibility codes.

Photo 2: Entry door with vertical offset from exterior to interior (arrow)

2.2.2 Electrical Systems

2.2.2.1 Power System

The building has a 120/240 Volt, 1-phase, 3-wire, 60 Amp overhead electrical service that enters the building through a utility meter mounted on the exterior of the building and terminates in a 100 Amp panelboard. The panelboard provides branch circuit power to lights and receptacles.

A quad receptacle is located next to the panel and a duplex receptacle is located within the electrical closet. There are not enough receptacles to support any type of use of the building other than storage.

The main service wiring is installed in EMT conduit, receptacle branch circuits are installed within EMT conduit, light branch circuits are installed within EMT conduit and transition to NM cable.

The utility meter, panelboard, and receptacles all appear to be in fair to good condition and fully functional.

2.2.2.2 Lighting Systems

The interior lighting consists of three 8 ft linear industrial fluorescent light fixtures and two screw base light sockets with BR30 type bulbs. The fixtures are controlled by a single manual light switch located next to the panelboard. The fixtures appear to be in fair to good condition but have older, less efficient fluorescent lamps.

The exterior lighting consists of two flood lights with dual LED lighting heads mounted on the east and south elevations. The fixtures are controlled by a single light manual switch located next to the panelboard and with a combination motion/day light sensor mounted to each fixture base. The fixtures appear to be in good condition but do not provide illumination for all four elevations.

The building does not have emergency egress lighting.

2.2.2.3 Fire Safety Equipment

The building does not have a fire alarm system or any fire monitoring devices.

2.2.3 Structural Systems

2.2.3.1 Foundation

At portions of the west and north elevations, approximately 3-1/2 ft at the base of wall is an exposed natural ledge outcropping of Roxbury puddingstone (Photo 3). This natural ledge outcropping is below the exterior grade, and thus not visible from the exterior. The puddingstone is generally in poor condition, portions of the puddingstone are deteriorated, loose, and friable, and the puddingstone ledge is damp indicating water seepage from exterior to interior (Photo 4).

Photo 3: Roxbury puddingstone ledge outcropping at west elevation

Photo 4: Moisture on floor at natural ledge outcropping along west wall

At one location, the rubble stone masonry above and adjacent to the puddingstone ledge appears to have settled. Portions of the wall directly above the ledge appear loose and are missing mortar and chinking (Photo 5).

Photo 5: Loose rubble stone masonry above puddingstone ledge

2.2.3.2 Masonry Walls

The stone lintels over the windows and doors are generally in good condition, with the exception of the two cracked lintels which are in poor condition (Photos 6, 7). These cracked stone lintels are present on the second-floor window and the entrance door on the east elevation.

Photo 6: Cracked stone lintel

Two stone lintels were previously replaced, one with stone (Photo 7) and another with steel (Photo 8). The replaced lintels are in good condition.

Photo 7: Lintel replaced with stone

Photo 8: Lintel replaced with steel.

The cornerstone at the base of the wall at the southeast corner of the building is missing, reducing the gravity support for the rubble stone masonry wall above (Photo 9).

Photo 9: Missing cornerstone

2.2.3.3 Removed Second-Floor Framing

The northern portion of the second-floor wood framing has been removed. Many of the second-floor framing members on the south side remain, but the floor decking and some of the framing members have been previously removed. This is consistent with the observations from the 1989 MDC report. The remaining framing members are checked, but generally in fair condition (Photo 10). The rubble stone masonry at the framing pockets is often cracked or loose, reducing the gravity support for the wood framing members (Photo11). We see no visible indications that the previous removal of the second-floor framing in the northerly half of the building has adversely affected the exterior masonry walls. The remaining second-floor loft in the southerly portion of the building currently serves as storage for salvaged structural wood members.

Photo 10: Checked second-floor wood framing

Photo 11: Cracked and loose rubble stone masonry at floor framing pocket

The existing stairs have been partially removed at the bottom of the run to accommodate the concrete masonry unit closet for the electrical equipment for monitoring the dam (Photo 12), thus creating a high first riser and narrow landing area that impede use of the stair.

Photo 12: Stairs to *second-floor* storage loft

2.2.3.4 Roof Framing

The original roof framing and sheathing appears to have been replaced relatively recently with new wood trusses and plywood sheathing (Photo 13). The roof framing and sheathing appears in good condition looking up from below.

Photo 13: Roof framing and sheathing

2.2.4 Exterior Elements

2.2.4.1 Roofing

The cedar shingle roofing appears in good condition from the ground (Photo 14). We understand the roofing was installed relatively recently.

Photo 14: Cedar shingle roofing (view from west)

2.2.4.2 Exterior Walls

The exterior rubble masonry walls are generally in fair condition. We observed the following:

- Localized areas of severely eroded mortar. At some locations, the relatively recent white mortar has been installed and appears to have been applied by hand, with finger marks visible at some locations (Photo 15). This relatively recent mortar is bright white and does not match the remaining existing mortar in color, texture, or profile.

Photo 15: Severely eroded mortar (arrows) and non-matching replacement mortar (circled)

- Localized areas of missing chinking (smaller in-fill stones) between the larger rubble stones (Photo 16). The voids at missing chinking can allow bulk water intrusion into the core of the

load-bearing masonry walls, as well as to the building interior. Additionally, the missing chinking means a loss of point-to-point contact between surrounding stones and creates a point where displacement (movement) of stones can more easily occur as water enters and mortar deteriorates.

Photo 16: Missing chinking in exterior stone masonry

- Localized graffiti on masonry (Photo 17).

Photo 17: Graffiti

- Biological growth, staining, and efflorescence on surface of rubble stone masonry (Photo 18).

Photo 18: Biological growth and staining

- One location on the west elevation where an exterior parge coat (i.e., render) is installed over the rubble stone masonry and brick infill (Photo 19). The parge coat is cracked and delaminated.

Photo 19: Parge coat at west elevation

- Gaps at door surrounds (Photo 20) and between exterior wall and roof framing. These gaps can allow pests (e.g., rodents) to enter the building.

Photo 20: Gap at door surrounds

- Multiple locations of electrical equipment and conduits fastened to, penetrating through, and marring the historic appearance of the exterior masonry walls (Photo 21).

Photo 21: Electrical equipment and conduits attached to, penetrating through, and marring the historic appearance of the exterior masonry walls

- Abandoned ferrous metal shutter tie-back hardware is present on the east elevation, indicating the building once had functioning shutters. (Photo 2). This is consistent with the early 20th century photographs included in the MDC report.

Photo 22: Shutter tie-back

2.2.4.3 Windows

The majority of the windows have been infilled with brick masonry. A small portion of the opening in the rubble stone above the entrance door has also been infilled with brick. At the east elevation, the second-floor windows and door have recently been replaced; the windows are covered with screens with historically incongruous white aluminum frames (Photo 23) that project forward past the face of the stone masonry walls. The attic windows have not been infilled but are open or filled with a wood frame and screen.

Photo 23: Brick infill and replacement window and door

2.2.4.4 Doors

The galvanized steel-clad entrance door at the east elevation is in fair condition. The door is historically incongruous, and the paint is peeling (Photo 24).

Photo 24: Peeling paint on galvanized steel entrance door

2.2.4.5 Landscape

We observed vegetation directly abutting the building and within a couple feet of the face of the building (Photo 25). Large roots from vegetation can damage the stone masonry.

Photo 25: Woody vegetation directly abutting the building

On the north and south elevations, the existing grade slopes parallel to the exterior walls toward the east. On the east elevation, the existing grade is relatively level. On the west elevation, the existing grade gently slopes parallel to the exterior wall from north to south; perpendicular to the wall, the existing grade slopes toward the building, directing water toward the building (Photo 26).

Photo 26: Exterior grade slopes toward the west wall of the building (arrow), where water seepage is occurring through the natural ledge outcropping at the interior

2.2.5 Interior Elements

2.2.5.1 Flooring

The interior floor is concrete, and the visible floor appears to be in good condition. Portions of the floor were covered with stored materials (e.g., lumber, picnic tables, etc.) at the time of our visits (Photo 27).

Photo 27: Interior concrete floor slab

2.2.5.2 Walls

The interior surface of the walls is partially rendered over the rubble stone masonry (Photo 28). The render (plaster directly applied and bonded to the masonry, without lath or furring) is not present at the second floor at the northern end of the building. The interior of the walls is generally in relatively good condition.

Photo 28: Interior walls are partially rendered (lower portion of photo)

Near the entry door, we observed a utility closet constructed with concrete masonry unit (CMU) partition walls (Photo 29). The closet appears to contain the water level monitoring equipment for the nearby Charles River, just above the dam. Multiple conduits from the exterior run to this closet, through a brick-infilled window and gaps at the entrance door surrounds.

Photo 29: CMU closet containing water level monitoring equipment

Section 3 – Code and Regulations Summary

The following is a summary of the essential requirements of the code review conducted for this project, describing the evaluation of the existing building in accordance with 780 CMR 34.00 (2015 International Existing Building Code with amendments) and the code compliance approach associated with the proposed work.

The 2,368 sq ft Barn requires exterior masonry repairs, window and door replacement, and minor interior repairs and lighting replacement for continued use for active storage. Note that this Barn is currently being used for light non-combustible storage at the ground floor, classified as S-1.

Applicable Codes

Building Code 780 CMR 34.00 (2015)	☒ Applicable	☐ Not Applicable
Fire Protection	☐ Applicable	☒ Not Applicable
Plumbing	☐ Applicable	☒ Not Applicable
Electrical	☒ Applicable	☐ Not Applicable
Mechanical	☐ Applicable	☒ Not Applicable
Elevator	☐ Applicable	☒ Not Applicable
Hazardous Materials	☐ Applicable	☒ Not Applicable
Energy	☐ Applicable	☒ Not Applicable
Accessibility	☐ Applicable	☒ Not Applicable
Historic Preservation	☒ Applicable	☐ Not Applicable

Code Analysis

The renovation work required for the Barn is general maintenance and ordinary repair in-kind and does not trigger any level alteration or energy code requirements.

Section 4 – Options and Proposed Solution

Based on our document review and observations, we offer the following recommendations. Our recommendations are based on the Secretary of the Interior's Standards for the Treatment of Historic Properties. Our recommendations and estimated repair quantities are summarized in Appendix E. We have divided the repairs into three options. See Appendix F for our proposed repair options.

OPTION 1: REPAIR AND PRESERVATION OF STONE MASONRY WALLS AND ELECTRICAL UPGRADES

The following work is necessary to stabilize and preserve the load-bearing exterior stone masonry walls of the building. We have prioritized the work into the two categories below, in case funding or scheduling does not allow for all of this work to be undertaken at once.

Immediate Stone Masonry Repairs (Priority 1)

Due to safety concerns or severe deterioration, we recommend that the following immediate repairs be implemented as soon as practical.

- Remove vegetation within 3 ft of the building.
- Install missing cornerstone at southeast corner of building.
- Repair cracked lintels over entrance door and windows.
- Install continuous site drainage along the west side of building to mitigate deterioration of the puddingstone ledge.
- Remove loose or deteriorated puddingstone ledge at interior side of west and north elevation walls and stabilize top surface (at intersection with rubble stone wall) with non-shrink grout.
- Repair localized areas of the interior rubble stone wall (at voids and areas of deterioration), with mortar and new chinking.

Near-Term Stone Masonry Repairs (Priority 2)

We recommend the following short-term repairs be implemented within the next five years to mitigate further damage to the building.

- Clean graffiti, efflorescence, and biological growth from stone masonry.
- Repoint eroded and non-matching/improperly repointed mortar joints.
- Replace missing chinking with mortar and stone chinking matching the existing.

In addition to the stone masonry repairs, we also recommend the following electrical upgrades be as part of Option 1:

- The existing service, utility meter, panelboard, and receptacles are to remain with no replacement.

- Replace the interior light system completely with six 4 ft linear lensed damp location rated LED light fixtures with a time clock switch control in lieu of the existing manual switch. The replacement shall include the removal and replacement of the light fixtures branch circuit wiring.
- Install two LED flood lights each with combination motion/day light sensor mounted to each fixture base. One light shall be mounted on the West elevation and the other on the North Elevation.
- Install two new emergency lighting battery units within the building and a remote lighting head mounted on the building exterior next to the entrance door, the remote head shall be powered by one of the emergency battery lighting units.
- All new branch circuit wiring shall be installed in EMT.

OPTION 2: RESTORATION OF HISTORIC WINDOWS AND DOORS

We recommend the following to restore the historic appearance and character of the building. Option 2 also includes the stone masonry repairs and electrical upgrades outlined in Option 1 above.

Removal of historically incongruous utility lines and equipment from the facade:

The utility conduits, lines, and meter mounted on and through the historic facade disfigure the historic appearance of the primary facade of this historic structure. We recommend implementing the following to restore the historic appearance of the facade:

- Provide temporary power to the existing utility closet and water level monitoring equipment to maintain continuous service. Remove all utility lines and equipment (e.g., meters and mounting brackets) from the building. Mount the electrical meter on a bollard away from primary facade, running the lines from the meter underground into the building, so as not to mar or penetrate the facade above-grade. Run the utility lines underground into the building from a telephone pole at least 25 ft away from the building, so as not to mar or penetrate the facade above-grade. Reconnect the utility lines to the existing utility closet and water level monitoring equipment. Disconnect the temporary power lines.

Removal of historically incongruous brick infill, and restoration of historic fenestration:

The brick infilled window openings, the loss of the historic wood shutters, and historically inappropriate metal-clad door disfigure the historic appearance of all facades of this historic structure. We recommend implementing the following option to restore the historic appearance of the facade:

- Remove all brick masonry infill in window openings, and all existing windows, doors, and insect screens. Install wood doors, shutters, and windows matching the appearance and

configuration of those visible in the 1925 archival photos from the SPNEA collection. Install the wood shutters with functional pintels and tie backs, so they may be either opened or closed as desired at various times for daylight or security. Specify heat-strengthened laminated glass lites in the historically appropriate windows to provide maximum security and resistance to vandalism when the shutters are open.

OPTION 3: SOUTH LOFT REHABILITATION

We recommend the following to enhance the usefulness of the building's use for storage. Option 3 also includes the recommendations included in Options 1 and 2 above.

- Remove and rebuild the non-historic stair currently accessing the second floor.
- Repair the framing and install floor sheathing on second floor.
- Install guardrail on leading edge of second floor.

Section 5 – Cost Estimate Summary

The project as described in this study project cost estimate sums to $528,523.00.

Section 6 – Proposed Schedule

We have grouped the recommended repairs into three priority levels. See Appendix E for these priorities. DCR can perform the repairs as they have availability, with the highest priority repairs being implemented first. We recommend the following timeline for repairs based on priority:

- Priority 1: Highest priority. We recommend these repairs be implemented as soon as practical.
- Priority 2: We recommend these repairs be implemented within five years.
- Priority 3: We recommend these repairs be implemented within ten years to restore the historic appearance of the building.

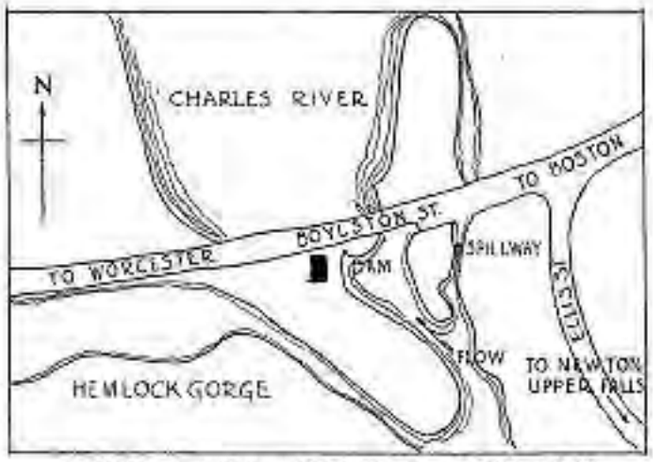
Section 7 – Appendices

Appendix A: HABS Drawings and Photographs


Mass. 145-C

ELLIS STONE BARN

BOYLSTON STREET
WELLESLEY MASSACHUSETTS



SKETCH MAP SHOWING LOCATION

BUILT CA.1750

HISTORIC AMERICAN BUILDINGS SURVEY
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

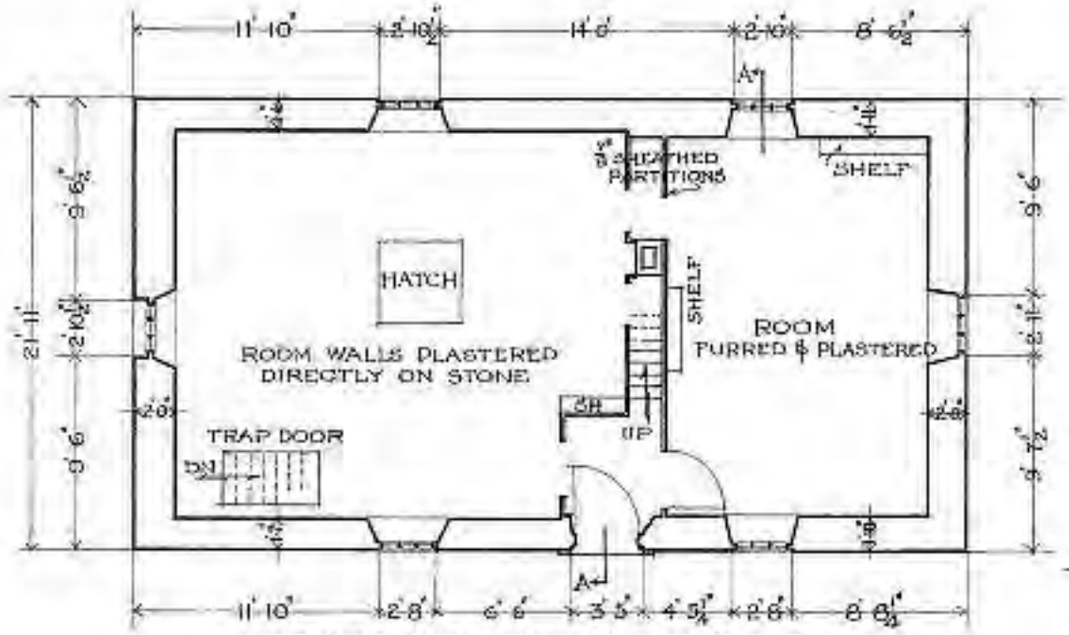
MEASURED: DEC. 21, 1934-JAN. 4, 1935
DRAWN: APRIL 5, 1935 - MAY 30, 1935.
MEASUREMENTS CHECKED: C. S. B.

DRAWINGS APPROVED: _____, DISTRICT OFFICER.
DRAWINGS APPROVED: _____, CHIEF ARCHITECT.
ACCEPTED FOR LIBRARY OF CONGRESS: _____

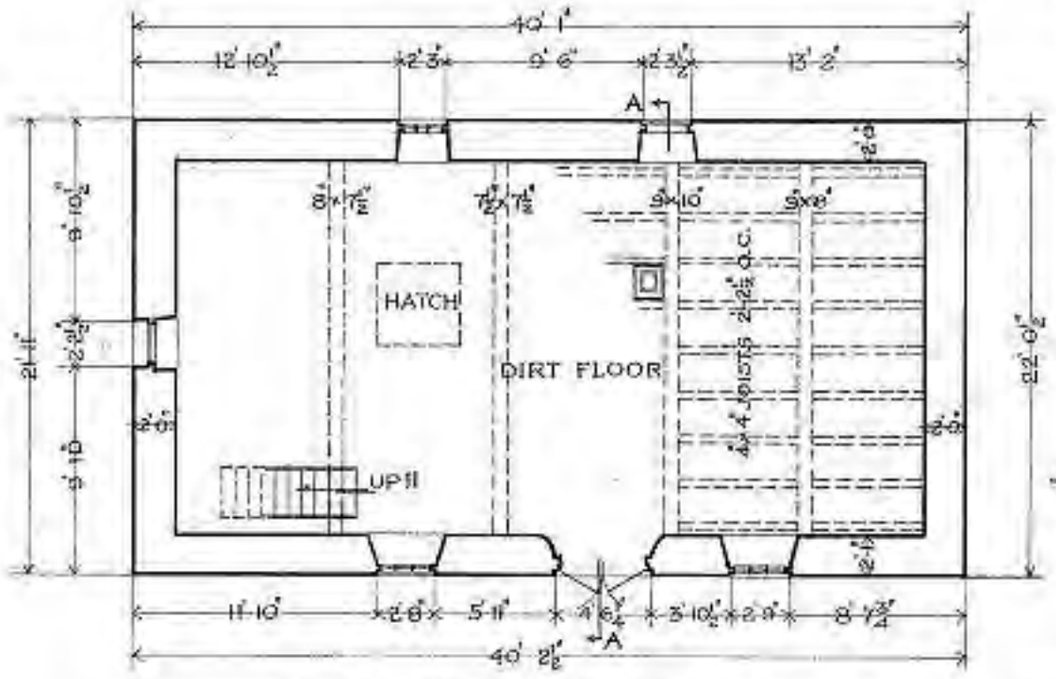
DISTRICT MASSACHUSETTS
FRANK CHOUTEAU BROWN
DISTRICT OFFICER-16 BRIMMER ST
BOSTON MASSACHUSETTS
FIELD MEASUREMENTS BY
CHARLES S. BOLDEN 199 LOWELL AVE.
NEWTONVILLE MASSACHUSETTS.

SURVEY NO.
MASS
14-5
TWO
SHEETS

INDEX NO.
MASS
W-WEL
1-



PLAN OF SECOND FLOOR



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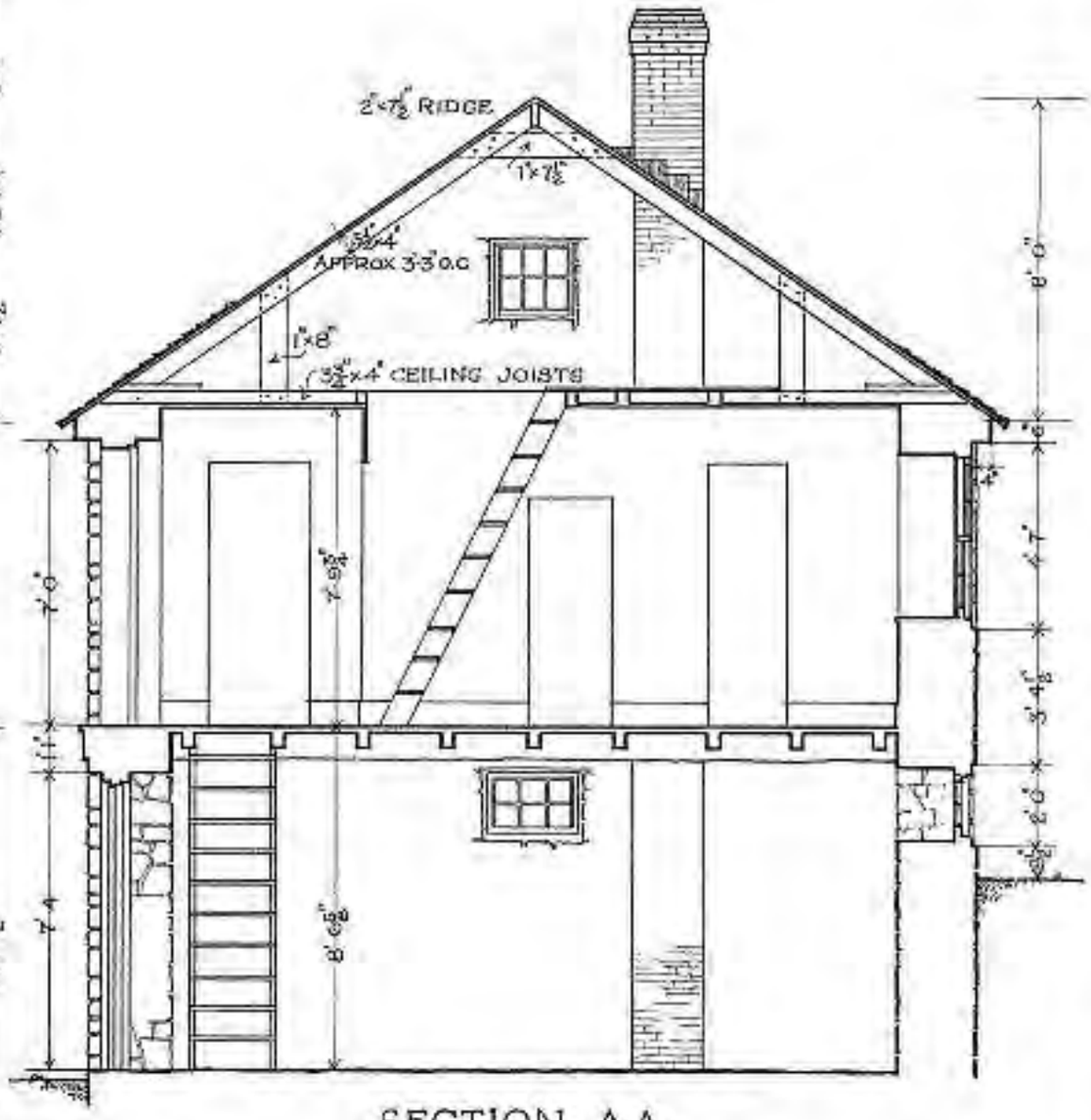


SECTION A-A

WORK DONE WITH MASS E.R.A. FUNDS
THOMAS B. SYME, DEL

BUILT CA. 1750

0 1 2 3 4 5 6 7 8 9 10
CENTIMETERS
0 5 10
SCALE OF FEET FOR SECTION
0 5 10 15 20
SCALE OF FEET FOR PLANS

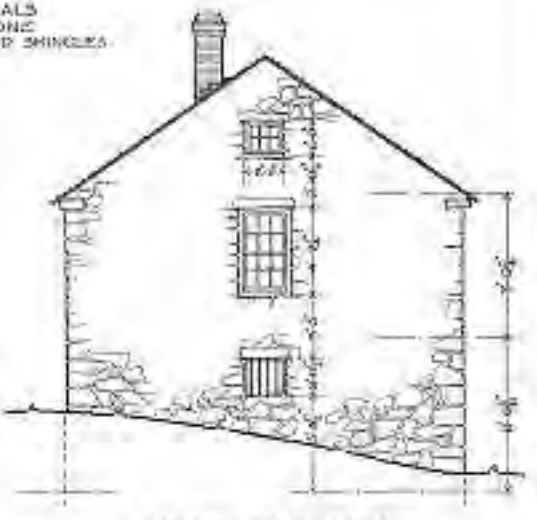
U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE ELLIS STONE BARN · WELLESLEY · NORFOLK COUNTY · MASS	SURVEY NO. MASS 145	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 1 OF 2 SHEETS	INDEX NO.

