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architectural data section (phase II)

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ARLINGTON HOUSE
THE ROBERT E. LEE MEMORIAL

GEORGE WASHINGTON MEMORIAL PARKWAY
VIRGINIA

HISTORIC STRUCTURE REPORT
ARCHITECTURAL DATA SECTION (PHASE II)
ARLINGTON HOUSE
THE ROBERT E. LEE MEMORIAL, VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY

by

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UNITED STATES DEPARTMENT OF THE INTERIOR
DENVER, COLORADO

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INTRODUCTORY COMMENTS

There are a number of conventions which will be used in the following paper for expediency and convenience.

Orientation is found by remembering that the famous portico of the house faces east. The wings of the house will be known as the north wing and the south wing and that portion built between the wings c. 1817-1819 will be called the main block. Each wing is adjoined on the west by a loggia, now enclosed. The latter are connected to the main block by two small additions known as the north and south connecting flankers.

All spaces within the house have been given a numerical designation which will appear on all drawings as well as in the verbal descriptions. Where introduced in this report, all spaces will initially receive their traditional name as well as number; in all cases afterward, however, they will be referred to by number only. All windows and doors which swing into the space in question will have a numerical designation which will incorporate the number of the spaces in which they are located.

The term "series" will be used in reference to the layers of plaster (brown coats and white skim finish coat) which make up a single finish for one time period. In many instances in the oldest part of the house there will be two, and sometimes three, complete series added one atop the other. A single skim coat can be referred to as a series if it is from a different time period than the hacked skim coat it covers.

The first "restoration" of Arlington House, carried out by the United States Army between the Congressional mandate of 1925, which

established the house as the Robert E. Lee National Memorial and the National Park Service acquisition of the resource in 1933, will be referred to as the War Department restoration.

In the space by space description of Existing Conditions at the Arlington House, some information initially presented in the Phase I report Structural Data (September 1979) will be reiterated so that a complete picture including all areas of concern will be located in a single document.

The Existing Conditions section (Chapter IV) will include a detailed description, and consequent documentation, of work carried out by the National Park Service from October 1979 to August 1981 as well a description of work performed at other times.

We wish to thank all concerned for their patience during the many months this report has been in preparation. Special thanks must go to Ann Fuqua, Agnes Mullins, and the entire Arlington House staff and volunteers for their kind indulgence during the many phases of our often disruptive work. Unencumbered communication among the National Capital Region Office, George Washington Memorial Parkway Administration, and the Denver Service Center established an atmosphere of cooperation within which many varied and complicated tasks were performed. It can be said, with very little hesitation, that this climate of mutual cooperation has resulted in substantial progress toward a more orderly preservation process at Arlington House.

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Technical Consultant & Chief Advisor:	James S. Askins
Principal Fabric Investigators:	Thomas M. Armstrong
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	Agnes D. Mullins
Principal Exhibit Specialists:	Thomas M. Armstrong
	Neil Borgmeyer
	Albert Levitan
	Edward Shewbridge
	Donald Tucker

I. ADMINISTRATIVE DATA SECTION

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A. Name: Robert E. Lee Memorial (Arlington House)

Number: 270

Location: Arlington National Cemetery, Arlington, Virginia

Management Category: 1A

Proposed Treatment: Preservation

B. Proposed Use: The mansion, its outbuildings and immediate site have been, since 1925, an official memorial to Robert E. Lee. It is being appropriately furnished and is used as a museum through which tours, both guided and unguided, are conducted. The site is open to visitors from 9:30 a.m. to 6:00 p.m. daily, April through September and from 9:30 a.m. to 4:30 p.m., October through March.

C. Identification of the planning documents prescribing the proposed treatment and use:

1. NPS List of Classified Structures, No. 00059-270.
2. Development/Study Package Proposal, "Prepare Historic Structures Report And Stabilize," 10/31/77.
3. Arlington House, George Washington Memorial Parkway, Package #506 - Task Directive, February 1980.
4. Arlington House, George Washington Memorial Parkway, Package #506 - Task Directive Amendment, November 19, 1981.

JOINT RESOLUTION OF CONGRESS AUTHORIZING THE RESTORATION OF THE LEE MANSION IN ARLINGTON NATIONAL CEMETERY, VIRGINIA, (PUBLIC RESOLUTION NO. 74 -- 68TH CONGRESS) (H. J. RES. 264)--Approved March 4, 1925.

Resolved by the Senate and House of Representatives of the United States in Congress assembled, That the Secretary of War be, and he is hereby authorized and directed, as nearly as may be practicable, to restore the Lee Mansion in the Arlington National Cemetery, Virginia, to the condition in which it existed immediately prior to the Civil War and to procure, if possible, articles of furniture and equipment which were in the Mansion and in use by occupants thereof. He is also authorized, in his discretion, to procure replicas of the furniture and other articles in use in the Mansion during the period mentioned, with a view to restoring, as far as may be practicable, the appearance of the interior of the Mansion to the condition of its occupancy by the Lee family.

STATEMENT OF SIGNIFICANCE

Description

Arlington House, the Robert E. Lee National Memorial, is located in Arlington County, Virginia, across the Potomac River from the Lincoln Memorial and Washington, D.C. The house occupies a prominent site on a wooded hill, and can be seen from many points in the capital city. Since the Civil War, the house has been surrounded by the Arlington National Cemetery. On the former grounds of the house are located the tombs of many famous American military leaders, the Kennedy Gravesites, and the Tomb of the Unknown Soldiers. As a property administered by the National Park Service, Arlington House falls under the jurisdiction of the George Washington Memorial Parkway.

Arlington House, an outstanding landmark for more than a century and a half, is unique in its association with the families of Washington, Custis, and Lee. Its builder, George Washington Parke Custis, was the foster son of George Washington and the father-in-law of Robert E. Lee. Custis, an exceptional figure in early nineteenth-century America in his own right, stands as a link between two of this nation's great men.

The Arlington estate, named after the Custis family's homestead on Virginia's Eastern Shore, was built on 1,100 acres purchased by George Washington Parke Custis' father in 1778. The house plans are attributed to George Hadfield, a young English architect in charge of the construction of the capitol. The north wing was built in 1802 and the south wing followed two years later. The large center section with

the portico, completing an imposing front 140 feet long, was finished from 1817 to 1819.

The main body of the Greek Revival house is rectangular and rises two stories over a full basement. The massive portico fronting on the east facade represents one of the earliest examples of the use of the colonial order on a private residence. The wings to the north and south are one story in height, with the north wing having a full basement and the south wing having a basement under all rooms but the conservatory. The entire house is of brick construction covered with a plaster scored ashlar. From photographs taken during the Civil War, it can be seen that much of the exterior was streaked with paint to resemble marble. It is assumed that the outbuildings adjacent to the house, symmetrically placed to the west of the main structure, were designed and built contemporary with the house itself.

Arlington House is listed in the National Register of Historic Places. Due to its status as a National Park Service Historic Site, Arlington House was automatically included in the National Register at its creation in 1966. In addition, supporting documentation on the house for the Register was completed on April 16, 1980. Projects affecting the house are subject to the Advisory Council on Historic Preservation's "Procedures for the Protection of the Historic and Cultural Environments" (36 CFR Part 800). Procedures necessary to ensure compliance of all work described herein with Section 106 of the Historic Preservation Act of 1966 and Executive Order 11593 will be executed by the Denver Service Center and the National Capital Region staffs. Technical data required for the compliance process will be provided by the professionals in charge of the various aspects of the

work. Since the architectural and archeological investigations affected cultural resources, clearance was obtained before these aspects of work took place. Additional clearance will be obtained before any future construction for restoration can begin.

Arlington House is recorded under Management Category IA in the National Park Service List of Classified Structures (LCS). The LCS recommends preservation of the interior and exterior.

Arlington House, both by its historical associations with famous Americans and its architectural significance as one of the nation's finest examples of the nineteenth century's "revival" periods, possesses in abundance the integrity and authenticity which justify the highest level of investigation and preservation treatment.

Concurrent related studies undertaken by the Northeast Team of the Denver Service Center to be published are as follows:

A. Historic Structure Report, Historical Data Section, Arlington House (The Custis-Lee Mansion), Virginia, Vol. I, 1802-1933, by Charles W. Snell;

B. Historic Structure Report, Historical Data Section, Arlington House (The Custis-Lee Mansion), Virginia, Vol. II, 1933-1979, by Charles W. Snell.

C. Arlington House, Historic Structure Report, Architectural Data Section (Phase I), by H. Lee Arnest III;

D. Archeological Excavations at Arlington House, The Robert E. Lee Memorial, Arlington County, Virginia, by John F. Pousson;

E. Engineering Study of Central Block Roof Support System, by Patrick Macdonald.

II. STRUCTURAL HISTORY 1802-1981

II. STRUCTURAL HISTORY

This first portion of this report will trace the presumed structural history of the Arlington House, employing historical information on file as well as data discovered through fabric investigation. It is hoped that continued investigations in both the fabric of the house as well as document repositories will constantly improve the detail and accuracy of this sketch.

Due to limitations of time and limited documentary evidence some features or artifacts discovered during the fabric investigation will necessarily remain unexplained. With this caveat in mind, this overview of the structural history should be read in overall terms, avoiding the pitfall of dwelling too much on any specific. In general, it is felt that enough is now known about the history of the house's development to make the conjectures of this report with neither hesitation nor remorse.

The tract of land on which the Arlington House was built was purchased in 1778 by George Washington Parke Custis' father, John Parke Custis. This tract comprised about 3000 acres and was purchased from the Alexander family. John Custis moved his family into an existing frame house near the Potomac in 1779, which they called "Abingdon."[1]

Following the death of his grandmother, Martha Washington, in 1802, George Washington Parke Custis moved from Mount Vernon to the Arlington property, which he called "Mount Washington." He brought the possessions acquired from the estate of his grandmother to a four-room brick cottage near the river in the summer of 1802.[2]

It has been maintained that Custis began construction of Arlington House to provide a drier environment for his Washington relics. Supposedly the many items he had brought to his cottage near the river were rapidly deteriorating through attacks by dampness and rats. The new house on the hill was begun in 1802.[3]

English architect George Hadfield's obituary in 1826 stated that he was the designer of the Arlington House, and there is every reason to believe it. Hadfield came to the United States in 1795 to serve as superintendent for the construction of the Capitol Building in Washington, but was dismissed in 1798 after difficulties with the commission overseeing the work. After his dismissal, Hadfield remained in Washington and took scattered private commissions.

George Hadfield was a young man and was a purveyor of the then modern style - the Classical Revival. He had been a brilliant student at the Royal Academy of Arts and was privileged to win the Gold Medal and a three-year travel scholarship to Italy. While in Italy Hadfield spent time drawing restorations of a number of ancient temples.[4]

Being young, and having been trained in the most current architectural taste, he was in a difficult position to find the kind of patron who would appreciate his designs and encourage the avant-garde nature of his work.

George Washington Parke Custis was also a young man at the time, and had been brought up in what must have been one of the more sophisticated atmospheres in America. He had lived all during his childhood with George and Martha Washington, and much of this time fell during the years of the first presidency. While his foster grandfather was certainly a conservative influence on the boy, life in

New York City and Philadelphia, and many of the individuals whom he came into contact with in the presidential household, provided the boy with a diverse cultural education. G. W. P. Custis' liberal tastes for the arts were undoubtedly formed early in life and later blossomed in his interests in painting and creative writing.

It is likely, therefore, that the meeting of Hadfield and Custis provided just the sort of association that each desired. Hadfield was very much in need of influential private clients of some means to commission his work; indications are that he was in particularly poor circumstances around the turn of the nineteenth century. Custis had inherited a large tract of land just across from the new capital city and was in need of an imposing family seat, placed high above the floodplain, in which to live and exhibit his relics from the Washington estate. Because of his interest in the arts and his own particular upbringing, it is reasonable to assume that Custis also wanted a house in the most modern style. It so happened that the classical style was exactly suited to the prominent site. Hadfield designed the massive portico in the Colossal Doric order like that at the Temple of Hera Argiva (Hera II) at Paestum, Italy, (see photograph #88) which had been built by Greek colonists circa 450 BC. It is also believed that Hadfield was influenced in his design for Arlington House by the Temple of Hephaestus (or Theseum) at Athens, Greece, also built circa 450 BC (see photograph #89). Not only was the chosen site ideal for Custis' intended family seat, but it was ideal as well as an exhibit of the architect's work. Hadfield remained in Washington and designed a number of public and private buildings before his untimely death in 1826.[5]

Prior to fabric investigation in 1980-81, it was believed that Custis had simply wanted a large house, hired Hadfield, and built the house between 1802 and 1819 as we see it today.

The north wing at Arlington House was to be the site of much of the structural stabilization work necessary for continued public visitation, and it was decided that fabric investigation would be carried out at the same time. The purpose of the investigation was to establish the appearance of the north wing in 1861.

A summation of the 1980-81 findings indicates that the part of the house now known as the north wing (minus the loggia) was constructed as a two-story house independent of all plans for the present house. Land surveys of the four-room brick cottage initially inhabited by Custis near the river show no house on the hills to the west.

G.W.P. Custis built the small two-story house on the hill overlooking Washington in 1802 soon after he realized the danger to the Washington relics from the dampness and rats in his cottage near the river. This small house was later modified and became the north wing of Arlington House.

The north wing has undergone extensive structural change during its history. Evidence of the two-story structure survives in the fabric of the north wing located beneath layers of plaster. The assumption of a two-story structure is based on the presence of the ledger wall believed to have once carried the joists of the first floor along the west wall of the winter kitchen and the wine cellar. Also, the archeological investigation of 1980 disclosed the fact that the original level of the land around the north wing was somewhat below its present level and that the present elevation was achieved with dirt moved during the

construction of the main block. The level of the cellar floor is just below what the ground level would have been circa 1802.

The archeological investigations of 1980 uncovered impressive foundation remains in the present north wing cellar (see archeological investigation, Pousson). One of the principal features is the remains of a 1'-6" wide foundation wall (see photograph #5) running east-west, located in the approximate center of the north wing cellar floor. Investigations have shown that this foundation wall may have been built at the same time as the foundations of the west wall of the winter kitchen, but there is no bonding between them. The east end of this wall was cut off during the War Department installation of the utility trench, destroying any evidence of historic treatment. The remnant foundation of a narrower wall (13") was discovered lying perpendicular to the east-west foundation and running from the latter to the south wall of the wine cellar. This wall bonds into the east-west foundation but not into the foundation of the original south wall. There are also a number of brick features adjacent to the east-west foundation wall. These include two parallel foundation wall remnants, 1'-8" apart, each measuring 2'-8" long and 13" wide. These two short foundation walls abut the east-west primary wall near its west end. In examining the brickwork it was seen that the primary wall was built before the two secondary ones and that there was no attempt to make a tie between the lesser and greater walls. The short walls also do not go as deep into the ground as the main wall, and the mortar in the small walls is very different from that in the major one. The purpose of these two small foundation walls remains unknown; as some charred remains were found

on a brick-paved area between them, it is thought they may have had some supporting function for a fireplace or oven. A possible indication of the time lapse between the building date of the principal wall and the smaller perpendicular walls is given by the build-up of a crust on the main wall, also located on the wall where the smaller walls intersect it.

Adjacent to these two small foundation walls already discussed, on the north side of the main foundation wall, are two perpendicular short walls, also built against the main foundation wall but not at the same time, and unconnected to it structurally. The mortar used in this brickwork is an entirely different type from mortar used in the other walls. It resembles portland cement in hardness and texture, but may date to the historic period.[6] These foundations each measured approximately 1'-6" x 2'0" (width by depth) and were located some 6'-6" apart. A similar foundation was located to the south of the main foundation wall, 6 inches to the west of the easternmost 1'-6" x 2'-0" foundation to the north of the principal foundation. It is speculated that these small foundation pieces may have supported a fireplace above, but there is no further evidence to support the theory.

The principal remnant foundations described above indicate that the first floor of Mr. Custis' early house was divided into three rooms. The largest room occupied half of the first floor, measuring approximately 18'-4" x 21', and may have had a large cooking fireplace with a 6'-6" firebox and a small adjacent warming oven over the westernmost perpendicular foundations. The next largest room would have been located in the southeast portion of the house and measured approximately 12'-0" x 18'-4". The smallest room would have been in the southwest portion and measured approximately 7'-10" x 18'-4"; all

first and second floor rooms would have had approximately 9'-0" ceilings. There could have been a fireplace as well in the southeast room if its west side was supported by the 13" perpendicular walls which divided the south part of the cellar.

No closed openings attributable to the two-story building were located during the investigation of the north wing. In all likelihood the former openings are largely incorporated into the existing ones. It is probable that both B02/D1 and B03/D1 were exterior doors to the first floor which were later cut down further into the foundation walls to serve the basement. From the rebuilding that has taken place in the basement windows, it is possible that the existing windows were once deeper than at present.

As the north wing now stands, part of the original first floor space is in the basement and part is exposed upstairs. Evidence in the existing first floor (the inner hall (north wing), Cuştis chamber, and Custis guest chamber) indicates that much of the original first floor was decorated in dark red paint on brown coat plaster. Some of this same scheme can still be seen on the east and south walls of the wine cellar. It can be assumed that the north and southeast rooms of the first floor were done in the red plaster. No evidence remains, however, for the walls of the southwest room except a very hard and rough grey plaster showing its natural color.

The wide foundation wall bisecting the north wing, the remains of which were found in the basement in 1980, evidently continued up through the second story of the original house. Evidence for its bonding into the west wall of the inner hall (north wing) is inconclusive.

The floor joists of the second floor of the original house rested on a ledger wall, which was located at an elevation approximately 4'-0" above the present floor. This ledger wall extended around the interior perimeter of the original two-story house. A line of broken headers located along the west walls of the school and sewing room and the inner hall (north wing) at 3'-1½" (centerline) above the present floor showed that the ledger wall was once present and bonded into the principal bearing walls on the exterior. This ledger wall, cut down to 2'-5" above the present floor, still exists below the chair rail in the school and sewing room, the inner hall (north wing), and the Custis chamber closet and under 107/W1 in the Custis guest chamber. The rubble seen behind the plaster layers between the top of the chair rail and the level of the original second floor is the original interior of the wall, exposed when the ledger wall was reduced. Wall interiors were often little more than rubble as seen in the northwest corner of the school and sewing room.

Very little is known about room configuration on the second floor of the building. While plaster layers from this initial period of the house's history survive in the inner hall (north wing) the Custis chamber, and the Custis guest chamber, there is no trace of them in the school and sewing room. Much of what we do know comes from the chimney breast investigated in the inner hall (north wing).

The chimney breast shows the trace of the wall which formerly bisected the original house, the foundations for which were uncovered in the winter kitchen during the 1980 archeological investigation. Three joist pockets define the level of the original second floor. To the north of the bisecting wall on the second floor there was a room

with a chair rail with cream-and-green wallpaper above it. The original finish below the chair rail has been lost. To the south of the bisecting wall was a room papered with red-and-cream leaf-patterned wallpaper. This wallpaper is also found all along the west wall of the inner hall (north wing) south of the chimney breast and on the cheek wall. It reappears as well on the cheek wall of the Custis guest chamber and along the east walls of the Custis guest chamber and the Custis chamber to 106/W1. This could indicate that this second floor room covered one-half of the house space. This red-and-cream wallpaper seems to have followed a former decorative scheme. It was applied over a dark-colored plaster in portions of the Custis guest chamber and covers the patch (in hard grey plaster which may be the hydraulic cement) of a former stud wall intersection at a point lying in the inner hall (north wing) midway between 105/D1 and 105/W1.

Little more can be speculated about the nature of the second story without further investigation. Much information was lost in the major changes which converted the north wing into a one-story building with a cellar.

No indication has been found of interior stairs in the two-story structure. Whatever may have been located on the south wall disappeared when the wall was removed. The mysterious flue in the chimney breast of the inner hall (north wing) may have served a fireplace in the northwest corner of the southwest room on the original first floor. The interior surface of the flue is plastered right out to the face of the chimney breast, suggesting that the flue originally curved through the brick bisecting wall and into a corner fireplace. The original house may have had a large central chimney on the

principal interior wall possibly carrying flues from two fireplaces on each floor, and an additional chimney on the west wall carrying one flue only. The two chimneys may have co-existed at the same time.

Exterior openings on the second floor appear to have been located in the same places as the present openings. The original openings may have been widened and located lower in the walls. A thorough investigation of possible wall openings was not attempted at this time.

A feature that could be projected for the exterior of the original two-story house is a possible two-story wood porch on the west side. The presence of the small rafter pockets on the east wall of the pantry, and the regularly spaced post holes found under the brick floor of the cellar stairway hall, suggest the possiblity of a makeshift wood porch of a temporary nature. Two brick footings found below grade to the north may have supported exterior stairs.

Custis was married to Mary Lee Fitzhugh in July of 1804; soon afterward he renamed his estate "Arlington."[7] It is most likely that the impending marriage had influenced him to obtain plans for his family seat.

The investigations of 1980-81 indicate that Custis probably did not have the Hadfield plans for the Arlington House when the north wing was built circa 1802, but he probably did have them before the building of the south wing in 1804.

It is felt that Cornelia Lee was describing the interior of Mrs. R.E. Lee's morning room (room 115) in the south wing when she wrote in April 13, 1804, to Mrs. Richard Bland Lee that "The house will be a very handsome building when completed. The room we were in was 24 feet square and 18 high . . . . "[8] While her measurements were not

highly accurate, the actual measurements being approximately 21' x 24' with 14' ceilings, Mrs. R. E. Lee's morning room is about the only room in either wing configuration, actual or conjectural, that would have been near what she described. It is, therefore, reasonably certain that the south wing was near completion by spring of 1804 and that the plans of the whole house were available at that time for Cornelia's inspection, or at least were at a point where Custis could give an impressive verbal account of what they would be. It is thought that the south wing was built as planned and that probably no major change has occurred since its completion. However, no fabric investigation has been performed to verify this conclusion.

As has been stated, it is thought that Custis had the overall plans for the Arlington House in hand by the beginning of construction of the south wing. At the very least he knew that there would be a major center section measuring approximately 58'-6" north to south and placed the south wing accordingly. It is probable that the size of the north wing in itself dictated the size of its twin, and the overall proportions of the entire mansion. It can be speculated that Custis had Hadfield visit the site and, in interests of economy, it was decided to employ the existing building as the north wing of the main house. While it would be involved to make the necessary interior changes in the north wing to have it conform to the south, it would have been easier to convert the north wing into a compatible part of Hadfield's design rather than build an entirely new wing.

It is probable that Custis had the whole building plan formulated prior to the construction of the south wing. It was established in 1980 that the south wing's north exterior wall was a temporary

partition from 1804 till the construction of the main block. The north exterior wall was probably of wood. Looking down from the north end of the south wing attic, onto the lath side of the great arch it can be seen that the south wing cheek walls, which extend out 1 foot from the east and west bearing walls and show 2'-0" on the east and west faces, were built as cheek walls intentionally when the south wing was built. The first 1'-6" from the north end is covered with stucco as it was considered part of the outside of the house, and the remaining approximately 6 inches, now seen as brick, formed the strip on either cheek face where the temporary stud wall abutted. When the main block was constructed circa 1817-19, the temporary stud wall was removed and the great arch was constructed between the east and west faces of the cheeks. The arch was built of split-wood lath and plaster on a wood frame. This arch, a major decorative feature of the house (see photograph #63) was necessary as a transition between the south wing and the main block.

Investigation of the analogous cheek walls in the north wing showed an entirely different sequence of events. Examination of the brick of the cheek wall east and west faces in the inner hall (north wing) and the Custis guest chamber clearly shows that the original south wall of this wing was broken through when the north wing became a part of the completed house. Part of the south wall was removed and perhaps the brick was reused. This seems to be a further indication that the original north wing was not intended to be a part of the whole house as later constructed, or at least that plans for the house had not been formulated by 1802.

Our first indication that the history of the north wing was not as simple as had been assumed came during the stabilization of the north wing roof in late 1979. Investigation in the attic here uncovered a number of pieces of interior wood trim, some in a greenish-blue paint and some in a reddish-brown paint grained in probable imitation of mahogany, which had been variously reused to stabilize ends of studs or stiffen plaster lath. As portions of chair rail found appeared to match that extant in the school and sewing room, and as some backband was identical to that on the interior casing of 104/D1, it was assumed that this trim was once part of a decorating scheme in the north wing. Concurrent discovery of the broken end of a chimney flue on the west side of the garret added to the accruing evidence that the north wing had undergone significant change during its history. At this point recommendations were made that a fabric investigation be undertaken and the compliance process was begun.

Note was also taken in the north wing garret of changes to the roof during the life of the building. As is recorded in the Existing Conditions section, Chapter IV, the rafters once had been unseated from their bearing plates and raised. This action was necessary during the change of the roof from one with splayed eaves to one with a single angle of pitch from ridge pole to fascia board. Remains of an outrider for the splayed eaves were noted at the end of the former south hip face, the rafters and partial sheathing for which are still extant in the north wing attic (see photograph #69). It was also noticed that the structure of the south wing roof differed substantially from that of the north wing by having a more reasoned structural system. By the use of the two king post trusses at the hip apices, the south wing had

been provided with a much stronger structure, and one that would have been more typically used by a designer trained in the architectural profession. On the other hand, the north wing had a system that was only marginally strong enough for its purpose. This contrast between the two roofs further reinforces the theory of Hadfield's involvement with the design of the south wing, but not the original north wing. A disturbance of the ceiling joists near the center of the north wing attic also gave further evidence to the presence of a large central chimney in the two-story north wing.

North wing fabric investigation resulted in one major conclusion: the structure was built originally as a self-contained, two-story building; it was then changed to a one-story wing of the projected complete house, and, at a later date, its floor plan was again changed. In terms of chronology, it may be that the north wing was changed from a two-story house to a one-story wing with cellar during or after the construction of the south wing. By this time (circa 1804), the Hadfield plan was in force and the north wing may have been changed from the utilitarian two-story house to the plan Hadfield had devised for it as the north wing of the projected mansion. After the south wing was completed, Custis would have had more space and may not have needed all the rooms of the two-story house which he had initially inhabited.

After the classic revival windows were installed in the north wing, the wings should have resembled each other closely. One of the major differences between the north and the south wings was the temporary wall in the north end of the south wing. From this time (circa 1804) until the building of the main block in 1817-19, there may have been

some kind of very temporary connection between the two wings as there was at the United States Capitol Building across the river, also in the midst of construction at this time. There is, however, no evidence to support such a theory at this writing. It is known that both wings were stuccoed at this time and had hip roofs with probable splayed eaves.

The fabric investigation of 1980-81 uncovered very little information about the first decorative scheme and floor plan of the north wing in the period immediately following the possible 1804 remodeling. An exterior opening which may have existed at the time, other than the four arched windows and the cellar windows below them, was 104/D1, as it still is outfitted with the early backband. It is likely that the two wings were as symmetrical as possible on the exterior; it can be assumed that they were as they are today on the east facade, except that the north wing has two more cellar windows than the south. As the loggias were possibly not built until after the main block was constructed, the west facades were probably very plain with no windows and only two nearly symmetrically-placed doors on each wing, 104/D1 and 105/D1 on the north, and 115/D2 and 117/D2 on the south. On the west side of the basement, however, there may have been only one opening on the south wing (B10/D2), but probably two were on the north (B02/D1 and B03/D1). The north face of the north wing was like the south face of the south wing except for the cellar window. The failure to excavate those areas in B10A and B10B resulted in the inability to make the two wings totally symmetrical.

The initial floor plan of the north wing after 1804 is not at all clear. The questions surrounding this are further complicated by the

position of the fireplaces and flues. It would be logical to assume that the large central chimney was removed completely when the north wing was transformed into a one-story wing. However, plaster layering on the chimney breast in the inner hall (north wing) clearly shows that at least the wide brick bisecting wall of the original two-story house may not have disappeared until the installation of the present, or second, north wing floor plan and decorative scheme circa 1820. Due to the changes in the level of the floors during the first change in the north wing, the fireplaces of the central chimney were evidently rebuilt to correspond to the new floor. While this operation would seem complicated, the lowering of each fireplace 5 feet on the chimney block was certainly possible and easier than rebuilding the entire chimney block.

The transformation of the original two-story house into the one-story north wing involved another major change. In addition to the reworking of the central chimney block, large arched windows had to be opened through the walls. While they incorporated some existing openings, there was still major destruction involved. This fact is partially supported by the archeological find of a large amount of brick and plaster rubble just to the east of the north wing. From the nature of this deposit and its covering, the archeologist determined that this brick rubble and plaster fragments had to have been deposited before the excavation for the main block.

The floor level was changed by lowering the second floor joists 5 feet. It is presumed that ledger wall joist support was abandoned, and the new joists set into pockets in the bearing walls to the east and west.

As near as can be established from the present evidence, there was a major room in the new north wing to the north of the fireplace block. From the evidence left by the chair rail and the ceiling cornice remains, it can be seen that the perimeter of the north room ran from the north edge of 106/W1 around to the north edge of the chimney breast of the inner hall (north wing). Evidently the portion of bisecting wall between the central chimney block and 106/W1 had been removed to allow for that central window. It also appears that the north half of the chimney breast in the inner hall (north wing) was enclosed and became a closet. This north room was provided with a chair rail capping the ledger wall, which had been lowered about 1' 6", hence the presence of the broken headers along the west wall uncovered in 1981. From the trim remaining on the interior of 104/D1, it can be stated with some assurance that the greenish-blue trim found in the garret belonged to this room.

The other half of the north wing was evidently another large room having a fireplace on the north side back-to-back with the one in the north room. From the spot where the chair rail began in the chimney breast, it can be speculated that there was a closet also in that location. The room was provided with a chair rail as well, attached against the brick wall with railing blocks. It is believed that the reddish-brown chair rail found in the attic was used in this room as it goes well with the simulated wood-grain wallpaper found on the portion of the wall below the chair rail channel. It is not known what finish was used above the chair rail in the south room, or on the walls above or below the chair rail in the north room.

No evidence has been found to indicate that the first floor of north wing was anything more than a two-room section after the wing's

restructuring, with the possibility of some closets. While we cannot be absolutely certain of the date of this change, it is likely that it occurred circa 1804 to make it compatible with the new south wing.

The Custis family lived for approximately fifteen years in the wings. While the cellar of the main block was said to have been dug early, no building commenced until circa 1817.

We are hypothesizing that Custis had Hadfield's plans in hand by 1804. There is a possibility that Hadfield designed the wings in 1804 and the rest of the house later, or even changed an initial design. As 1804 is an early date in America for a Greek Revival house design, there may well be those who would challenge the accepted idea that the house sprang fully designed from Hadfield's workshop in 1804. As has been pointed out, however, the young architect was fresh from England and the continent and would probably have had the very latest style at his disposal. Also, the presence of the stucco on the 1804 exteriors and the provision of a temporary wall in the north end of the south wing point strongly to the consideration of the final overall design seen today. There is no way at present to place an absolute date on Hadfield's plans.

It was not long after the completion of the main block (circa 1819) that the north wing underwent substantial change. The reason for the change can be seen by examining the plans of the house as it now stands. It will be seen that the doorway connecting the main block to the north wing was placed in the north bearing wall of the main block at the only available place, between the chimney blocks. If the north wing was arranged as presumed from circa 1804-1819, it meant that from

the main block one entered the north wing south room directly and passed through it to reach the north room. If these rooms were used as bedrooms as presumed, the circa 1804 plan of the north wing was inconvenient. Perhaps after the loggia was built, there was still only one actual connection between the north wing and main block, and this was 105/D2. This being the case, it is easy to see how the presence of the main block generated a need to change and adapt the plan of the north wing. A natural question to ask at this point, however, is why did Hadfield not plan the north wing circa 1804 to be compatible with the plan of the main block, if all was designed circa 1804? The answer may be simply that the family preferred to have the two large rooms at the time (if there were indeed two rooms only) in the absence of the main block, and may well have adapted the north wing circa 1804, knowing that it would be changed again once the main block was completed.

The circa 1820 change to the north wing may have included the removal of the brick bisecting wall or walls and the central fireplace block. Evidence of their removal at this time may be indicated found on the face of the chimney breast in the inner hall (north wing) where the area against which the bisecting wall abutted, and to which it appears bonded near the top, seems to be covered with one series of plaster only.

The north wing was believed to be redesigned circa 1820 to provide more than the two or three former rooms and to provide easy access to these rooms from the main block. In order to save space, the present partition wall separating the inner hall (north wing) from the Custis guest chamber at 107/D1 was placed as close to 105/D2 as possible. A new fireplace block was constructed and placed to serve

two of the rooms, creating a room to the north, the school and sewing room, which balanced in size the south room of the south wing, the office and study. It is likely that the fireplace block and dividing wall between the winter kitchen and the wine cellar were both built at the same time without foundations, their base bricks having been placed only a few inches below grade. Following the building of the fireplace block and a new chimney (which can be seen in the garret to have been constructed of used brick, probably from the central fireplace block), the current partitions in use today were believed constructed. In the case of the wall between the school and sewing room and the inner hall (north wing) and the walls of the Custis chamber closet, the partitions were built right over existing chair rails. No explanation has been found of the use of the short doors at 104/D2, 104/D3, 104/D4, 107/D1, and 107/D2. They were reused; perhaps they were from the north wing when it was a two-story house. It is likely that 105/W1 was added into the wall at this time to light the inner hall (north wing), and it is possible that the Custis guest chamber was heated by a stove. It will be noted here that all the partition walls of the north wing have a single series of plaster except those in the Custis chamber, which have an additional skim coat against the south wall of the school and sewing room, which has been extensively patched. It is suggested that very little has changed in the present arrangement of the north wing since 1820, and that its current plan may be of the circa 1860 historic period.

The north wing loggia does not bond into either the north wing or the main block, and may have been built before or after completion of the main block. Being thoroughly classical in style and feeling, these loggias are felt to have been an important part of the Hadfield design.

Visually they serve to tie the wings strongly to the main block of the house, giving a forceful composition where it was needed in a welding of three major elements built at disparate times. They existed in their purest classical state during the years following their construction as open arcades like those on north Italian villas of the Renaissance. Such loggias were found often on the villas of Palladio where they could serve as weather-proof connectors to utilitarian farm buildings or, as at the Arlington House, to living areas in the wings of the principal house.

It is not known why the Custis family was moved to enclose the loggias, but they needed convenient access to the main block and more usable space. It is not clear, for example, how the winter kitchen (room B02) was reached prior to the creation of the pantry (room 101), but it is likely that the movement of food from that facility to the new dining room (room 109) in the main block may have been found inconvenient. Before the building of the main block dining probably took place in the north wing in one of the principal rooms and was reached directly by an interior stairway, as evidenced by a framing box which still exists in the ceiling of the winter kitchen. If the only way to reach the winter kitchen from the main block dining room (room 109) after its construction was to descend from the north stair hall by the stairway in 110A and pass through B04, B04/D1 to the outside air before reaching the winter kitchen at B02/D1, then it is understandable why a more direct route was needed.

Once the loggias were enclosed, however, it was believed necessary to add the small north and south connecting flankers, thereby permitting one to pass directly from the main block stair halls

(north stair hall, south stair hall) into each loggia, and providing an alternate route in each case for one to enter either wing. It is not known at what date the loggias were enclosed, but it can be assumed that they remained open for a few years after their construction, circa 1820. The first indication, however, that the north wing loggia may have been enclosed comes in 1837 in a letter[9] where Robert E. Lee speaks of pipe being laid at the Arlington House. If Lee was writing about the installation of the bathroom and water closet, it follows that the loggia would have been enclosed by that time. Due to the presence of the sawn lath, rather than split lath, in the interior finishing of the loggia, a later date for the enclosing seems likely. Evidence that more work than just the bathroom enclosing was taking place at the time the loggia was enclosed is found in another letter,[10] also of 1837 but three months later, in which Robert E. Lee states that "Arlington must now look beautiful, and you and mother will be engaged with your improvements...." The fact that three months have passed is indicative of more work than just the bathroom enclosing may be taking place. Use of the plural "improvements", its emphasis in being underlined, and the fact that the whole house "must now look beautiful," also indicates that the work was prolonged and must have had a significant effect on the entire house.

A small indication of the early appearance of the loggias was given by a piece of thin cavetto molding found in place near the end of a ceiling joist in the overhang of the north wing loggia shed roof. This piece, protected for many years by the plain boxed eave which presently characterizes the loggia roofs, formerly finished an exposed joist end as a decorative dentil, thereby reinforcing the concept of the

loggias as strong classical elements of the house. The piece had been painted with a mixture of paint and sand in an attempt to give an appearance of stone.

Perhaps, in the years prior to its enclosure, the north wing loggia had no floor at the level of the first floor rooms, but was open with a dirt or brick floor at the basement level with stairs leading to the first floor doors. It is likely that this was the case, because it represents the traditional classical solution and because of the presence of the window B01/W4, which would have provided some significant light to B05.

An explanation for the difference in floor levels between the first floor levels of the north wing and the rest of the house is not now known. This circumstance was most likely not planned but was the consequence of a probable miscalculation on the part of the surveyor or builder when establishing the elevations of the first floor of the north and south wings. Such a mistake is understandable if the south wing was being built at the same time or before the north wing was being converted from a two-story structure to its present one-story situation. When the main block was built, its first floor elevation was chosen to be the same as that of the south wing, and a step was provided between the main block and the higher north wing.

Arlington House was pictured in a lithograph (see photograph #90) in the first edition of William Elliot's The Washington Guide in 1826. The lithograph is stylized, but does give an overall view of the completed structure. While it shows no chimneys or other details which would be of the greatest interest today, it does show the parapet roofs on the wings. It is likely that these parapets were not added until

after the main block was completed as they do abut its north and south walls. While showing the actual eaves of the low-pitched hip roofs, the parapets continued the faces of the wings to a point where most of the roof was concealed. These parapets were effective in contributing another strong classical element to the house, and remained in place at least until 1853 when they were pictured in a watercolor by Benson Lossing for Harper's Weekly (see photograph #91). They also appeared prominently in a rough sketch of the house done in 1843 by Markie Williams, although they are not shown to any particular advantage (see photograph #92). Historic photographs of 1864 (see photographs #87 and #93) show that the parapets were removed and that the roofs no longer had splayed eaves. While it is known that the very earliest roof of the north wing featured splayed eaves (see photograph #69), it is not known when they disappeared. As it seems likely that these parapets would have worked well with the splayed eaves, it may be assumed that the roofs retained splayed eaves through the epoch of parapets at the Arlington House. The parapets probably caused leaks in the roof, and the parapets were removed and the roofs changed to a more conventional design once the house fell under the influence of Robert E. Lee following Custis' death in 1857. Lee, being an engineer and a practical man, may well have preferred a tight roof over the stylistic considerations of the Greek Revival. It is also likely that the money situation at the Arlington House dictated the simplest of solutions to probable roof problems.

From the historic photographs, and 1859 insurance application, there is evidence that the wing roofs were of a simple tar and gravel composition.

It is certain that the house was roofed with split cedar shingles when built. Remains of these shingles have been found in the wing attics, and their nailing pattern is extant on the old sheathing of the south hip face preserved under the north wing roof. While it would seem that these shingles would have been simply replaced when bad, it could be that the weathered shingles were coated with tar and gravel to extend their life-span.

The wing roof shingles were replaced with slate in 1885 (from Superintendent's Report for September 1929) to match that of the main block which had been slated in 1858.[11] The War Department placed balustrades on the wing roofs during restoration; they were not a successful simulation of those in the historic drawings, in addition to not being true to the mandated historic period. The balustrades failed to visually continue the faces of the wings vertically, perhaps because of the absence of the splayed eaves. Due to leaks, and the discovery of further documentation rendering them inaccurate, these balustrades were removed in 1960. The wing roofs were then outfitted with tile shingles which simulated wood shingles. The present terpolymer and pebble roof was installed in 1974.

The rough texture of the south hip on the south wing as seen in photograph #86 appears to confirm the insurance policy description. The current roofs present a texture that is too smooth to truly simulate the historic condition. The interpretation of historic wing roofs could be made more accurate when the present roofs need replacement.

Arlington House as it has evolved differs somewhat from Hadfield's original design. The enclosing of the loggias and the necessary addition of the two symmetrically-placed connecting flankers

significantly changed the Hadfield intention of giving a chaste classical facade to the utilitarian back side of the house. Rather than preserving the classical feel of the composition as first built, Custis' enclosures and additions converted the design to one more mundane and two-dimensional. While adding space to the house interior, the enclosing of the loggias destroyed those features as design elements. The addition of the connecting flankers not only subtracted two arches from the composition, but threw discordant elements into the original proportional system as devised by Hadfield.

The east, or principal, facade of the house underwent change in detail only. Early sketches of the house by Williams (photograph #92) and Lossing (photograph #91) indicated that the area within the portico tympanum was scored as ashlar. It is assumed that this area, like the other exterior walls at the Arlington House, was done in stucco. The stucco was then scored as though it were stone blocks - a technique used throughout -- on the exterior. This stucco treatment was evidently removed prior to the historic photographs of 1861-1865, although it had stood in place since its creation circa 1820 and was still there in 1853 when Lossing made his watercolor (photograph #91). The stucco probably had to be removed from the tympanum because it was not as weather-resistant as the stucco on the remainder of the house. This stucco in the tympanum was the only stucco on the exterior on wood lath, a fact which probably explains its relatively short life. There is stucco on lath on the inside of the entablature, but that is not exposed directly to the weather. Whether or not there was similar stucco in the tympanum of the west facade is not known. The stucco and lath of the tympanum of the east facade was replaced by horizontal tongue-and-groove planks circa 1858.

From evidence encountered in exploratory excavations on the portico, it was discovered that another portico floor in conventional brick existed several feet below the present floor level. This former floor must have been in use prior to the installation of the present hexagonal pavers, known to have occurred in 1851.[12] It was also written that the portico steps were being replaced at the same time, and this rebuilding would have been logical as the level of the portico floor was raised at that time to where it exists today. It is probable that the portico steps seen in the historic photographs of 1861 and 1864 are those which were built at this time.

The marbleization at Arlington House was not noted in the 1853 watercolor by B. Lossing but was shown in the 1861 photograph by I. McDowell of the portico steps. The fact of its not being mentioned is unusual as the marbleization technique, while popular during the nineteenth century, was not seen universally and was nowhere seen to such an extent on an exterior as at Arlington House. In terms of fashion, however, the marbleization might be best dated to circa 1850. There was a general fashion at the time for things "Italianate", and this creation of a marble-like classical villa may well have been part of this movement to link the classical revival styles more closely with their country of origin. The claim that Custis personally did the marbleization work is at best fanciful; he was an old man by circa 1850 and was probably not capable of such a task. It may well be, however, that the idea to marbleize the house was his own, and that he directed the operation. The historic photographs suggest that the marbleization may have been somewhat crudely done; the only real detail discernable in these vestiges of early photography are the strong, grand strokes,

some of which appear erratic and fail to suggest real marble. Other detail, however, that was left unrecorded by the early camera equipment, may well have been a better representation.

Additional physical research is necessary to fully interpret the details of construction of Arlington House. One of the most significant discoveries of the 1980-81 fabric investigation in the north wing was the location of a lintel matching the profile of molding used under the arches between the family parlor and the family dining room and presumably under now-removed fan lights from these arches. This lintel was found nailed between the leadlined water tank above the bath and the water closet and the west wall of the north wing loggia. This evidence would appear to indicate that the water tank was installed after the fan lights, partitions, and doors were removed from the arches. It is possible, however, that the piece was nailed in place against the tank years after the tank was installed to replace an earlier one or that it was excess material left over from other construction. Written documentation for the installation of the bathroom in the north wing is meager. A letter in 1837 proposed laying of lead pipes. The written records are inconclusive for the date when the arches between the family parlor and family dining room were opened by removal of lath plaster, louvered doors, and fan lights. It would be contrary to accepted restoration practice to change the arches without absolute proof that their present condition is not accurate to the 1861 appearance.

There is also a question surrounding the plaster molding fragment found lodged in the attempted flue hole of the Custis guest chamber. This fragment, of an approximate length of 2 inches, is identical in profile to the exterior edge of the great arch against the north wall of

Mrs. R. E. Lee's morning room. No pieces of this molding are missing on the arch and if found in the flue hole they must have come from some feature destroyed at the time the flue hole was made. As the Custis guest chamber had no source of heat after its creation, it is likely that it was heated by a stove. The fact that two holes had to be opened before the main chimney flue was found would seem to indicate, however, that the flue was not opened by Custis, but either after his death by the Lees or still later, during the army occupation, when those working on the house were naturally less familiar with the location of its features. A flue hole also exists just across the chimney flue above the fireplace in the family parlor.

One of the principal contributions of the Lees to the house was a modern heating system installed in 1855.[13] Its location was confirmed by archeology in 1980. The cast-iron furnace was located toward the center of the house in B06. When the equipment was dismantled by the army, several large pieces were left in the basement and presently rest in B08. There can be seen a flat ring with a lip on one side and an operable grate approximately 1" thick which probably rested directly on the brick foundations located under the floor of B06 (see photograph #17). According to the grooves on top of the ring, there would have been another section between it and a large ring which remains in B08 as well. Between these two extant pieces was another large ring which probably held the access door for stoking the system. There was yet another large ring between the last one mentioned and another extant ring of smaller radius. Above this last ring was another missing piece from which issued the smoke pipe. All these rings were fitted with grooves which caused the whole assembly to fit together tightly. This

furnace, when together, would have formed a rounded and squat iron mass which had the capability to become very hot when stoked with coal. It is thought that this cast-iron unit was further surrounded by a brick mass in which the heat was captured and from which it rose by natural convection in ducts. As noted in the Existing Conditions Section, one duct rose vertically to the center hall (room 111), and continued up the north wall to the upstairs center hall (room 201). Another duct appears to have run off horizontally through the south wall of B06 where it fed a diffuser in the floor of the white parlor. This was likely the case as three of the floor joists are replaced to the west of the center beam in the middle of the floor system of the white parlor. The diffuser could not have been directly in the center of the white parlor due to the presence of this center beam; it was probably located just to the west of the center. The flue pipe from the furnace evidently passed through the north wall of B06, where there is an unfilled patch today, and to the flue of the fireplace in B05 located under the fireplace in the family dining room. No destructive investigation was carried out in either the center hall or upstairs hall; there is still a question as to whether the vertical duct traveled on the outside of the bearing wall, as is likely, or whether it was actually inside the wall. As the north wall of the center hall and upstairs hall is a solid brick bearing wall, the latter possibility is the least likely.

The white parlor, left by Custis with only the lath in place, was plastered and fitted out with architectural trim of the period by the Lees. It is reasonable to assume that the arch over 115/D1 was planned by Hadfield as it is in the brick of the bearing wall. It is also likely that the fine composition of the two fireplaces, the central arch,

and the east and west niches (see photograph #60) was also from Hadfield's plan. It is known that the Lees purchased and installed the two Victorian marble mantelpieces,[14] that Robert E. Lee requested that the room be painted white, and that the doors be grained in imitation of walnut.[15]

It is documented that the Lees supplied the morning room (room 115) with a mantelpiece similar in type to those in the white parlor[16]. The baseboard profiles in both rooms are very similar, if not the same, but the other architectural trim is unlike any in the rest of the house. This trim has been shown to have been attached with early-to-mid nineteenth-century nails, and reattached later with wire nails after floor replacement during the War Department restoration, so the room was definitely not finished by the army in the early twentieth century as some have claimed. Further fabric investigation is necessary to document the origin of this room's decorative treatment.

Obviously, many questions remain unanswered which govern the return of the house, and its full interpretation, to the period of Lee tenure. Continual research is needed to locate and assimilate documentary evidence in the site historic files to apply to the continuing restoration and interpretation of the house. There are also ten major repositories of Lee and Custis documents which are monitored by the site to record additional documentary evidence as it is added to these collections. Fabric research is important to support and explain the documentary evidence available.

It is essential that the physical fabric be carefully evaluated as much of the documentary evidence has been scattered and perhaps lost. It is important that the evidence in this architectural data section and

the two volume historical and architectural data section of the historic structure report be used to guarantee the accurate restoration of Arlington House.

III. CHRONOLOGY OF HISTORICAL EVENTS 1778-1981

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1778

Tract of land on which Arlington is built purchased by John Parke Custis.

1795 October

George Hadfield appointed superintendent for the construction of the Capitol in Washington, D.C.

1798 May

George Hadfield dismissed as superintendent for the construction of the Capitol.

1802 (May)

Martha Washington dies at Mount Vernon.

1802 SUMMER

G.W.P. Custis moves into four-room brick cottage on land inherited from J. P. Custis.

1804 13 April

Letter from Cornelia Lee to Mrs. Richard Bland Lee :

"The house will be a very handsome building when completed. The room we were in was 24 feet square and 18 high . . . . "

1804 July 7

G.W.P. Custis married Mary Lee Fitzhugh.

1805 (Presumed)

Diary of artist William Birch (updated) said to have seen the proposed plan for the entire mansion and noted:

"He had built the two wings of his capital house with the hill they stood upon was an ornament of every elegant situation within the City of Washington."

1811 May 7

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from The National Intelligencer:

"I was struck on entering the ground of Mr. Custis, at Arlington, on the bank of the Potomac opposite the City of Washington, with several of the most picturesque views. This seat is on a superb mount and his buildings are begun in a stile of superior taste and elegance."

1812-1815

War of 1812; Custis short of building supplies and money.

1817 19 December

Randolph Stucco ("hydrolic cement") test at Arlington House documented by newspaper article of August 19th, 1818.

1818 8 April

Note of G.W.P. Custis to Edward Stabler, druggist:

"not being able to command cash at this time from the heavy expense of my building, I enclose my note. . . "

1818 18 April

Receipt of Cornelius McLean to G.W.P. Custis:

"200. Received of Mr. Custis. Two Hundred Dollars on an account of his building being Fifteen Hundred & Fifty Dollars in cash up to this date 18th April 1818."

1818 May

Traveler's reference to Arlington House as "Custis' Folly."

1818 10 June

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from Alexandria Gazette:

"Arlington House, the seat of Mr. Custis . . . was struck by lightning during the

storm on Saturday morning. The lightning entered the roof and passed down by a temporary wooden pier, erected to support the unfinished part of the portico, but fortunately without any injury to the building or family."

1818 19 August

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from Daily National Intelligencer:

"... One other experiment was made on the [exterior] northwest corner of Arlington House, the seat of G.W.P. Custis, Esq., in the District of Columbia, just before sunset on Saturday, 19th day of December 1817 [test was successful]."

Article concerning the cement stucco of David Moore Randolph.

1818 22 August

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from a receipt given by an illegible hand:

"Received by George W. P. Custis, Esq. eighteen dollars which with the sums before received is in full of wages for plastering at Arlington House & of all demands."

1824 December

F. A. Levaseur, visiting Arlington House with Lafayette:

"His [Custis'] house, built according to reduced plans of the temple of Thesus . . . " .

1826

Hadfield dies, obituary lists "Mr. Custis House" as one of his creations. ("Daily National Intelligencer", Washington, D.C., February 13, 1826.)

William P. Elliot publishes first known picture of the house in the 1826 edition of his Washington Guide.

1830

Francis M. Trollope, travel description published in 1832:

"It is a noble looking place, having a portico of stately white columns..."

1831 June 30

Robert E. Lee wedding to Mary Custis.

1837 12 July

Letter from R. E. Lee to his wife:

"Tell Mother [Mrs. G.W.P. Custis] I was going to day [in Baltimore] to see about her pip[es] but on further consideration, I thought she would not be able to compass the matter unless I was there, as they would have to be laid with care, and the joints in lead . . ."

1837 16 October

Letter from R. E. Lee to his wife:

"Arlington must now look beautiful, and you and Mother will be much engaged with your improvements . . . "

c. 1840

Manuscript "Childhood Days at Arlington -- Mixed With After Memories" by Elizabeth Gibbon Randolph Calvert written in 1875.

FAMILY PARLOR -- "white walls"

"The dining room is divided from this one by three arches, that reach half way to the ceiling and have the spring of each arch filled in with glass set in radial panes." This room has no immediate connection with the outer world; its doors open, one on the main hall -- which is crossed at the back of a passage like the top of a T that accommodates two flights of stairs not seen from the front door -- the other door from the dining room opening towards the kitchen. Over both doors are arches of glass;" ...

1851 c. October - November

Letter from Mrs. R. E. Lee to her son, G.W.C. Lee: "Your Grandfather (G.W.P. Custis) is seized with a spirit of improvement lately--he is making new steps to the Portico (the old [wooden] ones having so decayed as to be unsafe) and intends paving it with octagon brick tiles which are now being burned in one of the vast brick kilns in Washington -then he is going to put a new roof on the stable which is more needful than the other--though all are most desirable . . . "

1851 5 December

Letter from Mrs. G.W.P. Custis to her grandson G.W.C. Lee:

"...The portico steps are finished at last, and Charles and Austin are engaged in

preparing the floor for the pavers who are to lay the tiles as soon as your grandfather can haul them from Washington..."

1852 December 30

Letter from G.W.P. Custis to Benson J. Lossing:

"I have had a capital excellent studio fitted up in the South Wing of this House, with a first rate light . . . also a stove and everything comfortable."

1853 April 23

Mrs. Custis dies at Arlington House.

1855 July 1

Letter from Robert E. Lee to his wife:

"I hope Mr. Heyward has completed the furnace, & that the plasterers have made a satisfactory commencement of their business. Write me all the particulars. I informed you in my last letter that the monument would be shipped on the 30th June, & the mantels on the 1st."

1855 July 9

Letter from Robert E. Lee to his wife:

"It is a comfort to learn the furnace is completed & the men out of the house; but I do not understand how "the walls in the Hall could have been so broken, as to require being plastered all over." They

could only have opened the strip for the air pipe in the Hall & that they should have restored. They could not give the new the exact Colour of the old plastering and the whole may have to be coloured, but not plastered, unless you wish it hard finished, as it is called, which it is not now."

"As regards the painting of the large room, white is the simplest & cheapest colour, & I think with stained doors will look very well. If well grained in imitation of oak or walnut, (the latter I prefer) it will look richer, though darker, & the room you know wants light."

1855 July 23

From R. E. Lee's Memorandum Book #5:

noted that he sent his wife a check for $240 "to pay for finishing large room at Arlington."

1855 August 20

From R. E. Lee's Memorandum Book #5:

Sent Mary C. Lee a check on the Bank of Commerce of New York to the order of Collin & Co., in payment of furnace for Arlington for $200.

1855 August 20

Letter from R. E. Lee to his wife:

"I am glad you are going to have the bookcases repaired."

1856 18 April

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from letter from Blanche Berard to her Mother:

"On the right of the hall opens a room, which a sort of archway divides into two, a larger & smaller apartment."

1856 October 2

Mrs. Lee to Col. R. E. Lee in a letter:

"The stable being pronounced unsafe we have a carpenter here putting on a new roof & I took the opportunity with Fathers sanction to have the partition taken down between the two front dressing rooms & leaving the door that opens into Markie's room as we are much in want of another room, but indeed the poor old place looks very ruinous..."

1857 October 10

Mr. Custis dies at Arlington House.

1858 2 October

Letter from Agnes Lee to Rooney Lee:

"Papa is very busy with the workmen, mending and building all of the time. The stable is beginning to approach completion and will be very handsome I think. He is repairing the shed to both

wings and rebuilding the "planks" of brick..." [this quote in its entirety seems to apply only to the stables].

1859 17 October

APPLICATION TO HARTFORD FIRE INSURANCE CO.

Records indicate that the roof of the mansion had been slated in 1858 and that a new gravel roof had been placed on the stables and the wings of the house.

1861

"On entering the house, on the right was the living room and, through folding doors, you caught a glimpse of the dining room beyond." [Evidence for presence of glass doors and filled arches during the Lee Period of Occupancy.]

from As I Recall Them (1936) by George L. Upshur [asked by War Department for his recollections as he was only living person having known Lee at Arlington.]

(Note: This recollection was 75 years later when Upshur was 82 years old)

1861

April 22nd - R. E. Lee left Arlington.

May 15th - Mrs. R. E. Lee left Arlington.

1861 24 May

Arlington House occupied by U.S. Army.

1861-1864

Arlington House used as army headquarters.

1864-1868

Arlington House served as office of the Superintendent of the National Cemetery.

1864 11 January

Arlington House sold for taxes and purchased by U.S. Government for $26,800.

1864 17 June

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200 acres opened as a National Cemetery; property taken from the Arlington Estate.

1864, June 28 and 29

Andrew Russell photographic survey of Arlington House.

1865 April 8th

"Upstairs in one room we saw the bedroom which Washington died and while in the room, the man in charge picked some pebbles from the roofing of the Conservatory and gave me, . . . "

from Contemporary letter written by Emma _____ donated to Arlington House Collection (copy) by Miss Pamela Hawkes in 1981.

1865 29 April

Nearly 5,000 soldiers had been buried in the Arlington National Cemetery since June 1864.

1867 August

Monthly report for the Arl. Nat. Cemetery:

"The main building is in very good condition. The roof of the north wing has been shingled and the woodwork on the inside of the north wing and the woodwork on the inside of the green-house, has been painted during the present month; the masonry on the outside of the main building has been whitewashed yellow during the present month."

1868

15,000 Union soldiers had been buried in the Arlington National Cemetery.

1869 September

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from monthly report of Arlington National Cemetery:

"Buildings: A new roof has been put on the South Wing of the Mansion and all leaks repaired on Mane (sic) building."

Thompson R. East
Supt.

1870 June

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from Monthly Report of Arlington National Cemetery:

"The main building has been improved by its having been recently painted. I would recommend the white washing of the masonry of the wood work on the inside of the North Wing of the main building, also the painting of the wood work on the inside of the green house."

Charles Fitchett, Supt.

1870 August

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from the Monthly Report of Arlington National Cemetery

"The main building is in very good condition. The roof of the North Wing has been shingled and the wood work on the inside of the green house has been painted, during the past month. The masonry on the outside of the main building has been whitewashed yellow during the present month."

Charles Fitchett, Supt.

1870 December

Monthly report of the Arlington Nat. Cemetery:

"The main building and two lodges are in condition except that about two dozen window frames are required. The two outhouses near the main building are very old and nearly worthless. I respectfully ask that these buildings may be inspected with a view of ascertaining whether they are worth the cost of repair."

1872 April

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from Monthly Report of Arlington National Cemetery

"I respectfully recommend that a cistern be built at the south end of the main building...."

F. Kauffmann, Supt.

1873 May 30

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from the National Republican of Washington, D.C.:

"The front of the mansion, which faces the river, received its share of beautifying, and the massive columns have all been repainted..."

1873 15 November

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from Letter to Quartermaster General from Wm. Myers:

"Leading water from roof of mansion-house to a new cistern and drainage."

1874

Report of the Inspector of Nat. Cemeteries: Arlington

"The old mansion and the outbuildings have been repaired and are now in good order."

1874 February

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from Monthly Report of Arlington National Cemetery:

"The Buildings: Are in good condition with the exception of porches and steps of the main building which need to be repaired."

F. Kauffman, Supt.

1874 May

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from Monthly Report of Arlington National Cemetery:

"The interior of the main building, especially that part of the house occupied by the Superintendent, needs repairing badly. The plastering has fallen off, the wind and snow beating through the window frames so that it is hardly possible to keep the cold out. New locks should be put on all the doors. There is not a complete lock on any door in the house. The front and back porches should also be replaced by new ones; they are in a very delapidated condition."

F. Kauffmann, Supt.

1874 August

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from the Monthly Report of Arlington National Cemetery:

". . . new porches and steps have been erected during the past (sic), also some repairs have been made inside and new locks have been put on all the doors."

F. Kauffmann, Supt.

"I would respectfully recommend that a glassroof be put on the old conservatory attached to the main building so as to make it more useful in preserving plants during the winter."

F. Kauffmann, Supt.

1874 October

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from Monthly Report of Arlington National Cemetery:

"... A glass roof has been put on old conservatory during the past month."

F. Kauffmann, Supt.

1878 March

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from Monthly Report of Arlington National Cemetery:

". . . the roof of the central part of the mansion is in bad condition and should be repaired at an early date. The roof is covered with slate nailed on the old shingled roof, the shingles are badly rotted and consequently the nails fastening the slate have no hold and the slates are blown off at every heavy gale..."

F. Kauffman, Supt.

1878 June

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from the Monthly Report of Arlington National Cemetery:

"...the roof has just been repaired by relaying the slate and putting on a new sheathing."

F. Kauffman, Supt.

1878 July

Monthly cemetery report:

"Mansion in good condition, the part occupied by Superintendent has had new windows put in and is now being white-coated and painted."

1879 August

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from Monthly Report of Arlington National Cemetery:

"...a new shingled roof has been put on the wing parts during the month."

F. Kauffmann, Supt.

1880 December 3

---

from The New York Times:

"The Arlington Mansion and its surrounding buildings have suffered no changes since Lee went to Richmond in 1861, ... save such as ceaseless work of decay have wrought. The doors and windows have faded; the pillars have blistered and scaled into ugliness; the narrow, ill-balustrated stairway is worn and battered..."

1881 17 May

Memo by M.C. Meigs, Quartermaster General:

"The capitals of the front Portico of the mansion at Arlington are of wood & more or less decayed. Where renewed they should be made of Portland cement with sharp sand. 1 cement/3 sand & their profiles should be cemented to resemble those of the Parthenon, which is the accepted canon of Grecian Ionic order".

1882 December

Supreme Court of the United States upholds lower court decision to return Arlington Estate to George Washington Custis Lee.

1883 March 10

U.S. acquires full title to Arlington estate from Lee heirs for $150,000.

1884 May

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from Monthly Report of Arlington National Cemetery:

"The old mansion, a part of which is occupied by the Superintendent is in good condition with the exception of some rooms on the second floor where the plastering is breaking away."

1884 June

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from Monthly Report of Arlington National Cemetery:

under General Remarks:

"The accumulation of filth, debris and foul rubbish in the cellar under the old Mansion, nearly one hundred cart loads, has been removed and the cellar thoroughly cleansed and white washed."

1884 November

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from Monthly Report of Arlington National Cemetery:

"The old mansion has been thoroughly renovated -- plastered walls mended and Kalsomined, all inside woodwork painted, and the columns scraped and painted."

E.M. Main, Supt.

1885 May 28

Estimate submitted for:

1. replastering fallen ceiling - 8 sq. yds. ("south room")
2. 2 new windows in south room
3. fitting up 2nd story of Mansion for the Gardener: sink, bath tub, & water closet.
4. slate roof on Main Building
5. slate roof for one outbuilding to match the other previously slated.

1885 September

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from a proposal for "Repairs of Improvements" -- SPECIFICATIONS:

1. Roofs of wings and outbuildings rebuilt and reslated.
2. Replace sash in two windows in "south" room.
3. Gate on main stairway.
4. A shelf 12' x 12" x 1" on a 1 x 4 strip w/coathooks.
5. Put up a partition with 2 x 4s and double boarded with beaded flooring in the arch between the pantry (presumed excavation) and the rest of house containing the window to be removed from the north side of the connecting room between pantry of north stairhall, the window to become a door.
6. Replace a plaster ceiling.
7. Install a bath tub (6'-0"), water closet, 18" x 30" sink, lay required vitrified pipe in cellar to accommodate sewage. 30 yd. hot water tank.

(Plumbing improvements were for Gardener and believed to have been done on the 2nd floor of house).

1886 May 29

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from Harper's Weekly:

"They have painted the old house [Arlington] yellow lately--not a screaming yellow, but a soft, unobtrusive tint that is very consistent with its age...."

1892

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from Historic Arlington, by Karl Decker and Angus McSween

"Over the main entrance to the building hangs a sign, "Superintendent's Office," and the door on the right that opens from the hallway leads to the apartments occupied by that official. The upper floor of the building and the entire right wing are taken up by the superintendent's apartments, and are not open to the public. The rooms on the left are always open, but they possess very little of interest."

1892 10 January

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from the New York Times

"The old yellow mansion of the Lees with its portico of heavy columns stands on the brow of the lofty bluff..."

1893

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from an unnamed newspaper clipping:

"...In the old building today, and especially in the dining rooms, are friezes, a little indistinct, but still traceable, which the cemetery people insist are the work of old General Custis (sic)."

1906

Steam heat installed in Arlington House.

1914 January 4

Bathroom in north wing changed. "Present Condition" drawing shows a bathtub against north window, wall and a partition between the two rooms of the bath complex. In the wall between is a small window. There is a 19th century WC shown, referred to as a "cabinate," with a holding tank suspended above on east wall of small room. Toilet seat is on a bench built across the north wall and there is a ledge and vent pipe behind. "Proposed New Condition" drawing shows partition wall w/window removed and door to small room fixed "in a permanent manner." Ledge and vent pipe remain, but WC fixture is new, self-contained unit. In this manner the two small rooms have been combined into one "modern" bathroom. Tub shown in same position; no sink shown on either condition.

[From NCR 2.3-130 (formerly Quartermaster Depot #H-51) kept in Arlington House files]. #530

1920 (?)

Drawing showing north wing & portion of main block as quarters for Cemetery Superintendent. #101 - partition with window across and divides it from flanking room; room divided into small "Living Room" at south end (south of 105/W1) and larger portion as "Dining Room". No stairs shown. No door at 101/D1 #102 & 103 - Bathroom arrangement as drafted in 1914 drawing; sink as south wall of #102. No door 102/D1. #104 - kitchen, with sink unit in northwest corner and stove (?) before fireplace.
#105-Hall-door indicated at 105/D1.
#106-Bedroom-door indicated at 106/D4/ 106/D1 swung opposite.
#107-Bedroom.
#108-Parlor-no doors indicated on arches.

#109-Bedroom/#110 stair hall (for occupant upstairs).
No doors indicated where "short" doors now exist.
Drawing probably done to illustrate conditions prior to 1920s restoration.
[from NCP 2.3-91-7 preserved at Arlington House files #305 (seems to be only partial drawing, rest missing).]

1924 March

Photograph in Architectural Forum of east and west facades in an article by G. L. Rodier: Also shows projected plan of "Restored Plan":
North wing was to undergo a major change in these early plans: Rooms 102 & 103 were to be torn out to give an enlarged "Pantry and Serving Room" and all partitions in north wing proper were to be removed giving a huge "Dining Room" with a fireplace on the chimney breast. 1885 partition under arch in 101 to remain.

1925 4 March

PUBLIC RESOLUTION #74 / 68th Congress
H. J. Res. #264

Act authorizing restoration of Arlington House to appearance immediately prior to the War Between the States.

1929 17 April

Results of a meeting of the Quartermaster Committee:

It was agreed that an outside heating plant would be constructed adjacent to the public comfort station in the rear of

the summer kitchen outbuilding to give heat to the main building and outbuildings. Also that the exterior of the main building was to be reconditioned and repaired without change to its present general appearance, except the addition of a proper type of railing around the roofs of the north and south wings and the substitution of stone steps for the wooden steps around the main portico. With regards to the interior, it was agreed "That the interior [should] be restored and repaired generally, that only temporary partitions be removed; that the arrangement of rooms in the north wing be allowed to remain, as well as the arches in the double parlors north of the main hall; that the large room in the south wing be furnished as the state dining room; that this room and the main drawing room south of the central doorway have new marble mantels [thereby removing the Lee mantels] installed similar to those in the double parlors; that all the modern flooring be removed and the original old floors restored; that an effort be made to discover reported mural decorations under the present paint in main drawing room; that mantels on second floor be replaced with mantels of the Colonial period."

1929 9 September

Heating plant at Arlington House removed from basement room to basement of comfort station; heating system renovated to provide forced hot air to house in general with connectors concealed under windows in north wing (all other radiators removed as part of restoration.)

Also: Nat. Archives drawing #2.3-3

Information from Plan #6608-161.

1929 September 9

Arch in basement connecting areas beneath white parlor and beneath morning room dropped approx. 1'-0" from original height and rebuilt.

from drawing #2.1-80 at National Archives.

1929 September 14

All basement windows replaced during restoration by army.

from drawing #2.3-13 at National Archives

1929 September 17

Installation of present electrical system at the Arlington House.

from drawings 2.3-4 through 2.3-6 at the National Archives, dated 9-17-29.

1929 October 8

Placement of wood balustrade on roofs of north and south wings.

from drawing #2.3-8 at the National Archives dated 10-8-29.

1929 October 10

Replacement of mantel in morning room with wood replica of Adam style (present mantel). Replacement of original marble mantelpiece in Lee bedroom by wood Adam style.

from drawing #2.3-10
at National Archives
& 2.3-11

1929 October 14

Army "restoration" of winter kitchen.

from drawing of fireplace crane for winter kitchen at National Archives, dated 10-14-29, #2.3-15.

1929 December 20

Plans to replace original marble mantels in white parlor with copies of those at Woodlawn.

from drawing #2.3-23 at National Archives.

1930

Army restoration of summer kitchen.

from drawings dated 1930 in Nat. Archives, series 2.3.

1931

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from report of L. M. Leisenring to the quartermaster general:

Locks on both parts of centerhall doors original. All other door hardware in house replaced by reproductions.

Has pine floor throughout as first floor; second floor original flooring (except centerhall upstairs) which was patched and repaired c. 1930 by old flooring taken from the first floor.

Heating system renovated & concealed.

1933 10 June

Executive Order #6166

Lee Mansion transferred from the War Department to the Department of the Interior.

1933 October (from Specifications)

Arlington House and dependencies painted inside and out.

1938

Plans for renovation (1947) & heating system show that fireplace located under fireplace in family dining room was a working fireplace changed to an arch with the heating duct taking up the space of the flue.

Under west fireplace in space under parlor there was an arch higher than one presently with a flue which was boarded up after inclusion of the heating duct. [from drawing #2.1-75 at the National Archives].

1941

Standpipe fire hose line for protection against air attack, small fires, etc. installed in south wing and southwest corner of main block during this year. Closet in store room presumably did not exist prior to this installation as it appears on no drawings of intended plans governing this matter. (Letter from C. G. Mortimer to W. F. Haiber, Oct. 21, 1940). Information from Arl. House Master Files.

1942 Spring

Interior of Arlington House repainted.

from memo dated August 20, 1942 for Mr. Clark.

1942 9 October

Exterior of mansion repainted.

from memo for Mr. Kelley, signed by John Hetrick.

1949 27 April

Heating system to provide internal air intake from house (rather than exterior); supplemental heating provided by further diffusers in family dining room, white parlor (west fireplace) and conservatory. Two return-air fans added under centerhall, one under morning room.

Information from drawing #NCP 2.3-81

1953 January

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from Murray Nelligan's monthly report.

"Early in the month the work of installing the Lee mantels in the drawing room of the Lee mansion was completed."

1961

Wing roofs replaced by simulated wood shingles -- parapets removed -- to better reproduce conditions as shown in the 1864 photographs.

[from memo sent out by Sutton Jett in Sept. 1960 and letter to Mrs. J. R. Buchley of August 16, 1961 as preserved in Arlington House Master Files].

1964

Much of house re-stuccoed. Repainted in first marbleization since historic period.

1973

House repainted & re-marbleized.

1980-81

Stabilization work carried out in house structural system. House sandblasted and remarbleized. North wing fabric investigated.

IV. EXISTING CONDITIONS AND RECOMMENDATIONS FOR TREATMENT

IV. EXISTING CONDITIONS AND RECOMMENDATIONS FOR TREATMENT

The description of Existing Conditions at Arlington House will cover each space in the house individually, beginning in the basement and proceeding to the attics, roofs and exterior. The Existing Conditions presented here will include a documentation of work carried out by the National Park Service from November 1979 to July 1981 in the areas of structural stabilization and exterior repainting and will, for the first time, document work carried out by the quartermaster corps of the U.S. Army during its restoration of the late 1920s. There will also be a concurrent description of investigations into the historic fabric of the north wing, conclusions drawn from those presented in the section under structural history.

Immediately following the description of existing conditions for each room or area will be the corresponding "Proposed Treatment" section. Alternating between "Existing Conditions" and "Proposed Treatment" for a specific area rather than providing two separate sections was judged more appropriate for the user.

CELLAR STAIRWAY HALL (ROOM B01) - EXISTING CONDITIONS

This space in the cellar of the north wing was the site of a good deal of renovation work during 1980. In order to better understand the necessity for, and extent of, this work, the following short history of the house's heating system will precede the discussion of Existing Conditions.

This treatment of the history of the Arlington House's heating system will begin in 1906 with the installation of steam central heating. The 1906 steam system employed cast-iron radiators set a few inches out from the wall on small feet. The pipes disappeared into the floor beneath and were connected to the main steam lines. The boiler for this system was located in a brick pit area in the west half of B05.[17]

The congressional resolution[18] of 1925 to restore the house to the period of Lee occupancy, just prior to the Civil War, required a complete renovation. To lessen the danger of fire, it was decided to remove the boiler from the house itself into a small building ("Comfort Station") north of the summer kitchen dependency, which would also house restroom facilities for visitors to the new memorial to General Lee.[19] At the same time, all radiators were removed in the conversion of the building from a cemetery headquarters to a house museum.

The heating system installed by the United States Army in 1929 was almost entirely concealed in the basement of the Arlington House.[20] Hot water was piped into the house underground from the nearby comfort station. Water was taken from the main line into six cast-iron coil units and then returned to the boiler. Air taken from outside

moving across the coils through ducts and thereby heated resulted in the heating of the first floor rooms. As a result of the installation of this hot-water-coil/hot-air system, however, much of the cellar was taken up with coil units and ductwork. This fact was of little concern as most of the cellar was not intended for public visitation. However, due to the presence of the winter kitchen (room B02) and the wine cellar (room B03) in the cellar of the north wing, and the intention to permit visitation to these rooms, it was necessary to devise a different heating system. It was decided to use a hot water connector system with the units semi-concealed under the windows as they are today in the school and sewing room and the Custis chamber. In order to heat the pantry, however, it was necessary to revert to cast-iron radiators which were concealed in the bottom of reproduction cupboards in the southeast and northwest corners. The idea was to place these radiators behind double doors in the base of the cabinet and the heat would escape through holes in a patterned tin panel in each door. While the room was minimally heated from these sources, they were never wholly satisfactory as the patterned tin barrier allowed very little heat to escape. The bath, as it was not to be presented to the public, was heated by an exposed radiator like that used in the B06 system. The basement of the north wing was not provided with any radiators or connectors, but received a minimal amount of heat off the exposed pipes running near the ceiling (see photograph #1). While the smaller heating pipes were exposed to public view near the ceiling, the main hot water line and return were concealed in a trench running near the north, east and west exterior walls of the north wing.

The present heating system, most of which was installed in 1929, underwent a modification during the late 1940s.[21] The original system

of 1929 took air directly from the outside and conducted it over the coils before sending it up through ducts and diffusers into the first floor. During the 1930s it was found to be better to return the house air through the system by use of additional ductwork and motor-driven fans. Returns for the main block were provided in the floor of the center hall, near the mid-point, to the north and south; fans and the necessary ductwork were placed below in B06. A separate return system was provided in the south wing against the north wall of Mrs. R. E. Lee's morning room with the fan located below in B10 (see photograph #2). Also at this time three additional cast-iron coils were added to the system, bringing the total to nine, and providing additional heat to the family parlor, the white parlor, and the conservatory.

The decision in 1980 to renovate the heating system in the north wing and to conceal all pipes from public view did not result from purely aesthetic concerns or to improve the historic ambience of the scene. It was made primarily for structural reasons. An engineering study of floor load capacities conducted in 1979 showed the floor of the pantry to be rated at only 34 PSF.[22] In order to upgrade the load ratings for this floor, which experienced heavy visitation, it was decided to add joists between the existing members in many locations.

The new joists could be installed with minimal disturbance to historic fabric in the brick supporting walls only by first removing the reproduction tongue-and-groove, pine flooring. Taking up this flooring, which dates from this century, would also permit removal of the plywood subflooring. The latter was visible in the basement and detracted considerably from the historic ambience. To remove the

flooring, however, would also necessitate removal of the reproduction corner cupboards and the radiators enclosed within. After consulting the Furnishings Plan for the Arlington House[23], which recommended removal of these cupboards, it was determined that a structural renovation of the floor of the pantry would also include, by necessity, a renovation of the north wing heating system.