ELLIS STONE BARN, WELLESLEY, NORFOLK COUNTY, MASS.

MASS 145

MATERIALS
WALLS - STONE
ROOF - WOOD SHINGLES

NORTH ELEVATION



SOUTH ELEVATION

BUILT CA 1750

EAST ELEVATION

WORK DONE WITH
MASS (E.S.A. FUNDS)
THOMAS B. LYNCH, DEL.

BUILT CA 1750

0 1 2 3 4 5 6 7 8 9 10
CENTIMETER
0 5 10 15 20
SCALE OF FEET

Appendix B: MDC Report

METROPOLITAN DISTRICT COMMISSION
20 SOMERSET STREET
BOSTON, MA 02108

CULTURAL RESOURCE INVENTORY
EVALUATION OF SIGNIFICANCE

PROPERTY ELLIS STONE BARN ADMINISTRATIVE UNIT Hemlock Gorge Res.

Photo: Robert D. McArthur

SUMMARY:

The Ellis Stone Barn is thought to have been constructed about 1809 as the nail factory for Rufus Ellis's Newton Iron Works Company. The building is the only surviving structure representative of the extensive industrial development which Ellis established here at the lower of the two mill privileges at Upper Falls. It is also a rare example of a nail factory from the earliest period of water-powered nail manufacturing.

MANAGEMENT RECOMMENDATIONS:

The building should be restored to serve as a functioning part of the Hemlock Gorge Reservation, using the 1934-35 HABS drawings for guidance. The building could serve as an office and interpretive center for Hemlock Gorge.

STAFF Peter Stott DATE 10 May 1989

ELLIS BARN, ROUTE 9 AT CHARLES RIVER, WELLESLEY
Administrative Unit: Hemlock Gorge Reservation
Current Use: Vacant
Condition: In ruins

Description: The building known as the "Ellis Barn" is a two-and-a-half story stone structure, overlooking the Charles River. The building, constructed of random-laid rubble, measures 40 feet in length by 22 feet in width. The structure is built into the hillside, with the result that although the east facade is a full two stories in height, the west facade is only little more than a story in height. Examination of the interior (see below) shows how the first floor was cut out of the rock ledge.

Today, all the openings but one door have been bricked in to prevent vandalism, and extensive damage to the interior has precluded the reuse of all but the stone shell of the building. Nevertheless, documentation prepared by the Historical American Buildings Survey (HABS) in 1934-35 (see figures 1 and 2) provides a good indication of the building's former appearance. The principal, east, facade, facing the Charles River, features three openings on each floor: a center entry flanked by single windows. Early 20th-century photographs (see figures 5-7) show that access to the second-floor doorway employed a wooden stair and landing (this structure had been removed by the time HABS documented the building in the mid 1930s). The second floor door employed a six-light fixed sash above two wooden panels. Window openings were 6/6 double-hung sash. On the lower floor, they were surmounted by rough-cut splayed lintels. Double doors clad in galvanized steel today provide the only access to the building.

The south elevation exhibits three openings, also bricked in. The principal, second-floor, window was a double-hung 6/6 wooden sash, like those of the east elevation, with smaller fixed sash windows lighting the attic and first floor. Today, the attic opening still retains its original wooden window surround.

The west facade, built into the hillside, displays two full-size window openings, formerly fitted with 6/6 double-hung sash with wooden shutters, above smaller casement sash just above the ground level, which lit the first floor. The stonework of the west facade is in the worst condition. The wall around the south window opening has collapsed, leaving a large 5-foot diameter hole in the top section of the wall.

The north elevation, facing Route 9, features a small lunette, a semicircular window opening suggestive of Federal period influence, probably installed during the first two decades of the 19th century. As it is the only obviously decorative detail on the exterior, its location facing the Worcester Turnpike suggests that it may have been inspired by a desire on the part of the factory owner to appear "up to date" to passers by on the new route to Boston. It is located above another full-size window opening, formerly fitted with 6/6 double-hung wooden sash. Both openings have been bricked in. The stonework of this wall appears to have been reworked at an early date; at least one stone appears to have been an early window or door lintel.

The stone employed in the walls is laid in a soft mortar, portions of which show horsehair binder. Several stones have been roughly shaped. A key example is the stone wall plate which lines the top of the east and west walls. Comparison with other early stone structures in Newton Lower Falls (described below) illustrates the same detail. At the southwest corner, in the west face, about six feet from the ground, an iron spike has been driven into the mortar, possibly marking the location of the second-floor floor joists.

The roof is in very poor condition. The collapse of the single brick chimney, together with fire damage, and several years of weathering, has left a large hole in the vicinity of the chimney's location. Although the HABS drawings indicate a wood shingle roof, the present roof consists of asphalt shingles nailed directly to sheathing boards. Both these boards, and the rafters to which they are attached, appear to date to the 19th century, as there is evidence of both cut nails and vertical saw marks.

The relatively sturdy condition of the exterior is in marked contrast with the interior. The original second floor (see figure 1) consisted of two rooms separated by a wood and plaster partition, framing an open stair to the attic. The smaller, northern, of the two rooms was furred out from the wall with cut lath and plaster. In the larger of the two rooms, the plaster was laid directly on stone. The collapse of the chimney, fire and weather damage have left the interior a complete shambles. The northern half of the second floor has collapsed into the first floor, although the remainder of the second floor is still capable of supporting weight.

On the ground floor, next to the door, the U.S. Geological Survey has constructed a 5'-9" square enclosure of concrete block to house stream gaging equipment. In the southeast corner, a stairway remains in place to the second floor, still supported at the south end of the building by the deteriorating timber beams and floor joists. The stone wall surfaces of the ground floor are uniformly coated with the remains of whitewash. The building is built directly on ledge rock, which has been broken out to a depth of nearly three feet along the south wall. The stones of the south wall are laid directly along the top of this bedrock. The north wall has also been excavated out of bedrock, and a combination of slate and Roxbury conglomerate intrudes along the western three-quarters of the north wall, and portions of the west wall, rising to nearly four feet at the northwest corner. At least one tapered drill hole, 12" deep and 1-1/2" wide at the top is visible near the middle of the north wall. The use of hand-held "drills" to excavate the rock is one of several factors suggesting a 19th-century date for the structure.

The HABS drawings indicate that the floor surface in the mid 1930s was exposed dirt. This is not currently the case; a concrete floor now exists beneath the debris.

Other examples of Stone Building Construction in vicinity

There has been considerable debate over the age of the structure, with possible dates ranging from the mid 18th century to the second quarter of the 19th century. There appears to be evidence supporting both extremes. By way of comparison, it is worth noting four other examples of pre-Civil War stone buildings in Upper and Lower Falls:

- "Ware Paper Mill," 2276 Washington St., Newton Lower Falls (1790 ?).
- Curtis Paper Mills (now the Shipley Co.), 2300 Washington St., Newton Lower Falls (1830s). (Stone portions visible from Wellesley side of river.)
- Otis Pettee "Silk Mill," 44 Oak St., Newton Upper Falls (ca. 1844).
- Moulton-Eaton Machine Shop, 37 Walnut Street, Wellesley Lower Falls (1853)

Unlike the Ellis Barn, all of the above examples employ clearly defined granite quoins. On the basis of the four examples, it appears that the later the date of construction, the more nearly regular are the quoins. Thus the quoins of the Eaton-Moulton Machine shop stand out from the surrounding stonework by both the light color of the granite and the large and regular size of the quoins themselves. [1] Both the Ware and Curtis mills, like the Ellis Barn, also display overhanging stone roof plates. The later stone structures exhibit wooden overhangs.

All four of the above examples also display regular fenestration; windows and doors are evenly spaced across the facade; no such regularity exists in the Ellis barn. In addition, sills and lintels in all four buildings are well formed and regular, in contrast to those of the Ellis structure.

An important difference between the four structures and the Ellis Barn is the intended use and size of the structure. The MDC property is the smallest of the structures, and its dirt floor and lack of finish may simply indicate a utilitarian use, rather than an early construction date. Supporting this thesis is the use of a lunette window in the gable facing the Worcester Turnpike, and the use of hand drills to excavate the rock ledge.

Although stone had been used in building construction for thousands of years, the use of granite and its related stones were seldom worked in this country until the 19th century. In the 18th century, the softer sedimentary stones of the mid-Atlantic states were sometimes quarried using iron drills, or "jumpers." Harley McKee cites their use in the Philadelphia area in the 1750s. [2] New England, dominated by the more resistant granites, was much slower to be be quarried. In Quincy, where granite bedrock was often exposed, 18th-century stone construction was limited to roughly shaped surface boulders. The coming of drills and wedges to New England was a event that reputedly happened quite suddenly, about the year 1800, and made an immense difference to the use of stone in building construction, with rapid growth in succeeding decades. [3] Thus, the late arrival of the type of stone cutting exhibited by the stone foundation also suggests a 19th-century date for the Ellis Barn.

Historical Significance:

As noted above, physical evidence suggests that the Ellis Stone Barn may have been constructed in the first decades of the 19th century, quite likely associated with the industrial activity which was initiated here after 1800 by Rufus Ellis. It is the only surviving structure representative of the extensive industrial development active here for most of the 19th century.

A number of sources, including the Wellesley Historical Commission and the Historic American Buildings Survey, have suggested a ca. 1750 date for the building. Frederic Detwiller, in his "Site Investigation Report," attributes this date to a reference in Francis Jackson's History of the Early Settlement of Newton (1859) to "the rock house" once owned by John Maugus, whom tradition reports to have been the last Native American to live in Newton. "Since this reference quotes a c. 1748 deposition by Sarah Tracy, an Indian, this may be the source of the 1750 date attribution to the Ellis Structure." [4] However, the reference is almost certainly meant to refer to the rock shelter, carved out of the Roxbury puddingstone immediately to the rear of the stone barn, often referred to as Magus Cave.

The building's 19th-century history is intimately associated with the development of industry at Upper Falls. The "lower" of the two mill privileges at Upper Falls took advantage of Turtle Island to channel the flow of water and eliminate the need for a single large dam. The earliest industry at this site (site of the present circular dam) was a sawmill, thought to have been in constructed by Thomas Parker, by 1782. The following year, his son-in-law, blacksmith Thomas Bixby, initiated nearly a century of iron working at Newton Upper Falls with the construction of a scythe mill on Turtle Island, equipped with water-powered grinding wheels. In 1798, Bixby sold shares in the property to several businessmen from Boston, including Jonathan and Rufus Ellis, who formed the Newton Iron Works Company to manufacture nails. [5] Rufus Ellis was appointed general manager and resident agent in 1799. Otis Pettee reported that "by the beginning of the year 1800 he had built a permanent dam across the river, and erected a building upon the island, and put in the required furnaces and machinery for rolling and slitting iron into a variety of sizes and shapes." [6]

A large part of the stimulus for this new industry were the newly patented nail-making machines invented in the previous decade by Jacob Perkins of Newburyport and Ezekiel Reed of Bridgewater. Jonathan Ellis himself patented such a machine, although Pettee reported it as "cumbersome" and "never very much used." [7] One of the most prominent inventors was Thomas Odiorne of Medford, who produced "a very good machine for cutting small nails and brads." [8] In 1809 the company constructed a new nail factory, in which several of the Odiorne machines were installed. It seems reasonable to conjecture that the "Ellis Barn" was this new "factory" erected in 1809. Historian Otis Pettee wrote that the Odiorne machines "were securely fastened to the top and sides of a heavy, white-oak post, about a foot and a half square, and firmly set in the ground." [9] The statement suggests that the original nail factory, like the Ellis Barn in 1936, had a dirt floor, which might reveal evidence of these posts.

With these machines and other improvements, the factory production rose to an annual production of 2,000 tons of manufactured iron, and 1200 tons of nails were shipped from the factory as far afield as the West Indies, New Orleans, Savannah, Charlestown, and other southern ports. Transport for the new factory was by cart to Boston over the newly opened Worcester Turnpike (Boylston Street/Route 9). The turnpike company, organized in 1806, was never a financial success, however, and on the company's petition, much of the road was thrown open to the public as early as 1831.

Ellis expanded his operations during the War of 1812 when the war cut off British textiles. Like many New England entrepreneurs, he constructed a cotton spinning mill with 3,000 spindles. Pettee reported that the mill was located on the Needham [now Wellesley] side of the river, although the location may have been on the north side of the Worcester Turnpike (Route 9). [10] The firm was reorganized in 1821, taking the name "Newton Factories," probably in recognition of the combination of industries that Ellis now controlled.

Pettee reported that Ellis continued to operate the nail factory until 1850, when the cotton mill, then operated under lease, was destroyed by fire. Ellis erected a new nail factory building on its site, and removed the machinery from the old factory into it. The old factory may have then become a storehouse, with perhaps a "counting room" on the second floor. A ca. 1850 date might be appropriate for the lath-and-plaster redecoration of the smaller room. A partial confirmation of this speculation is provided by the 1856 map of Needham, which identifies a "store" south of the Worcester Turnpike, and the "nail factory" north of the highway.

After five or six years, Ellis abandoned the nail business, and the "new" factory burned in 1873. Pettee then went on to describe a series of paper manufacturers in "the old nail factory." These uses, however, seem inconsistent with the size and location of the present building. [11] However, Pettee's dates appear to be internally inconsistent in this discussion, and he may be confusing the nail factory with "the old rolling mill," built on Turtle Island in 1800.

Later History of the Site

After the failure of the last lessee, the Superior Wax Paper Company, the property was purchased from the Ellis family in 1888 by the E.L. Crandall Company, which for several years made a durable quality wrapping and sheathing paper. Crandall's company collapsed in insolvency in the early 1890s, and court-appointed trustees sold the property to the Metropolitan Park Commission in 1895.

A series of photographs documents the building in the early 20th century. The earliest identified, figures 4-7, date to the 1905 reconstruction of the Boylston Street Bridge over the Charles River, and the building of the Circular Dam. The building was apparently used as a project office. The earliest view, figure 4, apparently taken during the construction of the dam, is the clearest of the four 1905 views. A wooden landing is located in front of the second-floor entrance, but the stairs leading to it have not been constructed. Several panes of glass are broken in the upper right window, and the north window is shuttered. Figures 5, 6, and 7 all show the stairway in place. The last of the group, figure 7, shows the bridge completed to the coping. The north window shutter is open, showing its board-and-batten construction.

Three photographs from the Society for the Preservation of New England Antiquities (SPNEA) show the building in the 1920s (figures 8, 9, and 10). New vegetation has grown up in front of the building, the stair and landing have been removed, and both doors have apparently been replaced by the entrances that were documented by the HABS team in 1934-35. Figures 8 and 11 are the only views to show the rear (west) elevation, indicating that both of the upper windows had wooden shutters, like that on the north side. Figure 11 is evidently the later of the two, perhaps postdating the HABS photography.

Among the latest views prior to the bricking up of the openings are the two photographs taken in 1936 by the HABS team, figures 12 and 13.

Recommendations:

The building should be restored to serve as a functioning part of the Hemlock Gorge Reservation. However, the wood framing, lath and plaster, and virtually all non-stone interior features are past saving. Rot and deterioration is extensive, even where the floors and roof have not yet collapsed. The building should be gutted to the stonework, and rebuilt using the 1934-5 HABS drawings as a guide. The restoration standards advocated by the Secretary of the Interior should be followed as closely as possible, allowing a National Register nomination to be filed when the work is completed.

The project should be undertaken in at least two phases, with the earliest phase being the removal of all debris and unsalvageable roof material, repair of the west wall using a compatible mortar, and the construction of a new roof system. Of necessity this would include the reconstruction of the building's chimney. The second phase, spread out as funding and support permit, would include the installation of mechanical and wooden structural systems, restoration of the window and door openings, and the provision of security lighting for the property.

Special attention should be given to mortar work, repointing the stonework with a complementary soft mortar of the same color and consistency as the original. Analysis of the existing mortar has recently been made, and the results of these findings are attached as an Appendix, together with recommendations for a suitable modern mortar.

Essential to the successful and secure future of the building is an active staff presence in the building. The Ellis Stone Barn would make an excellent office and interpretive center for Hemlock Gorge, utilizing the upper floor for office space. A portion of the lower ground floor might also be suitable for maintenance equipment.

A wide variety of interpretive themes might be explored. A selection might include:

- Natural Science. Hemlock Gorge is one of the richest areas in the Boston area for the study of the earth sciences. It is cited in most geological guides for its puddingstone outcrops; it also provides a good example of a rock ravine community, with a typical hemlock & beech environment. The completion of adjacent fish ladders will provide an additional attraction to the area.

- Native American settlement. The location was used seasonally by Native Americans from the Middle to Late Woodland periods (ca. 2000 - 500 years B.P.). The migration of anadromous fish up river attracted many individuals to the fishing here. Decorated pot sherds and bone may be available for a small exhibit.

- Archaeological exhibits might also incorporate excavations of several "kitchen middens" located on Ellis Street.

- Rich industrial Past. The Mill at Upper Falls is one of the best examples of a pre-Civil War clerestory monitor-roof textile mill in Massachusetts. The Ellis Barn is itself an unusual survivor which might be interpreted through artifact displays of the nail and cotton industries.

- Worcester Turnpike

- Echo Bridge and the Sudbury Aqueduct; Boston's water supply system in the 19th century.

- Walking tours of the Upper Falls Historic District are already in existence; the visitor center could act as a permanent distribution point for printed guides and guided tours.

The existing arrangement with the U.S. Geological Survey's Cooperative Stream Gaging Program should be continued, perhaps utilizing stream flow records in some form of interpretive exhibit. It will probably be desirable to alter the present housing for USGS equipment however, replacing the concrete-block housing with an enclosure more suitable to the building's new use as a staff headquarters.

Notes

[1] Interestingly, although it has long been the writer's contention that 2276 Washington Street was built about the same time, and by the same paper company, as the Curtis Mills, examination of the quoins suggests that this may not be so; the granite quoins of the Ware Mill are much less regular than the quoins of the adjacent Curtis Mill, although in both buildings, sills and lintels are well formed and regular. The granite also appears to come from different sources.

[2] McKee, Introduction to Early American Masonry (1973), p. 17.

[3] Arthur Brayley's 1913 account of the discovery of granite working is not well known and is worth repeating here. His source was a paper delivered in 1859 by Chief Justice Shaw, who credited the discovery of granite working tools [in New England] to Edward H. Robbins (1758-1829), Lieutenant Governor between 1802 and 1807. Robbins was a commissioner on the construction of the state prison at Charlestown (completed 1804-5), and as a result was concerned to obtain building stone on the best terms available. In passing through Salem, he noticed the foundation of a new building wit tool marks 6-7 inches apart. This was something new; Robbins had never seen such marks on hewn stone, and Robbins was able to trace the work to an obscure man by the name of

Tarbox, in Danvers. Tarbox showed Robbins the method of drilling holes and inserting wedges. Robbins took Tarbox to Quincy, introducing him to several of the principal stone dealers -- "and in less than three months every stone cutter in Quincy could split stone with small wedges as well as Tarbox." This improvement quickly reduced the stone to 5/8ths its former cost. [Quoted in Arthur Brayley, History of the Granite Industry in New England (1913).]

[4] Detwiller, "Site Investigation Report," p. 2.

[5] A deed in 1800 (Bk. 11, p. 141) transfering a part interest in the property from Jonathan to Rufus Ellis, mentions the "island, dam, scythe mill, house, and bridge."

[6] Pettee, p. 97.

[7] Ibid., p. 98.

[8] Ibid. But Odiorne was a Medford man, not from Milford, as Pettee writes.

[9] Pettee, in Middlesex County, iii, p. 98.

[10] The 1823 deed transferring the property from Rufus Ellis to Newton Factories lists the buildings then on the property south of the Turnpike: "a rolling and slitting mill, a nail factory, machine shop, carpenter's shop, blacksmith shop, and wood and coal houses." [Bk. 72, p. 169.]

[11] Hudson Keeney operated the paper mill in 1878, when Lockwood's Directory of Paper Manufacturers lists the machinery with which his mill was equipped: three 300-lb. engines and one 400-lb. engine; and one 56-inch Cylinder. The mill was powered by water and produced 2500 lbs. of manilla paper in 24 hours.

Acknowledgements

The writer is indebted to Frederic Detwiller, now a historic architect for McGinley Hart & Associates, of Boston. His own research on the building in 1978 while employed as architectural historian for SPNEA's Consulting Services resulted in the attached report (Appendix 1). As a colleague he has also freely shared his own knowledge and enthusiasm concerning the building.

Property Transactions

Relevant property transactions recorded in the Norfolk County Registry of Deeds are:

Bk. 11, p. 141 (1/22/1800): Jonathan Ellis to Rufus Ellis, two ninths interest in property, with island, dam, scythe mill, house, and bridge.
Bk. 22, p. 24 (5/30/1804): John Burridge of Dover to Rufus Ellis, one ninth interest in property, including island, dam, bridge, slitting mill privilege, "a privilege appropriated for manufacture of cut nails."

Bk. 58, p. 232 (2/17/1819): Otis Pettee to Rufus Ellis, one eighteenth of property.

Bk. 72, p. 169 (12/6/1823): Rufus Ellis, et al. to Newton Factories. "... also an island and mill dam being and standing in said river, together with a rolling and slitting mill, a nail factory, machine shop, carpenter's shop, blacksmith shop, and wood and coal houses belonging to same."

Bk. 247, p. 260 (3/9/1846): Newton Factories to David Ellis. Treasurer of Newton Factories (incorporated 6/14/1823) was then Rufus Ellis. David Ellis has purchased all stock and shares of Newton Factories. Deed includes land in Needham "together with the factory thereon containing about 40 acres. Also land opposite above on south side of Worcester Turnpike, containing about 7 acres, two quarters and seven rods .... Meaning to convey the whole property conveyed by Ellis to Newton Factories 12/6/1823.

Bk. 611, p. 541 (8/27/1888): Ellis family to Willard Marcy and Eugene L. Crandall, both of Newton.

Bk. 651, p. 167 (3/18/1891): Charles L. Barton of Newton to Edward J. Hickey of Hyde Park.

Bk. 714, p. 347 (6/1/1894): F.E. Orcutt, et al. to Henry D. Pope. of Boston, Frank B. Orcutt of Melrose, James A. Glass of Boston, Thomas J. Kenny of Boston, asignees of the estate of the E.J. Hickey Co. under appointment in and by the Court of Insolvency for the County of Suffolk. [Several parcels, including:] "the same premises conveyed by deed of Charles L. Barton, assignee in Insolvency of estate of Eugene L. Crandall and John M. Moore, surviving partners of the firm of E.L. Crandall & Co."

Bk. 744, p. 461 (9/4/1895): Metropolitan Park Commission taking, comprising lands taken from Henry D. Pope, Trustee, et al., delineated in MPC Plan No. 42 (see figure 3).

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A P P E N D I X

Nail Manufacturing at Upper Falls

Otis Pettee, son and namesake of the pioneer Newton Upper Falls manufacturer, prepared an extensive account of the industrial development of Newton for D.H. Hurd's 1890 History of Middlesex County. His portrayal of the development of the nail industry in Massachusetts and at Newton Upper Falls is still an important source for understanding this industry, and we quote the relevant portions below.

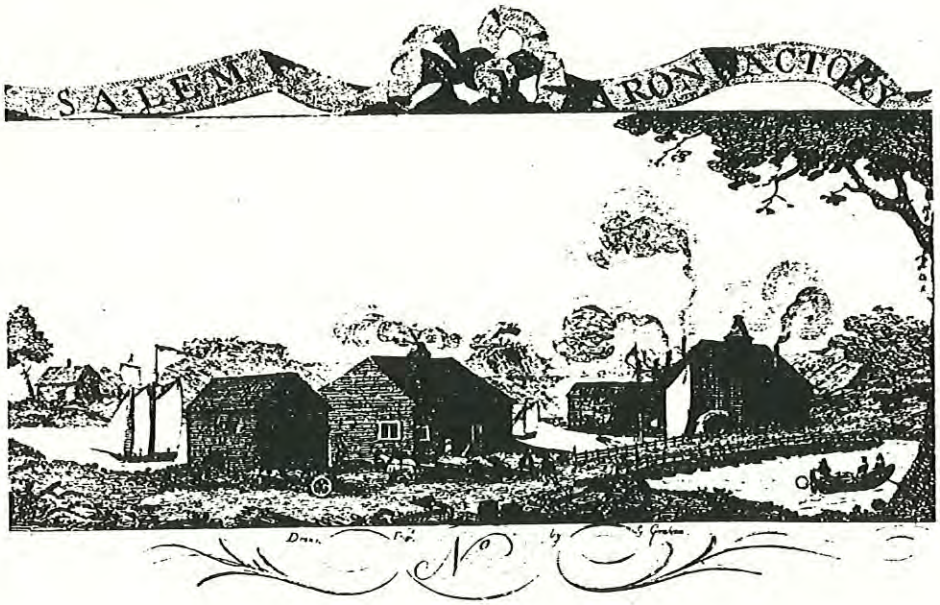
> NAIL-MAKING is an industry that occupies a place in the list of early manufactures. Quite a number of nail factories were built in this country in the tenth decade of the last century [the 1790s] and the first decade of the present century -- one at Fairmount, near Philadelphia, -- one at Pittsburgh, Pennsylvania, -- and several in New York State. Massachusetts had its share of the pioneers in the business; a factory at Wareham, one at Bridgewater, another at Weymouth; the little town of Dover boasted of a nail factory, and in several other places the click, clack of the nail-machine was heard.
>
> The increasing demand for nails called for better machines for making them. It is now (1890) about a hundred years since the introduction of power machinery for cutting nails from rolled iron plates. Previous to that time a greater proportion of the nails used were made from rods of iron cut off the required length for different sizes of nails, and headed by crude machinery, or forged by hand on the anvil. Occasionally a blacksmith made a speciality of forging nails as a partial supply to the market for builders' use.
>
> From 1790 to 1800, the nail-making business was greatly enhanced by the valuable improvements on inventions of earlier dates. The priority of these inventions has been claimed by a number of persons, noteably Benjamin Cochran, in 1790, Ezekiel Reed, of Bridgewater, Jacob Perkins of Newburyport, and Walter Hunt of New York. The first letters patent in this country for nail-cutting machinery were granted to Josiah G. Pearson in 1794. And while Jacob Perkins perfected his invention in 1790, he did not obtain his patent until 1795.
>
> The present century [beginning in 1800] opened with a continuation of the study for better machinery. Jesse Reed, a son of Ezekiel Reed, so advanced the process of nail-making machinery as to cut off the plate, and head the nail by a single turn of the machine. Still another device was applied to the same machine by a Mr. Ripley. His attachment consisted pf a pair pf nippers, so adjusted as to grasp the nail as soon as it was curt from the plate, and then turn it so as to give it what is termed a flat grip, instead of the edge grip, in use previous to his inventions. Mr. Thomas Odiorne, of Milford, Massachusetts [Malden, Mass.?], was the inventor of a very good machine for cutting small nails and brads. His machine was said to be a complicated invention that required a skilled workman to operate. Still another machine was patented by Mr. Jonathan Ellis, one of the proprietors of the Newton Iron Works. His machine was rather cumbersome and never very much used.

Mr. Seth Boyden, a son of the old town of Foxborough, Massachusetts, but who removed to Newark, New Jersey, in early manhood, invented a nail machine, and secured its patent in 1815. Mr. Boyden was one of the greatest inventors of his generation. The world today is indebted to him for malleable iron, and "patent" or enameled leather, and valuable improvements in both stationary and locomotive steam engines, and many other inventions of a lesser magnitude.

In 1809 the Newton Iron Works Company built a nail factory, and at first used the Odiorne machines. These machines were securely fastened to the top and sides of heavy, white-oak posts, about a foot and a half square, and firmly set in the ground. Whether the "Odiorne" was not adapted to their class of nails, or whether it was too complicated and inconvenient to operate, or for other reasons, it was soon laid aside, and the Reed machine, with Mr. Ripley's improvements, was put in its place.

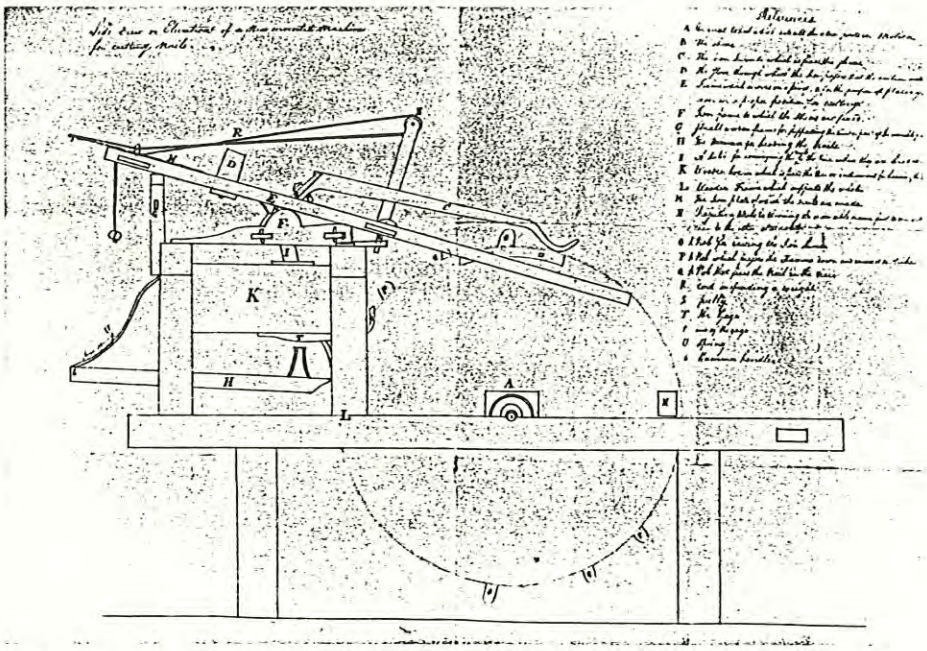
The annual production of manufactured iron from the rolling and slitting mill was about 2000 tons; and 1200 tons of nails per annum were shipped from the nail factory. None but the best quality of Russian and Swedish irons were used in the mills -- imported direct from those countries by the company's ships. In addition to the home markets, large consignments of manufactured goods were shipped to the West India Islands, New Orleans, Savannah, Charleston, and other Southern ports.

Documentation on the early nail machines is relatively scarce, prior to the patent office fire of the 1830s which destroyed the early records. Nevertheless, most drawings and models which survive from this period indicate that nail-making machinery was hand-operated. Thus a building set apart from the water-powered rolling and slitting mill would have been an appropriate location for such machines. Illustrated below, and on the following page are views of the works and machinery of the Salem Iron Factory, about the year 1800.

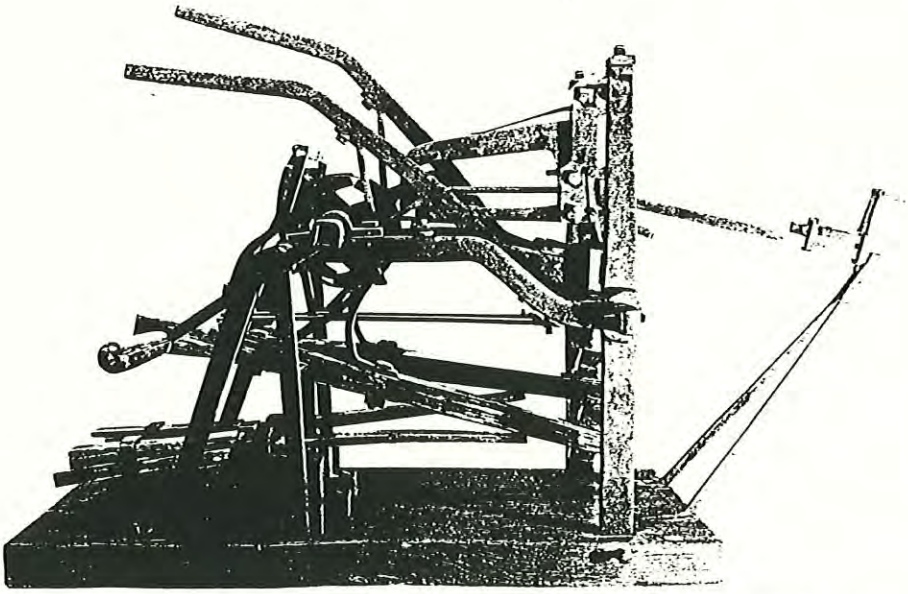


Certificate of Salem Iron Factory, c. 1800, detail, drawn and engraved by George Graham,

Collection of the Essex Institute, Salem, Mass.
Published in "Dr. Bentley's Salem, Diary of a Town"
A Special Exhibition, held at the Institute
23 June - 30 October 1977.



"Side view or Elevation of a new invented machine for cutting nails," c. 1797, by Nathan Read, scale drawing, 19¼×27½ inches.



Working model for a nail-cutting machine, 1798, by Nathan Read, H. 25 inches, W. 39 inches, D. 21 inches.

Nail-Making Machines

Collection of the Essex Institute, Salem, Mass.
Published in "Dr. Bentley's Salem, Diary of a Town"
A Special Exhibition, held at the Institute
23 June - 30 October 1977.

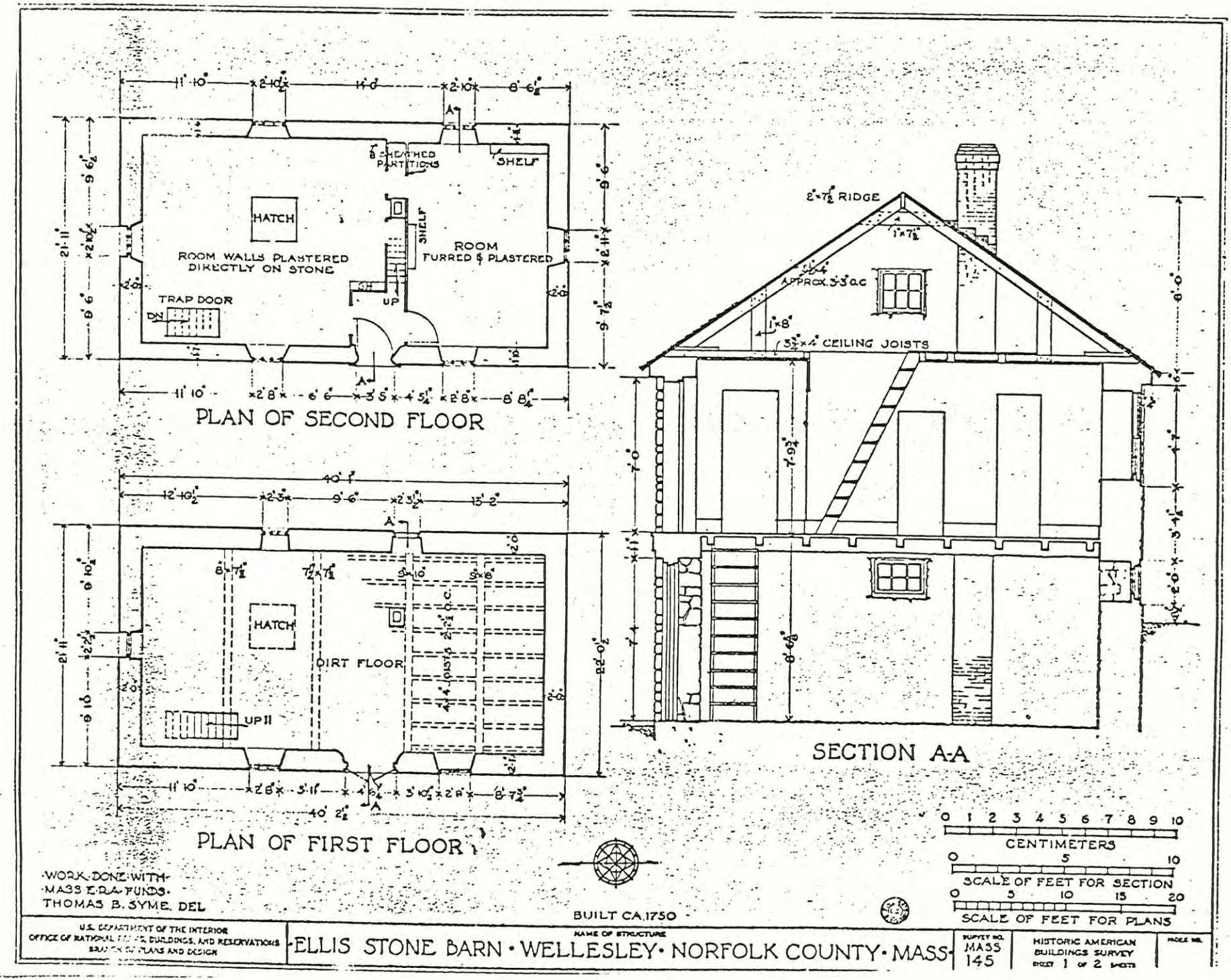
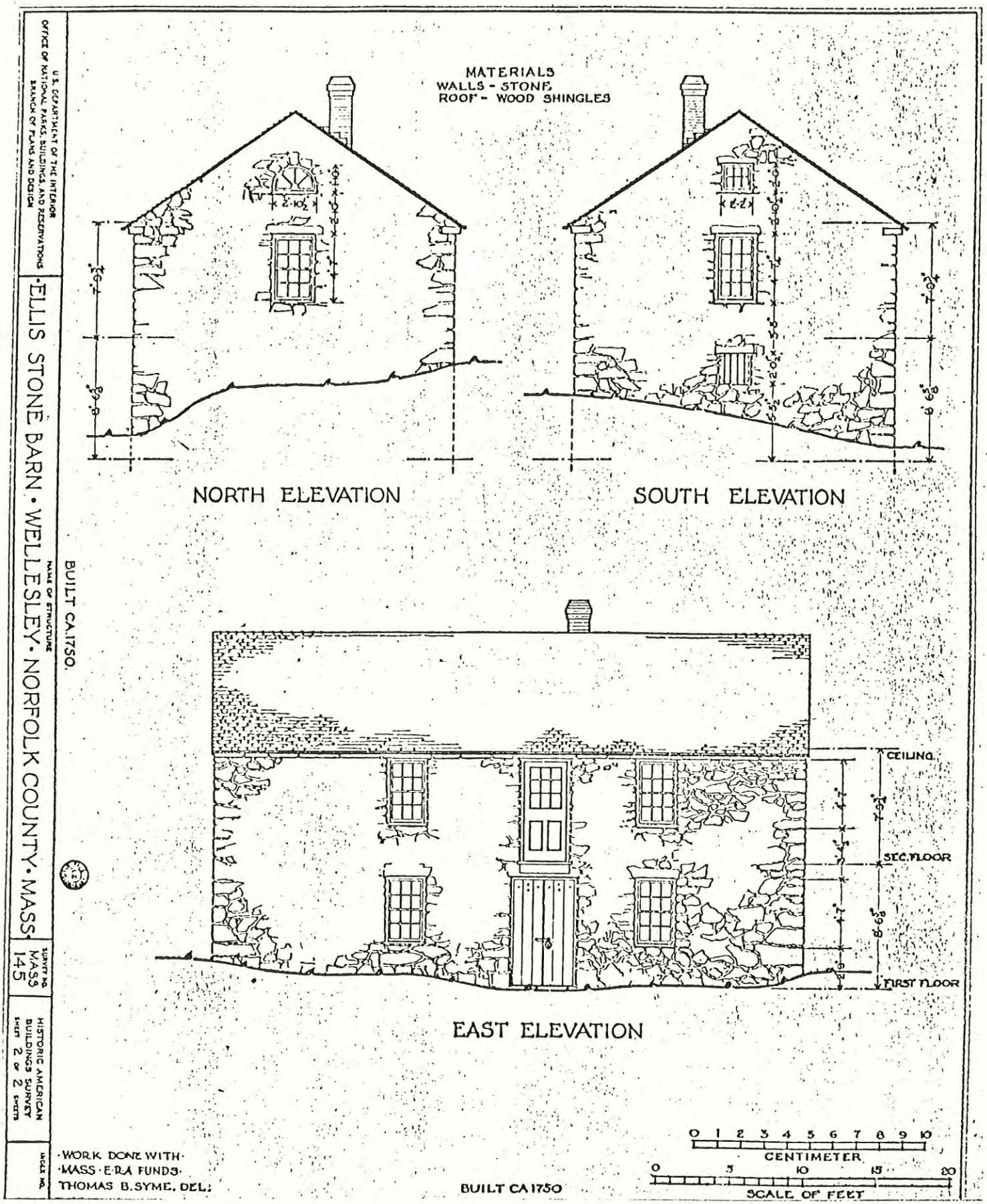
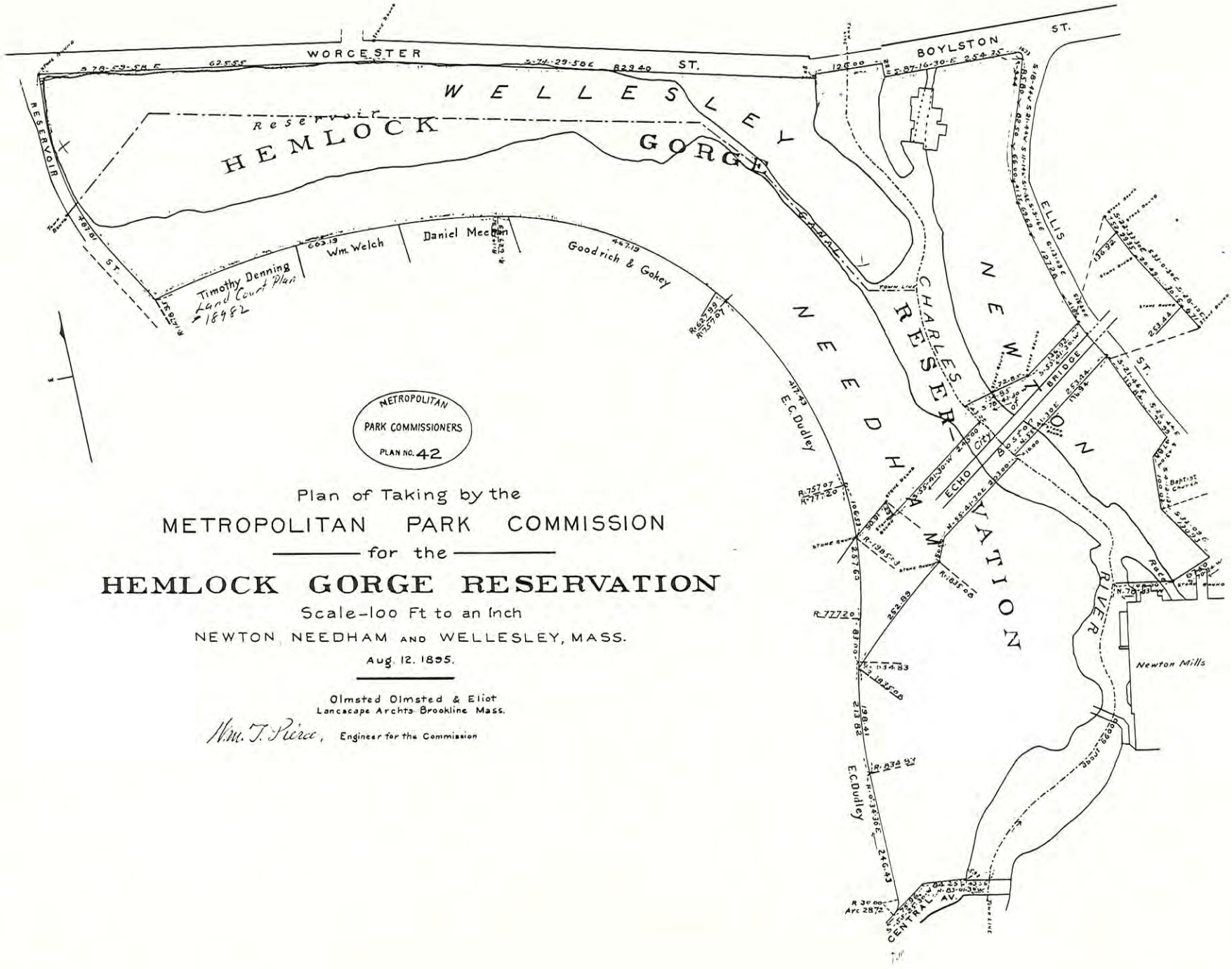

PLAN OF SECOND FLOOR
HATCH
ROOM WALLS PLASTERED DIRECTLY ON STONE
ROOM FURRED & PLASTERED
TRAP DOOR
SHELF
PARTITIONS
PLAN OF FIRST FLOOR
HATCH
DIRT FLOOR
SECTION A-A
RIDGE
APPROX. 3'-3" o.c.
CEILING JOISTS
WORK DONE WITH MASS E.R.A. FUNDS.
THOMAS B. SYME, DEL
BUILT CA. 1750
CENTIMETERS
SCALE OF FEET FOR SECTION
SCALE OF FEET FOR PLANS
U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
NAME OF STRUCTURE
ELLIS STONE BARN • WELLESLEY • NORFOLK COUNTY • MASS
SURVEY NO. MASS 145
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 2 SHEETS

Figure 1


MATERIALS
WALLS - STONE
ROOF - WOOD SHINGLES
NORTH ELEVATION
SOUTH ELEVATION
EAST ELEVATION
CEILING
SEC. FLOOR
FIRST FLOOR
BUILT CA.1750.
ELLIS STONE BARN · WELLESLEY · NORFOLK COUNTY · MASS
NAME OF STRUCTURE
U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
BRANCH OF PLANS AND DESIGN
SURVEY NO. MASS 145
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 2 OF 2 SHEETS
WORK DONE WITH MASS E.R.A. FUNDS
THOMAS B. SYME, DEL.
BUILT CA 1750
0 1 2 3 4 5 6 7 8 9 10
CENTIMETER
0 5 10 15 20
SCALE OF FEET



Plan of Taking by the

METROPOLITAN PARK COMMISSION

for the

HEMLOCK GORGE RESERVATION

Scale–100 Ft to an Inch

NEWTON, NEEDHAM AND WELLESLEY, MASS.

Aug. 12. 1895.

Olmsted Olmsted & Eliot
Lancscape Archts. Brookline Mass.