The loss of heat from the radiators and pipes in the cellar stairway hall and the pantry was compensated by the installation of a radiant electric ceiling in the pantry and a radiant hot water system in the floor of the cellar stairway hall. Radiant systems were chosen because they could be concealed from public view. (See photograph #3).

The first step in the installation of the radiant floor system in the cellar stairway hall was the removal of all brick, most of which was believed to have been installed by the army in 1929. It is recorded that prior to the War Department restoration, army personnel found "the winter kitchen and one other small room in the basement . . . paved with the original brick;" that "the wine cellar has a few bricks along one side," and that "the remainder of the rooms are not paved . . . ."[24] It would seem by this report that the army probably did not find the cellar stairway hall paved, but found it necessary to do so to accommodate practically the traffic of public visitation.

Following removal of all existing brick from the floor, a complete archeological investigation was undertaken. Several abandoned sewage and supply pipes were uncovered near the north end of the cellar stairway hall. From visual inspection, these pipes are believed to date from the latter part of the nineteenth century and are thought to have been installed by the U.S. Army during their renovations of the north wing as the cemetery superintendent's quarters. Also a number

of post holes were uncovered running in a line parallel to, and several feet to the west of, the east wall of the cellar stairway hall. It is believed that these post holes may date from a wood porch predating construction of the north wing loggia.

After conclusion of the archeological investigation in the cellar stairway hall, the dirt floor was excavated to a depth of approximately 6 inches. Three inches of gravel were placed in the excavated area and covered by a heavy polyethylene vapor barrier and 1 inch thick slabs of styrofoam insulation. Over this insulation was poured 3 inches of 3000 PSI concrete, sloping slightly to the south.

The radiant heating system (see photograph #3) in the floor of the cellar stairway hall is a grid of copper piping having two parallel 1 1/4" headers running north-south and 3/4" perpendicular cross pipes occurring approximately every 2 feet on center. The radiant system begins in the trench at a junction with the 3-inch main hot-water heating pipe 10 feet from that point where the main enters the house in the northwest corner of the cellar stairway hall. The 1 1/4" pipe leaving the main rises out of the trench and becomes the west header. The east header begins near the north end of the cellar stairway hall and continues back into the trench on the east side of the pier between B01/W4 and B04/D1.

The floor heating system is controlled by a gate and a solenoid valve in the northeast corner of B04 where the floor return meets the beginning of the main system return. The solenoid valve, electrically operated, is controlled by a bulb-sensor thermostat which is located in the restored floor of the cellar stairway hall between brick at a point approximately 4' 8" from the south wall of cellar stairway hall and 5' 3"

from the east wall. Following the installation of the system it was tested and found to give off very good heat. Prior to the replacement of the floor, the copper piping of the system was covered with asphalt paint to guard against corrosion. Sand was placed between the pipes and over them for a depth of several inches before replacement of the brick in its former pattern. Installation of the radiant floor system, and the corresponding radiant electric system in the ceiling of the pantry, allowed removal of all heating pipes running near the ceiling of the cellar stairway hall (photograph #1).

While the north wing benefits from removal of heating pipes from public view, it is not anticipated that heating itself will be improved in any north wing area (with the exception of the cellar stairway hall). Heating in other areas of the north wing has never been adequate. The only other heat sources on the main floor of the north wing are the convectors under the two windows in the school and sewing room and the one in the inner hall (north wing). The water closet, the innerhall (north wing) and the Custis guest chamber have never had heating elements and do not have them at present. In the cellar, the winter kitchen received some heat from exposed ceiling pipes, feeding convectors above in the school and sewing room and the Custis chamber, while the wine cellar remained completely unheated, as is also the case now.

The reason there will be no further attempt to upgrade north wing heating is due to the nature of visitation. As the public is not allowed in most of the rooms in the north wing, there is no particular reason that they be comfortably heated on an individual basis. Upstairs, the public will be primarily in the pantry, which will be served by the radiant ceiling as well as heat conducted through the floor by the warm

ceiling below. They will also be in the school and sewing room and the inner hall (north wing), which should be adequately heated from the sources in the pantry, the school and sewing room, and the Custis chamber. In the basement, they will be only in the cellar stairway hall, which will be very well heated by the radiant floor system.

A balanced heat distribution in the north wing should not be a principal concern. The uninsulated nature of the house, repeated exterior door openings and closings, the prevalence of drafts from the forced-air system in the rest of the house, all create a situation impossible to control during public visitation. It is also to be remembered that the visiting public in winter is dressed to be outside while they are in the house. As a result, it was felt by those concerned in this project that the maintenance of an overall minimum temperature of 60°F in the north wing will be satisfactory and should be easily achievable by the renovated heating system on all but the very coldest days.

North Wall: The north wall of the cellar stairway hall is stone up to a point 2' 6" off the brick floor. Some pipes were removed from this wall during the 1980 archeological work (none were thought to be historic but further study is recommended) and their through-holes patched with portland cement. Paint and mortar were removed from a small portion of the northeast corner; the north wall of the cellar stairway hall does not bond into the east wall, that is to say, the north wing loggia does not bond into the original west exterior wall of the north wing.

From the point 2' 6" above the brick floor the remainder of the north wall to the ceiling of the cellar stairway hall is brick in running

bond. Window B01/W1 is a six-pane single sash window, hinged at the top, and opening in. The sash, the hardware, and the jambs, head and sill all appear to be twentieth-century replacements. This is documented in a drawing made by the army in 1929 which notes that all basement windows were to be replaced during the restoration.[25] The lintel above the window, however, is old and may be original. On the exterior the window once had vertical square bars which may have also been a feature of the army's work in 1929. These bars, however, have since been cut off flush with the sill and pulled out of the head. They are still in evidence, however, on B02/W1, B02/W3, and B03/W1.

West Wall: The west wall of the cellar stairway hall was also constructed of stone up to a point 3' 6" above the brick floor. From this wall rise the bases, also in stone and measuring approximately 3' 6" in length by 2' 0" in height, of the brick pillars (approximately 1' 6" x 1' 6") which support the loggia arches. These pillars were stuccoed, some of which remains.

The pillar located between B01/W2 and B01/W3 was examined. Paint was removed on its north face and it was found that the brick infill between arches is not bonded into the pillars. This infill was mortared with a harder and whiter mixture than that in the joints of the pillar which is a cream color with a low lime content. Stuccoing on the pillars is also of the same material as that in the joints. The lack of bonding between the pillars and the infill confirms the assumption that the original design of Arlington House as a Greek revival building had incorporated open loggias.

The stone west wall of the cellar stairway hall ends approximately 7' 0" south of the north wall, the remainder of the wall being in brick.

The stone wall disappears at the south end of the west wall where it was evidently torn through to connect the main part of the cellar stairway hall with the basement of the north connecting flanker. Part of the west wall reappears again against the south wall in the presence of a small stone pier. Both the north and south jambs of this opening were then finished plumb by the use of brick infill.

Door B01/D1 is a four-panel door painted on both faces. It does not appear to have been cut-down or pieced and there are no ghosts of hardware which may have been removed. The lock stile has what appears to be a reproduction box lock, all hardware and keeper intact, a modern rim right "jimmy-proof" barrel bolt, and mortise bolt. The hinge stile shows no evidence of any hardware other than that now present, so it is assumed that the hinges are original to the door. There is also an automatic door closer which is twentieth century, as well as a twentieth century exit sign. The doorway was placed in this locale at the infilling of the arches. The present jambs appear to be replacements; they appear new and there is the further proof of a stretcher course between the head jamb and the lintel, which appears old. Threshold is worn but is in acceptable condition at this time.

Windows B01/W2 and B02/W3 are both like B01/W1 except that they have on the exterior four square protective wooden bars running horizontally. Lintels appear old.

Door B01/D2 is a four-panel door painted on both faces. This door presents the same situation as found in B01/D1, and probably also dates from the 1929 restoration. Hardware consists of a reproduction box lock missing its knobs, shank, and keeper, and a reproduction door handle and barrel bolt above the lock. Hinges appear original to

the door and there is the remnant of a door closer on the top rail. There is a replacement threshold over the sill.

South Wall: This wall is a part of the 1817-19 main block, and is a common bond. A 3-inch hole located 6" below ceiling joist and 2'-6" west of B01/W4 was filled in 1980 when the hot water return was removed from the ceiling of B01. Window B01/W4 is an interior window between the cellar stairway hall and B05. Present sash, which is six panes hinged at the top and opening into B05, appears to be a modern replacement. The jambs, sill, and lintel appear old, however, and the head jamb shows mortises of former hinges. Extra wooden pieces have been added to the east and west jamb faces reducing the window size to accomodate the present sash. The lintel also has an extraneous wood member attached to its north face for no apparent purpose. Brickwork around window confirms that the feature was intentionally placed there where the main block was built and was not cut in later. The window may have been installed to admit some light into B05 prior to the enclosing of the north wing loggia.

East Wall: The brickwork on this wall, as well as that on the north and west walls, appears to be running bond. It is difficult to determine absolutely as the brickwork is highly irregular and in places covered with many layers of paint and/or remnants of stuccoing.

Door B01/D3 is composed of vertical tongue-and-groove beaded boards approximately 5" wide each with narrower boards on each side. They are held together by two chamfered battens of the north face; both faces are painted. On the lock stile there are the remains on both faces of a door latch and handle which was probably installed during the War Department restoration. The catch for the latch remains on the

west jamb. A broken hook remains on the top west corner of the south face and has a corresponding eye on the west jamb. The hinges appear original to the door.

Door B01/D3 is the door of the stairway connecting the cellar stairway hall with the pantry. The treads of the stairway are in good condition due to the protection of a crosshatched rubber covering. The risers also have a rubber covering, but it has in many places worn through, resulting in significant riser board wear. There are also some worn places where the treads meet the risers on the east side of the stairway on treads #1 and #2 from the bottom, similar to mouseholes, which should be preserved. The skirt board of the stairs has a bead at the top and runs up the stairway, where it becomes the baseboard of the pantry. The stairway enclosure is constructed of vertical tongue-and-groove beaded boards, 5" in width, nailed to the north stair carriage stringer and to the log-joist header above. There is a handrail, round in shape, located on the east wall, and supported by brackets attached to a plain board. The handrail and its supporting features do not appear old. On the south face of the doorway to the east there is a trim of one beaded board which connects the baseboard above in the pantry with the beginning of the skirt board at the bottom of the stairs.

Above B01/D3 there is a wooden piece with trim dating from 1981 when it replaced a similar broken piece, which also was a product of the twentieth century.

This stairway was also stabilized during the renovation work of 1980. The bottom of the carriage is supported by a new wood plate which replaced one rotted by the damp ground with which it had been

in contact. This plate is supported on two short brick pieces rising from the concrete pad under the radiant heating system. The set of wood posts to the south rest on similar brick piers rising from the concrete pad, while those midway along the carriage run rest on the brick floor alone. The south posts are necessary due to the very slight connection between the top of the stair carriage and the log joists. The age of both sets of posts is uncertain; however, it must be re-emphasized here that the continued use of at least the south posts, regardless of their historical authenticity, is necessary for the safe support of the stairway.

The major stabilization effort in the cellar stairway hall was reinforcement of the log ceiling joists. The problem in this area stemmed from the original placement of the log joists too far apart for a PSI rating of only 34, as has already been stated. Following removal of the flooring and underlying quarter-inch plywood in the pantry, hewn oak logs of similar dimension to those already in use were installed. Joist pockets for these new members were let into both the east and west walls of B01 and the joists were secured in place with portland cement and brick. The new joists, counting from north end of the cellar stairway hall, are: 5, 6, 8, 10, 12, 14, 15, 17, 21, and 23. Joists number 5, 14, and 15 replace original joists which were removed due to their poor condition. The floor of the pantry was replaced with boards similar to those removed; the flooring under rooms 102 and 103, and the north connecting flanker was not removed.

Also, during the work of floor stabilization, the lintels above B01/W2 and B01/W3 were strengthened. The lintels were removed and a 4" x 4" steel angle was concealed inside each (see photograph #4).

The framing of floor joists around the stairway connecting the cellar stairway hall to the pantry was also strengthened by the introduction of log bolts through the flanking joists into the log header which carries joists 14 and 15. The north end of the boxing where the header intersects joist number 13 was further supported by the installation of a 5/4" inch thick oak board between the 1" x 5 3/4" trim board and the north end of the stairway enclosure. The oak and trim boards were glued and screwed together and to the enclosure; in appearance they now seem as one board which butts up under the header intersection and rests on brick which extends down to the concrete flooring under the radiant heating system. Both the floor of the pantry and the connecting stairway are now believed to have a loading capacity of at least 75 PSI, which is the design goal of the 1980 stabilization at Arlington House.

There are no lights or electrical outlets in the cellar stairway hall.

Cellar Stairway Hall (Room B01)- Proposed Treatment

While it is not likely that the floor in the cellar stairway hall was bricked during the historic period, it is recommended for practical reasons that the present brick floor remain in place. The radiant heating system installed beneath the floor in the cellar stairway hall was designed to be used in conjunction with the brick floor above, which would capture, store, and radiate the heat from the hot water pipes below. Also all public visitation of the north wing basement takes place within the cellar stairway hall; it is important for the safety of the visiting public that they have a solid and uniform surface from which

they can view the winter kitchen and the wine cellar. Once the recommendations of the Furnishings Plan are carried out, there will be no further necessity to make any change to the recently renovated condition of the cellar stairway hall.

The rubberized covering of the stair risers between the cellar stairway hall and the pantry should be replaced by material as compatible as possible with the wood in color. If there is a color change from the existing material, it will be necessary to replace the tread coverings as well. An effort should be made to preserve irregularities in the stairway such as the "mouseholes" to the east.

WINTER KITCHEN (ROOM B02) - EXISTING CONDITIONS

As in the cellar stairway hall, the brick floor of the winter kitchen was removed in 1980 for archeological investigation. While documentation has stated (see footnote 8) that the army found the winter kitchen paved with original brick in 1929, the brick covering the floor in 1980 did not appear at all different in color, texture, or size from that in any other portion of the north wing basement. It is, therefore, assumed that whatever "original" brick was in evidence in the winter kitchen in 1929 was replaced by brick acquired for the purpose of uniformly paving the north wing cellar.

The area beneath the winter kitchen proved exceptionally rich in archeological finds. Remains of a wide foundation wall and bases for possible fireplaces or relieving arches, as well as a narrower foundation wall running under the south wall to the south wall of the wine cellar, were all located near the surface of the south half of the room (see

photographs 5 and 6). In the north half of the winter kitchen, several brick and brick depressions were located in front of the fireplace, which might prove the presence of a cast-iron stove in that location during the historic period. This archeological investigation in the winter kitchen was discussed in the section on structural history and will be fully presented in the Archeological Data Section by John Pousson.

Just as in the cellar stairway hall, the 1980 renovation of the heating system in the north wing removed the supply pipes installed in 1929 which ran horizontally about 6 inches from the bottom of the ceiling joists, from which they were suspended. This supply pipe, which continued through the wine cellar, was cut in B05 near the northeast corner and removed. New copper pipe was installed to run behind the wine band rack in the wine cellar out of the public view and enter the utility trench in the northeast corner of the wine cellar. It continued its run in the trench around the exterior perimeter of the winter kitchen against the east and north walls. Fortunately, the return pipe was already in the trench and had been placed there in 1929 as the 3-inch pipe was too large to be put on public view. From the trench new supply and return pipes were run up the walls of the winter kitchen to connect with the convectors in the school and sewing room and the Custis chamber above. All pipes were run at locations where they would be out of public view, either concealed permanently behind architectural features (fireplace block, B02/D1) or large furniture according to the 1978 Furnishings Plan (see footnote 23). Both supply and return were furnished with new gate valves just above the level of the brick floor. The winter kitchen should receive minimal heating from these pipes as it did previously from those that were suspended from the ceiling joists.

At the conclusion of archeological and heating renovation work, the brick floor was replaced in the north half of winter kitchen in the original (1929) pattern. The elevation of the floor was raised approximately 2 inches from the 1929 level to be even with the sill/threshold of B02/D1 to reduce that element as a hazard to public visitation.

North Wall: The north wall of the winter kitchen is a mixture of old and new brick. It is difficult to ascertain its evolution due to the many layers of white paint over the brick. There is a distinct bulge to the east of B02W1 which covers most of the lower 2/3 of that wall. This bulge may be a patch, or at the least, a parging.

The twin copper pipes in the northwest corner which rise vertically from the utility trench are the supply and return for the connector under 104/W1. They are a product of the 1980 north wing heating renovation and were placed so as to be concealed from public view by B02/D1.

From all appearance B02/W1 was totally replaced in the 1929 restoration. As in the windows in the cellar stairway hall, it is a six-pane sash hinged at the top; all hardware, the sill, the jambs, and the sash are reproductions. It appears that the lintel above the window may have been replaced during the installation of the connector in the school and sewing room above. Window B02/W1 has wooden vertical square protective bars on the exterior, which are modern. The brick rowlock sill is in modern material as are the brick corners of the opening. It is assumed that all replacement work on and around B02/W1 was effected during the War Department restoration.

West Wall: The west wall has a great number of patches, areas of parging, and heavy painting which obscure any determination of its historical evolution (see photograph #7). Its distinguishing features are a ledger wall and a chimney corbel. The ledger wall is one brick thick and reaches a height of 2' 1½" above the 1981 brick floor level. The ledger stops approximately 6 inches from either side of BO2/D1. It thus appears that a hole was broken through the west wall for BO2/D1 and then rebuilt in masonry to the door jambs. This patchwork is particularly apparent on the south side of the south jamb.

The corbelling begins on the west wall 4' 0" below the first floor boards. From its point of beginning, the wall steps out 5 inches in 2' 0" of rise. Once out 5 inches, the wall remains out these 5 inches for another 2' 0". The brickwork of this corbel is highly irregular and the 4' 0" x 7' 9" area in question contains several small areas in its center which are little more than rubble. As with the remainder of the basement walls, all is covered by so many layers of paint that little detail is apparent.

The archeological remains of the 1'/-8" wide brick foundation wall running perpendicular to the west of the winter kitchen suggest that the corbelled chimney breast was bisected by a thick brick wall at some point in its history. The intersection of this now vanished wall with the west wall would explain the areas of rubble toward the center, and also the fact that the brick coursing on either side of the rubble is not wholly symmetrical. On close examination, it is found that the coursing on the south half of the corbel is quite regular with headers and stretchers arranged in the following pattern, beginning at the base of the corbel: HSSHSSH. The coursing on the north side of the rubble

in the center, however, follows an irregular pattern: HSSSHSH. This evident mistake in carrying through an intended rhythm could have happened much more easily if the two areas in question had been separated by a wall rather than have been visually connected as they are now. The ledger wall below the corbelled area has been rebuilt to make it level. A brick header was removed from this ledger wall during investigations and it was found to bond into the main wall behind, making both walls integral and original to the structure of the north wing.

The foundation of the west wall is made up of a row of headers resting on a row of stretchers vertically flush. Protruding 3/4 inches out from the headers and stretchers is a sailor course. As sailor courses were originally and traditionally used to fill a gap quickly between two masonry areas, such as in a patch, their presence in this circumstance is unexplained and remains both an idiosyncrasy and a mystery. Below the sailor course is another header course which protrudes 4 inches more to the east and west. This header course rests directly on the ground and forms the bottom of the base of the foundation wall.

The top 1'-4" of the west wall was totally rebuilt by the army in 1929 when the ceiling joists of the winter kitchen were reworked.

Door B02/D1 is a six-panel door stained on west face and painted on the east face. The door has been cut down at the top, bottom, lock stile, and particurly the hinge stile. The door is very old in appearance and has been very poorly maintained. There is a ghost of a strap hinge on the rail between the lock rail and the top rail and the ghost of one or more large box locks on the east face. Hardware

presently on the lock stile consists of a crudely-fashioned tin handle; there is no keeper on the jamb, and no signs of there ever having been one. Hinges were not mortised, but rather placed on the face of the door and the east face of the jamb. There are a variety of hinges present on the door, none of which seem to pre-date the twentieth century. There is a strap hinge at the top of the door and a broken half of a strap hinge at the bottom. Just above the broken strap is a large butt hinge; there is a spring-loaded screen door hinge near the center of the hinge stile.

There is also no sign of hinges on the face of the north jamb. The fact that the jambs are devoid of signs of any hardware indicates that the jamb may not predate the hanging of this door, which may have been done toward the end of the nineteenth century or even in 1929, although the army would seemingly have used better quality and more consistent hardware. It can be said with certainty that the present door is not original to the opening and the jambs are not original, in all probability, either.

Door B02/D1 has a lintel facing the cellar stairway hall, which is believed to be original. The lintel facing the winter kitchen, however, was replaced in the mid-1970s; following that work, however, the door frame began falling away to the east. This condition was repaired in 1981 when the frame was pulled back tight against the old lintel, which is lower than the new lintel above the door frame. The frame was secured in place by the driving and gluing of two oak dowels through existing holes in the old lintel into the door frame's top jamb. Also in 1981 the sill was reset on a concrete base added to the concrete pad beneath the radiant heating system.

South Wall: This brick wall, two stretchers wide, separating the winter kitchen from the wine cellar, is neither original to the north wing nor bonded into the walls it abuts. The archeological investigations in the winter kitchen showed that the wall had no real foundation, resting directly on the ground at a depth of only three courses. The wall is constructed in a very irregular pattern incorporating a good deal of headers or bride bats randomly placed within the stretcher courses. This absence of rhythm in the wall suggests it was built with unskilled labor. The patch just below the ceiling joists and 3'-6" from the east wall was the location of the heating supply pipe prior to the 1980 renovation.

East Wall: This wall appears to have been laid up in a fairly regular running bond. In the area approximately to the point 3'-0" above the floor there is evidence of extensive water penetration, a problem which has hopefully been cured by the 1980 waterproofing. There is a high irregularity of brickwork between the northeast corner of the room and BO2/W2. The entire wall appears largely rebuilt in the first 1'-0" down from the ceiling, due to the replacing and reworking of the joists in 1929. As in most other basement walls in the north wing, there is some brick determination, some patching, and large areas obscured by many layers of white paint.

Window BO2/W2 is a six-pane sash window hinged at the top as already seen in the cellar stairway hall and the winter kitchen. Like all windows in the basement were thought to be, it was replaced in 1929 (see footnote #25) with all hardware, etc., being reproductions. It also appears that the brickwork around the window was relaid, and samples of the mortar indicate that it was not as recently rebuilt as BO2/W1. It

would appear that a hole was broken through the wall during the early history of the house and that the brick was relaid to a frame. The lintel above the window is the only element which appears original; the brick bat sill and a stretcher course below were apparently rebuilt during the War Department restoration.

Window BO2/W3 offers the same characteristics and situation as BO2/W1 and BO2/W2. In this instance, however, the window frame was removed in 1981 for renovation when it was found that the sill and bottoms of jambs were rotten. It appeared that this frame was older than the War Department restoration. After removal of this frame, what was initially believed to be red-coated plaster was found behind both side jambs. On closer inspection, however, the red coloration appeared more as a stain on some very hard concrete, probably portland. There is a strong indication that the opening for this window was knocked through the east wall as a number of bricks behind both jambs are broken off. As in other windows in the winter kitchen the sill was redone, and a stretcher course below, in modern brick and materials, was built in the War Department restoration. This rebuilding on all windows in the winter kitchen, and also in BO3/W1, may indicate that the original windows were taller than the present. However, as there is no real evidence to support such a theory, the windows will remain as they now are, particularly as longer windows would put their sills below present ground level, opening the basement for further problems with water entry. The lintel above BO2/W2 appears old.

There are two pairs of vertical copper pipes along the east wall which were installed during the 1980 renovation of the heating system.

Those to the north of BO2/W2 feed the connector beneath 104/W2 and will be largely concealed by a kitchen dresser (#2-11 in the Furnishings Plan, see footnote 23). The pair to the north of BO2/W3 feed the connector beneath 106/W1 and will be concealed from the sight lines of visitors examining the winter kitchen from the doorway of BO2/D1 by the masonry block of the fireplace. Both pairs have new gate valves, all of which should be left in the full-open position at all times unless leaks develop between them and the connectors above.

Fireplace Block: The fireplace block dates from the early history of the north wing and is largely original. It sits directly on the ground several courses below the present floor level.

The north face of the block contains the opening served by a flue, which can be seen to exit up the chimney. The flue is plastered, beginning just above the level of the opening, and this plaster surface is coated with soot. The area below the flue, the fireplace box itself, was extensively rebuilt during the War Department restoration.

The rebuilt fireplace box (photograph 8) presents a problem. Although furnished by the army with an iron crane and hooks to simulate a cooking fireplace,[26] it is obviously too small to have served this function. Assuming that the army duplicated the original construction, it is quite possible that this represents a niche for a cast-iron cookstove. This hypothesis is supported to some extent by the fact that the interior side walls are not splayed, as they almost surely would have been near a fireplace.

It has long been presumed that the hand-hewn lintel ($5\frac{1}{2}$" x $7\frac{1}{2}$") across the opening of the "fireplace" box was installed during the War Department restoration, primarily because it showed no signs of soot or

burn marks. However, if the fireplace box held a stove instead of a true fireplace there would have been no reason for burn marks to have appeared on the lintel. One piece of evidence which points strongly to the lintel being original to the fireplace block is the presence of old brick in the first two courses just above the lintel (see photograph #8). The fact that the lintel is not placed symmetrically on the block, extending to the west edge but falls about 4 inches short of the east, also contributes to the theory that the lintel may be historic.

It can also be clearly seen (photograph #8) that most of the third through the fifth courses above the lintel are replacement brick and mortar from the War Department restoration. Toward the center of the north face of the fireplace there are several more new brick in a square area which may be infill from a stove pipe which once entered the flue. While some of the early cast-iron stoves, which existed in the Washington area from the early nineteenth century on, exhausted directly up the chimney from the back of the stove, a stove also may have been located further into the room and connected to the flue by a pipe.

The last several courses of the fireplace block on all faces were rebuilt during the War Department restoration when the joists in the ceiling were reworked. The sandbox above the north face supporting the hearth of the fireplace in 104 appears original. The strips of wood supporting the sandbox appear to be from a single board broken with the grain a number of times to have it conform to the necessary arc.

The west face, except for the very top, is original brickwork covered with many layers of paint. Most of the courses are in simple running bond; partial header courses exist at the eighth, fifteenth, and twenty-fourth levels above the brick floor.

The south face has a relieving arch, of the same depth as the 'fireplace' on the north face, which supports the fireplace above in 106. The arch is original, covered with many layers of paint, and in excellent structural condition except for a slight vertical crack on the back wall of the niche. The sandbox may be a replacement, and the top of the face is rebuilt.

The east face is largely the same as the west. Partial header courses are found at the eighth, fifteenth, and twenty-third levels above the brick floor.

Ceiling Joists: Counting from the north face of the winter kitchen, the first five joists were installed during the 1929 restoration. These members show circular-saw markings on their sides, while the bottom edge has been hewn to appear old. The third and fifth joists hold a header across BO2/W2 which holds the east end of joists #3 and #4. All connections are mortise and tenon and the tenons of the header are pinned, with the pair of the north tenon missing. Joist #6 is interrupted by the sandbox of room 104 and is supported by the fireplace block. The two middle ends of joist #6 abut headers, the south ends of which rest on the fireplace block with the north ends mortise and tenoned into joist #5. The sandbox of room 104 falls between these headers.

The 1979 engineering report on first floor load ratings (see footnote #22) judged these first five joists to be overspanned in their ability to adequately support the sewing room (104) above for public visitation, and gave the system between the north wall of the winter kitchen and the fireplace block a rating of 30 PSF. As the public only visits the first 6 feet of 104 out from the west wall in order to view the

school and sewing room, and as the joists #1 through #5 appear in excellent condition after over fifty years of use, it was decided that no stabilization work would be effected in this area. The theory governing this decision is that if the entire sewing room rates 30 PSF overall, then the area only 6 feet from the west end of the joists must be at least 70 PSF. Also, on further inspection, it was judged that the header above BO2/W2 had no need for angle clips as the connections were tight and the presence of the modern additions would only detract from the historic ambience, as they would be in full public view.

Joists #6, 7, and 8 are also interrupted by the fireplace block; they all show lath nail holes and indicate that the ceiling of the winter kitchen may have once been plaster. All joists in the winter kitchen are painted white, some have many coats. The seventh and eighth joists to the west of the fireplace block are notched one-half-inch deep and one-inch wide in their bottom edges (2' 3/4" from the block on #7 and 1' 8" on #8). Also to the west the eighth joist has been reinforced, probably during the War Department restoration, by a modern timber bolted on its north face.

Joist #9 is also interrupted by the fireplace block. To the east, #9 runs from the header atop the block, running between joists #8 and #10, over to the east wall at a slight angle. On the west, #9 runs from another header, also between #8 and #10, over to the east header of the framing box around an area which once may have held a stairway to the inner hall (north wing). Joist #9 is not mortise-and-tenoned at any point, but connects to the headers by having its top portion form a tongue which is let into the other member.

Joist #10 runs from the east wall over to the east header of the framing box. The two headers which rest on the fireplace block and carry the sandbox in 106 are connected to joist #10 by having their top portion form a tongue which is let into the top of the joist, as was the condition with joist #9 in connection with the other end of the headers. This method of connection, also a type of mortise and tenon in a general sense, occurs on what are believed to be historic members and may be therefore more representative of the true construction characteristics of the house than reproduction techniques such as the pure mortise and tenon with pines as used by the army in 1929.

Joists #11, 12, and 13 also run from pockets in the east wall over to the east header of the framing box. These joists are believed to be old, showing no modern saw marks; their bottom edges are also rough hewn, but they preserve no lath nail holes. Unlike the framing condition over BO2/W2, which dates only from 1929, joist #12 is not headed off over BO2/W3 but rests directly on the window lintel. The condition over BO2/W2 may be a reconstruction of the historic condition as preserved until the War Department restoration; the header is more necessary there than it would have been over BO2/W3 because it was needed to support two joists which spanned the whole space, rather than one which ran only two-thirds of the way.

The framing box in the southwest quadrant of the winter kitchen measures 2'-6" x 7'-9" on the interior. It has become narrower as of 1980 due to an extra member bolted on the west side of the east header (see photograph #9). Three short joists infill the box; they connect to the headers by a top-edge tongue, already described as being characteristic of traditional construction practices at Arlington House.

The short joists issuing from the west wall which correspond to #10, 11, 12, and 13 are headed off by the west header of the framing box. These short joists may be older than their counterparts as they show lath nail holes. On close examination, it is difficult to say absolutely whether #13 actually has the lath holes or not. This joist also differs from #10, 11, and 12 in that it extends across the south end of the framing box and is connected to the east header as well as the west. The short joists within the framing box and those abutting it on the exterior were strengthened by the addition in 1980 of bolted angle clips. Joist #12 has a 3/4" deep by 1½" wide notch, which is its bottom edge approximately 1' 0" from the west wall.

Joists #14 and #15 span the whole width of the winter kitchen and are modern with circular-saw marks clearly in evidence. The engineering report of 1979 (footnote #22) gave the joist configuration below 106 a rating of only 18 PSF, the lowest rating in the whole house. The load rating was brought up to an approximate 70 PSF by the addition in 1980 of a 10 x 30 steel channel let into the masonry walls 6 inches on both the east and west (see photograph #10). The channel was jacked tightly into place and rests on steel bearing plates now concealed within the new brick patches surrounding either end of the beam. During the installation of this large member, it was necessary to break a substantial hole all the way through the west wall of the winter kitchen; a patch can now be detected, therefore, on the east wall of the cellar stairway hall in the stairway as well as the west wall of the winter kitchen.

The steel channel was placed beside joist #14 and, often jacking tight against the floor of the inner hall (north wing) and Custis

Chamber above, was bolted to the joist every 12 inches alternating top and bottom. The south end of the east double header of the framing box was bolted through steel clips to the channel. As joist #14 intervened, steel sleeves were placed within the joist to prevent its being crushed between the two steel surfaces.

The winter kitchen contains no lights, but does have a duplex receptacle on both the east and west ends of joist #2 on the north side.

Winter Kitchen (Room B02) - Proposed Treatment

Due to the extent of change in the fabric of the winter kitchen over the years, and to the lack of written documents concerning house history, it is difficult to make definite recommendations to ensure that the winter kitchen is interpreted to the public as it existed c. 1861. It is evident that the windows are reproductions and that they must be left as they now are (as is also the case in the cellar stairway hall) because we have no way of knowing what they were like in 1861. While they do not appear in the historic photographs, it is assumed that the army in 1929 simply reproduced windows similar to what they found.

The issue of whether or not the winter kitchen had a plaster ceiling in 1861 presents a difficult problem. What appear to be the older joists show lath nail holes; however, there are also old members in evidence which show no lath nail holes. The latter may have been brought from elsewhere in the house and placed in the winter kitchen in 1929. In view of the inconclusive nature of the present evidence no restoration of a plaster ceiling as recommended at this time.

It is possible that the fireplace block was built originally to hold a cast-iron stove and was operating as such c. 1861. It is also possible that the army rebuilt the "firebox" as they had found it in 1929, although we have no evidence of this. The fireplace in the winter kitchen is too small to have served for cooking.

We concur with the recommendations in the approved furnishing plan and recommend that archeological evidence be considered when selecting the period cook stove. In view of the lack of evidence concerning the original appearance of the "fire box" and the inability to date the stove pipe hole, it is recommended that the hole be used in installation of a period stove. Care should be taken to protect and preserve the physical fabric.

WINE CELLAR (BO3) - EXISTING CONDITIONS

Based on the testimony of former slaves who grew up at Arlington, Room BO3 was restored as the wine cellar in 1929.[27] Archeological work in 1980 found that the room had had a clay floor prior to the 1929 work and had once served as a coal storage area. The 1906 steam boiler furnace had been located in the west end of BO5, just adjacent to the wine cellar.

The quartermaster corps found a line of brick near the south wall in 1929. They were left in place when the brick floor was added at a higher level during the restoration and were discovered in 1980.

North Wall: The War Department restoration of 1929 placed a rowlock pattern of brick on the floor approximately 1'-4" wide along two-thirds of the north wall. On this base, they constructed a reproduction wine

rack which they stabilized by attaching it into four holes 5 inches down from the bottom of the ceiling joists. From the west wall, these holes occur at 8", 6'5", 9'9", and 15'5 1/2". There are four roughly corresponding holes in the wall near the bottom of the rack which have no connection with the present structure. They are spaced from the west wall at 3", 5'11 1/2"; 9'4", and 14' 11 1/2" measuring from the ledger wall. The north wall, as well as the others in the wine cellar, was covered with a rough parging of portland cement of recent vintage. This parging was removed in 1981 to reveal an irregular pattern of brick already described on the other side of the wall, that is, the south wall on the winter kitchen. Approximately the top 6 inches of the north wall have been either rebuilt or repointed used portland cement. Some of the wall preserves a covering of very low-lime brown coat, which is soft in nature and has little ability to stick successfully on the wall. There were also seen traces of whitewash on some brick beneath this plaster coating. Patches in brick on the east end of the north wall were areas where heating pipes once passed.

West Wall: As in the winter kitchen, the west wall has a short ledger wall which may once have supported floor joists in a different arrangement of the north wing. This wall also shows traces of whitewash, with brick in an advanced state of deterioration, particularly to the north of B03/D1. It is probable that the portland parging was an attempt to preserve the brick; unfortunately, the hard and highly-adherent cement, in being removed, resulted in even more of the brick face being destroyed. The top 1' 6" of the wall was rebuilt in modern brick and portland cement in the War Department restoration when the ceiling joists were replaced. Further brick replacement

occurred in 1980 when the old lintel above B03/D1 was removed during the ceiling joist reinforcement in the cellar stairway hall. At that time, the interior of the lintel was reinforced with a steel angle before being replaced. This work was necessary due to the bearing of one joist in the cellar stairway hall and two in the wine cellar on the lintel above B03/D1 (see photograph #11).

Door B03/D1 is made up of four tongue-and-groove boards, both faces beaded and painted, with three chamfered battens across the east face. The door is swung from the casing by two large strap hinges of uncertain age; no other hardware, or its traces, is found on the door. The door frame itself appears old and may be original to the opening. It appears that the masonry was laid-up to the door frame on the south; on the north, however, there are unfilled brick from the level of the top of the ledger wall to the top of the door frame, indicating that a larger opening arc existed but was made smaller. As the condition begins at the top of the ledger wall, it may indicate that the opening did not originally come down to the present floor level. This condition may point to the presence of a window or a door when ground floor joists were supported by the ledger wall. This wall to the north is in a rough state of partial collapse, and to the south it has been rebuilt.

The door frame of B03/D1 has mortises for two butt hinges on the south jamb, showing that the present arrangement is not original to the frame. The threshold is worn but not enough to require replacement at this time. This threshold is probably not original to the frame. The door casing exhibits cut as well as wire nails.

South Wall: The central portion of this wall is the north wall of the main block constructed between 1817 and 1819. Brickwork in this

portion is regular, laid in the common bond characteristic of the main block with a header row every sixth course. There are a number of holes near the top of this wall which were punched through in the twentieth century to allow the passage of electrical conduit from the north wing to the service box in B05. Much of the surface of this wall is covered by remains of the low-lime brown coat over traces of whitewash.

The wall described above is flanked on either side by cheek walls of the original south wall of the north wing. The main block was built right against this original wall, and the major part of the original wall was presumably torn away to give maximum space in the wine cellar (and the inner hall (north wing) and the Custis guest chamber above). The two remaining pieces of the original wall, each approximately 3 feet in length, remained for support of the south corners of the north wing. These cheeks are two bricks wide, laid up in running bond like the rest of the north wing, and touch the wall of the main block without being bonded to it.

On the middle of the west cheek wall there is a soot-blackened flue hole 8 inches down from the bottom of the ceiling joists, which extends into a flue in the fireplace block on the west side of B05 (see photo-graph #12). On the east cheek wall there is a ledger wall 2'-6" high and two bricks thick which is not bonded into the cheek and which has no obvious purpose. Above this ledger wall on the north face of the cheek are found, just below the ceiling joists, some of the best examples of the brown coat which remain. At this location the plaster coat was covered with a red pigment similar to that found in the north wing rooms above and which apparently dates from the earliest

occupancy of the house. Over the red pigment are seen a number of layers of white and off-white paint. The edges of the cheek walls facing east and west are rough and show that the remainder of the south wall of the north wing was once torn out when it was no longer needed.

East Wall: The red pigment and subsequent paint layers on plaster can be detected again on the north section of the east wall of B03 where they can be seen to extend behind the north wall. The latter has already been shown to have been added later. This information says that the whitewash, brown coat plaster, red pigment and subsequent coats of paint were all on the walls of the wine cellar prior to the construction of the north wall dividing the winter kitchen from the wine cellar. The top of the wall on the east was rebuilt around the new ceiling joists during the War Department restoration and again partially in 1980 when the reinforcing channels were added. To the south of B03/W1 are found more evidence of paint over plaster; there is only little evidence, however, of whitewash beneath the plaster layer.

As with other basement windows examined in the north wing, B03/W1 appears to have a modern frame and hardware. This is the only case, however, where the six-pane sash may predate 1929. Vertical wood bars are found as the exterior; they are modern. The irregularity of the brickwork on the north and south jambs of the masonry opening suggest that the window may have been broken through an existing wall. The sill was rebuilt with new rowlock bats and three stretcher courses below it. This rebuilding, also detected in the winter kitchen, may mean the windows were once longer. This

would have been obtained when the ground level outside was lower, prior to the building of the main block (see Archeological Data Section). The area above the window was also completely redone in modern material in 1929. There is no lintel above the window and the masonry rests directly as the head of the window frame.

The War Department constructed a rack to carry wine barrels, etc., across the east wall during its restoration. This rack was built with the additional purpose of concealing the hot water heating system return pipe just before it disappears into the utility trench in the northeast corner of the wine cellar. The rack now also conceals the hot water heating system supply pipe, which was rerouted from the ceiling in 1980 during the heating system renovation.

Ceiling Joists: All the ceiling joists in the wine cellar, with the exception of #10 (counting from the north), show circular-saw marks and date from the War Department restoration. Joist #1 has its bottom edge hand-hewn in imitation of an old joist as found in #1 through #5 in the ceiling of the winter kitchen. Joist #2, which lies right beside #1 through #9 is not hand-hewn and has their full depth. It is apparent that the first joist was hewn prior to the decision to give the wine cellar a board ceiling to cover a network of conduits, thereby making hewn joists unnecessary. The ceiling which was installed was made up of all manner of discarded trim, flooring, etc. Being totally without authenticity or precedent at Arlington House, this board ceiling was removed in 1980 and will not be replaced.

Joist #10 is old and dates from the period after the main block was constructed and the major portion of the south wall torn away. It exhibits lath nail holes and stains from fresh plaster between the lath

ghosts. In a number of instances, whitewash can be seen over the plaster stains, as well as on the side of the joist. This evidence indicates that the joist was whitewashed after the plaster and lath were removed.

The other old member in the ceiling of the wine cellar is the header over BO3/W1 which is mortise-and-tenoned between joists #3 and #6 and which carries joists #4 and #5. Steel angle chips were bolted between these joists and the header in 1980. Joists #3 and #6, showing signs of longitudinal splitting near their west ends, were reinforced also in 1980 by the addition of a 9 x 15 steel channel lit into the east and west masonry walls on bearing plates and bolted every foot alternately near the top and bottom on each joist.

All conduit which was once concealed by the inappropriate board ceiling was either removed or rerouted in 1981. Three conduits were brought through the center of the south wall of the wine cellar, through the tops of the joists, and distributed as necessary. As they now are routed, the conduits cannot be detected from the doorway of the wine cellar, which is where the public stops to view the wine cellar. It will be noted here that all wiring and receptacles in the north wing were replaced in 1981 using copper wire when the conduits were reworked in the wine cellar.

At present there are no lights in the wine cellar and one duplex receptacle near the ceiling between the north wall and joist #1 near the east wall.

Wine Cellar - (Room B03) - Proposed Treatment

The testimony of ex-slaves identifies room B03 as the wine cellar.

The four pockets in the north wall at the base of the reproduction wine rack may mean that some kind of rack, which predated the present one and depended on these pockets for support, was once in place in that location. The present rack against the east wall served the additional purpose of concealing large pipes and cannot be removed unless the pipes are moved elsewhere.

As has been noted, the walls of the wine cellar show many treatments and give little indication of a date for any of them. In the ceiling there is evidence of both plaster and simple whitewashed joists, while the great majority of the material dates only from this century. There is at present insufficient detailed evidence to recommend change.

The interpretation of room B03 as the wine cellar must stand. Both wine racks should remain.

Based on the archeological evidence, it is recommended that the floor be shown as a hard clay with the brick under the wine rack remaining in place for needed support. There are also a few bricks on the floor against the south wall which should remain. The walls should remain as they are, showing a composite of all their treatments, until additional evidence is established. Patch all holes in the walls with the old brick and matching mortar before the space is reopened to public view. The wall texture as it now stands exhibits evidence of historic treatments.

With all conduit now rerouted out of public view, it is recommended that the existing circular-sawn joists in the ceiling be

whitewashed (as well as the underside of the floor boards above). As to the evidence of a former plaster ceiling found on the sole surviving original joist, without further corroborating evidence, no reconstruction of a plaster ceiling is recommended.

As was noted earlier, both the winter kitchen and the wine cellar should be included in the appropriate lighting plan for the entire house.

NORTH CELLAR HALLWAY (MAIN BLOCK) (ROOM B04) - EXISTING CONDITIONS

This area beneath the north stairhall is the only main block basement space to have a floor in 4" x 8" brick as found in the north wing basement rooms. This room was most likely bricked during the War Department restoration like the others.

All four walls of the north cellar hallway show many successive coats of paint and/or whitewash. Out of the north wall protrudes the end, very irregular in form, of the stone wall which is the major part of the west wall in the cellar stairway hall. This wall may have been torn away at this point, or simply not finished plumb and smooth in brick, as were similar end walls in the cellar stairway hall.

The doorway B04/D1 does not appear in the army house plans of the early-twentieth century now preserved in the graphic section of the National Capital Region. These drawings, however, are not to be trusted entirely as they also do not show the opening in B04's east wall, noted as B05/D1, which may have been in existence since the building of the main block in 1817-19.

Door B04/D1 is a four-panel door, painted on both faces. It is difficult to properly examine the door as the whole south face is covered in masonite as fireproofing and the south side of the frame in galvanized metal. The lock stile, however, does have a box lock of uncertain age on the south face. There are also ghosts on the north face of some former lock or knob, and an escutcheon plate exists there in connection with the box lock. The hinges are not mortised into the jamb and edge of door as usual, but are attached flat to the south face of the door and frame. It is difficult to estimate the age of either the door or the opening.

Two switches which control ceiling lights under the main block and south wing are located just to the east of B04/D1. Both the supply and return pipes for the hot water heating system rise out of the utility trench in the northeast corner of the north cellar hallway. Interrupting the return pipe is an electrically-operated solenoid valve and a manually-operated gate valve, both of which control the radiant floor system in the cellar stairway hall. The thermostat for the floor system is located on the north wall of the north cellar hallway; it is activitated by a bulb sensor, the location of which has already been described in the brick floor of the cellar stairway hall.

Near the northwest corner of the west wall are located all the telephone hook-ups for the main house. Both the telephone and electricity main wires enter the house near the floor level on the west wall several feet from the northwest corner. The electric cable runs up the west wall and across the ceiling of the north cellar hallway to service boxes in B05. The fire detection system, installed in 1976, is located on the west wall of north cellar hallway near the southwest corner.

Window B04/W1 is an eight-pane single-sash window all of whose elements are War Department restoration replacements. The masonry opening was also extensively rebuilt with new materials on the north and south jambs, the rowlock sill, and four courses beneath it. The window may have been longer at one time, or it was extensively repaired due to deterioration which took place prior to 1929. Window B04/W1 has four square horizontal wood bars on the exterior as a barrier, which also dates from the War Department restoration. The lintel above the window is old.

One of the original hot water coil units dating from the 1929 installation of the hot water heating system is located in the center of the north cellar hallway. A duct from this unit leads to a diffuser above B04/W1 in the floor below 110/W1.

The ceiling joist system is old and original to the building of the main block. The replacement floor of the north stair hall above rests on a thin layer of plywood, as was the case in the cellar stairway hall before the floor of the pantry was replaced. All old joists are whitewashed on the bottom edge and sides, and show evidence of lath nail holes indicating that there was once a plaster ceiling. Whitewash is also seen on some flooring, believed to be original, near the northeast corner of the ceiling of the north cellar hallway.

Counting from the north wall, joists #, 4, and 5 were cut near the east wall and headed off to accommodate an apparent stairway which once ran down into the north cellar hallway from 110A above. This stairway was removed, however, at some point in time and boards were placed over the hole. This removal must have occurred prior to the general whitewashing of the room as the undersides of the boards show remains of old whitewash.

In 1978 some shoring work was done in the north cellar hallway to strengthen the floor above and to give added support to the bottom of the servants' stair in the north stair hall. In order to go above to remove this shoring, it would be necessary to strengthen each ceiling joist, for which it would be further necessary to remove the replacement floor in the north stair hall. While this operation was recommended in the preceding report on structural stabilization in 1979, it was later decided to leave the present shorting in place and to do no further work in the north cellar hallway. The object of the structural stabilization work at Arlington House in 1980 was to bring all floor systems up to a load rating of 70 PSG, which was judged to be an acceptable rating for the visitation of a historic edifice not built as a public place. The engineering report of 1979 (see footnote #6), rated the shored-up ceiling of the north cellar hallway as 100 PSF. As the north cellar hallway was never to be seen by the public, and the 1979 shortin was not in the way of movement through the basement, it was decided that the work necessary to strengthen the ceiling joist system independently of the shorting was not worthwhile considering the many other, more serious structural problems to be addressed in the house as a whole.

There are no electrical outlets in the north cellar hallway. The space is lit by the single bulb in a porcelain fixture near the center of the room.

North Cellar Hallway (Room B04) - Proposed Treatment

The temporary shoring erected in 1978 should be left undisturbed unless it is decided to strengthen ceiling joists individually.

CELLAR UNDER FAMILY PARLOR AND DINING ROOM (ROOM B05) - EXISTING CONDITIONS

Cellar space B05 has a dirt floor throughout and presents no sign of ever having had anything else.

The north wall contains the lower portions of the two chimneys on the north side of the main block. The chimney base to the east is a relieving arch for the firepalce above the family parlor. The arcch was rebuilt in the War Department restoration after ductwork from a hot water coil unit was carried through the top of the arch to a diffuser in the floor of the fire box parlor fireplace.

While the base of the east chimney was always a relieving arch much as it remains today, the lower portion of the west chimney was originally, and probably historically, a work fireplace. Today the base has been transformed into another relieving arch, over which the ductwork form a hot water unit passes into the floor of the fireplace fire box in the family dining room. Not only is the arch of new brick and mortar as in the est relieving arch, but the infill of the original fireplace forming the arch jambs is also of modern material. The existence of this fireplace is documented in drawings for the renovation of the heating system carried out in the late 1940s.[28]

Door B05/D1 appears to be an old hollow-core firedoor. The door is painted gray on both bases; its only significant hardware is a modern rim right latch on the south face and the two hinges. The door frame is wood covered with metal and has above it a heavy cast-iron angle which served as a linted. It is difficult to determine whether or not the opening for B05/D1 was cut through the wall of the main block or built

as an opening in 1817-19. The presense of the cast-iron lintel would suggest that the opening is original is that it would have been the only connection between the north wing cellar and the main block prior to the enclosing of the north wing loggia. The limited examination of the brick jambs, which are covered by a hand plaster, seem to support the assertion that the opening is original.

All electric service boxes for the house are located on the west wall to the north of B05/D2. The opening B05/D2 contains a frame of unfinished wood, jambs only, with no casings, and an old wood lintel which supports the east end of several joists in the north cellar hallway and the west end of several other joists in B05. This lintel was examined in 1980 and found not to need steel reinforcement.

The south wall is covered with a number of heavy coats of paint and/or whitewash. Two major openings, each 4'0" wide, and corresponding to the other basement opening in the main block, were infilled with brick and mortar prior to the coats of paint/whitewash. There is a third, smaller opening measuring approximately 2'0" x 2'0" located several feet below the ceiling joists. It appears that this opening was infilled during the War Department restoration work; also, the bottom of the west opening was redone at the same time. The lintel of the west opening remains in place between courses of brick, while the lintel of the east opening is covered by a patch of portland cement.

The east wall is uniform, having no openings, and laid up in a common bond having a header row every sixth course. The only pathing is that of some areas at the top of the wall between joists. Supply and return pipes for the hot was heating system run north-south close to this wall at an elevation for several feet above the ground.

The ceiling joists are all original, having whitewash on their sides and bottom edges, and lath nail holes. The joist system overlaps in the center of the space atop a beam running north-south, which is supported at its center by a brick post. The 1979 engineering report questioned the support provided by this system; the combined spaces 108 and 109 were given a low rating of only 20 PSF. The structural stabiliation effort of 1980 gave the post a more solid bearing surface with a cast-in-place reinforced concrete cap that replaced a pile of loose brick. The beam itself, which was simply two 3 x 12's nailed together, was significantly strengthened by the addition of 3/8" flitch plates attached to its south side by through-bolts, washers, and tpas, alternating at the top and bottom every 6 inches. The flitch plates meet over the post and bear on two large pieces of close-grained pine. On the north the plates extend into the masonry wall, but they do not on the south. As neither the family parlor nor the family dining room are visited by the public, it is felt that the addition of the flitch plates brings the beam load rating up to a greater-than-acceptable level, which ensures the safety of furnishings in the rooms as well as any group of visitors which might be allowed access in the future on an occasional basis.

The joists supporting the two sandboxes on the north side of the room were reinforced by the addition of a wood member placed beside

each and bolted through. Further stabilization was achieved by the sue of solid plywood bridging between the new members of the next joist to the south. The headers holding the sandboxes, and the joists they carry, were all reinforced by steel angle chops bolted into place. Btoh sandboxes appear old.

There are two porcelain fixture litghts, one in the center of each half of the B05, and two duplex receptacles on the service box panels against the west wall.

CELLAR UNDER CENTER HALL (ROOM B06) - EXISTING CONDITIONS

The floor of the cellar under the center hall is laid in square paving brick measuring 8" x 8" over sand, all of which probably dates from the War Department restoration or later. There is no indication why there was a change of material size in the paving of this space.

The 1980 archeological investigation located the foundation remains of the coal-fired furnace installed by the Lee family in 1855.[29] It was found toward the center of the space, and north of an east-west centerline. Cast-iron remains of the furnace still extant at the Arlington House are located in B08.

The three form openings along the north wall, already described from the B05 side, exhibit brick and mortar which all seem to date from 1929. It is believed that the two large openings were originally infilled with only one width of brick that was flush with the south wall in B05. Later, during the 1929 work when the small opening was also closed, another width of brick was perhaps added to the previously infilled openings to bring them out flush with the north wall of B06.

The firedoor at B06/D1 was added in 1981. The old wood lintel above the opening, which dates from the building of the main block, was left in place and reinforced on its north and south face by the introduction of two 4" x 4" steel angles. Brick jambs were laid up on either side of the metal door frame to fill in the rest of the 4 foot opening. The large air duct passing above the doorway was enclosed with masonry.

The west wall exhibits large areas of repointed masonry which may have resulted from water entering the wall over the years and deteriorating the original mortar. Window B06/W1 is a three-pane single sash window dating from 1949 when the exterior heating system air intake was replaced by an air interior return system. The lintel is circular-sawn, and may date from the War Department restoration work when the masonry opening was opened into the west wall for the air intake. It is probable that no opening existed earlier than 1929 as none is shown in the army drawings of the house which preceded the restoration. The brick sills, jambs, and head were rebuilt in portland cement. There are two horizontal bars on the exterior.

The southwest and middle openings along the south wall were infilled with a width of modern brick and mortar in 1980 to provide a fire stop. The wood lintels were removed and replaced with steel 4 x 4 angles, and the brick above the lintels was replaced up to the level of the first floor. There is also a small opening to the east of the middle 4' 0" opening and just below the level of the ceiling joist, which was infilled during the War Department restoration.

The east wall is a uniform surface in the common bond characteristic of the main block. Heating return and supply pipes run

several feet off the floor near the wall, as they do also at the other wall, or north end of B06.

All ceiling joists are original and unpainted. Many are hand-hewn on one side, the sash-sawn on the other; some are sash-sawn on both sides. Counting from the east, joists #14 and #15 are notched near their north ends in sections measuring 1 1/2" x 1'-0" which face each other (see photograph #13). It was through this opening that the heating duct from the historic furnace passed to the upper floors.

Almost all ceiling joists show some powder post beetle activity; but in no joist is it extensive enough to require additional members at this time. The center hall (111) floor received a low 38 PSF rating in the engineering report of 1979 due to the danger presented by the old wood lintels over the openings. As all openings off B06 have no been either infilled or provided with steel lintels, there should be no further problems with load ratings in the future as the existing joists have such a short span. There is no evidence of any current powder post beetle activity.

Prior to the structural stabilization work in 1980, most of the cellar at Arlington House was open and highly susceptible to the rapid spread of fire. The only doors with any possible fire rating over one hour were B04/D1 and B05/D1, which separated the north wing from the rest of the house. It was felt upon examination of the cellar that the space B06 was a potential fire hazard area due to the presence of the two electric motors which handle most of the house heating air return. Other areas of potential trouble were the electric service boxes in B05 and the other return air motor in B10. As a result of these concerns for the retardation of fire, three modern fire doors (B06/D1, B08/D1,

B10/D1) were installed to divide the basement into five fire zones: #1-B01, B02, B03, #2-B04, B05; #3-B06; #4-B07, B08; and #5-B09, B10.

There are no duplex receptacles in B06; the space is lit by bulbs in two porcelain fixtures, one near each extremity of the room.

SOUTH CELLAR HALLWAY (MAIN BLOCK) (ROOM B07) - EXISTING CONDITIONS

This cellar space mirrors B04 in the symmetrical plan of the house. The floor is dirt and probably was never different. One of the six original hot water coil units was installed in the center of this space in the War Department restoration and feeds the diffuser above in the south stair hall. At the time some shoring was added near this unit to compensate for the weakening of the joist system by the introduction of the diffuser and ductwork.

Window B07/W1 is an eight-pane single sash window and all modern. The rowlock sill and six courses below it were also redone in modern materials in the War Department restoration. The wood lintel over the window is the only old element. There are four horizontal bars on the exterior.

All joists are original; counting from the north, joists #1, 2, and 3 had a modern member added beside each for strength in 1980, just as joists #4 and #6 were strengthened in the War Department restoration. Differing from B04, there are no remains of stairways to the room above.

There is one procelain bulb fixture in the center of the space and no receptacles.

CELLAR UNDER WHITE PARLOR (ROOM B08) - EXISTING CONDITIONS

Cellar room B08 has a dirt floor, with no signs of ever having had anything different, except for a 3'-0" wide walkway of square brick pavers leading from B08/D1 to B10/D1.

Door B08/D2 is the only instance in the house where a k-brace was used to strengthen a wood lintel (see photograph #15). The two legs of the brace extend out and down from the center of the lintel and are let into the jamb brickwork approximately 2'-0" from the top on either side. This brace is believe to have been added in the War Department restoration and gives very strong support for a weakened condition.

Both of the chimneys on the south side of the main block begin in B08 on the south wall. There are no fireplace remains in B08; rather the chimney bases both were fixed with relieving arches to carry the two fireplaces above in the white parlor. The arch to the east serves as a connecting passage to the south wing basement. The arch was originally 1'-6" higher, but was lowered in 1929 to permit passage of the heat duct to the diffuser in the floor of the east fireplace fire box. The west arch was similarly lowered in 1949 when the original six coil units were increased to nine, necessitating the installation of a floor diffuser in the west fireplace as well. The sandbox above this arch appears original, but the east one has been replaced in modern materials.

The joist system of the ceiling of B08 mirrors that of B05 with the difference that the joists in B08 are unpainted and show much of the same milling characteristics as those found in B06. Problems with this joist system were compounded by the fact that the public does visit the space above and actually moves through it when passing from the south

wing to the center hall. In order to increase the loading rating of 25PSF assigned to the white parlor in the 1979 engineering report, the existing center beam and post (see photograph #16) were treated in the same manner as in B)5, except that the flitch-plated beam rests on oak plates rather than pine (see photograph #17). The flitch plates extend into the masonry both on the north and south. Some of the plates extend into the masonry both on the north and south. Some of the joists show powder post beetle damage, but none to the extent to require reinforcement. Joists #7, 8, and 9 from the north wall on the west half of the space show circular saw marks and are believed to have been installed during the War Department restoration.

Joists and headers surrounding the two sandboxes on the south portion of B08 were reinforced in like manner to those in B05.

There is one porcelain bulb fixture in each half of B08 as bisected by the center beam, and no receptacles.

CELLAR UNDER STORE ROOM (ROOM B09) - EXISTING CONDITIONS

There is only a dirt floor in this space, and it slopes from B09/D1 to B10/D2. There is no evidence of any other floor material.

The north wall appears to be largely original brickwork. There is a brick post west of center engaged into the north wall which carries the north arch of the south wing loggia. This post shows some plaster on its west face, with which the whole post may have once been covered.

The west wall has been largely rebuilt in new materials from a point approximately 2'-6" above the dirt floor. B09/D1 is a four panel door

painted on both faces, which probably is no older than the 1929 restoration. There are no ghosts on the door. The lock stile has a supposed reproduction box lock and keeper, with a barrel bolt above missing its keeper. The hinges are not mortised, but applied direclty on the surface of the east face of door and jamb. It is believed that the door, frame, and sill all date from the War Department restoration.

The lower half of the south wall is in stone and rises toward the east. The west half of the south wall was entirely rebuilt in 1929; the other half is mostly original brick work except for the southeast corner of B09; there is also a valve and fire hose accordion in this corner to serve the cellar.

The east wall has an opening (B10/D2) into B10 which is spanned by the only example of a segmental arch at Arlington House. The arch, however, is not believed to the original as it is constructed entirely in modern materials, as are portions of both jambs. It is probable that the arch replaced a wood lintel in 1929; it is also possible that the segmental arch may have replaced a similar one found in disrepair and reconstructed during the War Department restoration.

The ceiling joists in B09 are the split-log variety as seen in B01, but using timers of even less section. This floor system received a low rating of 25 PSF in 1979. This rating posted a particular problem as the store room (Room 114) is the point at which the public passes through. Counting from the east, #3 and #5 were added in 1980 to supplement areas where the original joists had been placed too far apart. Joist #4 was also reset in portland cement at this time, as were the new joists. It is now believed that the small store room above can safely support any normal loads from visitation.

There is one porcelain bulb fixture near the center of the room and a duplex receptacle above the fire hose rack attached to the south side of a ceiling joist.

CELLAR UNDER MORNING ROOM & OFFICE (ROOM B10) - EXISTING CONDITIONS

This room has a dirt floor throughout except for a 2'-1" wide walkway of square brick pavers leading from B10/D1 to the south wall. Archeological investigation in 1980 discovered a herringbone pattern floor preserved approximately 10 inches beneath the present dirt floor. Portions of this floor were uncovered in front of the east face of B10/D2 and in the northeast corner of the room; the full extent of the herringbone brick floor is not known at this time but is presumed to cover all of B10.

The north wall of B10, which is the juncture of the south wing and main block is almost entirely original brickwork dating from construction of the main block in 1817-19. The original south wing wall is represented by two small cheek walls at the east and west extremities. They were laid up smooth and exhibit not broken bricks. Archeological investigations in 1980 uncovered a brick foundation which connects the cheeks. The occurrent of the cheeks and foundation led to the hypothesis, stated in the previous section, that when the south wing was built in 1804 construction of the main block had already been envisioned and a temporary wall built here.

The edges of the south wing cheek walls have been so extensively rebuilt that no ghosts which might suggest the nature of the temporary

wall have survived. Wood frame seems the most likely material for it, however.

The modern firedoor B10/D1 (see photograph #18) was installed in 1980. Due to its closing off an arch in masonry, it was necessary to construct a new set of jabs in modern materials to the south of the passageway to hold the rectangular metal frame. Frame, jambs, and original brickwork are all connected by pins.

On the west wall, the opening B10/D2 shows modern brickwork on the B10 side of the segmental arch as well. There was also some rebuilding of the arch jambs as well. There was also some rebuilding of the arch jambs on the B10 side. Two 8" x 1' 0" brick posts were constructed in 1980 on either side of B10/D2 and rest on the herringbone pattern floor discovered beneath. Pins connect these posts to the original brickwork. These modern posts carry a beam (see photograph #19) composed of four 2 x 12's nailed together and bolted into the masonry wall to the west. This beam strengthens the carrying capacity of the joist header beneath 115/D2 upstairs where the public moves from the store room into the morning room and congregates in the northwest corner of Mrs. R. E. Lee's morning room.

It is believed that the present relieving arch in the base of the south wing chminey (see photograph #2), also on the west wall of B10, was once a fireplace serving B10. The present relieving arch and the brickwork on the arch jambs and in the back of the fire box were probably effected during the War Department restoration when the heat coil unit and ductwork were installed to serve the diffuser in the fireplace fire box floor in Mrs. R.E. Lee's morning room above. One of the best places of evidence for its having been a fireplace is that the

back of the fire box has been rebuilt by a new brick wall; this rebuilding wood have been necessary if it had been a working fireplace due to the usual and rapid deterioration of brick when exposed to repeated fires. There is also a clear line of demarcation between the old and new brickwork on the face of the north leg of the fireplace showing where the fireplace fire box was infilled when the arch was built. There is not such line on the south leg as it has been entirely rebuilt.

The majority of the rest of the west wall of the south of the fireplace block also appears to have been rebuilt during this century except for the portion directly beneath the duct serving 116. This coil unit, duct, and diffuser were added in 1949. It is believed that the diffuser in 116 served by this heat coil unit was placed in a small opening, perhaps a window, which found a connection between B10 and 116 prior to this heating installation. A lintel presently seen over this duct on the west wall of B10 is whitewashed like the original joists in B10 and the lintel over B10/W1.

The south wall of B10 was largely rebuilt in modern brick, mortar, and mortar repointing during the War Department restoration. The opening B10/D3 was cut through at the time, and the area in B10A partially excavated to accommodate one of the original six heating coil units which served 117 from a diffuser in the floor under 117/W2. Opening B10/D3 has a lintel made of two heavy steel channels placed side by side.

The east wall of B10 was also mostly rebuilt during the War Department restoration. It is evident from the original brick remaining and their present condition that the problem of water entering the basement through the exterior walls has largely been at fault in causing

the degeneration of the soft brick used in the construction of the house. It is thought that the waterproofing carried out in 1980 has alleviated the problem of water entering from the exterior through the brick foundation walls.

A six-pane sash hinged at the top (B10/W1) is also found in the north wing of the cellar. The sash, hardware, and frame all appear to date from the War Department. Due to its poor condition, the sash was renovated in 1981. The lintel is whitewashed and appears original as do the sailor courses which form the joists. The sill has been rebuilt in brick. The presence of the rebult sill and the sailor courses may all indicate that the window has been made small since the south wing was constructed c. 1804.

With regard to the ceiling joists in B10, counting from the north, #1 seems original. Numbers 2 through 8 and 14, however, show circular-saw marks and were installed during the War Department restoration. The original joists were once whitewashed, but show no lath nail holes. Joists 3 through 5 were headed-off over opening B10/D2 and their west ends attached to the header by heavy steel angles and lag bolts, as well as a rough mortise-and-tenon. The header is also roughly mortise and tenoned into joists 2 and 6. Because of the inability to accurately evaluate the strength of these connection, the brick piers and composition beam were installed, as has been described.

The engineering report of 1979 gave the morning room (115) a low PSF rating of 20. Much of the weakness found in that floor system was attributable to the high load carried by certain header joists. header joists 2 and 6 were relieved of a large burden by the piers and composition beam above B10/D2. A good deal of floor load of 115,

however, was also being carried by joists 7 and 12, which support the sandbox header carrying the west ends of joists 8 through 11. In order to strengthen these critical members and bring the floor load rating up to an acceptable level, a flitch plate was bolted to each joist, alternately near the top and bottom, every 6 inches (see photograph #2). Those plates were not continued into either the east or west walls, however, due to their length and the necessity to bring them into the contrained space in one piece. Additional strength was provided by clipping all header and joist connections with steel angles and bolts. The sandbox enclosed by the header was apparently rebuilt in the twentieth century.

Space B10 is lit by one porcelain bulb fixture toward the center of the room; there are no receptacles present.

Space B10A was partially excavated during the War Department restoration contain the heat coil unit as has already been noted. In order to be better able to move in the space to inspect conditions on the south exterior wall of the south wing, more of the area was excavated in 1980 and a low brick retaining wall of modern material was constructed. In order to better provide access to the adjacent, unexcavated crawl space to the east notated as B10B, an opening was cut through the east wall of B10A in 1981 and fitted with an appropriate frame in salt-treated, wood. This opening replaces one in the south wall of B10, which was largely blocked by heating supply and return pipes along that wall and finally infilled with modern brick and mortar in 1981.

Space B10A has a large mass of unmortared brick in the northwest corner; its purpose remains unknown. The brickwork of the south wall shows the worth overall deterioration of anywhere in the Arlington House cellar (see photograph #20). This condition was noted in the 1979 structural stabilization report; B10B also shows similar problems on south

and east walls. The joists in the ceiling of B10A and B10B are all replacements and were reused from other places in the house during the War Department restoration. As these joists did not have to span a great distance, the ones used may have been the good portions of longer joists which were cut down for this purpose. Some of these joists show lath nail holes and were used one at some location to support a plaster ceiling; all the joists used in both B10A and B10B are whitewashed.

There is no light in B10A, but there is a single bulb porcelain fixture in the center of B10B. There are no receptacles present in either space.

Cellar - General Recommendations

Further recommedations for the cellar area at Arlington House are the identification of and the monitoring of any water coming through walls from the exterior, in any of the spaces, and, in particular, those of the south wing cellar. It is also felt that fire dampers should be installed in all ductwork passing through the walls of B06. It is recommended that all structural stabilization work carried out in 1980-81 be monitored for correct performance as anticipated by the residence exhibit specialist. Space B10A should also have its own porcelain light fixture connected into the basement lighting system for proper monitoring of the south foundation wall. Also, the standpipe and firehose accordion should be removed from B09.

PANTRY (ROOM 101) -EXISTING CONDITIONS

The flooring of the pantry is random-width, tongue-and groove pine running north-south. This floor was put down in 1980 following renovation of this support system; the floor it replaced was also twentieth-century flooring formerly used elsewhere.

The baseboard in the pantry is continuous and intact. The board is characteristic of the north wing in being of simple design with a single bead running at the top. This baseboard dates from the enclosing of the north wing loggia sometime between 1820 and 1850.

As was noted earlier, both BO2 and BO3 are much in need of historic house lighting, particularly an accentuating of notable features. North Wall: This south wall of the bathroom (room 102) is plaster on sawn lath with only one series of plaster. The east corner of this main portion of the north wall of the pantry is done in a curve and is the only historic instance of such a usuage at Arlington House. The curved portion is fashioned out of two pieces of board, 1½" thick, each of which completes 45° of the total 90°. The whole is beaded on the west edge. Some of this beading is cut off at the bottom and mitred in to a 45° angle which suggests it once may have been intended to intersect with a baseboard.

Moving more to the north, to the minor portion of the north wall of the pantry, the area between 101D3 and 104/D1 is made up of a board 5" wide and a thin section of sawn lath and plater (see photograph #21). From the presence of a sawn lath, it can be speculated that this wall was added later than the last partitioning of the north wing. The minor portion of the north wall is covered by two finish layers of plaster; the

first layer is a plaster series on the lath ending with a finish coat which is hacked to provide a rough surface for the bonding of the second finish coat, which is a simple one-layer skim coat only.

The doorway 101D3 leads into the water closet off the pantry. It is being considered under the pantry, because it swings into that space. It is a six-panel door painted on both faces. The door has been radically cut down to fit the opening and was certainly not original to it. There is a transom light on the panes above it, fixed into place. The door has a reproduction box lock and keeper with an escutcheon plate on the exterior which does not fit the keyhole. The hinges appear old but are not original to the door frame as can be seen from examining the overly-large mortises on the jamb. The only ghost present is that of a transom bar lying between the sash and the head of the door; it is just above the present bar, on the south wall of the water closet.

West Wall: This west wall of the pantry is also divided into two parts, the major part in the pantry and the lesser part further west in the connecting flanker. Beginning of the north side of the wall, 101/W1 is a double-sash six-over-six pane window with no counterweights. The lower sash was reconstructed in 1981.

The four-panel door (101/D1) is painted on both faces. The door has not been cut down on either side, but a 1/2" piece has been added to the top rail and a 5/8" piece to the bottom. The door is fitted with a reproduction box lock and a modern dead bolt lock. The escutcheon plate is missing on the exterior. There is a dripmold on the bottom nail on the exterior. The hinges are modern. The 101/D1 doorway has a three-pane transom light hinged at the bottom, the height of which brings the doorway up to the height of the window head jambs in the

pantry. The transom light was reversed in 1981 in its frame in order for the more attractive side to correctly face the exterior. The hardware of the transom sash does not appear old. The door 101/D1 was removed in 1981 and renovated during the painting of the house.

To the south of 101/D1 between the door and the north jamb of the arch into the connecting flanker is a pegboard, the center line of which is 5'-6 1/2" above the floor. The board dates from the enclosing of the pantry; there are holes for eight pegs, and three are presently missing. The board is beaded at the top and bottom edge.

An investigation into the plaster wall just below the pegboard exposed one of the brick piers (see photograph #22) from which the arches spring. Within the exposed area, clear lines of demarcation can be seen between the brickwork of the original pier and that of the brickwork which later infilled the arches when the loggia was enclosed. As is the case on the exterior, the wall survace of the arch face drops back from the face of the pier, the piers being thicker than the arches. As a result, it was necessary that the interior wall of the pantry above be level with the piers so it could be furred out and lathed to be plumb. The west wall of the main part of the pantry, therefore, is plaster on brick up to the main part of the pantry, therefore, is plaster on brick up to the level of the top of the piers (5'-0" above the floor) and plaster on lath above to the ceiling. The west wall has a series of plaster with a tan-gray finish coat, which is hacked and covered with an off-white skim coat. The earlier finish shows a yellow-ochre color near the ciling instead of the tan-gray.

Moving to the south side of the uncovered pier, it was found, as expected, that the north wall of the connecting flanker was not bonded

into the loggia. The flanker wall, however, did not abut the exterior wall of the north wing loggia as was thought, but rather continued into the loggia space under the arch, adjacent to its jamb, and flush with the interior wall of the infill. In order to accommodate the intrusion of this flanker wall, it was necessary to make the finished arch between the main part of the pantry and the north connecting flanker 10 inches less in diameter than the original arches, the remains of which can be seen on the exterior of the north wing loggia. This interior arch, therefore, while recalling the open arches of the loggia in the Hadfield plan, is smaller than the originals and built out on lath and a wood frame, rather than brick, to conceal the end of the north flanker north wall.

An area on the north wall of the connecting flanker was also investigated. The skim or top finish coat of plaster was removed (see photograph #23) to reveal the older finish coat and its hacked surface between the northeast edge of the arch jamb in the pantry and 101/D2. This area investigated reached from the top of the baseboard to a height of several feet above the floor. The ghost of a 4 1/2" wide partition wall was uncovered as documented.[30] A list of "repairs and improvements" to the Arlington House made in 1885 called for the installation of "a partition with 2 x 4's and double boarded with beaded flooring in the arch between it and the rest of the house containing the window to be removed from the north side of the connecting room, the window to become a door."[31]

From the foregoing description of improvements and a visual examination of 101/D2, it is not difficult to ascertain that the door on the north wall of the connecting flanker was a later addition. 101/D2 is a four-panel door painted on both faces. It does not show any

cut-downs on the stiles or nails, or any piecings. There is a reproduction box lock and a modern rim right latch. There is no escutcheon plate on the exterior. The hinges are the loose-pin type dating probably from the door installation of 1885. The door was taken down and renovated in 1981.

Also in the connecting flanker, 101/W2 is a double sash, six-over-six window with no counterweights. The window which was once where 101/D2 is now located, and which was removed in 1885 and installed in the arch partition, was probably the same in size and design as 101/W2. The flooring in the connecting flanker was not removed in 1980, but is a twentieth-century removed in 1980 in the pantry. The roof of the flanker rests on log rafeters similar to those in the north wing loggia roof. This ceiling is composed of sawn lath and has one series of plaster only. Also in the connecting flanker is a 1" x 1" wood bar, of uncertain age and purpose, which runs betwen 101/D1 and 101W2 near the window of the door heads.

The south wall of the pantry is a portion of the north wall of the main block constructed in 1817-1819. It shows the two series of plaster already found on the west wall, the first finish showing a tan-grey color. An area in the southwest corner of the main part of the room was investigated (see photograph #24) and it was found that the south end of the loggia arcade, currently encased in lath and plaster, abuts but does not bond into the north wall of the main block. The brick of the arch jamb is covered by a rough layer of hard stucco to no apparent purpose. The coating is far too rough for a finish coat to an exposed surface; also, if it was to be covered with lath and plaster, there was no need to cover the brick with a surface. There is an air

space of approximately 1 to 2 inches between the rough plaster surface and the furring strips which are nailed to horizontal strips on the brick surface itself. In the area investigated half-way between the floor and ceiling, the two furring strips encountered were reused pices, one a piece of beaded trim painted a brown as found on many other portions of old trim found in the north wing attic, and one a pice of old flooring with a groove. It was also seen that the lath of the arch jamb was nailed on a curve made up of the joining of many short pieces cut on a curve and nailed into a framework on the arch face. Sawn lath was used in this area as well.