Wm. T. Pierce, Engineer for the Commission

Figure 3

Figure 4 (1905)

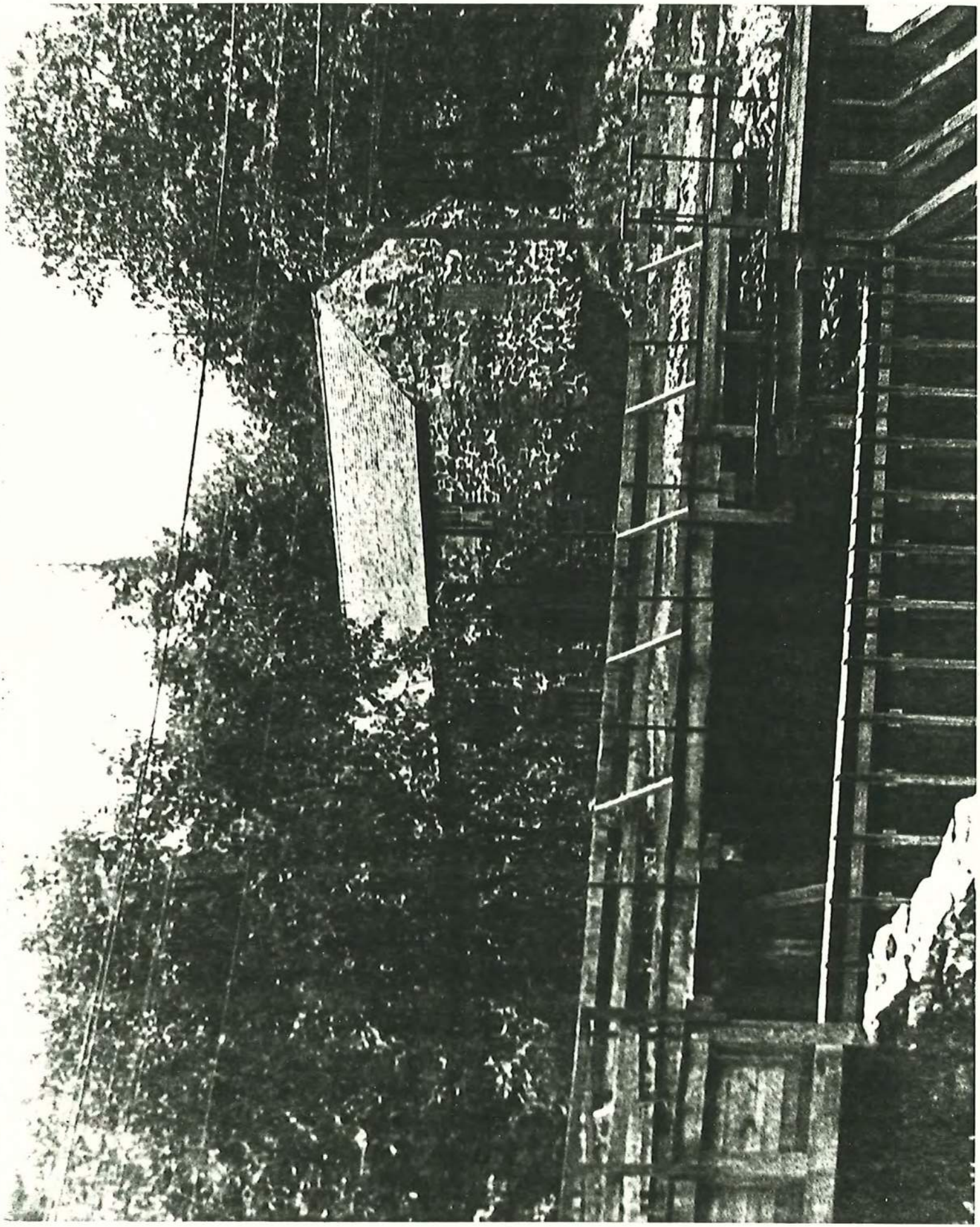


Figure 5 (1905)

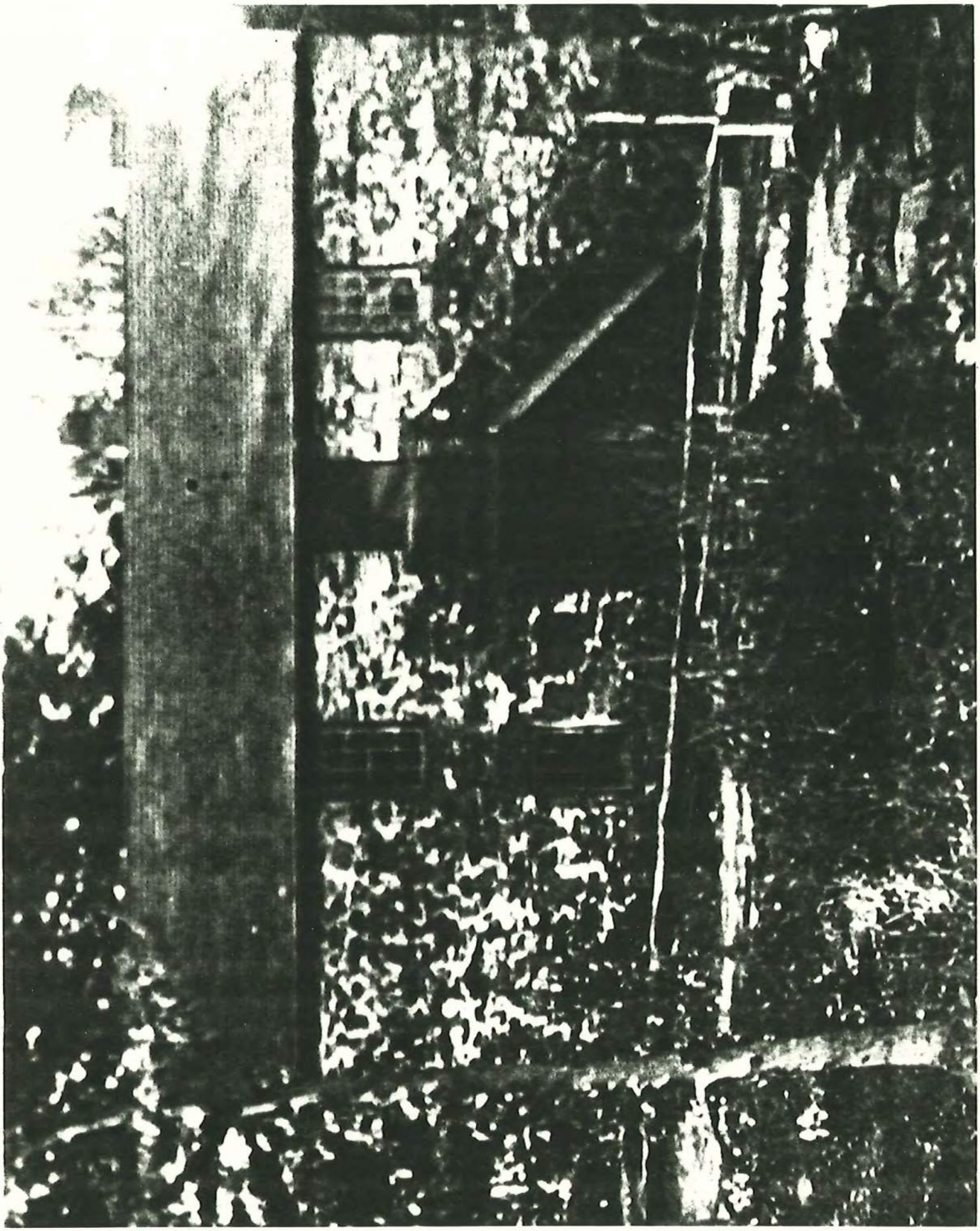


Figure 6 (1905)

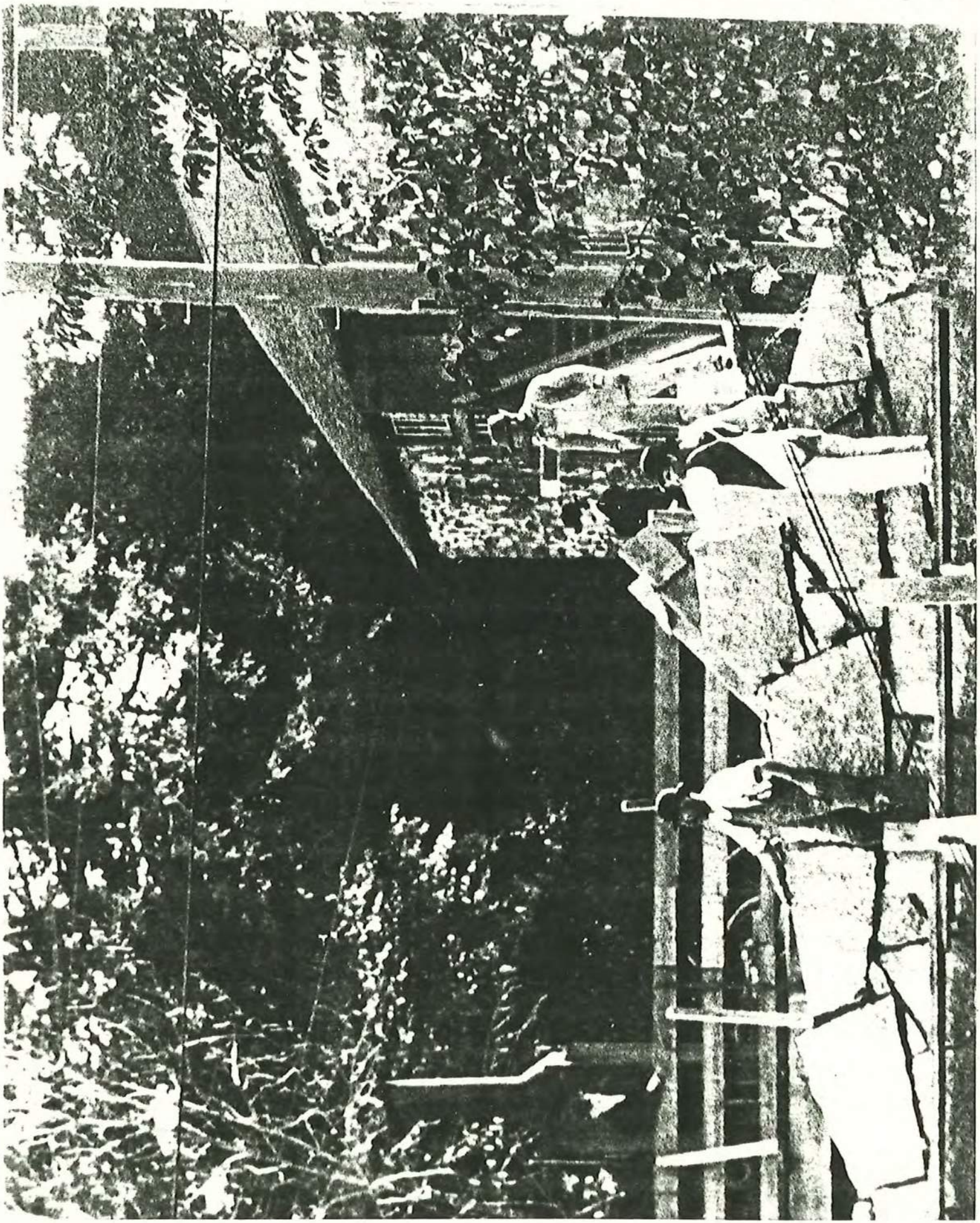
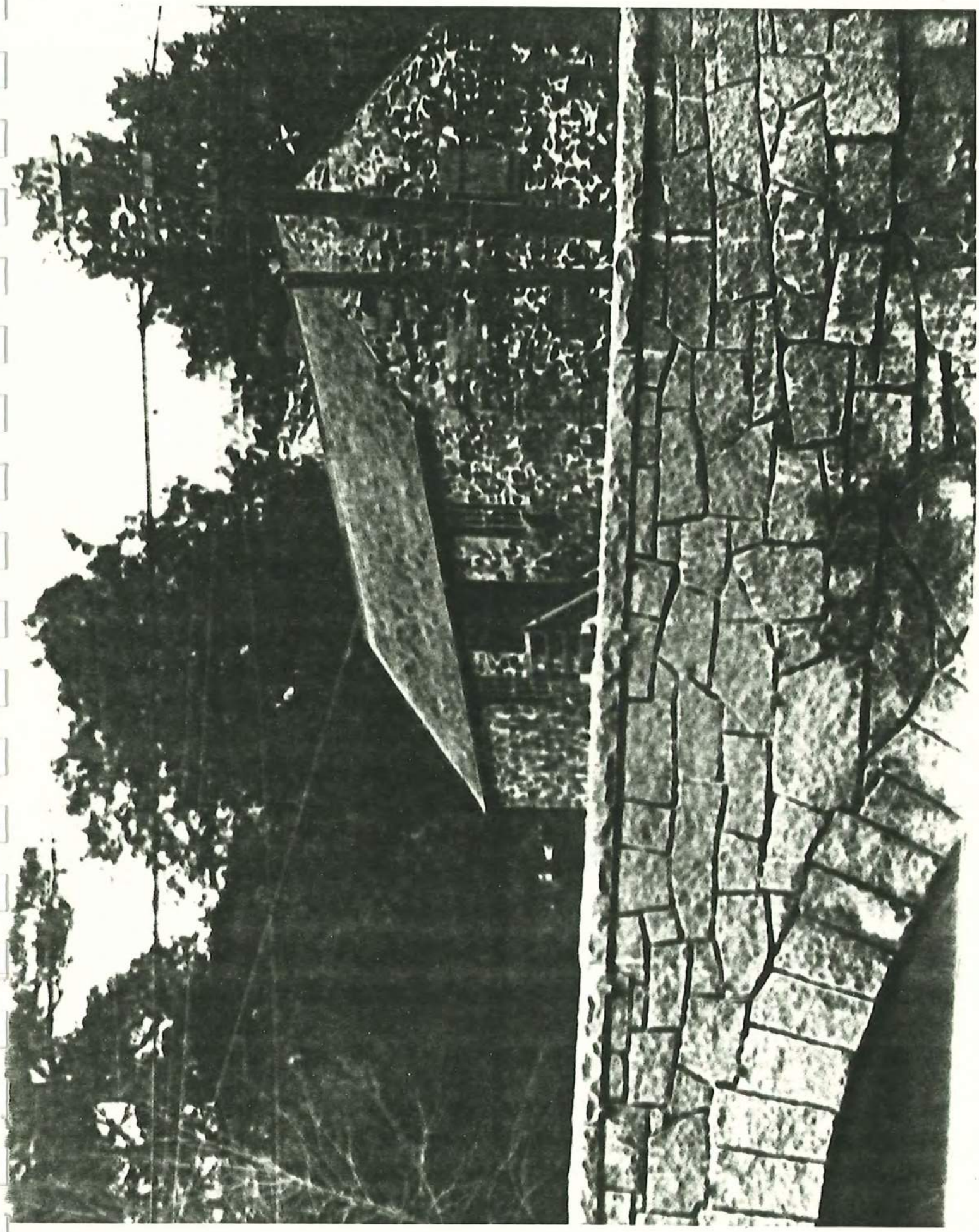
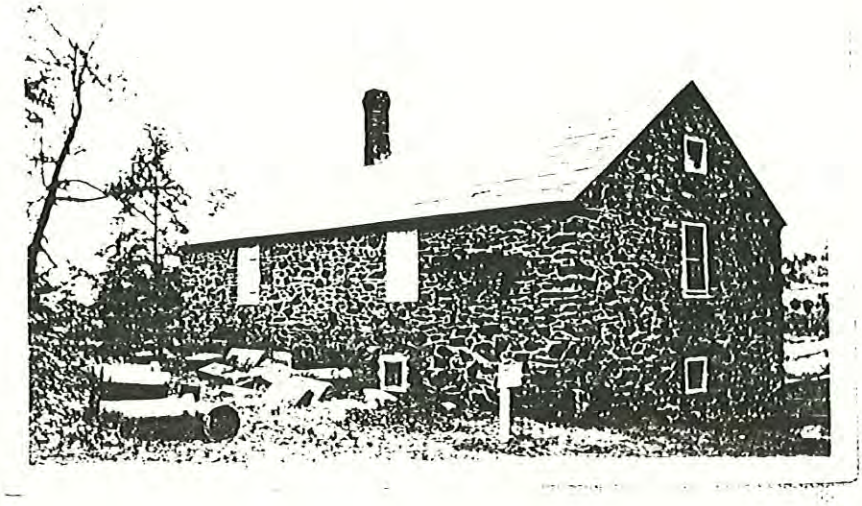
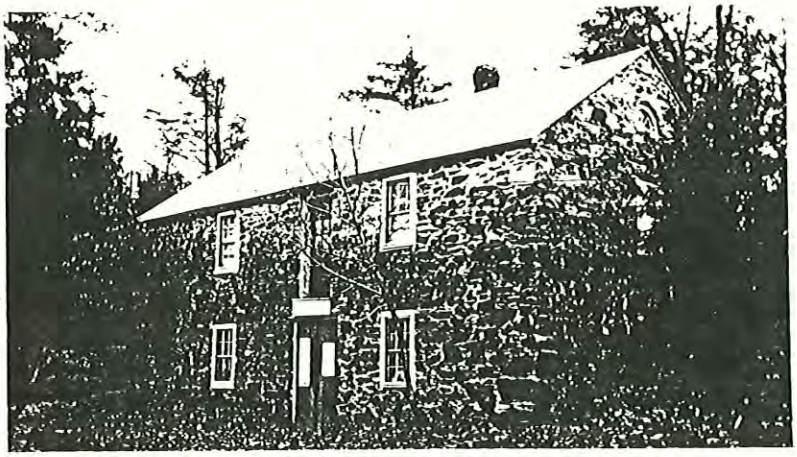


Figure 7 (1905)







Figures 8 (top) and 9 (bottom)

Ellis Stone Barn, ca. 1925.
SPNEA Collection.

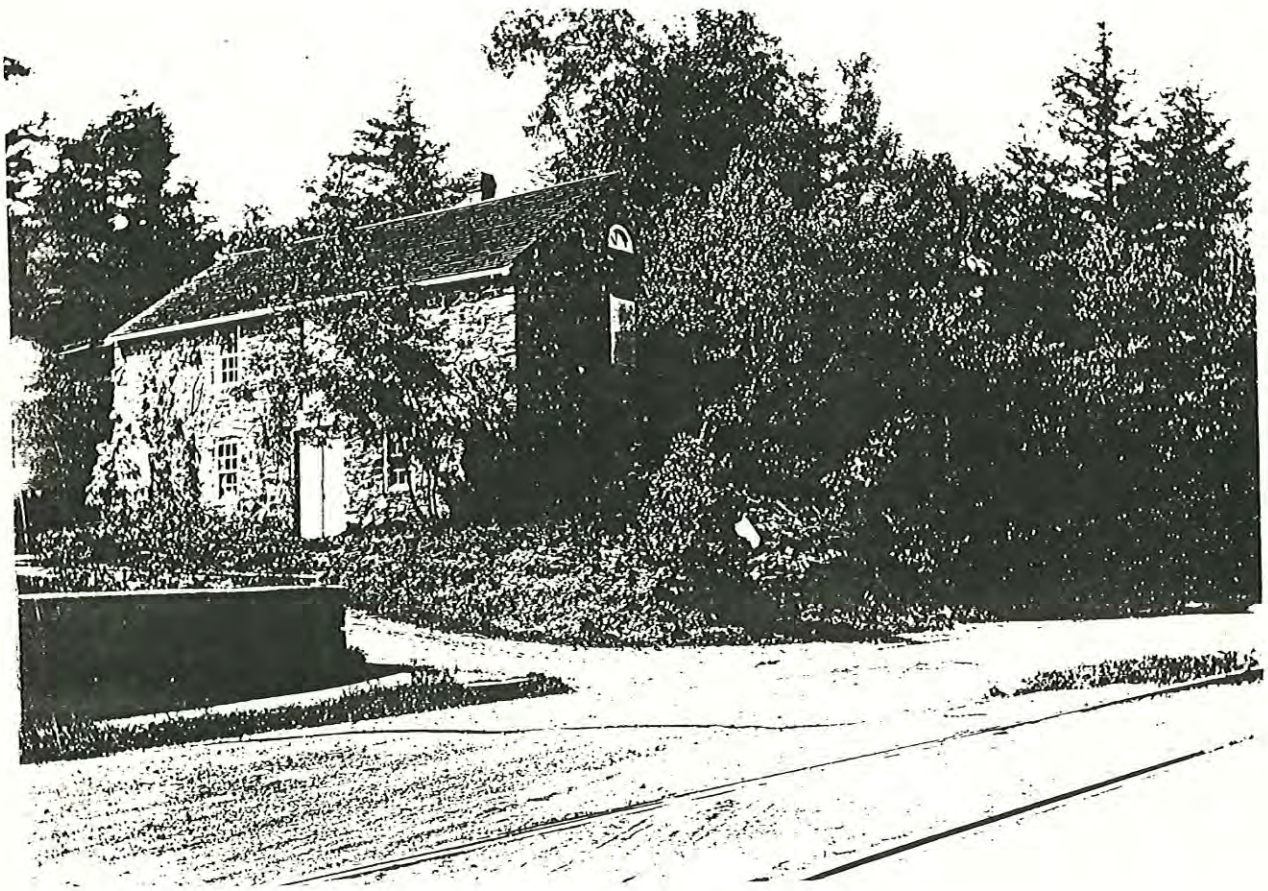
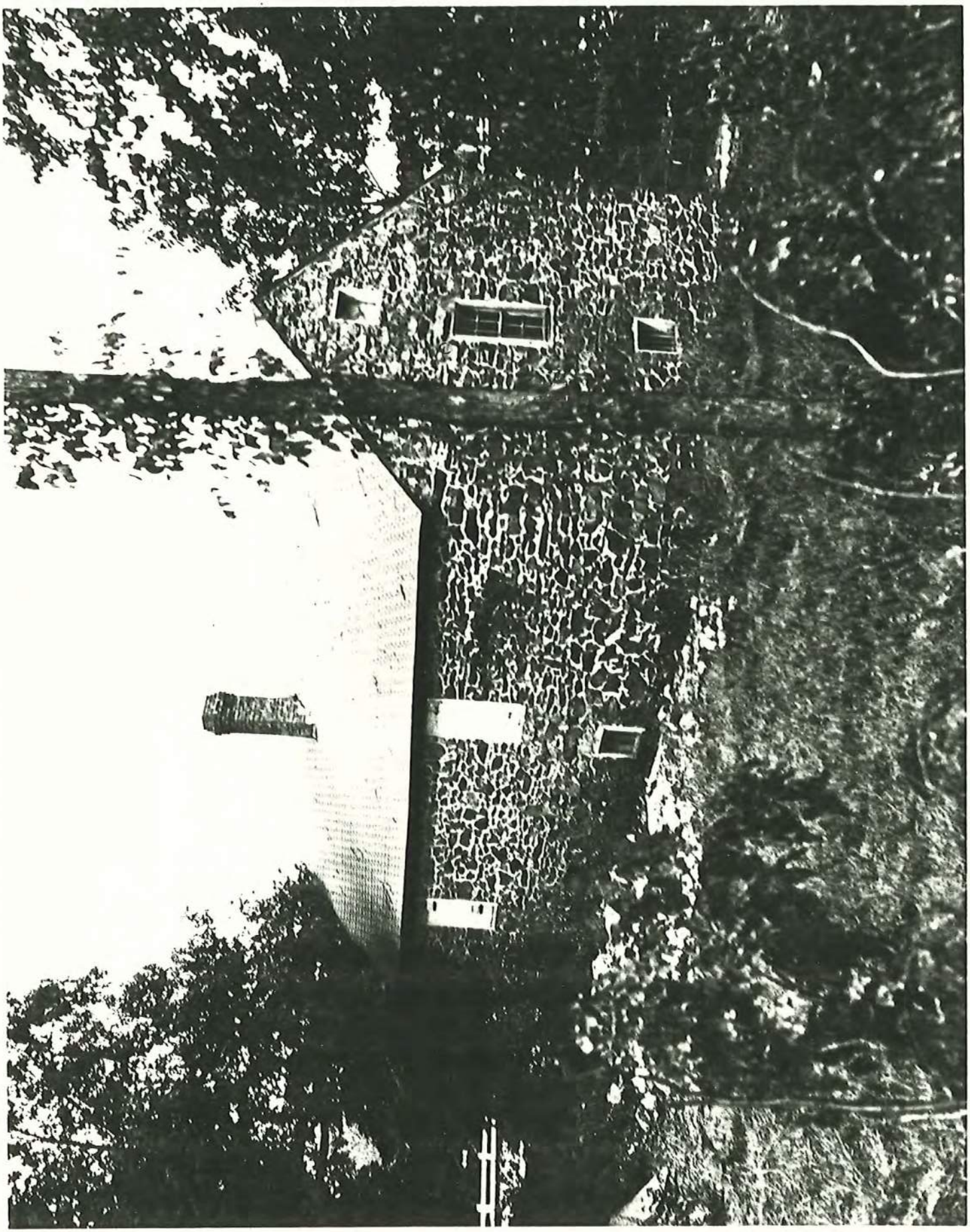


Figure 10

Ellis Stone Barn, 1924.
H.W. Reynolds, Photographer
SPNEA Collection.

Figure 11



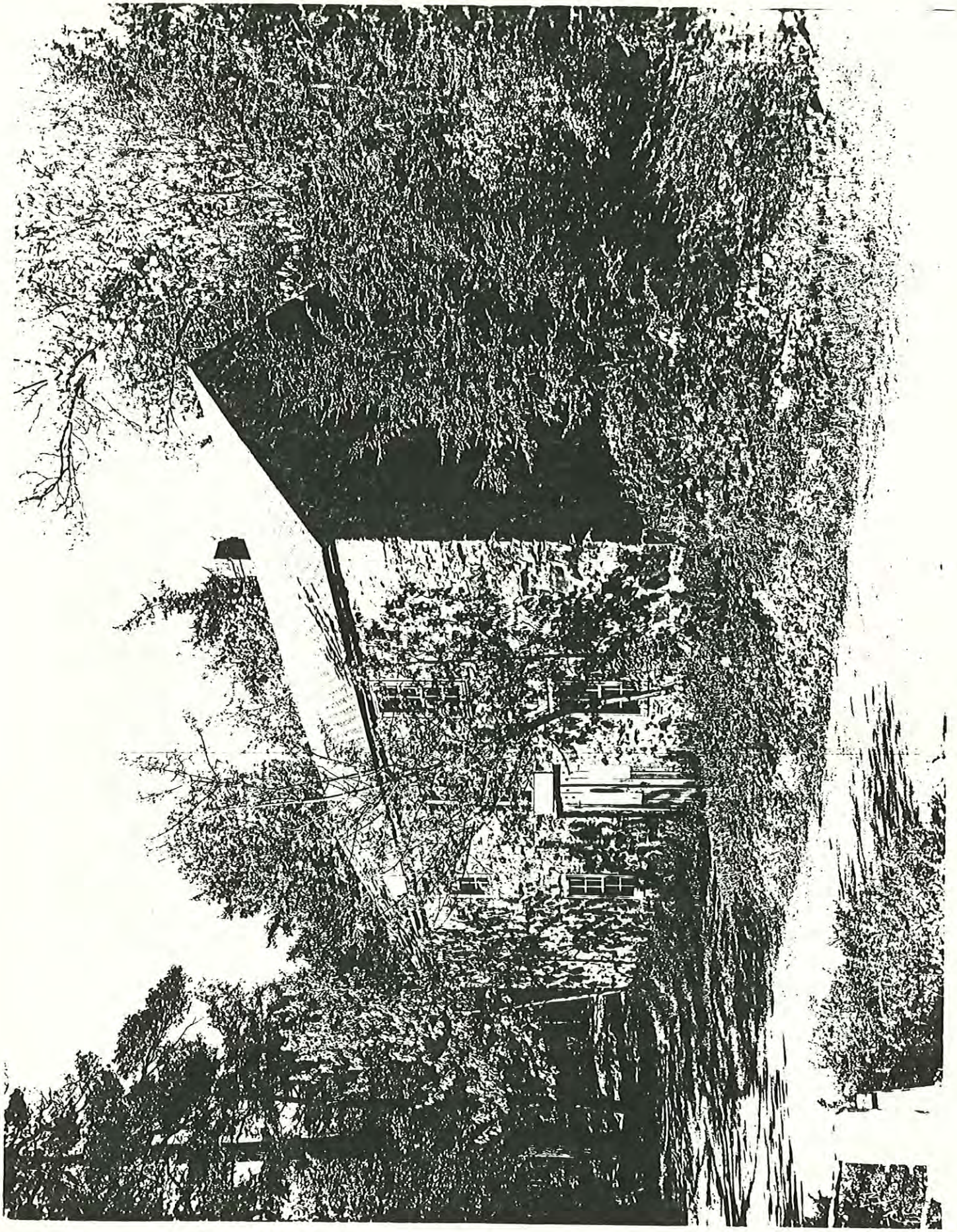


Figure 12

Historic American Buildings Survey Photograph, 1935.
SPNEA Collection.

McGinley Hart & Associates
Architects and Planners
-

77 North Washington Street * Boston, MA. 02114 * 617-227-2932
FAX 617-227-8316

ELLIS STONE BARN, WELLESLEY, MA. May 19, 1989

SITE VISIT & MORTAR ANALYSIS

Client: Metropolitan District Commission

ATTENDEES: Peter Stott, MDC

Frederic C.Detwiller, McGinley Hart & Associates

The site was visited on Tuesday, May 16, to obtain samples of mortar for analysis. The building was examined with the following observations:

1. Masonry Characteristics -

The Ellis Stone Barn is built of split-faced uncoursed polygonal rubble stone in a very soft, sandy lime mortar. The original mortar on the wall interior is mostly sand with a small amount of lime, and a little more lime in the pointing mortar at the surface. The building was repointed in some areas with a white lime mortar in the nineteenth century, and with a hard cement mortar in the twentieth-century, including the masonry blocking the window openings.

2. Mortar Matching -

A representative mortar sample from the original wall exterior, tested by McGinley Hart to establish the proper sand color, and to determine the proper mortar mix, gave the following results:

The off-white mortar was composed largely of lime and sand, since the lime dissolved in the hydrochloric acid, leaving only the sand residue. A labelled sample of the sand is provided for the owners. The sand should be carefully matched so that the exposed surface aggregate after weathering will match the areas of existing old work. It is suggested that a mortar mix with the component parts listed here (1 white Portland cement, 2 1/2 parts lime, 10 parts sand) be utilized.

The finished joints should be raked back flush with the edges of the stone, and washed with Sure Klean Masonry cleaner (600 Detergent containing hydrochloric acid) in order to dissolve the lime binder and expose the surface aggregate. The cleaner should be left on for sufficient time to dissolve the lime coating and the surface scrubbed with a soft bristle brush in order to expose the sand aggregate. This will assure better matching of the weathered appearance of existing surfaces. Thorough final rinsing of the surface should be completed according to manufacturer's instructions.

Frederic C. Detwiller

Frederic C. Detwiller, AIA

cc/ Attendees

MAC/200/MDC Stone Barn 5/19/89

Appendix C: Massachusetts Historical Commission Form B

Massachusetts Cultural Resource Information System
Scanned Record Cover Page

Inventory No:	WEL.20
Historic Name:	Ellis Stone Storehouse
Common Name:	
Address:	Turtle Island Rt 9 - Boylston St
City/Town:	Wellesley
Village/Neighborhood:	Lower Falls;
Local No:	
Year Constructed:	C 1808
Architectural Style(s):	No style;
Use(s):	Other Engineering; Other Governmental or Civic; Other Water Related; Warehouse;
Significance:	Architecture; Engineering; Industry;
Area(s):	
Designation(s):	
Building Materials:	Roof: Asphalt Shingle; Wall: Brick; Stone, Uncut; Foundation: Stone, Uncut;
Demolished	No

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

FORM B - BUILDING

USGS - Newton

AREA

FORM NO.

20

MASSACHUSETTS HISTORICAL COMMISSION
80 BOYLSTON STREET

Wellesley (Newton Upper Falls)

ess Turtle Island

oric Name Ellis Stone Storehouse

Present pressure reading station for the MDC

Original storage house for nail factory and cotton factory

RIPTION

c. 1808-1809

ce photographic files, Preservation Society, Cambridge Street.

e industrial

Architect unknown

Exterior Wall Fabric stone

Outbuildings no

Major Alterations (with dates) windows were filled in at an unspecified date in the 1950's

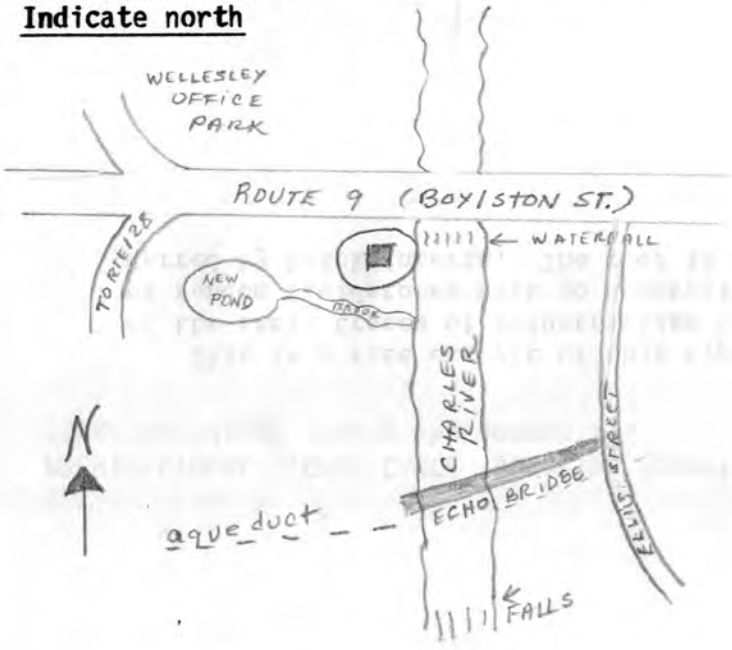
Condition poor

Moved no Date

Acreage

Setting This building is located on Turtle Island on the side of the Charles River. It is within 50 feet of the Route 9 acess road at the three way boundary of Wellesley, Newton and Needham.

Sketch Map: Draw map showing property's location in relation to nearest cross streets and/or geographical features. Indicate all buildings between inventoried property and nearest intersection(s).
Indicate north



UTM REFERENCE

USGS QUADRANGLE

SCALE

Recorded by Margaret Murray, Bryant Follen Jr
E.K. Tritsch of the Dedham Grant Survey

Organization Mass. Historical Commission

Date 1968, 1971, and 1981 respectively
combined in 1988

WEL.20

NATIONAL REGISTER CRITERIA STATEMENT (if applicable)

ARCHITECTURAL SIGNIFICANCE Describe important architectural features and evaluate in terms of other buildings within the community.

This is a rare example of this type of industrial building in an area where most of the early traces of industrialism have been wiped out. The building material is of random fieldstones with no decorative detailing. The original windows have been marred by brick inserts. The roof is side gabled with a low pitch.

HISTORICAL SIGNIFICANCE Explain the role owners played in local or state history and how the building relates to the development of the community.

According to Clarke's History of Needham, around 1800, Rufus Ellis erected the buildings of the Newton Iron Works Company on Turtle Island. This date seems in agreement with the date established by the files of the Preservation Society. However, there is no date given for the destuction of the rest of the buildings which made up this factory. In 1814, Ellis built another factory on the Needham side of the river. This cotton mill burned in 1850 and was replaced by a nail factory in 1853. This structure was converted into a grist mill, but it was also to suffer destruction by fire in 1873. Clarke states that "At the division of the town (1881), the water-privledge and the stone store house were still owned by the heirs of David Ellis." There are many conflicting reports on the history of this structure. However, it can be reasonably assumed that the stone building did indeed function as a storage house for the factories on the Northern side of the river. In recent years this building has been used as an ice house to store ice cut from the river. Currently the structure is owned by the MDC who have bricked up the windows and now use the building as a pressure reading station for the river and waterfall.

BIBLIOGRAPHY and/or REFERENCES

Research by Margaret Murray and Bryant Follen—
Clarke History of Needham Masschusetts pp. 380-381.

For further information see Hurd History of Norfolk County, Smith History of Newton Mass.
Alexander Some of the Older Houses of Newton and Other Historic Spots

SITE INVESTIGATION REPORT

Ellis Stone Barn

by Albert Swanson
Historian

Rte. 9, Hemlock Gorge, Charles River Reservation

Wellesley, Massachusetts

M.D.C.

1978

The Ellis Stone Barn, located near Newton Upper Falls on the Charles River, has characteristics which have led architectural historians to date it variously from c. 1750 to c. 1808. One early photo in the SPNEA collection, taken in 1924, estimates it was "built 100 years ago", which may be a good estimate for the time of its re-building as we know it today (Figure 1).

The building is two stories high with a large open room on the ground floor (with small block enclosure for a U.S.C.G.S. Charles River metering station), and two rooms above with a chimney flue and storage between them. The front facade has a central entrance with a window flanking it on each side with a similar arrangement above. The two ends have a single window on each floor with a third opening in the attic gable end. The attic window in the north end is a demi-lunette. The old openings are presently bricked up, however fragments of the six over six sash, doors, and frames, as well as interior vertical board partitions remain in the building, and pieces including a portion of the fanlight sash are now in the possession of the SPNEA.

The external appearance of the structure with the asymmetrical placement of the splayed window openings is more characteristic of the eighteenth century prior to the appearance of formal symmetry in the Georgian and Federal periods. Reference in The History of the Early Settlement of Newton, by Francis Jackson (Boston: Stacy and Richardson, 1859) is made to "the rock house" in the vicinity once owned by John Maugus; and improved by the Indians. Since this reference quotes a c. 1748 deposition of Sarah Tracy, an Indian, this may be the source of the 1750 date attribution to the Ellis structure. However, the "rock house" reference may be to the caves, since Maugus reportedly lived in a wigwam. The caves were apparently used by the Indians in connection with the fish weirs which reportedly were constructed in part of stone, three feet above the river bed.

The Ellis Stone Barn, while it has some characteristics of the early eighteenth century in its form, was probably built, or rebuilt, early in the nineteenth century. All the major interior members are sawn, which suggests a date after the eighteenth century when most of the major members were hewn and somewhat heavier. The heavy mortise and tenon window frames, while archaic in form, would not be unusual for an early nineteenth century industrial building.

Jackson's History of Newton quotes a letter from Rufus Ellis in which he records that on "about one-quarter of an

Sheet Protector MY-11 Made of Du Pont "MYLAR"

WEL.20

acre, on the Needham side of the river, opposite the small island . . . in 1809, a new factory was erected for the purpose of manufacturing cut nails." This may refer to the present building, although the Newton IronWork Company had operated a rolling mill here earlier, since c. 1800. A saw mill owner by Jonathan Bixby had reportedly operated on this site since 1783.

The c. 1809 reference to the erection of a building on this site seems a plausible date for the structure. However, the interior cicular sawn lath fastened with cut nails would seem to date much of the interior finish to c. 1820's to c. 1830's or slightly later. The four panel doors and Federal style six over six window sash were still in use in the area at these dates as well. Two plausible dates for improvements to the building would be c. 1823 when Newton Factories were formed, with Ellis as agent, or c. 1835 when Rufus Ellis and David Ellis became sole owners of the property. A detailed title search could verify some of Jackson's statements, and possibly date the building conclusively. The building could also be compared to at least one similar stone structure (now a bank) at Newton Lower Falls. Certainly amply evidence exists to allow an accurate restoration of the building.

Attached is a copy of an 1876 Atlas plan, which shows the building labelled "C. Ellis" (Figure 2). An 1874 Atlas

shows the home of Charles Ellis across the River on the opposite side of Boylston Street or the Worcester Turnpike (Rte. 9) (Figure 3). A 1909 Atlas shows the Hemlock Gorge Reservation, the Sudbury River Aqueduct, and Echo Bridge, constructed in 1876. (Figure 4). Attached are copies of early stereo views of the Gorge, and Echo Bridge under construction. The SPNEA has a large collection of stereo views of which copies may be obtained showing the Sudbury River Aqueduct under construction.

WEL.20

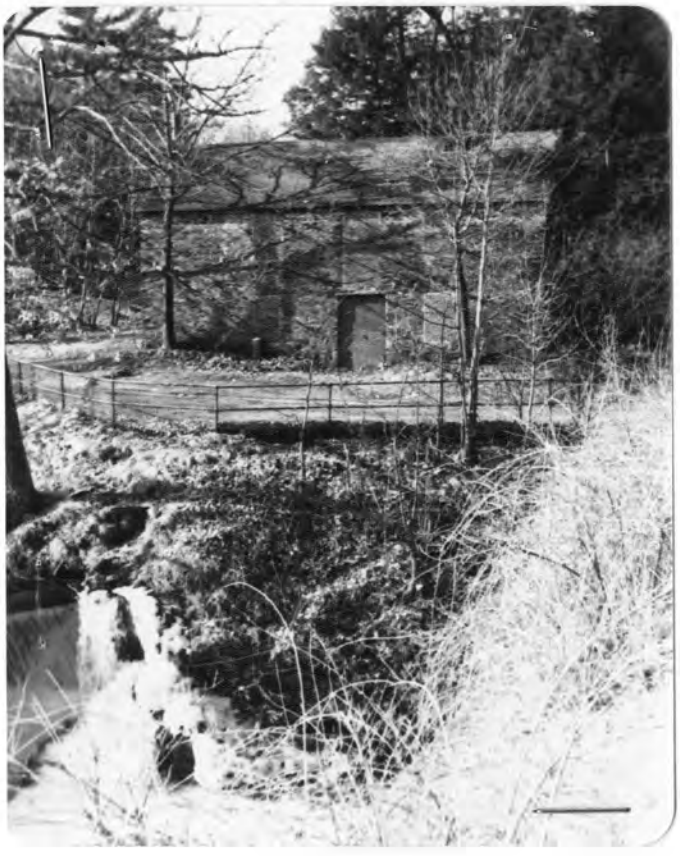
USGS 1970

N4215-W7115/7.5

Wellesley

1/15/71

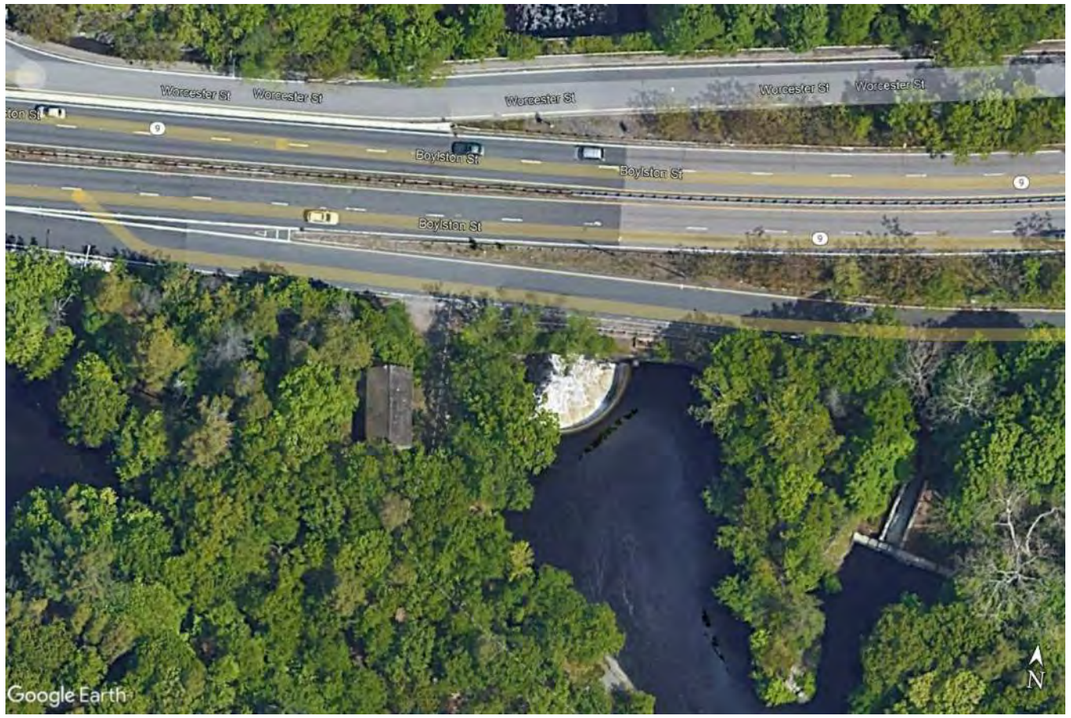
1/15/71



Appendix D: Existing Condition Drawings

Ellis Stone Barn Study

Wellesley, Norfolk County, Massachusetts



N

Department of Conservation and Recreation
251 Causeway Street, Suite 700
Boston, MA 02114

The Commonwealth of Massachusetts
Division of Capital Asset Management and Maintenance (DCAMM)
One Ashburton Place, 15th floor
Boston, MA 02108

DHK Architects, Inc.
54 Canal Street, Suite 200
Boston, MA 02114

617.267.6408
www.dhkinc.com

480 Totten Pond Road
Waltham, MA
02451

781.907.9000
www.sgh.com

SAR Engineering Inc
150 Grossman Dr
Braintree, MA 02184

617.221.9220
www.sar.com

Agency Project #: P22-3481-S1A
Building #: 601MDC9503

June 30th, 2022

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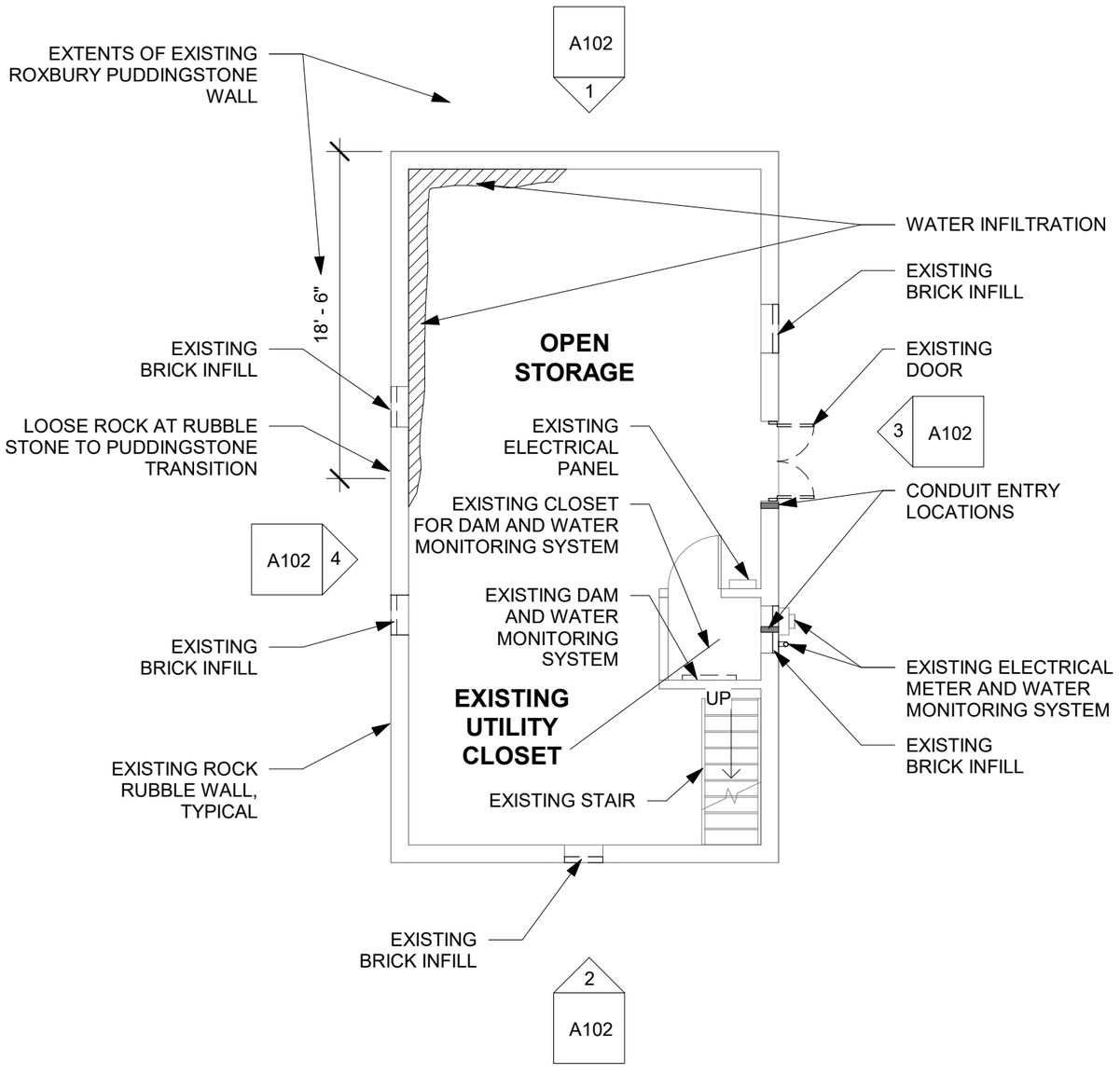

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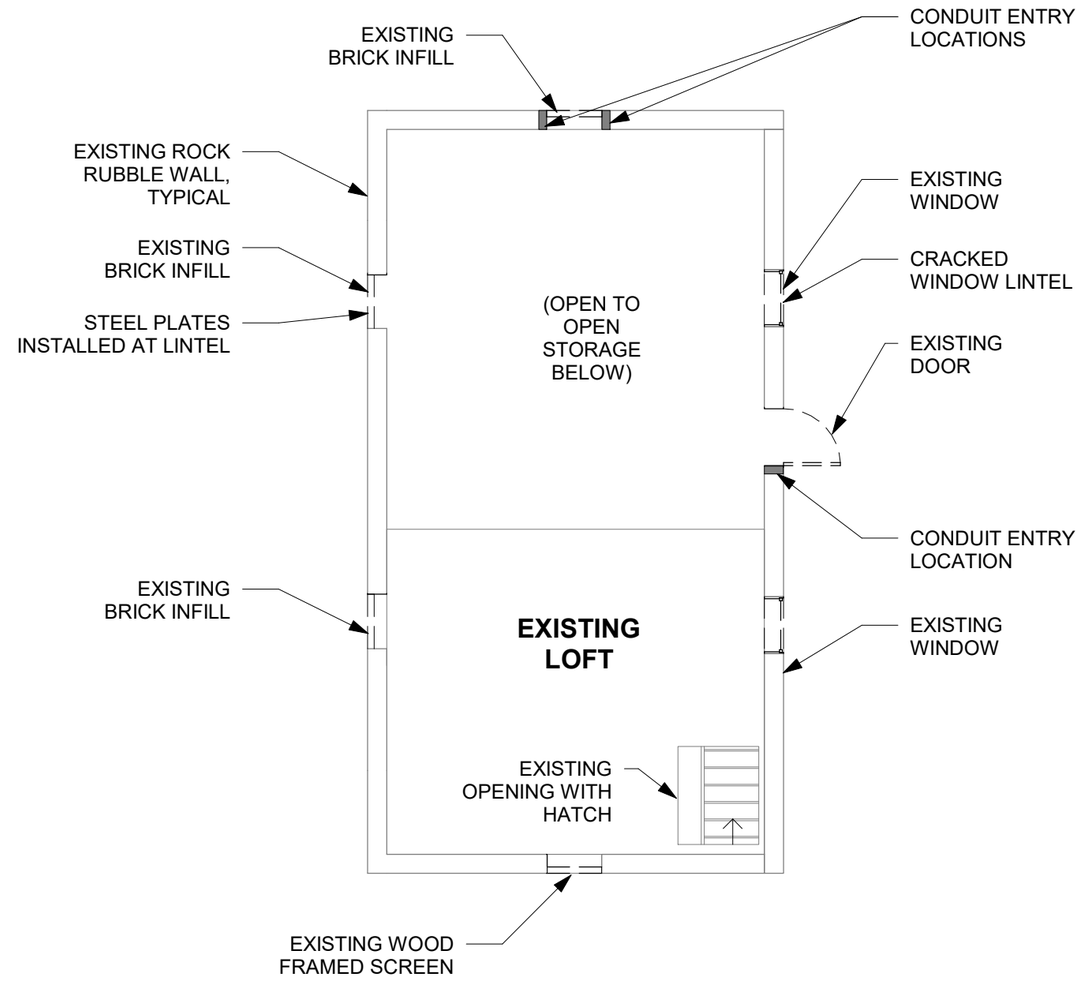