A good deal of plaster was removed from the east wall of the pantry (see photograph #25), particularly in the area near the ceiling. The tan-gray color was again encountered on the older finish coat. Beginning on the south end of the wall, a 5" vertical band of hard stucco directly on the brick was found which continued unbroken around the southwest corner of what was the original north wing building prior to any additions. The north side of the band shows an edge where it was once made up against a wall which paralleled the present south wall of the pantry. Moving north, there is a 1'-0" gap over which was found some low-lime content mortar which may have served as a patch. To the north of this 1'-0" vertical strip there begins whitewash over brick which continues to the south edge of 105/W1. Whitewash also covers the south end of the lintel above 105/W1 on the west, where it extends into the whitewashed area. On a centerline 9 1/2" down from the present ceiling level were found a series of pockets approximately the size of a brick bat, some of which had been loosely filled. Centerlines of these pockets, measuring from

the principal north wall of the pantry are: 2' 6", 5' 4", 8' 1", 11' 2", 21' 9", and 27'7". Railing, balusters, and metal supports of the stairway to the cellar stairway hall are presumed original to the finishing of the pantry.

The pantry has no lights and one single receptacle in the baseboard of the north wall near the center.

Pantry (Room 101) - Proposed Treatment

It is clearly documented, both written and in the physical evidence found, that 101/D2 was a window prior to 1885. In order to return the pantry to a closer approximation of what is was like during the Lee tenure, it is recommended that doorway 101/D2 be carefully removed and whatever window evidence found beneath the casings, jambs, etc. be documented. Once the door frame is removed, it should be possible to determine the size of the replacement window, which will be then designed and installed.

The three pegs missing from the pegboard on the west wall should be replaced.

A plan should be developed to retain access to salient architectural evidence in situ and maintain compatibility with the 1861 appearance of the pantry. Archeological evidence indicates brick columns of loggia, infill wall, and evidence of loggia column abutment to the main block wall.

BATH (ROOM 102) - EXISTING CONDITIONS

Some of the floor in the bath may be original to the enclosing of the north wing loggia. There has been, however, patching of the floor in twentieth-century material, particularly in the southwest corner. The two 1" holes near the northwest corner along the west side of the room served the radiator removed in 1980. The purpose of the larger hole in the same area is unknown.

North Wall: The baseboard and wainscoting date from the completion of the room as a bathroom. The paneling between 102/W2 and the west wall was removed during the north wing investigation. The wainscoting was nailed to furring strips which were nailed to nailing blocks set into the brick wall when constructed to enclose the loggia. The individual boards of the paneling are 6 1/2" wide with a bead on one side.

It was once thought that the north wall of the loggia was possibly an arch infilled when the loggia was enclosed. Investigation proved otherwise, however, as the brickwork of the north wall does not bond into the north end of the loggia arcade; also, the brickwork of the north wall is rough, of an unfinished quality and was never meant to be seen, as in a loggia, but rather meant to be covered by finish materials. An investigation into the plaster above the wainscoting shows evidence of an early attempt at waterproofing by the use of a black, tar-like substance between the brick and plaster. The room shows only one plaster series.

The double sash, six-over-six window with no counter-weights. The bottom sash was renovated in 1981. There is no evidence that this

window was added later; it is thought to have been put in place when the north wall was built to enclose the loggia.

West Wall: The west wall of the bath is primarily a result of the loggia infill. Examinations of its northwest corner revealed that a plaster parging originally covered the loggia arches. The wainscoting and baseboard are of the same age and design as that on the north wall. Also, 102/W1 is the same as 102/W2 except that it was placed in the wall 4" higher, for no apparent reason. This condition is particularly mystifying as the loggia is presumed to have been infilled at the same time on the north and south walls.

South Wall: The south wall of the bath has been partially restored, probably during the War Department restoration. As the sink of the cemetery superintendent's bathroom hung on this wall,[32] it is likely that some of the original wainscoting needed replacing. While the present wainscoting and baseboard are close matches with those on the north and west walls, they are not old. The baseboard also has a 1" piece added to its bottom edge to bring it up to the height of the original. Room 102 also has a pegboard along the south wall, the centerline of which is 5'-11" above the floor. The board is beaded on both edges; of the original nine pegs, only two survive.

East Wall: As in the south wall, the wainscoating on the east wall is a reproduction of the original. Also the wall between the bath and the water closet is not old, dating only from the War Department restoration. Evidently there was a wall between the rooms at some point which was removed in 1914.[33] During the War Department restoration, indications of this wall were found and the wall was replaced. It is likely that the drawing showing the condition prior to

1914 was used in the War Department restoration as the wall was replaced with a small four-pane window as indicated.

A six-panel door (102/D1) is painted on both faces. It is cut down radically on both stiles, and was certainly not made for that opening. There is a piece added to the bottom sloping from the south (1") to north (1/4"). There is evidence of the door having had one or more box locks on its hinge stile. The sticking on the east face is integral and not applied. There is a box lock and keeper, probably reproduction, as are the present lock stile and a modern rim right latch. The hinges are not original to the opening and apparently date only from the late nineteenth century. There is an operable transom light above the door with a three-pane sash hinged at the bottom and opening to the east. The HL hinges are probably reproductions from the War Department restoration.

Examination of the doorway jamb reveals that there was once a door affixed to the opposite side of the jamb; the door stop molding is in place and wood pieces fill the former hung mortises. Removal of the bar on the west face separating the transom light from the doorway revealed other moldings inside which served as a transom bar prior to the removal of the door to the west side of the jamb, where it now is located. In the bath, the backboard to the north of 102/D1 is severely worn, as are two pieces of wainscoting, by the action of a guard's metal chair rubbing against the area over the years.

There is no lighting and two duplex receptacles side by side on the baseboard of the east wall.

Recommendations

No evidence was found in either the bath or the water closet during the fabric investigation of 1980-81 as to their function as bathrooms during the Lee occupancy. It is recommended that an investigator with experience in the nature of nineteenth-century bath facilities be brought in to examine these two small spaces. Should no hard evidence surface after this further investigation, it is recommended that a bathroom typical of the period be installed to interpret to the visiting public what was probably there circa 1861.

WATER CLOSET (ROOM 103) - EXISTING CONDITIONS

The flooring in the water closet seems to predate the twentieth century, but may not be original to the enclosure of the north wing loggia.

All wainscoting and baseboard dates only from the War Department restoration. Panelling was removed from the east wall during investigations of 1980 to reveal horizontal nailing strips attached to nailing blocks in the brick wall (see photograph #26). The black waterproofing substance reappears under the plaster of the east wall as well. There is a very hard plaster over this waterproofing which may be the original finish of the north wing exterior, but could be only a patch. There is one series of plaster over that hard surface. An examination of the northeast corner of the water closet revealed that the north wall was not bonded into the east.

The north wall has only one plaster series on the brick above the wainscoting; it had a sink hung from the wainscoting until its removal in 1980. There is no evidence now of other plumbing fixtures, however, the drawing as noted in footnote #17 showed a nineteenth-century wall tank water closet fixture, the seat, supported on a ledge built into the north wall and facing south. The renovated water closet of 1914 showed the fixture as a modern self-contained unit facing east into the bath after the removal of the partition wall.

As has been noted, the west wall dates only from the War Department restoration. This wall was investigated where it touches the wooden ceiling of the water closet and was found to be plaster on metal lath. The presence of paint on the wood ceiling within the air-space of the partition wall indicates that there was no wall in this position originally or it may date from the 1914-29 period.

The south wall has sawn lath and one series of plaster around 101/D3.

The thermostat for the radiant electric ceiling in the pantry is located near the southeast corner of the water closet on the south wall. The bulb sensor is located nearby under the step tread of 104/D1 in the pantry. There are no lights or receptacles in the water closet.

SCHOOL AND SEWING ROOM (ROOM 104) - EXISTING CONDITIONS

The flooring of the school and sewing room dates from the twentieth century and is random-width, tongue-and-groove pine running north-south. Baseboard on the north, west, and east walls is intact and of the same design, unique to the house. Examples of this

baseboard were found in the north wing attic; it is presumed to date from the decorating scheme in the north wing which preceded the present one. The baseboard as the south wall, however, is of the simple beaded variety found in the rest of the north wing and loggia.

North Wall: There is a chair rail 2' 6" off the floor which caps a ledger wall. The wall was investigated in the northwest corner just above the chair rail (see photograph #27). A very crudely constructed brick wall was found under two series of plaster; the first a full series, the second a skim coat only. The first series had an unusually thick brown coat under a hacked finish coat. Behind the plaster was a good deal of broken brick, sailors, and rubble up to a point approximately 4' 10" above the floor; from that point on, the brickwork becomes very regular and well-laid.

A continuous band of plaster 1' wide was removed across the north wall, the bottom of which was 4' 10" above the floor. The brickwork was uniform except for an unusually thick layer of mortar just east of 104/W1 at 5" 0" above the floor. At 7" from the ceiling, the ghost of the top of some type of molding was uncovered on the hacked face of the first finish coat.

There is a 15 over 8 double sash, semi-circular headed window (104/W1) with counterweights. This type of window appears in the historic photographs of the house taken in 1864. From documentary evidence, however, it appears at least the sashes of these particular windows in the north wing date from later than the historic period. The monthly report of the Arlington National Cemetery superintendent for July 1878 states that "Mansion in good condition, the part occupied by Superintendent has had new windows put in and is now being

white-coated and painted."[34] It was assumed before this document was found in 1980, however, that these windows were army replacements as the muntins show no detail, unlike similar windows in the south wing. Four small mortises on the interior of each jamb show that there were once interior shutters. The window casings and backbands are also unusually simple in form, lacking any distinguishing detail.

The window stool should be a continuation of the chair rail design; in the case of these windows in the school and sewing room, however, the stool is a much simpler element in detail and let into the existing chair rail at a later date. From examination of the masonry opening in which the frame is placed, it would appear that the existing window in the north wall (104/W1) was placed there originally and the walls were built to it, rather than the hole for the window having been broken through an existing wall. The connector built under the window was added in 1929.

West Wall: (See photograph #28) The ledger wall capped by chair rail continues along this wall. The portion of the chair rail to the south of 104/D1 appears to differ slightly from that in the rest of the room. This difference in detail, however, may result from differing numbers of paint layers on the chair rail in different parts of the room. The vertical board at the end of the ledger wall to the north of 104/D1 was removed to reveal that the wall end was largely rebuilt during the War Department restoration. Removal of the baseboard also to the north of 104/D1 showed an extensive rebuilding of the wall above the joist line where the electrical conduits were installed. The vertical boards covering each end of the ledger wall, where it is interrupted by 104/D1, are actually pieces of the room baseboard put to a different

use. While these vertical pieces and the baseboard to the south of 104/D1 largely resemble the rest of the baseboard in the school and sewing room, there may be a slight difference in detail. These differences, if they exist, however, are difficult to determine or evaluate due to the many layers of paint on each.

On examining the wall to the south of 104/D1, it was found that the brick courses were not laid-up against the door frame, but were broken off unevenly. Investigation into the other side of the frame, to the north of 104/D1, however, showed courses built evenly to the frame. A railing block set into the masonry was also encountered on this side of the doorway, showing that it was intended that a frame be placed in that opening when the wall was built. A ghost of a backband was also discovered on the scored skim coat of the first series of plaster. The width of this backband ghost differs from the present backband in being 1" wider. This is an interesting find in that the backband present on the door casing is believed to be the oldest in the house, surviving from the decorating scheme of the north wing which preceded the present one. Near the ceiling, the ghost of a molding, perhaps a picture molding already described as appearing on the scored finish coat on the north wall, is also present in the same location on the west wall.

There is a six-panel door (101/D1) painted on both faces. The door has been cut down by an inch on the lock stile and may have been cut also on the head rail. Indications are that the door was not made for this opening. On the lock stile there are indications that other locks preceded the present reproduction box lock and keeper. The hinges appear old and are probably original to the door. The hinge

mortises on the jamb, however, show the presence of larger hinges once in place and the top mortise is made on a piece let into the door casing. To the west, this doorway has jamb panels (see photograph #21) like those separating the center hall (111) from the rooms to either side (108, 109, 112). This example is the only use of such panels in either wing at Arlington House. There is the ghost of a 2" wide piece once attached to the head jamb panel on the west side. There is a paint layering exhibit panel on the east face of 104/D1.

South Wall: The south wall, a partition wall believed to have been added to the north wing around 1820, is split lath having one series of plaster. The finish surface has been scored, and has a skim finish coat. There are areas within the first 6' off the floor between the doors, mantelpiece, etc. where the showing skim coat is over a modern brown coat, probably redone in this century. Modern nails were found in the split lath under some of this work.

The mantelpiece is of classical design and of questionable age and provenance (see photograph #29). The brick hearth is old and shows a number of layers of paint and the interior of the firebox does not show any rebuilding. There is a brick jack arch over the fireplace opening. The interior of the firebox was once fully plastered; however, most of the plaster has now fallen off.

Doorway 104/D2 is an opening only, the door itself having disappeared. There are remains of two hung mortises on the east jamb and a strike plate on the west.

Door 104/D3 has six panels, painted on both faces, and serves as entrance to a closet, 104A. This door has been cut down radically on

both stiles, the head rail, and the bottom rail. There is the ghost of a former lock in the form of a keyhole, now filled, below the present escutcheon plate; the present lock is a box with only a mortise in the west jamb as a strike. The hinges appear original to the door, as there are no other mortises in evidence on the jamb.

A small closet (104A) is roughly plastered in one series, and having many layers of paint. Several small areas opened in the plaster revealed the use of split lath. The baseboard is intact and matches that on the south wall of the school and sewing room. There is a pegboard on the south wall, the centerline of which is 5' 7" above the floor, with seven pegs intact. The ceiling is old and is located 6' 6 3/4" above the floor. Closet flooring is a continuation of that in the school and sewing room.

There is a six-panel door (104/D4) painted on both faces. Both stiles and the head rail have been cut down. Reproduction hardware is found on the lock stile and is all intact. Hinges appear original to both door and jamb, and there are no ghosts. The only element of note on the casing is the section around the keeper which has been pieced. There is a fixed transom light of three panes above the door that is set into the partition wall and is evidently original to it.

East Wall: The east wall shows the same characteristics as the north and west in plaster, chair rail, etc. Window 104/W2 is like 104/W1 as to visual characteristics; no investigation was conducted, however, into the brickwork around the window frame. There is a connector beneath 104/W2, partially concealed in the wall in 1919, matching that under 104/W1.

The ceiling in the school and sewing room is new and dates from the mid-twentieth century. It is plaster on expanded, ribbed metal

lath. An area measuring approximately 4' by 4' was opened near its center in 1979, and a piece of a ceiling joist cut out, to allow movement of materials into the north wing attic for stabilization work carried out at that time. The area was closed and patched in 1981.

There are three duplex electrical outlets in the school and sewing room: on the east wall near the northeast corner in the baseboard, on the north wall about 5'-0" from the northwest corner, and on the west wall near the northwest corner. There are no lights in the school and sewing room.

School and Sewing Room (Room 104) - Proposed Treatment

There is some evidence in the school and sewing room for the use of interior window shutters. Small hinge mortises do appear on jambs of 104/W1 and W/2; however, the jambs themselves may only date to 1878 (see footnote 34). Physical window framing which would have carried historical interior shutters is believed to have been completely removed from the north wing. Photographs of 1861-1864, however, prove the existence of interior shutters in both rooms of the south wing. Similar shutters may have been extant in the north wing during the historic period. It is recommended that interior shutters be reconstructed for the school and sewing room, Custis chamber, and the Custis guest chamber based on the historic photographs and surviving period shutters in Alexandria.

It is recommended that a door be reconstructed for opening 104/D2. While it is impossible to say when this door disappeared, it is reasonable to assume that it was intact during the Lee period and was

lost after the house passed out of private hands. The door should match 104/D3 and D4 and be outfitted with appropriate hardware.

Door 104/D1 differs in design from all other doors in the house. The west face of the door has flush panels with delicate beads which have undergone many repaintings. It is recommended that the paint be carefully removed from these beads and that this face of the door be repainted.

INNER HALL NORTH WING (ROOM 105) -- EXISTING CONDITIONS

The flooring of the inner hall (north wing) is random-width, tongue-and-groove pine, running north-south, that dates from the twentieth century. The baseboards are all of the simple design, beaded at the top, which is found in most of the north wing. The baseboards are intact; however, that portion around the chimney breast may be a modern replacement.

North Wall: The north wall of the inner hall (north wing) is the partition wall between the school and sewing room and the inner hall (north wing). Portions of plaster and lath were removed in the northwest corner where the partition wall intersects the brick west bearing wall of the north wing. It was found that the north wall of the inner hall (north wing) is only one series of plaster on split lath.

It was found that the chair rail as discussed in the school and sewing room continues unbroken through the partition wall into the inner hall (north wing) and ends by abutting the chimney breast. Removal of plaster and lath in the corner revealed the covered portion of the chair rail, which is green in color and shows very little paint

layering. That portion of the chair rail existing wholly in the inner hall (north wing) appears to have been stripped as the paint study shows no green having been found on it. In the protected area within the partition wall a series of plaster can be seen below the chair rail painted a light ochre. One-half inch to the east of the lip of the chair rail is located the first shed of the partition wall. This stud lies about 4" or more from the major portion of the west wall and the lath railed to it is cantilevered over to the west wall, just touching it without being connected to it. Due to this tenuous connection of the plaster wall to a bearing wall, seen in a number of other instances in the north wing as well, it was necessary for the army to rebuild such corners in the north wing with expanded metal lath and new plaster during the War Department restoration. Above the chair rail within the partition wall is also seen a series of plaster with a finish coat white in color. This finish disappears, however, just above the chair rail, and only a brown coat is seen on the surface up most of the wall.

West Wall: The plaster between the north wall just discussed and the chimney breast in the middle of the west wall, both above and below the chair rail, shows one series of plaster only. It is believed that this series is different from the one in evidence on the west wall within the partition wall. This major series is unusually thick, in excess of 2", having two discernable brown coats and one finish. The series within the partition wall is of a much more usual thickness and is believed to be considerably older.

Investigation into the plaster surface above the chair rail on the west wall uncovered the presence of a line of broken headers, the centerline of which is 3'-1 1/2" above the finished floor. This line of

headers was also located in the northwest corner of the school and sewing room on the west wall.

The portion of the west wall between the chimney breast and the north wall is the only part of the inner hall (north wing) having the ledger wall and chair rail. At the south end of the chair rail, the top board of the rail running above the ledger wall is cut at a 45° angle. This end condition was buried within the plaster of the chimney breast north end until 1980 when it was uncovered. This mitre cut indicates that the chair rail once took a 90° turn at that point, either to go around the chimney breast or to follow a wall perpendicular to the north end of the chimney breast; a partition wall would have disappeared during a reorganization of north wing spaces.

A band of plaster 1' 0" wide, the bottom line of which was 5' 0" above the finished floor, was removed along the west wall from the chimney breast to the north wall. In this 6' 0" stretch of wall it was found that the brick had been laid in a type of running bond where the vertical joints of the brick approached a condition of actually lining up (within 1") vertically as in stack bond. This pattern, of questionable strength and purpose, would have been an odd choice for an exper-ienced bricklayer and points to the use of unskilled or inexperienced workmen.

Plaster was removed in the corner where the west wall to the north of the chimney, which has just been discussed, intersects with the chimney breast itself, at a point 3' 0" below the existing ceiling. This west bearing wall is two bricks wide, and it could be seen that the east course of brick did not bond at all into the breast. It could be seen also from observation of the east wall in the pantry, that the

west course of brick bonded smoothly all the way along the west wall of the north wing.

Chimney Breast: The chimney breast of the inner hall (north wing) (see photograph #30) is one of the richest, most complicated and most difficult, as well as most interesting, discoveries of the Arlington House investigations of 1980. As a result of this complexity, it will be discussed after first dividing it into its logical parts, each of which will be presented independently: north end, north part of west wall, center of west wall, south part of west wall, and south end. In its entirety the chimney breast measures only 7'9" in width and contains only one moderate-sized flue which begins near the center of the breast and rises against the north edge, ending in the north wing below the level of the tops of the joists.

North End: As has already been noted, the north end of the chimney breast does not bond into the east course of brick of the west wall. Also, the north end of the face of the breast has all of its brick broken off at the corner (see photograph #31) as though the breast once continued north as a wall. Between this face and the west bearing wall there is a vertical stack of sailor brick closing off the north side of the flue; these sailor bricks extend back into and abut the west course of brick of the north wall. This complex brickwork strongly indicates that a number of changes were made at different times in this area, and the lack of bonding suggests that they were effected by unskilled workmen.

The north end had two full series of plaster. The earlier of the two was cut back irregularly to within 2" of the north wall. This first series has a hard white skim coat which can be seen to join the present

skim coat of the west wall, which has just been discussed. It is evident that both these earlier layers of plaster on the north end of the breast and that on the west wall (north portion) were all applied at the same time. Since that application, however, another series of plaster has been applied to the north end of the breast. This series is very thick (approximately 3") and covers a great number of irregularities at that north corner of the breast, including the broken brick course and the earlier plaster series.

North Part of West Wall: The lower part of this portion of the chimney breast, as well as the rest of the breast, was disturbed and rebuilt in 1929 when the army reset the floor joists. Measuring up from the finished floor, the first 4'0" contains three complete series of plaster. The earliest series was finished by a hard brown coat and covered by a dark red paint. This red plaster ends irregularly at the bottom several inches above the floor. To the north this plaster is broken off irregularly just as the brick to which it adhers was broken at the north corner of the breast. To the south, however, the red plaster ends in a straight line. Markings and a lip formed by the application tools indicate that this plaster series once turned a corner there on a wall which once bisected the chimney breast but which has since disappeared (see photograph #32). At the top, also, the red plaster ends in a lip which indicates that it once turned there onto a ceiling. This odd circumstance of finding a ceiling condition several feet above the present floor was explained by two filled joist pockets found just above the level of this top lip. This red surfaced plaster was hacked to give good binding to the next series above it.

The second series of plaster, lying on the red plaster, has a

fairly smooth skim coat which appears to have been painted off-white. This series ends irregularly on all sides except the north where it appears to have made a 90° turn on an inside corner approximately 6" from the present north end of the breast on its outside edge. This off-white series was also hacked to accept bonding from the third series, a thick one which forms the present finish of the room.

The filled joist pockets (see photograph #33) already noted were found about one-quarter the way up the wall. They fall approximately 1' 7" on center and may have held joists measuring as large as 3" x 12". These pockets are located just above the lips formed at the top extremity of the red plaster and its undercoatings, and once held the joists which carried a ceiling intersecting the red plaster walls. By the era of the off-white plaster, however, the north wing had taken a different form, the joists had disappeared, and their pockets had been filled and covered by the second plaster series (see photograph #30).

It is disconcerting to find that there is no series of plaster above the joist pockets which corresponds to the red plaster. The off-white series, however, continue over and above the joist pockets (see photograph #30) to become the first series against the brick up to a channel, the centerline of which is 7' 6" above the finished floor. This channel is 5" wide and was filled with what appears to have been a patching plaster. It is presumed to have held a chair rail; there is a nailing block still present, measuring 3/4" x 3", which is mortared between two bricks. The off-white plaster was hacked to receive the present top series of plaster.

There is a change in the plaster above the channel. The off-white plaster stopped definitively below the channel, and the series above it

on the brick is made up of several brown coats, the last of which is finished enough to serve as a surface for wallpaper. This hard brown finish covers the upper portion of this section in question and preserves a number of wallpaper fragments, most of which are located just above the chair rail channel.

The fragments uncovered showed a golden cream background (see color photograph #C-1) with some elements in several shades of green decorating the surface in conjunction with groups of curved lines in brown and white. This particular paper was either covered by, or bordered with, another paper having a cream ground with multi-toned green objects of decoration. Just above this channel at its south extremity (see photograph #34), there are several inches of the plaster on which this paper is located that rises vertically in a lip. The presence of this lip indicates that this plaster wall formed an inside corner there with the brick wall which once bisected the chimney breast. The plaster above the channel, on which the wallpaper fragments are located, was covered by the series of plaster which form the contemporary finish of the inner hall (north wing).

Center of West Wall: The strip of bare brick rising vertically in the center of the chimney breast was covered with only one series of plaster, the most recent of which can be seen as the finish series on all the walls of 105. At times the series in this center section are as much as 3" thick; and approximately 1'7" wide.

The bottom of the center section bisected as well a patch in the brickwork measuring approximately 2'0" wide by 2'8" high, all the brick of which had been removed back two brick widths. The patch was filled with brick pieces, rubble, and a neat mortar. There is a

possibility that the patch dated from the War Department restoration, when their initial plans included the restoration of a fireplace which they believed had been located on the breast, matching that of the south wing when the entire north wing had been one large "banquet room."[35] It could have been that they opened the wall at this time to uncover the fireplace and, finding none, had patched what they had taken out. It would seem, however, that better materials would have been used in the patch had it occurred in 1929, and that it may have been done earlier when the north wing was in use as the cemetery superintendent's quarters.

The one flue located in the chimney breast begins at a point approximately 3' 9" above the finished floor. A patch was found over the hole in 1980 and was easily removed, leaving an opening measuring approximately 1' 0" x 3' 1". The flue had been plastered inside on all sides and was blackened with soot. A distinguishing feature of this flue opening is that the sooted plaster extended out virtually to the face of the breast on the entire south side of the opening and on both sides near the bottom of the hole.

Several broken headers were uncovered to the north and south of the flue opening; they were not, however, consistently placed, and none appear between the bottom of the flue hole and the large patch at the bottom of the breast. Also, few were located to the south of the hole.

The broken-off headers which define the wall bisecting the breast are not apparent in abundance until the top quarter of the chimney breast is reached. As can be seen from the evidence drawing, these broken headers are not consistently located anywhere on the ghost of

breast. From a point 3' 8" below the ceiling, the bisecting wall is not bonded at all into the brickwork of the breast either to the north or south. As a result of a hole opened into the brickwork of the breast just to the north of the consistent header area, it was found that the brick of the former bisecting wall as seen in the all broken-header area forms a mass of brickwork completely foreign to that of the breast itself. Not only is it not bonded into the breast to the north or south, but it is not bonded to the final west course of brick which forms the east wall surface in the pantry. This final course passes by the west end of the all-header brickwork mass with a space of several inches in between, and was built to cover inconsistencies and to give the east wall of the pantry a smooth surface.

South Part of West Wall: The first element above the floor in this chimney breast section is a channel in the plaster measuring 3 1/2" wide. The bricks at the bottom of this channel have been hacked to create a smooth surface, and a nailing block is located between two stretchers. It is presumed that this channel, the bottom of which is 2' 1 1/2" above the finished floor, once held a chair rail (see photograph #35).

The plaster coat under the modern series removed in the investigation was found to be no more than a thin brown coat finished smoothly, over which fragments of wallpaper still adhered. This paper (see color photograph #C-2) has a brown-purple background with lines of cream, red, and black running vertically in waves to simulate a stylized wood paneling below the chair rail. At the bottom edge of the paper where it would have contacted the baseboard, there appear fragments of a wallpaper border in a sawtooth pattern with black shading on a cream base (see Appendix IV).

The chair rail channel and the plaster coat below it which carries the wallpaper all end at a point approximately 1' 10" north from the south edge of the breast. From the character of the plaster at this point it can be seen that there was once a wall intersection here. This wall was approximately 3 1/2" wide and extended up to a point 5' 6" above the finished floor, after which height the markings of the wall in the plaster disappear.

There are a series of plaster patches similar in color and texture to the smooth brown coat below the chair rail channel, between the wall ghost just described and the brick bisecting wall ghost. To the south of the plaster wall ghost and above the chair rail channel is yet another area in rough-textured brown coat which shows a finished edge against the chair rail channel and against the plaster wall ghost on the north. Near the top south corner of this area was found another joist pocket, smaller than the others and measuring approximately 3" x 6", the centerline of which is about 6" from the south edge of the chimney breast.

Yet another plaster layer, independent of all those yet described, begins at the 5' 6" point above the floor and runs to the ceiling. This coat forms a straight edge and lip against the ghost of the bisecting brick wall on the north. The top two-thirds of the coat is hacked, but the bottom one-third remains smooth. A straight mark on the plaster surface runs vertically up the coat to the ceiling from the south end of the ghost of the plaster intersecting wall at 5' 6" above the floor. Just to the north of this line at a point approximately half-way up the breast is a square hole, one course deep, with a surface measuring about 4" x 4". Prior to the 1980 investigation the hole was filled with

a mortared brick bat. The area had been patched over with plaster; the hole served no obvious purpose.

The area of this major plaster surface on the top half of the south part of the chimney breast, which is hacked, has many small fragments of a distinctive wallpaper which also exist on other walls of the north wing yet to be discussed. The wallpaper has an off-white background covered with a stylized leaf design in red and cream.

All plaster on the south part of the chimney breast turns the south corner and extends over onto the south end. The south part just discussed was all covered uniformly with the series of plaster which finish the inner hall (north wing); the vast majority of this most recent series was left undisturbed elsewhere in the inner hall (north wing) during the 1980 investigation.

South End: This end of the chimney breast, like the area preceding it in this description, has two series of plaster: the earlier contains fragments of the red-cream wallpaper, and the most recent uniform plaster coats cover the walls of the inner hall (north wing) as seen today. All plaster layers are continuations of those on the south end of the chimney breast which turn the corner. The chair rail channel as well turns the outside corner and runs to the west wall; there is another nailing block in the channel. In the inside corner formed by the chimney breast and the west wall, plaster was removed to reveal that the chimney breast was not bonded into the wall at that point either.

West Wall South of Chimney Breast: The first major element to the south of the chimney breast is 105/W1. This double sash, nine-over-six window has no counterweights. While most windows at

Arlington House fall into different series which are consistent in their characteristics, this window and its elements are unique. There is no casing (see photograph #36) other than a backband which is nailed to the frame as a plaster stop, and there is no apron board below the stool which also serves as a plaster stop. The window has no lintel on its innrt hall (north wing) side, rather the window frame head serves as a lintel which supports the brick above. This brick in its first course above the window differs from the other brick in the west wall and was apparently added later. It is believed that the window was added after the wall was built; particular evidence for this theory is the irregularly broken plaster layer 811 above the window which carries the red-black paper and a plaster patch between this surface and the window head. A similar condition was uncovered to the south of 105/W1. In this example, it is particularly obvious that the wall was torn through to allow installation of the window. There is also a 6 1/2" x 6 1/2" wood block between the window frame on the north and the south corner of the chimney breast, which lies flush with the final plaster coat, and which has no obvious purpose. The brick above this block, which is located two-thirds the way up the window frame, are sheared off where they encounter the frame and the space between their ragged ends and the frame infilled with mortar.

Spaced almost evenly between 105/W1 and 105/D1 is a vertical patch of plaster 6 1/2" wide. This patch is a very hard plaster type and fills a strip which once held the intersection of a perpendicular partition wall (see photograph #36). This partition was evidently removed early in the history of the north wing as the red-cream wallpaper extends over the patch as well as the finish plaster walls on

either side. After opening several areas on the wall between 105/W1 and 105/D1, it became obvious that the plaster layer holding the red-cream paper did not extend below the level of a theoretical second floor as established by the joist pockets found on the chimney breast. In the area below the 5' 0" point on the wall above the finished floor was a seeming patching plaster with a rough texture like some of the patches found on the south side of the chimney breast. Also, in this same area, the line of broken headers, the centerline of which is 3' 1" above the floor, was uncovered at several other points in rooms 105 and in 104.

Doorway 105/D1 has no door (see photograph #37). Like 105/W1, this doorway is also unique at Arlington House in presenting a condition of a jamb within a jamb. The smaller of the jambs held the door when it was in place, as can be seen by the presence of three hinge mortises on the south jamb and a mortise lock strike plate on the north. The larger jamb to the east of the smaller measures 4" wider on each side and taller at the head (see photograph #38). It appears that the east jamb at least was added later as the plaster carrying the red-cream wallpaper is seen to have been broken through irregularly at the top and sides of the jamb frame when it was installed. The doorway has a substantial, rough-hewn wood lintel above it; the brick rest above the lintel and were not mortared into place. These brick simply lie on the lintel with a substantial crack separating them from the brick of the wall above. As there is a clear crack between the brick on the lintel and the brick of the west wall hanging above, there has never been proper support.

An assortment of excellent red-cream floral wallpaper samples was found on the west wall between 105/D1 and the cheek wall to the south. Also located was a stove pipe hole having double intersecting diameters (see photograph #38) of 6-1/2" each cut through the west wall, the center of which is approximately 1' 0" from the west cheek of the south wall at 7' 7-1/2" above the floor. These holes are seemingly connected to an attempted flue hole (see photograph #37) on the west cheek of the south wall. These double holes were filled with brick and mortar. The surfaces bond into each other where the west wall meets the south in the southwest corner of the inner hall (north wing).

The west face of the cheek wall was opened at three points and shows the roughly broken courses (see photograph #39) which resulted from the removal of the major portion of the south wall of the north wing following the construction of the main block in 1817-19. Above the 5' 6" point on the wall, there are two plaster series in evidence, the older having the red-cream floral wallpaper fragments. This older layer is broken roughly following the breakage line of the brick on which it lies. There is a 1" separation between the south face of the cheek wall and the north wall of the main block. A hard stucco surface can be seen on the former exterior of the cheek wall and this surface is presumed to have covered the exterior of the north wing when it was a house standing alone.

South Wall: The south wall of the inner hall (north wing) includes the north face of the cheek wall dating from the earliest building on the site (see photograph #37), and a portion of the north face of the main block north bearing wall of 1817-1819. After plaster removal, the cheek wall exhibited a patched flue hole, 7" in diameter, the centerline of

which is 7' 7-1/2" above the finished floor, and 1' 0" east of the southwest corner. Removal of the rubble fill showed that this hole had been cut to a depth of 11" with no success at intersecting a flue. A chair rail channel was located on the cheek wall; it is 4" wide, with its bottom line at 2' 2" above the floor. Plaster on the cheek wall includes the two full series already found on the south portion of the west wall of the inner hall (north wing), which carries the red-cream paper and is the present finish of the room. Plaster around the inside southwest corner is continuous in both series.

The remainder of the south wall of the inner hall (north wing) lies approximately 9" to the south of the face of the cheek wall. Here there is only one series of plaster, the most recent. Much of the wall area is taken up by 105/D2; the presence of a segmental relieving arch above the doorway set into the brickwork shows that this doorway dates from the building of the main block (see photograph #40).

The six-panel door 105/D2 is painted on both faces. The door has been cut down on the hinge stile and does not fit well between the top of the lock stile and the head of the frame. The door is provided with a mortise lock which is lacking all its hardware other than the lock body and the strike plate. The hinges appear original both to the door and the frame. There is a paint layering exhibit panel on the north face which has no protective covering.

There is an abandoned fire extinguisher support to the west of 105/D2 between the door frame and the cheek wall end. The protrusion in the ceiling against the south wall is plaster over a beam which was put in place to support the remains of south roof outriggers following removal of most of the south wall when the north wing was attached to the main block.

East Wall: Some of the southeast corner of the inner hall (north wing) was opened (see photograph #40) just above the head of 105/D2. No stud was found lying against the south wall to support the lath of the east, with the first stud being located approximately 9" north of the south wall. There are two possible explanations for this condition. The stud may presently be 9" from the south wall because it was against the original south wall of the north wing which was removed; or the builders may have felt that it was necessary only to have a stud beside the frame of 107/D1 where the lath could be easily cantilevered over to the south wall. Examination of several pieces of lath on the stud seemingly confirmed the second theory as no nail holes other than the present ones were found, thereby indicating that the lath which extends to the present south wall is original to the stud. There is only one series of plaster on this lath, corresponding to the most recent finish. It is concluded that the south part of the east wall is contemporary with the building of the main block.

It was also found that the area within the east partition wall on the south wall had received a rough brown coat before the lath was put in place. There is no apparent reason for this brown coat; it is possible that the entire south wall of the inner hall (north wing) on the 1817-19 construction received a brown coat before the present partitions were erected in the north wing. The lath having no end support against the south wall, the army installed expanded metal lath in the southeast corner of 105 and new plaster to give stability and keep the corner from cracking. The entire east wall of the inner hall (north wing), including the small area facing south on the exterior wall of the Custis guest chamber closet, is the most recent series of plaster over

split lath with no other series present. There is a curved wooden protective corner piece on the one exterior corner along this wall. This piece was once well defined by a "V" cut in the plaster down each side, as still can be seen in some parts, but most of this has been infilled by plaster patching.

The ceiling of the inner hall (north wing) is old and shows one series of plaster on split lath corresponding to the most recent plaster finish.

There is one duplex receptacle in the baseboard to the south of 105/D1, and no lights in the inner hall (north wing).

Connection to the North Wing (Room 105A): The flooring of the connection to the north wing is a continuation of that in the inner hall (north wing) and has the same characteristics and history. The baseboard is also like that in the inner hall (north wing), and is intact. The area in 105A is entirely within the main block construction and is formed by the enclosure of space falling between the two fireplace blocks. The change in elevation between the north wing and the rest of the house, a matter of 5 3/4", occurs here just behind 108/D2. As the space of 105A is all within the main block, it would seem logical that the elevation change would occur just behind 105/D2. Due to the swing of the doors involved, however, it functions better the way it was done, probably in 1817-19. Other unusual features of the connection to the north wing are the door casings. The trim of the south face of 105/D2 is typical of doorways in the main block, while that of the north face of 108/D2 is like those in the north wing, all of which would seem opposite of what it should be. As in a closet, the ceiling of 105A is only 7'8" above the finished floor. There is no

obvious purpose to the small plaster wall protrusion behind the beaded exterior corner in the northeast area of the inner hall (north wing).

Other elevation changes between the north wing and the rest of the house occur on the west side of 104/D1 and 105/D1.

Inner Hall (North Wing) (Room 105) - Proposed Treatment

As has been noted previously, the uncovered chimney breast in the inner hall (north wing) is one of the most interesting, as well as most complex, architectural finds of the north wing investigation. As much of the evidence found there remains unexplained and as the inner hall (north wing) is primarily a utilitarian space, it is recommended that a way be found to only temporarily cover this breast and other important architectural features so that they can be further investigated and interpreted for visitors. In covering the breast, it will be necessary to construct something which will appear to be the actual plaster finish when in place, but which can be moved conveniently when necessary.

It is recommended that all wallpaper fragments be recorded graphically and photographically in situ before final treatment is determined.

Although the door at 105/D1 is currently missing, it was drawn in place in the sketch of the superintendent's quarters made c. 1920.[36] While this sketch is not felt to be wholly accurate in respect to other doors, it is obvious that there was once a door at 105/D1 and that it probably was in place circa 1861. It is recommended that the door be replaced with one similar to the other six-panel doors in the north

wing. There is a possibility that the door in question was removed in the recent past and may be still stored somewhere at Arlington House. A search for it should be conducted before its reconstruction is initiated.

It is recommended as well that the loose brick above the lintel of 105/D1 be mortared in place prior to the replastering of the walls. Other brick removed on the west wall, other than those places on the chimney breast itself, should be remortared as well before replastering occurs.

Final recommendations include the removal of the fire extinguisher support on the south wall and restoration of the plaster configuration against the wooden piece protecting the exterior corner along the east wall. It will be noted again that the inner hall (north wing) is a dark space and could benefit from historic house lighting.

CUSTIS CHAMBER (ROOM 106) - EXISTING CONDITIONS

The flooring of the Custis chamber is random-width pine, tongue-and-grooved, running north-south, a twentieth-century replacement of the originals. The baseboard is the beaded variety characteristic of the north wing; it is intact.

North Wall: The north wall of the Custis chamber has an original plaster series on split lath, with a hacked finish coat covered by a skim coat, which shows on all walls as well as the ceiling.

The firebox of the fireplace was rebuilt during the War Department restoration; the portland mortar between the brick was colored dark. The flue is closed off with a copper sheet; temporary removal of this in

1980 uncovered old newspaper fragments dated 1924. The brick hearth is in good condition.

The Adam-style mantelpiece over the fireplace was removed in 1980 during the fabric investigation. The applied floral decoration is in poor condition, with some of it missing. From the back it became apparent that both legs of the mantelpiece had suffered from burning, particularly the west one. Two different sized pieces had been added on the interior of the plinth blocks (see photograph #41). Examination of the back of the mantel revealed a good deal of hand-planing marks. The stud to the west of the mantelpiece, and one of two to which the mantel was attached, showed several mortises and a round hole (see photograph #41) which are unexplained. It is likely that this stud once served elsewhere in a different capacity and was moved to this location during the last major decorative renovation of the north wing. The mantelpiece was reattached in 1981 and the areas to its east and west replastered over metal lath (see photograph #42).

Closet 106A to the west has two shelves 1" thick each, the tops of which are at 5'0" and 6' 3-1/4" above the finished floor; the shelves are 1' 1"deep. The north wall of the closet has a cornice composed of a piece of beaded trim with a backband running at the top. The closet floor is like that in the Custis chamber, but is separated from it and could be original. The baseboard is beaded and similar to that in most north wing rooms. The closet ceiling is 7' 11" above the floor.

Plaster removal in 106A on the north wall showed one series on split lath. The east wall of the closet and 8" of the north which abuts it is the brick of the fireplace block. On the brick are seen two series of plaster and an appearance of blue paint or wash not previously seen.

The surface of the first series of plaster is hacked to give adherence to the second.

The double doors 106/D2 lead to closet 106A; they have three panels each vertically placed, and are stained on both faces. The east half overlaps the west. The west door has been cut down. There is a box lock on the east door on the north face and an escutcheon plate on the south face; no ghosts of any other hardware are seen, though, and there is no strike plate or keeper on the west door. The hinges appear old and are seemingly original to the doors. However, they are not original to the mortises on the west jamb which are too large for the present hinges. These doors may have been installed during the War Department restoration. The trim on the north face of the door frame inside 106A is a simple backband.

A connecting closet-hallway to the school and sewing room, (Room 106B) is believed to have some original shelving on the west wall. These five shelves are 1" thick, 11-1/2" deep, and the tops of each are at 1' 9-1/2", 2' 9", 4' 0", 5' 3", and 6' 6" above the floor. The floor of 106B is a continuation of that in the school and sewing room and is a twentieth century replacement. The baseboard on the east wall is like that in the school and sewing room; that on the west wall, however, is a slight variation on the baseboard in the Custis chamber. The interior trim of the two doorways, as in closet 106A, is a simple backband. Shelves on the east wall were removed in 1980 during the investigation and discarded as they dated obviously from the twentieth-century. The east wall has a ledger wall and chair rail, a continuation of that same feature in the school and sewing room. Both the north and south partition walls are built right over the chair rail and ledger wall (see

photograph #43); the chair rail ends abruptly just under the plaster of the northeast corner of the Custis chamber where it was cut off roughly (see photograph #44).

The north and most of the south walls of 106B are one series of plaster over split lath. The west wall is the brick of the fireplace block. The east wall has a plaster series above the chair rail and a skim coat, all on the brick east exterior bearing wall. There is also a small portion of the south wall between 106/D3 and the southeast corner of 106B that has a plaster series and a skim coat.

The double doors to closet 106B (106/D3), which are the match to those at 106/D2, are each three panels placed vertically and stained on both faces. Again, the east half overlaps the west. There is a ghost of a different box lock that was once in place. Pieces have been added to the bottom of each door, but the stiles of the doors have not been cut down to fit the openings. There is a box lock on the east door, most likely a reproduction, which is missing its shank, knobs, and escutcheon plate. There is, however, a strike plate on the west door. The hinges appear old and are probably original to both doors; the hinge mortises on the jambs also appear original. There is a paint layering exhibit panel on the east jamb.

West Wall: The west wall has one plaster series and a skim coat over split lath. There is a six-panel door 106/D1 stained on both faces. The lock stile has been cut down as has the bottom rail. The door originally had a mortise lock, but presently is fitted with a reproduction box lock with all its hardware intact. The hinges appear original to the door. On the door frame, the north jamb has been pieced where there was once a strike plate and the south jamb where

there were two hinge mortises. The door is probably not original to the opening.

South Wall: The south wall also has one plaster series and a skim coat over split lath. Unlike the unusual conditions in the northwest and southeast corners of the inner hall (north wing), or the northeast corner of the Custis chamber, this partition wall on the east begins with a stud right against the bearing wall. The doorway 106/D4 is without a door. The only remains of the door, which probably was removed within this certury, are two halves of two Victorian butt hinges applied directly to the face of the east jamb and not mortised. There is also the keeper of what appears to have been a reproduction box lock on the west jamb. There are hinge mortises which have been pieced on the west jamb indicating that an earlier door swung from that jamb. Investigations were also carried out above the frame head on the Custis guest chamber side of 106/D4. What appeared to be patching plaster was found above the doorway and there was no header within the framing system. Both of these discoveries would indicate that 106/D4 was added later as a doorway. However, removal of the backband on the door head casing showed hand planing in the making of the moulding and small L-head nails, both characteristics of the early nineteenth century during which the partitions were believed to have been erected. It was then confirmed that the carpenter of the partitions did not have the habit of putting framing headers above his doorways. First 106/D3 was investigated; there was no header and the studs above the doorway measured only 1 x 4, thereby showing that he knew he was framing a doorway and not just a wall in which a doorway would later be cut. The same backband was found, and the same nails.

Investigation of D6/D1 showed the same result, except that the studs above the head were, full size, like those in 106/D4.

East Wall: (See photograph #45) Window 106/W1 is a 15 over 8 double sash semi-circular headed window with counterweights. The same questions surrounding its authenticity exist as with two windows in the school and sewing room. Former window headers (photograph #46) were found under the sill of both 106/W1 and 107/W1 and may have been headers for the original round-headed windows in the north wing. Like those windows in the school and sewing room, 106/W1 has a partially concealed connector underneath installed by the army in 1929.

As with the west wall of the inner hall (north wing), the complexity of the east wall of the Custis chamber (photograph #45) will necessitate its being divided into three sections for description: Portion north of 106/W1, above 106/W1, and portion south of 106/W1.

Portion North of 106 W1: The first few inches above the floor were heavily rebuilt during the War Department restoration with the resetting of joists and installation of electrical conduits. The initial 2' 2" above the floor is the ledger wall once under the chair rail cut off in the northeast corner of the Custis chamber (see photograph #44). There is a definite ghost line of a wall perpendicular to the east wall on the face of the ledger wall approximately 2' 2" south of the northeast corner of the Custis chamber. To the north of this line is a plaster series on brick with the finish coat hacked to carry the top skim coat. The plaster series forms a lip where it abuts the red plaster to the south of the ghost. This red plaster is the same as that found on the west wall of the inner hall (north wing). It appears in this area of the Custis chamber to the south of the wall ghost line and to the north of some

modern brickwork done during the War Department restoration at the north end of the convector beneath 106/W1. This area of red plaster is only about 8" wide by 1' 6" high, and it continues on the brick below the hacked plaster series already described in its ribbon toward the north at an elevation just above the electric conduit.

The brick wall above the level of the chair rail is composed of rubble, bats, and sailors, much like the condition in the northwest corner of the school and sewing room, to a height of approximately 5' 4" above the finished floor. There is a straight vertical joint in this rough brickwork, 11" from the northeast corner and which runs 1' 10" from the level of the chair rail to a point approximately 4' 0" above the floor. This area of rough brickwork was covered with a series of plaster which becomes increasingly thicker as it approaches the chair rail level so that it eventually covered the remains of the ledger wall with a smooth surface from the ceiling to the floor. This renovated wall was no longer plumb but rather angled into the room slightly at the base. This thick series carried another series over it approximately 3/4" thick. Over this last series was the present skim coat; both plaster series below were finished in a basically white color and hacked to receive the adherence of the layer above. Both the first layer on the wall above the chair rail (see photograph #47) and the white plaster below on the ledger wall appear contemporaneous as they both extend behind the partition wall to the north and predate its placement in the north wing. The second series is the same plaster layer as that on the lath of the partition wall to the north; it is continuous around the northeast corner of the Custis chamber.

The first series ends at a point 2' 2" from the north partition wall, in line with the wall ghost on the ledger wall below. As can be seen in photograph #48, the series stopped in a lip indicating that the wall turned a corner here and departed perpendicularly to the wall now gone. The area to the south of this line where the theoretical wall intersected was found to be brick covered by the second series and skim coat only. The brick is seen to have been laid right up against the north edge of the frame of 106/W1 in this area, and it is believed that the window here was probably installed when the east bearing wall of the north wing was built. However, there is a portion of brick in this area that seems to have been patched, which prevents the idea that the window may have been added later from being completely dismissed.

At a point 10" from the north partition wall and 5' 3" above the finished floor is a 3/4" space between two bricks (see photograph #49) which probably once held a railing block. The only other possible plaster layer not discussed yet to the north of 106/W1 is a hard finished brown coat, a small portion of which exists near the window head under the second series of plaster. This layer seems to correspond to similar finished brown coat to the south of 106/W1, which carries fragments of the red-cream wallpaper.

Above 106/W1: The window has a poorly constructed segmental arch above it. A crack begins near the center of this arch and works its way vertically to the top of the wall. The area above the window shows a hard, light-gray plaster on the brick, over which was placed the second series of plaster and the skim coat seen throughout the present surface of the Custis chamber.

Portion South of 106/W1: As in the north portion, this area shows an extensive rebuilding in the first few inches off the floor where the army installed electrical conduit. Also the brickwork between the chair rail channel and the 5' 6" mark above the floor is very poor and composed largely of rubble, bats, and sailors, as well as the backside of the sandstone sill which shows on the exterior of the building. Above the 5' 6" mark, however, the brickwork is well-laid in running bond. The chair rail channel is apparent here as well, the bottom of which is 2' 1/2" off the floor. Both the areas above and below the chair rail channel are covered in the hard, light-gray plaster already seen above 106/W1. This plaster is covered by the second plaster series and the skim, with the base coat of the second series filling the chair rail channel.

The area above the 5' 6" mark on the south portion of 106/W1 is done in red plaster, which extends up to the bottom of a second chair rail channel at 7' 2" above the finished floor. This higher channel is also filled with a base coat of the second plaster series. Above this second channel is found a heavily-aggregated brown coat with a smooth-finished surface. Both the red plaster and the smooth-finished brown coat show remnants of the red-cream leaf pattern wallpaper.

As on the portion north of 106/W1, there is a vertical joint in the poor brickwork running up six courses from the chair rail channel at a point 3' 8 1/2" from the south partition wall. As in many other corners in the north wing, the southeast corner of the room was strengthened by the placement of expanded metal lath and new plaster during the War Department restoration.

The ceiling of the Custis chamber is on split lath and is composed of one series corresponding to the second series on the east wall of the Custis chamber and a skim coat. The center of the ceiling is sagging badly due to weak joists above. This structural condition was corrected, however, in the 1980 stabilization of the north wing roof, and the sag in the ceiling was stabilized in place.

There is no lighting in the Custis chamber. There are two duplex receptacles: one to the north of 106/D1 on the baseboard and one to the north of 106/W1 on the baseboard.

With all conduit now rerouted out of public view in the winter kitchen, it is recommended that the existing circular-sawn joists in the ceiling be painted a matte white to simulate whitewash (as well as the underside of the floor boards above). As to the evidence found on the sole surviving original joist, there would be nothing wrong with the wine cellar having a plaster ceiling should it be decided to have one as well in the winter kitchen. The plaster ceiling, however, may not seem appropriate with the dirt floor.

As was noted earlier, both the winter kitchen and the wine cellar are much in need of historic house lighting, particularly an accentuating of notable features.

Custis Chamber (Room 106) - Proposed Treatment

The door for 106/D4 is believed to have recently been removed. The door is indicated on the drawing c. 1920, which shows the superintendent's quarters.[37] It is recommended that this door be located, and if it cannot be found, it should be reconstructed following

the design of a typical north wing six-panel door. The hinges should match those on other doors in style and position on the frame.

It has been established that the north wing was once a two-story building. It is recommended that the east wall be replaced by movable panels, over the evidence. In this manner, the evidence established by the investigation of 1980-81 may be preserved and uncovered in the future.

As has been noted, the ceiling of the Custis chamber was stabilized in place during the work of 1980. As it is old and probably original to the present partition arrangement of the north wing, our recommendation is that it be left in its present sagged condition unless any further deterioration is noticed.

Restoration of mantel trim is recommended since this may be the oldest mantel in the house and it is possibly original to this room.

CUSTIS GUEST CHAMBER (ROOM 107) - EXISTING CONDITIONS

The floor of the Custis guest chamber is random-width, tongue-and-groove pine running north-south. It is a twentieth-century replacement. The baseboard is intact, and is the simple beaded variety prevalent in the north wing.

North Wall: This wall is one plaster series with a skim over split lath. As has been mentioned in regard to the Custis chamber, there is a large modern patch over 106/D4.

West Wall: The west wall of the Custis guest chamber also has one plaster series on split lath with a skim coat showing. There is a paint layering exhibit panel on the plaster wall between 107/D1 and 107/D2 running vertically from the top of the baseboard.

There is a six-panel door (107/D1) painted on both faces. The door has been cut down on the hinge stile. There is a box lock with all hardware missing, including the keeper. The hinges appear original to the situation and no other mortises are showing on the door or jamb. There is a paint layering exhibit panel on the east face. Like 104/D2, 104/D3, 104/D4, and 107/D2, 107/D1 is a 6' 2" high door.

A six-panel door (107/D2) is painted on both faces. The door has been cut down on the lock stile and at the bottom. There is the ghost of a box lock and keeper on the east face of the door and its frame. There is currently a simple reproduction box lock and escutcheon plate on the door; there is no strike plate or keeper, but rather a simple mortise cut into the jamb. The hinges may be original to the door but the jambs have hinge mortises which are larger than presently necessary. The trim on the exterior of 107/D2 is the same as that on the interior of 107A. There is a six-pane fixed-sash transom light above 107/D2 which illumines 107A behind. There is a paint layering exhibit panel on the west face of 107/D2.

There is a large closet (107/A) off the Custis guest chamber which has a pine floor that is a continuation of the one in the main room. As in the Custis guest chamber, as well, there is the simple beaded baseboard, which is intact. There are four shelves which continue around the north, west, and south walls. The shelves are 1" thick, 10 1/4" deep, and with tops located at 2' 6", 3" 8-1/2", 4' 11-3/4", and 6' 2-1/2" above the finished floor. There is a brace under each at the mid-point of the west wall. The shelves are believed to be original to the closet construction.

Closet 107A has a plaster ceiling 9' 6" above the floor and a 2' 4" x 2' 4" access trap door to the north wing attic. There is a rough ladder in modern materials which gives access to this ceiling opening that was constructed in 1980. There is one series of plaster throughout in 107a on split lath and many coats of paint.

South Wall: Like the south wall of the inner hall (north wing), that of the Custis guest chamber has two sections: the 1817-19 north bearing wall of the main block and the earlier cheek wall of the original south bearing wall of the north wing. Differing from the south wall in the inner hall (north wing), however, the main block portion of the south wall in the Custis guest chamber is a plaster series under a more recent skim coat. The southwest corner of the room was disturbed when metal lath was introduced to give additional strength during the War Department restoration. During investigations in 1980, two flue holes were located, (see photograph #50); the centerlines of both are at 8' 0" above the finished floor, on the 1817-19 wall. One was found to have a blackened interior and is connected to the flue of the chimney in the family parlor. It is 6-1/2" in diameter and is located 4' 6" from the west wall of the Custis guest chamber. The other is of a smaller diameter of 4" and is 6' 1" from the west wall. The smaller hole was dug 1' 7" into the wall before it was abandoned as a possible attempt to find a flue. When located and dug out, it was found to be filled with a broken piece of plaster trim like that presently found around the edge of the large arch against the north wall in Mrs. R. E. Lee's morning room.

The cheek wall portion of the south wall has two full plaster series. The earlier one against the brick is the smooth-finished brown

coat with remnants of the red-cream wallpaper as also identified on the upper portion of the east wall in the Custis chamber. It can be seen that this series was on the south wall of the north wing at the time it was broken through for connection to the main block; the series is broken off roughly like the brick below it. The second series is the same as that at the east wall of the Custis chamber, it turns the corner of the cheek wall, covers its ragged end, and continues to become the principal series of the 1817-19 south wall.

East Wall: Window 107/W1 is another 15 over 8 double-sashed and semi-circular headed window with counterweights like those in the school and sewing room and the Custis chamber. It shares the characteristics of those others as described except for the fact that it has no concealed convector beneath it. In place of the convector, this window has, for no apparent reason, retained the ledger wall beneath it (see photograph #51) which once ran along the entire east and west interior walls of the north wing. This short piece of the ledger wall was investigated in 1980 and found to be broken off on both its ends. Its first series of plaster, the red coat seen in the inner hall (north wing) and the Custis chamber, is also broken like the brick ends. The hole is covered with the second series and skim coat of plaster which finishes the ends and continues onto the east wall to the north and south.

The area to the north of 107/W1 corresponds strongly to the conditions on the portion south of 106/W1 in the Custis chamber. All series and features are the same; also, there is a railing block mortared between two bricks 11" north of 107/W1 and 5' 4" above the finished floor. Also, just above the lower chair rail channel on the hard, light gray plaster, there was found a fragment of wallpaper which may be

the same as the simulated wood-graining paper found below the chair rail channel on the south part of the chimney breast in the inner hall (north wing). It is probable, however, that this fragment is from a paper having a different pattern from the simulated wood-graining.

The smooth-finished brown coat is also found near the southeast corner of the Custis guest chamber around 8' 0" above the floor. Much of the upper wall area to the south of 107/W1 appears to be a patch. The lower chair rail channel continues to the south of 107/W1.

The ceiling of the Custis guest chamber is a modern replacement on expanded metal lath. A hole several feet square was opened in it near the mid-section of the west wall in order that a support could be erected to carry a composite beam during its assembling for the attic structural stabilization. A similar hole was opened and patched near the southwest corner of the Custis chamber as well.

There are no lights in the Custis guest chamber and one duplex receptacle to the south of 107/W1 on the baseboard.

Custis Guest Room - Proposed Treatment

Recommendations for the room will be deferred until the north wing investigation is completed.

NOTE: The following portion of the report will discuss existing conditions in the main block, the south wing, the house garret, and the house exterior. As only limited fabric investigation was carried out in parts of the house other than the north wing, consideration of the following spaces will not be as comprehensive as the foregoing sections on the house basement and the north wing.

FAMILY PARLOR (ROOM 108) - EXISTING CONDITIONS

The flooring of the family parlor is random-width, tongue-and-groove pine, running north-south and dating from the twentieth century.

The baseboards, door and window casings, arch casings, and elaborate plaster ceiling cornice are intact and original to the decorative scheme of the main block. There are paint layering exhibit panels beneath 108/W2 on the baseboard, on the wall and cornice above 108/W2, and on the east wall of the room near the southwest corner.

The fireplace has a carved marble mantel and a brick hearth laid in a regular pattern. The floor of the firebox contains a hot-air diffuser installed during the Department restoration. The back of the firebox appears to have original brickwork, but the sides have been rebuilt. The flue was stopped by copper sheeting during the War Department restoration. There is a jack arch over the firebox opening 4" behind the mantelpiece. It can be seen that the top of the jack arch on either side has been cut off to allow installation of the mantel; the middle of the bottom of the jack arch has also been chipped away.

Windows 108/W1 and 108/W2 are both twelve-over-eight double sash, with counterweights. There is no reason to believe that they are not historic fabric; they are in very good condition.

Door 108/D1 has six panels and is stained on both faces. It has not been cut down, but has had a small piece added to the top rail. The mortise lock is not original and replaces a larger mortise lock. Escutcheon plates, knobs, shank, and strike plate are missing. The hinges are apparently original to the door and jamb. There is a paint layering exhibit panel on the lower north face.

Doors 108/D2 are double doors, three-panels each, stained on both faces. These doors lead into space 105A. Both doors here have been cut down on hinge stiles to fit the opening and a 1" piece has been added to both bottom rails. The hinges, which are painted white, are apparently not original to either doors or jambs. There is a ghost of a strike plate on the west jamb, and the top mortise on the east jamb is served inches larger than the present hinge. There are no signs on the doors themselves of any missing or former hardware. The west door is provided with a reproduction mortise lock with all parts intact; this side of the two door group overlaps the other and shows a bead down the lock stile. The lap behind it on the east door also has a bead on its north face.

Doors 108/D3 are double doors like 108/D2; they close off closet 108A. They have three-panels each and are stained on both faces. A piece was added to the west jamb of the doorway so that the doors would fit the opening, the west door having been cut down radically on its hinge stile. A 1 3/8" piece has been added to the bottom rail of each door. The west door has a simple box lock on its north face and no escutcheon plate on the south face. The east door is pierced where a strike plate once may have been located. Indications on the jambs are that the doorway was originally filled by a single door, its hinges having been on the west jamb. There is a paint layering exhibit panel (circa 1950s) on the south face of the west door. The west door overlaps the east with a bead down the lock stile.

The closet 108A has a simple baseboard incorporating a smaller version of the bottom portion of the family parlor baseboards. The closet has one shelf at 6' 5" above the floor and a line of what appears

to be patched peg holes at 5' 11' above the floor. The top of the closet is formed by a wood board with a beaded edge flush with the top of the door jamb. The ceiling of the closet is 7' 9-1/4" above the floor. There are no door casings on the interior, although evidence shows there were at one time. The rough-hewn studs are exposed flanking the door frame and exhibit nail holes and bent rails left in place from former casings. The floor of 108A is a continuation of that in the family parlor corresponding space west of the chimney block is discussed as 105A (see page 1064).

There are no lights in the family parlor and one duplex receptacle in the baseboard behind 108?D1.

Arches Separating Family Parlor and Family Dining Room

The three arches (see photograph #52) separating the family parlor (room 108) and the dining room (room 109) share the common characteristic of appearing to have originally held fanlights. There remains today as evidence of these fanlights a channel in each arch jamb above the springing line. The study collection contains one fanlight believed to have been removed from these archives.

Under the springing line of the center arch remains evidence of double doors which swung into the family dining room. Both the north and south jambs of this center arch have hinge mortises which have been pierced; also, to the east side, there are door stops beyond the infilled hinge mortises.

The south arch of the three was investigated to determine original conditions. The beaded trim board from the post within the north jamb

of the south arch which faces east was partially removed. It was seen that the post, which is placed to indicate support of the blocks of the reeding band above, is composed of a rough stud against the arch jamb finished with trim boards on three sides. Nail holes unconnected with the trim boards were found, however, in the stud. These small holes appeared to be the result of the lath nails; also seen on the study were faint white stains at regular intervals, indicating that lath and plaster had once been against the stud.

The blocks at the bases of the arches near the springing line which present a reeded band were made to duplicate the rest of the band; however, they are more crudely fashioned and do not appear to have been done by the same craftsman (see photograph #53).

There is an old nail above the center of the south arch which may have been used for Christmas ornaments. There are no similar nails, however, above the center of north arch. There is a paint layering exihibit panel on the south jamb of the south arch on its west side.

FAMILY DINING ROOM (ROOM 109) - EXISTING CONDITIONS

The flooring of the family dining room is random-width, tongue-and-groove pine dating from this centering and running north-south. All baseboards, door and arch casings, and ceiling cornices are seemingly original and in good condition. There are two groups of shelves (see photograph #54) on the extremities of the west wall which are adjustable to every 3 1/2". The molding above the bookcases, a reed band having a single torus, is continuous along the west wall and on the east at the springing line of the arches. The

fanlight above 110/D2 on the west wall of the family dining room (see photograph #55) has a number of cracks and missing pieces from the individual almond-shaped panes.

The carved marble mantelpiece is similar in design to that in the family parlor, but differs in detail and decorative elements. The hearth is brick laid in a regular pattern, and the sides of the firebox have been rebuilt. There is no jack arch over the fireplace opening, but rather a simple running bond over a cast-iron bar let into the wall to the east and west. There is a hot-air diffuser in the floor of the firebox which dates from 1949. There are paint layering exhibit panels to the ast of the fireplace on the north wall, to the south of 110/D2, on the baseboard beneath the north bookcase on the north wall, and two on the south wall behind 109/D1.

Door 109/D1 is a six-panel door stained on both faces. Both stiles have been cut down, and a 3/4" piece has been added to the bottom rail. The lock is a smaller mortise than the original and is missing the shank and knobs. There is a strike plate on the jamb, but the tongue is broken off. The hinges and their mortises appear original to the location. There are two paint layering exhibit panels on the north face of 109D1.

There are no lights in the family dining room, and one duplex receptacle in the baseboard behind 109/D1.

Family Parlor and Family Dining Room - Proposed Treatment

The marble mantels in the family parlor and family dining room are in need of cleaning.

There is no question that the arches between the family parlor and the family dining room were once filled, but it has not been established that they were filled in 1861. This question may be answered by evaluation of paint sequences, documentary evidence from the Agnes Lee journal, and study of the arch molding in the ceiling of the bath. There is insufficient evidence to recommend a change in existing conditions. Circumstantial evidence supports the present treatment.

In terms of design, the three fanlights should following pattern established by those between the family dining room and the north stair hall, and between Mrs. R. E. Lee's morning room and the office and study, for lack of further evidence. The double doors may have been a simple design of two vertical rows of panes each, unless further information about them is located. Reconstruction of these arch elements should await the completion of the history section at Arlington House.

NORTH STAIR HALL (ROOM 110) - EXISTING CONDITIONS

The flooring in the north stair shall is random-width, tongue-and-groove pine, running north-south, as replaced in this century.

All baseboards are in good condition and believed to be original. The baseboard running along the west wall appears to have been removed and reapplied 1/2" out of the brick surface. This baseboard may have been taken down and incorrectly replaced during the War Department restoration when the diffuser below 110/W1 was installed. The baseboard on the panelled wall below the stairway is perfectly

plain. There is an overboard as well on the panelled wall below the stair, riding on the plain baseboard, which corresponds to some older baseboard from the north wing found in the north wing attic, a type which survives only as the principal baseboard of the school and sewing room.

Window 110/W1 is a twelve-over-eight double sash window with all moldings, etc. in good condition, and counterweighted. There is a steel rod running from the top of 110/W1 to stabilize the stair rail. There is no cornice around the ceiling of the north stair hall.

Door 110/D1 is a six-panel door painted on both faces. The only addition to the door is a small piece above the top rail beginning on the lock side 3/8" and feathered to the hinge side. Hinges appear original; no other mortises are in evidence on either door or jamb. There is a reproduction box lock, loacking only the keeper, over the ghost of a larger lock which measured approximately 5 1/4" x 9".

Door 110/D2 is a six-panel door painted on both faces. It has been cut down on both sides, radically on the hinge stile. There is a piece added to the top rail 3/8" on the lock side and feathered to the hinge. There is a mortise lock on all parts intact, but needing renovation to become thoroughly operable. The hinges are seemingly original to both the door and jamb. The reed band above the door and under the fanlight corresponds to that used on the springing line of the arches in the family parlor in having double tori instead of the single torus of the family dining room. The door has a paint layering exhibit panel on its west face. To the south of the door are two horizontal boards which once supported a fire extinguisher.

Door 100/D3 is a six-panel door painted on both faces. The panels from the inside show evidence of hand planning, and the lock stile is worn a good deal. There is a ghost of a box lock on the interior face, which measured 3 1/2" x 5". There is a modern rim right latch on the interior and a reproduction fixed knob screwed to the lock stile on the exterior. The only strike plate is that for the modern lock, although ghosts of others are visible. The escutcheon plate is of uncertain date. The hinges are apparently original as there are no other mortises in evidence.

Door 110/D3 is the door to closet 110A. This small space under the servants' stair to the second floor was once a stairway to B04. The stairway hole is covered strongly with pine boards which overlay the present floor of the closet. A piece of the original baseboard, which runs unpainted along the east wall, matches the bottom portion of the principal baseboard in the north stair hall. Both the ceiling and the west wall of 110A are covered in modern sheet rock. In 1981 a 4" x 4" steel angle was placed in the head of the closet to give better support of the center stringer of the stair carriage above. The east end of the angle was mortared 4" into the brick bearing wall and the west end was folded over and bolted into a stud with four lag screws. The east casing of the closet door on the interior is a piece of beaded trim.

There are no operable electrical receptacles or lights in the north stair hall.

North Stair Hall (Room 110) - Proposed Treatment

It is recommended that the baseboard along the west wall be removed and reattached so that it fits closer to the wall; as well as, removal of the old outlet and piecing of the baseboard. The fire extinguisher support and the boards on which it is attached behind 110/D2 should be removed as the extinguisher is no longer is use. The metal rod stabilizing the stair rail should be left in place for the safety of the public.

CENTER HALL (ROOM 111) - EXISTING CONDITIONS

The flooring of the center hall is random-width, tongue-and-groove pine dating from the twentieth century and running east-west. There is a small portion of the center hall between the north arch on the west end and 111/D3 where the boards run north-south.

The baseboards are intact, seemingly original, and like those seen in the water closet, the family dining room, and the north stair hall. The curved blocks attached to the baseboard east of 109/D1 and west of 112/D2 were placed there as steps. Arch and door casings and jambs are also apparently original; many of them have the unusual feature of being pieced near their contact with the floor. The varied piecings are irregular in size and are often crudely done in imitation of the original designs. This piecing may have been necessary due to excessive wear. The four doorways leading off the center hall into the family parlor, the family dining room, and the white parlor have jamb panels of the same design. There is a paint layering exhibit panel (circa 1950s) in the center of the south wall above the baseboard.

Both the ceiling of the main portion of the hall to the east and that of the smaller portion to the west, defined by the three arches, have elaborate plaster cornices similar to those in the family parlor and the family dining room. They are in good condition and may be original. The small area north of the north arch and south of 111/D3 has no ceiling cornice.

Doors 111/D1 are double doors of five vertical panels each painted on both faces. These doors provide the principal entry to the house from the west. The doors were made for this opening and are held to be original to the 1817-19 building for the main block. The north door has floor and head bolts, and the south door has a 6" x 10" box lock and keeper; all hardware is intact and believed original. There is no suggestion of any other hardware having ever been on the doors; the hinges appear original as well and there are no other mortises on the doors or jambs. The doors were taken down in 1981, stripped of all paint, and given a much needed renovation necessitated by paint build-up and the working loose of the door rail and stile joints. On the west (exterior) face, the north door overlaps the south by 1/2" in a vertical bead. Doorway 111/D1 is flanked by 111/D1 and 111/W2, two six-over-four double sash windows which act as side lights to the doorway. These are small windows placed above panels which extend to the threshold on the floor; the windows are not counterweighted.

Doors 111/D2 are double doors opening onto the portico, which serves as the principal entrance to the house. They are painted on both faces; each has two panels of the same size beneath the locking rail and ten small panels of the same size above above it. The south door has two cracked panels on its north side. The south door has a

large 6" x 10 1/4" box lock and a circular brass knocker and brass escuthceon plate on the exterior. The north door has the lock keeper and a bolt at the head and bottom; the bottom bolt is missing its strike plate. The hinges on both doors appear original to the doors and jambs. There are no signs of former hardware and that on the doors is intact except for what has been mentioned. The doors were rehung in 1981 after being repainted as the screws were working loose. The only original paint sequence remaining on the front doors is located on the hinged edge of the north door.

Door 111/D3 is a six-panel door painted on both faces. The door has not been cut down, but has a 1/2" strip added to the bottom rail. There is a large box lock having a plate attached reading "Arlington Mansion - The Gift of Mr. Charles L. Frank of Washington, D.C.". The lock and the keeper are in good condition but the lock currently lacks the shand and knobs. There are no signs of former hardware on the door. There is a paint layering exhibit panel (circa 1950s) on the south face.

The structure of the north arch of the center hall was extensively renovated and stabilized during 1980. Due to the very poor quality of the brick and mortar used and to the fact that this structural element of the center hall was not constructed as a true arch as it is supported by only one curved row of headers lying flat on their broad edge (see photograph #56), certain cracks had developed which indicated a need for repair. While it could not be ascertained how long the cracks had been in evidence, it is believed by close observers that they had grown wider in recent years. There was a possibility that the cracks had originated just after the building of the main block, but there was no

documentation to indicate when they were first noticed. During the mid-1970s, plywood centering supported by wood posts was erected under the arch to protect the visiting public. From the crack pattern which had developed on the south face of the arch and mural attributed to George Washington Parke Custis, there was reason to believe that a triangular section of the arch, measuring approximately 2' on a side, could disengage.

Stabilization work began with removal of the plaster on the opposite side of the arch from the mural painting. Once the brick surface was exposed (see photograph #56), a major crack 1" in width was seen to have developed vertically above the arch running down to the west; other smaller cracks were also observed. The fact that some of these cracks were reflected in the mural on the opposite face showed they were severe and that a genuine problem existed.

Small-diameter threaded steel pipes were lodged into these cracks at intervals (see photograph #56) and a substantial brown coat of plaster was applied over the area of exposed brickwork and allowed to dry. A highly-fluid grout mixture, designed to penetrate all spaces within the cracked arch, was pumped by hand through a hose connected to the threaded ends of the short pipes issuing from the cracks. The process began at the lowest pipe and pumping continued at low pressure until liquid grout ran from the next highest pipe location, at which time the grout hose was connected to the higher pipe. As narrow streams of grout were found on basement walls, it is assumed that the entire arch was filled from the floor of the center hall to within 1' of the ceiling. Over one hundred and fifty pounds of grout were pumped into the north arch, all of which was allowed to cure for one month before work proceeded.

For the second phase of arch stabilization work, a foot wide band of plaster was removed down to the brick under the curve of the arch jamb at its apex. A quarter-inch steel plate 10" wide and 5' long was manufactured in a curve (see photograph #57) corresponding to that of the arch, and temporarily braced under the arch against the brick. Using a diamond bit, 1" holes were then bored at the four corners of the plate to a depth of approximately 2' into the grounted area of the arch mass. Three-quarter inch stainless steel rods were inserted to the bottoms of these holes and were lodged there by self-expanding metal wedges. The curved metal plate was bolted to these rods and the grout was pumped into the space remaining between the rods and the hole channels through a small hole drilled through the plate beside each bolt (see photograph #58). Grout was also pumped into small holes distributed over the plate to fill in the area between the plate and the brickwork of the arch. All these small holes had been threaded to hold the fitting of the grout-pump hose. The plate was then painted and plastered (see photograph #59).

The only visible reminder of the arch stabilization shows in the repair of the arch casing on its south edge to the west, which exhibits a filled joint where the molding sheared at some point in time during the slow dislodgement of the triangular mass and was displaced permanently.

The south arch of the center hall, which faces the arch just described, has no mural. Like the north arch, however, it does show a crack which runs vertically from the apex of the arch to a point near the ceiling where it veers to the west. This crack also is a probable result of poor quality materials and design. However, this crack

differs substantially from the other on the north arch as it has not isolated a triangular mass in the center of the arch, which is in danger of disengaging.

The arch to the east, which is wider in span than the twin north and south arches, carries a mural and shows no sign of structural decay. Its excellent condition is ude primarily to the fact that the arch is not of brick (as are the two others), but is constructed out of wood, lath and plaster.

The remaining center hall mural, that above the west door (111/D1), was damaged in the past by two major cracks which were once restored. Unfortunately, the restoration paint has not adhered and the cracks currently show as two large white marks across the face of the mural. These cracks appear old, and may well date from the very early years of the main block. There is a good chance that these cracks results from the general settlement of the building and, in particular, from the natural deformation of the lintel above the wide expanse of 111/D1 and 111/D1 and W2 which carries a large area of brick. This material movement has probably long since stabilized itself as it shows no sign of recent deterioration.

There are no lights in the center hall, and two duplex receptacles: one at the base of the west jamb of the north arch at the west of the center hall, and one to the north of 111/D2 on the baseboard at the east end.

Center Hall (Room 111) - Proposed Treatment

Since the north arch was repaired in the fall of 1980, no further movement has been observed. If this condition remains until the fall of 1981, it can be assumed that the mural above the arch can be safely restored. The mural is presently in poor condition due to cracks from the structural failure of the arch and deterioration af the 1930 restoration. The mural above 111/D1 has also been damaged by past cracking; it is probable, however, that the material movement responsible for these cracks has stabilized. It is the recommendation of the report that the two damaged murals be repaired and that all three murals be throughly cleaned and restored by a qualified specialist.

The south arch, which exhibits only a minor crack, should be left as is unless further cracking or other deterioration is observed. Cracks in the door panels of 111/D2 and worn ends of door and arch casings near the floor should be left as is for their value in enhancing the historic ambience of the house.

It is recommended that the north wall and related structure be examined to identify location of air passage from 1855 furnace to center hall and upper hall. The duct should be restored if there is sufficient evidence of the 1861 appearance.

WHITE PARLOR (ROOM 112) - EXISTING CONDITIONS

The flooring of the white parlor is random-width, tongue-and-groove pine running north-south and dating from this century. The baseboards are intact; their only dubious feature historically is the

odd, unfinished manner in which they stop adjacent to the fireplaces on the south wall. In design they are like those in the center hall.

The door and window casings differ from those in the rest of the house and exhibit a later style than the Greek revival character of most of the rest of the main block. The white parlor and Mrs. R. E. Lee's morning room adjacent to it are the only areas in the house having plinth blocks.

Windows 112/W1 and 112/W2 are twelve-over-eight double-sash windows with counterweights. They have wood panels between their sills and the baseboard, as do those in Mrs. R. E. Lee's morning room. The baseboard beneath these panels in the white parlor, between the plinth blocks of the window casings, differs from that in the rest of the room and in the rest of the house.

The most distinctive feature of the white parlor is the design of its south wall (see photograph #60). The elements are composed symmetrically around the doorway (115/D1) to the south wing, which is accented by a double recessed semi-circular arch. To either side of this doorway is an identical fireplace, and, between each fireplace and the side walls a semi-circular arched niche. The inner arch around the doorway is the only one in brick; it is built into the south bearing wall to the main block. The other arches are all in lath and plaster over wood, as is the great arch on the north wall of Mrs. R. E. Lee's morning room just across the bearing wall from them.

The interior of the east fireplace box has been completely rebuilt (see photograph #61); this work was probably done during the War Department restoration. There is no arch in evidence above the fireplace opening, but rather a modern angle iron. The heating system

diffuser was installed in the floor of the firebox in 1929. The hearth is of stone and broken near the center. There are several small cracks in the marble mantlepiece itself.

The west fireplace, which has a carved marble mantlepiece typical of the Victorian period, exhibits similar conditions as described in the east fireplace. The only differences between these twin fireplaces is that the west one has no cracks in its face, none in its hearth, and a heat diffuser which dates only from 1949.

The ceiling cornice is of molded plaster similar to those in the family parlor, family dining room, and the center hall; it is intact and believed to be historic. There is a circular plaster decoration (see photograph #62) in the center of the ceiling composed of three gilded tori which surrounds the chain of the light fixture. It is consistent with the decor of the rest of the room and believed to be original.

Door 112/D1 is a six-panel door stained on both faces. The door has neither been cut down nor pierced, and there are no indications that there has ever been any different hardware on the door. The mortise lock fits the door, but appears to be a reproduction. The strike plate is bent out of shape and the portion of the casing bead in front of the strike plate appears to be a replacement. The hinges appear to be original.

Door 112/D2 is a six-panel door stained on both faces. It has been cut down on both sides and has a 1 1/4" piece added to the bottom rail. Both the mortise lock and hinges have been moved to opposide sides of the door from where they were orginally. The mortise lock (5 1/2") is smaller than the original (7") and is probably a reproduction; the mortise bolt knob is missing. There are the ghosts

of three hinge mortises on the lock stile which are pieced over. The present arrangement has two hinges; the hinge mortise near the center of the jamb, which is not in use, is piece over. The strike plate is bent out of shape, and the beaded casing in front of the strike plate is pieced. The hinges presently in use may date from the historic period. There is a paint layering exhibit panel on the south face of 112/D2.

Door 112/D3 is a six-panel door stained on both faces. The door has nether been cut down nor pieced. The face opposite the mortise bolt knob shows a small plug which may indicate a possible change of the lock from one face of the door to the other. The mortise lock in size appears original to the door, however, as the mortise is in no way either pieced or plugged, the lock itself and hardware are probably reproductions. The hinges are old, but are not original to the jamb where the present arrangement is pieced. The top hinge appears to have originally measured 6 1/2", while the one currently in use is only 5". The strike plate is missing and has been partially replaced by a modern element. The bead on the casing in front of the strike plate has been replaced; it is presently torn away again and presents a mutilated condition to public view.

There are no lignts in the white parlor, but there is a duplex receptacle on the west wall of the east niche beside the east fireplace and a single receptacle on the baseboard behind 112/D2.

White Parlor (Room 112) -- Proposed Treatment

A U.S. Army drawing[39] preserved in the National Archives called for the replacement of the Victorian mantels original to the Lee period with copies of earlier mantels found at Woodlawn Plantation. These drawings show an existing condition at Arlington House whereby the

Victorian mantels are in place, as they are today, prior to their removal. There existed then a different condition, which should be restored, where the firebox was smaller than today and defined by a 4" band of plastered brick following the mouth of the fireplace mantel opening. The fireboxes as seen today are those that are rebuilt to conform to the Woodlawn replicas of 1929. When the original mantels were restored in January 1953[40], the fireboxes were not changed back to accommodate them. This change to the original condition should be made as soon as possible to contribute to the authenticity of the scene. The fireboxes, as they now stand, are neither authentic nor convincing.

Further recommendations for the white parlor are that the door casing in front of the strike plate on 112/D3 be repaired and that the baseboard stops against the mantels be further investigated to determine a better solution than their present condition, unless that condition can be proved to be historic.

It is recommended that the floor register for the 1855 furnace be restored. The walls should be analyzed for the possible location of historic lighting fixtures.

SOUTH STAIR HALL (ROOM 113) - EXISTING CONDITIONS

The flooring of the south stair hall is random-width, tongue-and-groove pine, running north-south and dating from the twentieth century. The diffuser grill under 113/W1 was installed during the War Department restoration. There is a patch along the east wall near the southeast corner measuring 1 1/2" x 2 1/2".

The baseboard is of three different types. The section between doorway 112/D1 and the center hall is similar to that of the family parlor, family dining room, north stairhall, and the center hall. The short section below the panelled side of the stairway is different in detail from anything in the house. The baseboard in the remainder of the south stair hall differs from main block designs but shares some characteristics (see molding profiles). There is an unusually large buildup of paint layers on baseboards and other moldings in the south stair hall.

Window 113/W1 is a 12 over 8 double-sash window with counterweights. The pegboard located on the west wall between 113/W1 and 113/D1 appears original. This same west wall is cracked and in need of resurfacing.

Most of the top sash of Window 113/W1 is cut off from view in the south stair hall by the main stair landing. The underside of this landing, which is the low ceiling of much of the south stair hall, has no cornice. This ceiling is freshly cracked, indicating that the stabilization work carried out in 1978 should have been more extensive.

Some work was undertaken in 1978 to strengthen this landing of the main stair. The header spanning the width of the landing, running east-west, framed into the west side of 112/D1 and into the area north of 113/W1. The framing system of the landing was weak due to the deep mortises cut into existing headers in the east and west walls to catch the joists of the landing, thereby decreasing the effective sections of these headers. To solve the problem of an unstable landing which consistently cracked the plaster on its underside, a double laminated header was added just above 112/D1, and an additional timber

was placed along the side of the landing to the west in front of 113/W1. The existing header running east-west along the north edge of the landing and catching the carriages of both runs of the main stair was attached to the new timbers on either end with metal clips. Also, the connection between the landing header and the stair carriages was strengthened by the addition of metal connectors.

Door 113/D1 is a six-panel door painted on both faces. It does not appear to have been cut down significantly on either side; it does, however, have a 1" piece added to the bottom. There is the ghost of a plug on the south face of the door indicating that a different lock may have been once used. The present box lock appears old, but may be a reproduction. The lock is in good condition and has all its elements. The hinges appear original with no mortise ghosts in evidence. The door has been pieced vertically (3/4" x 1'-2 1/4") on the lock stile half-way between the lock and the top of the door. Also, the casing has been pieced on the east between the keeper and the doorway head.

Door 113/D2 opens to closet 113A. It is a six-panel door painted on both faces. The door has been extensively pieced on the hinge stile (1"), the bottom rail (2"), and the top rail (1/2"). A block has been let into the middle rail on the hinge singe and piecing has been done around the strike plate area. The present box lock appears to be a reproduction. On the south face of the lock stile there is a brass escutcheon plate serving the box lock and a reproduction knob screwed onto the door to be used only as a door pull. The strike plate appears new and probably corresponds to a contemporary locking device, the ghost of which appears on the north face of the door above the box lock. The east jamb shows evidence of hinge mortises which have been pieced near the head and bottom of the frame.

The closet 113A has original house flooring in evidence. It is pine, random-width and tongue-and-groove, running north-south. The baseboard in the closet exists only on the west wall; it corresponds to that in the south stair hall on the west wall as well. The walls of 113A were redone in sheetrock, and some modern timers are apparent in the cloet to stabilize the stair stringers above. There is evidence of some bug damage on the baseboard, but it is not thought to be recent. This closet is not shown to the public and is used for storage.

There are not lights or working electrical outlets in the south stair hall. There is an abandoned old-style single plug outlet in the baseboard on the west wall near the southwest corner which could be removed. The baseboard is very much in need of paint removal; the outlet hole could be pieced at that time.

South Stair Hall (Room 113) - Proposed Treatment

It is recommended that further work be carried out in the south stair hall to stabilize the stair landing as cracking in the ceiling underneath is apparent, indicating excessive movement. The west wall of the south stair hall between 113/W1 and 113/D1 needs resurfacing. The baseboard below this wall has an old-style receptacle, no longer in use, which could be removed and the baseboard pieced.

STORE ROOM (ROOM 114) - EXISTING CONDITIONS

The flooring of the store room is random-width, tongue-and groove pine, running east-west, and dating from this century. The baseboard is intact and features a simple bead like that used in the north wing.

This baseboard in the store room, however, is wider than that found in the north wing.

There is a pegboard, the centerline of which is 6' 4 1/4" above the finished floor, running between 114/W1 and 114/D1 and along the south wall. Window 114/W1 is a six-over-six double-sash window with no counterweights. The ceiling of the store room has no cornice.

Door 114/D1 is a four-panel door painted on both faces. The door is not cut down but has a 1 1/4" piece added to the bottom rail. The box lock is intact, and there are no signs of other hardware having been on the door. It has been pieced, however, in the lower east corner beneath the box lock. The hinges appear original. There is a four-light transom sash on "HL" hinges above the door; it opens from the bottom on the interior. The door is very similar to 101/D2, which is located in the same position on the symmetrically opposite side of the house; both doors were renovated in 1981.

Door 114/D2 has six lights of undated origin over two panels painted on both faces. The only change in the door dimension is a 1" piece added to the bottom rail. There is a box lock which appears to be a reproduction; the two hinges may well be old. There are no signs of missing or changed hardware. The door trim is like that on 114/D1. The bottom 1'6" of each jamb is pieced.

Door 114/D3, the door to closet 114A, is a six-panel door painted on both faces. It was cut down radically to fit the present opening, and shares no characteristics with any other doors in the house. There is a reproduction box lock and a decorative door knob which is screwed to the south face. There is no strike plate for the box lock, but rather a simple mortise in the jamb. There is a modern rim right

latch which has its own strike plate. The hinges appear original to this composition.

Closet 114A does not appear in any plans of the house, even the Historic American Building Survey drawings of 1940. The floor is a continuation of that in the store room and the baseboards are the same as well.

There are no lights in the store room; a duplex receptacle and the telephone are located in 114A.

Store Room (Room 114) - Proposed Treatment

It was recommended in late 1940 that a standpipe firehose system be installed at the Arlington House for protection against air attacks. The first proposal had the pipe running up through the store room in its southwest corner behind 114/D1. While evident to the public, it would have been partically concealed behind the door when it was open. It is obvious that the room 114A was constructed thereafter to serve as the route by which the standpipe would rise through the store room. This closet was not drawn in the original standpipe proposal, and did not appear on any drawings of the house, including the Historic American Building Survey drawings of 1940. It was necessary to construct this closet if the pipe were to be totally concealed; it was also necessary to provide a place for the firehose accordion, a major element evidently overlooked in the first proposal.

It is the recommendation of this report that closet 114A be removed from the store room in order that space can be interpreted as the store room as outlined in the 1978 Furnishing Plan.[41] It is also recommended

that the standpipe be completely removed from all four floors of the house. This standpipe represents an antiquated piece of equipment which is more of a danger to the house than an asset. Should it ever be activated, water from initial leaks in the cloth hose prior to the necessary swelling of the fibers would do more damage to the house than the fire. As it now stands, small fires would be handled by the many CO_2 extinguishers located throughout the house. These extinguishers should handle virtually any small fire well with minimal damage to the house, including those from electrical causes. Larger fires will be handled by the Fort Myer Fire Department, which is only several minutes away. Testimony from firemen on duty at that station maintained that a fire at Arlington House would be met with the standard rubber hoses which unroll off the truck and which are easily probable to any spot in the house, including the upper floor and attic. The cloth hoses and standpipe are inappropriate for building of only a few stories, and, according to the firemen's testimony, would never be used during a fire at Arlington House. During destruction of 114A, any remains of the original store room, such as shelf lines, should be identified and documented.

MRS. R. E. LEE'S MORNING ROOM (ROOM 115) - EXISTING CONDITIONS

The flooring of Mrs. R. E. Lee's morning room is random-width tongue-and-groove pine, running north-south, and dating from the twentieth century. Two heating returns are located in the floor against the north wall under the great arch.

The baseboard of Mrs. R. E. Lee's morning room is different from any in the rest of the house except that in the office and study. Due to its large scale, it does not fit well in its junctions with the plinth blocks. The only locations where the baseboard works correctly are between the tow bases of the great arch on the north wall (see photograph #63), the east and west walls, and against the window shutter boxes where any molding, no matter how large, could stop. The section of the baseboard running around the chimney breast and between the breast and 115/D2 is a copy of the original and was probably put in place after the removal of the original marble mantel in 1929. Like the baseboards, the plinth blocks, and the door and window casings are of a design unique to Mrs. R. E. Lee's morning room,

Windows 115/W1 and 115/W2 are semi-circular headed windows, fifteen over eight lights, similar to those in the principal rooms of the north wing, by the muntins show more detail. They are double sash and operate with counterweights. Both the north and south plinth blocks on 115/W1 were present in the construction; a cut nail was also found in the sticking of the north panel under 115/W1. The backband running vertically up the casing from the plinth block was partially removed and exhibited cut nails.

Windows 115/W1 and 115/W2 are the only windows at the Arlington House to have shutter boxes. While most of the box structure appears to be old, the vertical boards to either side of the window sashes are the semi-circular piece following the top arch of the sash appear to be much more recent. A piece of trim was removed on the north edge of one of these boards in 1981 and it could be seen that both the board and trim were modern, with the trim exhibiting wire nails. The

semi-circular piece above these flanking boards have been put in by the army to conceal a window curtain roller. As a result of these flanking boards being new, there is no trace of the interior shutter hinge mortises. From the size of the boxes themselves, it is apparent that the portion of the shutter lying in the box and showing when fully open would measure approximately 13-1/2". As the total window opening is 47", each of the inner two leaves of the shutters, which would disappear completely behind the larger outside leaves when opened and lying in the box, would measure 10" each. This feature is unique and deserves full documentation and comparative study.

The cornice is in good condition and apparently dates from the original decoration of the room. The ceiling is also believed original and shows a good deal more cracks than found in most other rooms. From the south wing garret can be seen that the plaster in on split lath. The chandelier rosette (see photograph #64) is also thought to be an original feature. It is an elaborate molded plaster type of great mass that is missing some parts of three places around its edge.

The fireplace firebox has had its side walls rebuilt and its back roughly plastered with concrete. There is a brick jack arch in good condition spanning the opening. The floor of the firebox received a heat diffuser in 1929. The hearth is of solid stone, broken in the center and filled with a different stone type laid irregularly into the gap. The mantelpiece is a reproduction Adam-style type in wood installed during the War Department restoration (see photograph #65).

Door 115/D1 is a six-panel door stained on both faces. The door has been cut down radically on both sides. The present mortise lock replaces a larger one (as was the case in both the family parlor and the

family dining room) and the openings for the former lock have been crudely filled. The strike plate is in good condition, but the mortise bolt knob and both the escutcheon plates are missing. The hinges appear original to the door and to the frame. The plinth block to the west of the doorway appears to be a crude, too small copy, overshot by the base molding of the baseboard.

There is a six-panel door (115/D2) painted on the west face and stained on the east. The door has neither been cut down nor pieced. As in 115/D1, the mortise lock is a smaller replacement of a larger original. The strike plate is in place, but the mortise lock is a smaller replacement of a larger original. The strike plate is in place, but the mortise bolt knob is missing. The two hinges appear original; the lower is partially broken in one corner and has the letters "P H I L A D" cut into the door butt. The molding at the head of the door is cut in an unusual horizontal fashion. Each of the wide jambs has two parallel bands of reeding having four tori each extending up each side jamb and across the head. This feature is unique at the Arlington House.

A probe into the north wall during the paint study investigation revealed there is only one series of plaster over the brick at that point in Mrs. R. E. Lee's morning room.

There are no lights in Mrs. R. E. Lee's morning room, but there are three duplex receptacles; behind 115/D2 on the baseboard of the west wall, on the north face of the north end of the shutter box of 115/W1, and on the south face of the south end of the shutter box of 115/W2.

Mrs. R. E. Lee's Morning Room (Room 115) - Proposed Treatment

The existing "Adam" style wood mantel in Mrs. R. E. Lee's morning room was placed there by the army in 1929 after removal of the marble mantel installed by the Lees in 1855. As was the case in the white parlor, Charles Moore of the Commission of Fine Arts could not believe that these Victorian marble mantels dated to the historic period; as no documentation had yet been found regarding them, they were removed and stored in the basement of Arlington House. The historic marble mantel was replaced by an example of early nineteenth century work in reproduction, thought to be more fitting to the overall style of the house.

After documents[42] had been located c. 1950 establishing the authenticity of the Victorian mantels, the two matching ones from the white parlor were retrieved from the basement and placed back in their original locations. Unfortunately, the similar but less decorated mantel of Mrs. R. E. Lee's morning room was missing and has never been recovered. If the original mantel is not available, a period mantel of similar design is recommended in the approved furnishing plan.

When the marble mantel was replaced in 1930 with the "Adam" reproduction, the hearth stone was removed and cut down 2-9/16" on its north, south and east sides. Two drawings helpful in understanding the removal of the mantels are located at the National Archives and Arlington House.[43]

As was noted in the existing conditions, the ceiling of Mrs. R. E. Lee's morning room is probably original. It is important that this ceiling be preserved as is, since it is an enhancement to the present

historical ambience of the house. The ceiling is in need of preventive stabilization treatment (restoration of broken keys in place).

While it appears that the past procedure at Arlington House has been to totally replace a deteriorating ceiling, it should be the practice in the future to preserve what is inplace. There are several methods to stabilize an aging plaster ceiling; all of these should be exhausted before wholesale replacement. Should it be possible to end the firing of large guns near Arlington House, as recommended, the remaining original ceilings should last a good deal longer than they will at present.

It can be seen from the historic photographs of June 1864 that the windows in Mrs. R. E. Lee's morning room were provided with interior shutters. In the photograph showing the east facade of the house from the southeast, it can be seen that the leaves of the shutters are folded back into their boxes. All that can be seen in the photographs would indicate that the shutter leaves are solid, with recessed panels and in four hinged parts.

CONSERVATORY (SOUTH WING LOGGIA) (ROOM 116) - EXISTING CONDITIONS

The floor of the conservatory is all brick laid in a herringbone pattern. The age of this brick floor is undetermined. The brick pattern is interrupted under 116/W1 where eight rowlock brick and one stretcher occur. A stone complete the brikwork between the stretcher and the south jamb of 116/W1. There is only this unusual brickwork between the jambs of 116/W1; in its place between the jambs of the

other windows (116/W2 and 116/W3) are concrete thresholds. The purpose of the brikework under 116/W1 remains unexplained.

Some fabric investigation was conducted in the conservatory by the Arlington House historian, Mr. Murray Nelligan, during the early 1950s. He found that the arches were once open, as in the north wing loggia, and that the conservatory windows had been added later. His probings showed no bonding between the brick under the windows and the posts of the arches. He also located a series of what appeared to be joist pockets several feet below the present level of the roof rafters along the east wall of a flue hole.[44] There are similar pockets in the east wall of the pantry in the north wing.

The short stairs that lead into the store room and the office and study appear from their construction to date only from this century. North of the stair on the east wall into the office and study is the ghost of a former stair which ran against the walls. There is also a heat diffuser on this wall that dates from 1949. The hole in which the diffuser was placed appears to have once been a connecting opening between the conservatory and B10.

Windows 116/W1, 116/W2, and116/W3, are all alike in being operable eight-over-either double sashes at the bottom, two windows within each arch divided by a wood post. Under the semi-circular head of each arch are two quarter-circule windows which open into the conservatory by hinges on the center post. It is difficult to tell what parts of windows are original and which are replacements. This information could be possibly ascertained by a paint investigation of all parts. Extant window hardware should be dated.

Doors 116/D1 are reproductions. The original doors are in the study collection. Between them is a wood post which can be removed allowing maximum access to the conservatory. The door has what appears to be a reproduction box lock with all its parts intact, a modern barrel bolt, and a modern mortise bolt with all its parts intact, a modern barrel bolt, and a modern mortise bolt on its lock stile. The semi-circular arch head above the door and fixed panel also has two operable quarter-circle windows.

The shelves along the east and west walls are all twentieth-century additions. There are no lights or receptacles in the conservatory, but there is a water spigot in use which is located on the north wall to the west of the staircase leading into the store room.

OFFICE AND STUDY (ROOM 117) - EXISTING CONDITIONS

The flooring of the office and the study is random-width, tongue-and-groove pine dating from this century and running north-south. The heat diffuser under 117/W2 was installed in 1929.

The baseboard is like that in Mrs. R. E. Lee's morning room. The base molding does not junction well with the door casings, which are rather flat against the walls following the basic design of those found in the north wing. The base molding is too large for the overall decorative scheme and overshoots the casings.

The northwest corner of the room is cut off at a 45° angle an contains a flue hole high up off the floor, which connects through the west wall to the flues of the fireplace in Mrs. R. E. Lee's morning room.

A small hole dug behind 117/D2 during the paint study revealed that the wall had only a single series of plaster. The ceiling cornice is intact and believed original; small than most of the house cornices, it is in a scale appropriate to the office and study.

Windows 117/W1 and 117/W2 are both semi-circule arch-top, 15-over-8 double-sash windows. They operate on counterweights. No physical evidence of interior shutters has been found.

Doors 117/D1 are double doors with four vertical panels each, stained on both faces. The west door has had a 1" piece added to its hinge side, a 2" piece added to the bottom rail, and a 1" x 3" piece let into the lock stile near the bottom. The east door also has a 2" piece on the bottom rail and a 1 1/2" x 5" piece let into the lock stile near the bottom. Both doors have a poor, cracked finish and many scratches. There is a reproduction box lock on the west door over the ghosts of several previous locking devices. A keeper is present on the east door, and the doors close in a lap. The hinges appear to be in their original location. There is a fanlight above the door similar to the above 110/D2. One of the almond-shaped panes is broken and there are cracks in other panes.

Door 117/D2 has six panels and is painted on both faces. The lock stile has been cut down and a 1 1/4" piece added to the bottom rail. There is a ghost of a former box lock on the hinge stile. There is a box lock and keeper, which may be reproductions. The hinges appear original to the door and jamb. Approximately 1' of the door jamb is pieced on either side at the bottom. Both faces of the door have paint layering exhibit panels (circa 1950s).

There are no lights in the office and study, but there is a duplex receptacle behind 117/D2 on the baseboard.

Mrs. R. E. Lee's Morning Room and Office and Study (Rooms 115 and 117) - Recommendations

A photograph of June 29, 1864 (neg. 165-C-517) shows closed shutters behind the closed window 117/W2. It can be clearly seen that the center two shutter leaves are operable louvers, with the two side leaves hinged to the window jambs, of solid wood. It is possible that solid wood has recessed panels but that is not visible because of lack of clarity in that part of this paragraph. As was noted in the Existing Conditions, there are no shutter boxes in the office and study or present signs of shutter hinge mortises. Windows and frames should be studied to establish date of installation. From the historic photographs it can be seen that Mrs. R. E. Lee's morning room and the office and study were fitted with interior shutters during the historic period. In Mrs. R. E. Lee's morning room, examination of the extant boxes indicates that the two outslide leaves of the shutters would sold with recessed panels and measured 13 1/2" across.

In the office and study two inside operable louvered leaves are located in the interior shutters. The outside leaves show no detail but could be recessed panels. It would be logical to use the photographic evidence we have from the north and south wing windows and supplement it with a study of period interior shutters.

Further study of the photographic evidence is recommended in conjunction with detailed study of similar interior shutters still in situ in Alexandria, Virginia and Georgetown, D.C. On completion of this

study it is recommended that indoor shutters be designed and restored to windows of the north and south wing where shutters were hung in the historic period.

MAIN STAIRS - EXISTING CONDITIONS

The first flight of the main stairs up from the center hall to the landing seems in good structural condition. It is well-supported by the panelled wall under its east side, which forms a wall of the closet 113A. For many years all treads and risers of this stairway and landing have been covered with a crosshatched rubber material. This covering, institutional in character, detracts considerably from the historic ambience of the house, yet has been a valuable tool in preserving the fabric from the effects of high visitation.

The bannister of this first flight is stabilized by a 1/2" metal road which attaches its underside to the decorated face of the carriage of the second flight near that point where the two flights meet at the landing. The bannister is further stabilized at four points on the flight by small metal angles securing the bottom of balusters to the treads. All newel-posts and bannisters are stable. The most obvious problem along the first flight of the main stairs is on the baseboard where there is such a build-up of paint layers that all detail is obscured.

The stair landing, the stability of which has already been examined in the treatment of the south stair hall, is lit by the top two-thirds of the top sash and 113/W1. The ceiling above the landing appears old.

Prior to stabilization work performed in early 1978, there were problems with the connection of the second flight of the main stiar to the second floor level of the house. The header which carried the top flight of the main stair and the bottom flight of the attic stairs, and the joists connecting to it supporting the floor of the upstairs hall, were crushing the soft brick in the top of the arch which supported the wood members. In order to amend this situation, the flooring over the affected area was removed, the joists cut back, and an additional header was seated on metal plates into the pilasters on either end. The existing joists were attached to this header and secured with prefabricated metal clips, thereby relieving the arch below and giving the second floor and the stair flights greater solidity.

Several further problems plagued the framing at the head of the main stairs. Once the flooring was removed for the repairs just described, it was found that there was no positive connection between the main stair stringers and the header between the pilasters put in place to cathc the stair stringers. This header was doubled, and the stringers from the main stair from below and those of the adjacent stairs from the attic were positively attached to the double header by metal straps fashioned for this purpose. The base of the newel post was solidly fixed to the header.

The bannister is stabilized by a 1/2" metal rod attached from the tops of four balusters to a plate against the west wall. Two balusters are also secured at their base to stair treads by small metal angles along the second flight near its center. Molding at the end of the tread of the first step above the landing needs reattachment.

Servant's Stair

The servants' stair runs from the north stair hall to the upstairs hall in one flight only. It connects to a small ante-hall in the upstairs hall, rather than to the main part of the upstairs hall, as does the main stair. Like the main stair, the servant's stair is covered by the crosshatched rubber treads and rubber-covered risers.

The bottom portion of the flight is supported by the panelled wall on its west edge, and the steel angle in the north stair hall closet already described. The bottom five steps curve 90°, and are difficult to negotiate by the visiting public. This situation is intensified by the second step up from the floor to the north stair hall being loose. The third step up has had some steel braces attached to its riser for additional support. The baseboard running up the stairs is like that on the second floor. The moldings on the west end of treads #3 and #10 from the top of the stairs need reattaching.

The balustrade of the servants' stair is the same as on the main stair. The bannister, however, is heavier than that of the formal stairway and shows less articulation. The top newel is stable, and the bottom one has been reinforced with a metal pin. The bannister is stabilized, as has been mentioned in the treatment of the north stair hall, by a metal rod connecting its center with the head of 110/W1.

There is a circular handrail of uncertain age located on the north and south sides of the stair by hangers which appear to be twentieth century. The rail is very sturdy; its hangers are attached to a board with is further attached to the wall behind. These hangers carry a crude lighting system for the stairs, which employs small clear bulbs on

what appears to be a strand of Christmas tree lights. This lighting is used at night during functions at the Arlington House.

Stairways - Proposed Treatment

Moldings at the end of certain treads on both the main and servants' stair need reattachment; they are located in the stairway descriptions under existing conditions.

Due to excessive movement observed in the lower end of the servants' stair where it curves 90°, it is recommended that the bottom five steps be disassembled and reconstructed by a qualified exhibits specialist to give the stairway better underpinning.

Both main staircases are in need of lighting. Additionally, the Furnishing Plan of 1978 calls for both the main and servants stairs, as well as a portion of the center hall, be restored to their 1861 appearance.

STAIR LANDING ROOM (ROOM 200)

The flooring of the stair landing room is random-width, tongue-and-groove pine, 1 1/8" in thickness, and original. There is a 2" hole in the floor near the northeast corner, which allowed the passage of some electrical cables now removed.

The baseboard is very plain like that in the other closets on the first floor. The room is surrounded by two levels of shelving at 4' 0" and 6' 1/2" above the floor. The shelves are 1" thick, 10" wide, and believed to be original by the manner in which they are let into the

plaster walls. It appears they were put in place before the plastering occurred.

The six-panel door (200/D1) is painted on both faces. The door has been cut down; it cannot be examined for ghosts due to a masonite fireproofing on its south face. There is a box lock on the interior with a strike plate and an escutcheon plate on the exterior face. The door is also outfitting with a modern rim right latch and strike plate. The hinges appear original to the door and jamb; they both are inscribed with the word "GODDINGTON" on their face.

There is a standpipe located in the southeast corner of 200 with a firehose accordion. A light in a porcelain fixture is located in the center of the ceiling in the stair landing room.

It is recommended that the standpipe and firehose accordion be removed from the stair landing room.

UPSTAIRS HALL (ROOM 201) - EXISTING CONDITIONS

The flooring of the upstairs hall is random-width, tongue-and-groove pine, running east-west. There is a small area to the north at the head of the servant's stair outside the main portion of the hall which runs north-south. The wide board under the north arch was replaced in 1980 after arch repairs below. All flooring dates from 1960; prior to that date the entire second floor had original boards which had been patched during the War Department restoration with the remains of the original first floor boards, which had been replaced at that time.

There was work in 1978 carried out to strengthen the floor system above the north arch. This system depended on the seating of the

joists in the brickwork of the top of the arch. These brick, unusually soft and deteriorated due to underfiring, had been crushed and no longer supported with any solidity the joists above. After removal of flooring in the area between the pilasters separating the small area of the upstairs hall to the north from the major portion of the hall, joists above the arch were cut back to allow the insertion of a header seated on metal plates on the bases of the opposing pilasters on their south face. The joists were attached to this header and secured by prefabricated metal connectors. With all the joist load taken off the deteriorating arch, the floor became more stable and the structural deficiency was corrected.

The baseboard is the same as that running up each stairway and is characteristic of that used on the second floor. It is in fact and original. Those rounded blocks affixed to the baseboard were placed there to stop the gates to the rooms when opened.

The cornice is intanct and in good condition. The cornice of the main portion of the room is typical of the design in many of the rooms. There is a simpler crown moulding above the small portion to the rnorth and above the main stairs, which does not appear elsewhere in the house. The ceiling of the upstairs hall is old and may well be original.

There is a window-door combination (201/D1) not found elsewhere at the Arlington House. The top portion of this combination in an eight-over-eight double-sash and counterweighted window. The bottom portion is made up of double doors having one panel each and hinged on the north and south. Closure of the doors is on a 45° angle and the doors are held closed by a bolt into the floor on the north door. The doors and hardware have been painted over many times and the

hardware is no longer operable. This window-door combination is original and may have been instituted for the entrance of large pieces of furniture to the second floor. Architectural historian T. T. Waterman[45] assumed that this window-door was meant to serve a two-story porch planned by Hadfield but never constructed on the west side of the house.

Windows 201/W1 and 201/W2 are small double-sash four-over-four windows with no counterweights above a panel, which flanks 201/D1. The window-door and flanking windows all rest on the threshold below the panels. No evidence was found of exterior shutters on these windows.

There are no lights in the upstairs hall; there is one duplex receptacle to the south of 201/W2 on the baseboard.

LEE GIRLS' DRESSING ROOM (ROOM 202) - EXISTING CONDITIONS

The flooring of the Lee girls' dressing room is random-width, tongue-and-groove pine running north-south and is original. The baseboard is intact, in good condition, and apparently original. There is no molding at the cornice; the ceiling appears original.

There is a pegboard and shelving, all apparently original, running north from 202/W1, across the north wall, and south to 203/D2. The centerline of the pegboard is 6' 3-1/4" above the finished floor, and the top of the shelving is 7' 6-3/4" above the floor. The east section of the pegboard runs 1" below the other two sections. There is a circular area 7-1/2" in diameter on the north wall, the centerline of which is 4' 3" above the floor, which has been left unpainted because the area

contains a pencil sketch thought to date to the historic period. Window 202/W1 is an eight-over-eight double-sash window with counterweights. A six-panel door (202/D1) has its north face stained and its south face grained in imitation of oak. (This finish was restored by the National Park Service in the 1950s). The door has not been cut down on any side. There is a mortise lock which is missing all its hardware except the strike plate, which is in good condition. The hinges appear original to the door and jamb.

There are no lights in the Lee girls' dressing room, but there is a duplex receptacle located behind 202/D1 on the south baseboard.

For dating of the molding see Arlington House repair and restoration log circa 1950.

LEE GIRLS' CHAMBER (ROOM 203) - EXISTING CONDITIONS

The flooring of the Lee girls' chamber is random-width, tongue-and-groove pine, running north-south, and original. The trim boards around the hearth lie on the floor rather than let into it, and are in poor condition with the west piece missing. The baseboard is all intact.

The fireplace mantel is of the period of the construction of the house and appears original. The firebox has not been rebuilt and retains its historical authenticity. The hearth is of stone, broken in many places, and rests unevenly on its bed. The flue hole was closed during the War Department restoration with copper sheeting.

A distinctive feature of the Lee girls' chamber and of Colonel and Mrs. R. E. Lee's chamber across the hall is the use of segmental arches over each window. They spring directly from the chimney breast and die into the room walls to the east and west. The arches are of lath and plaster, rather than being of brick or let into the bearing wall.

The ceiling has many cracks and imperfections, as does the cornice. The design of the cornice differs from that of any other in the house and has a distinctive feature, a recessed square block in each corner.

Windows 203/W1 and 203/W2 are eight-over-eight double-sash windows with counterweights. The stool of 203/W1 is noted at its each and west extremities.

A six-panel door (203/D1) has oak graining on the south face and is stained on the north face. It has been cut down slightly on both stiles. The mortise lock is a smaller replacement of one that once was there; currently all the lock hardware except the strike plate is missing. The hinges appear original to the door and jamb. There are paint layering exhibit panels (circa 1950) on both the north and south faces of the door.

Door 203/D2 has six panels and is stained on both faces. The door was apparently made for the opening; there are no signs of hardware other than that present. The mortise lock is missing all its hardware except the strike plate, which is in good condition. The threshold is worn almost all the way through.

There are no lights in the Lee girls' chamber, but there is one duplex receptacle behind B03/D1 on the baseboard of the south wall.

Lee Girls' Chamber (Room 203) - Recommendations

The ceiling and flooring with their imperfections should be preserved.

MARY AND MARKIE'S CHAMBER (ROOM 204) - EXISTING CONDITIONS

The flooring of Mary and Markie's chamber is random-width, tongue-and-groove pine running north-south and is original. The baseboard is characterisitic of the upstairs at the Arlington House; it is intact and in good condition. The ceiling cornice is of a simpler design than most in the house; it is also intact and in good condition. The ceiling is old and in good condition.

The fireplace has a simple marble mantel. The firebox was extensively rebuilt during the War Department restoration and the flue was covered by copper sheeting. The hearth was one piece of stone, but is now broken into many pieces; the pieces, however, now appear to be well-bedded. The pine molding surrounding the hearth is well-worn.

Windows 204/W1 and 204/W2 are eight-over-eight double-sash and counterweighted windows. They are in good condition with all their parts apparently original.

There is a six-panel door (204/D1) with oak graining on the south face that is stained on the north face. It has been cut down on both stiles. There is a mortise lock, but all its hardware except the strike plate is missing. There is the ghost of a former box lock set on its side which measures 3 1/2" x 5". The door casing opposite the lock has been pierced.

The six-panel door (204/D2) is oak-grained on both faces. The door has been cut down on both stiles; the hinges appear original to the jamb. There is a mortise lock, but it has no hardware except the strike plate. There is a paint layering exhibit panel (circa 1950) on the west jamb.

Door 204/D3 opens to the closet of Mary and Markie's chamber. It is a six-panel door, oak-grained on both faces. The door on the stiles is 1/2" too small for the opening. The hinges appear original to the door. There is a small box lock on the interior face and a fixed knob and escutcheon plate on the exterior, both of which have been oak-grained. There is no keeper or evidence of one.

The flooring and baseboard of the closet are like that in Mary and Markie's chamber. This closet is 11-1/4" deep, and its ceiling is 7' 2" above the finished floor. The shelves are 1" thick; their top edges are at 3' 2-7/8", 4' 6-1/8", and 5' 9-1/4" off the floor.

There are no lights in Mary and Markie's chamber, and a single receptacle behind 204/D1.

Mary and Markie's Chamber (Room 204) - Proposed Treatment

It is recommended that the mantel in Mary and Markie's chamber be thoroughly cleaned.

SMALL CHAMBER (ROOM 205) - EXISTING CONDITIONS

The flooring of the small chamber is random-width, tongue-and-groove pine, running east-west, and is original. The baseboard is

intact and is the upstairs type. There is a paint layering exhibit panel (circa 1950) in the center of the east wall under 205/W1. The ceiling appears old and there is no cornice.

The small chamber contains extensive shelving which may well be original. The shelves are 3/4" thick and are 11 1/2" wide. The lower shelves' top edge is 3' 3 1/4" above the finished floor, the middle is at 5' 4 5/8", and the upper at 7' 6". The top shelf runs across the south, west, and north walls and rests on the tops of the door casings without brackets. The middle shelf runs between 204/D2 and the west wall and from the north wall to a point 9 1/2" from 205/D1; it also continues on the other side of 205/D1 at a point 1' 1 5/8" from the door and to the south wall. This middle shelf is on wood brackets made from the same material as the shelves; there was also a shelf once running between 206/D2 and the west wall but it has disappeared, leaving only a bracket against the casing of 206/D2. The lower shelves are also on brackets and run from the north and south walls in to points near 205/D1, like the middle shelves above.

There is a triple window grouping (205/W1). A six-over-six double-sash window with counterweights is flanked by two small two-over-two double sash windows with no counterweights. The stool is badly worn toward the center of the window.

A six-panel door (205/D1) is oak-grained on the west face and stained on the east face. The door has been cut down slightly, and there is a ghost of a box lock set on its side as on 204/D1. The mortise lock has knobs which are definitely reproduction; it is missing its mortise bolt knob and escutcheon plates. The hinges appear original to the door and the strike plate is intact. The door casing opposite the lock may have been pieced.

Note that door 205/D1 was installed in 1857. Additionally, the heating system was installed in 1855. Construction evidence of these two features should provide a dating benchmark for paint sequences and perhaps for structural detail.

There is no light in the small chamber, but there is a duplex receptacle south of 205/D1 on the baseboard.

Small Chamber (Room 205) - Proposed Treatment

The missing shelf in the small chamber should be replaced with one to match the others.

LEE BOYS' CHAMBER (ROOM 206) - EXISTING CONDITIONS

The flooring of the Lee boys' chamber is random-width, tongue-and-groove pine, running north-south, and is original. The baseboard is original; there is a piece missing between 206/D1 and the west wall, and the section between the fireplace and 206/D3 is like that in the north wing.

The fireplace mantel is like those in the Lee girls' chamber and Mary and Markie's chamber. The firebox has been rebuilt and the flue hole closed by copper sheeting in the War Department restoration. There is a jack arch over the fireplace opening. The stone hearth is cracked and the surrounding pine molding is considerably worn. There is a burnt circle in the floor 3' 0" out from the hearth. The baseboard is too thick to be properly stopped by the legs of the mantel.

Windows 206/W1 and 206/W2 are eight-over-eight double-sash windows with counterweights. They are in good condition and are

original. The ceiling is old, and the cornice is in good condition. The cornice does not meet on the same level in the northwest corner and has been patched. It appears to have broken at that point when the floor above the white parlor sagged prior to the installation of the truss in the west wall of the Lee boys' chamber in the War Department restoration.

A six-panel door (206/D1) has oak graining on the north face and stain on the south face. The door has been cut down on the lock stile. The mortise lock appears original to the door; it has reproduction hardware and the mortise bolt knob is missing. The hinges appear original to the door.

Door 206/D2 is a six-panel door with oak graining on both faces. The door has been cut down; the reproduction lock and hardware are intact. The hinges are original to the door and jamb.

Door 206/D3 is a six-panel door oak-grained on both faces. The door to the closet 206A has not been cut down. There is a small box lock on the interior; the escutcheon plate and fixed knob on the exterior have been oak grained. There is no keeper or strike plate, and the hinges appear original to the door and jamb.

Closet 206A is 11-3/4" deep and has 1" thick shelves, the tops of which are 3' 4-1/8", 4' 7-1/2", and 5' 10-1/4" above the finished floor. The baseboard and flooring are like those in the Lee boys' chamber and the ceiling is 7' 2-1/4" off the floor.

Door 206/D4 is a modern steel access door measuring 2' 0" x 2' 0", installed in 1980 to give easier entrance to the south wing attic. The face of this door has been covered with plaster like the wall. This door will be effectively concealed by the placement of furnishings

against the south wall, as outlined in the Furnishing Plan (see footnote #23).

There are no lights in the Lee boys' chamber, but there is a single receptacle in the baseboard behind 206/D1.

Lee Boys' Chamber (Room 206) - Proposed Treatment

It is recommended that baseboard matching that in use be installed where it is missing between 206/D1 and the west wall. The baseboard, where it stops against the legs of the marble mantel, should be leveled into the face of the legs for a smooth transition as seen in a similar situation in the Lee girls' chamber.

It is also recommended that 206/D2 be removed and the hole plastered over. It did exist in the original main block, but was closed in 1857 when Mrs. Lee changed the small chamber from two dressing rooms, serving Mary and Markie's chamber and the Lee boys' chamber, into a small bedroom.[46] Indications of this doorway were found in the War Department restoration and, lacking current documentation found later by Historian Nelligan, the doorway was restored as having been part of the main block. What the army did not know was that this change had been effected by the Lees themselves and not after the Civil War, as presumed. (See Furnishing Plan, 1978). Use partition scar for paint analysis and dating evidence

COLONEL AND MRS. R. E. LEE'S CHAMBER (ROOM 207) - EXISTING CONDITIONS

The flooring of Colonel and Mrs. R. E. Lee's chamber is random-width, tongue-and-groove pine, running north-south, and is

original. The baseboard is intact and believed original, with the possible exception of a segment between 207/D1 and the north wall, which may be slightly different in profile.

The fireplace mantel is of wood and in a style predating the other mantels of the second floor. There is a plaster-covered jack arch over the opening and the firebox has been rebuilt. The hearth is of brick and believed to be old; it is surrounded by well-worn trim. There is a burnt spot at the edge of the hearth molding in front to the east.

Windows 207/W1 and 207/W2 are both eight-over-eight double-sash windows with counterweights. Above them are found the same false arches as seen in Lee girls' chamber. The ceiling of Colonel and Mrs. R. E. Lee's chamber is new and the cornice is in good condition. This cornice, in design and proportion, is one of the best in the house.

The east wall of Colonel and Mrs. R. E. Lee's chamber contains a truss which was installed in the War Department restoration and renovated in 1976. A structural problem existed here because, originally, the second floor joist system of the south side of the main block framed into a beam beneath the wall separating the Lee boys' chamber and Colonel and Mrs. R. E. Lee's chamber. The beam, however, lacked the requisite depth for such a span. The combined weight of the plaster wall above, and one-half the total floor loads of the Lee boys' chamber and Colonel and Mrs. R. E. Lee's chamber, caused the beam to sag over a number of years.

A truss was let into the east wall of Colonel and Mrs. R. E. Lee's chamber during the War Department restoration. The badly deflecting beam was hung from the truss and the stability of the floor system was greatly increased.

By the mid-1970s the truss was suffering from several defects. These defects included improper seating, slippage and openings along the joints, and a further deflecting weight from a large chandelier placed in the white parlor c. 1930.

Renovation of the truss began with the removal of the large chandelier. The wall was opened and webs, vertical and horizontal tension rods, blocks, and gusset plates were added to the 1929 truss. Hangers were added where certain room floor joists intersected the center beam. The truss was re-enclosed within the partition wall after the renovation work was completed. All indications are that the truss as repaired is presently in good working order and operating within its designed capacity. Access to the tension rod is found to the west just inside 206/D4.

Door 207/D1 is a six-panel door with oak graining on the north face and stair on the south face. The door has been cut down some on the hinge stile; the hinges appear original. The mortise lock and reproduction hardware are intact; the strike plate is also in good condition.

Door 207/D2 is a six-panel door painted on both faces. The door has been cut down somewhat on both stiles. The ghosts of a former lock system are in evidence. There is presently a mortise lock with what appears to be reproduction hardware; the mortise bolt knob is missing. The strike plate is intact and the hinges appear original. The door casing adjacent to the strike plate has been pieced 1' 7-1/4".

There are no lights in Colonel and Mrs. R. E. Lee's chamber, but there is a single receptacle in the baseboard just to the east of 207/D1.

Colonel and Mrs. R. E. Lee's Chamber (Room 207) - Proposed Treatment

The wood mantel in Colonel and Mrs. R. E. Lee's chamber was installed during the War Department restoration[47] to replace what was believed at the time to be a non-historic marble mantel. The mantel that was in Colonel and Mrs. R. E. Lee's chamber, and which is now known to have been historic, is presumed to have been like those in the Lee girls' chamber, Mary and Markie's chamber, and the Lee boys' chamber. The mantel situation in Colonel and Mrs. R. E. Lee's chamber parallels that of Mrs. R. E. Lee's morning room. Establish loading capacity of truss.

LEE DRESSING ROOM (ROOM 208) - EXISTING CONDITIONS

The flooring of the Lee dressing room is random-width, tongue-and-groove pine running north-south, and is original. The baseboard is intact and is the same as that in the rest of the main block upstairs.

There is a pegboard on the west wall between 208/W1 and 208/D2, the centerline of which is 6' 2-3/8" above the finished floor. There are eight pegs in all; the third from the north is disengaged but has been preserved. The one furthest south, actually located within the closet, is missing.

Window 208/W1 is an eight-over-eight counterweighted double-sash window. The top row of panes is cut off by the attic stair landing above. The ceiling of the room is 7' 4" above the finished floor and has no cornice.

Doors 208/D1 and 208/D2 are both two-panelled doors painted white on both faces, which open into closet 208A. Each door has a small box lock on the interior face with no strike plate. The lock was operated by a key alone; there is an escutcheon plate on 208/D2, but none on 208/D1. The tongue of the lock evidently caught behind a wood edge on the mullion between the two doors. The hinges on both doors appear original.

Room 208A is presently a closet behind two doors. It was originally two individual closets, but the narrow wood partition between them has been removed. The ghost of this partition wall can be seen; it measures 13/16" wide. The closet contains two shelves 13/16" thick, the top edges of which are 3' 2-1/2" and 5' 5-1/4" above the finished floor. The firehose standpipe rises in the southeast corner of 208A. It is obvious that these closets were added after the room was finished as the wooden closet wall is fitted over the existing baseboards and the end of the pegboard.

The Lee dressing room has not been painted in many years and much of the existing paint is flaking off. There are neither lights nor electrical outlets in the Lee dressing room.

Lee Dressing Room (Room 208) - Proposed Treatment

Establish construction date of room 208A.

GARRET STAIRS - EXISTING CONDITIONS

The stairway from the upstairs hall to the main block garret is the same width as the main stairs below. They are also covered on the treads and risers with the same crosshatched rubberized material as the

other stairs. Moldings at the end of risers #5, 7, and 8 need reattaching. The bannister is stabilized by metal angles at the base of the balusters at three locales toward the center of the flight. The bannister on the attic stairs is not as stable as that of the main or servants' stairs, however, as it is not stabilized by a horizontal metal rod.

On the west wall near the top of the first flight of the attic stairs are located the hooks which once held a fire extinguisher. The stair landing is minimally lit by the small amount of light from the top north corner of 208/W1. On the short second flight of the stairs the nose of the second tread is completely broken off. The bannister is very stable on the second flight.

The baseboard on the attic stairs is like that on the second floor and along the main and servants' stairs. The ceiling above the main stairs has crown molding, but the ceiling above the attic stairs does not.

Garrett Stairs - Recommendations

Reattach the moldings on stairs #5, 7, and 8 from the second floor; replace the tread on #2 stair from the landing. The hooks which held a former fire extinguisher against the west wall near the landing may be removed. The bannister on the first run of the stairway should be stabilized.

GARRET STAIR LANDING ROOM (ROOM 300)- EXISTING CONDITIONS

The flooring of the garret stair landing room is random-width tongue-and-groove pine, running north-south, and is original. The baseboard is the simplest type in the house, 6" deep, and also found in the other closets. It is continuous in the garret stair landing room and intact.

The south and west interior walls are exposed brick. They show the use of a common bond as has been seen also in the basement of the main block. The header courses are irregularly placed; the first three courses counting down are stretchers, the next seven are headers, and a final stretcher is encountered just above the baseboard on the south wall.

The top south corner of 208/W1 appears at the bottom of the northwest corner of the room. Window parts such as the full jamb, lintel, and brick relieving arch above are clearly seen. The east and north walls are rough plaster on split lath.

Many key roof elements of the main block structure can be seen close at hand in the garret stair landing room. To the south and west are located the large beams which hold the mortise-and-tenon outriggers pinned in place. The south outriggers rest on a continuous plate, but those to the west have no plate and are individually blocked. Also on the west is the rafter beam which holds the west pediment outriggers and a purlin which holds the rafters and sheathing of the roof itself.

Door 300/D1 is a six-panel door painted on the north face and covered with masonite on the south face. The door has been somewhat cut down on both stiles. There is the ghost of a box lock which has

disappeared; there was once a rim right latch which is gone, but the holes remain. The lock stile of the door is missing a piece which has been torn off, leaving the door in an unsightly state. Other door hardware includes two hooks on the interior face, one at the top and one at the bottom of the lock stile with no corresponding eyes on the jamb. The hooks could only serve to lock someone into the garret stair landing room from within. The hinges are believed to be modern; they are both broken. The door has been fireproofed by the masonite on its south face and galvanized metal around the door jamb. There is a mortise in the lock side of the jamb which may once have accommodated the tongue of a box lock.

The fire standpipe rises to its final height in the southeast corner of the garret stair landing room. There is an accordion hose emplacement there which can be reached through a small door in the east wall accessible from the main block garret.

There is one light in a porcelain fixture attached to a purlin above the center of the garret stair landing room, and no receptacles.

Garret Stair Landing Room (Room 300) - Recommendations

It is recommended that 300/D1 be taken apart and the lock stile replaced. The hinges should be replaced with reproduction ones to match the cast-iron variety found in the house. Remove standpipe and firehose accordion.

MAIN BLOCK GARRET (ROOM 301) - EXISTING CONDITIONS

The large garret of the main block at Arlington House is divided into five bays of approximately the same size. From the west, the first three bays cover the interior of the main block, with the last two over the open portico.

The five bays are defined by five large kingpost trusses and one rafter-beam on the west end. The builders opted for a rafter-beam on the west end of the main block instead of another kingpost truss because of the presence of 301/W1 in the west pediment wall. The trusses and rafter beam run the width of the house and overhang the north and south bearing walls of the main block to carry the exterior cornice.

Beginning at the east, the first truss is supported by the six massive Doric columns of the portico. The truss is upheld by the structure of the entablature which rests on the brick of the columns. The second truss is the least well supported as it was upheld only by the two columns and the structure of the entablature above them to the west of the main line of six columns across the portico. The third truss rests securely on the east bearing wall of the main block. The fourth truss is upheld by the north and south bearing walls; both the bottom and top chords of the truss on each end pass through the mass of the east chimneys between the two flues. This fourth truss is also supported by the two interior bearing walls that define the center halls (B06, the center hall, and the upstairs hall). The fifth truss rests on the interior bearing walls and is supported by the north and south bearing walls of the main block, as is the fourth. The rafter-beam on the west end rests on the west bearing wall of the main block.

The ceiling of the portico, which is new plaster on expanded metal lath, and the ceilings of the second floor rooms, are all carried by joists running east-west between the trusses. These joists are nearly square in a majority of cases and are winder than they have to be, as well as not as great in the depth as they should be. They are supported by the trusses in being notched squarely toward the center of their depth and lodged onto a ledger board which is nailed to the lower portion of the bottom chord of the truss.

The trusses themselves are made up of long members pieced where necessary by elongated lap or tongue-and-groove-joints. Other than the kingpost, which is mortise-and-tenoned and pinned between the top and bottom chords, the trusses have a vertical post on either side, two-thirds of the way from the kingpost to either extremity, which is also mortise-and-tenoned between the top and bottom chords.

The surfaces of the east and west pediments are covered with horizontally placed and nailed tongue-and-groove boards 5-1/2" wide. The only portion of the attic which is floored is the area in the first bay on the west side where the attic stairs give into the main attic space. The stairs are enclosed by rough studs having plaster on split lath, with the finished surface facing away from the attic space. The flooring of this bay is random-width, tongue-and-groove pine, running north-south and presumably original.

The door to the garret stairs from the main block garret, notated as 301/D1, is a six-panel door painted on the south face and covered with masonite board on the north face. The door has been cut down slightly on both stiles. There are the remains of a locking hasp on the south face as well as a hook and an eye. There is a large eye on the

jamb which works with the smaller hook, but is not a companion piece to it. The hinges appear original, although they are considerably oversized for the door. The doorway has been minimally fireproofed with a masonite backing and the covering of the jamb with galvanized metal.

Window 301/W1 is an eight-over-eight window, double-sash, having a segmentally-arched head. This window is located in the center of the tympanum of the west pediment. It has no counterweights or interior casing. The window is original in appearance; the muntins were repaired and strengthened with epoxy injections in the mid-1970s.

A pattern of purlins is mortise-and-tenoned between the top chords of the trusses and rafter-beam. The rafters run north-south over the purlins and meet at a ridge board let into the tops of the kingposts. The rafters are covered by tightly spaced sheathing boards approximately 1" in thickness, and a slate roof covers the sheathing.

The truss on the east end has outriggers mortise-and-tenoned on the top and bottom chords which hold the pediment above the portico. The rafter-beam on the west holds similar outriggers which support the west pediment. The cornices to the north and south below the surfaces of the main roof are held by the truss cantilevers and by outriggers mortise-and-tenoned into secondary beams running east-west between the trusses and rafter-beam. These small beams are mortise-and-tenoned between the trusses and rafter-beam and pinned with wood dowels.

It is assumed that the roof of the main block was in poor condition by the time of the War Department restoration because of the amount of work carried out at that time. The army found it necessary to install

intermediate purlins, on blocks bolted through the top chords of the trusses and rafter beam, between the original purlins.

As the second truss from the east had no mid-supports as did the others, and as it was undoubtedly sagging badly, two auxiliary trusses were installed at right angles to the main trusses. These secondary trusses spanned the portico ceiling and were found bearing on the truss on the east bearing wall of the main block and on large posts rising from the tops of two of the columns. Iron rods ran from the peaks of the small trusses through their bottom chords and through the bottom chord of the sagging truss. These rods pulled the bottom chord of the second truss up to an acceptable level condition; they appear to be acting well over fifty years later, and show no structural problems.

The south end of this same second truss from the east had come loose prior to the War Department restoration, the top chord having become detached from the bottom. Army repairs at the time included the securing of this end by a chain around metal pins driven through the two chords.

Contrary to what many involved with Arlington House have assumed, the trusses do not now and may have never operated as real trusses. The truss form was chosen when the main block was built in 1817-19 as a convenient way to support a large roof with the wood members available. Except for the second truss from the east, which failed many years ago and which was stabilized by the use of additional trusses, it was not necessary to have true trusses at any of the other points because of the various points of support each truss had available in the structure of the main block beneath.

Many problems identified in the main block roof have been repaired over the years, yet many remain. It is thought that the main block roof system was originally built to support cedar shake shingles and did so successfully until 1858 when General Lee installed a slate roof. The fact that the roof system was not designed to carry the load of a slate roof has resulted in many additional problems over the years. The visual manifestations of these problems are occasional longitudinal splitting in some purlins and truss chords, and the fact that the whole system appears to be leaning slightly to the east. Also, the action of the top chords of trusses bearing extra-heavily on cantilevered bottom chords beyond the north and south bearing walls is causing the bottom chord ends to deflect downward, bending the cornices down on either side as well. There have also been attempts to give additional supports to sagging roof areas and members by the introduction of posts at random. A further difficulty with the roof system is that these temporary posts can cause more damage than they are correcting if placed without reasoned engineering.

There is a large amount of conduit which runs over the ceiling to bring electricity to the second floor receptacles. There is currently only one porcelain light fixture in the garret over the floored portion to the west.

Main Block Garret (Room 301) - Proposed Treatment

It is recommended that the structural system of the main block roof and its condition be examined through an engineering study like those already carried out for the north and south wing roofs.

Meanwhile it is recommended that the ceiling joists of the second floor rooms, which run between the bottom chords of the trusses and which are often not well-connected at present, be reattached with metal straps. It will be necessary to examine them individually and to decide whether or not they need stabilization. This work may be done by a qualified exhibit specialist.

It is important that the roof system be closely monitored for any changes in its present condition, which would indicate deterioration or impending collapse. It is recommended that further lighting be installed in the garret so that all portions of that large space may be clearly examined. It is felt that the addition of four fixtures on the center line of each bay, one each on the purlins down from each side of the ridge pole, and one each on the purlins on each side first up from the floor, would be sufficient. These lights should be on their own circuit to the main service box in B05 and should be controlled by a disconnect adjacent to 301/D1. The twenty fixtures should each have a one-hundred watt bulb. All wiring is to be run in conduit.

NORTH WING GARRET - EXISTING CONDITIONS

The north wing roof was found to be in extremely poor structural condition in 1979 and work was performed extensively in this area in 1980 for its stabilization.

Prior to the stabilization work in 1980, the north wing roof had existed in a state of continuous deterioration for many years. On close examination, it was found that the roof structure was not well-engineered, even from the standpoint of common building sense,

from its inception. Virtually all structural members -- ceiling joists and rafters -- were under-sized for their load requirements. Additional problems were caused early in the roof's history when, during a reworking of its structure, the rafter ends were lifted off their original plate and moved to one with a slightly higher elevation. This work was done in connection with the change of the roof from one with splayed eaves to one with a continuous angle of pitch from the ridge to the fascia.

The leaking of the roof also contributed to the general roof deterioration. By 1980 the ends of many rafters were not only poorly connected to the plate, but were occasionally rotted away at that connection (see photograph #66). Also, the hip rafters, the most important elements of all for the strength of the total structure, were not well connected to the corners of the wing. The two hip rafters on the south end of the north wing had no connection at all to the plate below (see photograph #67).

When the rafters were raised off the plate, all positive connection was lost between them. Prior to the 1980 work, the most insignificant connection between the rafters of the north wing and their plate was that supplied by gravity and friction. The usual connection between the rafter end and the ceiling joist, separated by a block or an additional plate, was a single vertical piece nailed to one side of the joist and rafter. At the most there were two vertical pieces, one to either side of the joist and connecting rafter. In other cases, there were no connecting pieces at all while some rafters were suspended in mid-air with vertical connection, but an absence of blocking (see photograph #66).

One of the main problems of the north wing prior to 1980 was attributable to the small size of the rafters which were required to span a significant distance at a very low pitch. Other than the rafters making the north hip face, which are replacements, most of the rafters are original and in good condition. In some cases, particularly in the gable end built over the remains of the south hip face when the north wing was connected to the main block, the rafters were not centered close enough together to be wholly effective.

The north wing roof was strengthened somewhat in 1961 by the addition of collar beams where possible; also, some rafter extensions and sheathing were replaced out beyond the plate line. At the same time a double line of vertical pieces was put in place near the center of the rafter spans. These boards were nailed to the south side of the rafters and rested on the top edge of the corresponding ceiling joist with no connection. These vertical pieces prevented some of the roof rafter deflection as intended, but also passed loading forces onto the ceiling joists, causing two joists to fail completely and endangering the plaster ceilings below.

All ceiling joists are apparently historic, as are the outriggers. During the replastering of the ceiling of the Custis guest chamber, auxiliary joists in the form of 2 x 4s were added between existing ceiling joists to give added strength to the metal lath. Prior to the 1980 work, most of the original joists were in good condition except the following: counting from the north end, the third joist contained powder-post beetle damage; the ninth was broken completely in half; the tenth, eleventh, and twelfth were discontinuous and extended less than half-way across the span; and the fourteenth had a longitudinal

crack which rendered it ineffective. On the east side of the north wing, ends of joists three, five, six, eight, seventeen, and nineteen were damaged by rot and were connected to the fascia board by joist extensions.

Following the compiling of measured drawings of the north wing roof, a report[48] was made evaluating the structural condition of the roof and giving recommendations for correction of problems. It was found that ideally the roof should be capable of supporting a superimposed live load of 20 PSF minimum with member stresses allowable being per current allowable code stresses. Investigation of existing conditions found that stresses under a 20 PSF live loading in several cases approached 400 PSI in bending, almost three times the conventional allowable stresses of even the better woods in use today.

The primary members that were overstressed were the 3 x 3 roof rafters, which were calculated to have a stress of 3823 PSI based on a live load of 20 PSF (minimum per code) and by treating the roof system as a three-hinged arch which, by present conditions, most nearly described its action. The hip rafters on the north end were found to be overstressed by a lesser amount, and the ceiling joists by an even lesser amount. The engineer's conclusion was that remedial action was necessary to reduce the stress and to bring the structure better in line with conventional safety practice.

The objective in the structural stabilization of the roof of the north wing at Arlington House was to follow the National Park Service policy of preserving where possible the greatest amount of historic fabric. While it is difficult to fully assess the extent of repair and replacement of fabric over the years, it was decided to follow the

engineering recommendation that proposed the installation of a post-and-beam system which would support and preserve all existing fabric in the garret. Essentially, this modern system would form a second full structure under the existing historic system without disturbing the old system or the roof. An additional positive feature of this post-and-beam system was that it could be moved into the garret space in pieces and assembled there without necessitating removal of any major existing historic fabric.

The principal components of the new structural system in the north wing roof were three large beams each composed of two 1/4" x 11" steel flitch plates sandwiched between three Douglas fir 2 x 12s. These beam components were bolted together at a minimum of 10" spacing with 1/2" bolts. Because of the constraints imposed by limited access to the garret through a hole in the ceiling of the school and sewing room (twentieth-century plaster on expanded metal lath), none of the individual pieces of the beam could be continuous over the required total beam length of 22' 6". In the design of the beam, each of the two pieces of steel is 18' 6" long; they were lapped in the beam itself so there would be steel strengthening the whole length of the beam from one bearing wall to the other. These beams were manufactured and assembled on the ground, then disassembled and taken in pieces into the garret where they were reassembled in place. One foot sections of rafter plates were removed to seat each end of each beam onto a wood bearing plate directly on the top of the brick bearing walls of the north wing to the east and west. The beams were assembled at approximate third points along the length of the north wing (see photograph #63).

Once the beams were installed, doubled 2 x 12s nailed together were run atop the beams north-south at points approximately 5' 0" to the east and west of the garret centerline. These wood beams were held upright by 4 x 4 steel angles bolted between them and the sandwiched flitch-plate beams below. Similar 4 x 4 steel angles were bolted along the length of the wood beams vertically to give support to all rafters near their mid-points and, where necessary, to hold up weak joists below. The wood beams found support at their south ends by being mortared into the north bearing wall of the main block and at their north ends on plates above the north bearing wall of the north wing. Several doubled 2 x 12s were also run east-west over the wood beams to help support the south hip point and jack rafters on the north face of the north hip. The bad end conditions where the rafters meet the plates were strengthened by the addition of gusset plates made of 3/4" plywood placed between the rafters in question and the corresponding ceiling joists below.

Remaining historic features in the north wing garret include the soot-blackened and cut-off end of a chimney, level with the ceiling joists on the west side near the center of the garret space. This flue is all that remains of a chimney which once served the flue in the chimney breast of the inner hall (north wing). It is not known when the chimney was abandoned and cut off, but it is felt that it ceased to be used prior to the 1861 interpretive period. Also, scattered throughout the north wing garret are pieces of trim which once were part of a north wing decorative scheme thought to have predated the interpretative period. These pieces of trim were reused in the garret to strengthen split wood lath and to stabilize studs in place for the partition walls below.

Of primary interest as a historic feature of the house, which remains in the north wing attic, is the abandoned south hip face. This feature was left in place and covered c. 1817-19 when the north wing roof was connected to the main block by a new gable-end construction. Original jack rafters, sheathing, wood shingle nail patterns, and ribs for splayed eaves (see photograph #69) remain in place. Also to be seen against the north wall of the main block are the truncated outriggers which once held the south eave of the north wing when it stood as a separate building. These outriggers were cut off when the main block was built and the north wing roof extended to abut it, but at least half their original length remains in place.

There is a ventilating grill let into the south face of the chimney in the north wing garret. The grill connects to a flue from the closed fireplaces in either the school and sewing room, the Custis chamber, or the winter kitchen and was placed there, probably in the War Department restoration, to give some air circulation to the garret space. In order to increase the air circulation in the main garret space, and to provide some ventilation of the north wing loggia garret as well, the molding at the top edge of the fascia board above the west face of the north wing was louvered in 1980 by 1", thus making a continuous slit through which air could enter all along that side of the building. This air, as well as that entering through cracks, etc., continues between rafters from the loggia garret into the main garret on its way to the chimney grill.

The present roof on the north wing and loggia, as well as the south wing and conservatory roof, is a modern terpolymer membrane attached to exterior tongue-and-groove plywood over the old sheathing.

This roof coating, installed in 1974, is covered with pebbles and is intended to simulate the tar and gravel roof seen in the 1864 photographs of the house taken by the Signal Corps of the U.S. Army. On removal of the guttering during the repainting of the house in 1981, it was found that the lack of a drip edge, purposely left out of the design to better represent the historic condition, had resulted in a total rotting of the plywood edge. Approximately 16 inches of both the north and south wing roofs were removed around the edges and replaced in 1981. The renovated work was outfitted with a drip edge to better preserve the repairs effected in 1980.

In addition to the deteriorated roof edges, numerous areas of the remaining roof surface were found to be deficient and were patched accordingly. It was felt, however, that these repairs were stopgap measures and that the entire roof surface of both wings would require replacement in several years. At fault is the roofing system itself.

The terpolymer membrane has a tendency to break down when exposed to the elements and therefore is ill-suited for this application. It has lasted for less than six years, which has to be considered unacceptable in light of the fact that a "typical" roofing system will last a minimum of 12 to 15 years. It is advised by DSC that alternatives to the present system be examined with a view toward more conventional materials that may well prove less expensive and longer lasting.

The north wing attic has no lights or receptacles. There is, however, a disconnect just above the access to the attic garret the ceiling of 107A, which serves the electrical radiant ceiling in the pantry.

North Wing Garret - Proposed Treatment

For proper monitoring of the roof stabilization above the north wing, it is recommended that three porcelain fixtures be placed there, one near the north end north of the chimney, one in the middle, and one in the south end near the wall of the main block. These fixtures should be fitted with 100-watt bulbs with metal cages to protect those bulbs in the shallow garret from inadvertent breakage. All three fixtures will be controlled from a switch near the present disconnect above 107A. All wiring is to run in conduit.

NORTH WING LOGGIA GARRET - EXISTING CONDITIONS

Access to this garret is through an approximate 1' 0" x 3' 0" opening in the ceiling of the northeast corner of the pantry. Trim around the opening and its cover appears to date from the original finishing of the room.

On inspection of the garret in 1979, the structural system was found to be in poor condition. Unlike the main garret structure, the loggia roof was made of logs flattened on one or two sides. The ceiling of the pantry was plaster on sawn lath, all of which was removed to allow proper access to the garret for renovation work.

The engineering report[49] on the loggia roof system found the stresses to be approximately 1200 PSI maximum, which was within the present code allowables. The main problem found with the roof, however, was that it was not anchored to the inner, or west bearing, wall of the north wing (see photograph #70). As can be seen from the

photograph, the ceiling joists rested loosely in pockets too large for them. Thrust from the rafters was being taken by the exterior wall only and computed stresses indicated that this net tension was approximately 30 psi. It was found that this tension could be reduced by 60% by tying the ceiling joists to the west bearing wall of the north wing.

In order to strengthen the roof system as well as connect it more firmly to the west bearing wall of the north wing, seven half-trusses were installed at points where the existing ceiling joists appeared in a weakened condition or were spaced too far apart. These half-trusses (see photograph #71) gave additional support to the lean-to roof and new strength to the ceiling of the pantry. Additional pockets were cut in the bearing wall for extensions of the bottom chords of the trusses and these east ends were firmly attached to the west bearing wall of the north wing by threaded steel rods and plates manufactured for this purpose. These rods were bolted against the west wall of the inner wall (north wing) by use of 6" x 6" steel washer plates (see photograph #34). A new ceiling of plaster board specifically manufactured for use with an electric radiant ceiling was hung from strips running north-south and connected to both the new half-trusses and the original log joists. This plaster board was strung on its lower side with the radiant ceiling wire that was stapled onto the board. The wires were covered with one brown coat and one white finish coat, each approximately 1/8" thick, of a plaster formulated for use with a radiant ceiling. The ceiling of the north wing loggia was insulated above the radiant ceiling and a 4' 0" wide strip of plywood was nailed to the top edge of the bottom chords of the half-trusses down the center of the

loggia garret for added strength, as well as to provide a crawl surface to inspect the garret (see photograph #71).

The north end of the north wing loggia garret contains the lead-lined water tank installed toward the middle of the nineteenth century to serve the bath and water closet. The presence of this tank causes the ceiling in the north end of the loggia to be only about 9' 0" above the finished floor. The bottom of the tank is composed of 3/4" x 9-3/4" boards running east-west. These boards are supported by timbers which run north-south and which are visible across the ceilings of the bath, the water closet and a small portion of pantry; these beams are beaded on their lower corners. The sides of the tank are made of heavy, planed timbers, tongue-and-grooved, and approximately 2-1/2" thick. This wood box measures approximately 8' 0" x 9' 0" and is 2' 0" deep. It was originally lined with a 1/8" fabric of lead which covered the bottom and extended up each side. There was no top for this cistern; its stored water was protected, however, by the slanting loggia roof above. Having been abandoned for a century, the lead lining is in poor condition today with some of the lead having been torn from the bottom of the tank and some of that along the sides having fallen over.

Water entered the tank at a point approximately 2' 0" from the northeast corner along the north side of the tank at the top. At this point there is a cut several inches deep and approximately 6" long on the top edge of the tank. This notch is covered with lead like the tank interior. Behind the notch, one layer of brick was removed at the top of the north wall of the loggia and the rafter plate was also cut to allow a 6" opening to the exterior. It is thought that water was

pumped up to the tank from the nearby well. From the location of the access to the tank, it is possible that some water may have entered from the gutter system as well.

Water probably flowed from the tank to the bathroom below through a 2" hole, now patched, 2' 0" along the north wall of the tank from the northeast corner. Nearby there is a rectangular hole measuring approximately 1' 0" x 2' 0" in the bottom of the tank, of no apparent function. There is also a hole measuring approximately 2" toward the center of the south wall of the bath in the tank bottom; it does not, however, extend through the lead lining; its purpose also remains unknown. There is also a hole in the roof sheathing approximately above this hole; if it were not for the presence of the lead lining over the hole, it would appear that a vent pipe might have once occupied these holes.

Considerable work was performed in 1980 to stabilize the roof above the water tank. The hip rafter was resupported by two wood beams running north-south across the top of the tank (see photograph #72) from which 4" x 4" steel angles rise to connect with the rafters. The composed beams were connected to the tank and held in place by other 4" x 4" steel angles.

The north wing loggia garret has no lights or receptacles.

North Wing Loggia Garret - Proposed Treatment

Like the north wing garret, the loggia garret should also have at least two porcelain fixtures at the third points near the high point of the attic. These fixtures should have protective cages, 100-watt bulbs,

and a switch near the access hole in the garret. All wiring is to run in conduit.

SOUTH WING GARRET - EXISTING CONDITIONS

The south wing roof is the same size as that of the north wing, but its construction and parts are very different. As in the north wing, the early twentieth-century roof contained the parapet walls and splayed eaves which characterized the wings of a neo-classical building. As the south wing was to contain only two rooms, both of which were to extend the width of the wing, king post trusses (see photograph #73) were installed to carry the hip apices. The rafters, generally larger in section than those in the north wing, were supported near their mid-span by purlins running between the trusses, between the trusses and the hip rafters, and between the hip rafters on either end. Many of the rafters were notched into the purlins, which were also let into the trusses and wedged tight. The purlins were later given further support by a number of wood struts rising vertically from the ceiling joists. Forces taken by the struts to the ceiling below from heavy roof loads were detrimental to the plasterwork in Mrs. R. E. Lee's morning room and the office and study.

Unlike the plate in the north wing, the south wing plate is uniform and continuous; its corners are reinforced by diagonal braces let into the plate in half-dovetail joints (see photograph #74). Like the condition in the north wing garret prior to the 1980 work, there is little connection between the rafter ends and the plate, as the rafters here are also raised on blocks and connected to the joists with short

vertical pieces (see photograph #75). Many rafters on the west side of the roof were doubled by the addition of adjacent new rafters of similar size. The same collar beams which appear between north wing rafters were added in the south wing garret where possible.

Even a cursory examination of the south wing roof shows that its construction is superior to that of the north wing. While much of the original material is probably weaker than when it was installed, it was still sufficient to carry expected loads prior to the stabilization work of 1981. An exception was the area between the north king post truss and the south wall of the main block. Pertinent sections of the engineering report on the south wing roof are presented here:

> Unlike the north wing, the south wing roof was constructed to a pattern; members fit better, and overall sizing and spacing of members make up a much better roof system.
>
> The original roof was constructed with hips at both ends, later modified, extending the gable to the main house when this portion of the structure was completed. The roof consists basically of 3" x 4" rafters and 3" x 8" ceiling joists at approximately 1'-5" centers. At either end where hip rafters frame to the roof ridge line, there is a king post truss with strutted top chord support and bracing. The original hip flanking the main house has been removed, but the hip rafters remain. Roof rafters have an intermediate 4" x 4" support member (purlin) spanning between the king post trusses.
>
> Investigations reveal that the rafters can carry their loading by compression and bending without the intermediate support (purlin), and, furthermore, the 4" x 4" intermediate support is not capable of furnishing full support if the full load was transferred there. It is suspected that the rafters deliver some load to the 4" x 4" causing it to deflect to a point where the rafters then act as a normal rafter system. Computations reveal that if the 4" x 4" were to carry all dead and live loading that would be normally assigned to a support beam, then stresses would be of such magnitude that failure would be imminent.
>
> The final conclusion is that the rafters act basically as normal rafters, and that the 4" x 4" member (purlin) acts as bracing and carries only minimal load, and that the full system is sound.