2 LEVEL 2
1/8" = 1'-0"

N

DHK ARCHITECTS
Plans by:
54 CANAL STREET
2ND FLOOR
BOSTON, MA 02114
617-267-6408
Fax: 617-267-1990

Project:
Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:
EXISTING LEVEL 1 & 2 FLOOR PLANS

Project number	P22-3481-S1A
Date	JUNE 30TH, 2022
Drawn by	DK
Checked by	WG

A101

Scale 1/8" = 1'-0"

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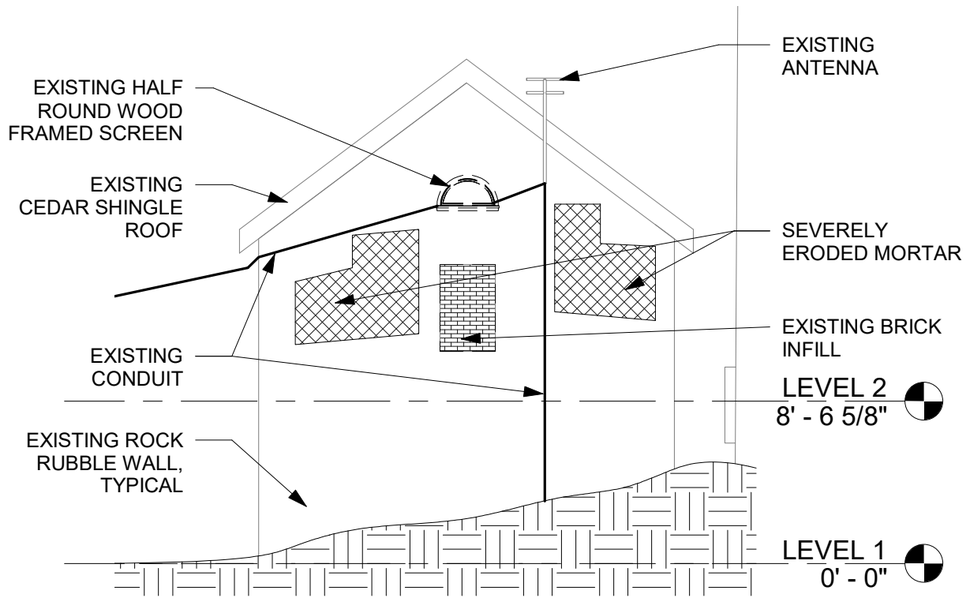

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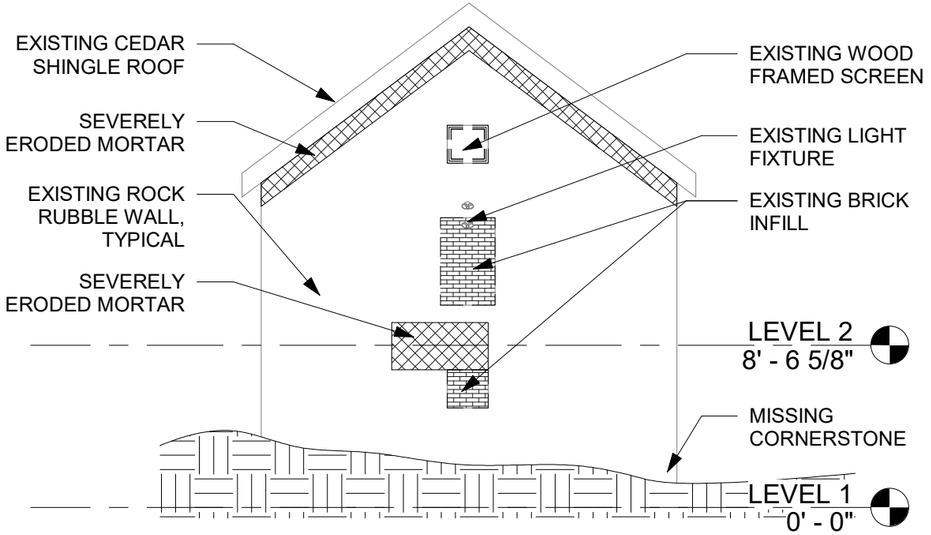

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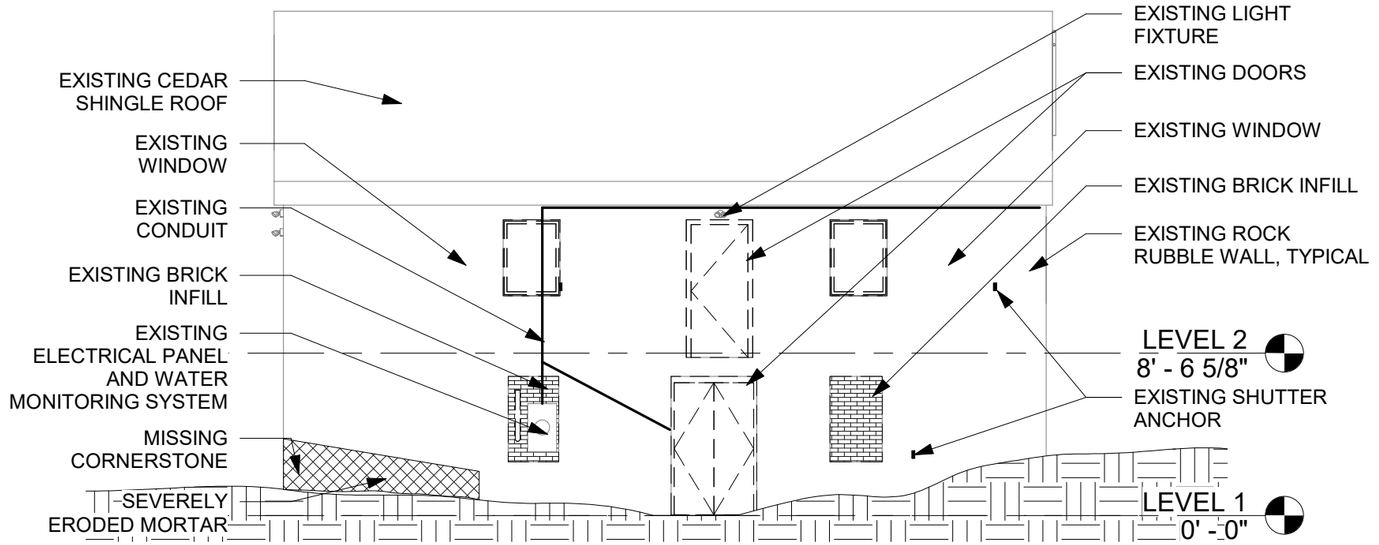

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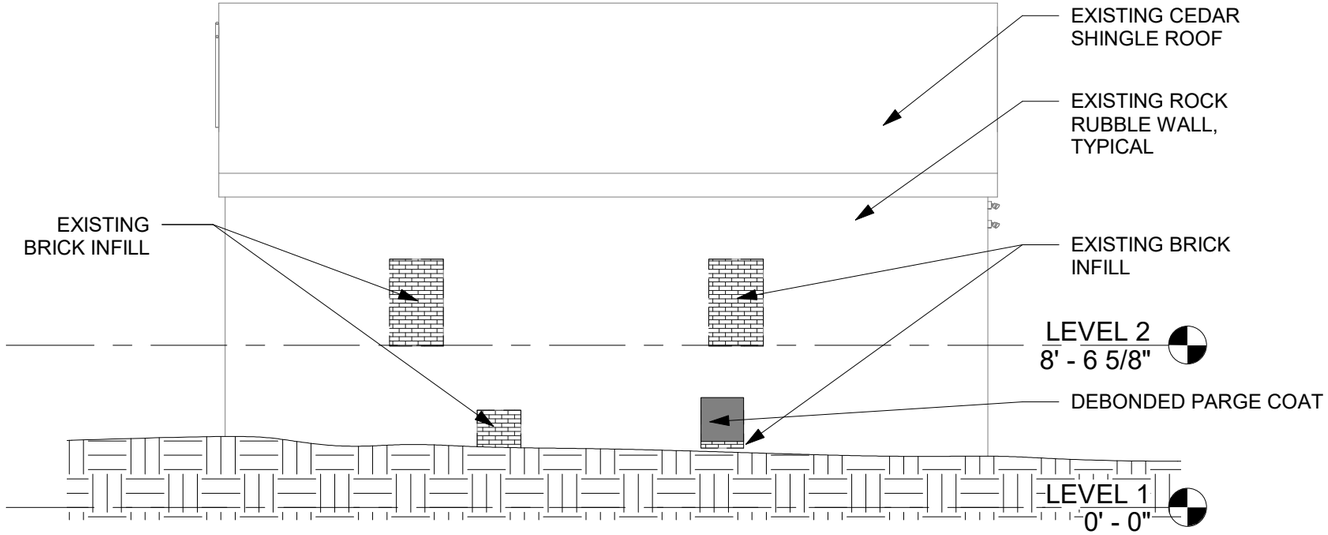

4 WEST ELEVATION
1/8" = 1'-0"

NOTE: ALL MORTAR ON WEST ELEVATION IS SEVERELY ERODED.

N

Plans by:
54 CANAL STREET
2ND FLOOR
BOSTON, MA 02114
617-267-6408
Fax: 617-267-1990

Project:

Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:

EXISTING ELEVATIONS

Project number	P22-3481-S1A
Date	JUNE 30TH, 2022
Drawn by	DK
Checked by	WG

A102

Scale 1/8" = 1'-0"

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SOUTH VIEW

SOUTH VIEW

SOUTH VIEW

WEST VIEW

NORTH WEST VIEW

NORTH EAST VIEW

EAST VIEW

SOUTH EAST VIEW

N

DHK ARCHITECTS

Plans by:
54 CANAL STREET
2ND FLOOR
BOSTON, MA 02114
617-267-6408
Fax: 617-267-1990

Project:

Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:

INTERIOR PHOTOS

Project number	P22-3481-S1A	A107
Date	JUNE 30TH, 2022	
Drawn by	DK	
Checked by	WG	Scale 12" = 1'-0"

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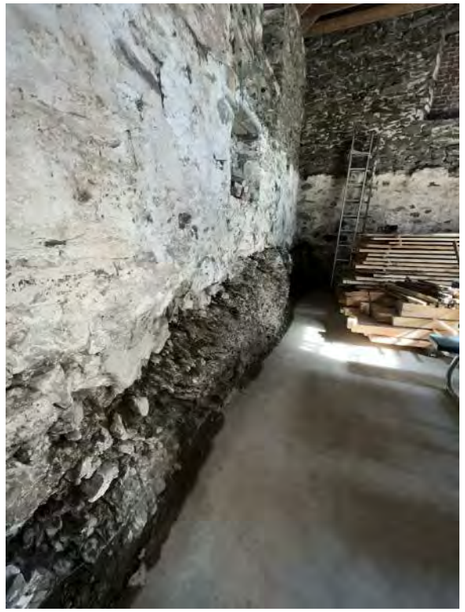
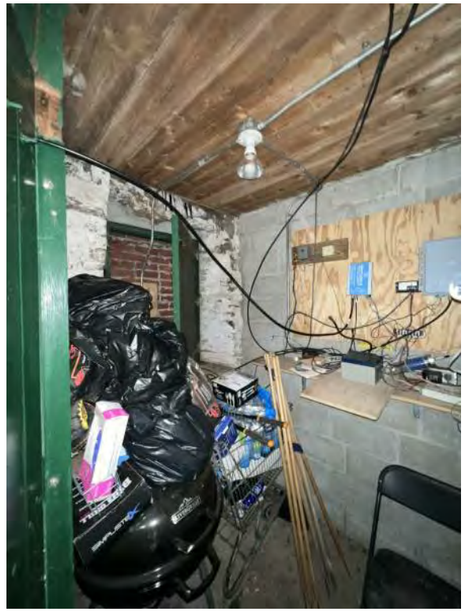
PUDDINGSTONE AT WEST WALL

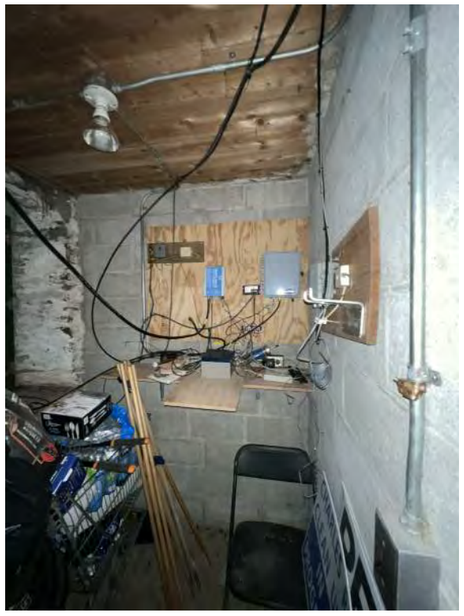


PUDDINGSTONE AT WEST WALL

PUDDINGSTONE AT NORTH WEST CORNER



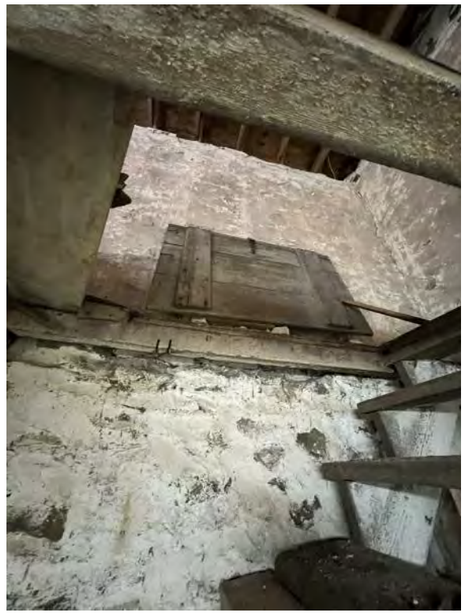
ELECTRIC CLOSET



ELECTRIC CLOSET

STAIRS

STAIRS



HATCH ABOVE STAIRS

N

DHK ARCHITECTS

Plans by:
54 CANAL STREET
2ND FLOOR
BOSTON, MA 02114
617-267-6408
Fax: 617-267-1990

Project:

Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:

INTERIOR PHOTOS

Project number	P22-3481-S1A	A108
Date	JUNE 30TH, 2022	
Drawn by	DK	
Checked by	WG	Scale 12" = 1'-0"

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EAST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

WEST ELEVATION

NORTH ELEVATION

N

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Fax: 617-267-1990

Project:

Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:

EXTERIOR PHOTOS

Project number	P22-3481-S1A	A109
Date	JUNE 30TH, 2022	
Drawn by	DK	
Checked by	WG	Scale 12" = 1'-0"

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Appendix E: Repair Recommendations and Estimated Quantities

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
CHECKED BY MBB

CLIENT DHK Architects
SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

NOT FOR CONSTRUCTION

Repair Type		Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
A	**Repointing**		Repoint eroded and non-matching/improperly repointed mortar joints with Type O mortar.	Exterior	100%	100%	100%	100%	100%	**100%**	**2**
B	**Cleaning - Graffiti Removal**		Clean surfaces of graffiti (Prosoco SureKlean Graffiti Remover or sim.)	Exterior	5 sf	0 sf	100 sf	15 sf	120 sf	**135 sf**	**2**
C	**Cleaning - General**		Clean stained surfaces or surfaces covered with biogrowth (Prosoco Enviro Klean 2010 All Surface Cleaner or sim.)	Exterior	100%	100%	100%	100%	100%	**100%**	**2**

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
CHECKED BY MBB

CLIENT DHK Architects
SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

NOT FOR CONSTRUCTION

Repair Type		Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
D	**Replace Chinking**		Replace chinking where missing or where large pockets of mortar would be required. Assume stone (basalt) obtained from nearby.	Exterior	5%	5%	5%	5%	5%	**5%**	**2**
E	**Reroute Conduit - Water Monitoring**		Remove water monitoring system from face of building (east elevation) and reroute to bollard near northwest corner of building.	Exterior	0	1	0	0	1 ea	**1 ea**	**3**

SGH

CLIENT DHK Architects

SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

SHEET NO. 1

PROJECT NO. 220606.00-ELLS

DATE 30 June 2022

BY EML

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NOT FOR CONSTRUCTION

	Repair Type	Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
F	**Reroute Conduit - Other**		Reroute conduits attached to building or entering through open windows or doors to be below-grade and not visible where possible. Remove antenna.	Exterior	2	1	0	0	3 ea	**3 ea**	**3**
G	**Remove Vegetation**		Remove large vegetation within 3 ft of the building face.	Exterior	22 lf	40 lf	22 lf	40 lf	124 lf	**125 lf**	**1**
H	**Replace Blocks**		Replace blocks where missing. Assume stone (basalt) obtained from nearby.	Exterior	0	1	0	0	1 ea	**2 ea**	**1**

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SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
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NOT FOR CONSTRUCTION

	Repair Type	Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
I	**Remove Parge Coat**		Remove delaminated parge coat from face of stone/brick.	Exterior	0 sf	0 sf	0 sf	15 sf	15 sf	**15 sf**	**3**
J	**Repair Cracked Lintels**		Shore lintel as required. Remove cracked lintel portion and square off remaining stone. Provide replacement lintel portion, 1/4 in. min. diameter s.s. spring anchors (2 per replacement block), and Type O mortar to match color, texture, and profile of existing stone.	Exterior	0	2	0	0	2 ea	**3 ea**	**1**

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SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
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Repair Type		Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
K	**Patch Gaps**		Patch gaps at door surround and at rafters with Type O mortar and chinking as required to prevent pests from entering building. Assume stone (basalt) obtained from nearby.	Exterior	0 lf	10 lf	0 lf	40 lf	50 lf	**55 lf**	**3**
L	**Install Drainage**		Install drainage at west side of building. Dig down to level of puddingstone and install crushed gravel, filter fabric, and clay liner to outlet in dry well to south of building. Regrade landscape to slope away from building.	Exterior	0 lf	0 lf	0 lf	100 lf	100 lf	**120 lf**	**1**

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SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
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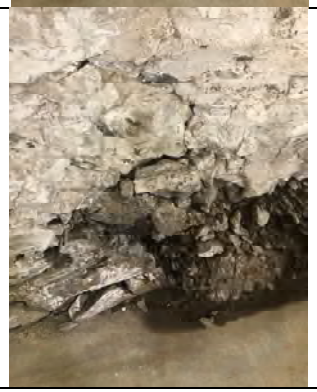
NOT FOR CONSTRUCTION

Repair Type		Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
M	**Replace Door**		Remove and replace door with historically appropriate wood door (cedar or sim.)	Exterior	0	1	0	0	1 ea	**1 ea**	**3**
N	**Remove Brick Infill and Install New Windows**		Remove and replace existing windows and door on east elevation. Remove brick infill from window openings and install new 6 over 6 double hung windows with heat-strengthened laminated glass and wood shutters. Do not install insect screens. Install windows at small openings not infilled on north and south elevations.	Exterior	2	5	3	4	14 ea	**14 ea**	**3**

SHEET NO. 1
PROJECT NO. 220606.00-ELLS
DATE 30 June 2022
BY EML
CHECKED BY MBB

CLIENT DHK Architects
SUBJECT Ellis Storehouse – Preliminary Estimate of Repair Quantities

NOT FOR CONSTRUCTION

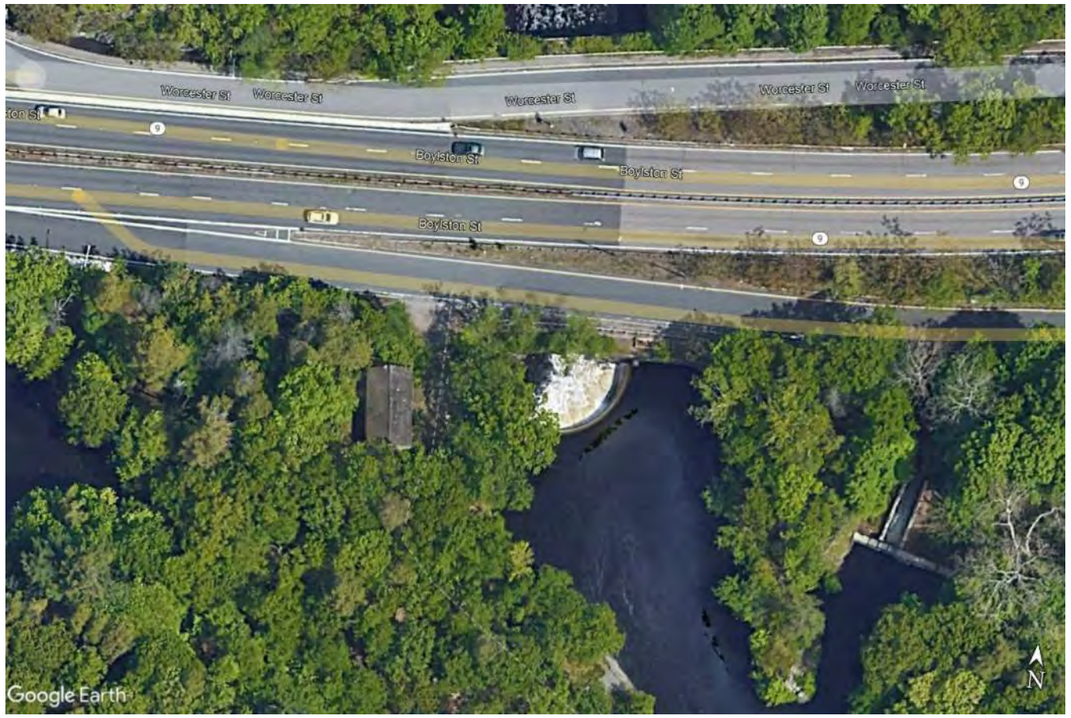
	Repair Type	Photo	Description	Interior or Exterior	Quantity						Priority[1]
					North Elevation	East Elevation	South Elevation	West Elevation	Total from Condition Assessment	Total for Cost Estimate	
O	**Remove Loose Puddingstone and Patch**		Remove loose puddingstone and stabilize top surface (at intersection with stone wall) with non-shrink grout.	Interior	11 lf	0 lf	0 lf	19 lf	30 lf	**30 lf**	**1**
P	**Rebuild Wall**		Remove loose stone and re-set, chinked tightly to adjacent intact stones with Type O mortar and new chinking as needed. Assume stone (basalt) obtained from nearby.	Interior	0 sf	0 sf	0 sf	40 sf	40 sf	**50 sf**	**1**

[1] Priorities are noted from 1 - 3, with 1 being the highest priority. High priority items (1) are those with the greatest potential to be or create structural issues.