> Investigations on the hip rafter at the south end of the structure indicate that if the rafter acts only as a beam, stresses would be of such magnitude that it would be considerably overstressed under full live loading. At the south end, however, jack rafters form arches and carry most of the hip rafter's load down to the walls, and it is concluded that this system needs no repair.
>
> The hip rafter at the north end where modifications occurred, however, is not as well taken care of. Stresses here are computed at 2800 psi, and are enough in excess of common allowables to warrant additional support. In addition, roof rafters added at the time when the roof was converted from a hip to a gable are spaced too far apart, and, although structural failure is not assured, stresses in the members, their consequential deflections, as well as deflections in the roof sheathing, are considerably higher than should be allowed. These deflections will, under live-loading, cause sagging and resultant damage to the membrane roofing, causing shorter life and more leakage. It is therefore recommended that at the north end the rafters, ridge beam, and hip rafters be strengthened to increase structure and roof life.[50]

Beyond certain localized problems of rot, bug damage, under-structuring or connection, the main problem of the south wing roof structure, as stated in the engineering report, is that section of the roof added to connect the south wing to the main block. In this end the rafters are over-spaced and therefore considerably under-structured. The second and third rafters from the north end on the east side are notched and consequently have only a 2" depth of section; the same condition exists in the third rafter on the west and there is powder-post beetle damage in the north end of the purlin on that side as well. At the same end of the roof, the west hip rafter is not well seated and the east hip rafter contains an 18" longitudinal split at its end (see photograph #76).

All the plaster visible in the garret floor is on split lath and believed to be original. Some of the keying is broken and the connection between plaster and lath is difficult to assess. Unlike that

of the north wing, the brick of the south wing walls continues up between the joists, adding stability. Access to the garret was originally found only through a cricket just to the east of the south wing chimney. Due to the necessity of bringing in timbers, etc. for the 1980 stabilization work, it was found imperative to add a more convenient and reasonable access. Door 206/D4 was cut in the south wall of the Lee boys' room to connect directly to the south wing garret space.

Following the same preservation policy as presented in the north wing garret and the other stabilization work pursued at Arlington House in 1980, the historic fabric of the south wing was left in place and supported where necessary by modern materials (photographs #77, 78, 79). Much of the stabilization effected was in the area between the north king post truss and the south bearing wall of the main block. Doubled 2" x 8"s were fitted tightly under the north hip rafters running from the top of the king post down to the rafter bearing plate. They were held in place at their bases by doubled 2 x 6s reinforced at the bottom with a 4 x 4 steel angle mortared on one end (see photograph #77) into the masonry wall of the main block and with the end resting on a wing bearing wall. The lip of the steel angle was bolted into the diagonal corner brace of the continuous rafter plate below. The plate is further reinforced by doubled 2 x 6 salt-treated members clipped by steel angles to the north outrigger beam and mortared into the main block wall. The bottom chord of the north king post truss is reinforced by the addition of doubled 2 x 12s bolted onto its north side. The new hip rafters are held at the king post by the pressure of a tight fit and 4 x 4 posts which are supported by the doubled 2 x 12s below (see photograph #73).

The ridge pole in the weak area was reinforced by two 2" x 6" members (see photograph #79) running under and beside it, and separated by 3" blocks. The ridge pole reinforcement is mortared into the main block wall on the north and held up on the south by a piece running between the new hip rafters (see photograph #78). New 2" x 6" rafters were spaced between the old; they depend on the new ridge pole members at the top and rest on a ledger board beside the new hip rafters. There were several ceiling joists toward the south end of the south wing which showed some powder-post beetle damage. These were strengthened by a 2" x 8" member nailed to one side.

Three 8" x 8" members were removed from the garret space in 1981 when the large crystal chandelier in Mrs. R. E. Lee's morning room was removed. These members had been in place over the ceiling joists, and had been used to hold the weight of the chandelier, all of which was transferred directly to the joists. It is recommended in the furnishings plan to install a smaller chandelier (c. 1804) in its place. In order to suspend the new chandelier, a 2" x 8" member was installed running from one king post to another on either side of the post. The former chandelier, and the beams from which it was suspended, were installed by the army in the early years of the twentieth century.

There are no lights or receptacles in the south wing garret.

SOUTH WING GARRET - RECOMMENDATIONS

It is recommended that the south wing garret be outfitted with three lights--like those in the north wing garret, to be controlled by a switch adjacent to 206/D4 inside the garret space.

SOUTH WING LOGGIA ROOF - EXISTING CONDITIONS

Investigations in the conservatory carried out in the early 1950s found a line of joist pockets several feet below the present roof rafters on the east wall. These ceiling joists may have been in place in the late nineteenth century when the roof was replaced with one of glass to better serve the plant conservatory; these joists might also have dated from before 1860. The glass roof did not prove successful, however, as it was plagued with leaks and rotting members. It was replaced in 1961 by the present rafter structure, which is apparently well-seated on both the tops of the north wing west bearing wall and the west loggia wall, and does not employ ceiling joists. The 1961 roof was covered in concrete tiles simulating wood shingles, as are presently seen on both the north and south servants' quarters. These tiles were replaced in 1974 by the terpolymer membrane and pebbles over tongue-and-groove exterior plywood.

The same problems of a rotting edge as were found on the north wing roof were also discovered on the south wing roof. As in the north wing, approximately 1' of this roof at the edge was removed in 1981 and replaced with new plywood and membrane. The south wing roof edges were also fitted with a drip edge to prevent future problems.

EXTERIOR - EXISTING CONDITIONS

North Wing

The north and east sides of the north wing were waterproofed in 1980. For many years the Arlington House basement had been plagued with moisture problems. While it was assumed that some of the moisture was rising from the floor itself, it was felt that a good deal was entering directly though the side walls. Monitoring with an electric moisture detection meter in late 1979 and early 1980 at predetermined points on basement walls showed a marked increase in moisture levels in certain exterior walls after a rain. The worst walls were those facing the north and east in the north wing and the south and east in the south wing. It was decided to waterproof these walls from the exterior to reduce the high moisture level in the basement. It was understood at the time that all moisture problems in the basement could not be totally eliminated without the further covering of all basement floors with a waterproof membrane and the insertion of a membrane into the exterior walls to stop all capillary action.

The waterproofing of the north and east foundation walls of the north wing was accomplished by first digging a trench on the wing exterior to the foundation base. The foundation walls, all of brick, were cleaned by brushing and repointed where necessary.

Considerable rebuilding of corners was necessary at the northeast and northwest (where loggia wall meets original north wing). Much of the soft mortar in the joints of these corners had been removed by water erosion, particularly in the northeast corner where a drain

connection box was leaking against the house. This box, installed during the 1970s, was composed of cinder block walls and a metal top, and was an intrusion on the authenticity of the historic scene, as well as being of questionable functional value. Freezing and thawing had broken the box in a number of places, and the boxes had been observed overflowing during heavy rains. Both this box and its symmetrically corresponding mate on the southeast corner of the south wing were removed and their necessity eliminated by the installation of new, below-ground drainage pipes of pvc, which came together as one at the corner, and ran out to daylight near the southeast corner of the vegetable garden.

Both the northeast and northwest corners of the north wing were rebuilt in modern mortar, as was the stone north foundation wall of the loggia. The waterproofing was carried out by first parging the brick walls to achieve an even surface. Expanded galvanized metal lath with ribs was attached to the parged surface with galvanized nails driven into the mortar joints. This lath (see photograph #80) was covered by a scratch coat of portland cement which, when thoroughly dried, was provided with a smooth-floated finish coat (see photograph #81). The concrete surface was kept wet for a period of time to prevent cracking. The smooth portland surface was covered with an asphalt coating and a heavy plastic. The plastic was protected with plywood sheets which were systematically removed as the trench was refilled. It is thought that the galvanized metal lath will prevent cracking of the parged and asphalted surface and guard against further leaks to the old walls.

A number of old pipes were removed from the stone north foundation wall of the north wing loggia during the trenching. Most of

these pipes that could be identified were found to date from the late nineteenth to early twentieth century use of the north wing as living quarters. Some were too deteriorated by rust to be given proper identification. The area under B01/W1 on the exterior just above the stone wall was rebuilt in 1981 during the cleaning and repainting of the house.

During the cleaning and repainting of 1981, the sills under the semi-circular arched windows in the north and south wings were found to be of Aquia Creek sandstone. They were discovered to have some carved detail, such as a drip kerf, most of which had been filled with paint. Water had gotten behind the painted surface and had succeeded in deteriorating some of them severely. Repairs were made on all stonework in 1981 where it was necessary. In all, there are three pieces of sandstone under each window; the principal piece, measuring 4' 9-3/4", falls directly under the frame of the window, and there are two flanking pieces at 1' 5" each, which run out to the jambs of the recessed archway around each window.

The majority of the stucco surface of the north wing was redone in 1964. Due to the poor quality of the original stucco and to the deteriorated condition of much of the surface of the house, a layer of portland cement was placed over the expanded galvanized metal lath that had been nailed to the original surface. All of the north wing was redone except for the pebble-dash base and the plinths of the engaged posts supporting the recessed arches of the west face. These plinths were covered in a hard stucco of excellent condition, which apparently dates from the same application as that on the west wall of the main block. The date of the present pebble-dash base is not known, but it

is not felt to be original in its entirety to the early nineteenth century. There are definite areas of patching and multiple applications. The pebble-dash surface was lightly sandblasted in 1981 to remove the loosest material prior to repainting. There was no effort, however, to clean all the surface down to bare mortar and stone due to the tendency of the stones to quickly lose their seating, thereby accelerating deterioration.

The canopies over B01/D1 and B01/D2 are not original to the historic period. The lattice on each is attached with wire nails and appears to be a replacement. Canopy B01/D1 was cleaned in place in 1981 using a scraper and heat gun. Canopy B01/D2, however, was detached from the north wing and dipped to achieve total paint removal.

The cornice and dentils of the north wing do not appear old and may have been redone in the War Department restoration. The north wing chimney's stucco was patched in 1981.

The six-over-six windows on the north wing all have louvered shutters. The semi-circular arched windows have no shutters on either the north or south wings and show no signs of ever having had any.

The exterior stairs to 101/D1 and 101/D2 were found to be unsafe due to rotting, and were removed. These stairs dated from the late nineteenth century and led to both doors after 1885. The original stairs, however, led only to 101/D1 (as 101/D2 was a window) as they appear in the photographs of June 1864. The present exterior stairs are merely utilitarian and were placed there in 1980 to serve the visitor traffic flow through the house.

South Wing

The conditions of the south wing exterior are largely the same as those described as pertaining to the north wing. The south wing was waterproofed (see photograph #81) like the north except for the fact that the south wall does not extend as far into the earth as the north wall of the north wing, as the space behind was not excavated.

In 1981 the doors of 116/D1 were reversed after they were stripped of paint and renovated. As previously hung, they presented the putty side of the muntins to the interior of the conservatory. The door sill on the exterior was reworked so that it would drain away from the doors. The canopy of B09/D1 presents the same condition as those on the north wing. It was hand-scraped prior to repainting in 1981.

The stucco of the south wing was redone in 1964 as described for the north wing. The stucco on the south and west walls of the loggia and on the connecting flanker was not redone in 1964 and is apparently the same age as that on the west wall of the main block.

The only shutters on the south wing are those on 114/W1, which are louvered. There is an electric wheel chair lift adjacent to 114/D1, which was installed in November 1980.

EXTERIOR - MAIN BLOCK - EXISTING CONDITIONS

The stucco surface of the north side of the main block was renewed in 1964 by portland cement over expanded metal lath and the surface scored to simulate ashlar as was done on much of the north and south wings. The surface is in good condition.

The shutters of 203/W1 and 203/W2 are the panel type. Some patching of the stucco on the north chimneys of the main block was carried out in 1981 prior to painting.

Main Block - West Side

The stairs to the center hall doors (111/D1) were redone in the mid-1970s in an effort to reproduce those appearing in the historic photographs of June 1864. They replace stairs having heavy balusters, which probably date from the late nineteenth century like the stairs to the north wing. Some archaeology was conducted prior to the construction of the present stairs and the supposed remains of the original stair footings were located where the present concrete footing was poured.

Three hinge pintles are located on the north side of 111/W1 and the south side of 111/W2; the bottom north one is broken and the bottom south is missing. They appear to have served large shutters to either side of the 111/W1 - 111/D1 - 111/D2 grouping: shutters on BO4/W1 and BO7/W1 are the panel type, as are those on 202/W1 and 208/W1. Louvered shutters appear on 110/W1 and 113/W1. There are no shutters on BO6/W1, 201/W1, 201/W2, or 301/W1.

The stucco of the west facade of the main block is in very good condition. It is a particularly hard and durable variety and apparently dates from army work at the end of the nineteenth century.

The wood sill of 110/W1 was found to be in a rotted condition in 1981. Rotten parts of the surface were removed and the cavity was treated with wood preservative. The cavity was filled with a two-part resin, and sanded before repainting.

The slate roof of the main block appears in good condition. There have been some problems with leaking on the north edge of the roof in the recent past, but they have been repaired and are not presently a problem.

Main Block - South Side

Like the north side, the south side of the main block had its stucco surface removed in 1964.

The shutters of 207/W1 and 207/W2 are of the panel type.

Main Block - East Side

Stucco on the east face of the main block at Arlington House was renewed in 1964 by a coat of portland cement over expanded galvanized metal lath. It was attached over the old stucco with galvanized nails. It is in very good condition. The windows on the first floor have panelled shutters; those on the second floor have no shutters.

A small test hole was dug approximately 1' 0" deep in the portico floor against the side of the house just below 108/W2 in 1981. It was found that the old stucco layers extend down only to the level of the present portico pavers and not below the level of the ground beneath.

The portico stairs are of wood and date to this century. Due to the lack of flashing and certain other design faults, the feet of the stringers are mostly rotten. Because of their deteriorated condition and lack of historic authenticity, they were removed prior to the column damp-proofing contract work begun in September 1981. Replacement is scheduled for early FY 1983.

Many of the pavers of the portico floor are worn and appear to date to the historic period. Others, specifically between the columns on the north and south edges of the portico, are replacements presumably dating from the War Department restoration. These newer pavers are not reasonable copies of the original, however, being both larger than the originals, a uniformly deeper red color with little variation, and of a slightly different shape. The sandstone coping around the edge of the portico dates also from the War Department restoration work when it was projected to outfit the house with stone steps.

A hole was bored through column C-1 in 1981 which established the fact that the columns are solid masonry. The exterior ring of brick is placed in an all-header pattern around the circumference of the column. These brick are of a special form, basically trapezoidal; they are the size of a normal brick, 2 1/4" deep by 8 1/2" long, but have an outside end of 4 1/2" and an inside end of only 2 1/2". The interior of the brick header ring is filled with random mortared brick. Some of the stucco on the columns dates from the turn of the century; most, however, seems no older than the 1964 stucco renovation.

A hole was dug on the west side of column C-3 for investigative purposes in 1981. It was found that the column stucco ended approximately 1' 1" below the surface of the existing pavement. The stucco at its lowest point spread out in a foot about 4" from the surface of the column. The brick column was found to sit on a rock base 1' 2" deep and extending 1' 7" out from the column base. The base was made up of a number of rocks mortared together, the surface of which was 3' 6" below that of the pavers. During the excavation, the

hexagonal pavers were found to be underlain by 1 1/2" portland cement. At 1' 10" below the surface of the existing pavers, another level of brick was located. This regularly shaped brick apparently made up a former portico surface; this older surface probably predates the historic period.

During the investigative drilling of portico column C-1, it was observed that the brick particles being removed were wet. It had been felt for a long time that capillary action was drawing moisture up into the columns and that this unusually high moisture content was one possible cause for the problem of paint peeling off the columns in the past. Also, there had been an observed tendency for large sections of column stucco to crack and separate from the columns. This condition (see photograph #82) was believed to be caused by freezing and thawing of moisture in the columns.

In an effort to definitively correct the problems caused by moisture in the columns, it was decided in 1981 to waterproof the columns and pilasters of the Arlington House portico. The method used was to drill the columns and pilasters just below the level of the portico pavers in two series of holes of 3" in diameter. In order to drill the columns, the portico steps were removed and the diamond drill was brought against the sandstone coping through which all the holes were bored. The first series of holes were drilled 5" apart and 2 1/2" below the level of the pavers to a depth of 5' to 7' in order to penetrate all the way through the columns. These holes were filled with a non-shrink and non-metallic grout which was given ample time to cure to achieve 80% of its strength. After three days the next series of 3" holes were bored on center between the existing filled holes. These

second holes intersected the first series approximately 1/2" on either side; they were filled with a non-shrink epoxy grout that was pumped into the hole until all spaces were completely filled. Similar drilling, grouting, and epoxying were to take place at the base of the pilasters. However, due to the instability of the pilaster brickwork, it was necessary to introduce a dampproof brick course by hand. That work was deferred until March 1982.

Prior to the drilling of the columns, the first approximately 7' 0" of stucco on the columns up from the portico floor were removed down to the brick. This action was taken to facilitate the release of moisture from the columns into the atmosphere. After the waterproofing operation, the columns were given an opportunity to dry further. A contract to stucco and paint the columns in preparation for marbleizing was com-pleted in May 1982. Marbleization of the structure was due to begin toward the end of July 1982.

The echini of the portico columns are made of metal and are assumed to be original. They have been painted all during their tenure on the Arlington House and are in a good state of preservation. A sample of the metal was taken in 1981 and submitted to the Federal Bureau of Investigation for analysis.

The column capitals are of wood and are covered at the top by metal flashing. They were inspected during paint removal in 1981 and found to be in good condition. It is assumed that these capitals date from 1881 when a memo from Montgomery C. Meigs noted that "the capitals of the front portico of the mansion at Arlington are of wood and more or less decayed. When removed they should be made of Portland cement with sharp sand. One cement and three sand and their

profiles should be cemented to resemble those of the Parthenon, which is the accepted canon of Grecian Ionic order."[51] It is interesting to note that some sound judgment was exercised in ignoring Meigs' memo and replacing the decayed Doric wood capitals in wood rather than concrete Ionic.

On the entablature of the portico, the interior portion between the column capitals and the ceiling is all plaster on split wood lath. In like manner the bottom edge of the portico entablature, which exhibits recessed panels, is also plaster on split lath. The hooks which are screwed into the bottom of the entablature between columns are of unknown origin or purpose. A section of the interior cornice on the east side near the northeast corner fell in the mid-1970s during a storm and was replaced.

The exterior face of the entablature is all wood, as is the tympanum which was shown in early drawings to be scored to simulate ashlar. While no destructive investigation has taken place in the tympanum to determine if lath and plaster were once in place there, it is assumed that it was originally plaster which was replaced within the first forty years of the house's history due to its inability to properly withstand weathering. It is shown as wood in the 1864 photographs of the house.

The roof of the portico is also slate like that of the remainder over the main block. The slight change in the elevation of the portico roof from that of the main block has no technical function, as has been maintained. This break in the roof line is a stylistic element only, to show on the exterior of the house roof where the portico ends and the main block begins. The snowboards on the main block have not

received close inspection but they have been noticed from a distance to be in deteriorating condition.

All guttering at Arlington House was returned in the early 1970s to the pattern seen in the 1864 photographs.

Exterior - Proposed Treatment

Should the basement areas at Arlington House prove to have a higher moisture content than is acceptable, even after waterproofing of the exterior walls accomplished in 1980, it is recommended that the basement walls be drilled and filled with grout and epoxy systematically as will be done for the portico columns already described. This drilling would take place around the perimeter walls on the interior just below the level of the present floor. In this manner a waterproof membrane would be introduced into the exterior walls to prevent any further capillary action. It is also recommended that a waterproof membrane, in the form of a thin concrete floor over a vapor barrier, be instituted in all basement rooms. The recommended drilling of perimeter walls, however, would not have to take place except in those spaces where the high moisture content was identified. If the source of the moisture cannot be identified, it would then be necessary to introduce the vapor barrier into all perimeter walls.

Should it be necessary to resurface any stucco areas on the exterior of Arlington House, it is recommended that Number Two Type Portland cement be used. Number One type was used on the resurfacing of 1964 and the result was the many shrinkage cracks seen on the surface after the sandblasting of 1981.

The Russsell photographs of 1864 show a simple stairway leading from the ground up to 101/D1. In addition to the landing at a level just under the door sill, there are five steps which appear to be approximately 4' 0" wide. The rise and run of the stairs appears to be a normal proportion; there are no railings.

The stairway leading to 111/D1, which was reconstructed in the mid-1970s, appears close to that which is seen in the 1864 photographs. There is some question as to whether the historic stairs are as steep as those reconstructed. In order to check the authenticity of the present stairs, it is recommended that a photograph of the present stairs be taken from the approximate same position as that held by the 1864 photographer, and that this modern photograph be overlaid with the old. Should there be a significant difference between the original stairs and those reconstructed, it is recommended that the existing stairs be changed to conform with the historic ones.

In the Russell photographs of 1864, there are several features seen on the north side of the main block which should be examined further. One difficulty of ascribing the elements seen in the 1864 photographs to the Lee tenure at Arlington House is that the Lees left Arlington in 1861 and these photographs were taken in 1864 over three years later. Therefore, when an element such as the rather makeshift stoop canopy over 111/D1 is under consideration it is difficult to ascertain whether or not it was installed by the Lees or the occupying U.S. Army. As it is of such a temporary nature, and as it does not reflect the same design values as other elements on the house, it is the recommendation of this report that the canopy be considered a product of the U.S. Army occupation and not reconstructed.

It will also be noticed in the 1864 photographs that the large shutters to either side of 111/D1 are not seen. It is logical, however, that these shutters were installed along with the others at the house, and that they were a product of a family's concern rather than that of an occupying army, as they are essentially decorative. It is possible that they were removed by the army. Proof of their existence is found in the existing pintles, however, and if it cannot be shown that these pintles are a product of the twentieth century, the shutters should be reproduced and placed on the building.

It is clear from the photographs of 1864 that the chimneys and the west wall of the main block were not stuccoed in 1864. There has long been a question as to whether or not the stucco should be removed from these areas for the authenticity as required by the Congressional mandate of 1925. However, as has been pointed out at the beginning of the section on Historic Conditions and Recommendations, the wording of the resolution specifies that Arlington House will be restored "as nearly as may be practicable" to the time of the Lee tenure. Due to the hardness of the c. 1900 stucco in question, and to the soft quality of much of the brick used in the house, it would be inordinately destructive to the historic fabric of the house to attempt removal. The protective face of much of the brick would be removed with the stucco, and deterioration would proceed rapidly once the protective stucco was off the brick and it was exposed directly to the weather. It is therefore judged not practicable to expose the exterior brickwork as seen in the Russell photographs of 1864, and it is recommended that the stuccoed west wall and chimneys remain as they are seen today.

One exception to this recommendation is the north wing chimney. It can be easily seen from the 1864 photographs that the chimney was not only exposed brick, but also much shorter than it is today. From the photograph showing the east facade of the house in 1867, (see Arlington photograph collection), it can be seen that the north wing chimney is only about 1' above the apex of the roof with a simple cap. It is recommended that the chimney be investigated for the location of its original height and cap, and be restored to that condition. It is further recommended that the shortened chimney retain a stucco surface to protect the historic brick fabric and to make it appear consistent with the other chimneys.

Close examination of the Russell 1864 photograph of the west facade (see photograph #86) from the south reveals a crude stove pipe exiting from the wall south of 113/W1 and rising to a pipe T; the whole pipe is approximately 5' 0" in length. The provenance of this feature is certainly in doubt and, like the canopy over 111/D1, it would appear to be an army addition. It is not recommended that it be reinstituted.

The present portico stairs differ significantly from those seen in the historic photographs. Due to the obvious age of the steps seen in the 1864 photographs, it can be safely assumed that these steps were also in use during the Lee period of occupancy dating probably from 1851. Following the waterproofing of the portico columns, the stone coping surrounding the portico perimeter on the north, east and south will be removed as specified in the scope of work for that project. This coping was installed during the War Department restoration in preparation for construction of stone steps. The army felt that Mr. Custis' choice would have been stone steps.

It is recommended that the wood steps be restored according to the historic photographs (see photograph #87). The stone coping will be replaced by wood, and a 1" gap will be left between the coping riser and the three steps below it. The three steps will also be done in good pine recut from old wood beams, the treads and risers all to be of the same wood. The pine will be left unpainted and will be treated only with a clear wood preservative. The treads and risers will be held on the carriage with reproduction rails and any other concealed means necessary to keep the treads from cupping excessively. The carriage will be fashioned out of salt-treated lumber to ensure the maximum longevity of the reconstruction. The only concession to modern safety requirements will be in the treads, which will be purposely wider than the originals.

It is recommended that the hexagonal pavers of the portico floor located between the columns to the north and south be replaced by ones closer in size, shape, and color variation to the other pavers in evidence, which are original.

It is recommended that the large flag pole directly in front of the portico at the Arlington House be permanently removed. This flagpole is not authentic to the Lee period of occupancy, and its continued presence in front of the principal view of the house detracts considerably from the historic authenticity desired by the Congressional resolution of 1925. It will be noted that Mr. Custis dutifully flew an American flag from the portico of the Arlington House itself; the pole would be restored had it lasted into the historic period as shown in the Russell 1864 photographs.

Lastly it is recommended that the condition of the snowboards on the main block be identified, and if found to be unacceptable they should also be replaced.

Exterior Painting - 1981

Arlington House was cleaned and repainted on the exterior in 1981. This repainting was necessitated by the very poor condition of the repainting and marbleization of 1973 which had, in a number of places primarily on the east facade, begun to fail after only a few years (see photographs #83, 84, 85). The problem of paint adhesion was investigated (see Appendix III) and it was concluded that many of the problems defeating the 1973 effort stemmed from capillary action on the wings and columns and the lack of a good clean surface.

Preparation for the exterior painting of 1981 began with the water-proofing of affected walls in the wings, as already described, and the later removal of stucco on the columns near the base. The 1964 stucco surface of the entire house was sandblasted using a large aggregate at a moderate pressure. After the sandblasting operation was completed, it was concluded by National Park Service personnel that damage had occurred on the 1964 surface but that the major part of the work had been satisfactorily effected. Specific damage occurred under the canopies of B01/D1 and B01/D2 where the operator obliterated historic fabric in both areas on the west wall of the north wing. The stucco of the west wall of the main block was not sandblasted due to its age c. 1900, but hand-cleaned. As the 1973 paint had adhered well to this west facade with minimal cracking and

peeling, however, and since this area is not to be marbleized, it is felt that the minimal cleaning given it in 1981 is all that was necessary.

Although it was originally specified that the cracked and alligatored paint on exterior woodwork be removed by hand scraping, it was later modified to permit the use of heat guns. It was found that the heat gun provided an effective way to remove paint safely down to the bare surface with minimal damage. The object of the cleaning process, however, was not to remove all paint on the woodwork, but rather to provide a good painting surface.

After sandblasting or hand-cleaning, the stucco surface was repaired prior to painting. The incorrect use of portland cement type no. 1 in the 1964 resurfacing of much of the house had resulted in a cracking of much of the surface, some of the cracks being hair-line in nature and others of greater width. Ashlar units were individually called out for resurfacing, which was effected with a very thin coat of stucco which filled the smaller cracks. Larger cracks were cut out individually and filled more meticulously.

In the interest of ensuring the maximum adhesion of paint to the stucco surface, it was specified that all paint was to be brushed on and that any use of rollers as had been used in 1973 was prohibited. These specifications were later changed on site, however, by the government supervisor when it was found that rollers succeeded in putting a more uniform coat of paint onto the rough surface.

It was also specified that all paint products used on the house be of the same manufacturer to ensure quality control and liability. Products specified were from the Benjamin Moore Company of Montvale, New Jersey, or approved equals; the Benjamin Moore products were

used by the contractor. On the stucco surfaces, the initial coat was an oil-based masonry primer to give the maximum penetration into the surface; intermediate and final coats were Benjamin Moore's "Eggshell." The wood surfaces were primed with Benjamin Moore's "Moorewhite Primer", and intermediate and final coats were Benjamin Moore's "Eggshell," where the surface was to be marblized and semi-gloss paint where it was not. The metal echini of the capitals, gutters, and hardware, and the metal canopy roofs were first primed with a zinc coat before further painting. The pebble-dash rusticated base of the north and south wings was lightly sandblasted to remove loose paint without removing the pebbles. In order to best simulate what are believed to have been the historic conditions, the pebble-dash will be covered with a yellow-ochre wash. All shutters were cleaned, primed, and painted with Benjamin Moore semi-gloss. All paints used on the house were oil-based.

Exterior Paint Color Investigations

Investigation to determine accurate colors for the exterior of Arlington House were carried out in 1980 and 1981 by National Park Service personnel. Initial investigation was produced by David Arbogast of the Denver Service Center, who analyzed samples from twenty-one areas on the house exterior (see Appendix I). Further investigation was conducted in the spring of 1981 by a committee formed by the administration of the George Washington Memorial Parkway, which consisted of Mrs. Agnes Mullins (ARHO), Mr. Gary Scott (NCR) and Mr. John Sligh (DSC-TNE). In addition to the further examination

of the samples taken by Arbogast, the committee took some twenty additional samples.

In order to examine the color of the exterior stucco, major samples measuring approximately thirty-six square inches each were taken by sawing from the east facade of the main block between the south pilaster and 206/W2, and from the east facade of the south wing in the panel under 115/W1. These samples extended back to the brick surface of the house itself. The samples taken near 206/W2 gave a complete section of plaster beneath the 1964 lath and plaster overlay; that from under 115/W1, however, gave no historic plaster. Mr. James Askins, when removing the samples, observed that the stucco layering in the corner of the pilaster and surface of the east facade where he took the samples showed that the pilasters had been stuccoed before the rest of the facade. This sampling consisted of a 6 x 6 square on the east facade beside the south pilaster south of 206/W2 and a similar-sized square next to it, and at 90° to it, on the north face of the south pilaster.

The committee's report (Appendix II) may be examined at the end of this report. While the examination of paint layering is tedious and particularly tiring to the eyes, it will be maintained here that the task of counting layers of paint and matching their colors to the Munsell system is a task which can be accomplished by any moderately knowledgeable person. Mr. Arbogast and the enumerated committee took a great number of samples from the house, examined them at length, and compared their findings to the evidence presented in the historic photographs of 1864. The paint colors as used in the 1981 repainting of Arlington House are the product of examination of diverse

samplings and the constant questioning of findings. As such, these colors are the best that present knowledge can offer and, while not wholly definitive due to crucial absences of historic fabric, they represent a decided move toward 1861 authenticity.

Exterior Paint - Proposed Treatment

Should it be necessary to clean the stucco surface at Arlington House in the future, it is recommended that a study of available techniques be performed at that time. It is also recommended that surface stability be checked as sandblasting, if at all possible, should be avoided. Cleaning of the wood parts should be done by handscraping.

While a great deal of sampling and investigation of paint took place in 1980-81 in order to choose the present house colors, it is recommended that samples continue to be taken and investigation proceed when possible to further refine these findings. When dealing with a structure as complex as Arlington House, where a good deal of historic fabric is missing, it is difficult to ascertain exactly when further investigation is no longer needed. It is certain that with the correct attitude toward investigation and the value of historic discoveries, valuable information affecting the future interpretation of the house will continue to surface.

The final decision regarding the types and variety of marbles to be simulated can only be made after a marbleizer is engaged by contract to do the work. This craftsman, in conjunction with the architectural and curatorial staffs at Arlington House, will interpret the information

provided by the historic photographs of 1864 and decide what marble types were probably present on the house during the Lee period. It has been tentatively recommended that the portico columns be represented as Carrara and the entablature, portico raking cornice, and wing cornices be simulated as Sienna. It has also been decided, until better evidence is presented, that the east facade of the house under the portico and the two pilasters differ from the north or south walls of the main block, which are the same as the walls of the north or south wings. The pebble-dash rusticated bases of the north and south wings differ from the facades of the house and the echini of the columns, and perhaps their capitals differ as well from the entablature. The sandstone sills directly under the lower sash of each of the semi-circular arched windows in the north and south wing are darker than the surrounding areas, or their continuations in either direction. Also the wooden sills, and perhaps even the windows themselves of the second floor east facade under the portico, are much darker than those on the wings. It is obvious that the cornice at the west end of the portico from the south was in the process of being marbleized and the process was roughly stopped at that point. It is recommended that this interesting effect be reproduced by the marbleizer.

It is recommended that, in doing this marbleization work, the craftsman follow as nearly as possible the outstanding details as clearly perceived in the photographs of 1864. It is also to be kept in mind, however, that the cameras of that period could not capture all the detail that was probably present on the house, particularly as the photographs were taken at some distance from the structure. It will, therefore, be necessary that the craftsman use his professional

judgment and knowledge of marbleization in the nineteenth century in the execution of details which could not be revealed on to us by early photography.

There has long been some question as to the nature of the paintings in the recessed panels above the first floor windows and front door under the portico. While many felt these paintings depicted realistic scenes, others felt they represented yet another marble type. Examined under low magnification, it was evident that these paintings were indeed realistic scenes very much like those in the center hall and above the doors on the servants' quarters. It appears that the panel above 108/W1 pictures a single animal, a sheep or a dog, in a landscape. The panel next to it over 108/W2 is not as clear, but seems to hold several small figures, also in front of a landscape; they appear to be wild turkeys, or some other bird, but the scene cannot be fully ascertained. That above 112/W1, while visible as a panel for the most part, is not decipherable as a painting. Unfortunately, the panels above 111/D2 and 112/W2 are blocked by columns and their contents can never be known from the photographs. It is recommended that further efforts through detail enlargement and magnification be undertaken to establish more clearly what is represented in the three visible panels. Should it ever be known what is represented in all five panels, they should be restored as nearly as possible. As was noted earlier, the layer of plaster on which these paintings existed is no longer found inside the panels.

It has not been satisfactorily established exactly what color was on the shutters when the 1864 Russell photographs were taken. It is recommended that the historic shutters undergo further investigation until this important color is firmly established.

V. GENERAL RECOMMENDATIONS AND SUMMARY OF RECOMMENDATIONS

GENERAL RECOMMENDATIONS

The following recommendations cover more than one space in the house and are summarized here to avoid repetition:

1. Prior to any future repainting on the interior at the Arlington House, paint studies should be completed on all the fabric of one room and samples of full paint sequences selected to be preserved in place. While it appears that much of the north wing was scraped in the past, this is not true of the main block. It is recommended that if scraping is apparently necessary to reveal profiles, before beginning to scrape existing woodwork, paint panels which preserve complete paint layering sequences be left intact, preferably in inconspicuous places. The panels can be consulted in the future.

It has been proposed that there could be a connection between the use of a canvas covering on interior walls, which is designed to be easily stripped when paint layers have built up over time, and the difficulty in keeping paint on certain areas of the exterior walls. The theory is that there exists a certain amount of capillary action in the exterior walls. When the walls wick even a small amount of moisture, it is necessary for the water to eventually escape from the walls at some point. The canvas covering glued to the walls in the main block has prevented moisture from exiting to the interior; not being able to exit to the interior has left the moisture only one direction to go. Leaving through the exterior the moisture has caused some paint peeling. The situation was different historically, however, where the use of a colored wash, or kalsomine, on the interior walls allowed the free passage of moisture into the house rather than through the exterior paint.

Although this theory may or may not be valid, moisture should not be allowed to penetrate masonry walls as rising damp is a major cause of deterioration of masonry (brick) buildings. In 1980 the exterior walls with the most extreme water problems were water proofed. If moisture continues to be a problem in the walls of the house, further water proofing should be performed to correct the problem.

The canvas on the walls and ceiling of the main block was installed in the 1940s and 1950s. It is in very deteriorated condition and should be removed, replaced with new canvas, and painted with a breathable paint.

Great care will have to be exercised in removal of the canvas because of the deteriorated condition of the plaster beneath. It is recommended that the site appoint a committee to study all extant painted surfaces, record findings, completely document research, and recommend color restoration on the basis of the study. Interior painting must be done by brush at all times and in all cases.

In connection with the foregoing subject, it is also recommended that a careful search be instituted during any wall paint removal to locate certain murals said to have been done by G.W.P. Custis and noted by certain eyewitnesses who visited the house and left records of their visit during the nineteenth century. While these murals may well have been lost during prior paint removals or replastering, there is a chance that some may have survived, particularly in the center hall, the family dining room, or Mrs. R. E. Lee's morning room.

II. There have been suggestions in the past to install a climate control system at Arlington House. The system would ideally control temperature and humidity levels for the ultimate protection of the

building and its furnishings. It is recommended that a climate control study be performed and that on the basis of the study a system of climate control that will not be harmful to the structure or artifacts be selected, funded, and installed.

Working with the existing system, it is recommended that a system of fire dampers be installed in the ductwork to reinforce the fire zones as established by the 1980 installation of fire doors in the basement. They are specifically needed in the duct above B06/D1, in the north wall of B07, and the small duct in the east wall of B08. These dampers should be operated by fusible links set to activate in the presence of fire. They should be installed as soon as possible as the fire zone system is incomplete without them. This work would afford an excellent opportunity to thoroughly vacuum the duct system to reduce the levels of dust transmitted to the exhibition rooms above. This vacuuming is strongly recommended.

A number of rooms on the first and second floor have been monitored since the 1970s. There is a serious deficiency in the recommended humidity levels for the preservation of the structure's historic furnishings December through March, with excessive humidity occurring May through August. While there was a natural fluctuation in the figures gathered, it was generally found that the humidity levels stayed around 35%. With the current theory giving a recommended humidity of 40% to 60%, humidity induction is needed. These induction units are easy to install on the existing system and are controlled by a humidity-level sensor. Dehumidification is needed May through August to maintain recommended levels.

The heating system depends largely on five diffusers which are located in the floors of fireplace fireboxes. There is one each in the

family parlor, family dining room, and Mrs. R. E. Lee's morning room, and two in the white parlor. The south wing is similarily heated by a diffuser on the east wall of the conservatory and under 117/W2.

It will be noted here that it is incorrect to install filters under the grills of diffusers as has been done in the past at Arlington House. The filters should be placed under the two grills of the returns in the center hall and in Mrs. R. E. Lee's morning room where there are two small return grills against the north wall. As the house air is filtered when it enters the heating system at the return-air grills, and as the system is closed, it is not necessary to filter the air again where it re-enters the house at the diffusers. Correct operation of this system, however, does depend on clean ducts; as has been already observed here, the ducts in the basement of Arlington House are dirty at present and should be thoroughly vacuumed. After cleaning, fresh filters should be placed beneath the return air grills at least once a month. If these filters on the return appear heavily clogged at the end of a month, they should be changed every two weeks. Regularly replaced filters at the return will ensure clean ducts and clean heat from the diffusers. It is important to remember that there should be nothing impeding the flow of air at the diffusers and that filters at that point will make the heating system inefficient for its designed function and will shorten the life of its moving parts. The ducts should be inspected every year at the diffusers to see if further vacuuming is necessary.

III. It is recommended that a small independent study be conducted documenting the remains of the 1855 heating system installed by the Lees. As has been mentioned, the foundation of the coal-burning

furnace was uncovered in BO6 during archeological investigation of the base in 1980, and several pieces of the original cast-iron furnace remain in BO8. Wall cracks in the center hall and the upstairs hall give some indication of where the hot air duct once ran, but it is not clear whether that duct was dug into the brick bearing wall or whether it ran outside and alongside the north wall and was visible to those in the center hall. It is known that the furnace was ordered in 1855 from a Mr. Heyward[51] in Baltimore, and that it was quickly installed.

Although it is probable that the furnace will not be restored as it is not in a public space and will not be on view to visitors, it would be essential to a complete history of the house to know the working nature and complete appearance of the unit as used by the Lees. While the extant furnace parts show no manufacturer's name or serial numbers, if documentary evidence established the history of the furnace, it may be possible to identify the unit in a trade publication or catalogue of the 1850s period given the appearance of the parts at hand.

IV. Electricity was first installed at Arlington House toward the turn of the century. When the decision was made to restore the house as a museum, many switches, fixtures, and outlets were abandoned, leaving conduit and wiring in place. The condition today is a confusing assemblage of abandoned old wiring, old wiring in use, and various installments of wiring from the War Department restoration to the present. It is recommended that the electrical system at the Arlington House be thoroughly inspected by a qualified engineer and brought as up-to-date as possible. Fortunately, the electrical needs of the Arlington House are minor and uncomplicated, and the system therein should reflect that value. All receptacles in the north wing were rewired in 1981, as has been noted in the existing conditions section.

V. Arlington House has had at least three fire detection systems since the War Department restoration. The first system depended on a hollow wire which, when heated, set off an alarm. The second system relied on detection heads which were located throughout the house, much like the system in use today. This present system, reflecting the latest fire detection technology, was installed in 1976 and relies on a detection head in every space in the house. After several years of observation, the system appears to operate well and with great sensitivity.

There have been suggestions in the past of installing a fire suppression system similar to those at a number of house museums. Such a system relies on accurate detection and activates a rush of fire-suppressing gas that quickly fills the space and extinguishes any fire without damage to the room contents. While this system has many virtues, it is decidedly most practical in a structure where the rooms are small, as at Mount Vernon, where a system was recently installed. Successful operation of the system depends on the rapid compaction of the gas in the space in question; even in small spaces the amount of gas necessary for one activation is considerable and extremely costly. The greatest problem confronting the successful installation of such a system at Arlington House is the large cubic footage of many of the spaces. In the installation of a gas-suppressive system at Arlington House, the amount of stored gas and the system necessary for its proper distribution would be disruptive to the house structure and inordinately expensive. Arlington House's proximity to the Fort Myer Fire Department and the presence of a good detection system within the house create a situation where further fire protection would be difficult to justify. Also, it may be added that once the house electrical system

is inspected and brought up to current standards, there will be a minimum of fire hazards at Arlington House. It is the recommendation of this report that the staff of Arlington House work toward reducing fire hazards at the house and grounds and that the further installation of technology be avoided where possible due to its ultimate effect on the historic scene. It is also recommended that the remaining wire from the initial detection system, some of which can still be seen running around the cornices, be removed during the paint removal process. VI. It has been suggested in the past that an intrusion-alarm system may be needed at Arlington House. These devices are often seen at house museums, institutions, and increasingly in private houses. Arlington House will not have enough interpreters to staff the entire building once the North Wing is reopened; thus, both a nighttime intrusion alarm and a daytime visitor control system should be installed. VII. There is a real need at Arlington House for effective lighting of artifacts. Due to the design of the house, there are certain spaces which lack sufficient natural lighting, particularly the winter kitchen, the wine cellar, the inner hall (north wing), the family dining room, and parts of the white parlor, to effectively illuminate the artifacts which are crucial to an interpretation of the house and its history. It is recommended that a specialist in historic house lighting be engaged to formulate a system of unobtrusive lighting which would subtly illuminate spaces and objects without intruding into the historic scene. This lighting plan would have to be formulated in connection with the 1978 Furnishings Plan and the renovation of the electrical system. It would also be necessary to provide illumination for the house interior when used at night for an occasional tour or function. Particularly

needing special lighting at night are the servants' stairway, the main stairway to the second floor, and the stairway between the cellar stairway hall and the pantry. The most important characteristic of this lighting after its lighting function should be its unobtrusiveness on the historic scene.

VIII. There are a number of paint layering exhibit panels throughout Arlington House, dating from the 1950s, all of which have been noted in the section on existing conditions. Many of these panels were covered by protective sheets of plexiglass which are now yellowed and cracked. Also the frequent repainting of doors, etc., has resulted in paint running under the edges of the sheets. It is our recommendation that all damaged panels be removed and replaced with concealed covers.

IX. Most of the door hardware at Arlington House, as described in the existing conditions, is incomplete and incorrect and should be restored as soon as possible. It has been documented by the house architect of the War Department restoration that almost all locking hardware at Arlington House, with the exception of doors 111/D1, 111/D2, and 111/D3 were reproductions installed in 1929.[52] It is assumed that all hardware was intact at the opening of Arlington House as a memorial and museum and that its deterioration has all taken place since the War Department restoration. At present, many locks are missing knobs, shanks, escutcheon plates, and mortise lock knobs. Some mortise locks are loose and need reattachment, as do some hinges. It is recommended that all hardware at Arlington House be examined, the missing pieces reproduced, and that all be firmly reattached.

X. There are many incidences of visible wear and tear at Arlington House. A good deal of the door casings, particularly in the

center half, have been pieced at the bottom and much of the reproduction flooring on the first floor shows cracks, splits above the tongue, and uneven wear patterns. Like visible cracks in the plaster walls, however, those signs of wear should be preserved and jealously guarded as being a valuable part of a house museum. One of the great dangers in the preservation of a historic structure is the tendency to make elements appear too perfect and too new. These appearances of newness are difficult to predict and to control. As a result, it is recommended to preserve all elements, even those which were frank reproductions during the War Department restoration and which have now acquired a certain appearance of age, until that point when they must be replaced to ensure public safety.

XI. An unusual threat to the preservation of Arlington House is present in the regular firing of large guns for practice and ceremony in Arlington National Cemetery and Fort Myer. While it is understood that the firing of these guns is a necessary part of military and cemetery functions, the vibrations of large guns fired near the house are unquestionably damaging to the structure of the house. As has been noted, the primary building material is very poor quality underfired brick and a low-lime content mortar, both of which form an extremely weak structure. The structure formed by these low-quality materials has no tensile strength and can easily be shaken to pieces, little by little, over a long period of time. Also the plaster, most of which is original, can be weakened by the continual and regular vibration of these firings and will eventually come loose from its keys through the wood lath. In consideration of this problem, it is to be remembered that the danger to the house is not that it will one day collapse

spontaneously, although that could happen, but rather that, eventually, individual elements and areas will slowly detach and need repair. The kind of deterioration which will occur will be subtle and may not identify itself as a result of the explosive vibrations. It is difficult to assess the extent of damage already sustained by the house from the firing of the guns, but there is no question that some deterioration does occur during each firing in proximity to the house. It is the recommendation of this report that large guns be kept a minimum of 2,000 feet from the house when firing, and be consistently aimed in the opposite direction, and never toward the structure, as is often done today. It is suggested that the site manager continue her personal contacts with the superintendent of Arlington Cemetery to protect Arlington House in the future. It should also be noted that the airplanes flying directly over the house deposit impurities in the air, especially sulfur, that cause exterior paint deterioration and interior artifact damage. On days when the cloud ceiling is low, the noise vibration causes serious plaster damage, such as the fall of the plaster medallion in Mrs. R. E. Lee's morning room (1983) and earlier portico ceiling damage. Some effort should be made to bring this condition to the attention of those who control the flight pattern to and from National Airport.

XII. Both the north and south servants quarters have undergone extensive renovation during the twentieth century. The War Department did a major restoration of the north building in 1929[53] and opened the summer kitchen to the public. After the National Park Service acquired Arlington House, it was decided that the treatment of the summer kitchen was historically inaccurate. The north servants

quarters was extensively reworked, changing it from a two-story to a one-story building. Windows were filled with stone (north face) and the stairways to the former lower floor were buried (south face). The north building is not interpreted today but rather serves the utilitarian purposes of providing space for a bookstore, a storage room, and a women's dressing room for the house guides. The south building, reworked in 1958[54], presently consists of a large storage room and an interpretive "servants' room." Examination of fabric reveals that there is a good deal of replacement in both buildings. Due to the extensive change wrought on both structures, a detailed examination of either at this time for authenticity is pointless. Should it be decided in the future that the use of either building should change toward a more interpretive function, then an individual historic structure report on either could be effected. It is recommended that both buildings be examined on a bi-annual basis for structural deterioration and possible repair needs. The Custis murals over the exterior doors should be preserved.

XIII. Taken together, the written documentation on the history of Arlington House is unusually small in consideration of the architectural importance of the house and the place in American history of those who inhabited it. No plans, either drafted or written, have ever been found of Arlington House. While it is admittedly rare to find actual building plans, as they were nonreproducible and usually worn-out by the builder, it does seem likely that there would be more extant notations of the house being built and its features in letters, ledgers, sketches, and diaries. However, one must remember that family papers were scattered during army occupation of the grounds, 1861-1865.

There has been an effort to collect documents relating to Arlington House since its opening as a memorial to Robert E. Lee. The greatest period of activity was from 1948 to the mid-1950s when Murray H. Nelligan was historian in residence at the house. Mr. Nelligan wrote a doctoral dissertation on life at Arlington House during the tenure of the Custis and Lee families. While this study was weighted toward the social aspects of the subject, Mr. Nelligan did have an interest in the history of the house structure itself and included in his tract whatever information he found on this subject.

For his research, Mr. Nelligan examined Custis and Lee papers in many repositories, including the Library of Congress, the Virginia Historical Society, and Washington and Lee University. Since Mr. Nelligan's work almost thirty years ago, ten depositories have been selected for survey monitoring of collections of documents related to Arlington House and its occupation. Two of these surveys have been completed and are due for updating; funding is being sought for continuation of this project. Documentary information is incorporated into the site historic data file on a continuing basis. As it is difficult to interpret the results of fabric investigations without accompanying written documentation, it is strongly recommended that a resource study be undertaken to revisit the known repositories of Custis and Lee material, to search out other papers, and to continue and expand acquisition of complete copies of known documents. See Appendix V for recommended sources.

XIV. It is recommended that future preservation work at Arlington House follow a regular maintenance plan under the guidance of an exhibits specialist engaged to have this site as his/her primary

responsibility. Past work at the house has been undertaken after it was long overdue in many cases. The philosophy of repairing many diverse problems periodically, as has been the case at Arlington House in the past, is not a responsible solution to the preservation of such an important, as well as highly visible, resource as Arlington House.

XV. As noted previously, the north and south wing roofs are covered with an experimental membrane installed over plywood sheathing in 1974. At this time, it is recommended that these roof areas be recoated with this same membrane material and be top coated every 1 to 2 years or as recommended by the manufacturer. If a more durable roofing material is available in the future it should be investigated to determine its compatibility with the existing roofing system.

XVI. It is recommended that a complete study of the loading capacity of the south staircase be made and necessary stabilization be performed. The load limit of the staircase for both the south and north stairs should be established.

SUMMARY OF RECOMMENDATIONS

GENERAL RECOMMENDATIONS

I. INTERIOR FINISHES

A. Perform complete paint study and paint analysis of each room.

B. Establish paint samples of layering in situ and preserve complete sample of physical fabric in each unique area.

C. All painting to be done to follow recommendations based on valid paint study.

D. Cover paint layering panel exhibits (c. 1940 and 1950) with concealed cover and place near samples in unobtrusive location.

E. Provide conservation treatment for wallpaper and cover with protective covering in situ.

II. HEATING SYSTEM

A. Perform complete climate control study.

B. Experiment with controlled installation of room humidifiers and dehumidifiers based on need established by study in progress.

C. Install fire dampers in basement ducts.

D. Devise and install inconspicuous hoods for existing fireplace diffusers.

E. Put heating filters only in return-air grills, not under the diffusers.

F. Change return-air filters regularly.

G. Thoroughly clean duct system.

H. Inspect ducts for dirt once a year.

III. INVESTIGATE 1855 HEATING SYSTEM

A. Study furnace, ducts, vents.

B. Restore 19th century vent covers visible in 1861 as near as possible to original locations (eg. White Parlor, Center Hall, Upper Hall).

C. Restore all other physically visible sections of 1855 system in exhibit areas.

IV. HOUSE ELECTRICAL SYSTEM

A. Inspect electrical system. Repair, rewire, and upgrade to meet standards.

V. FIRE ALARM SYSTEM

A. Test fire alarm system yearly; replace malfunctioning heads with Pyron #D1-4A.

VI. SECURITY SYSTEM

A. Install comprehensive security system integrated with security systems for all other site buildings and to meet specific daytime / nighttime security needs of this site. Also upgrade staff and guard force training and performance to fully complement security system.

VII. HOUSE LIGHTING

A. Develop unobtrusive total lighting plan for house maintaining respect for historic light levels and practices.

B. Improve exterior lighting:
   1. Install more sophisticated lighting system.
   2. Upgrade nighttime security.

VIII. HARDWARE

A. Study hardware collection located at Arlington House and recommend restoration of hardware in use in 1861 or general hardware similar to that in use in 1861.

B. All hardware (except on doors 111/D1, 111/D2, and 111/D3) should be evaluated and if not accurate to 1861 period be replaced with hardware proper to the period of interpretation.

IX. REPAIR WING AND CENTER ROOFS

A. Inspect and repair as needed center section of slate roof. Set up on-going maintenance plan.

B. Inspect and repair wing roofs and set up on-going maintenance plan.

X. MAINTENANCE

A. Prepare maintenance plan to insure effectiveness of work performed by site and park staff.

XI. FUTURE WORK

A. During all work at Arlington House exercise great care to protect and record all historic fabric, and perform all investigations on existing fabric that would be meaningful in interpreting the house.

SPECIFIC RECOMMENDATIONS - NORTH WING

CELLAR STAIR HALL (ROOM B01)

A. Retain existing brick floor.

B. Remove riser and tread coverings on stairway.

C. Repair, stabilize, and refinish risers and treads where necessary.

D. Install new protective material on treads and risers; material to blend with the historic ambiance of the house - painted canvas is suggested.

WINTER KITCHEN (ROOM B02)

A. Stabilize archeological excavations.

B. Investigate how archeological features can be interpreted.

C. Verify stability of chimney. If stabilization is required, careful records must be made of all evidence of chimney construction and effort made to date the physical fabric, interior, and exterior of this chimney. If extensive stabilization work is required, investigate and restore flues and chimney block to safe functioning condition.

WINE CELLAR (ROOM B03)

A. Patch walls as needed; match existing material. Preserve original fabric in situ.

B. Install hard clay floor leaving brick sill in place under reproduction wine rack. Retain rack along East wall concealing pipes.

C. Date construction of flue and if present before 1861 restore appearance.

D. Treat ceiling joists and ceiling as recommended in valid paint study.

PANTRY (ROOM 101)

A. Remove 101/D2; install window similar to 101/W2.

B. Install removable cover over exposed brick pier and at exposed junction of loggia and main block.

C. Install removable or see through cover over area now exposing infill North wall of flanker and brick pier of loggia beneath peg board.

D. Restore missing pegs to pegboard.

E. Install electric lights in pantry garret sufficient to illuminate for maintenance and full examination.

BATH AND WATER CLOSET (ROOMS 102 and 103)

A. Restore all missing paneling. Match existing paneling; reuse historic material where possible.

SCHOOL AND SEWING ROOM (ROOM 104)

A. Remove canvas from mantel. Using paint study, attempt to establish date of mantel installation. Restore mantel to 1861 appearance, if possible.

B. Verify stability of chimney between Room 104 and 106. Treatment will be same as item C under winter kitchen.

C. Install door in 104/D2 opening; match 104/D3. If original is not available, complete study of period shutters and shutter boxes.

D. Strip paint from panel beads on west face of door 104/D1 after paint study is completed.

INNER HALL (NORTH WING) (ROOM 105)

A. Provide conservation treatment for wallpaper and cover with protective covering in situ.

B. Mortar in place loose bricks over lintel of 105/D1.

C. Install removable cover over all of chimney breast and a small (2') cover over east face of west cheek wall (the original south wall of north wing). Also place a small cover over early partition patch showing wallpaper fragment between window 105/W1 and door 105/D1. This illustrates the former partition before wallpaper; it is an example of sequential evidence.

D. Remove fire extinguisher support from south wall.

E. Cover stove pipe holes with period or reproduction covers.

F. Install six-panel door in 105/D1 opening if period door is not available.

CUSTIS CHAMBER (ROOM 106)

A. Restore mantel; retain as much original fabric as possible - reproduce missing parts to match original appearance.

B. Install removable cover over entire east wall.

C. Install six-panel door in opening 106/D4; use original if possible.

CLOSET (ROOM 106A)

A. Carefully remove all unstable paint after paint study is completed and samples and preservation area established.

B. Cover all holes where plaster has been removed by covering with mylar.

C. Remove sufficient plaster on East wall to reveal cornice scar and molding scar of earlier room decor. This should be done in conjunction with paint study. This will make possible fabric interpretation of early square parlor.

CUSTIS GUEST CHAMBER (ROOM 107)

A. Provide conservation treatment for wallpaper and cover with protective covering in situ.

B. Install period or reproduction covers over all stove holes.

C. Cover heater and retain; blend unobtrusively into wall treatment.

CONNECTING ROOM (ROOM 108B) BETWEEN INNER HALL (NORTH WING) AND FAMILY PARLOR

A. Carefully remove all unstable paint after paint study is completed.

B. Patch walls and ceilings as necessary.

OTHER SPECIFIC RECOMMENDATIONS - NORTH WING	Cellar Stair Hall (B01)	Winter Kitchen (B02)	Wine Cellar (B03)	Pantry (101)	Bath and Watercloset (102 and 103)	School and Sewing Room (104)	Inner Hall (105)	Custis Chamber (106)	Closet (106A)	Custis Guest Chamber (107)	Connecting Room (108B)
Install security system	●	●	●	●	●	●	●	●	●	●	●
Install lighting based on lighting study	●	●	●	●	●	●	●	●	●	●	●
Patch walls as necessary using removable material	●			●	●	●	●	●		●	
Patch ceiling as necessary using removable material				●			●	●		●	
Cover walls with canvas so that treatment is reversible				●	●	●	●	●		●	
Cover ceiling with canvas so that treatment is reversible				●			●	●		●	
Restore missing wood base and trim; reuse historic material where possible or match existing				●	●	●	●	●		●	●
Complete study of period shutters and shutter boxes						●		●		●	
Based on study, construct and install new interior shutters and shutter boxes						●		●		●	
Install period or reproduction hardware on all shutters based on hardware study						●		●		●	
Install period or reproduction hardware on all doors based on hardware study	●	●	●	●	●	●	●	●		●	
Remove protective floor covering						●	●	●		●	
Refinish wood floors to c. 1861 appearance				●	●	●	●	●		●	●
Paint entire room, colors based on valid study; restore textural appearance of plaster	●			●	●	●	●	●		●	●
Restore furnishings, based on approved furnishings plan	●	●	●	●	●	●	●	●		●	

FURTHER WORK SUGGESTED FOR MAIN BLOCK AND SOUTH WING

CELLAR UNDER CENTRAL HALL (ROOM B06)

A. Install fire dampers in ducts passing through walls.

CELLAR UNDER STORE ROOM (ROOM B09)

A. Remove obsolete standpipe and firehose accordion.

CELLAR UNDER OFFICE AND STUDY (ROOM B10A)

A. Install porcelain light fixtures; connect to existing system.

BATH AND WATER CLOSET (ROOM 102 AND 103)

A. Have specialist examine and evaluate physical fabric for evidence of specific features of bathroom and water closet and historic evidence dating wall arrangement between room 102 and 103 in 1861.

FAMILY DINING ROOM (ROOM 109)

A. Examine plaster for any evidence of murals.

NORTH STAIR HALL (ROOM 110)

A. Reattach baseboard on west wall.

B. Remove fire extinguisher supports.

C. Remove abandoned outlet; piece baseboard.

D. Restore arches to their 1861 appearance.

CENTER HALL (ROOM 111)

A. Repair, restore, and clean existing Custis murals; identy 1861 plaster surface and search for location of additional Custis murals.

B. Monitor south arch for movement.

C. Locate and examine air duct from 1855 furnace located in north wall. Restore air duct if sufficient evidence of its 1861 appearance is found and restore vent and vent cover.

WHITE PARLOR (Room 112)

A. Reconstruct mouth of fireplaces to 1861 appearance.

B. Repair casing on 112/D3 (NE door to Center Hall).

C. Restore floor register from 1855 furnace.

D. Analyze original wall surfaces for possible location of historic lighting fixtures during preparation for next painting.

OTHER WORK SUGGESTED	Cellar Under Central Hall (B06)	Cellar under Store Room (B09)	Cellar under Office and Study (B10A)	Family Parlor (108)	Family Dining Room (109)	North Stair Hall (110)	Center Hall (111)	White Parlor (112)	South Stair Hall (113)	Store Room (114)	Mrs. R. E. Lee's Morning Room (115)	Office and Study (117)	Stair Landing (200)	Upstairs Hall (201)	Lee Girls' Dressing Room (202)	Lee Girls' Chamber (203)	Mary and Markie's Chamber (204)	Small Chamber (205)	Lee Boys' Chamber (206)	Col. and Mrs. R. E. Lee's Chamber (207)	Stairways and Landing Rooms
Install security system				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Clean mantels				●	●			●								●	●		●		
Install lighting based on lighting study				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Remove unstable canvas on walls and ceiling				●	●			●	●	●	●	●			●						
Record exposed surfaces with measured drawings and photographs, identify and date physical fabric				●	●			●	●	●	●	●			●						
Install new canvas so that treatment is reversible				●	●			●	●	●	●	●			●						
Paint entire room, colors based on valid study; if on canvas, restore textural appearance of canvas				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Install period or reproduction hardware on doors based on hardware study				●	●			●		●	●	●	●	●	●	●	●	●	●	●	●
Restore furnishings based on approved furnishings plan				●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	
Remove obsolete standpipe and firehose accordion		●								●			●								●

E. Repair baseboards around mantels.

SOUTH STAIR HALL (Room 113)

A. Resurface west wall to 1861 finish.

B. Remove abandoned receptacle; piece baseboard.

STORE ROOM (ROOM 114)

A. Remove c. 1940 closet (Room 114A). Record all physical evidence to establish features associated with loggia and flanker.

B. Research to expose physical fabric to date construction of loggia and construction of flanker.

C. Paint study should be implemented during restoration before destruction of paint evidence and loss of opportunity dating features.

D. Restore 1861 physical features.

MRS. R.E. LEE'S MORNING ROOM (ROOM 115)

A. Install period marble mantel similar to mantels in Room 112. Check and record physical evidence revealed in this work (wall paper was found behind mantel in 1930s).

B. Restore hearth stone to its original size.

C. Complete study of historic period shutters and shutter boxes. Construct and install interior shutters in existing shutter boxes using period or reproduction hardware.

OFFICE AND STUDY (ROOM 117)

A. Complete shutter study. Construct and install interior shutters and shutter boxes with period or reproduction hardware.

B. Make stove removable for summer season and supply period or reproduction stovepipe hole cover.

STAIRWAYS

A. Reattach moldings on main and servants' stairs.

B. Maintain loading control to recommended levels.

C. Monitor cracks.

UPSTAIRS HALL (ROOM 201)

A. Monitor ceiling; preserve in place if necessary.

B. Research and restore physical evidence of 1855 furnace system visible in 1861. Record all physical evidence revealed in work.

C. Verify engineering studies and loading capacity.

SMALL CHAMBER (ROOM 205)

A. Replace missing shelf.

B. Record all physical evidence revealed during work. Datable paint sequences may be present; plaster over opening.

LEE BOYS' CHAMBER (ROOM 206)

A. Install new baseboard. Match existing baseboard; use historic material if possible.

B. Bevel baseboard against mantel legs as in Room 203 treatment.

C. Remove door 206/D2 to Lee Boys' Chamber which was not in place in 1861. It was walled up by Mrs. Lee in 1857. Plaster over opening. Record all physical evidence.

COLONEL AND MRS. R.E. LEE'S CHAMBER (ROOM 207)

A. Install period mantel similar to mantels in rooms 203, 204, and 206.

B. Establish loading capacity of truss.

C. Restore stove pipe hole for heating stove and restore period c. 1855 stove and stove pipe.

GARRET STAIRS

A. Remove fire extinguisher hooks.

B. Reattach moldings and replace tread.

C. Stabilize bannister.

D. Check ceiling for cause of paint peeling.

GARRET STAIR LANDING ROOM (ROOM 300)

A. Repair 300/D1; replace lock stile and hinges.

MAIN BLOCK GARRET (ROOM 301)

A. Monitor roof system.

NORTH AND SOUTH WING GARRET AND NORTH AND SOUTH WING LOGGIA GARRET

A. Install light fixtures; all wiring to be in conduit.

EXTERIOR

A. Continue to monitor moisture level of basement walls.

B. Use type #2 Portland cement for stucco resurfacing.

C. Restore stairway to 101/D1 to its 1861 appearance.

D. Verify stairway to 111/D1 is the historic configuration.

E. Install shutters on 111/W1, 111/D1, and 111/W2. Restore their 1861 color and texture.

F. Monitor pavers on portico floor and replace when wear requires with reproduction pavers which closely match historic pavers c. 1851.

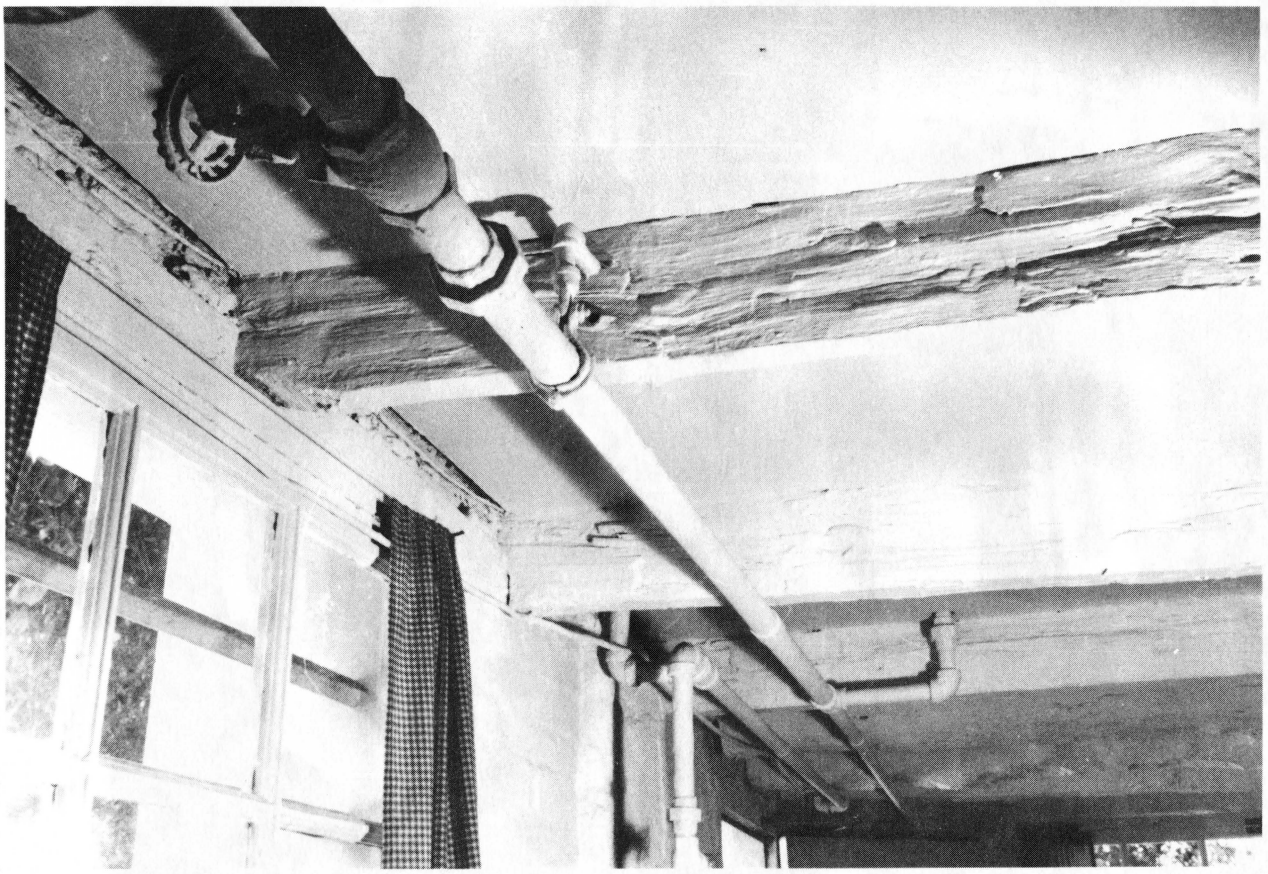
G. Remove flagpole in front of portico; negotiate with cemetery for proper location.

H. Restore all exterior shutters to 1861 paint color and texture and rehang with original hardware.

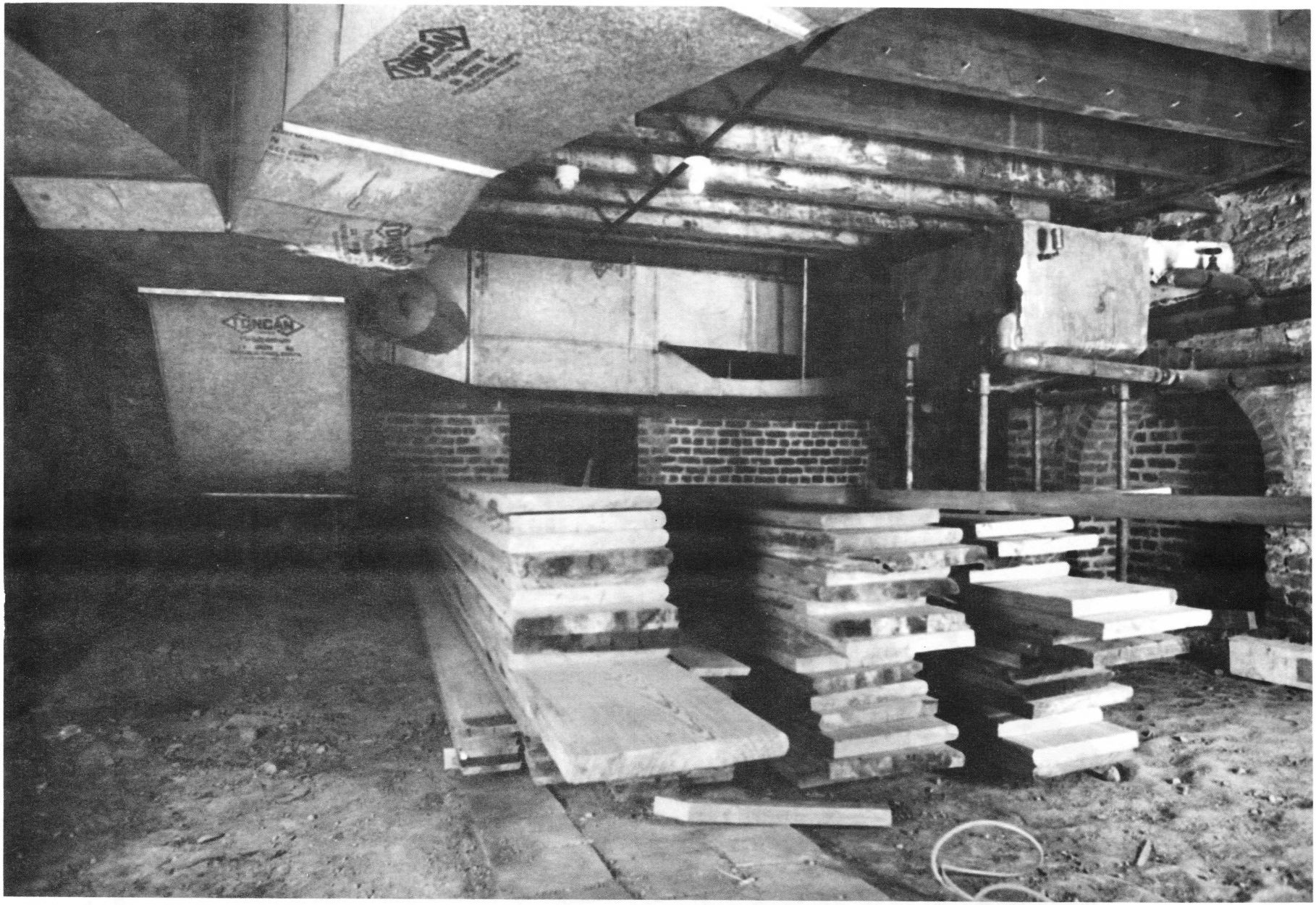
I. Replace all damaged window glass with glass cut to size from 19th century glass stored in site collection for this purpose. Retain in study collection the original glass that is removed.

J. Reglaze all windows and install ultraviolet filtering film.

VI. PHOTOGRAPHY



Radiator pipes at ceiling in Cellar stairway hall (room B01) 1
(removed).



Repairs and materials in cellar under morning room and office (Room B10.) 2



Radiant heat floor under brick floor in the cellar stairway hall (Room B01).