Appendix F: Schematic Design for Proposed Solution

Ellis Stone Barn Study

Wellesley, Norfolk County, Massachusetts



N

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Boston, MA 02114

The Commonwealth of Massachusetts
Division of Capital Asset Management and Maintenance (DCAMM)
One Ashburton Place, 15th floor
Boston, MA 02108

DHK Architects, Inc.
54 Canal Street, Suite 200
Boston, MA 02114

617.267.6408
www.dhkinc.com

480 Totten Pond Road
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02451

781.907.9000
www.sgh.com

SAR Engineering Inc
150 Grossman Dr
Braintree, MA 02184

617.221.9220
www.sar.com

Agency Project #: P22-3481-S1A
Building #: 601MDC9503

June 30th, 2022

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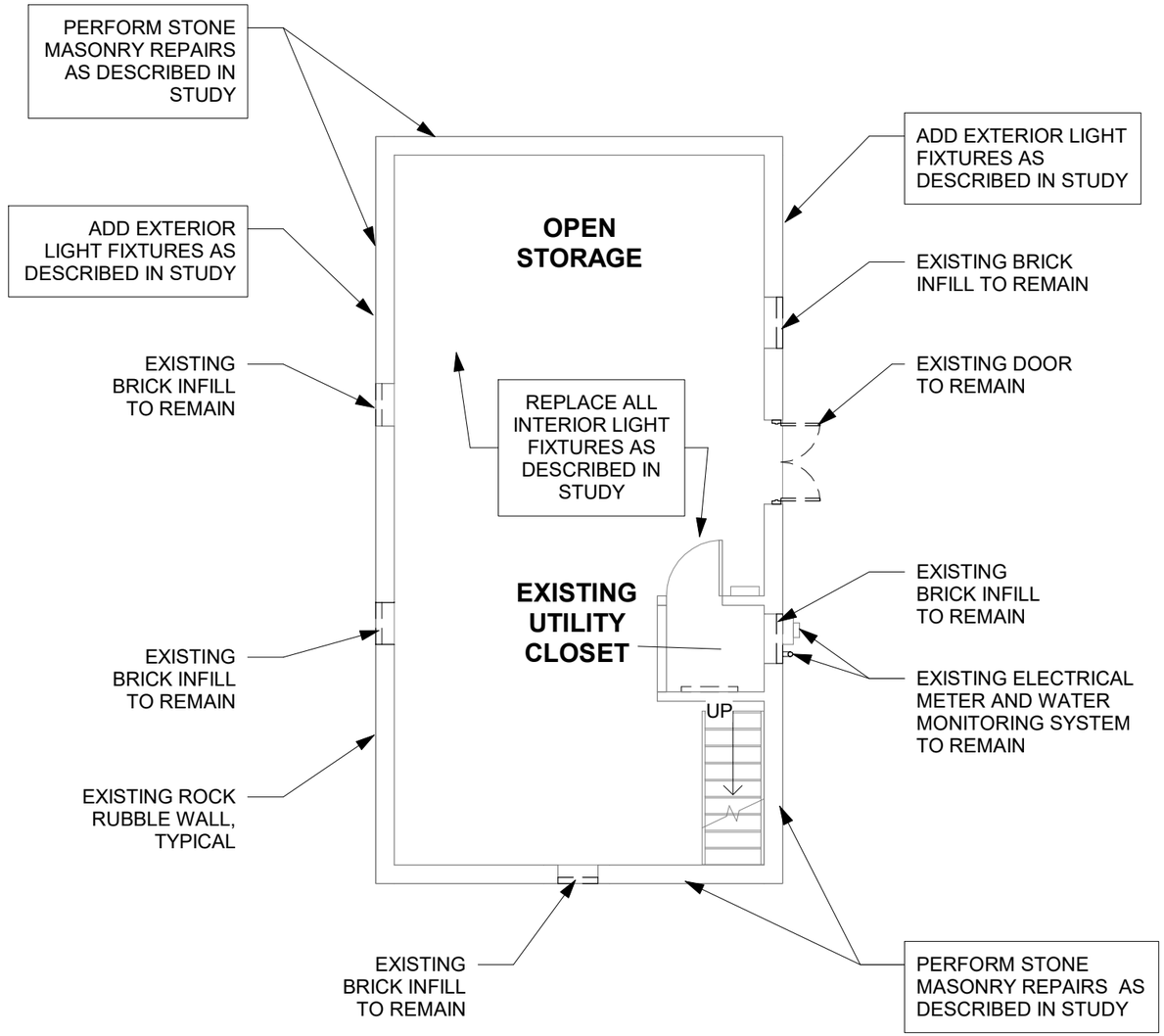
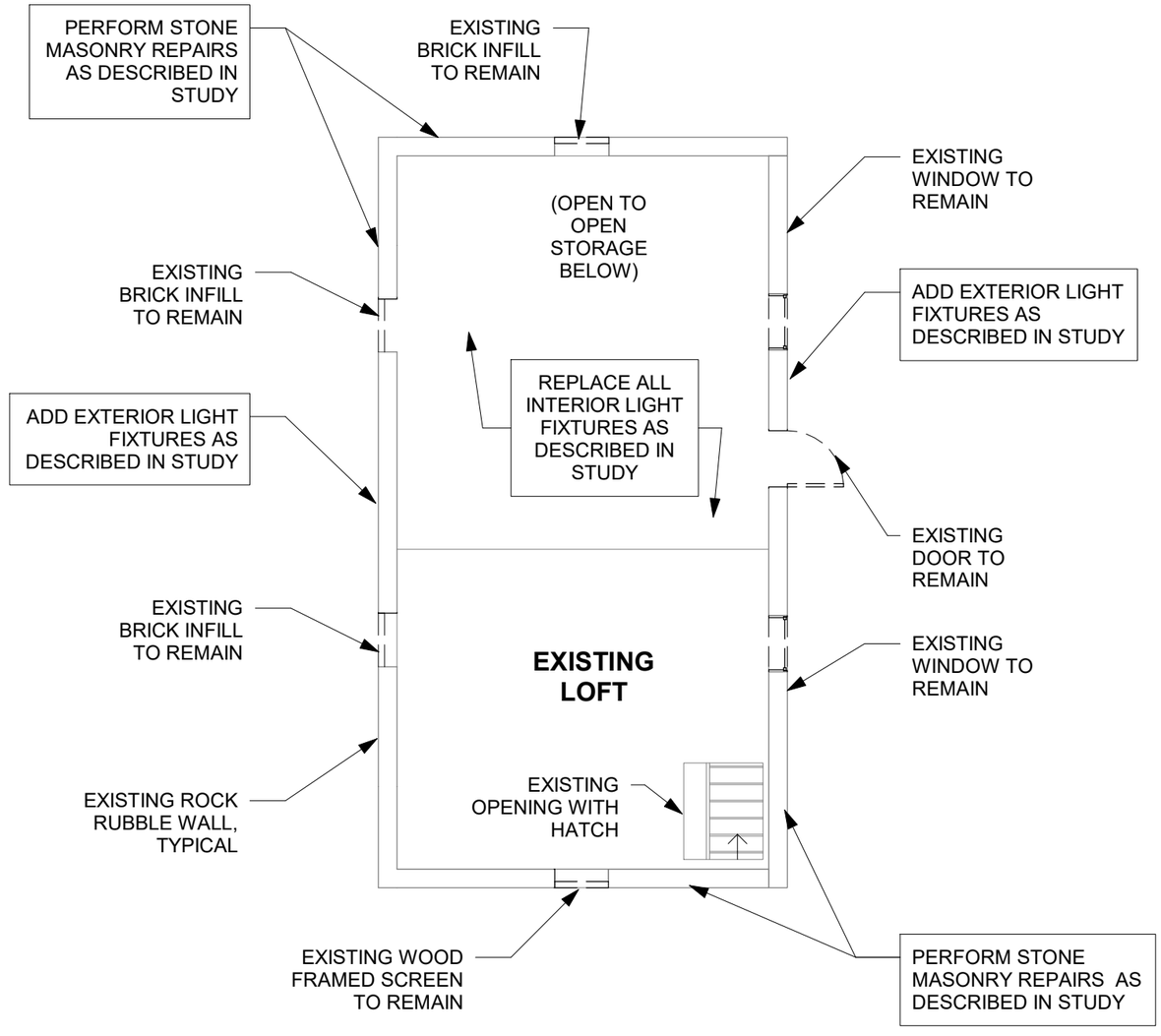


1 LEVEL 1 - OPTION 1
1/8" = 1'-0"

BOXED TEXT INDICATES OPTION 1 IMPROVEMENTS



2 LEVEL 2 - OPTION 1
1/8" = 1'-0"

BOXED TEXT INDICATES OPTION 1 IMPROVEMENTS

N

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Fax: 617-267-1990

Project:
Department of Conservation and Recreation

Ellis Stone Barn Study

No.	Description	Date

Drawing:
OPTION 1

Project number	P22-3481-S1A	A103
Date	JUNE 30TH, 2022	
Drawn by	Author	
Checked by	Checker	Scale 1/8" = 1'-0"

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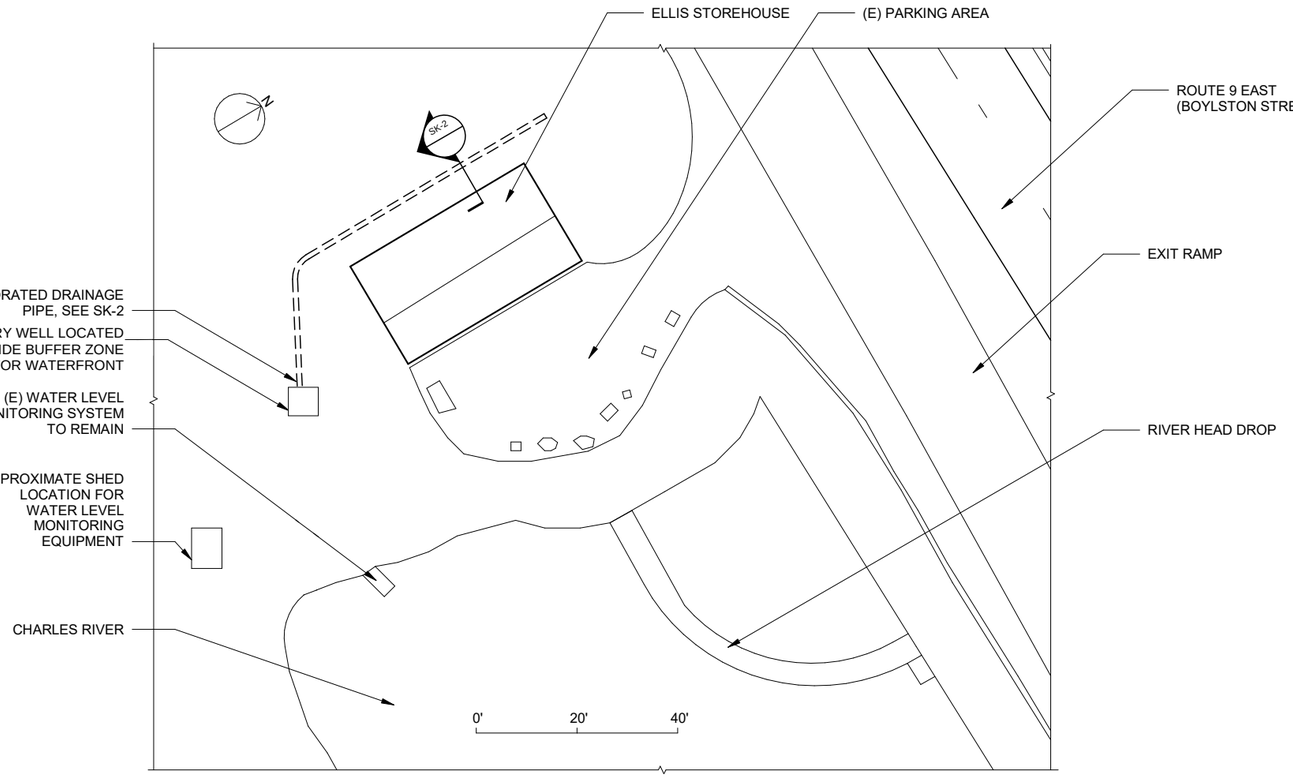
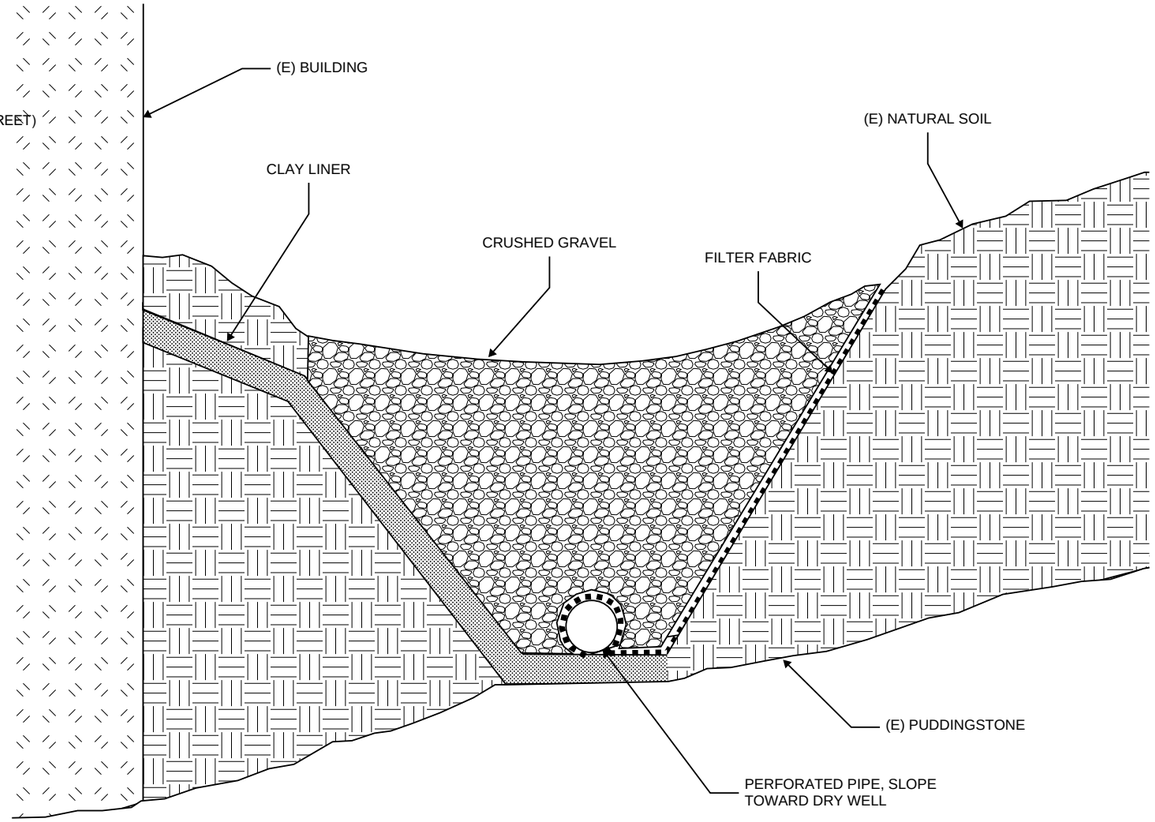


SK-1 - DRAINAGE PLAN - CONCEPT SKETCH, NOT FOR CONSTRUCTION



SK-2 - DRAINAGE SECTION - CONCEPT SKETCH, NOT FOR CONSTRUCTION

N

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Ellis Stone Barn Study

No.	Description	Date

Drawing:

OPTION 1 DETAILS

Project number	P22-3481-S1A	A103a
Date	JUNE 30TH, 2022	
Drawn by	Author	
Checked by	Checker	Scale

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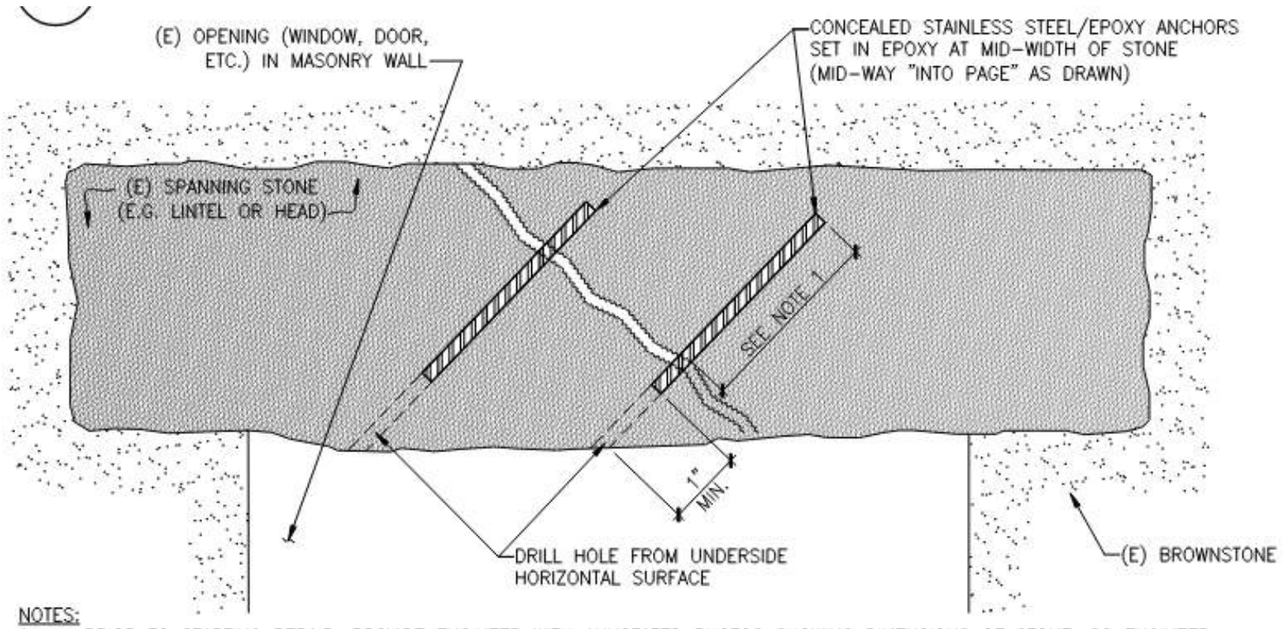
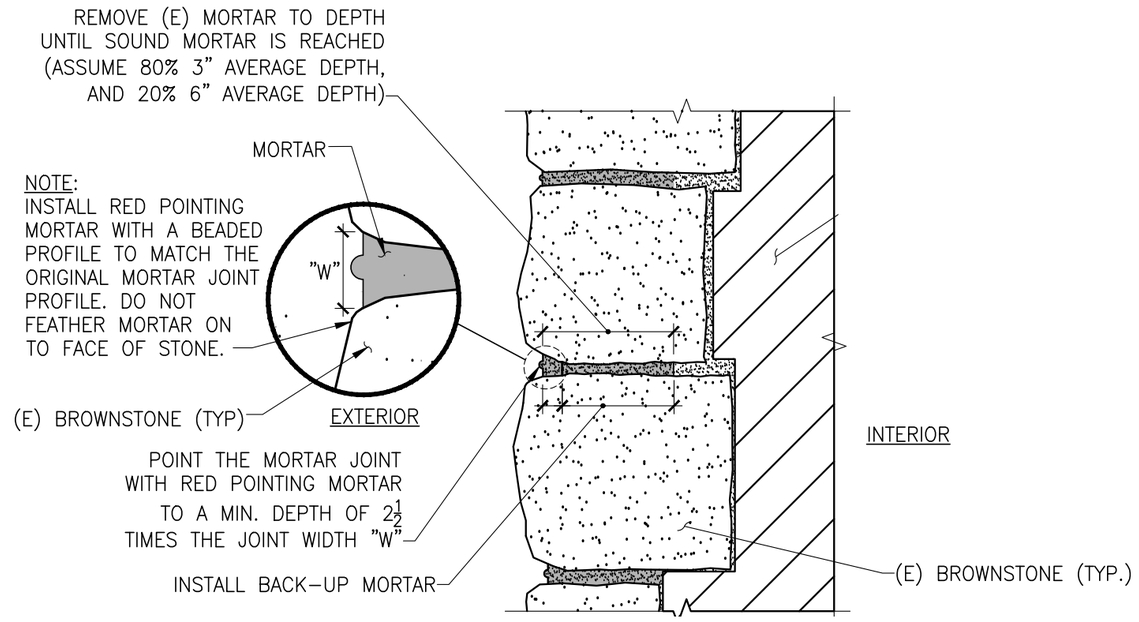


NOTES:

1. PRIOR TO STARTING REPAIR, PROVIDE ENGINEER WITH ANNOTATED PHOTOS SHOWING DIMENSIONS OF STONE, SO ENGINEER CAN SPECIFY MINIMUM EMBEDMENT LENGTH, MINIMUM DOWEL DIAMETER, NUMBER OF RODS REQUIRED, AND ANGLE OF ROD.
2. INSTALL STAINLESS STEEL ROD ANCHORS SET IN EPOXY, INSTALLED PERPENDICULAR TO CRACK AT MID-WIDTH OF STONE, TWO MINIMUM PER MEMBER. RECESS HEAD OF ANCHOR MIN 1" FROM EXPOSED STONE.
3. CLEAN CRACK WITH COMPRESSED AIR. INJECT CRACK WITH NON-STAINING EPOXY TINTED TO MATCH COLOR OF STONE. APPLY STONE DUST FROM DRILL HOLE TO SURFACE OF EPOXY WHEN WET.
4. PATCH EXPOSED HOLE AT DRILL POINT WITH REPAIR MORTAR.

SK-3 - CROSS-STITCH REPAIR - CONCEPT SKETCH, NOT FOR CONSTRUCTION



SK-4 - REPOINTING - CONCEPT SKETCH, NOT FOR CONSTRUCTION

N

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Ellis Stone Barn Study

No.	Description	Date

Drawing:

OPTION 1 DETAILS

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Date	JUNE 30TH, 2022	
Drawn by	Author	
Checked by	Checker	Scale

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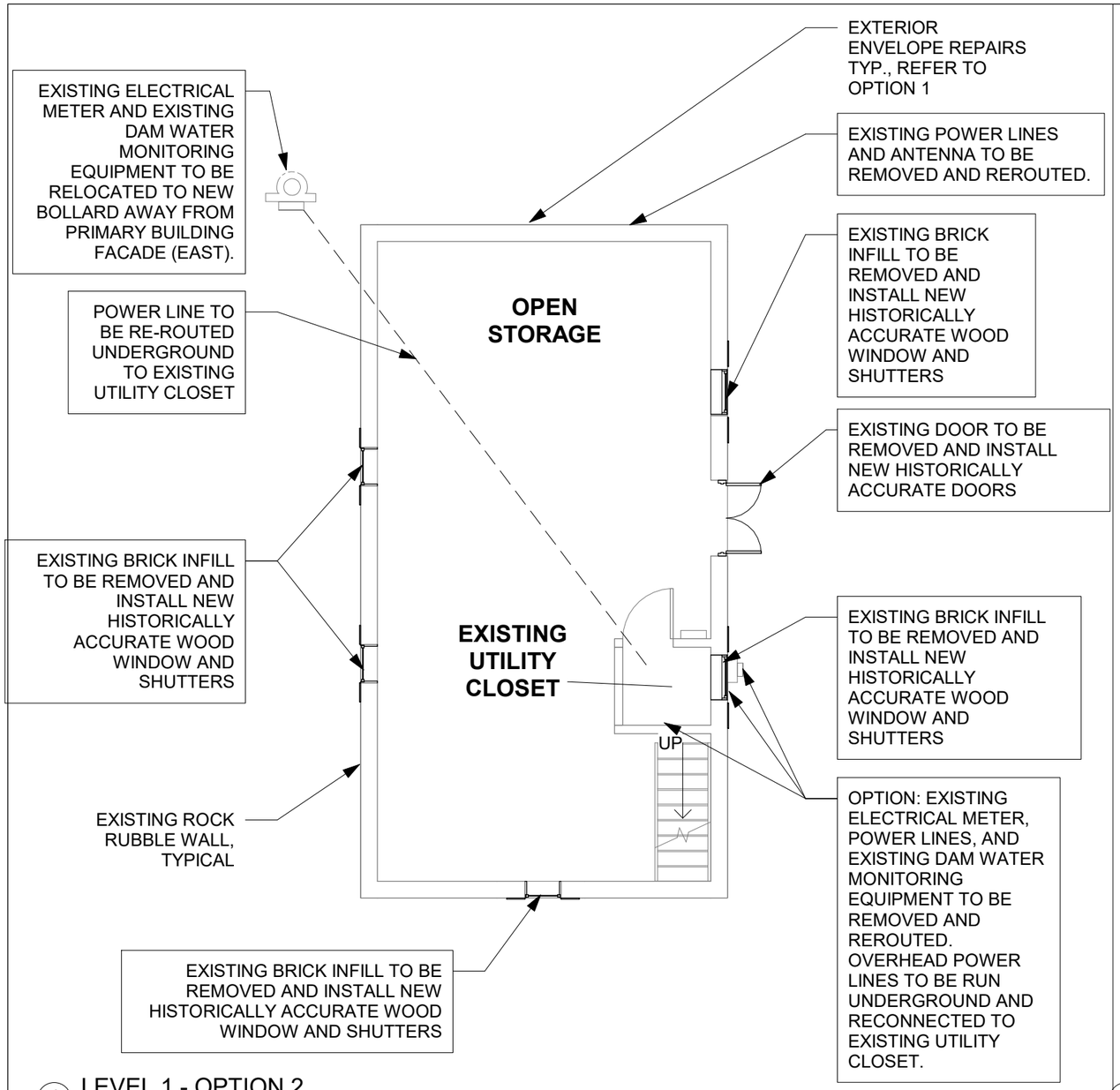

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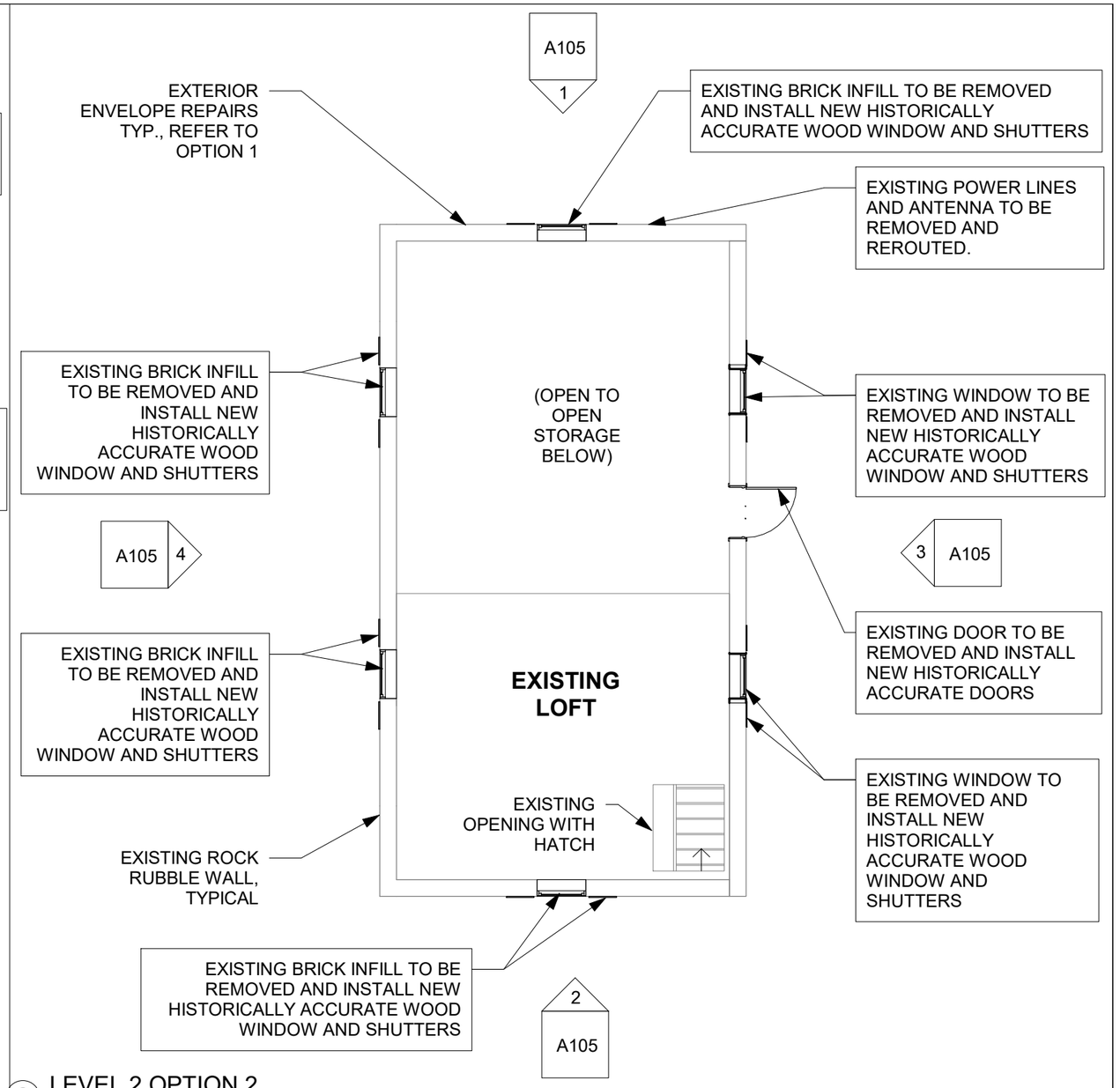

2 LEVEL 2 OPTION 2
1/8" = 1'-0"

BOXED TEXT INDICATES OPTION 2 IMPROVEMENTS

OPTION 2 IMPROVEMENTS SHALL INCLUDE OPTION 1 IMPROVEMENTS

BOXED TEXT INDICATES OPTION 2 IMPROVEMENTS

OPTION 2 IMPROVEMENTS SHALL INCLUDE OPTION 1 IMPROVEMENTS

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Project:

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Ellis Stone Barn Study

No.	Description	Date

Drawing:
OPTION 2

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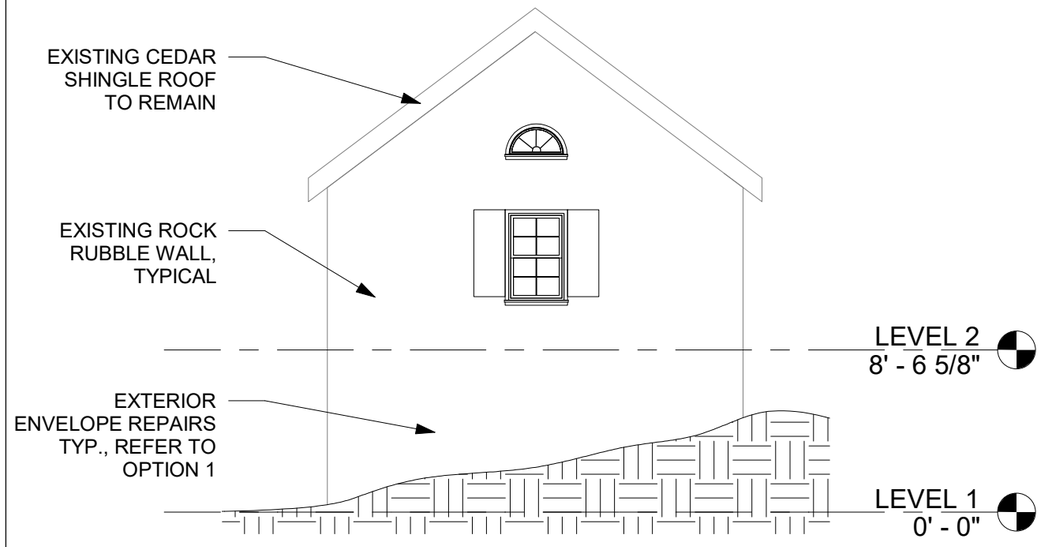

1 NORTH ELEVATION -OPTION 2
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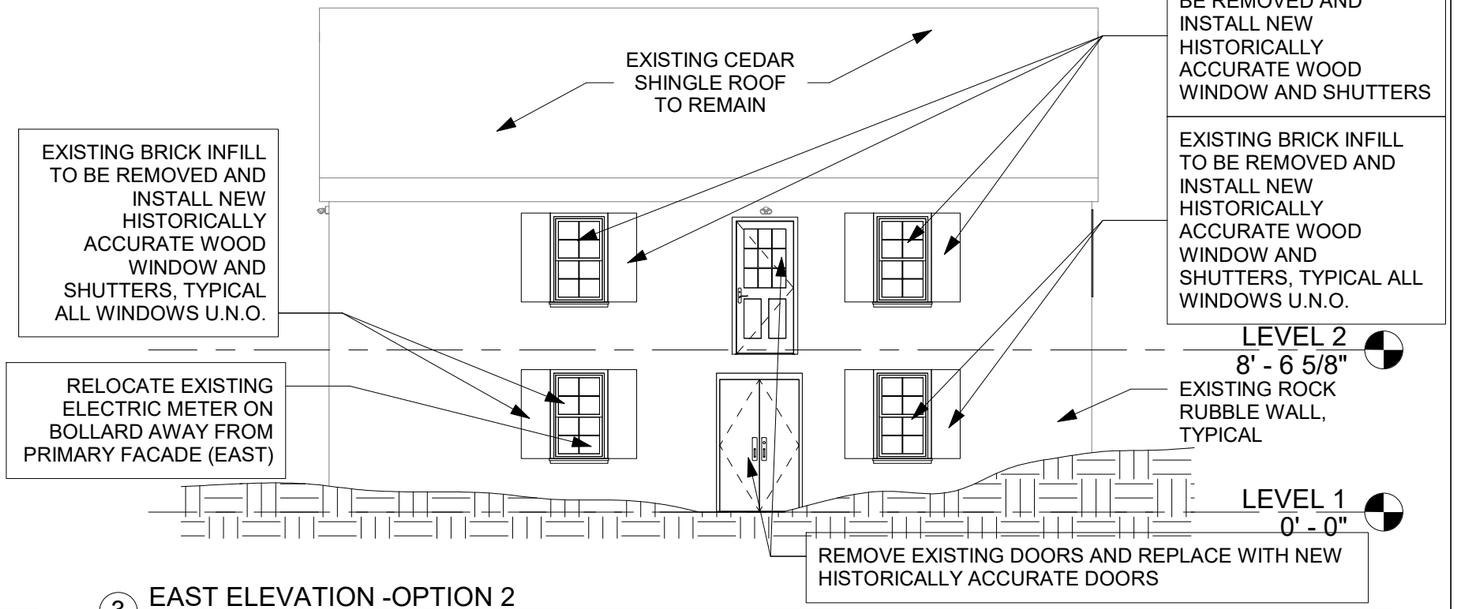

3 EAST ELEVATION -OPTION 2
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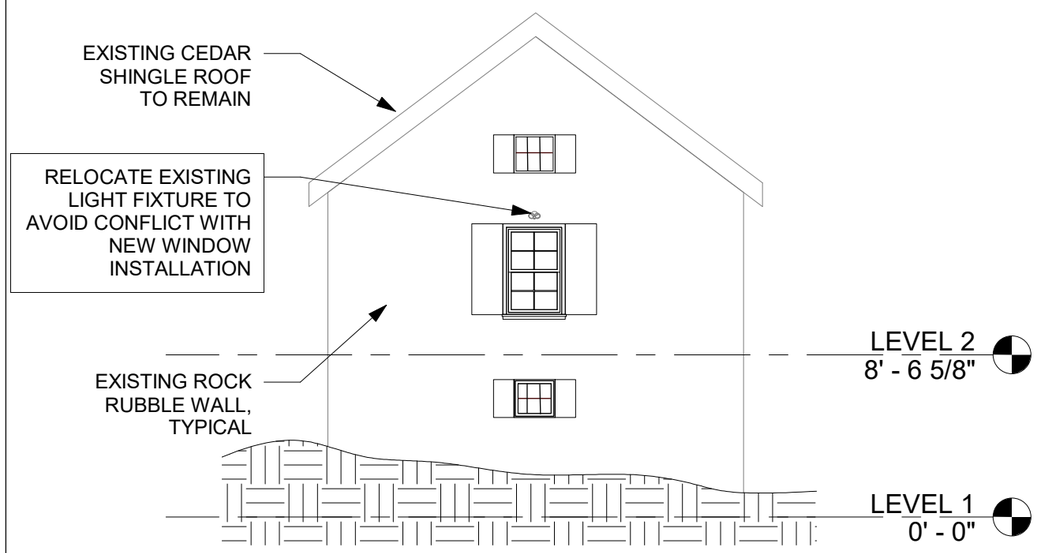

2 SOUTH ELEVATION -OPTION 2
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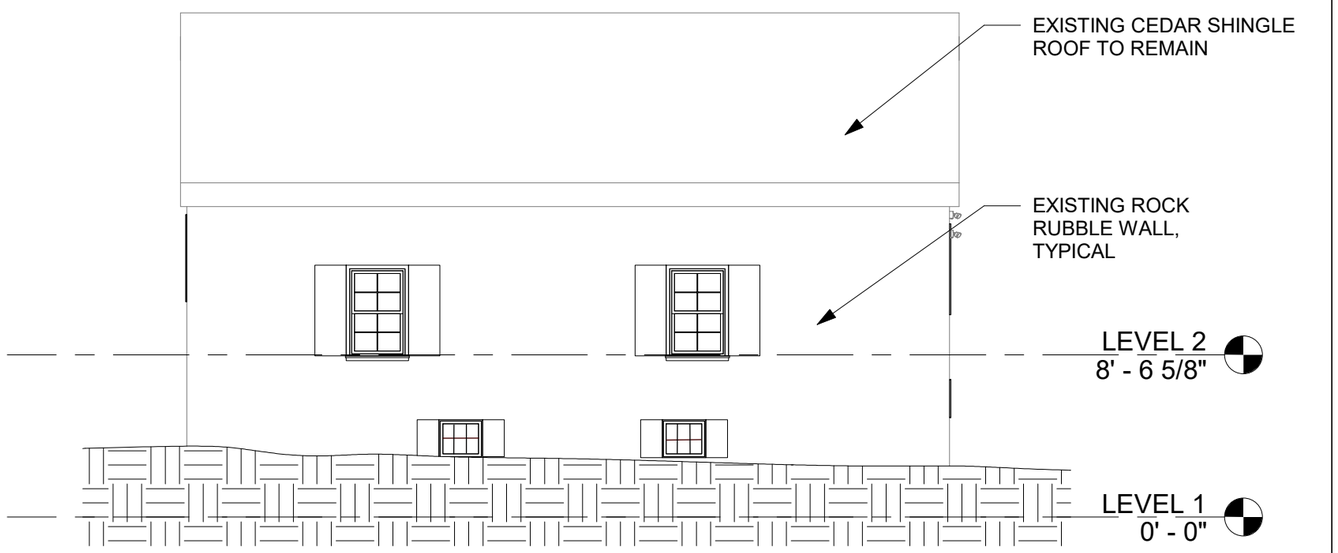

4 WEST ELEVATION -OPTION 2
1/8" = 1'-0"

OPTION 2 IMPROVEMENTS SHALL INCLUDE OPTION 1 IMPROVEMENTS

BOXED TEXT INDICATES OPTION 3 IMPROVEMENTS

N

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617-267-6408
Fax: 617-267-1990

Project:

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Ellis Stone Barn Study

No.	Description	Date

Drawing:

OPTION 2 ELEVATIONS

Project number	P22-3481-S1A	A105
Date	JUNE 30TH, 2022	
Drawn by	DK	
Checked by	WG	Scale 1/8" = 1'-0"

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Project:

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Ellis Stone Barn Study

No.	Description	Date

Drawing:

OPTION 2 DETAILS

Project number	P22-3481-S1A	A105a
Date	JUNE 30TH, 2022	
Drawn by	Author	
Checked by	Checker	Scale

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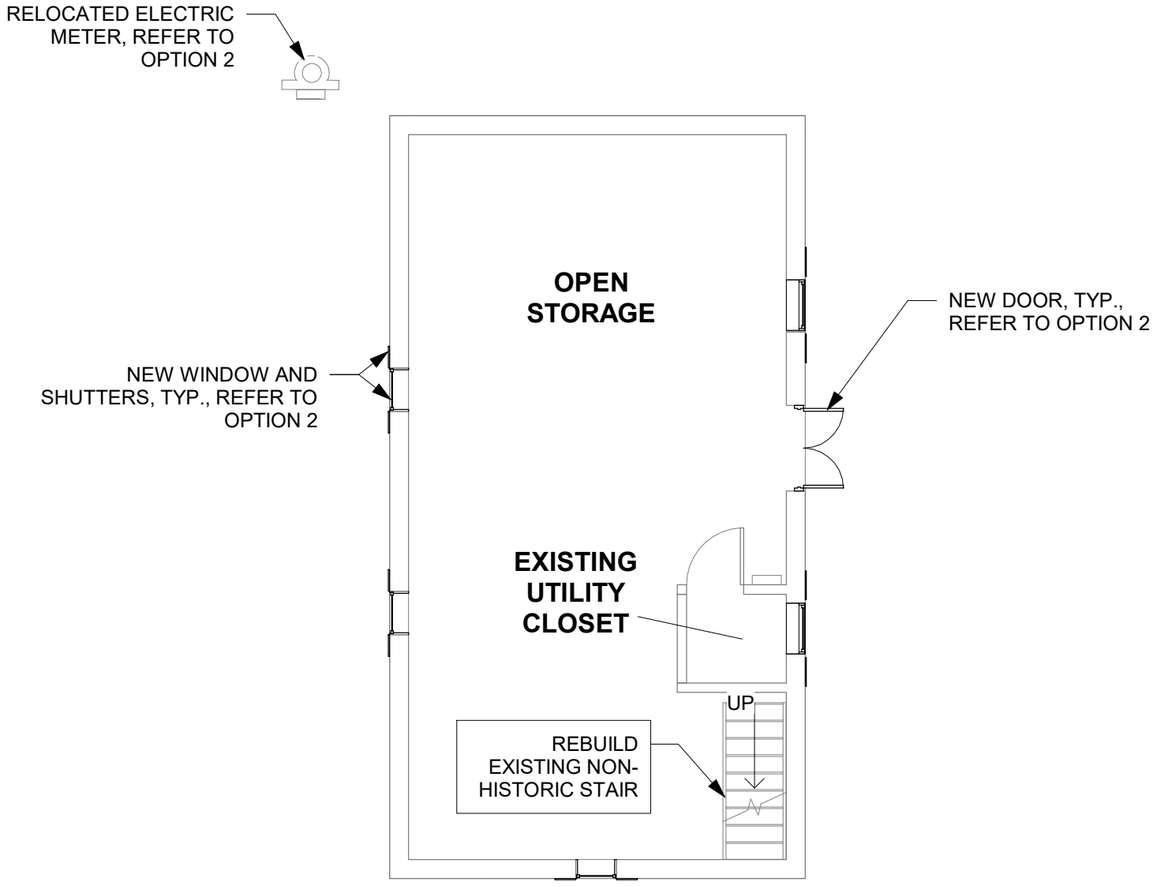

OPTION 3 - SOUTH LOFT REHABILITATION

1 LEVEL 1 OPTION 3
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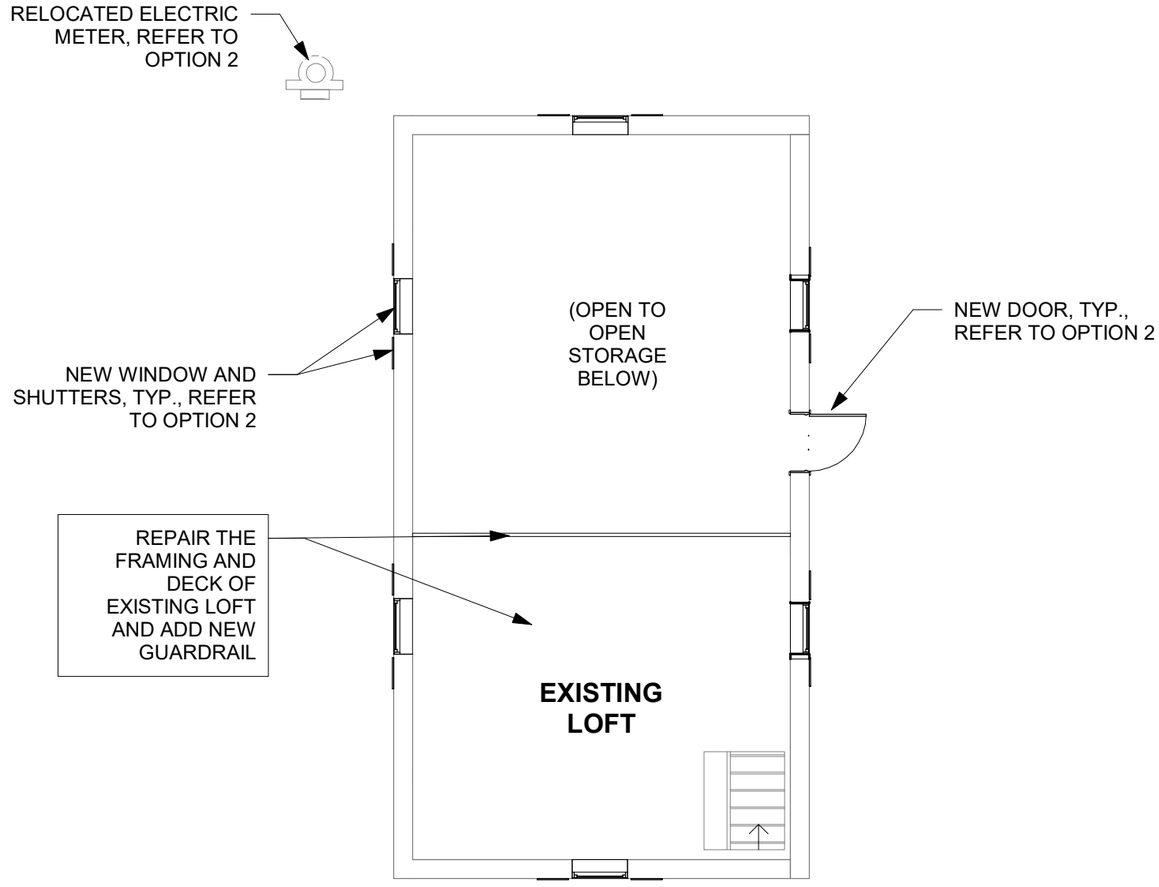

OPTION 3 - SOUTH LOFT REHABILITATION

2 LEVEL 2 OPTION 3
1/8" = 1'-0"

BOXED TEXT INDICATES OPTION 3 IMPROVEMENTS

OPTION 3 IMPROVEMENTS SHALL INCLUDE OPTIONS 1 AND 2 IMPROVEMENTS

BOXED TEXT INDICATES OPTION 3 IMPROVEMENTS

OPTION 3 IMPROVEMENTS SHALL INCLUDE OPTIONS 1 AND 2 IMPROVEMENTS

N

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Project:
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Ellis Stone Barn Study

No.	Description	Date

Drawing:
OPTION 3

Project number	P22-3481-S1A	A106
Date	JUNE 30TH, 2022	
Drawn by	DK	
Checked by	WG	Scale 1/8" = 1'-0"

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Appendix G: Full Cost Estimate

Cost Estimate
Prime: DHK
Consultants:

Project Title
DCR Ellis Stonebuilding

Date Updated:

Date: June 30, 2022

Gross Floor Area = 2,368 SF

Reference	*Description*	*Unit rate*	*Quantity*	*Subtotal*
020000	**EXISTING CONDITIONS**			
	Install drainage at west side of building. Dig down to level of puddingstone and install crushed gravel and perforated pipe to outlet near Charles River.	168 LF	120LF	$20,160.00
	Remove large vegetation within 3 ft of the building face.	$2400.00 ea.	1 LS	$2,400.00
Subtotal	**EXISTING CONDITIONS**			**$22,560.00**
040000	**MASONRY**			
	Repoint eroded and non-matching/improperly repointed mortar joints with Type N mortar.	$8.00	2220SF	$17760.00/sf
	Clean stained surfaces or surfaces covered with biogrowth (Prosoco Enviro Klean 2010 All Surface Cleaner or sim.)	16	135SF	$2160.00/sf
	Clean stained surfaces or surfaces covered with biogrowth (Prosoco Enviro Klean 2010 All Surface Cleaner or sim.)	16	2220SF	$35520.00/sf
	Replace chinking where missing or where large pockets of mortar would be required. Assume schist obtained from nearby.	$178.00/sf	444SF	$79,032.00
	Replace blocks where missing. Assume schist obtained from nearby.	$325.00/sf	444SF	$144,300.00
	Remove delaminated parge coat from face of stone/brick.		15SF	$ 3.00
	Shore lintel as required. Remove cracked lintel portion and square off remaining stone. Provide replacement lintel portion, 1/4 in. min. diameter s.s. spring anchors (2 per replacement block), and Type N mortar to match color, texture, and profile of existing stone.	$3600.00 ea.	QUANTITY 3	$10,800.00
	Patch gaps at door surround and at rafters with Type N mortar and chinking as required to prevent pests from entering building. Assume schist obtained from nearby.	96 LF	55LF	$5,280.00
	Remove loose puddingstone and stabilize top surface (at intersection with stone wall) with non-shrink grout.	$112.00 / lf	30LF	$3,360.00
	Remove loose stone and re-set, chinked tightly to adjacent intact stones with Type N mortar and new chinking as needed. Assume schist obtained from nearby.	$112.00 / lf	50SF	$5,600.00
Subtotal				**$303815.00/sf**
060000	**WOOD, PLASTICS AND COMPOSITES**			
	Install Misc floor framing	$4000.00 ea.	1	$4,000.00
	Install Guardrail at second floor	$7200.00 ea.	1	$7,200.00
	New support post with concrete footing	$2500.00 ea.	1	$2,500.00
Subtotal				**$13,700.00**

080000	OPENINGS			
	Remove and replace door with historically-appropriate wood door (cedar or sim.)	$8500.00/sf	1	$8,500.00
	Remove screens from door and windows on east elevation and replace glass with laminated glass. No work on remaining window openings or door.	$3800.00 ea.	3	$3,800.00
	All new windows to receive shutters or laminated glass (T.B.D. for option) Remove brick infill from window openings and install new windows (sim. to previously installed windows on east elevation). Install windows at small openings not infilled on north and south elevations.	$4600.00 ea.	QUANTITY 11	$50,600.00
	Remove screens from door and windows on east elevation and install wood (cedar or sim.) shutters. No work on remaining window openings or door.	$12600.00 ea.	3	$37,800.00
Subtotal				**$ 100,700.00**
260000	**ELECTRICAL**			
	Electrical Service & Distribution			
	Reroute conduits attached to building or entering through open windows or doors to be below-grade and not visible where possible.	$2800.00 ea.	3	$8,400.00
	Remove water monitoring system from face of building (east elevation) and reroute to new shed away from building.	$3400.00 ea.	QUANTITY 1	$3,400.00
	Lighting and Branch Wiring			
	(6) 4' linear lensed damp location rated LED light fixtures with a time clock switch control in lieu of the existing manual switch. The replacement shall include the removal and replacement of the light fixtures branch circuit wiring.	$1600.00 ea.	6	$9,600.00
	(2) LED flood lights each with combination motion/day light sensor mounted to each fixture base	$950.00 ea.	2	$1,900.00
	(2) new emergency lighting battery units within the building and a remote lighting head	$2200.00 ea.	2	$4,400.00
	New branch circuit wiring in EMT			
Subtotal				**$ 27,700.00**

Total				
ALL	All Locations	-		$ -
	ESTIMATED NET COST	-		$ 480,475
MARGINS & ADJUSTMENTS				
General Conditions / Requirements		15%		$ 72,071
Insurances & Bonds		5%		$ 24,024
Overhead & Profit		25%		$ 120,119
Design & Estimating Contingency		10%		$ 48,048
ESTIMATED TOTAL COST				$ 528,523