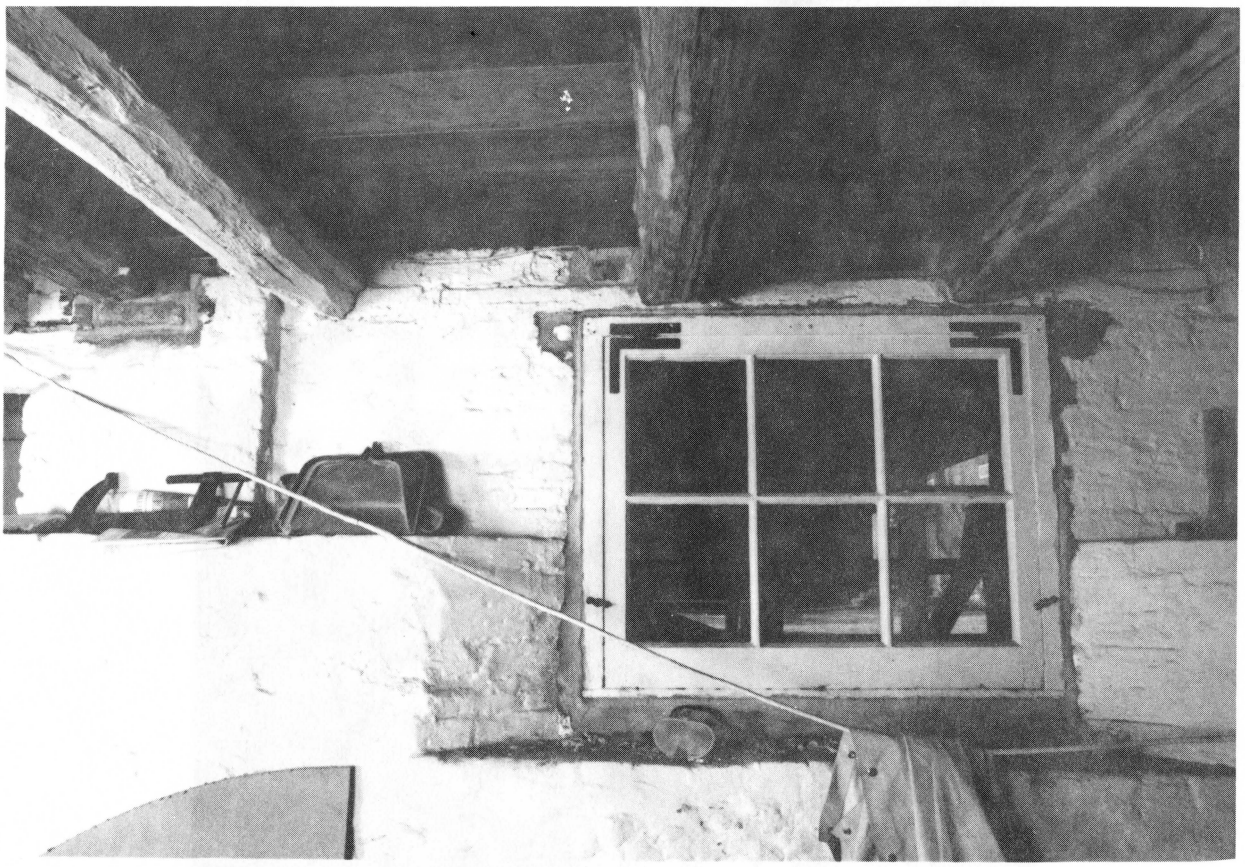
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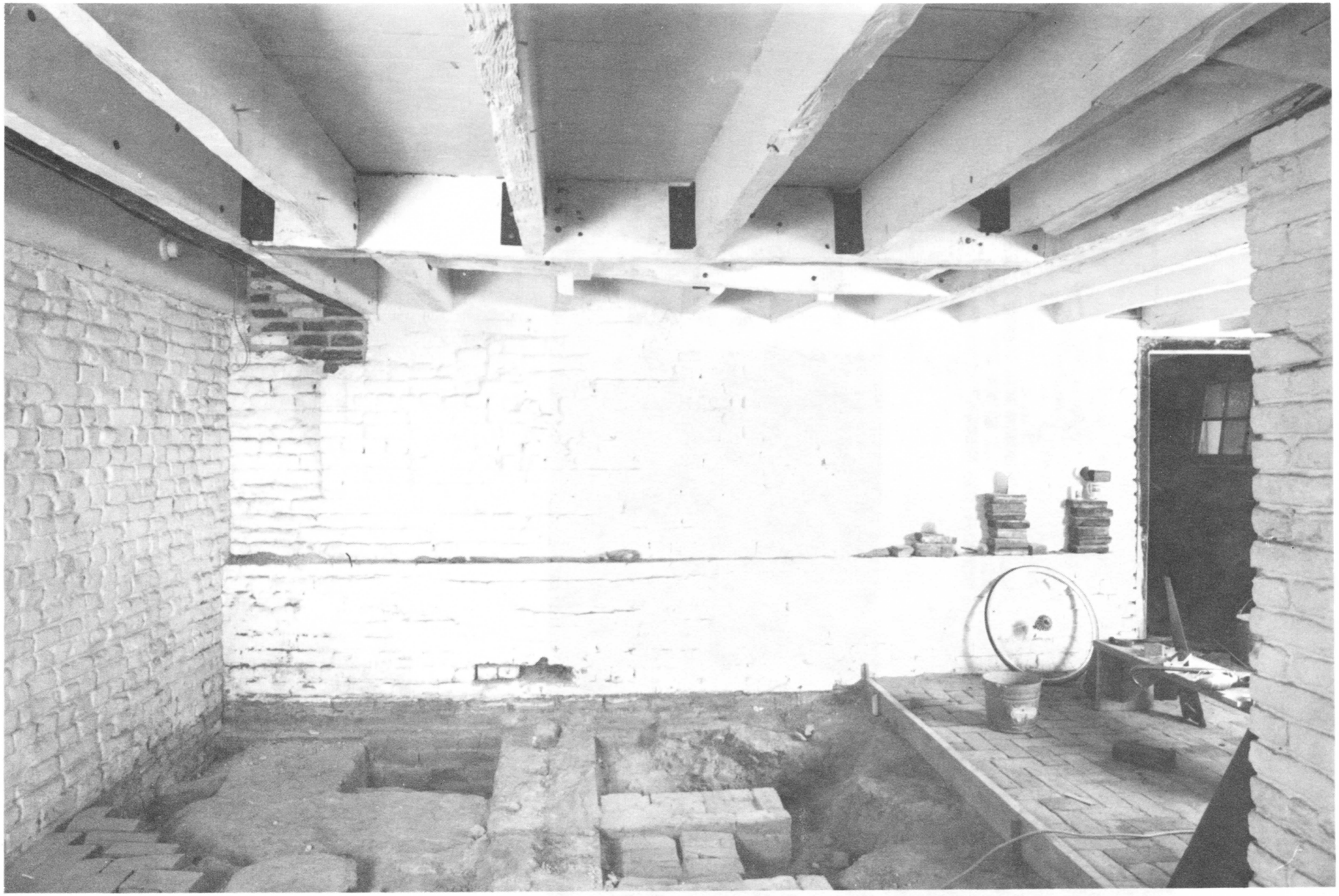
Excavations in southwest corner of the winter kitchen (room B02.) 4



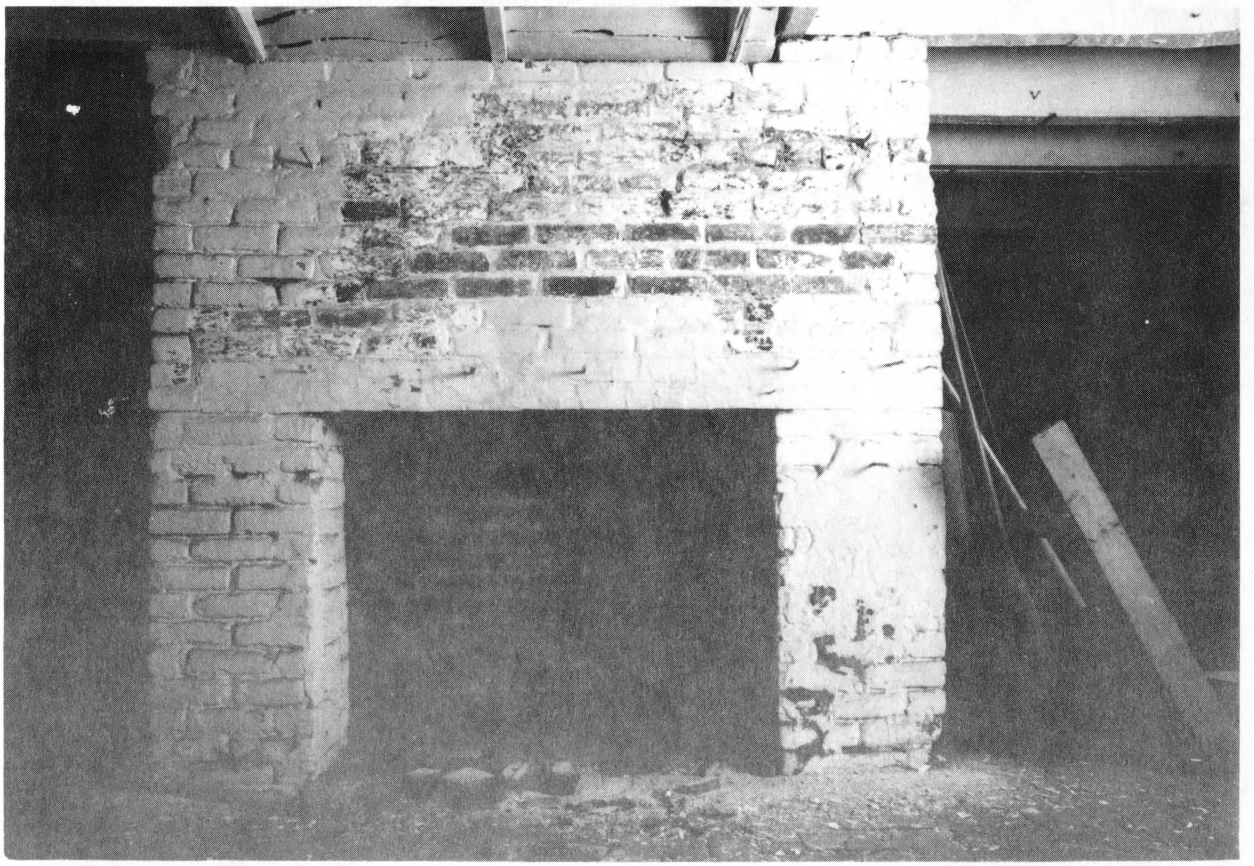
Excavations in south side of the winter kitchen (Room B02). 5



Window repairs and additional floor joists in the cellar stairway hall (Room B01.) 6



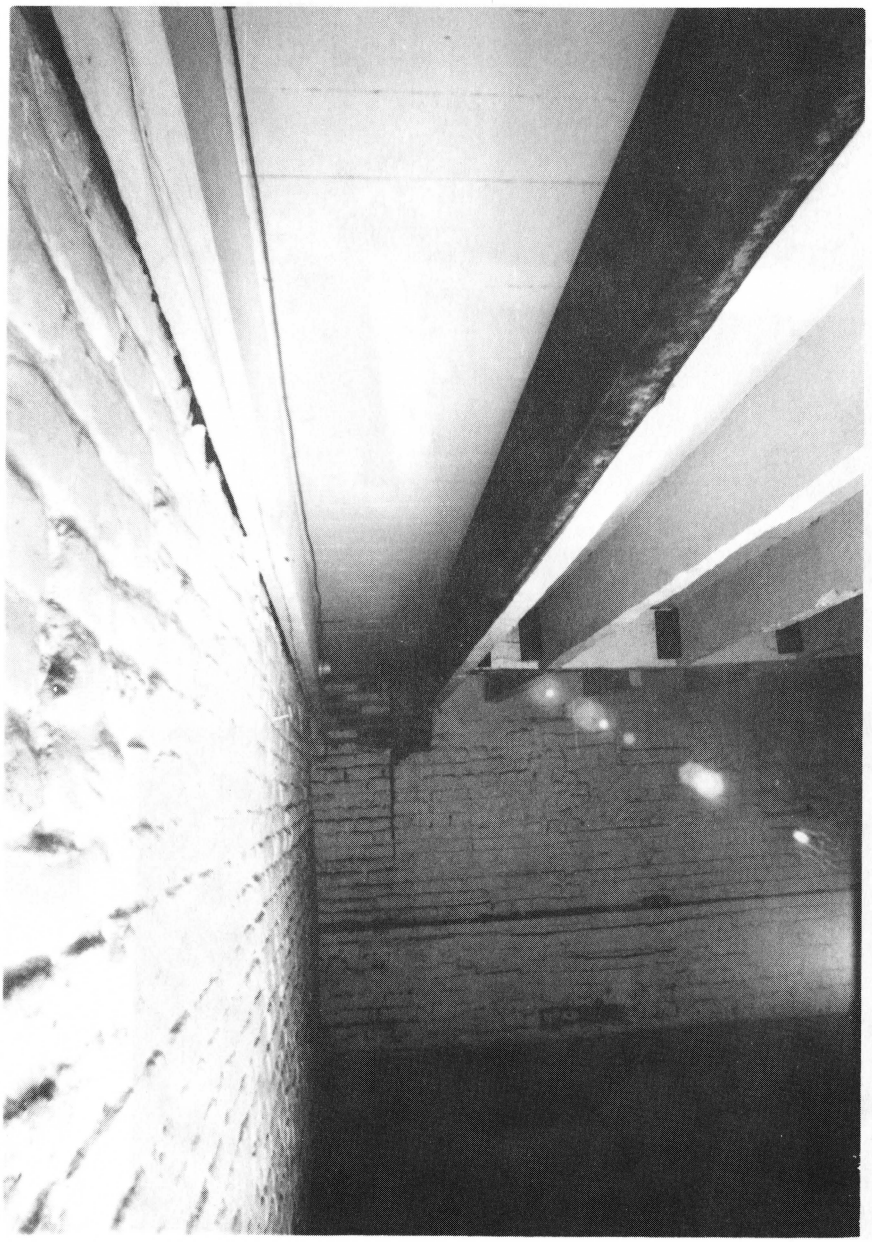
Excavations and floor joist repairs in the winter kitchen (Room B02). 7



Chimney breast in the winter kitchen (room B02). 8



Repairs to floor joists in the winter kitchen (room BO2) 9



Repairs to floor joists in the winter kitchen (room B02) 10



Repairs to header above B03/D1. 11



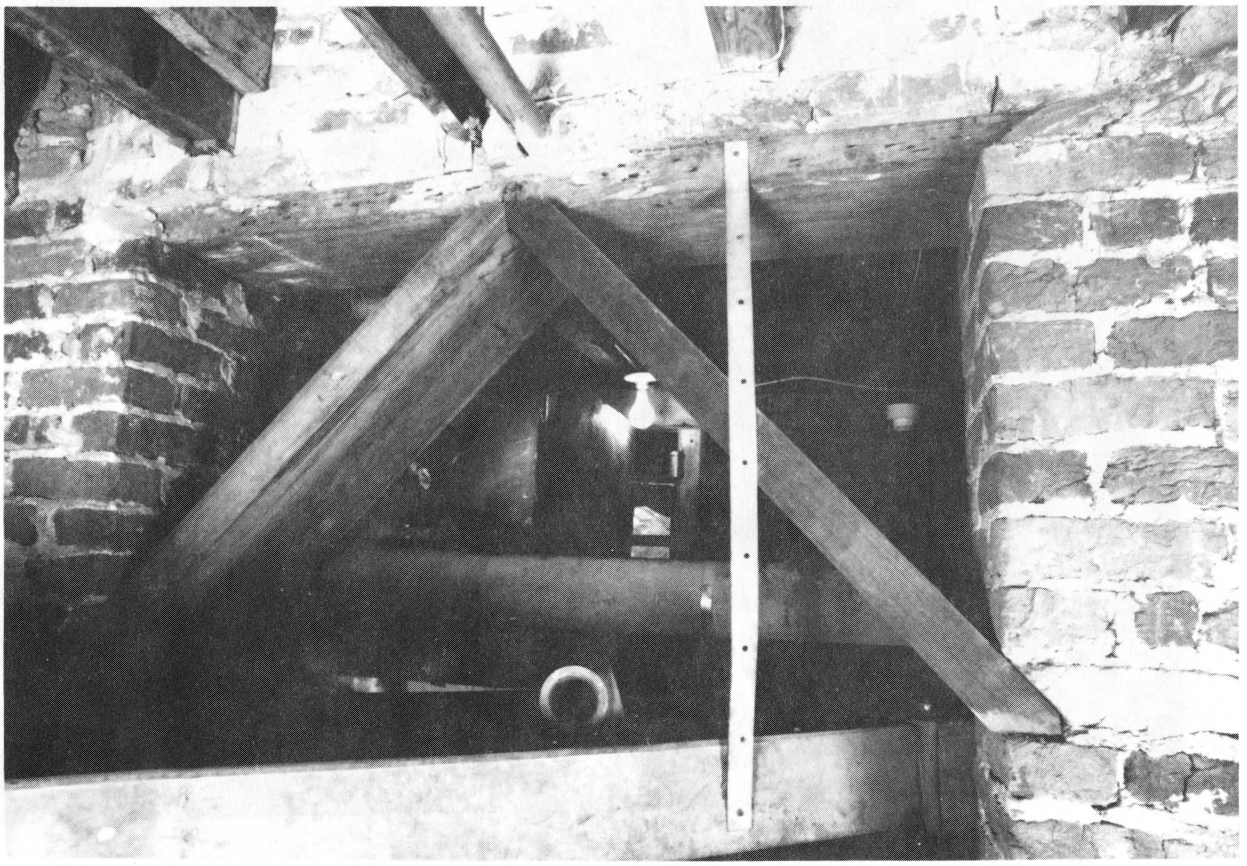
Closed chimney flue in southwest corner of the wine cellar (room BO3). 12



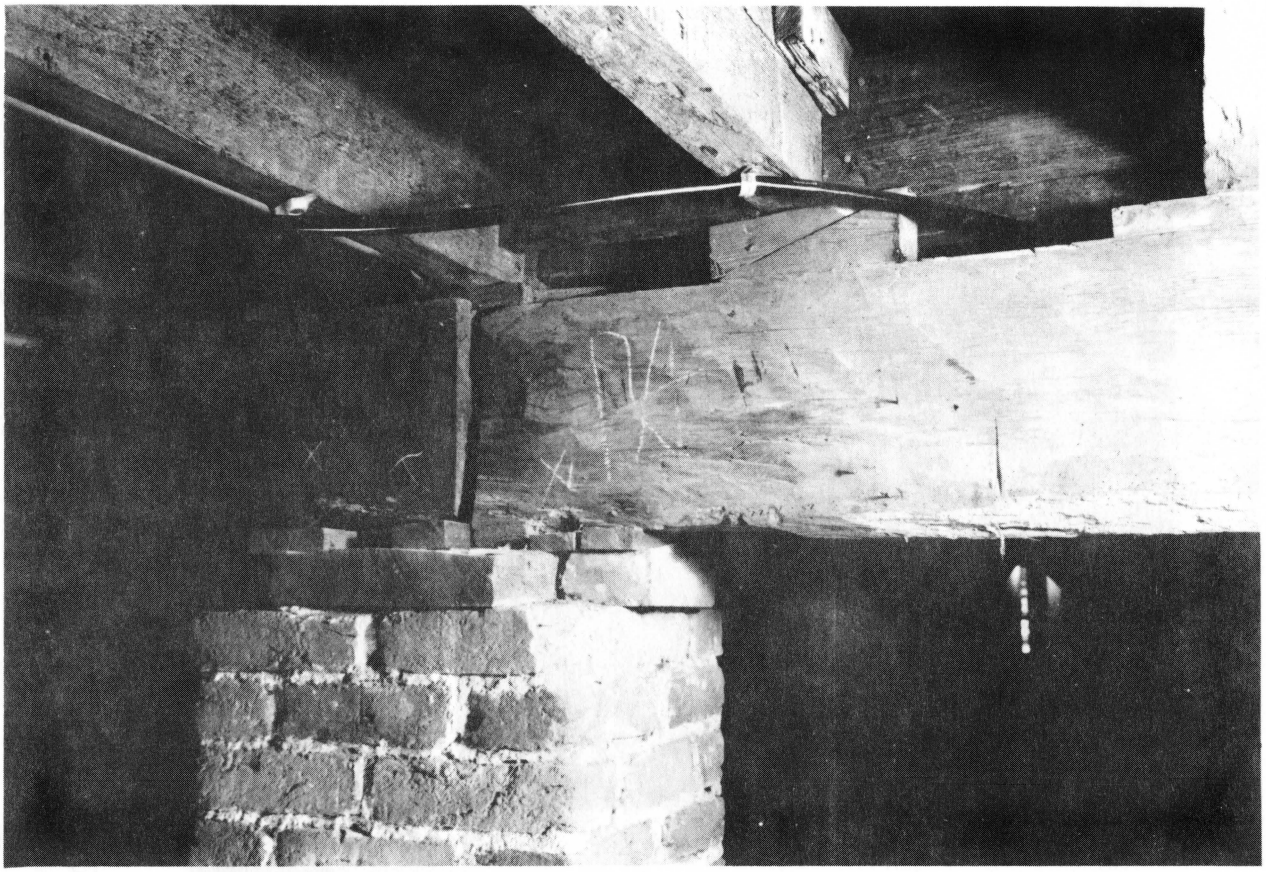
Looking up at floor joists of the center hall (room 111) showing notches defining location of early hot air heating duct. 13



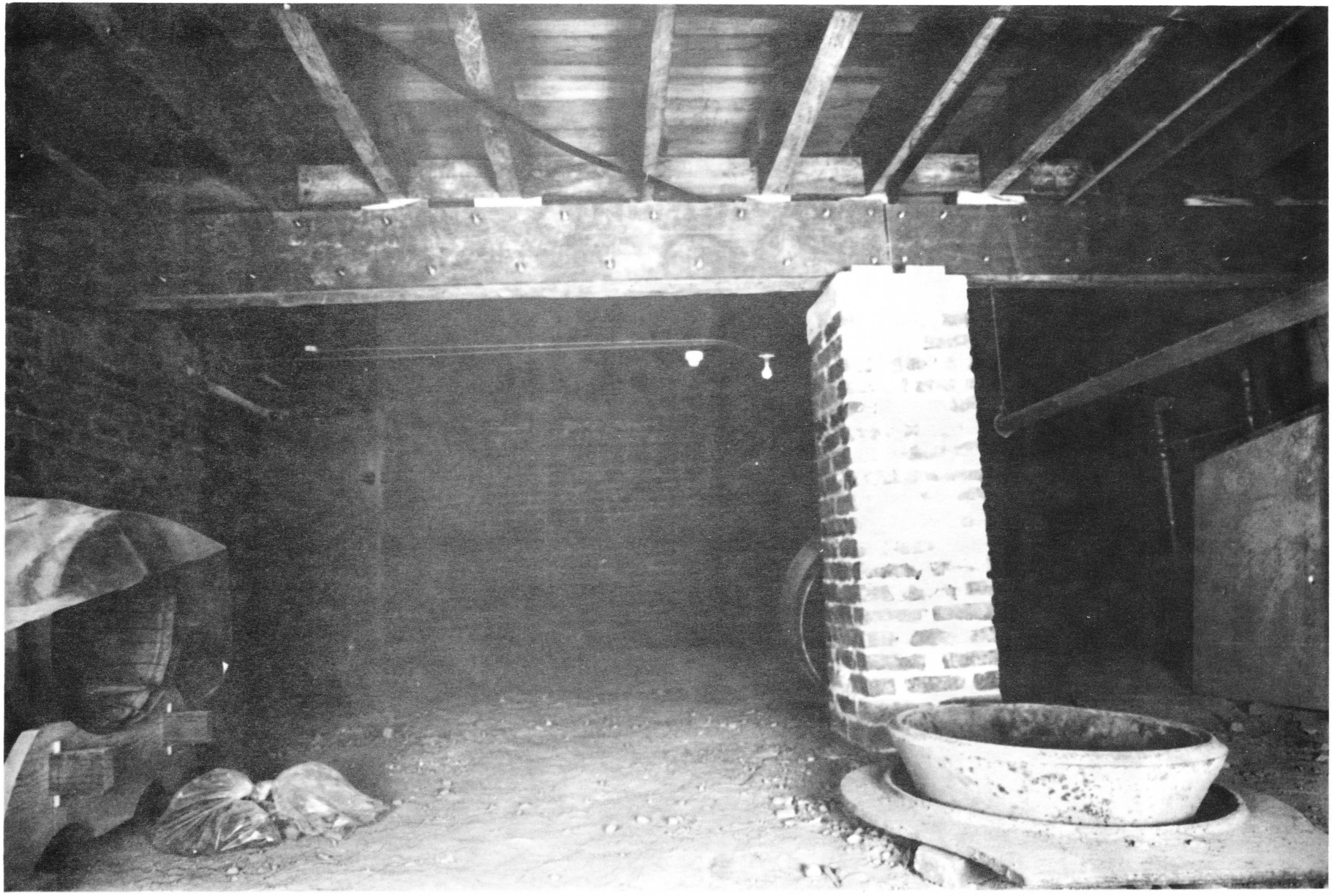
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"Before" condition at pier in the cellar under the white parlor and the family parlor and dining room (rooms B08 and B05). 16



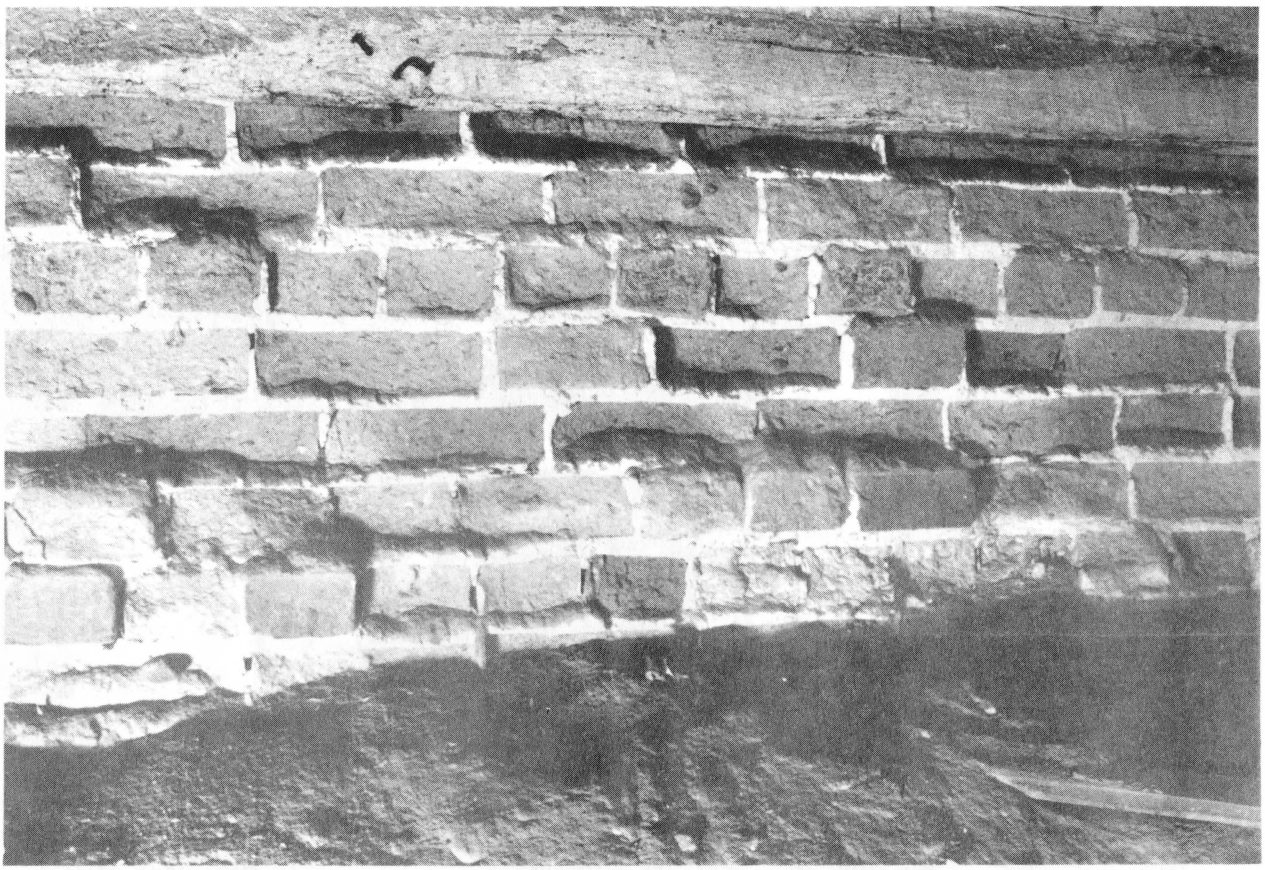
"After" condition at pier in the cellar under the white parlor and the family parlor and dining room 17 (rooms B08 and B05) showing concrete cap and 3/8" steel plate.



New firedoor at B10/D1. 18



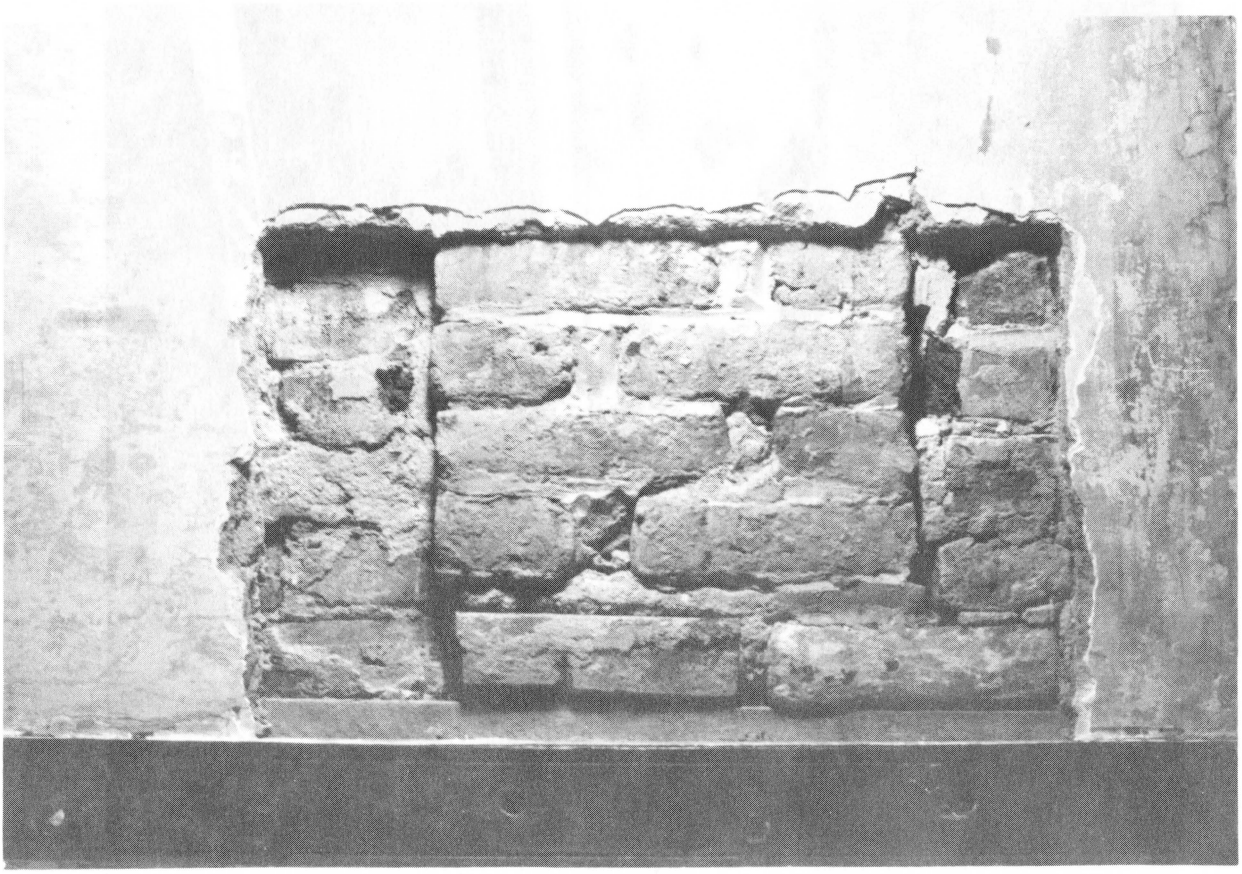
Triple 2' x 12' on new piers at B10/D2 19



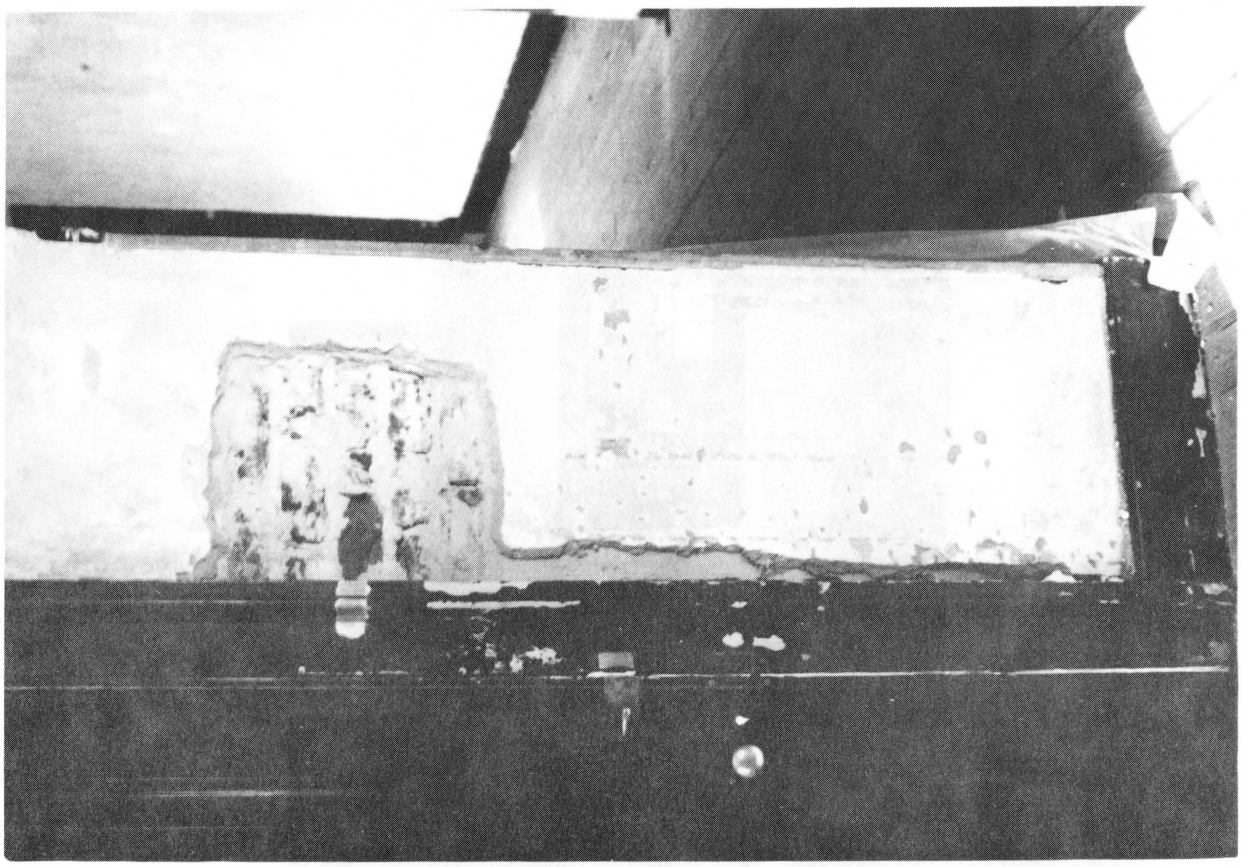
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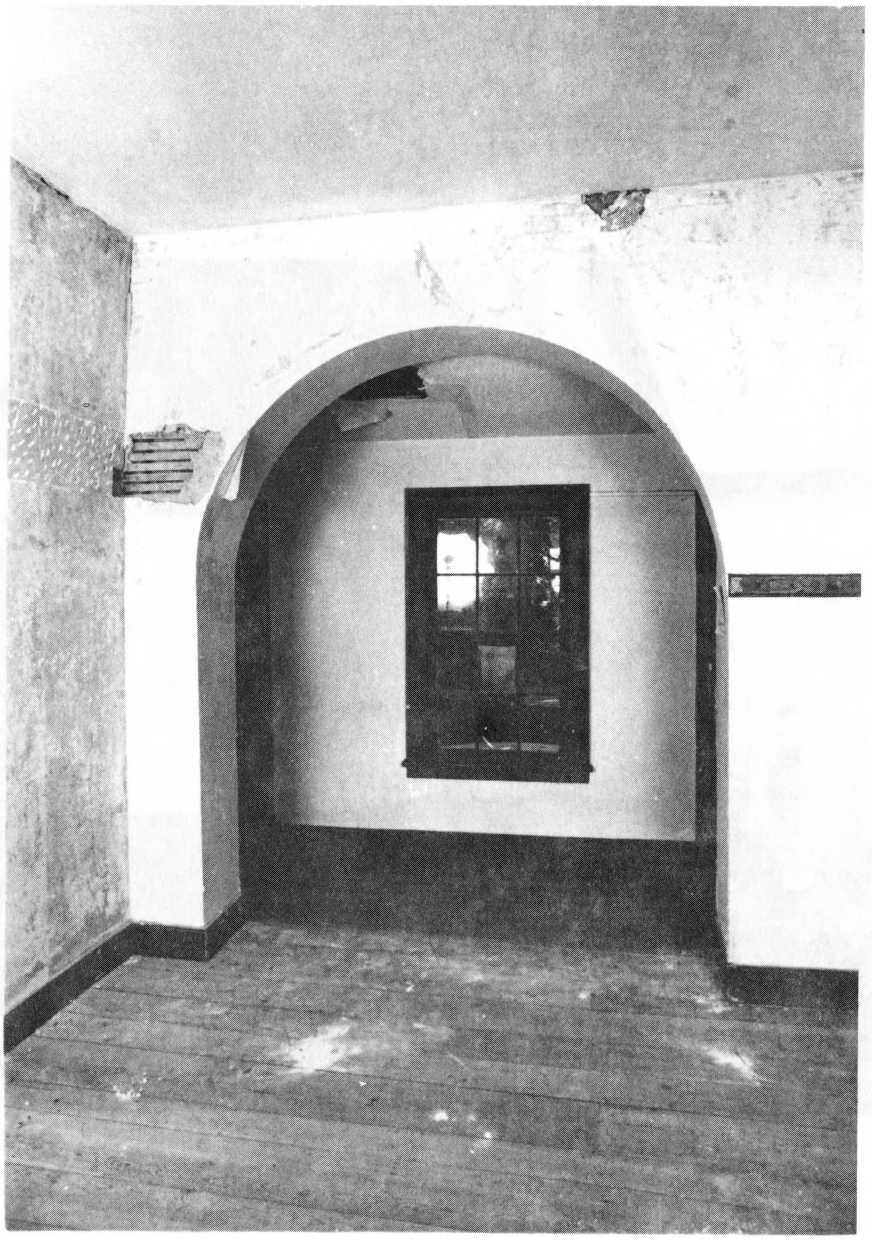
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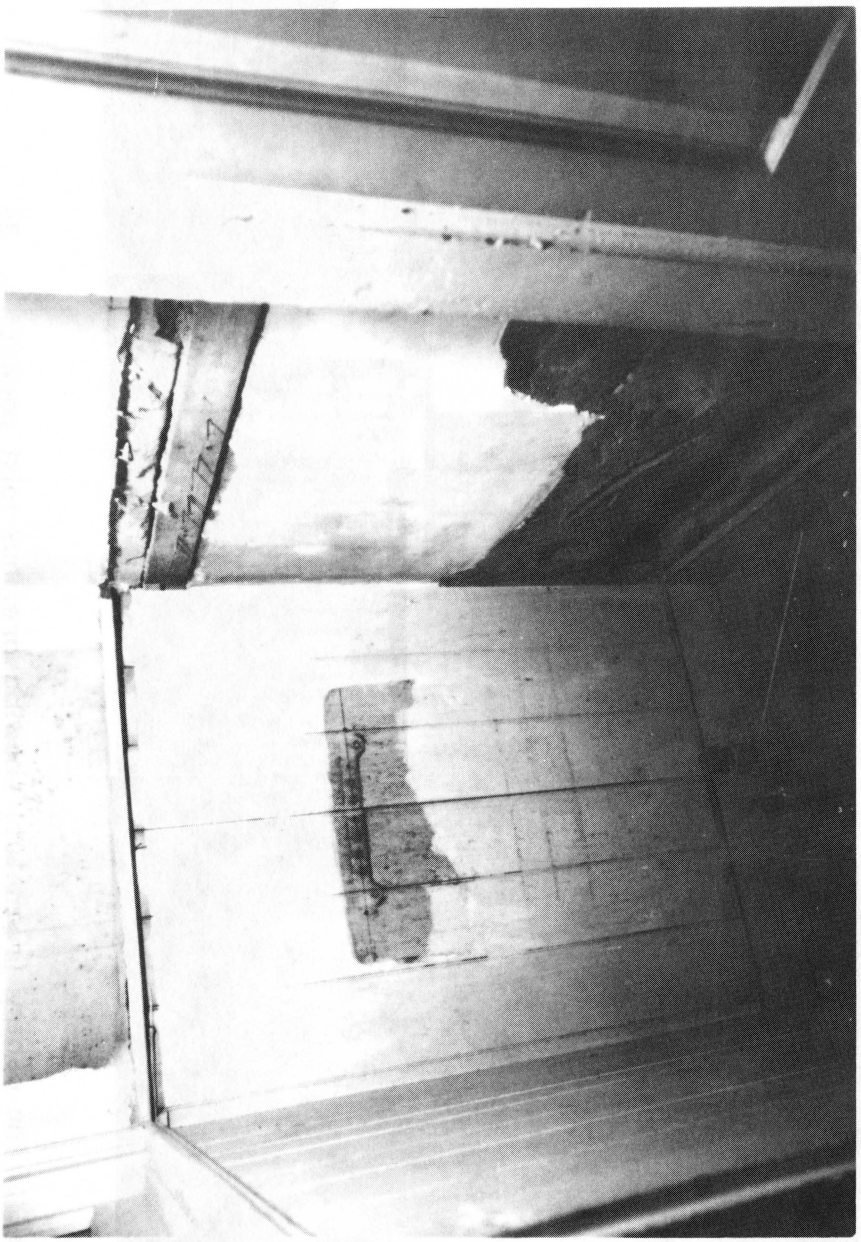
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West wall of the school and sewing room. 28



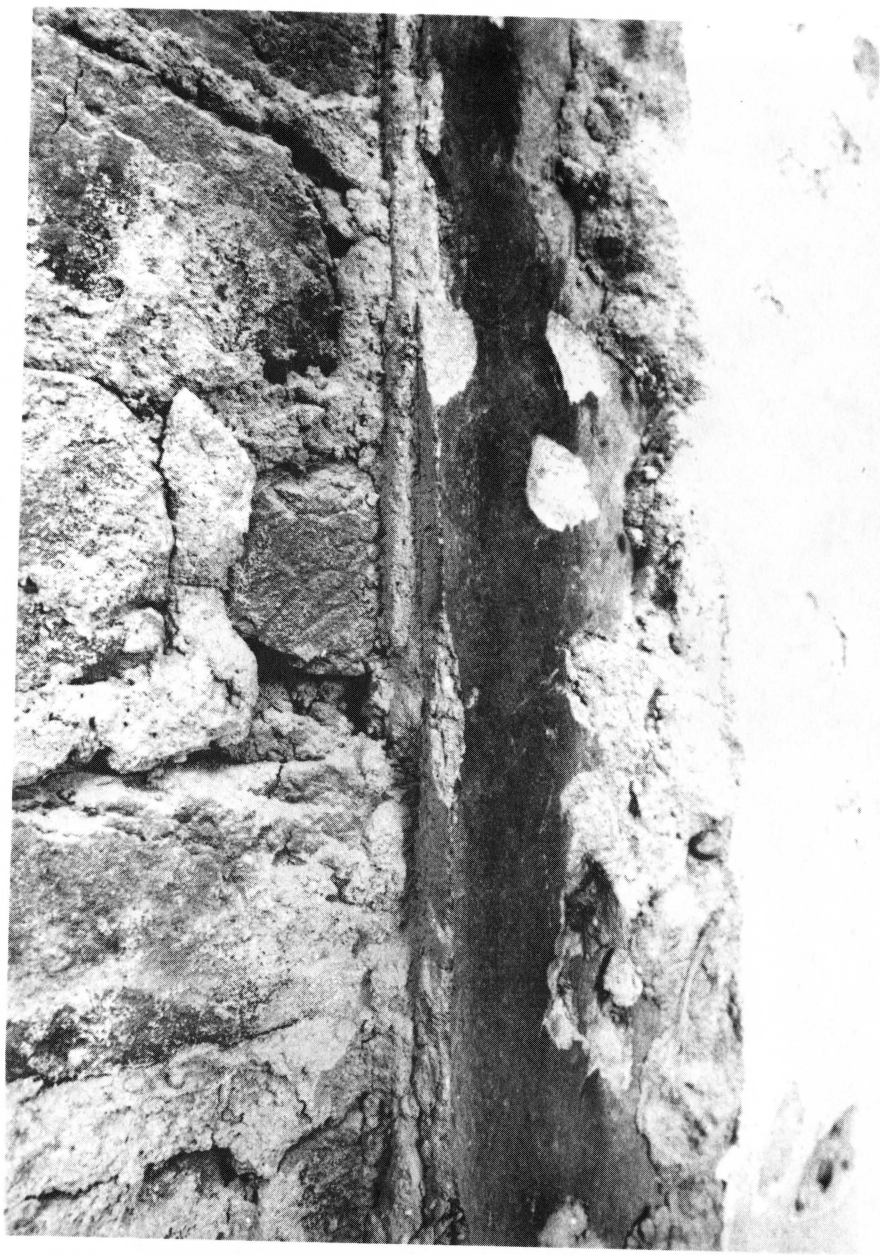
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Chimney breast at west wall of inner hall (north wing) (room 105) showing modified flue and "washer" of loggia ceiling rafter tie-back system. 31



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Chimney breast at west wall of inner hall (north wing) (room 105) showing ghost of earlier central brick bearing wall and loggia ceiling rafter tie-back system. 34



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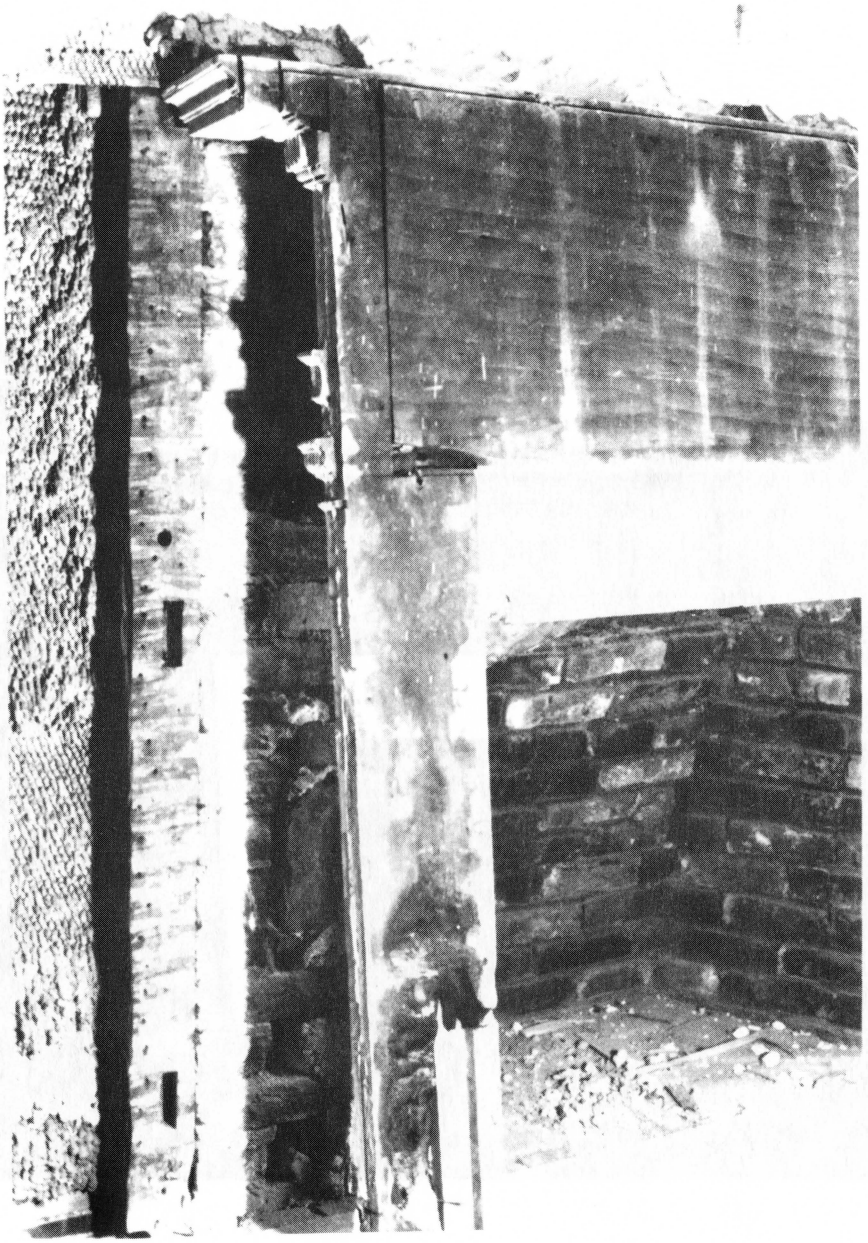
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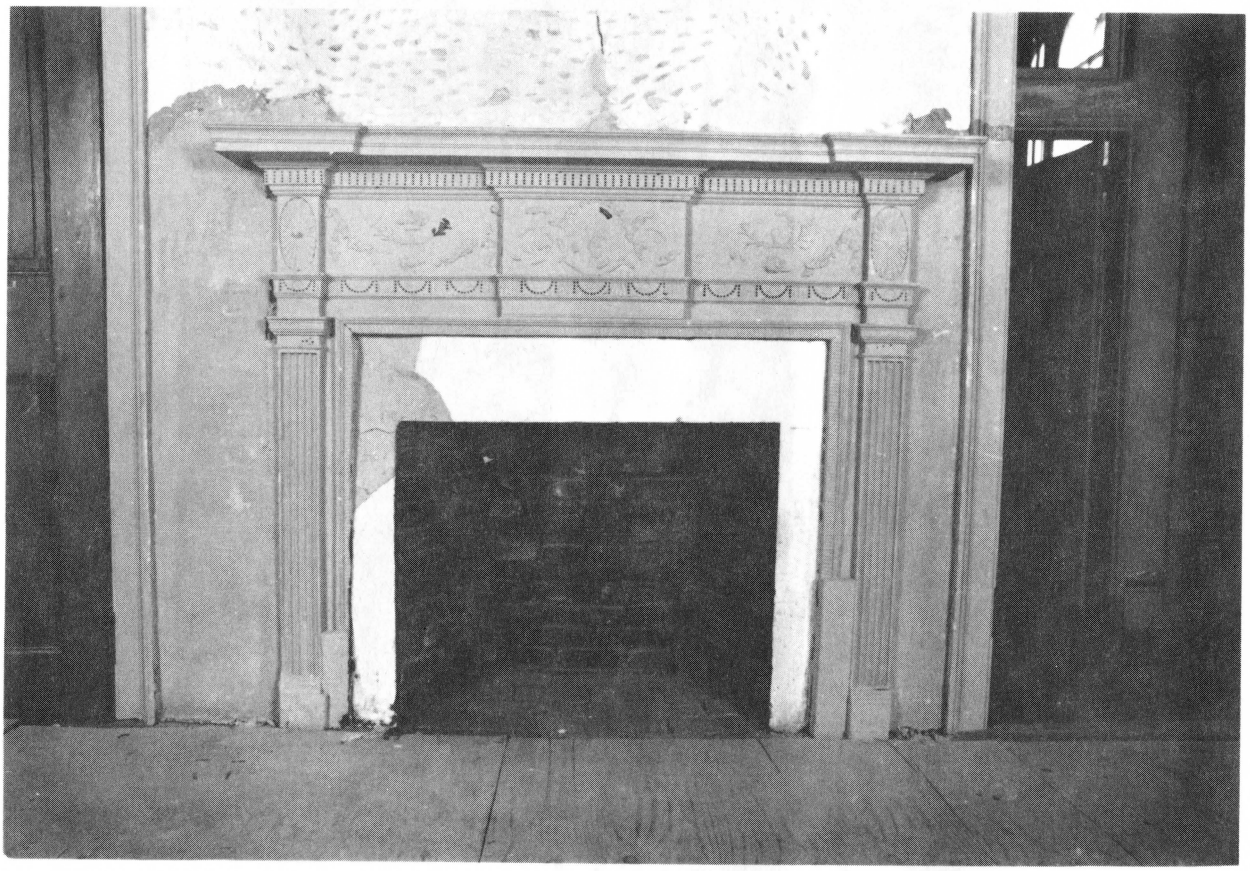
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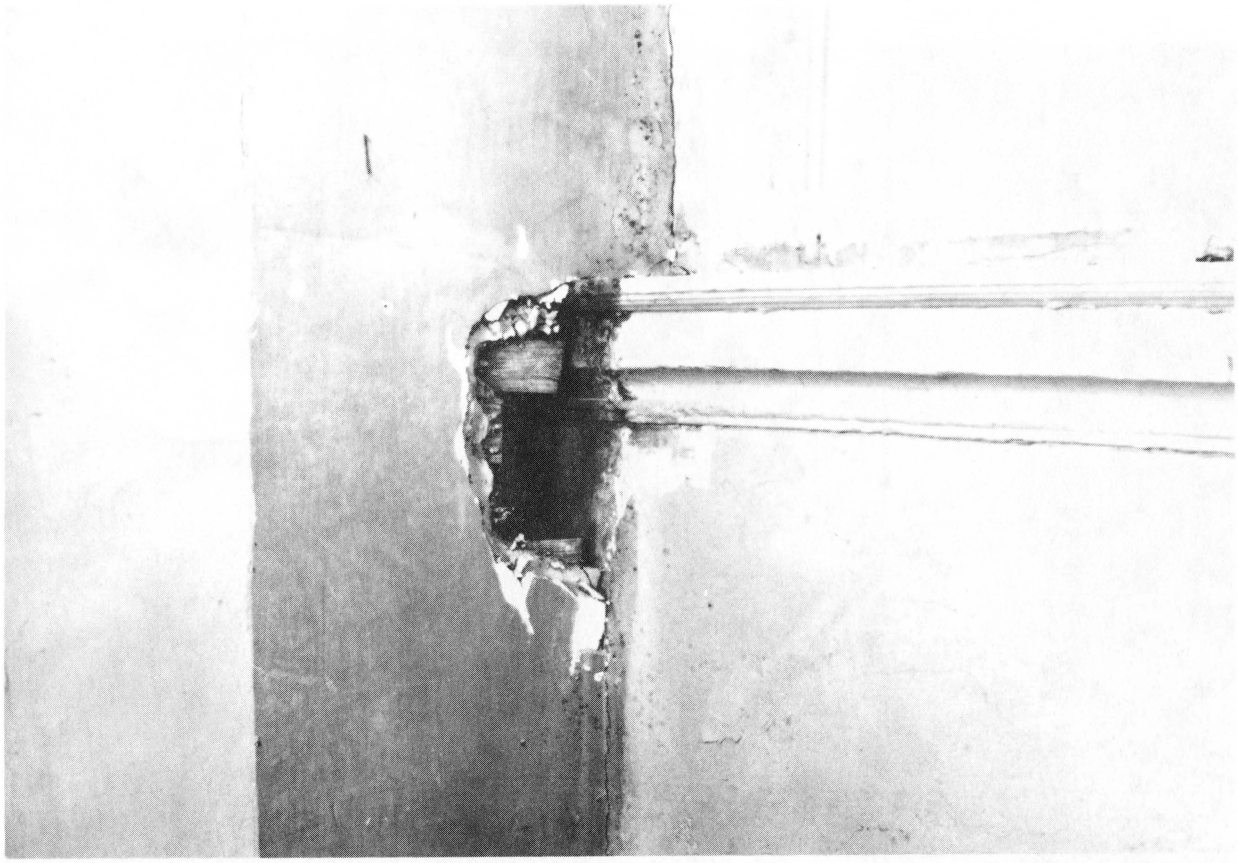
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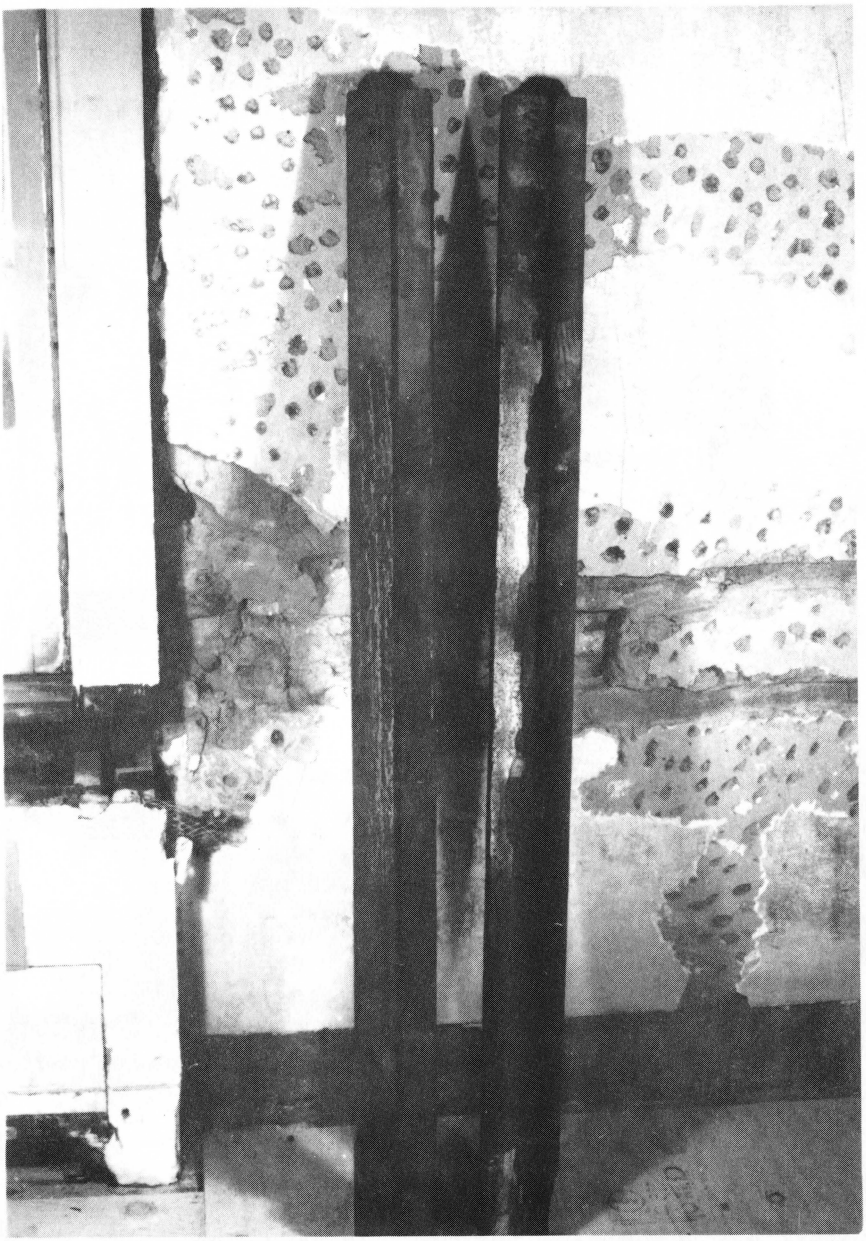
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Chairrail penetrating partition at northeast corner of Custis chamber 44 (room 106.)



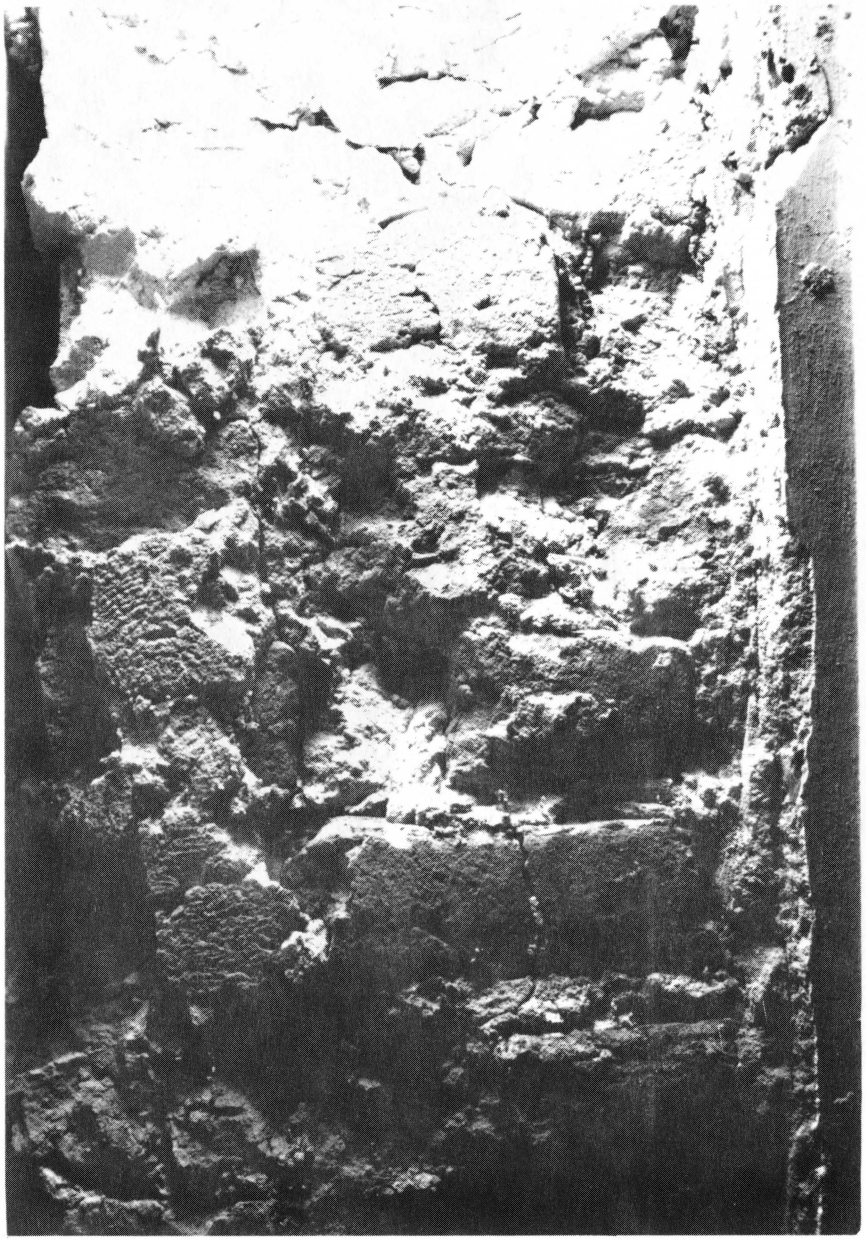
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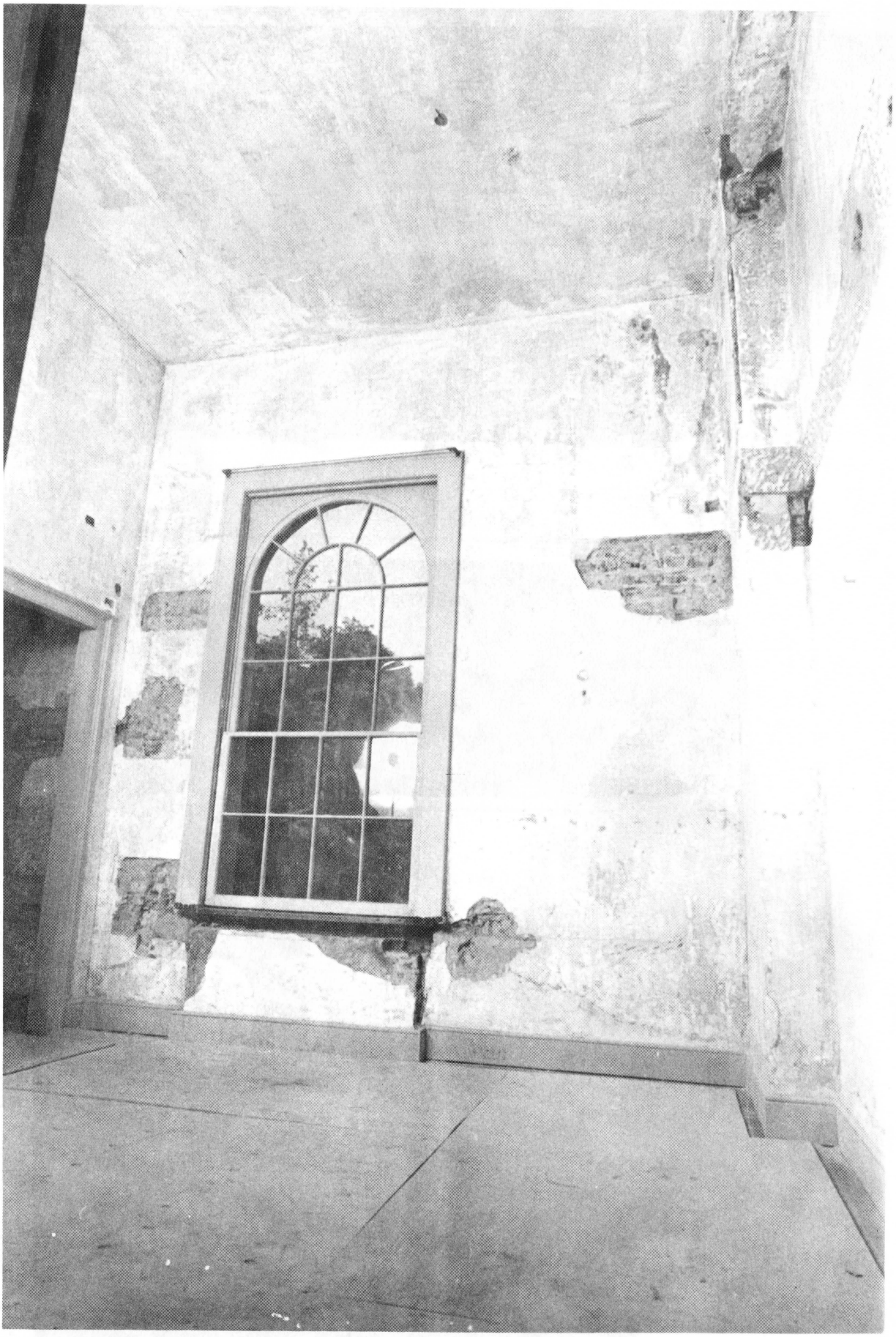
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East wall of Custis Chamber (room 106), north of 106/W1. 49



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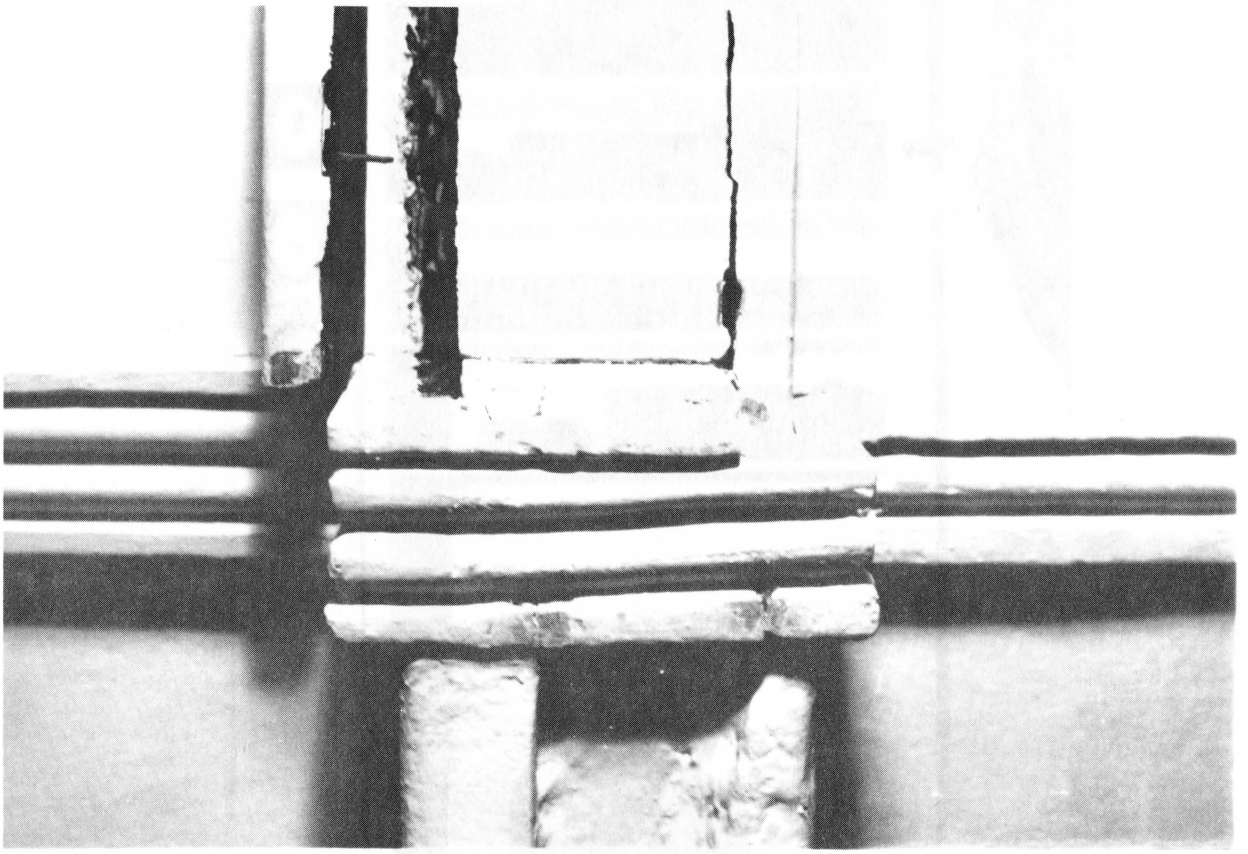


East wall of Custis guest chamber (room 107).

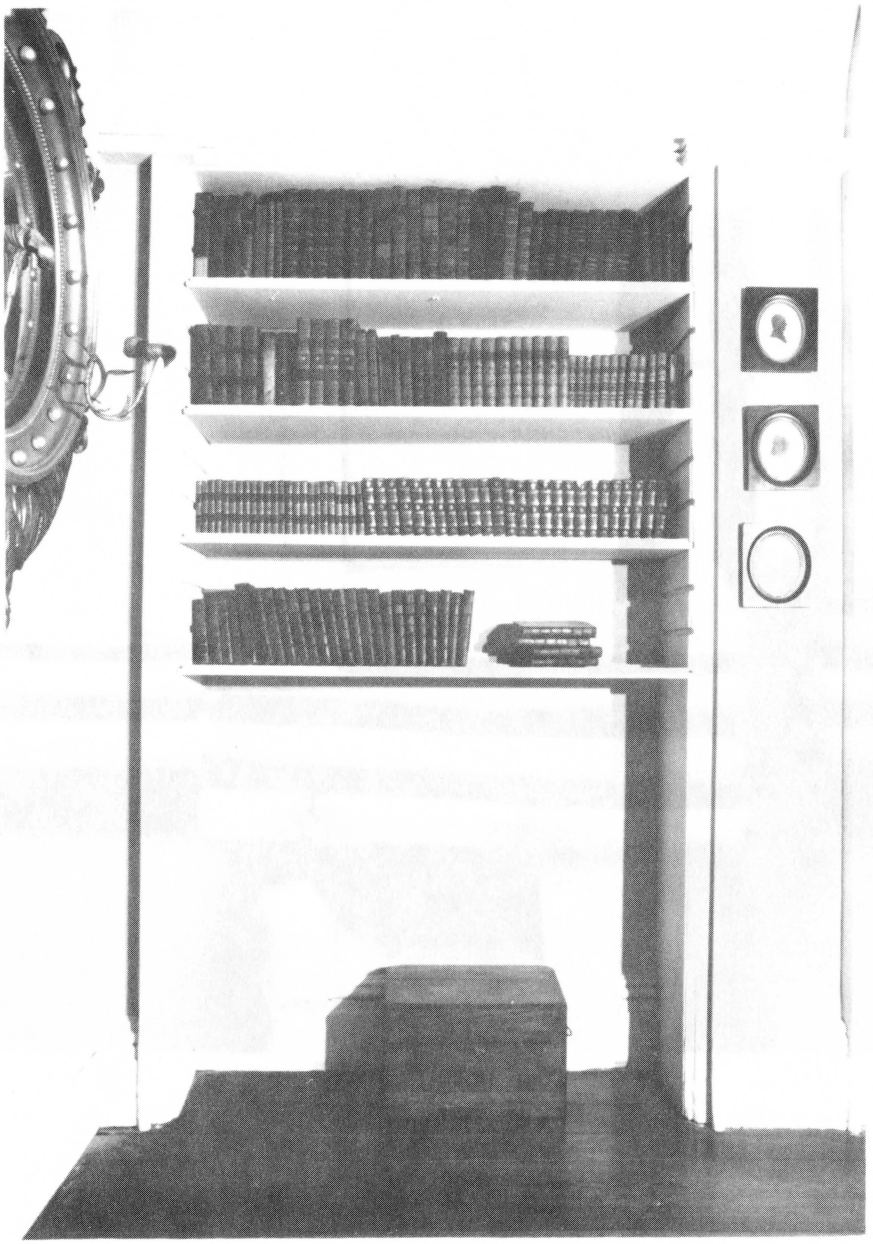
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West wall of family parlor (room 108) showing once partitioned arches.



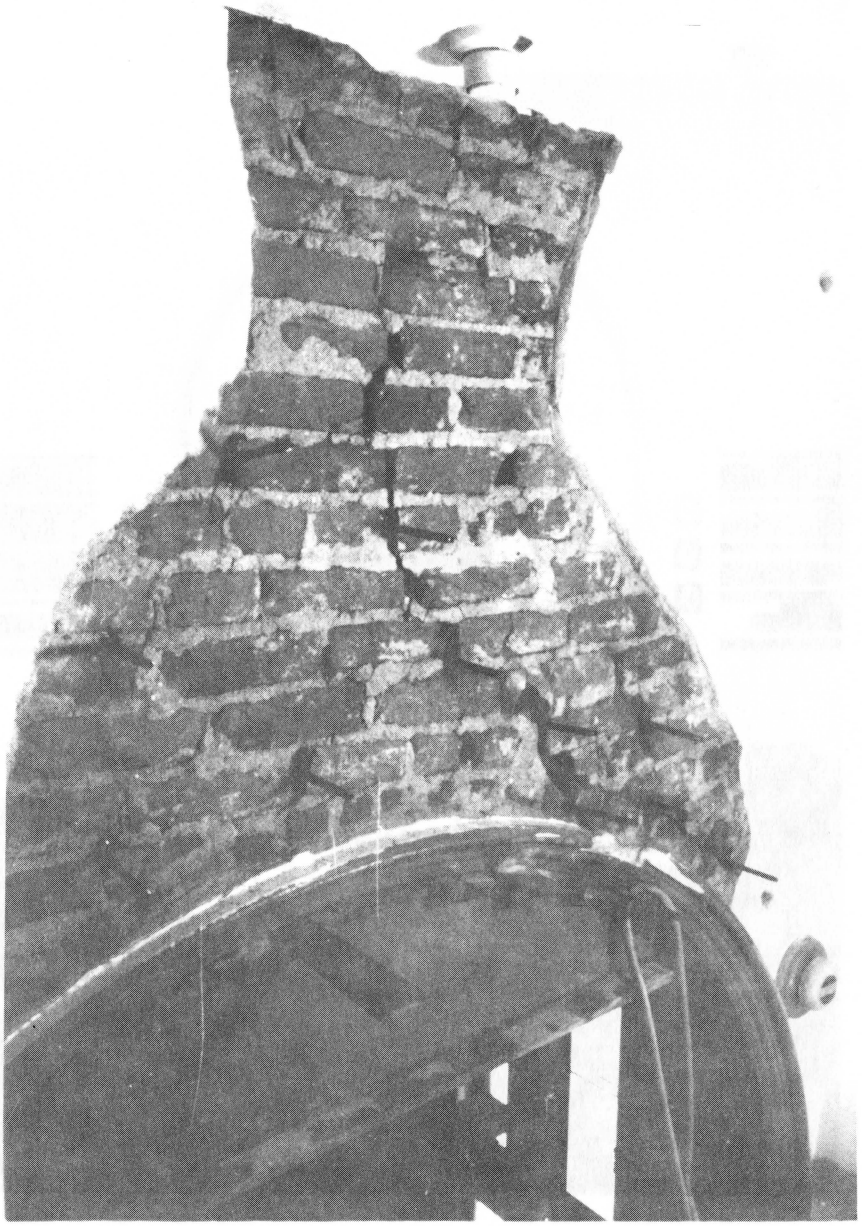
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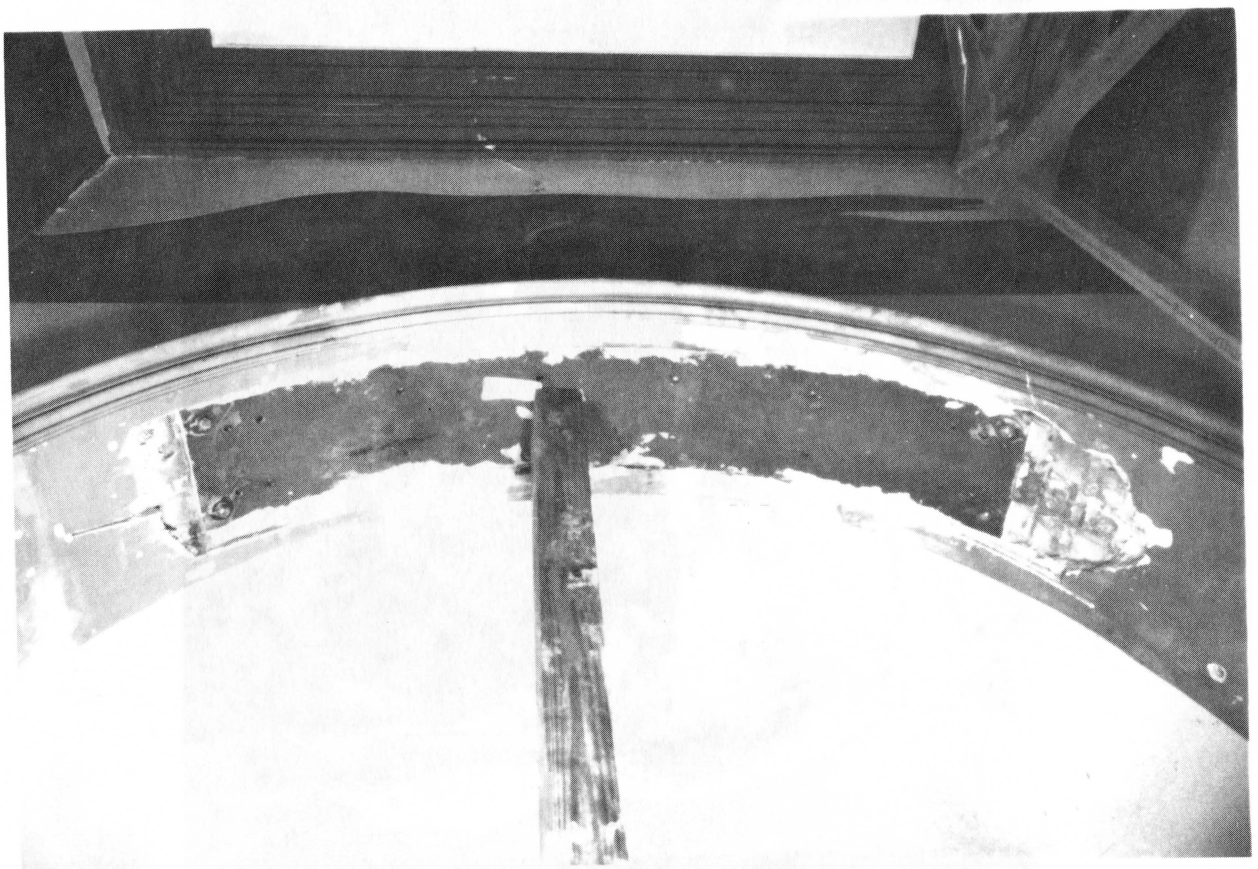
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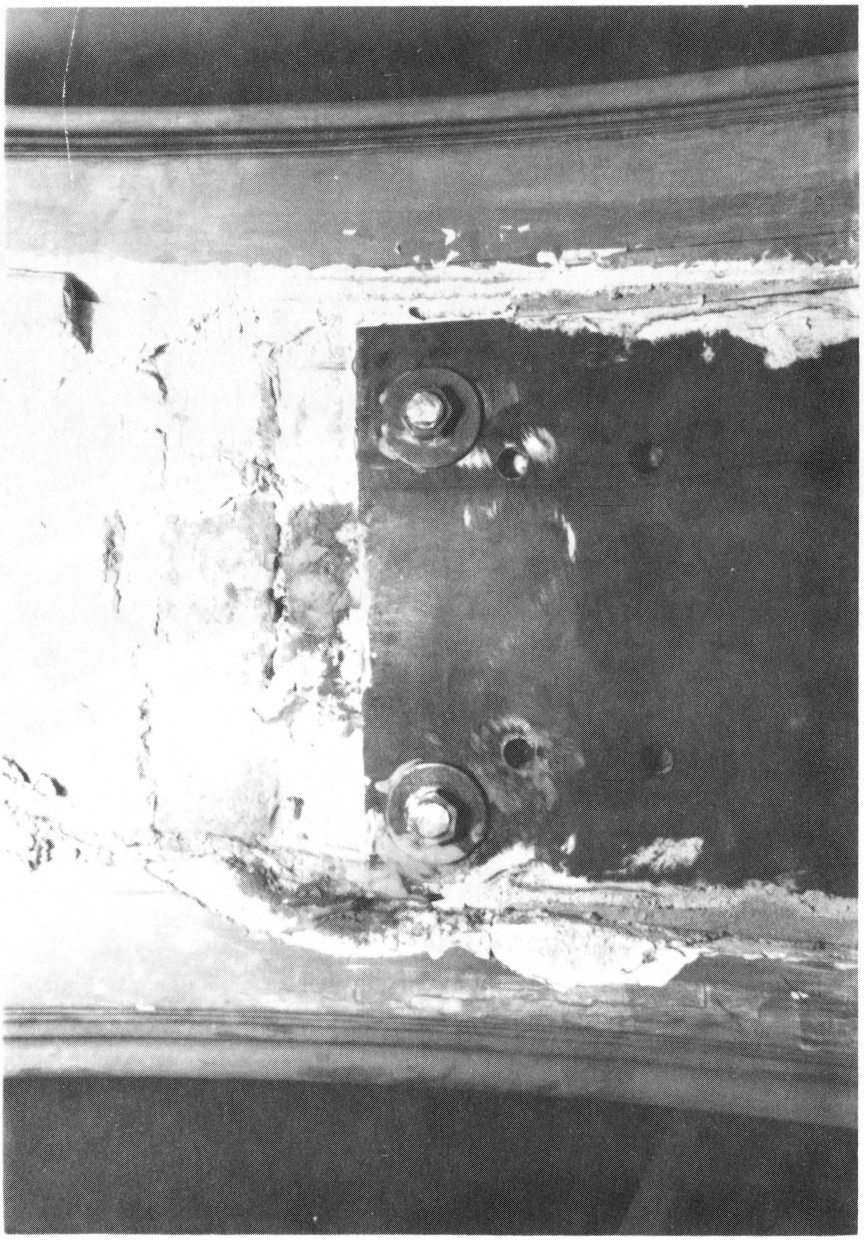
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North side of north arch in center hall (room 111) showing extent of 56 failure and grout tubes inserted for consolidation injection.



Underside of failed arch in center hall showing steel support in place in center hall after grouting completed. 57



Closeup of steel arch support in center hall. 58



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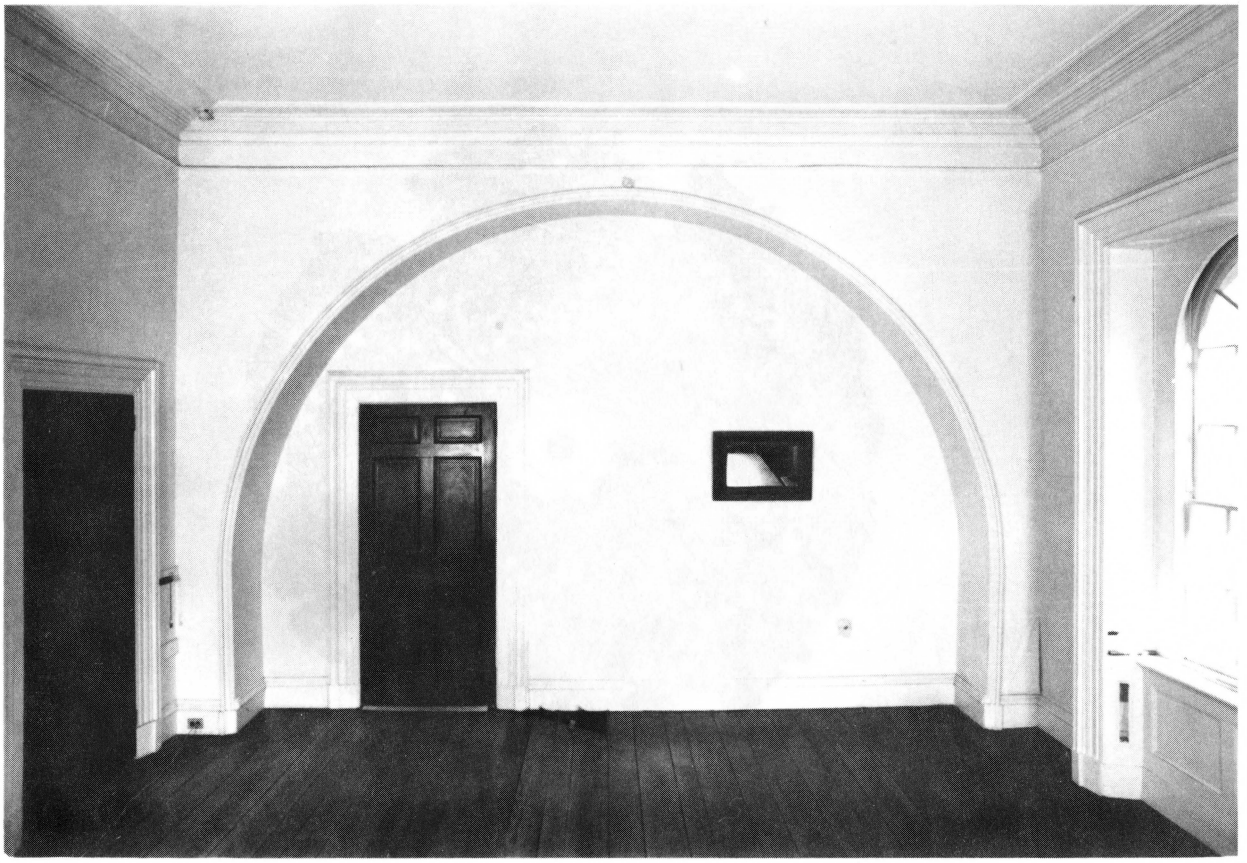
South wall of white parlor (room 112). 60



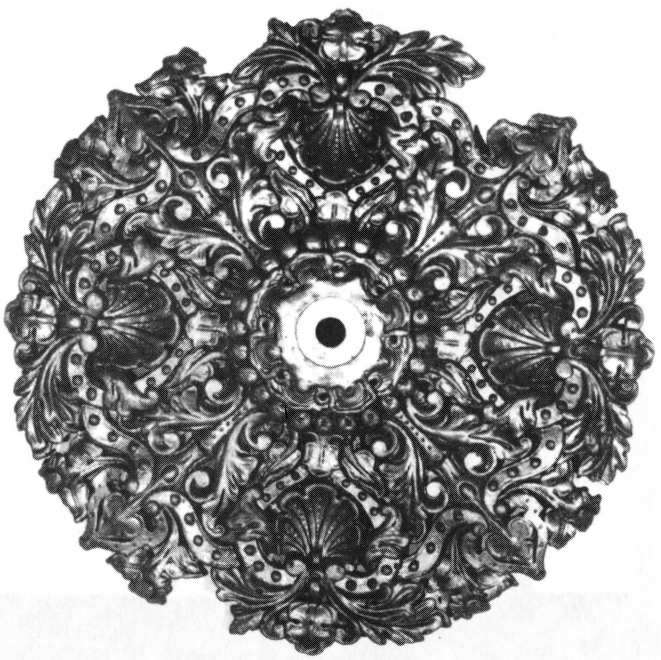
One of the identical Victorian mantels to the east and west of 115/D1 on the south wall of white parlor (room 112). 61



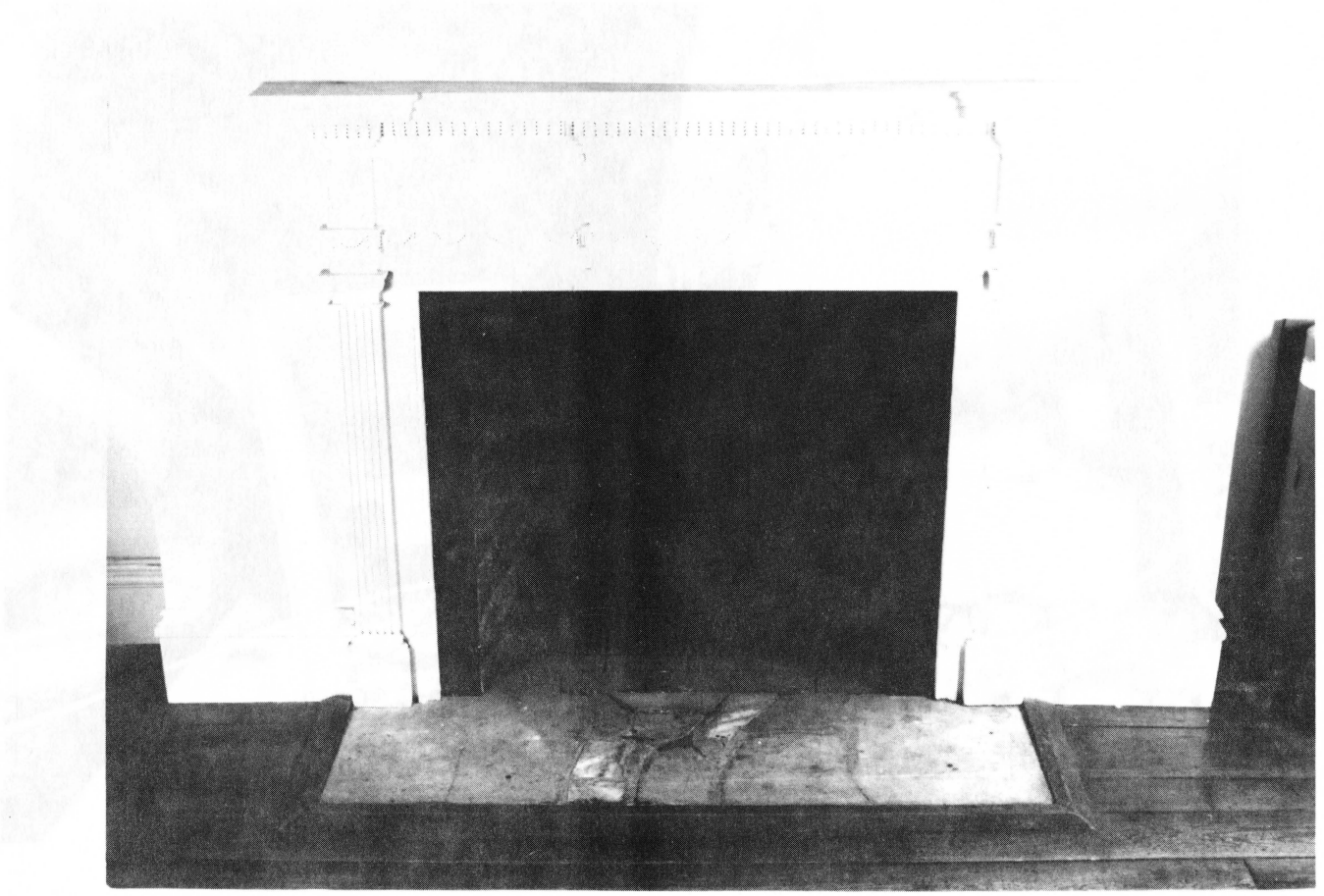
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North wall of Mrs. R. E. Lee's morning room (room 115) showing false arch. 63



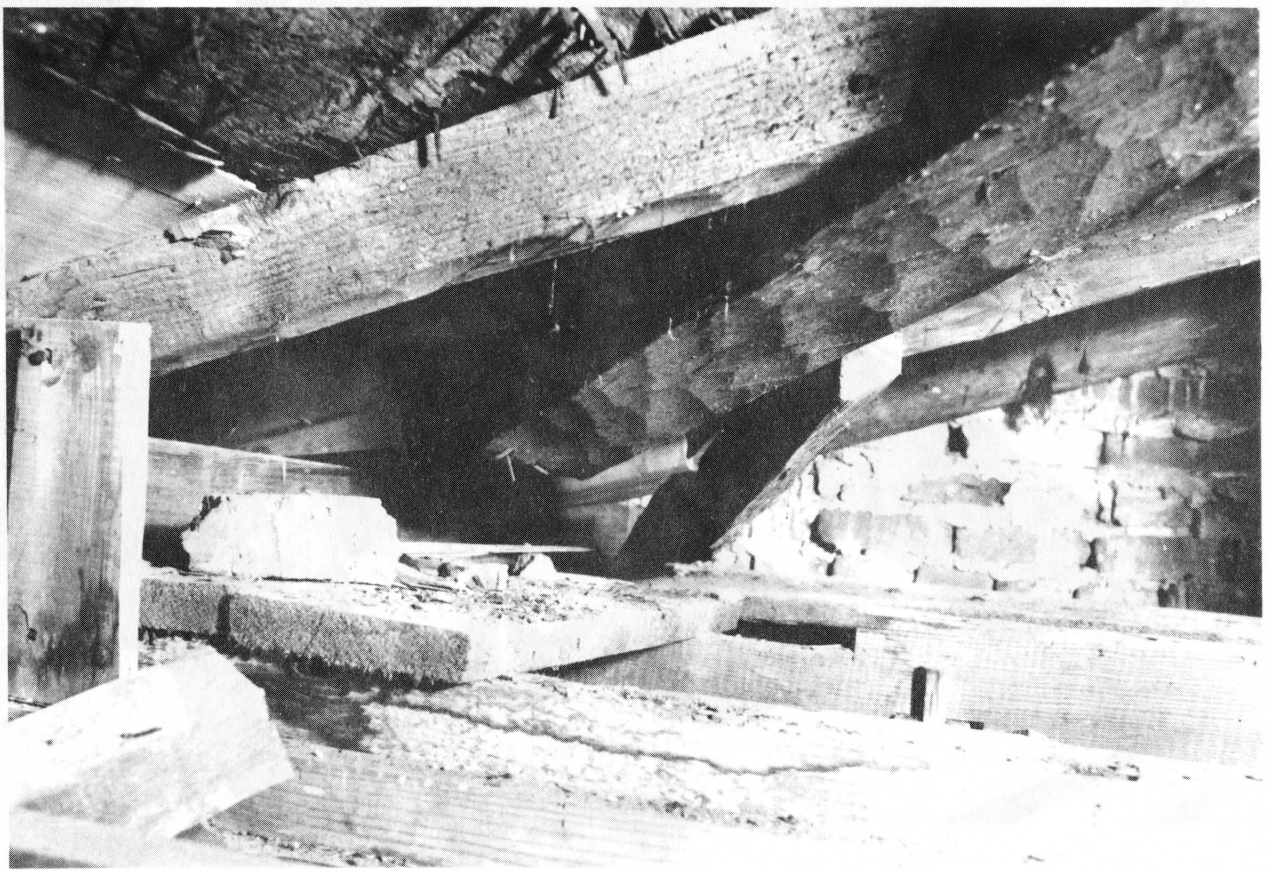
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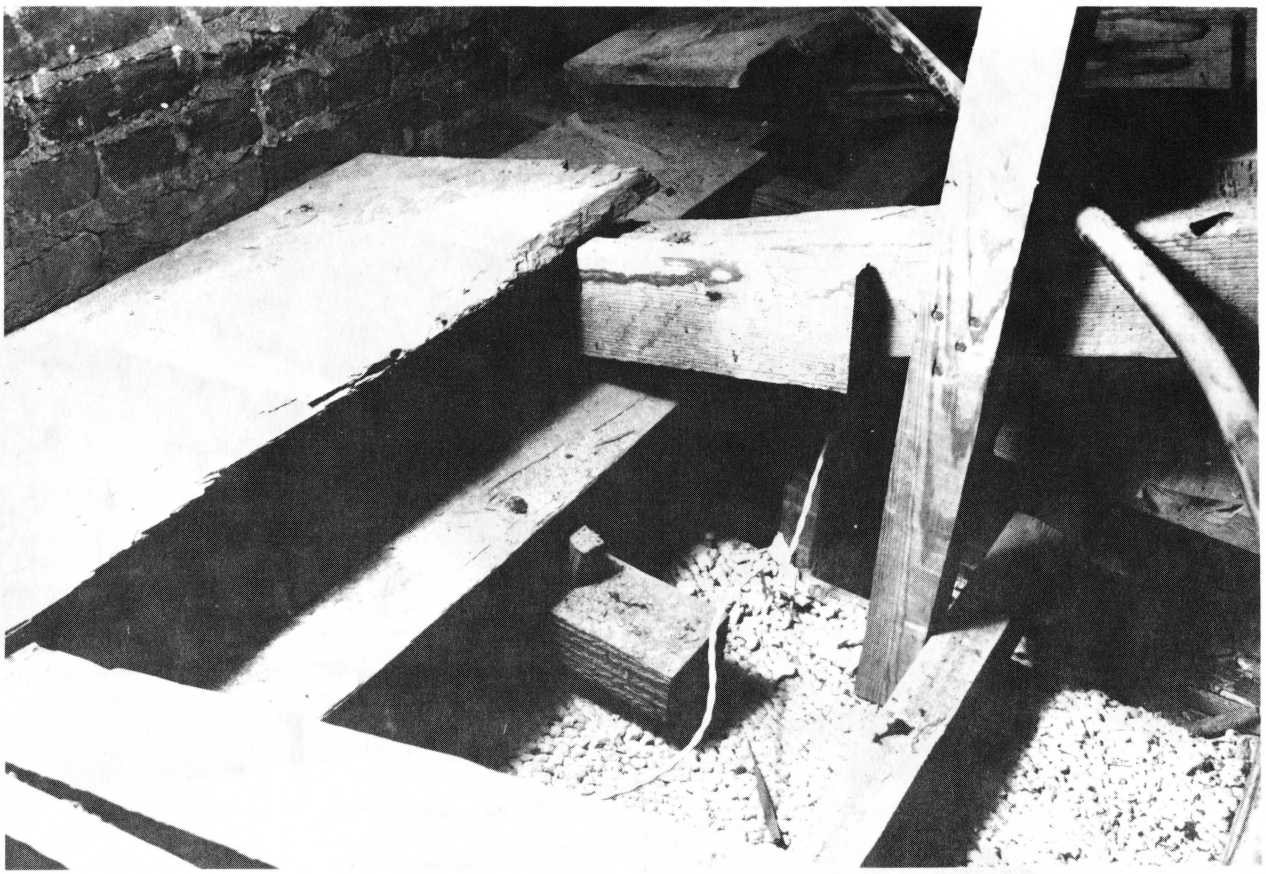
Mantel at west wall in Mrs. R. E. Lee's morning room (room 115). 65



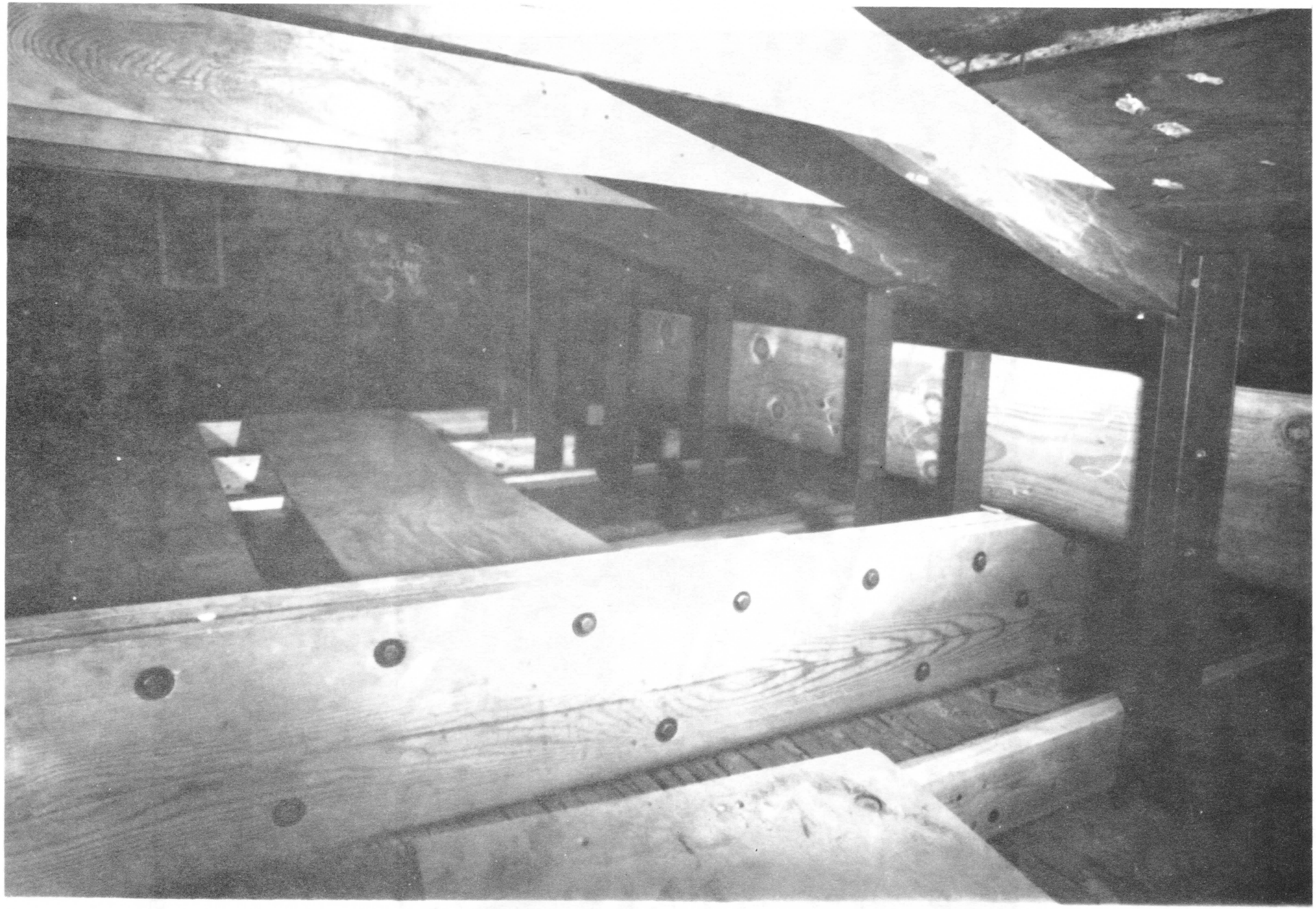
Rafter ends at north wing attic. 66



Hip rafter and condition at southeast corner of north wing attic. 67



Remains of original hip rafters and sheathing at south end of north wing attic. 68



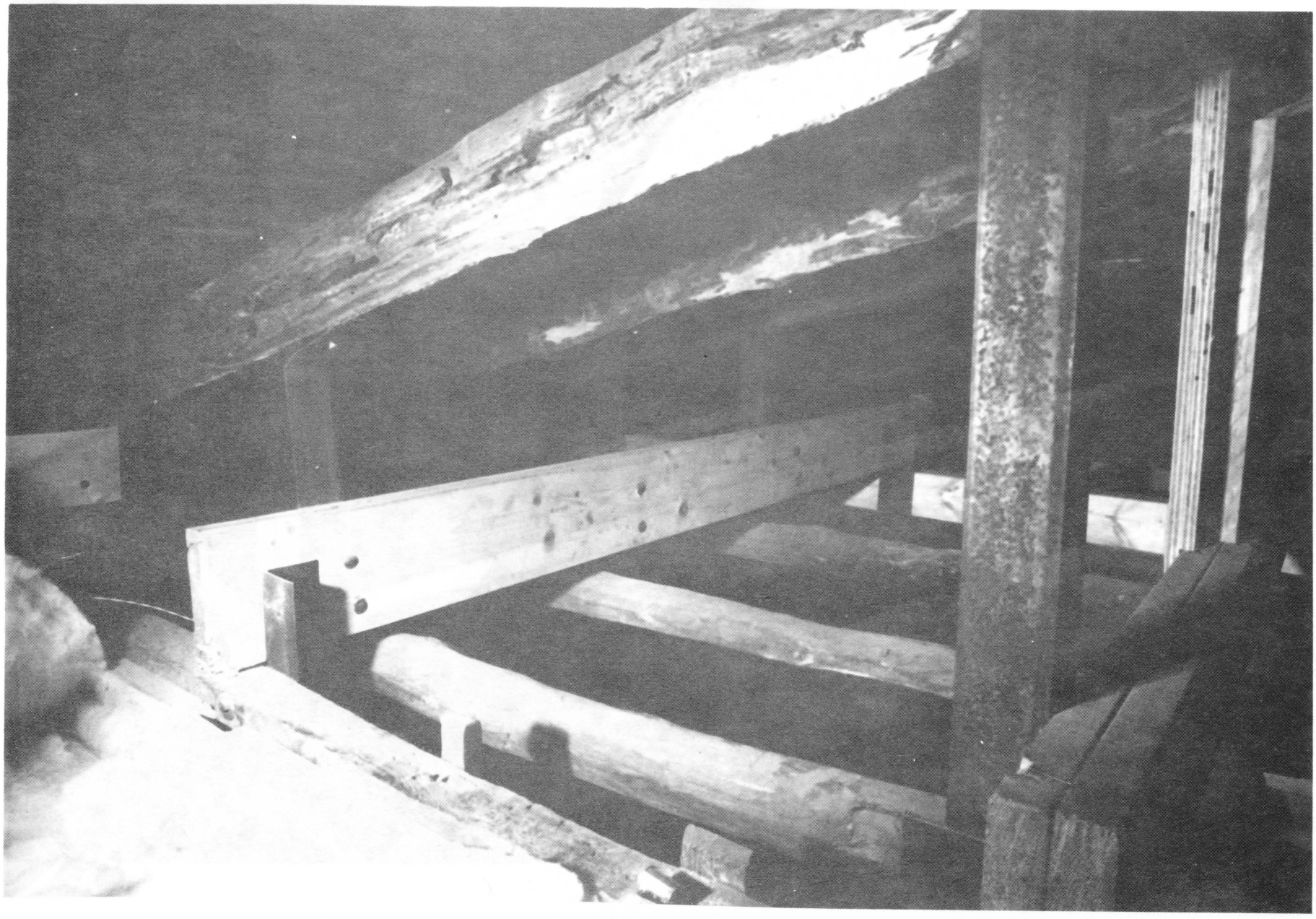
Looking north at north wing attic at 1980 National Park Service structural repairs. 69



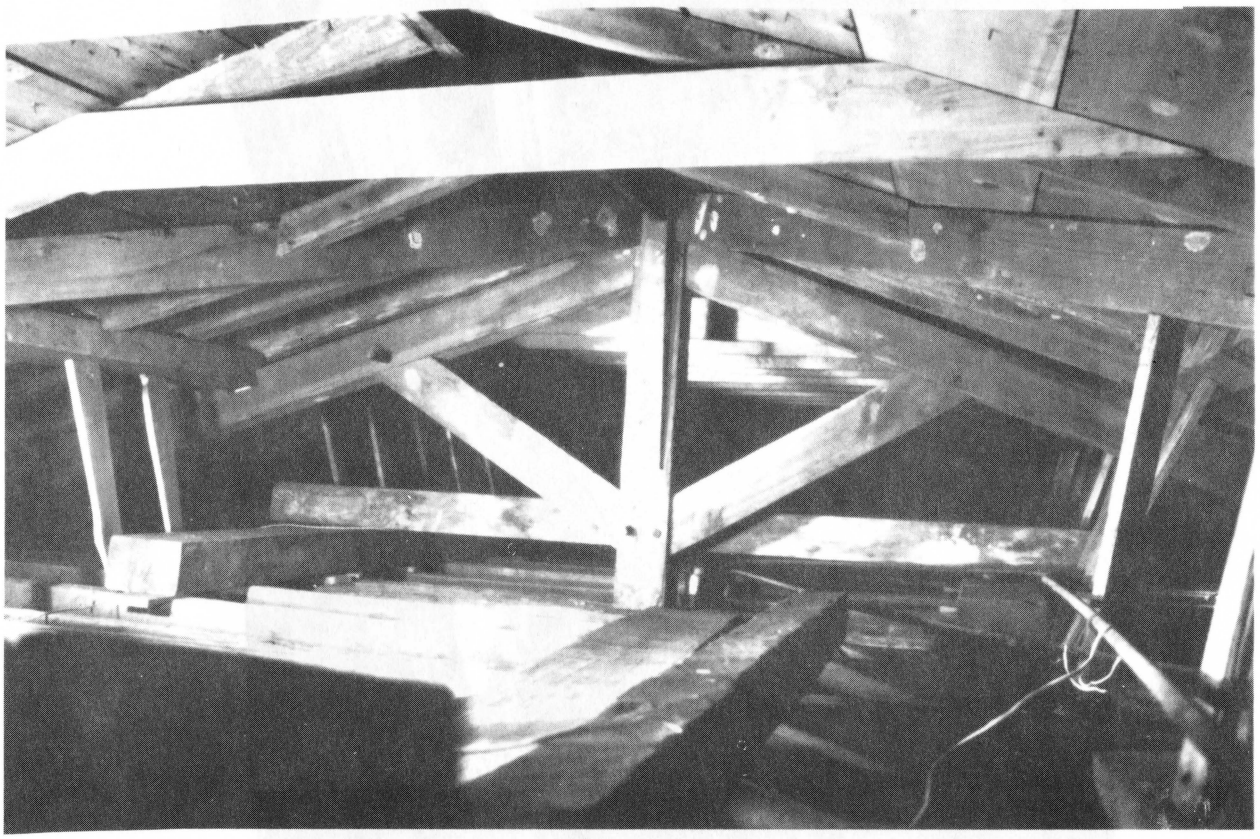
Loggia ceiling rafter at joist pocket before tie-back system. 70



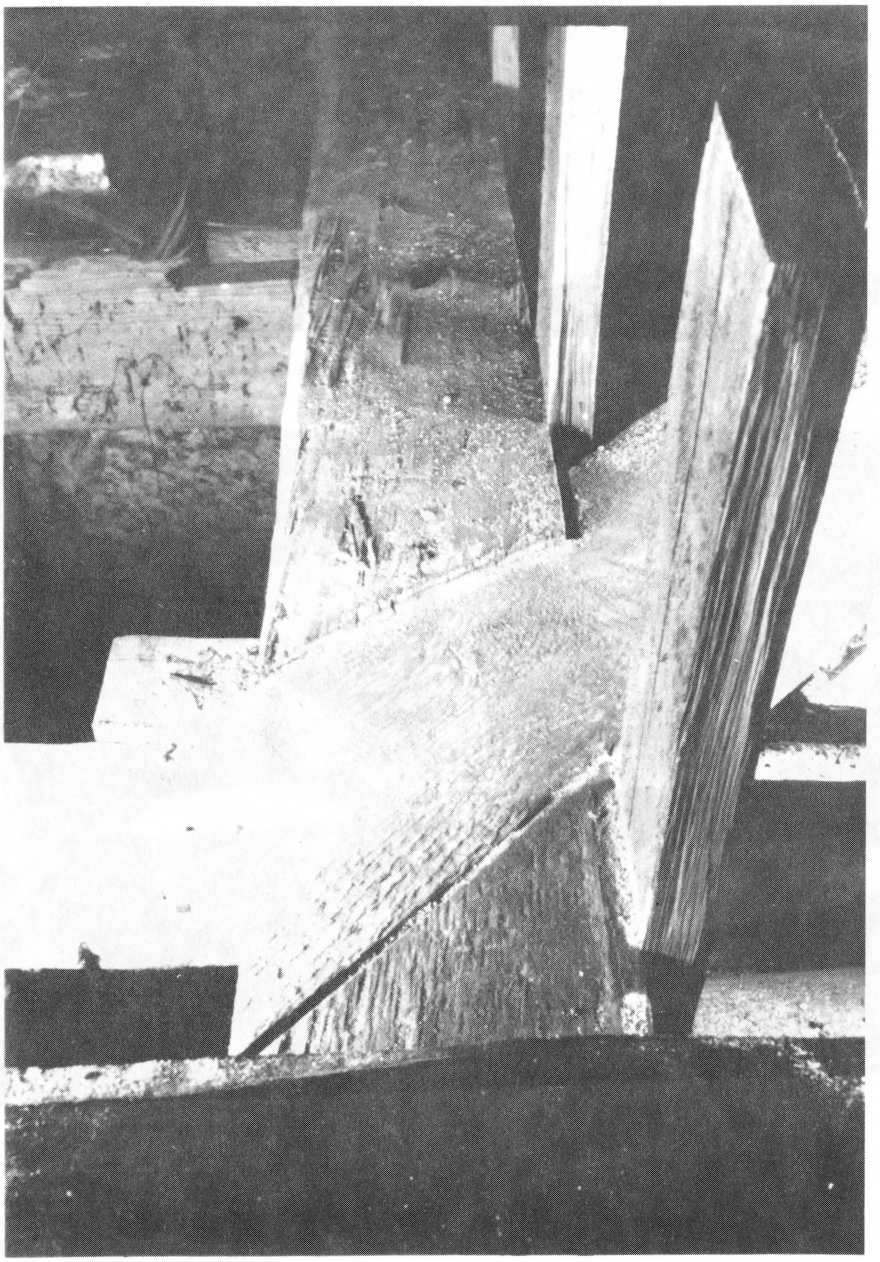
North loggia crawl space after 1980 National Park Service repairs.



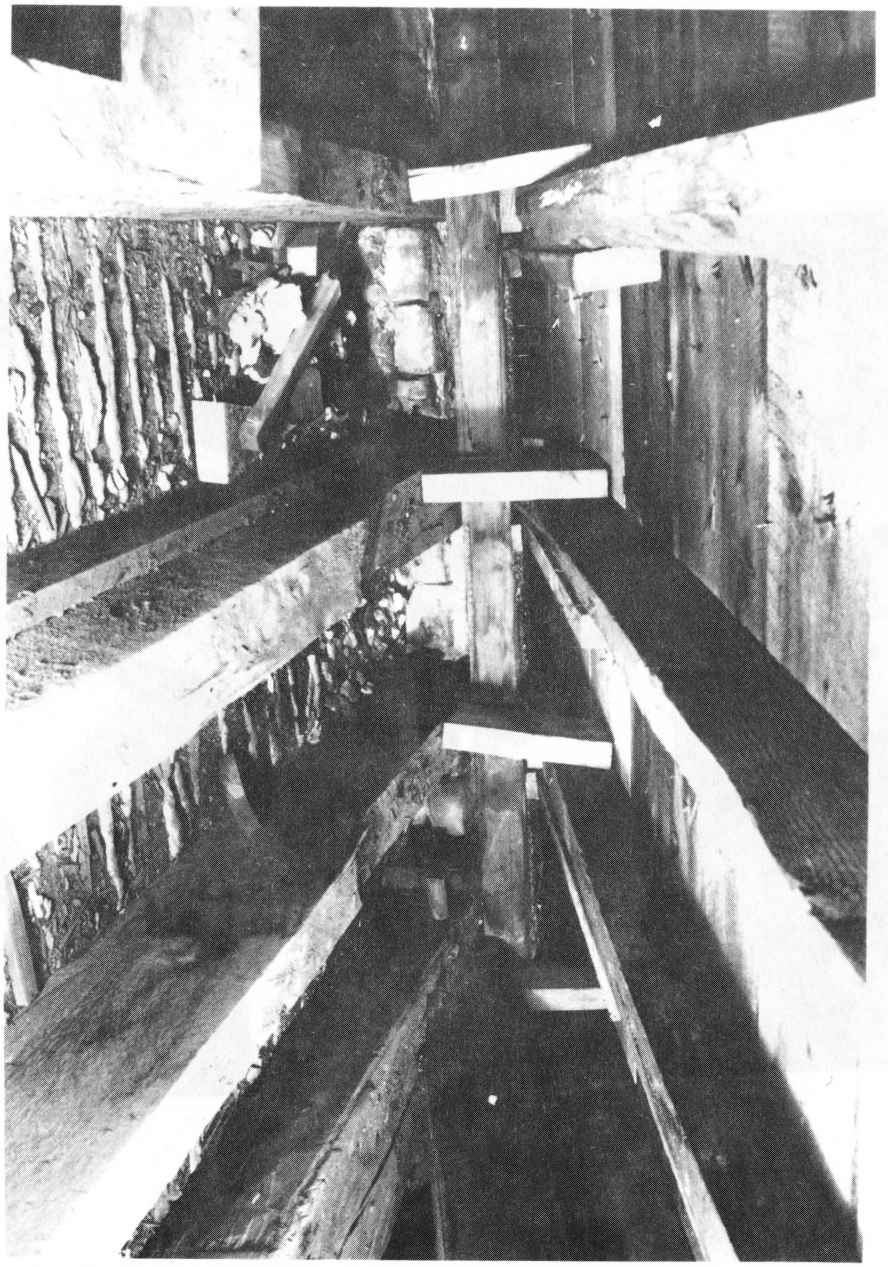
1980 pairs over water tank in north loggia crawl spac



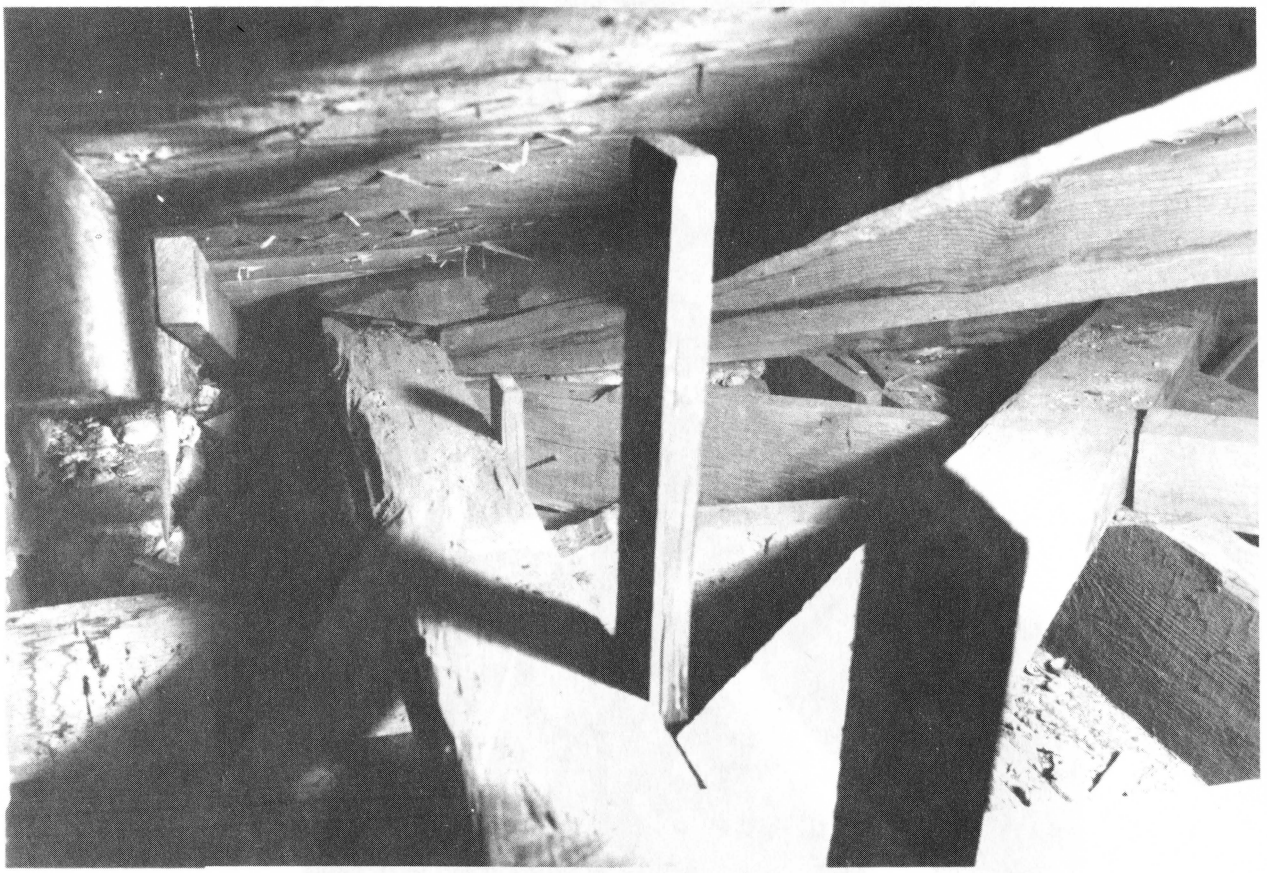
North king post truss in south wing attic. 73



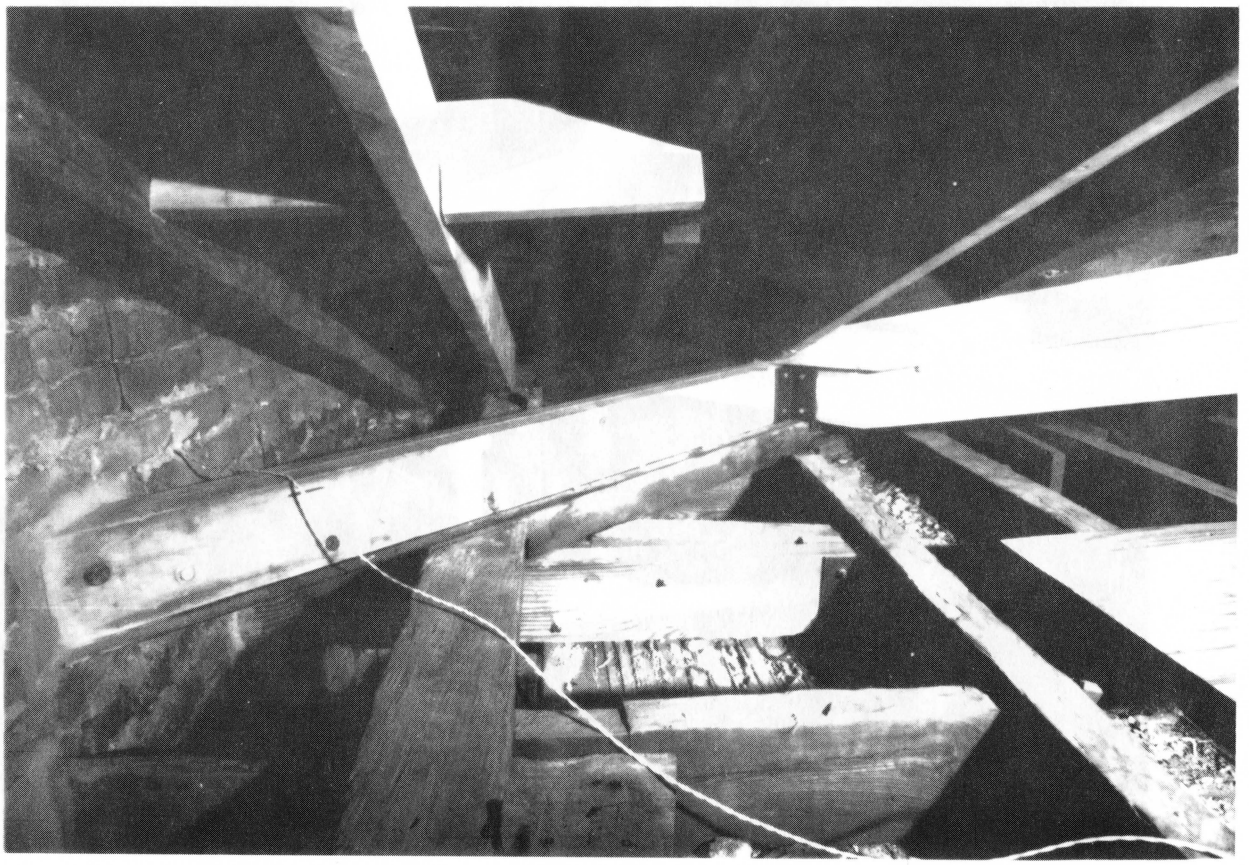
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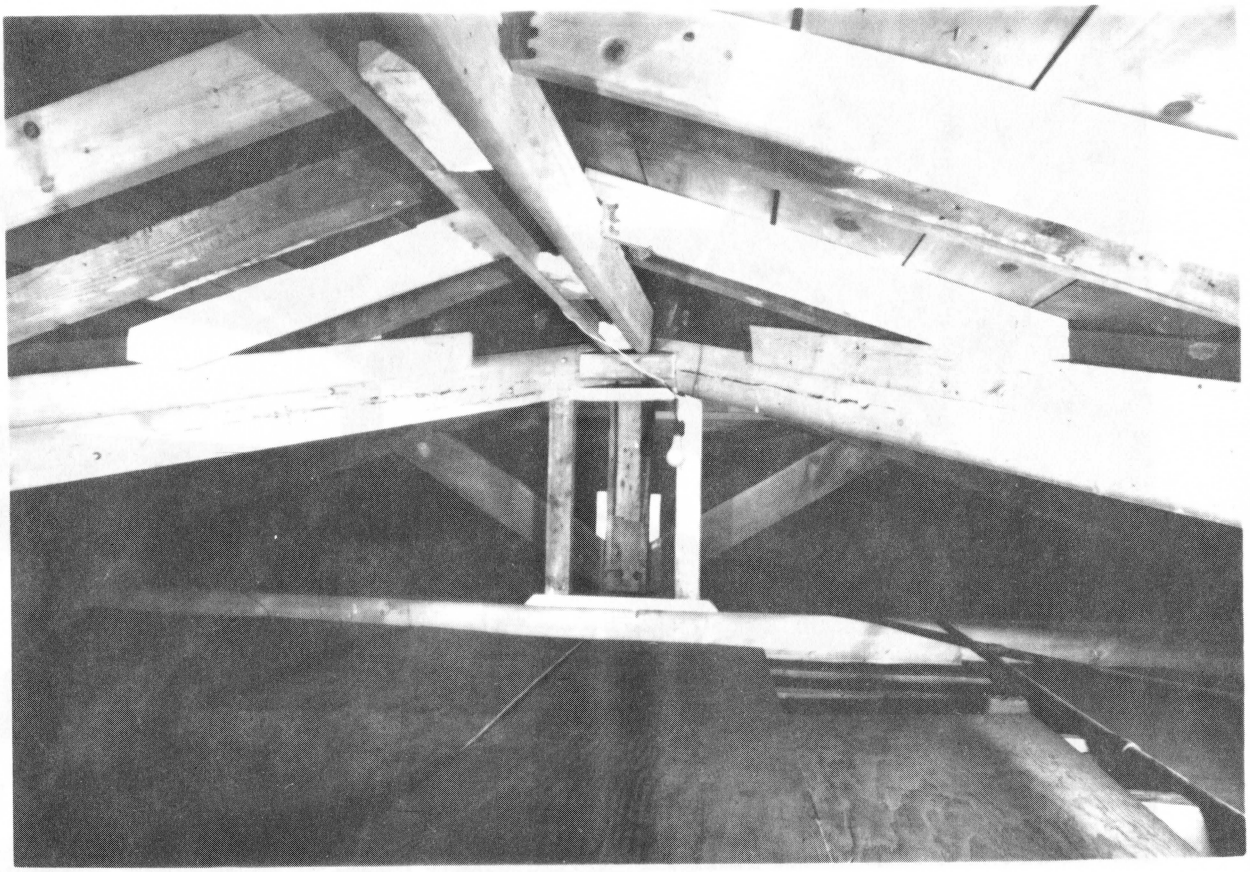
Rafter/sill plate connection at east wall, south wing attic. 75



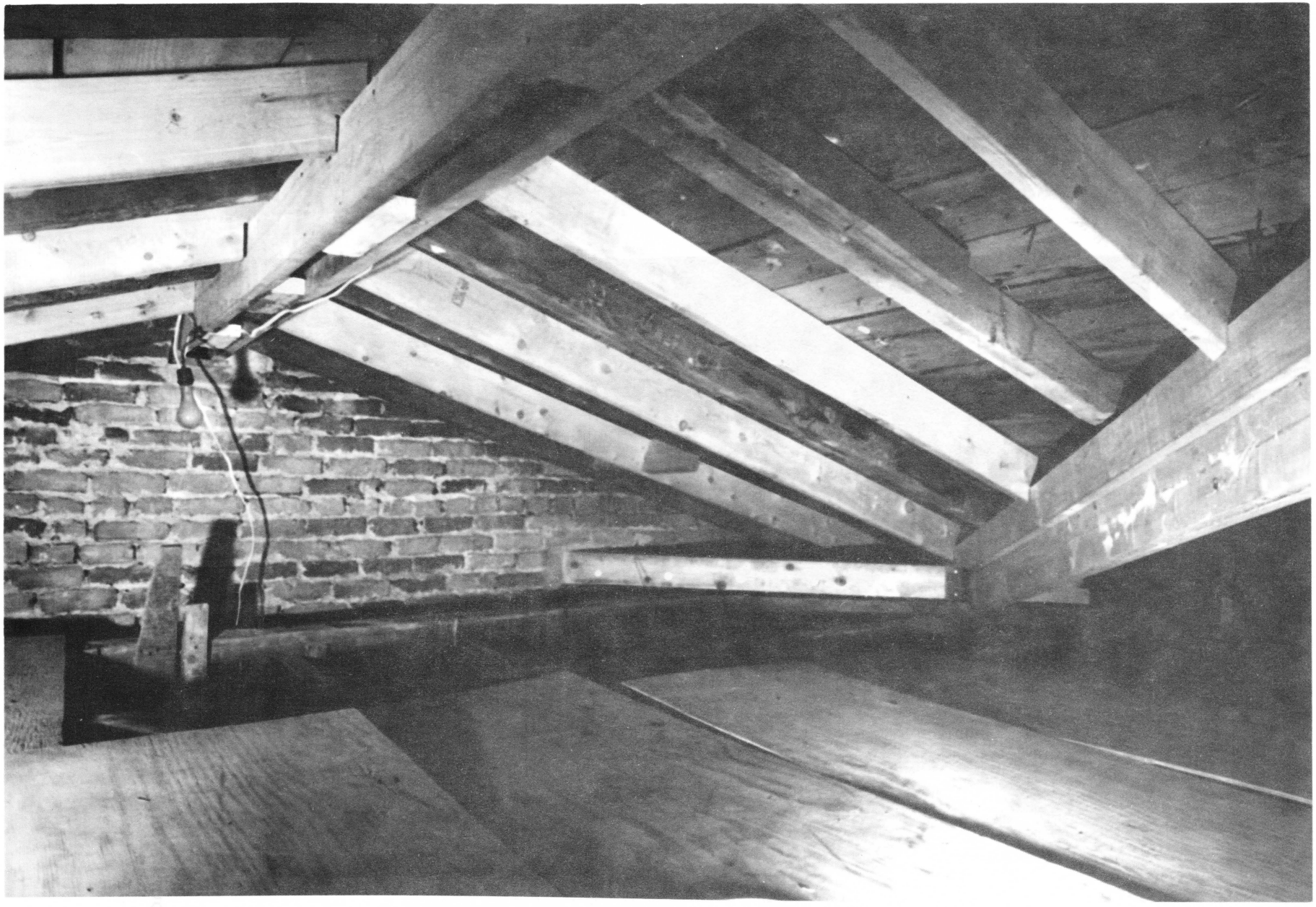
Hip rafter at northeast corner of south wing attic. 76



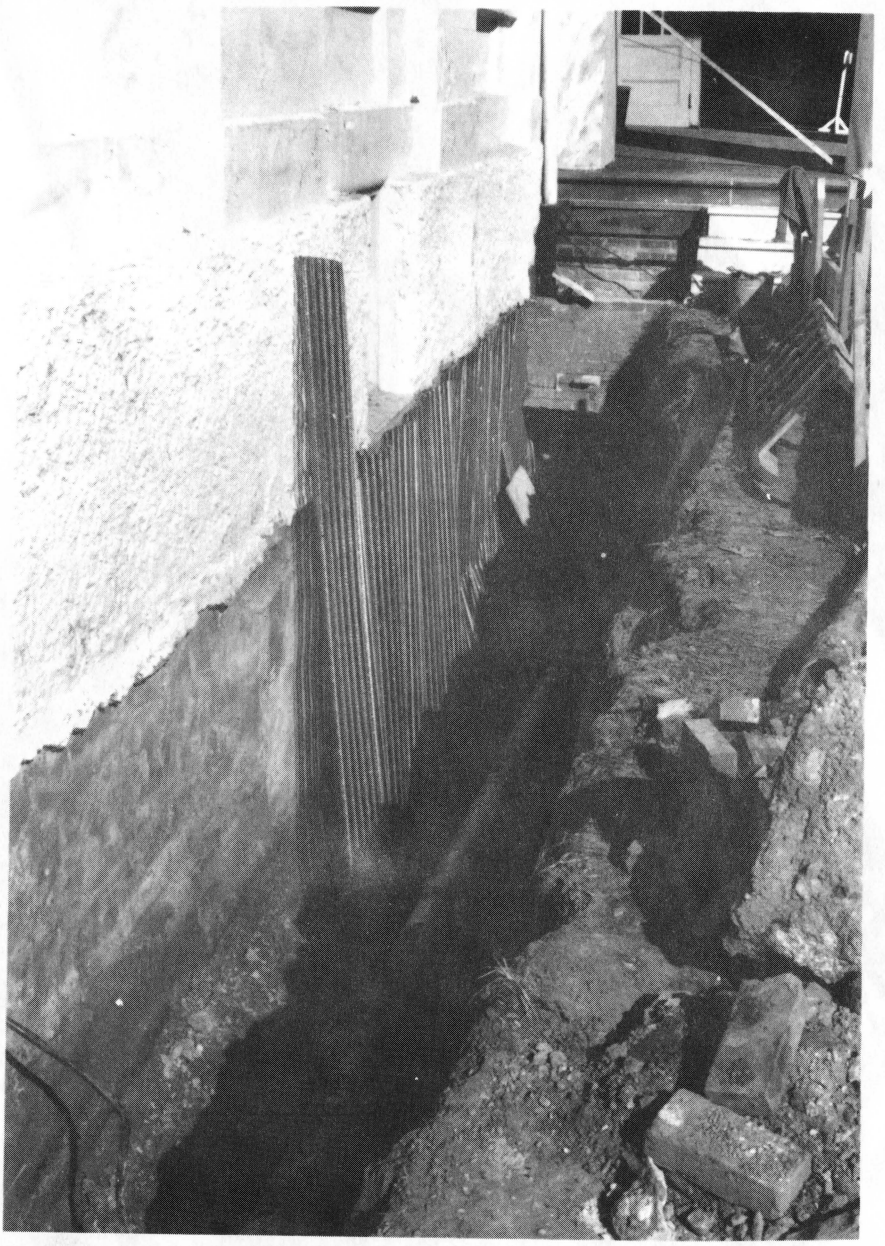
"Beef-up" of northeast corner of south wing attic. 77



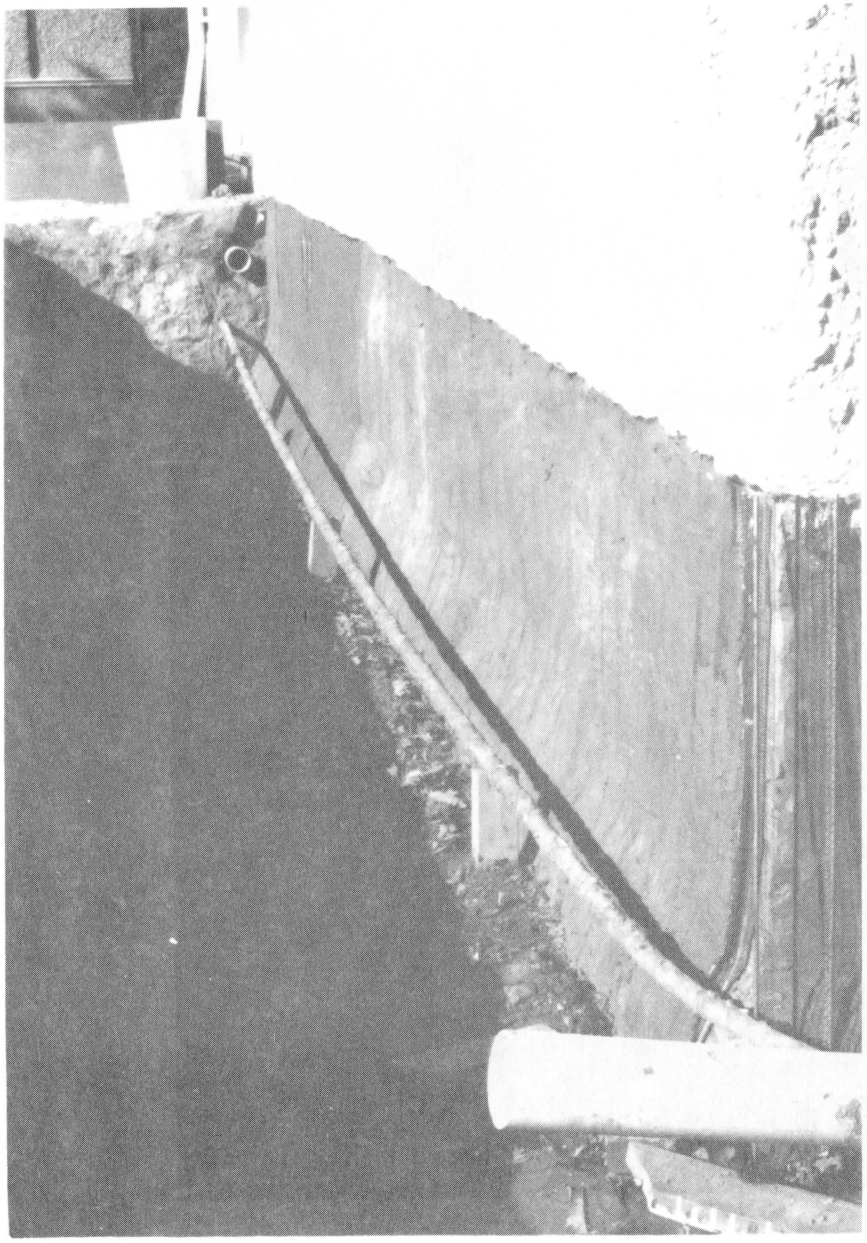
Area of 1981 repairs at north end of south wing attic structure. 78



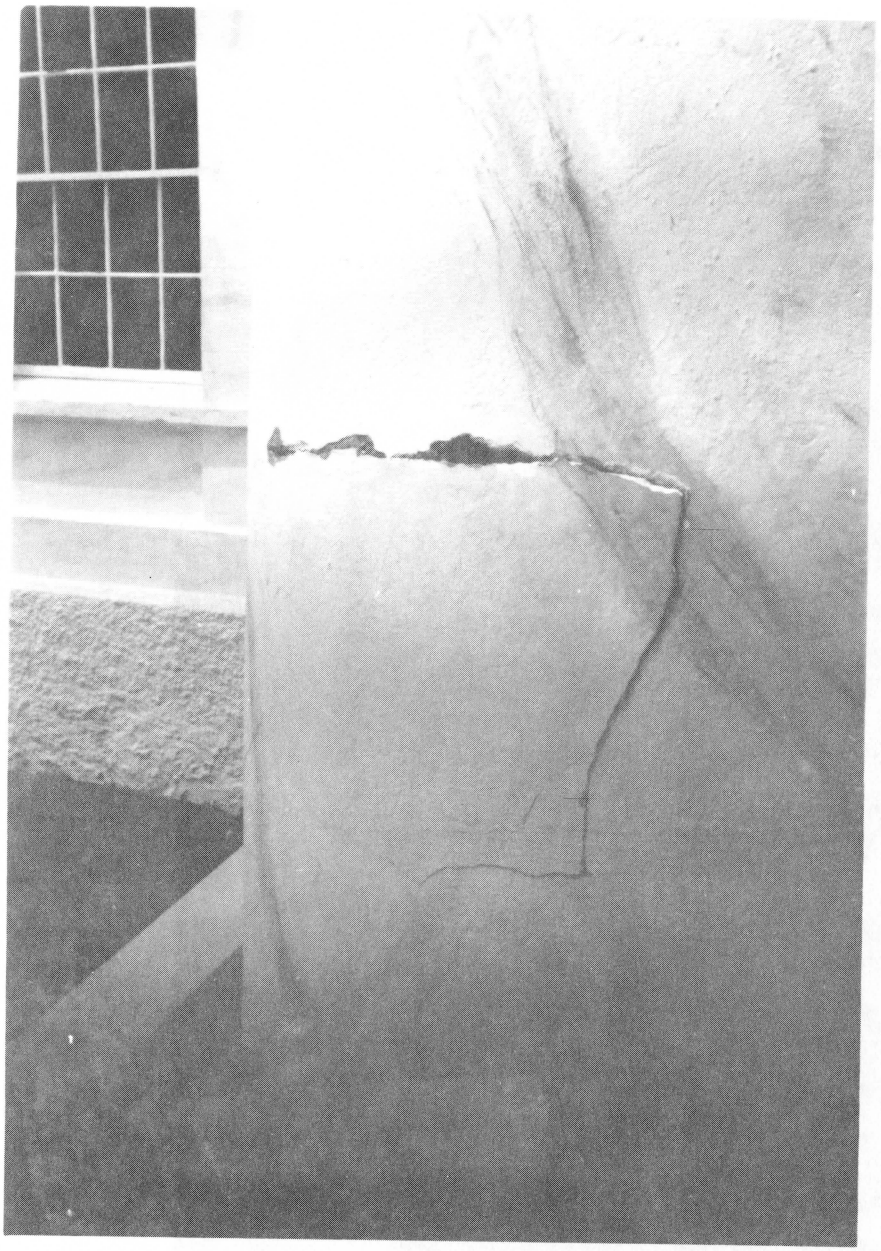
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Foundation dampproofing in progress at south wing. 81



Deterioration of plaster at portico columns. 82



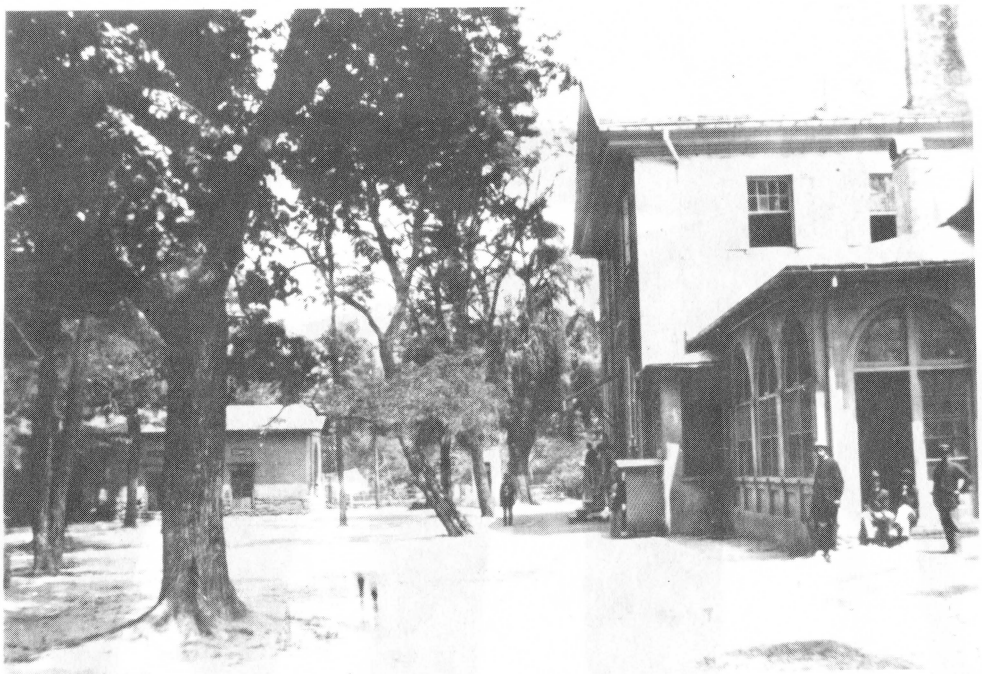
Paint peeling; typical of conditions before 1981 painting. 83



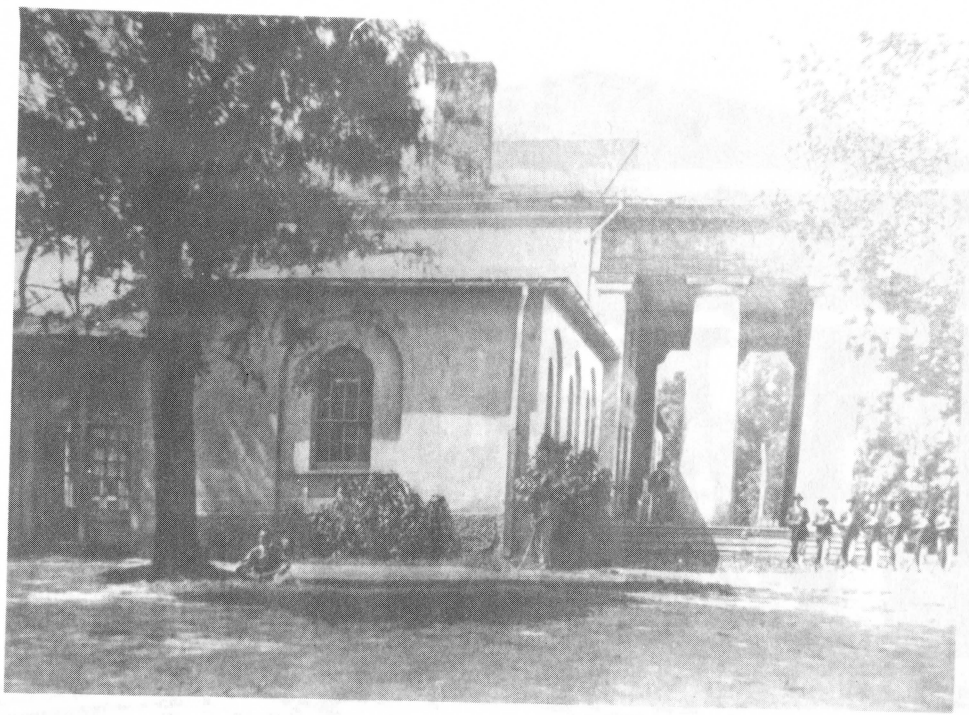
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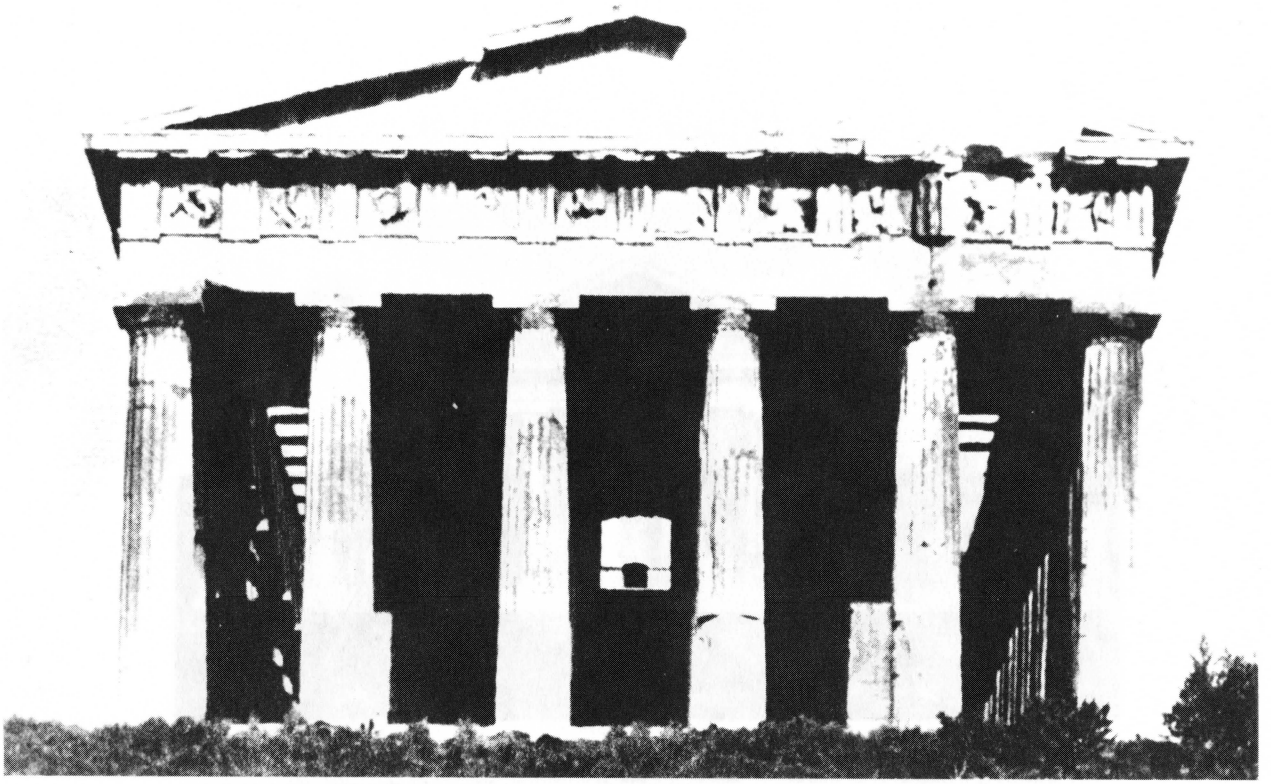
Photograph by Captain Andrew J. Russell of south elevation of Arlington House taken June 28, 1864. 86



Photograph by Captain Andrew J. Russell of south elevation of Arlington House taken June 28, 1964. 87



Temple of Hera Argiva (Hera II) Paestum, Italy. 88



Theseum (Temple of Hephaestus) Athens, Greece circa 450 B.C. 89



Lithograph published in William Elliot's The Washington Guide (1830 90 edition).



Watercolor by Benson Lossing for Harper's Weekly, 1853. 91



Pencil sketch by Markie Williams, a resident of Arlington House, 1843. 92



East facade, 1864 (Van Horn donation; original preserved at Arlington House). 93

VII. HANDICAPPED ACCESSIBILITY

Providing handicapped access to public buildings, especially those of historic significance, has often proved problematic in nature and Arlington House is not an exception. Retaining architectural integrity while resolving the logistics of handicapped access frequently leads to frustration of one or the other. Willingness to compromise through an assessment of the design trade-offs is a necessary part of any discussion concerning accessibility retrofitting.

Several studies, including two conducted by the Paralyzed Veterans of America and one by the George Washington Memorial Parkway staff, have compiled an impressive list of areas at the Arlington House site that to date do not comply with Public Law 90-480, The Architectural Barriers Act of August 12, 1968, as amended January 6, 1981. What follows is a history of those problem areas with a proposed solution for each.

1. a. Lack of signage indicating handicapped parking.

b. Provide adequate signage that does not detract from the historic scene.

2. a. Restrooms are inaccessible by wheelchair.

b. Provide an on-grade restroom accessible by wheelchair to both sexes.

3. a. Loose pea gravel and brick paths access by wheelchair, cane, or walker difficult and unpredictable.

b. Brick paths can be relaid in an attempt to minimize irregular surfaces. Loose gravel can be pressed into subsurface and excess removed.

4. a. Public telephone is inaccessible by mobility impaired visitors.

b. Locate phone in area around present comfort station adjacent to handicapped restroom.

5. a. Bookstore is inaccessible by mobility impaired visitors.

b. Access to the bookstore can be gained one of three ways. A ramp could be used but would have to be at least 36 feet long; its impact on the historic scene would be unfavorable. Access by lift would be inappropriate because of both cost and visual considerations. The choice remaining is to lift the visitor manually only to place him/her in an already cramped space. The only real solution is to relocate the bookstore to a space that is designed for and accessible by the handicapped.

6. a. The second floor and basement of Arlington House are not accessible by mobility impaired visitors.

b. Access to the main floor (first) is gained by a mechanical chairlift installed in 1981 and although the wire screens at the doorways of the various rooms are difficult to see beyond, it can be generally stated that the first floor complies with Public Law 90-480. Ramp access to the second floor is out of the question for obvious reasons. Access by chair lift or elevator is equally ill-advised as the visual intrusion on the historic scene would be impossible to alleviate. Several past studies have suggested a book of photographs as a means of showing the inaccessible areas of the house to those visitors who are restricted in their movement. This is a simple solution and stands every chance of being successful as well. It is recommended that it be initiated as soon as is convenient.

Other suggestions include providing an on-site wheelchair, tactile signs for the blind, and improvement of the museum which has been determined to be inadequate for a variety of reasons.

It should be noted, however, that in spite of remaining deficiencies, Arlington House has made some progress toward accommodating handicapped visitors. The previously mentioned wheelchair lift plays a major role in granting access to the building. Arlington House staff conduct special sign language tours and guided tours for the blind are available year round.

Brief Accessibility Checklist

A complete and comprehensive survey checklist is available in Volume II: A Technical Manual and from the Denver Service Center.

This checklist, however, is provided to give the reader an overview of the areas and features of a site which need to be accessible. It will be helpful for managers to use this checklist while making a brief survey of a site and its structures.

The brief survey will probably show many areas in need of improvement; thereby demonstrating why this Guide can become important to the task of upgrading the accessibility of historic sites.

			YES	NO
PARKING	Special Spaces	Reserved for handicapped visitors?	—	X
		Extra-wide?	—	X
WALKS	Paths of Travel	Level, paved or stabilized, wide enough for a wheelchair, free from curbs, steps and obstacles?	—	X
	Walkways	Level, paved or stabilized, wide enough for a wheelchair, free from curbs, steps and obstacles?	—	X
ENTRANCE	Primary Entrance	Accessible to wheelchairs?	—	X
		Railings?	—	X
	Alternate Entrance	Accessible to wheelchairs?	X	—
		Railings?	X	—
MAIN FLOOR	Floors	Non-slip finish?	X	—
	Carpeting	Anchored securely?	X	—
	Doorways	Allow wheelchairs to pass through?	X	—
	Thresholds	Negotiated safely by wheelchairs and those with mobility impairments?	X	—
	Paths of Travel	Free from obstacles to wheelchairs and visually impaired people?	X	—

X

OTHER FLOORS	Stairways	Have railings which can be grasped for stability?	X	
		Carpeted or otherwise free from projected nosings (i.e., extensions of tread beyond risers)	X	
	Other Access	Provided for those in wheelchairs?		X
CONVENIENCE FACILITIES	Toilet Rooms	Permit entry by wheelchairs?		X
		One wide toilet stall?		X
		Sink, mirror, soap and towel dispenser at height for wheelchairs?		X
		One low urinal for wheelchairs?		X
	Water Fountains	One low enough for wheelchairs?		X
	Telephones	One low enough for wheelchairs?		X
		Equipped with amplifying device for hearing impaired?		X
ELEVATORS	NA	Conform to modern specifications?		
		Provide room for wheelchair and attendant?		
WARNING SIGNALS	Emergency Alarms	Both audible and visual?		X
	Doors leading to dangerous areas	Properly identified? NA		X
IDENTIFICATION	Signs	Large letters on contrasting background, raised or recessed and located within reach?		X
	Paths of travel	Indicated by International Symbol of Accessibility?		X
VISITOR INTERPRETATION	Exhibits	Able to be viewed from wheelchair?		X
		Appreciated by visually impaired persons?		X
	Recordings	Have amplifying device for hard-of-hearing visitors?		X
	Standard Verbal Interpretation	Also available in written transcript?		X
	Written Visitor Information	Also available in simple terms for those with reading difficulties?		X
	Alternate Accommodation	Provided if physical access is not possible?		X
	Park Guide for Handicapped Visitors	Available which describes facilities--what, how and where?	X	

VII. STATEMENT OF EFFECTS

It is necessary to examine the list of recommended dangers proposed in the two previous sections in light of the Criteria of Effect and Adverse Effect, Chapter 36 Part 800.3 of the Code of Federal Regulations, to assess the impact the implementation of a particular recommendation might have on the integrity of Arlington House. What follows then is an examination of each "General Recommendation." Specific recommendations will be discussed collectively toward the latter half of this section.

I. Interior Paint: Implementation of the recommendation to paint the interior of Arlington House will have an effect on the appearance of the building. It is judged to be of no adverse effect only if the methods of paint removal, paint type, and application techniques described in this report are adhered to strictly.

II. Heating System: The introduction of a humidity control system at Arlington House has been recommended but should be considered in the most serious light before any work proceeds. While humidity levels of between 45% and 55% are suggested for the proper preservation of historic furnishings, the introduction of significant amounts of moisture into a building interior has been proven to cause deterioration of architectural features in some cases, especially exterior walls. The impact of a potential humidity system then must be carefully considered and only after all concerned have determined that no adverse effect will result should installation take place. The presence of an existing heating system will allow inclusion of a humidity system without alteration of any part of the historic fabric or introduction of visual, audible or atmospheric elements that would be out of character with the property.

III. Update House Electrical System: As long as the visual impact of an electrical heavy-up is minimized then this proposed system up-date can be determined to have no adverse effect as it will have minimal impact on historic fabric.

IV. Reduction of Fire Hazards: Removal of old wiring and fire hazards has an effect on the structure. The effect of this proposed work is found not to be adverse because it will not result in the destruction of any significant features of the property. It will, in fact, eliminate non-historic elements that presently interfere with the ambience of Arlington House.

V. Recover Paint Layering Panel Exhibits: This function will have an effect. It is judged to be of no adverse effect because it will not result in damage to historic fabric, rather, it will protect historic fabric.

VI. Historic House Lighting: The introduction of a system of lighting will have an effect on the structure. The effect of this proposed work will not be adverse because it will not result in the destruction of any significant features of the property. If designed by a lighting specialist in conjunction with DSC, GWMP, and NCR personnel, then this system would not cause modification of significant features other than the possible introduction of power outlets. These outlets would be located, as much as possible, in non-historic fabric and would be situated so that the visual impact will be minimized. Lighting can be of the removable type.

VII. Replace/Repair Existing Door Hardware: Replacement and/or repair of hardware will have an effect. If authentic reproduction or restored historic hardware is utilized, then this work is determined to

have no adverse effect, but rather will remove non-historic elements that are presently out of character.

VIII. Preserve Incidences of Natural Wear and Cracks: This non-action is determined to have no effect because cracks in plaster and worn flooring board that are not yet dangerous contribute to the historic ambience of Arlington House.

IX. Replace Wing Roofs: Replacement of the roofing of the wing roofs will have an effect. This effect is judged not to be adverse because the proposed work will not result in the destruction of significant features of the property. The terpolymer membrane and plywood sheathing are recent, as of 1974, so their removal will have very little impact on the structure. Installation of a new system, designed to approximate the historic condition, will return the wings as nearly as possible to their appearance during the Lees' residence.

X. Stabilize Main Block Attic: Stabilization of the attic structure will have an effect on Arlington House. The effect is considered not to be adverse because the proposed undertaking will not result in the destruction of significant features of the property, even though substantial alterations are planned. Although the restructuring will introduce elements that are out of character with the historic conditions, this is not felt to be adverse as the new work will not be visible to the public. The proposed undertaking will not result in the deterioration or destruction of federally owned property, but will in fact prolong the life of Arlington House and will remove the possibility of harm to site visitors from partial or total roof collapse.

XI. The reconstruction of the portico steps will have an effect on the structure. This effect is considered not to be adverse because the

proposed undertaking will not result in the destruction of significant features of the property. Some demolition will take place but only material dating from the twentieth century will be modified. Care was taken in the ordering of special treads and risers to match material shown in the 1864 Russell photographs of the structure. The effect will be to return the portico to its appearance during the years of the Lees' residence.

Specific Recommendations

Recommendations for treatment for specific rooms or areas are numerous and so will be discussed as they fall into three work categories. The category of maintenance, whether routine or cyclical, includes patching plaster walls, painting, minor repairs, and the like.

Restoration/Preservation of missing or damaged historical material constitutes a second category. Typical work would include reconstruction of altered fireplace mouths, replacement of damaged or unsafe fabric, and removal of non-historic non-essential elements, such as abandoned wiring or unused fire extinguisher wall brackets.

The reconstruction and installation of new fabric to approximate the historic condition falls into the third group. This type of work would consist of, for example, refurnishing the winter kitchen (room B02) to more accurately represent a 19th century kitchen, removal of door 101D2 and installation of a historically accurate window, and the reconstruction of new interior shutters for the north and south wings to approximate, as nearly as possible, the historic condition.

In all cases these proposed changes will have an effect on Arlington House. In applying the criteria of adverse effect, 36 CFR Part 600.3(b), the National Park Service has found the effect not to be adverse because:

a. The proposed undertakings will not result in the destruction of the significant features of the property, even though alterations are planned. This structure underwent a period of modification during the years of 1864 to 1933 when administration of the building was by the U.S. Army.

Many of these modifications remain and have been included in the recording of the structure, both in the form of accurate measured drawings and historic and contemporary photographs. The removal of these modifications will be an essential step in the process of restoring Arlington House to its appearance during the years of the Lee family's residence.

b. The proposed undertaking will not result in the isolation of the property from, or alteration of, its surrounding environment. Rather, it will more accurately re-create the historic scene.

c. The proposed undertaking will not introduce visual, audible, or atmospheric elements that are out of character with the property or its setting.

d. The proposed undertaking will not result in transfer, sale, deterioration, or destruction of federally owned property.

IX. COST ESTIMATES

DSC-HFC
Form 802

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

PACKAGE ESTIMATING DETAIL

REGION	PARK
National Capital	George Washington Memorial Parkway
PACKAGE NUMBER	**PACKAGE TITLE**
506	Arlington House - Historic Structures Report

(If more space is needed, use plain paper and attach)

ITEM	QUANTITY	COST
PRIORITY 1A		
1.) Security system study (entire house)		$ 10,000.
2.) Lighting system study (entire house)		10,000.
3.) Paint analysis (north wing)		7,000.
4.) Climate control study (entire house)		20,000.
a.) Experiment with humidifiers & dehumidifiers		6,000.
5.) Evaluate electrical system		7,000.
6.) Hardware study		7,500.
7.) Interior shutter study		5,000.
8.) Investigation of chimney Room 104/106		2,500.
PRIORITY 1B		
1.) Install security system		$ 30,000.
2.) Investigate Room 106A		4,000.
3.) Repair masonry above lintel 105/D1		300.
4.) Install lights/pantry, garret		1,000.
5.) Cellar hall stairs		1,500.
6.) Remove canvas on mantel Room 104/restore		1,000.
7.) Remove paint on Door 104/D1		400.
8.) Restore missing millwork		7,500.
9.) Restore mantel Room 106		2,000.

SUMMARY OF CONSTRUCTION ESTIMATES

CLASS OF ESTIMATE: ☐ A Working Drawings ☐ B Preliminary Plans ☒ C Similar Facilities

Proj. Type		Totals from Above B & U	R & T
52	Museum Exhibits		XXXXX
55	Wayside Exhibits		XXXXX
62	Audio-Visual		XXXXX
89	Ruins Stabilization		XXXXX
91	Construction		
92	Utility Contracts		XXXXX

ESTIMATES APPROVED (Signature)	(title)	(date)

POST PROFESSIONAL SERVICES ESTIMATES AND SCHEDULING ON BACK OF FORM

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

PACKAGE ESTIMATING DETAIL

REGION	PARK
National Capital	George Washington Memorial Parkway
PACKAGE NUMBER	**PACKAGE TITLE**
506	Arlington House - Historic Structures Report

(If more space is needed, use plain paper and attach)

ITEM	QUANTITY	COST
PRIORITY 1B (continued)		
10.) Wallpaper conservation		$ 3,000.
11.) Patch walls & ceiling (north wing)		5,000.
12.) Removable panels on walls		10,000.
13.) Cover walls & ceiling with canvas		22,000.
14.) Paint (north wing)		10,000.
PRIORITY 1C		
1.) Install Doors 104/D2, 105/D1 & 106/D4		$ 5,000.
2.) Remove Door 101/D2; install window		3,500.
3.) Clay floor Room B03		1,500.
4.) Pegboard		500.
5.) Period hardware		8,000.
6.) Date flue Room B03		2,500.
7.) Cover heaters		3,000.
8.) Shutter boxes & shutters (north wing)		10,000.
PRIORITY 2 (refer to text for specific work items in each room)		
1.) Room B06		$ 1,500.
2.) Room B09		500.
3.) Room B10A		200.

SUMMARY OF CONSTRUCTION ESTIMATES	CLASS OF ESTIMATE: A ☐ Working Drawings; B ☐ Preliminary Plans; C ☒ Similar Facilities		
Proj. Type		Totals from Above B & U	R & T
52	Museum Exhibits		XXXXX
55	Wayside Exhibits		XXXXX
62	Audio-Visual		XXXXX
89	Ruins Stabilization		XXXXX
91	Construction		
92	Utility Contracts		XXXXX

ESTIMATES APPROVED (Signature)	(title)	(date)

POST PROFESSIONAL SERVICES ESTIMATES AND SCHEDULING ON BACK OF FORM

DSC-HFC
Form 802

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

PACKAGE ESTIMATING DETAIL

REGION	PARK
National Capital	George Washington Memorial Parkway
PACKAGE NUMBER	**PACKAGE TITLE**
506	Arlington House - Historic Structures Report

(If more space is needed, use plain paper and attach)

ITEM	QUANTITY	COST
PRIORITY 2 (continued)		
4.) Room 108		$ 24,000.
5.) Room 109		18,000.
6.) Room 110		7,000.
7.) Room 111		12,000.
8.) Room 112		5,500.
9.) Room 113		3,500.
10.) Room 114		16,000.
11.) Room 115		10,000.
12.) Room 117		6,000.
13.) Room 200		2,000.
14.) Room 201		6,000.
15.) Room 204		500.
16.) Room 205		11,000.
17.) Room 206		9,000.
18.) Room 207		8,000.
19.) Garret stairs		4,150.
20.) Room 300		1,250.
21.) Room 301		2,500.
22.) Garrets		3,000.
23.) Exterior		22,000.
24.) Bath & water closet study		10,000.

SUMMARY OF CONSTRUCTION ESTIMATES

CLASS OF ESTIMATE: ☐ A Working Drawings ☐ B Preliminary Plans ☒ C Similar Facilities

Proj. Type		Totals from Above B & U	R & T
52	Museum Exhibits		XXXXX
55	Wayside Exhibits		XXXXX
62	Audio-Visual		XXXXX
89	Ruins Stabilization		XXXXX
91	Construction		
92	Utility Contracts		XXXXX

ESTIMATES APPROVED (Signature)	(title)	(date)

POST PROFESSIONAL SERVICES ESTIMATES AND SCHEDULING ON BACK OF FORM

X. FOOTNOTES

FOOTNOTES

1. Dissertation by Murray H. Nelligan on Arlington, unpublished NPS manuscript, 1953, pp. 21-25.

2. Ibid., 59.

3. Ibid., 74.

4. Ibid., 70.

5. Ibid., 71.

6. "Daily National Intelligencer," August 19, 1818.

7. Nelligan, 81.

8. Letter from Cornelia Lee to Mrs. Richard Bland Lee, April 13, 1804 (Lee Family Papers, Library of Congress).

9. Letter from Robert E. Lee to his wife dated June 12, 1837. (Arlington House Data File).

10. Letter from Robert E. Lee to his wife dated October 16, 1837. (Arlington House Data File).

11. Robert E. Lee's application to the Hartford Fire Insurance Company, dated October 17, 1859, a facsimile of which is preserved in the Main Data File at the Arlington House.

12. Letter from Mrs. G.W.P. Custis to her grandson, G.W.C. Lee, dated December 5, 1851 (Arlington House Main Data File.)

13. Letter from Robert E. Lee to his wife dated July 9, 1855 (Arlington House Main Data File).

14. Letter from Robert E. Lee to his wife dated July 1, 1855 (Arlington House Main Data File.)

15. Letter from Robert E. Lee to his wife dated July 9, 1855 (Arlington House Main Data File.)

16. From drawing #2.3-10 at the National Archives.

17. From drawing on file at NCR or ARHO.

18. Public Resolution No. 74-68th Congress (H.J. Res. 264), dated March 4, 1925, "Joint Resolution of Congress Authorizing the Restoration of the Lee Mansion in Arlington National Cemetery, Virginia."

19. Report of architect L. M. Leisenring to the quartermaster general, undated, c. 1931 (on file at the Arlington House office).

20. From Drawing #2.3-3 at the National Archives.

21. From Drawing #2.3-3 at the National Archives.

22. Robison, C. Dean, "Arlington House: First Floor Load Rating and Repair Recommendations." Arthur Beard Engineers, Inc. 1979 (unpublished manuscript on file at TNC-DSC-NPS).

23. Mullins, Agnes D., "Furnishing Plan for Arlington House, The Robert E. Lee Memorial," June 1978 (unpublished NPS manuscript).

24. Report of Elbert Cox, historian, to Chatelain, dated November 15, 1933 (on file at the Arlington House office).

25. From Drawing #2.3-13 at the National Archives.

26. From Drawing #2.3-15 at the National Archives.

27. Op. cit., report of architect L. M. Leisenring.

28. From Drawing #2.1-75 at the National Archives.

29. Letter from R. E. Lee to his wife dated July 9, 1855, a copy of which is preserved in the files at the Arlington House.

30. From Drawing #2.3-91-7, c. 1920.

31. Item #5 in a "Proposal for Repairs and Improvements" dated September 1885 as preserved in the files of the quartermasters corps at the National Archives.

32. From Drawing #2.3-91-7.

33. From Drawing #2.3-130 (formerly #H-51; ARHO #530).

34. Files of the quartermaster corps, the National Archives.

35. From Drawing #2.3-81.

36. Drawing #2.3-91-7, preserved in the Arlington House files as #305.

37. Upshur, George L., As I Recall Them, a personal memoir requested by the War Department in 1936. (Arlington House Data File).

38. Drawing #2.3-23 at the National Archives.

39. From monthly report of Historian Murray Nelligan on file at the Arlington House.

40. From letter written by C. G. Mortimer to W. F. Haiber dated October 21, 1940, and preserved in the files of the Arlington House.

41. Mullins, Agnes D., "Furnishing Plan for Arlington House, The Robert E. Lee Memorial," June 1978 (unpublished NPS manuscript).

42. Letter from Robert E. Lee to his wife dated July 1, 1855 (Arlington House Data File).

43. Drawing #2.3-10 at the National Archives.

44. Notes by Nelligan preserved in the Main Data File, Arlington House.

45. Letter from T. T. Waterman preserved in the Main Data File, Arlington House.

46. Letter from Mrs. Lee to her husband, Col. Robert E. Lee, dated October 2, 1857 (Arlington House Data File).

47. Drawing #2.3-11 at the National Archives.

48. Robison, C. Dean, "Arlington House: North Wing Roof Investigations," Arthur Beard Engineers, Inc., 1979 (unpublished manuscript on file at TNC-DSC-NPS).

49. Robison, C. Dean, "Arlington House," Arthur Beard Engineers, Inc., 1979 (unpublished manuscript on file at the TNC-DSC-NPS).

50. Robison, C. Dean, "Arlington House: South Wing Roof Investigations," Arthur Beard Engineers, Inc., 1979 (unpublished manuscript on file at TNC-DSC-NPS).

51. Letter from Robert E. Lee to his wife dated July 1, 1855, and preserved in the Arlington House Main Data File.

52. Report of architect L. M. Leisenring to the quartermaster general, undated c. 1931 (on file at the Arlington House office).

53. Drawing #2.3 dated 1930 at the National Archives.

54. Drawings #2.3-97-1, 2, 3 at Arlington House.

APPENDICES

APPENDIX I

COMMITTEE PAINT STUDY OF THE EXTERIOR

Agnes Mullins
John Sligh
Gary Scott

Legislation (Pub. Res. 74, 68th Congress, March 4, 1925) directs the restoration of Arlington House to the appearance it had when it was last the home of Robert E. Lee and his family, 1860-61.

Marbleizing Colors

The portions of the house which were marbleized in 1860-61 are shown in the remarkable collection of photographs made chiefly by the Army Signal Corp in 1864 and supplemented by private photographs of officers posed on the portico 1861-1865. Prints and copy negatives are available from the Arlington House photographic file and/or the National Archives. (B6246 N.A., B1762 N.A., CN5654, BA1502 N.A., CN972 N.A., CN969 N.A., & CN6799 N.A.)

Documentary descriptions of the exterior of the house are limited. A soldier stationed at the site during the Civil War wrote home describing the house as "white". Early in the 1870s the house is described as having recently received a "yellow wash." Monthly cemetery reports record the columns replastered, the exterior "Kalsomined" and a yellow wash coat of paint applied to the patched exterior of the mansion in 1884. A former Arlington servant, "Uncle Jim" Parks told quartermaster corps' officers in 1929 that the building had been painted with "a sort of whitewash" with yellow trim but his recollection was questioned.

Physical evidence was sought before the exterior painting in 1955-56; 1964-66; and 1974. Analysis of paint samples taken yielded only circumstantial evidence of a marbleizing color. In 1966 the color was based primarily on the photographic evidence. In 1973 the color was based on inconclusive physical evidence and the judgement from the photographs that the marbleization resembled Dove marble and fell into the gray-white area.

Paint sample #331 was taken before the 1974 painting by Dave Murphy. This sample has been layered and a deep yellow ochre containing red streaking is located six layers of paint above the wood taken from the entablature of the portico. The first coat of paint would have been placed on this part of the house c. 1818-1820 when the center of the house was completed. The sixth coat of paint from the wood could have been the finish coat in 1860. If each paint layer stood alone, the trim would have been painted on the average of every seven years. The yellow ochre is the only color in the first eleven layers dark enough to have been the color shown in the marbleizing in the photographs of the entablature 1861-1871. It is significant that there is red streaking found in the layer in cross section. An 1828 description of Sienna Marble states "The ground colour of Sienna marble is pure

yellow ochre. While the shading colour is wet, the veins that are more removed red and a little prussian blue:..." (The Decorators', Painters' and Glaziers' Guide by Nathaniel Whitlock, London 1828 - L.C. #NK 2175 WA). The complete layering of this paint sample (23-27 coats) indicated that it represents the full paint sequence placed on the entablature through 1966. Based on the above evidence, we recommend that the cornices and entablature finish color be yellow ochre. The part to be marbleized should have egg shell finish. The part to be left unmarbleized to be finished in semi-gloss.
Munsell - Custom Chip; Benjamin Moore GB-13

Pebble Dash Physical evidence is not conclusive but yellow ochre is present on old pebble dash.
Recommended: Munsell-Custom Chip; Benjamin Moore GB-13

Capitals and Columns Marbleization on the capitals and columns may be different from the entablature and cornice. The painting of the columns is differed by stabilization. The capitals, which seem lighter in Photograph BA 1502, could remain in base coat until the type of marble is determined.

Window Sashes, Conservatory Wood Trim, and Doors No physical paint chip was available for study. Photographic evidence indicated that they were all of a light color and probably off-white. An early off-white found on paint sample #327 was matched. This paint is on a shutter hinge which came from the frame of the north window on the west facade of the north wing. The doors, conservatory wood trim, all window frames except those of the arched windows appear light in the photographs. The off-white from #327 is recommended.
Munsell 2 5y 9/2 Benjamin Moore GB-30

Stucco - Samples examined: #321, #322-b, #332 and #333
#321 - Plaster from east facade of the main block at second floor level adjacent to south pilaster. This was taken from behind the 1964 stucco and was attached to the old brick. The number of coats of paint seemed too few (8) to represent a complete historical paint sequence.
#322-B-Plaster from recess above northeast window of the white parlor on east facade of the main block. There are insufficient coats of paint to represent historic sequence taken from a typical area.

#322 - Plaster from the west elevation of the north wing from the section under the north canopy. (This area was partially sand blasted before sampling). It is considered reliable only for colors near stucco. This sample was eliminated in favor of #333.
#333 - Plaster from the west facade of the north wing beneath the canopy above the southwest door to the cellar. This sample was cratered and cross sectioned. It seemed to be covered by 16 coats of paint. The sixth coat from the plaster seemed to exhibit the degree of lightness indicated by the paint on the stucco in photographs 1861-1865. (1650-520; CN5654; BA 1502 & CN 972)
Recommended: Munsell #10 yr 9/4 Benjamin Moore OP-5

Frames of Arched Windows in North and South Wings See Photograph 165-o-518 N.A. This indicates that frames match the stucco color.
Recommended: Munsell #10 yr 9/4 Benjamin Moore OP-5

The gutters and downspouts seem to match the stucco in photographs CN N.A. & CN 972 N.A.
Recommended: Munsell #10 yr 9/4 Benjamin Moore OP-5

Shutters Only two original shutters survive with any old paint colors. One is a louvered shutter XV from which paint samples #330, 313 and 314 were layered and studied. This shutter carried about 18 coats of paint but only the cream primer (1st coat) matched light enough to be the color in photographs (CN 969 N.A., CN 5634 & CN 972 N.A.). Shutter XVII is a panelled shutter from which paint samples #328, 315 and 316 were taken. This shutter had fewer coats of paint than the louvered shutter (11) but only one color, a gray, was light enough to have been represented in the photographs. This color appeared as a second and fourth coat. This is the same gray matched from the shutter for the 1974 painting of the house. Both the physical and photographic evidence is inconclusive but without other evidence we recommend that the gray be used again.
Munsell 5y 8/1 Benjamin Moore mix to the Munsell color chip

Canopies No physical evidence from the canopies carry the historic paint sequence. The presence of wire nails and uniform mill work indicate that the canopies have been reproduced since 1860, probably in the restoration by the War Department. Since there is no physical evidence, the photographs were used to evaluate the color intensity. (CN 969 N.A., & CN 6799 N.A.) Recommend that color match stucco.
Munsell #10 yr 9/4 Benjamin Moore OP-5

Window Sills The center of sills on the wings are natural Aquia sand stone (165-o-518). They should be restored to original 1861 appearance.

Window sills on the rest of the house seem to match the shutters except for the sills on the second story of the east facade of the main block of the house. These are very dark, matching in intensity of color the natural sandstone sills on the wings.

Recommendation: Investigation of paint samples taken from these areas to identify colors seen in the historic photographs and paint accordingly.

We wish to recognize the assistance rendered to this committee by Gary Thompson in layering samples, analyzing photographs, evaluating physical evidence, and matching colors.

Gary Scott

John Sligh

Agnes Mullins

NOTE: This committee was appointed to report the summarized conclusions as quickly as possible. One week's examination was made of the physical pictographic and documentary evidence on hand. We regret that the chemical analysis of the samples discussed in this report has not been completed and is not factored into the above recommendations. The paint study at Arlington House should be continued to provide documented recommendations for future interior and exterior painting of this important house.

APPENDIX II

REPORT ON THE INVESTIGATION OF THE EXTERIOR PAINTS: CONDITIONS AND TREATMENTS

ARLINGTON HOUSE, ARLINGTON, VIRGINIA

Prepared by Frank G. Matero, Architectural Conservator, North Atlantic Historic Preservation Center/NARO
July 1969

REPORT ON THE INVESTIGATION OF THE EXTERIOR PAINTS: ARLINGTON HOUSE, ARLINGTON, VIRGINIA

A. OBJECTIVE

An examination of the exterior paints of the Custis-Lee (Arlington) House was conducted on June 6, 1979, in order to evaluate the present conditions of the exterior finishes and to prepare recommendations for the cleaning, surface preparation, and repainting of the exterior.

B. DESCRIPTION

Site investigation (including surface moisture testing) and laboratory analysis of selected samples was conducted in order to determine the causes of the deterioration of the existing exterior finishes.

A review of the restoration files at the site and discussions with Mr. Lee Arnest of the National Capital Region Office, NPS, was undertaken in order to gain information about the historic finishes as well as the restoration/maintenance of the house over the years. According to views of the house (east facade) dated between c. 1967 and c. 1973 and correspondences on file regarding exterior paint investigation and analysis, it appears that the house was repainted twice during this period, the latter being the present finish (1973). In both instances, an alkyd resin-solvent thinned masonry paint (Re-Nu-It) was applied. In addition, the west (rear) and north facades were resurfaced in 1964. Photographic documentation indicates

that these areas were sandblasted and received a Portland cement stucco applied over inserted wire mesh.

Visual inspection of the exterior surfaces was made from the ground with the aid of field binoculars where necessary. Access to the portico entablature for inspection and moisture testing was conducted on an extension ladder.

C. OBSERVATIONS ON THE EXTERIOR FINISHES

Examination indicated that in general the exterior paint film is in sound condition; however, localized adhesion failure, characterized by peeling, blistering, and surface checking was observed in the areas outlined below:

Central Block: East facade (figs. 1 & 2)

a. portico cornice and pediment soffit,
b. column capitals
c. column shafts; upper third of eastern exposure,
d. south portico pilaster (southern exposure),

South Wing: East facade (fig. 3)

a. Detail.

General:

a. all window sill ledges and water table.

Paint failure in these areas can be attributed to several factors: improper surface preparation and paint application, unusual weather exposure, and faulty construction detailing. No indication of the deterioration of the paint film itself was observed due to masonry alkalinity or improper paint selection.

1. An examination of the wooden cornice and entablature of the portico exhibited an excessive build-up of paints characterized by severe peeling, cracking, and cross-grain checking (Figs. 2 & 4).

These conditions can be attributed to the differential expansion and contraction between the many paint layers and the wood substrate. In addition, these openings have allowed water to penetrate and swell the wood fibers thus breaking the bond between the paint and wood and causing further deterioration of the paint film.

2. The elastomeric sealant used to caulk the joints in the cornice area has lost its adhesive qualities and has pulled out of the joints thereby allowing water access into the wood and behind the paint film.

3. Moisture meter readings taken in this area indicated an unacceptable (approx. 15%) moisture content in the wood. Even higher readings (15-20%) were found in the lower architrave area and the abaci of the capitals. This high moisture condition has caused excessive peeling and general rot in this area and can be attributed to the retention and absorption of water caused by a metal flashing sleeve which was installed over the tops of each capital and around the lower edge of the architrave (Fig. 5).

4. The most widespread example of adhesion failure found on the masonry and wood surfaces was observed as a consistent peeling between the last finish coat and the present primer-finish coats. This

condition can be attributed to improper surface preparation or incorrect paint application at the time of the last repainting (1973).

5. An examination of the window sills and upper ledges of the water table indicates severe blistering and paint film deterioration due to water penetration. Poor run-off detailing, minor structural cracking, and inflexible paint build-up are responsible.

6. In addition to the factors already cited, it is important to note that the heaviest concentration of peeling and blistering on both the wood and masonry has occurred on the unprotected south facade where extreme temperature cycling has accelerated the deterioration processes.

D. RECOMMENDATIONS

In order to correct the problems cited as responsible for the deterioration of the exterior paints, a comprehensive preservation/maintenance program should be developed and carried out as outlined below.

1. Surface Preparation

a. General

Proper surface preparation is extremely important to the success of any paint job. Without proper surface preparation, peeling and blistering of the paint may occur soon after the painting. If the old surface coatings are sound and show no peeling or blistering, they may

be repainted readily after cleaning and repair of cracks and breaks. If the surface shows extensive flaking and peeling, then it will be necessary to remove the old coating completely. This will provide a firm surface to which paints will adhere. Before repainting, all surfaces should be washed with a non-ionic detergent.

b. Wood

The preparation of previously painted wood surfaces is more difficult than for new surfaces. The substrate, together with any coats of paint that may be on it, is the foundation for the new coating and must be in sound condition to support it. Paint removal is therefore essential and should be conducted in those areas where the paint is no longer well-bonded. Total paint removal destroys the historic record of paint colors and painting techniques (marbleizing, graining, etc.). It is therefore strongly recommended that paint not be stripped off those areas where it is securely bonded. After removal, but before repainting, areas should be photographed to show future researchers where old paint remains.

Methods of paint removal should be selected which are most appropriate for each location. Areas of peeling and flaking paint can be best removed by careful scraping and brushing to avoid any damage to delicate moldings or carved detailing. Conditions such as checking or alligatoring which also require complete removal can best be accomplished by the use of a non-alkali (organic solvent) paint stripper or an electric rod burner. Under no conditions should a high temperature hot air gun be used due to the potential fire hazard involved.

Those areas found to have a high moisture level should be closely examined after scraping and a search made to determine the source of water penetration. Although no blistering or peeling could be traced directly to a faulty gutter system, this system should nevertheless be examined in order to avoid future problems. It is recommended that the sheet flashing be removed from the abaci of the portico capitals in order to inspect and treat (if need be) the wood. After thorough drying, a low-viscosity epoxy (such as Seep and Seal, Arcon Products) used in conjuction with a water-repellant-wood preservative is advisable in these areas. Should new flashing be required, it should be designed to shed rather than retain moisture and be as inconspicuous as possible.

c. Metal

During inspection of the building, it was observed that the echini of the portico capitals were constructed (or sheathed?) in a sheet metal presumably galvanized iron. Although only 1-2 layers of paint were evident, these had peeled due to improper surface preparation of the metal. In order to insure secure bonding of the new paints, the best method of paint removal and cleaning for these areas is by low abrasive blasting. Tests should be carried out in order to determine the abradability of the metal and the type of abrasive selected.

d. Masonry (Stucco)

Microscopic examination of selected paint samples removed from the stuccoed walls and columns indicates in general that most of the

previous paints were either removed or weathered (chalked) off over time. A heavy paint build-up was observed in the interstices of the coarse aggregate stucco of the raised basement. The earliest masonry paint layers found with any consistency were ochre washes believed (according to architect Arnest) to date to the late 19th century.

Proper surface preparation is essential if the masonry is to be repainted. An examination of the exterior surface indicates that most of the previous paints are sound and have only lightly chalked. As mentioned earlier, areas of peeling and flaking between the previous finish coat and the present primer exist due to improper surface preparation. Hand brushing with non-ferrous brushes will remove loose paint. Controlled field testing needs to be executed in order to assess the best method of paint removal.

All surface cracks and stucco loss need to be repaired prior to repainting. Surface cracks should be opened up in order to better receive the patching mix and be cleaned of all dirt and loose debris. Curing time for all new stucco work should not be less than 30 days to allow sufficient though probably not complete carbonation of the lime before painting.

2. Painting

a. Wood

In order to insure a durable and well-bonded protective paint finish on all exterior wood elements at Arlington House, it is strongly recommended that a traditional three-coat penetrating linseed oil primer system be applied as outlined below:

1. Apply by brush two thin coats of thinned raw linseed oil: First coat-50% raw linseed oil; 50% mineral spirits. Second coat-75% raw linseed oil; 25% mineral spirits.

2. After each application, rub linseed oil into the wood with burlap. This pushes the oil into the wood fibers.

3. Next apply one coat of paint: 75% finish paint or adjust to the weather. Add one-eighth teaspoon of Japanese Drier or Pratt and Lambert Drier on cloudy days.

4. Apply one coat of finish paint(s) thinned for brush mobility.

Both primer and finish paints should be an alkyd oil type. A fairly hard 'trim' alkyd should be used for all exterior woodwork (including shutters) so that chalking does not occur onto the masonry surfaces.

b. Metal

Should the metal-sheathed echini of the portico capitals prove to be galvanized iron upon closer inspection, then a chemical pre-treatment should be applied prior to repainting. After surfaces have been mechanically cleaned with either low abrasive blasting or wire brushing, a commercially available phosphate-phosphoric acid wash is recommended. After pre-treatment, a two-coat primer-finish system should be applied. In order to insure adhesion, a linseed-oil-zinc dust primer is recommended over a traditional alkyd primer.

c. Masonry

As mentioned earlier, there is no indication that the alkyd resin paint applied during the last two repaintings has failed due to vehicle breakdown by alkali attack. Discussions with Mr. Gene Goldsmith, Exhibit Specialist, National Park Service, have also verified the high quality performance of this paint when applied properly according to the manufacturer's directions.

Since it appears that very little new masonry work will be required, the use of an alkali-resistant coating (latex water-thinned emulsion) is unnecessary. Moreover, switching to a latex emulsion system may impair penetration of the new coat into the old alkyd-oil where well-adhered previous paint remains. A penetrating type surface conditioner, supplied by the same manufacturer of the finish paint, should be applied to these surfaces in order to strengthen and bind the previous paints to the underlying masonry surface.

It is essential that the paint manufacturer's directions be followed closely, particularly with regard to thinning, spreading rate, and application conditions, since all paints are not alike and surface conditions vary considerably.

d. Exterior Marbleization

According to early photographs of the house dated c. 1867, (Fig. 6) the present marbleizing appears to be fairly accurate in its overall

tonality, pattern location, and style. Lacking in the present restoration, however, are the beautifully marbleized panel insets above the first story openings on the main portico facade. These appear to have been painted out by the turn of the century as indicated in a southeast view of the house taken in 1904. A comparison of values between the stucco walls and coarse aggregate raised basement in the 1867 photograph indicates that the basement story of the wings was painted a darker color than the rest of the masonry. In addition, it is interesting to note that by 1867 the west (rear) facade and chimneys were still exposed brick, and did not receive a stucco finish until some time before 1904.

According to a memo (June 18, 1973) concerning the exterior painting of Arlington House, no evidence of the original or 1867 stucco paint was found. Trim and entablature colors were reproduced based on surviving paint drips found under a molding on an original shutter.

It is this author's opinion that before the exterior is repainted again, an extensive paint investigation and analysis should be performed in order to determine the original colors. Sufficient photographic documentation of the exterior of the house exists to identify surviving features of the house and aid in the dating of the paint layers.

E. RECOMMENDATIONS SUMMARY

Obviously several approaches are possible for the restoration of the exterior paints at Arlington House. Based on the conditions and

treatments already discussed, it is this author's opinion that the entire exterior need not be repainted at the present time. After specified problem areas have been prepared for repainting, the marbleizing could be in-painted by skilled professionals. As summarized below:

1. Prior to repainting, all surfaces should be washed with a mild non-ionic detergent that rinses clean leaving no film. Washing should proceed from top to bottom using sponges followed by a final rinse with clean water.

2. All construction details suspected of causing water penetration should be examined and repaired or replaced if necessary. This includes the roof and gutter system, all caulking, flashing, and exterior stairway construction.

3. All exterior woodwork including the entablature, cornice, doors, windows, enframements, and shutters should be repaired, consolidated, prepared, and repainted. Paints in these areas were found to be the most deteriorated and/or subject to excessive weather or wear.

4. Only those areas of the exterior masonry where the paint is poorly bonded and/or surface cracking and stucco loss has occurred should be repaired, prepared, and repainted.

5. A comprehensive preservation/maintenance program should be established including an inspection and washing of the exterior surfaces as described in Item 1 every six months.



Figure 1: Central Block, East Facade (July, 1979)



Figure 2: South Side of Portico (July, 1979)



Figure 3: Detail of South Wing, East Facade (July, 1979)



Figure 4: North End of Portico (July, 1979)

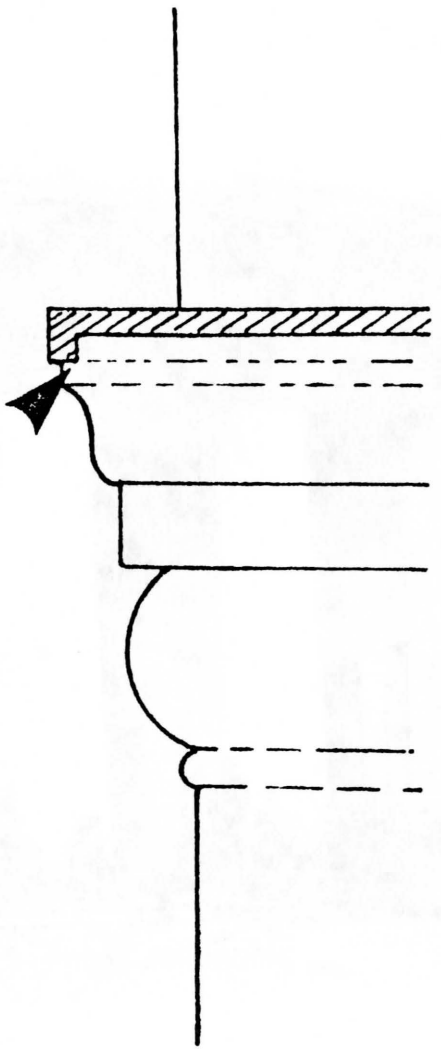


Figure 5: Representative portico capital showing metal flashing sleeve installed over the echinus. Arrow indicates point of greatest water penetration.



Figure 6: Portico, 1867.

RE-NU-IT CORPORATION

315 WEST 39th STREET • NEW YORK, N.Y. 10018

(212) 279-7029

March 21 1979

Mr. H. Lee Arnest, III
Project Architect
Branch of Historic Preservation
United States Dept. of the Interior
National Park Service
Washington, D.C. 20240



RE: GEORGE WASHINGTON MEMORIAL PARKSWAY
PACKAGE NO.506, HISTORIC STRUCTURES
ARLINGTON HOUSE (H30-DSC-TNC)

SUBJECT: PAINT SAMPLES FROM ARLINGTON HOUSE.

Dear Mr. Arnest:

This will serve as a formal acknowledgement and report of your letter of February 9th, in which you enclosed samples of peeled material taken from the above building; also the writer's visit and personal inspection on March 6, 1979.

Laboratory examination of the samples sent in and personal inspection of the job proved conclusively the difficulty is not due to a product failure. Our recommendations for recoating this building are as follows:

1. All loose scale and peeling paint and any material that does not have a tight bond should be removed down to the bare surface. This may be accomplished by hand scraping, wire brushing and the use of a belt sander.

2. All cracks and openings up to 1/32nd of an inch should be patched with RE*NU*IT Exterior Wall REsurfacer (textured material). This should be done by forcing same in with a putty knife and simultaneously brushing over. Any wider cracks should be patched with suitable caulking compound or masonry patching compound as the surface requires.

3. All areas that are down to bare masonry and have been patched, should be spot primed by brushing on a coat of RE*NU*IT Exterior Wall Coating, which is a smooth finish. This coating should be allowed to dry for a minimum of 36 hours before the prime and finish coats are applied.

4. PRIME COAT- After the areas to be treated have been prepared, a prime coat consisting of one coat of RE*NU*IT Exterior Wall Coating brushed on should be applied on the prime coat. A minimum of one gallon of RE*NU*IT Exterior Wall Coating is to be used per 100 square feet.

5. FINISH COAT- After the prime coat is thoroughly dried and a minimum of one week has elapsed, the finish coat may be applied. RE*NU* IT Exterior Wall Coating should be applied by brushing using a minimum of one gallon per 150 square feet.

6. SPECIAL INSTRUCTIONS: NO THINNING OF THE RE*NU*IT EXTERIOR WALL COATING SHOULD BE ALLOWED, WHATSOEVER. Also your specifications should include caulking of windows and other essentials connected with an exterior coating job.

Preparation is the major part of this job. As discussed during my visit, we heartily recommend and cannot over-emphasize the fact that instead of this work going out on bid to an outside contractor the job be done by your own maintenance crew. You have people who are thoroughly experienced with the proper application of these materials and by doing the work with your own crews you should be assured of proper preparation and application.

Very truly yours,

RE-NU-IT CORPORATION

A. H. Hardy
President

AHH:sc

UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

Action	NATIONAL CAPITAL TEAM APR 10 1980	Info	Initials
	Asst Mgr. TNC		
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✓	PIFS (make a)		
✓	Central Files		

April 4, 1980

MEMORANDUM FOR Lee Arnest
National Park Service
Falls Church, Virginia

From: Paul G. Campbell PGC
Building Materials Group

Subject: Examination of the Curtis-Lee Mansion

This memorandum, for the record, concerns our inspection of the Curtis-Lee Mansion on March 21, 1980. Reviewing the structure and coating systems used, the following items are of interest:

- The building exterior is of stucco over brick.
- The columns were stucco over brick also. However, the capitals were of metal and wood. The brick shaft was coated with a black pitch-like substance before being stuccoed.
- Most of the building was restuccoed in 1965.
- Painting was in 1965 and 1973 using a textured "Renuit" coating. A "marbleized" finish was used as part of the finish coat.
- Rollers were used instead of brushes for the 1973 paint application.

Most of the paint failures appeared to be on the outer portions of the portico and columns and the east elevation. Other than having isolated paint failures, the other elevations were in good condition, especially the south elevation. The east elevation protected by the portico was of relatively good appearance. Examination of selected areas of paint failure indicated that the 1965 paint layer had alligatored and chalked. This could have accounted for some of the paint failures observed. Also, the 1973 paint layer was 10-20 mils which may have incurred some stress to the existing paint layers. Noticeable areas of spalling were noted on the columns which would have to be repaired before any repainting is undertaken.

In my opinion, the best course of action would be to remove all old paint (1965 and 1973) before repainting. I am biased towards a technique using paint stripper to soften the old paint and then applying high pressure water spray. The process would be repeated until all the paint would be removed. Another effective technique, potentially lower in cost, would be the use of walnut shells or similar type abrasives for an abrasive blast cleaning operation. Dave Henderson, NPS (FTS 8-234-6112), found this technique effective and you may wish to contact him about this method. Other variations on the abrasive blasting technique would be using sand at low pressures or a water-sand abrasive blasting. In any event, a test area should be used for paint removal and the results examined for both effectiveness of paint removal and preservation of the stucco substrate. Care should be exercisized where the soft brick exposed by spalling would be subject to abrasive blasting.

After the paint is removed, necessary repairs may be made to the exposed substrate. The alkaline mortar/grout should be cured before painting. I feel that a two coat application of an acrylic emulsion paint, e.g., F.S. TT-P-19, applied at 250 to 300 square feet per gallon should provide a durable finish.

Photographs were taken of the problem areas and these will be available. If you have any questions, please contact me at 921-3114.

PGC:jb

APPENDIX III

PLASTER STUDY

Denver Service Center

ARLINGTON HOUSE

PLASTER ANALYSIS

On November 3, 1980 ten samples of plaster removed from the interior walls of the north wing of Arlington House were sent to the Denver Service Center as part of the fabric analysis conducted in conjunction with the Historic Structure Report. Chemical analysis of the samples was conducted by Greg Koehn, private contractor, utilizing the testing methodology developed by the North Atlantic Regional Preservation Center of the National Park Service in Boston, Massachusetts. Interpretation of the results and report-writing was undertaken by David Arbogast, historical architect, of the Denver Service Center. The purpose of the analysis was to determine approximate dates and types of plastering used in the house. In some locations as many as three sets of brown and skim coats were applied to the walls with paint finishes located on intermediate skim coats, as well as the most recent skim coat. The brown and skim coats were separately analyzed, where possible, because of the considerable differences in composition. Thus, a total of eighteen samples were analyzed.

The samples were located and numbered by Lee Arnest, historical architect, of the Denver Service Center, and Mrs. Mullins, Site Curator. The sample numbers and locations are as follows:

1A. Pl-1. Custis Chamber, Room 106, East Wall, Outside Layer, Skim Coat.

1B. Pl-1. Custis Chamber, Room 106, East Wall, Outside Layer, Brown Coat.

2A. Pl-2. Custis Chamber, Room 106, East Wall, Layer Under Top Layer (Pl-1), Skim Coat.

2B. Pl-2. Custis Chamber, Room 106, East Wall, Layer Under Top Layer (Pl-1), Brown Coat.

3A. III. Custis Chamber, Room 106, North of Window, North of Red Painted Patch, 0.5" Below Chairrail, Scar, Skim Coat.

3B. III. Custis Chamber, Room 106, North of Window, North of Red Painted Patch, 0.5" Below Chairrail, Scar, Brown Coat.

4. II. Custis Chamber, Room 106, East Wall, North of Window Below Chairrail Level, North of Flue Hole, 10" Below Chairrail, Scar, Plaster from Brick to Red Paint.

5A. Inner Hall, (North Wing), Room 105, West Wall, Chimney Breast Below Chair rail Level, North of Flue Hole, 10" Above B.B. Scar and South of North Edge of Chimney, Removed in One Piece, Brown Coat.

5B. IV. Inner Hall, (North Wing), Room 105, West Wall, Chimney Breast Below Chair rail Level, North of Flue Hole, 10" Above B.B. Scar and South of North Edge of Chimney, Removed in One Piece, Brown Coat.

6. V. Inner Hall, (north wing), Room 105, West Wall, Below Chair rail Scar, South of Chimney Flue, Between Brick Masonry and Paper.

7. VI. School and Sewing Room, Room 104, West Wall, South Side of Door to Parlor, Above Chair rail, Between Brick Masonry and Skim Coat.

8. VII. Inner Hall, (north wing), Room 105, South Wall, Fill from Chairrail Scar.

9A. VIII. Inner Hall, (north wing), Room 105, West Wall, South of Window, North of Door, from Wall Scar, Paper Found in Layering Above Scar Fill, Between Brick Masonry and Skim Coat, Skim Coat.

9B.VIII. Inner Hall, (north wing), Room 105, West Wall, South of Window, North of Door, from Wall Scar, Paper Found in Layering Above Scar Fill, Between Brick Masonry and Skim Coat, Brown Coat.

10A. IX. Inner Hall, (north wing), Room 105, South Wall, Between Pier and West Door Casing at Door Top Level to Family Parlor, Skim Coat to Brick Masonry, Skim Coat.

10B. IX. Inner Hall, (north wing), Room 105, South Wall, Between Pier and West Door Casing at Door Top Level to Family Parlor, Skim Coat to Brick Masonry, Brown Coat.

11A. X. Inner Hall, (north wing), Room 105, South Wall, Pier, 6'-8" Above Floor, 2" from West Wall, Skim Coat to Brick Masonry, Skim Coat.

11B. X. Inner Hall, (north wing), Room 105, South Wall, Pier, 6'-8" Above Floor, 2" from West Wall, Skim Coat to Brick Masonry, Brown Coat.

Sample 1A, the most recent skim coat from the Custis chamber, revealed a mixture of eleven parts of sand, by volume, to seven parts of lime, by volume. The relatively high proportion of lime to sand is typical of nineteenth century plaster skim coats. The use of gypsum plaster did not attain general popularity until the twentieth century, thus placing this plaster as possibly dating from the historic period.

Sample 1B, the brown coat associated with the skim coat of sample 1A, displayed a typical nineteenth century mix of roughly five parts of sand to each part of lime, by volume, with horsehair used as a binder. This is a relatively typical nineteenth century plaster mix for brown and scratch coats.

Sample 2A, found below the most recent plaster of the Custis Chamber, contained, in its skim coat, a slightly higher ratio of lime to sand than that found in sample 1A, but not significantly higher to indicate any difference in original specifications between the two. It is possible, because of their similarity, that they may have been applied by the same plaster or specified by the same builder.

Sample 2B, the brown coat associated with the skim coat of sample 2A, exhibited a formulation of approximately three parts of sand, by volume, to each part of lime, with horsehair used as a binder. Again, this is a common type of plaster used for scratch and brown coats throughout the nineteenth century.

Sample 3A, also from the Custis Chamber, showed, through analysis, a mixture roughly comprising five parts of sand to two parts of lime, by volume, with horsehair used as a binder. Its mixture and

location in relation to sample 3B single it out as probably being a brown coat applied during the nineteenth century. It is also possible that it may have been a very early skim coat, lacking the high lime content and whiteness of the later skim coats.

Sample 3B, the plaster coat beneath sample 3A, appears to have been a scratch coat of plaster applied during the nineteenth century. Its analysis revealed a mixture of roughly twenty parts of sand, by volume, to three parts of lime, with horsehair used as a binder. The extremely high sand content accounts for the softness of the plaster. Such plaster could only have been used as a scratch coat.

Sample 4, located also in the Custis chamber, revealed a mix with a slightly higher lime content than that seen in sample 3A. For all intents and purposes, however, they are the same plaster with the only exception being that sample 4 lacks horsehair as a binder.

Sample 5A, the skim coat from the chimney breast of the inner hall, (north wing), displayed a mixture of roughly five parts of sand to four parts of lime, by volume, with horsehair used as a binder. With the exceptions of the horsehair content, this plaster is a relatively typical mix for the nineteenth century.

Sample 5B, the brown or scratch coat beneath sample 5A, contained roughly thirteen parts of sand to two parts of lime, by volume, with horsehair used as a binder. This mix is approximately identical to that found in sample 3B.

Sample 6, also from the west wall of the inner hall, (north wing), exhibited a formulation of approximately two parts of sand to each part of lime by volume with horsehair used as a binder. A typical nineteenth century brown or scratch coat mix, this plaster may well date from the original construction of the house.

Sample 7, the only sample removed from the school and sewing room, showed, through analysis, a mixture, by volume, of approximately five parts of sand to each part of lime with horsehair as a binder. This provides a relatively soft mix suitable as a brown or a scratch coat.

Sample 8, located on the south wall of the inner hall, (north wing), appears to have been a standard nineteenth century brown or scratch coat, having approximately six parts of sand to every part of lime, by volume, with horsehair used as a binder. This mix is within the ranger seen for brown and scratch coats.

Sample 9A, a skim coat in the inner hall, (north wing) revealed a typical mixture of approximately four parts of sand, by volume, to three parts of lime with no horsehair used. This plaster is similar to many of the other skim coats analyzed.

Sample 9B, the brown or scratch coat associated with sample 9A, displayed a composition of equal parts of sand and lime without horsehair. This mix is quite unusual for a brown coat with such a high lime content. The sample analyzed may have been an anomaly.

Sample 10A, also a skim coat from the inner hall, (north wing) contained approximately four parts of sand, by volume, to each part of lime without horsehair. This mix contained an unusually high proportion of sand to lime for a skim coat, not unlike sample 3A.

Sample 10B, the brown or scratch coat associated with sample 10A, exhibited a formulation of five parts of sand to each part of lime, by volume, using horsehair as a binder. This mix is similar to 1B and sample 7.

Sample 11A, yet another skim coat from the inner hall, (north wing), showed, through analysis, a mixture which was highly unusual, containing approximately thirty parts of lime, by volume, to each part of sand. The small sample size, a product of thin layer, leads to statistical problems. It is also possible that the sample may have been an anomaly out of an otherwise consistent plaster having considerably less lime per sand.

Sample 11B, the brown coat beneath sample 11A, provided a much more typical mixture when analyzed. Its formula was almost the same as that seen in samples 1B, 7, and 10B.

When plotted as a statistical chart, the plaster samples provide an interesting range. The chart shows a clear difference between mixes used generally for skim coats and those used for brown coats. The chart is on the following page.

Lime Parts (column down) Sand Parts (column across)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	9B	6*			7,	10B*																							
2																													
3					9A													8*			3B*								
4																					11B*			5B*					
5																					10A*			1B*					
6																													
7											1A																		
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28																													
29																													
30	11A*																												

*Horsehair

From the above chart it can be seen that the brown and scratch coats of plaster tend to be grouped near the upper right side of the chart, indicating a generally higher proportion of sand to lime than the skim coats. In addition, the horsehair tends to be associated with those samples at the right upper side, indicating that the skim coats did not employ horsehair as a binding agent as a rule.

In all cases, the sands and fines resulting from the analysis were virtually identical, indicating similar material sources for all of the samples. The fines can be seen as being dirt associated with the original sand and not as an additive, as is the case with pigmented or Portland cement mortars.

These samples provide a reasonable indication of the ages of the various layers of plaster in the north wing. Comparison of these results with written historical records is suggested. Further analysis might also be conducted with samples from the center block and the south wing, as well as the mortar used in the brick masonry. Often similar, if not identical, mixtures were used in mortar and plaster alike.

APPENDIX IV

WALLPAPER STUDY

Ann F. Clapp

Winterthur Museum

December 1, 1980

Mrs. Agnes Mullins
Staff Curator
National Park Service
George Washington Memorial Parkway
Turkey Run Park
McLean, Virginia 22101

Dear Agnes:

At last these analyses come your way. I hope that you can make something out of them which will help in the restoration of Arlington House. There is a sameness to the findings which may be disappointing. All the papers, except Acc. No. 847, are handmade with block printing. One could not tell from the evidence of the papers whether they were mounted on the walls in 1804 or 1817. They all are of the same vintage, however. As you know, machines for making continuous rolls of paper were in use by the early years of the 19th century. But wallpaper makers were slow to adopt them. There are handmade wallpapers of the sort used at Arlington House which date even as late as the 1840's. One thing is certain, the papers of Arlington House date well before 1857-60 when General Lee made his improvements. The character of the design indicates the early 19th century.

The same dating problem exists for block printing of wallpapers. It lasted into the 1840's before the introduction of roller painting took its place. If larger sections of the paper can be uncovered, it might be of some value to try to determine the manner of applying the ground coat of paint. The earliest method was to brush it on by hand. In the first of the 19th century, application by machine was instituted.

The rough plaster which was applied over the papers is of no great help either. It too is nearly the same for all the specimens. The pleasing warm tone may be a clue that the plaster was made from very locally obtainable materials. If the plaster below the wallpapers has the same composition as that above, this possibility could be substantiated. If the use of a layer of finish plaster, as in the Custis Bedroom, can be found to be characteristic of a later renovation, the lack of it could indicate an earlier date. You will notice that the finish plaster from the Bedroom has several layers of paint between it and the paper. If, by pure guess, the finish plaster layering could be dated to the 1857-60 period, possibly 10 to 20 years may have intervened before the blue paper was applied, making its use around the time when the House was sold to the U.S. Government.

I am sending everything back to you, contrary to our suggestion on the telephone. You may need the samples while considering the comments upon them. Should your examination together with your knowledge of the history of the house, find some facet which further examination of the samples could clarify, please do send them on and I shall search them for a possible answer. I am sure that they can be packed securely to travel safely, and thus save you a long trip under what could become troublesome road condition.

- continued -

Do let me hear further from you. Inspite of the facts that it has taken me so long and that the results are not exciting, the examination of your specimens, drawings and photographs has been great fun.

Sincerely,

Anne

Anne F. Clapp
Print & Paper Conservator

AFC/fas

Enclosure

Fragments of Wallpaper from Arlington House:

Acc. #839 Fragments of paper found under the present top coat of plaster. The plaster layering at the point where this paper is found is from the outer surface to the brick:

1. Finish Plaster
2. Coarse Plaster (possibly 2 coats)
3. Paper
4. Coarse Plaster
5. Brick Wall

Most of the plaster above this paper remains in place awaiting the arrival of a paper conservator to remove it. Any suggestions you may have regarding possible techniques for removing the covering plaster from the paper would be most welcome. We have not yet found anyone who has worked with removal of plaster from the face of wallpaper. We wish to remove the plaster leaving the paper in place.

2 fragments of paper - unattached
3 fragments of paper - attached to plaster

Acc. #847 - This small piece of paper attached to plaster was found in the east wall of the Custis chamber in a hole near the window on its south side.

Acc. #842 - graining design and black and white
1 fragment attached to plaster
1 fragment removed from plaster
2 fragments like the first but not attached to plaster
2 fragments black and gray-white
The graining design is found on coarse plaster which is on the brick.

Acc. #846 -
1 fragment of graining not attached to plaster - found below the chair scar and above the baseboard scar.
1 fragment of circular frame found above the chair rail scar, 40" below the ceiling and 18" north of the south chimney edge.

Acc. #848 - Plaster painted red found at the same level as the grained paper but in an adjoining room if contemporary with the old, no longer extant wall. Could this pigment be analyzed and compared with pigments used on the paper.
4 fragments of plaster with red paint

Scaled drawings:
Floor plan of the North Wing - First Floor
Floor plan and Wall Elevations - Inner Hall, North Wing
Elevation of chimney wall - locating wall paper fragments

Photographs: 10 photographs and 3 slides.

FRAGMENTS OF WALLPAPER--HOUSE, West Wall of Inner Hall, North Wing

Acc. No. 839 found under several layers of plastic half-way up the wall.

As submitted to the Winterthur Paper Laboratory:

A. Rough plaster
   1) Some fragments crumbled into small grains.
   2) Several small lumps some of which have fragments of paper clinging to them.
   3) A large piece with a smooth surface to which a largish piece is attached (see B1 below).

   It is assumed that all the plaster submitted was found on top of the paper fragments. However, the paper is reported as having been applied directly to older (est.) rough plaster without a layer of finish plaster between.

B. Paper - besides the small bits of paper clinging to the lumps of plaster, there is:
   1) A largish piece of paper attached to the large fragment of plaster
   2) An unattached piece of paper

Analysis of materials:

A. Plaster - it is a rough plaster with a distinctive warm color. It is composed of:

   1) Particles of sand of a fairly fine uniform grit, some of which are nearly colorless, others vary from light gray to dark
   2) Occassional translucent plates of silica
   3) Calcium carbonate which has been given a warm tone (normally calcium carbonate is white)
   4) A generous use of animal hairs, pale red-brown to a darker brown color

B. Paper - none of the paper fragments show on their reverse any traces of the material upon which they were mounted.
   All of the paper is handmade laid paper whose fiber content is linen and cotton with considerable amount of scattered filling stock which is composed of shavings of dyed fibers.
   Most of these fibers are blue, although a few red and yellow shavings are present. The blue fibers which were examined are cotton. Some brown flecks are bundled fibers like jute. There are also scattered wood chips present.

This kind of paper and its content are typical of wallpapers of the early 19th century.

   1) The paper still attached to the plaster is undecorated and could probably be the border of the decorated paper, or, less likely, a lining paper.

2) The unattached paper bore a printed decoration, but the paint has flaked so extensively that the design cannot be determined.

C. Paint on Paper B2
The paper was first covered with a wash of an aqueous base coat, deep warm cream in color. The specimen was too small to tell whether this coat was applied by brush or rollers. The printing technique was block printing.

NOTE: The attached paper could be tooled away mechanically from the covering plaster by careful manipulation with a spatula, without the use of water or heat. Perhaps for the clearing of the plaster from a large area of paper, the rough plaster, which is quite dry and friable, could be reduced to a thin layer mechanically. Then the thin layer could be gently lifted off by flaking it away with a spatula, provided, of course, the design is not injured. If dry removal does not work, a cautious use of moisture may be needed, working small areas at a time.

Acc. No. 842, found between baseboard and chair rail.

As submitted:

A. Paper with a design resembling wood-graining in black, pale orange and red-brown.
1) Attached to plaster
2) Unattached
3) Unattached to plaster but obviously fallen away from a piece of rough plaster (see C1 below). It undoubtedly was a paper used to cover the dado area of the wall.

B. Paper with a design in black and pale blue-gray that was the border strip along the baseboard.

C. Rough plaster which has the design of the grained wallpaper transferred onto its surface.

Analysis of materials:
A. Paper - the paper is handmade "wove" paper whose fiber content is linen and cotton with a generous sprinkling of filler stock most of which are dyed blue. Section 1 has traces of adhesive on its obverse and a continuous cover of adhesive with no trace of plaster on its reverse.
The same is true of Section 3.
Section 2 has residues of adhesive and plaster powder on its obverse. On its reverse, one-half shows traces of adhesive and the other half has adhesive plus some grains of plaster sand. The dividing line between the two conformations is straight as though the paper lay at a junction or a discontinuity, as overlapping another paper or at the edge of the plaster.

B. Paper - handmade "laid" paper whose fiber content is the same as Paper A. It has two sections. One has clumps of rough plaster on its reverse with no traces on its obverse. The other has no traces on its reverse, but tiny residues of rough plaster clinging to two phases on its obverse. Both sections are crumpled. The crumples together with the mix-up with plaster could be explained if the paper lay at a junction as between the plaster wall and a wooden member.

Paint on the papers. Both papers have block-printed designs. Paper A has a red-brown base and Paper B a pale blue-gray. The pigments are consistent with early paints: the black is carbon black, the white is calcium carbonate and red-brown is red iron oxide, probably mixed with red lead.

C. Plaster - a thick piece of rough plaster whose composition is like that of Acc. No. 839.

It has the design of the grained wallpaper on one of its flat surfaces. When as a wet plaster it was applied over the paper, it must have acted as a poultice causing the top of the aqueous paint to transfer. Judging by the shape of the plaster's surface and the contours of the transferred design, it must originally have been on top of Paper A3.

On the face with the paint, the plaster surface is not smooth beyond the paint, suggesting that it could have been forced, or allowed to flow, into a crevice or corner between two surfaces.

It is very smooth on the surface away from the painted one and has an impression which could have been made by a metal object like a nail.

Acc. No. 846a, found below the chair rail and above the baseboard.

As submitted: a fragment of the wallpaper with the wood-grained pattern, roughly torn on all sides.

This paper is identical in all ways to Paper A of Acc. No. 842. Also, the Paper A section 2, half of its reverse has particles of plaster and the other half has not. Since the line of division is fairly straight, the conclusion could be that it too lay at a junction place between two building surfaces.

Acc. No. 846b, found above the chair rail and 40" below the ceiling.

As submitted: a tiny scrap of wallpaper which is designated as "circular frame."

It is a handmade paper whose fiber content is cotton and linen with a generous scattering of dyed fibers mostly blue. In other words, it is the same in content as the other wallpapers submitted (except that of Acc. No. 847). The fragment is too small to be certain, but it appears to be "laid" paper rather than "wove."

Acc. No. 848, found at the same level as the wood-grained paper but in an adjoining room.

Analysis of paint:

The paint pigment has a content of iron and is therefore probably a red-iron oxide. It is an aqueous paint.
All the paints on the wallpapers are also aqueous. The red pigment on the wood-grained paper has lead in its content as well as iron which could mean that it is a mixture of red lead and red iron oxide.

FRAGMENT from the east wall of the Custis chamber

Acc. No. 847, found in a hold near the south window.

As submitted: two scraps of rough plaster, one of which has a coating of finish plaster and is covered with a piece of blue paper.

Analysis of materials:

A. Rough plaster - although it is much thinner than the plaster found on specimens from the inner hall, it is the same warm color and composition. The mix seems a little richer in calcium carbonate.

B. Finish plaster - it is a layer of fine white plaster 2-4 mm thick composed of calcium carbonate.

C. Paint - there are about four layers of paint over the finish plaster which could indicate four separate painting episodes. The colors are well off-white, ranging from a pale pink-tan to a light yellow-gray. They appear to be aqueous. The white pigment in the mixture tests to be lead white.

D. Coating - on top of the paper is a brown unpigmented layer which probably is shellac since it is soluble in acetone but not in ethyl alcohol.

Comments on the Bell flower pattern

Judging from the photograph, it looks like the design that could occur in old paper. Like the fragments submitted it lies below the same layering of later plaster. It is hard to tell if it runs horizontally or vertically. If the former, its position 30 inches below the ceiling is confusing. Some old ceiling borders in the form of festoons often extend down some distance, but probably not as much as 30 inches. If it runs vertically, it could of course be part of a paper which had vertical stripes of ornamentation.

APPENDIX V

POTENTIAL DOCUMENT SOURCES

Agnes Mullins

POTENTIAL DOCUMENT SOURCES

Major depositories of documentary and pictorial collections containing information related to Arlington House and the people who lived there are listed. These depositories are designated for survey and monitoring for locations and copying material related to R. E. Lee and Arlington House for the Arlington House files.

California

The Huntington Library, San Marino

District of Columbia

*The National Archives
- Cartographic
- Census Records
- Military Records - Civil War Units, Personal Service Records - O.M.C. Records - Engineers Records
- Still Pictures Sections
- Washington, D.C., Wills and Inventories

*Library of Congress
- Manuscripts
- Music Division
- Prints and Photographs

The Columbia Historical Society
The D.C. Public Library - Washingtoniana Room
Peabody Room, Georgetown, D.C.
Georgetown University
- Archives
- Library

City Hall, District of Columbia
- Land Records
- Tudor Place - Peter Collections
- The U.S. Corp of Engineers, History Section - Library and Museum
- Bureau of Vital Statistics - D.C. Government
- District Court Records

Georgia

Fort Pulaski National Monument, Savannah

Maryland

Baltimore Museum of Fine Arts, Baltimore, Md.
Maryland Historical Society, Baltimore, Md.
Mt. Airy, Prince Georges County

Missouri

St. Louis National Historical Society, St. Louis

New York

The New York Historical Society, N.Y.C.
The New York Academy of Fine Arts, N.Y.C.
*The Library, Museum and Archives, U.S.M.A., West Point

North Carolina

*Library, Duke University, Chapel Hill

Texas

San Antonio Historical Society
The Fort Mason Historical Society

Virginia - Alexandria

Alexandria City Hall - Court Records
Christ Church
The Alexandria Association
*The Alexandria Public Library, Lloyd House
The Lee Boyhood Home
The Lee Fendall House

Arlington

Arlington County Court House
Arlington County Hist. Sq.
Arlington National Cemetery
Fort Myer
Henderson Hall

Charlottesville, Virginia

Alderman Library - U.Va.
The Lee-Jackson Foundation
The museum in the school of architecture, U.Va.

Fairfax, Virginia

The Fairfax County Court House
The Fairfax County Historical Society

Lexington, Virginia

Historic Lexington
*The Lee Collection at the U. of W. & L.
McCormick Library
Lee Memorial Chapel
The manuscript and pictographic collection V.M.I.
The Rockbridge County Court House
The Rockbridge County Historical Society

*Mt. Vernon

The collections of the Mt. Vernon Ladies Association of the Union.

New Kent County

The Court House
The Historical Society

Richmond, Virginia

Historic Richmond Foundation
Holleywood Cemetery
Lee House - 707 Franklin Street
The Association for the Preservation of Virginia Antiquities
The Museum of the Confederacy and The Confederate White House
*The Virginia Historical Society
The Virginia Museum of Fine Arts
*The Virginia State Library
The Valentine Museum

*Stratford, Virginia

The Collection of the R. E. Lee Memorial Foundation

*Important Related Collections

Compiled by: Agnes Mullins - Curator - Arlington House - 9/81

NORTH WING PHYSICAL INVESTIGATION

THE ARLINGTON HOUSE

GEORGE WASHINGTON MEMORIAL PARKWAY

by

S. Elizabeth Sasser

Technical Advisor

James S. Askins

Denver Service Center

Williamsport Preservation Training Center

July 1985

I. INTRODUCTION

This report details the findings of a program of limited destructive investigation in the north wing of the Arlington House, conducted in May 1985, by the Williamsport Preservation Training Center. The purpose of the investigation was to attempt to resolve questions relating to the origins and evolution of the north wing, raised by architectural features uncovered during structural stabilization work (1980-1981), and research for the Historic Structure Report (Architectural Data Section, Phase II, Arnest and Sligh, 1983). Extensive fabric removal in the course of the structural and investigative work revealed unanticipated evidence of a complex and largely undocumented history of construction changes.

It was determined on the basis of this evidence that the north wing existed in some form as a freestanding structure prior to completion of the central block and loggia; that the originally constructed first floor elevation was approximately five feet higher than the existing; and that there were major changes in openings, partition arrangement, and fireplace locations. However, integration of this evidence into an evolutionary sequence and chronology of construction is complicated by the obliteration of much early fabric in the implementation of the design program for the mansion as a whole, and in subsequent phases of alteration, repair, and attempted restoration. Primary architectural evidence usually found at floor and ceiling level was destroyed during the Department of the Army program of restoration (c. 1906-1929). Also, the continuity of architectural finishes was severely disrupted by general repairs and the introduction of plaster patches over expanded metal lath at all partition/wall intersections. Therefore, the extant evidence relating to early periods of construction is fragmentary and isolated in context. The current lack of sufficient historical documentation to support positive identification of period features, particularly those relating to the interpretive period (c. 1861), further complicates the interpretation of physical evidence.

In December 1984, at the request of the Park, the Williamsport Preservation Training Center conducted an evaluation of the physical evidence uncovered in the previous phase of work. After four weeks of onsite investigation by Jim Askins, Chief, WPTC, assisted by Historical Architect, Elizabeth Sasser and Preservation Trainee, Barry Caldwell, it was concluded that the evidence as it was then understood was insufficient to determine the original extent and form of the structure, or the evolution and dating of interior partition arrangements. Therefore it was recommended that additional, limited destructive investigation be completed, with the following objectives:

-- To establish the original building limits and siting of the north wing in its earliest configuration as a freestanding structure. This was felt to be a critical indicator of whether the building was a pre-existing structure of unknown function and appearance, adapted for use, or was constructed by GWP Custis as an element of the design concept for the mansion as a whole, as attributed to architect George Hadfield.

-- To determine the nature and location of any fenestration predating the existing, and to establish whether existing fenestration represents original construction.

-- To further establish the location and sequence of partitions predating the existing, and aid in developing other sequences in finish con struction.

This proposal forms the basis for the architectural investigation detailed in this report. It should be noted that this is not a comprehensive treatment of conditions in the north wing. The present work was completed in conjunction with the revision of the Historic Structure Report, Architectural Data Section, for which it is to serve as an addendum, dealing only with the issues outlined above. A number of questions relating to the dating of the loggia, bathroom, and the nature of interpretive period cooking arrangements were beyond the scope of the present investigation. Finally, the author gratefully acknowledges the assistance and many kindnesses shown by the entire staff of the Arlington House, particularly Staff Curator, Agnes Mullins, during the course of the investigation.

METHODOLOGY

The investigation procedure consisted of removal of an 8 inch wide band of plaster down to brick, extending completely around the interior of the perimeter wall of the north wing. The 8 inch width of the plaster band represents 3 courses of brick, which was felt to be the minimum necessary to identify construction joints or major changes in masonry rhythm. The height of the plaster band was set at approximately 90 inches above the existing floor, or 30 inches above the previous, higher floor level. This was done to intersect potential infilled openings relating to the earlier floor elevation. As the investigation proceeded, the height of the plaster band was adjusted upward slightly in several locations to avoid disturbing significant concentrations of extant wallpaper, and to maximize the potential for encountering infilled openings.

Plaster removal was completed one coat at a time on each wall. Representative samples of each plaster type were labeled with the area from which they were taken and accessioned by the Park into their permanent artifact collection. Several areas of plaster showing significant concentrations of wallpaper fragments were left in situ. Where incident wallpaper fragments were encountered within the confines of the plaster band, they were photographically recorded before removal. Every attempt was made to remove them with the entire thickness of plaster backing intact. These also were labeled and given to the Park to be accessioned.

PRESENTATION OF PHYSICAL EVIDENCE

The format chosen for the presentation of physical evidence was adopted for two reasons. First, to simplify discussion of the features by placing them in a visual context. The drawings were intended to highlight key features by reducing the mass of superfluous detail. Despite the limitations of recording a three dimensional space in two dimesions, it is hoped that the photographs will assist the reader in making an independent evaluation of the narrative analysis accompanying the drawings. Also, in the event that future treatment of the structure renders the physical evidence inaccessible, this approach provides at least a partial graphic record of existing conditions.

GLOSSARY OF PLASTER TERMS

series--an application of plaster in one or more coats, of which the outermost is intended as a finish coat in a specific period.

coat--a single layer application of plaster over a surface.

rough coat--the first coat in three coat plaster work. The term is used here in preference to the contemporary term "scratch coat" due to the fact that no raked base coats were found in the north wing.[1]

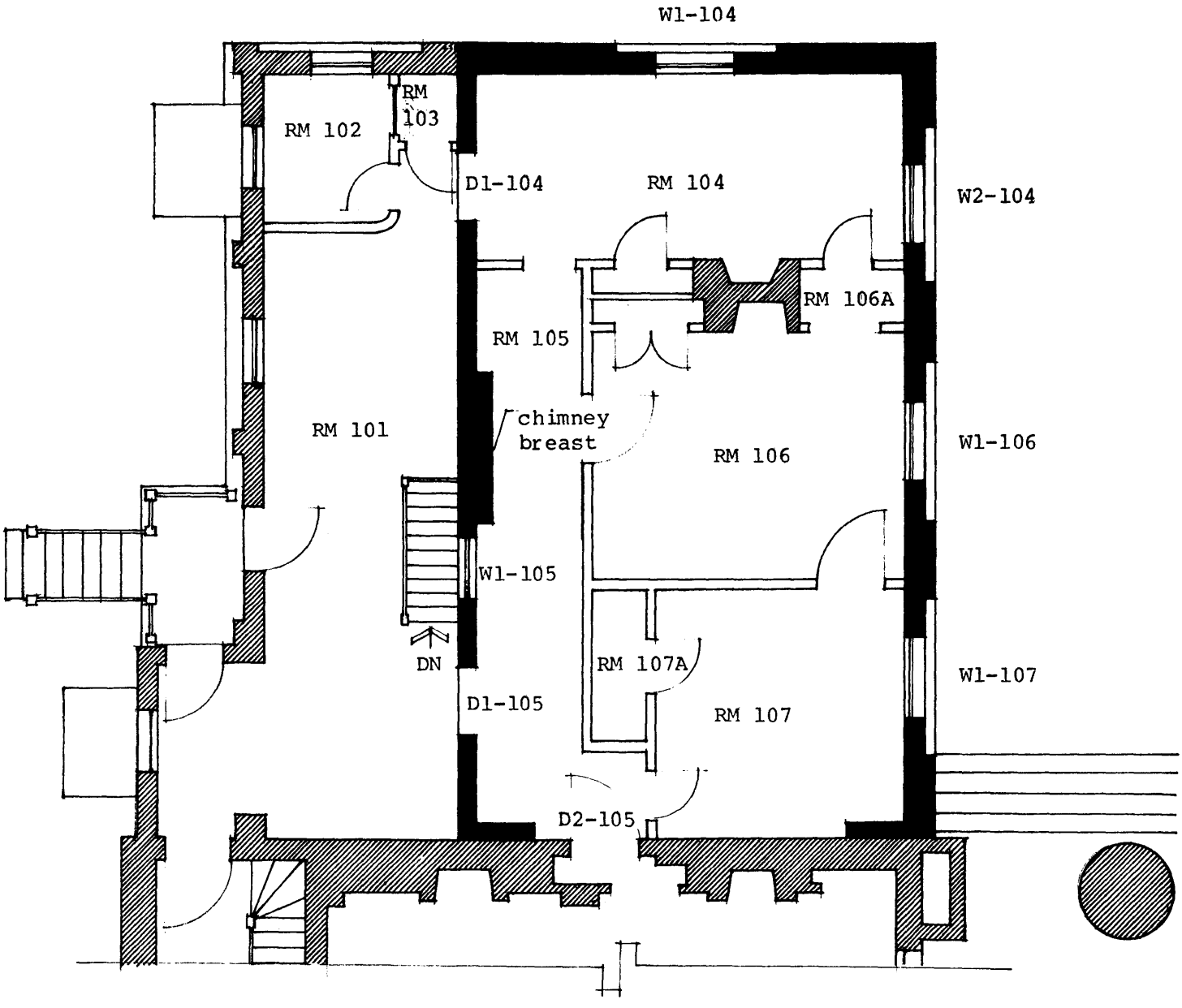
brown coat--The second coat in three coat plaster work. It should be noted that this term is not a reference to plaster color.

finish coat--The third and final coat in a three coat plaster series, forming either the final finish condition for the wall or a substrate for paint or wallpaper.

scored coat--A plaster surface which has been hacked with a tool such as a plasterer's axe after the plaster has set, to form a key for adhesion of subsequent layers of plaster.

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1. Harley J. McKee. Introduction to Early American Masonry. (Washington, D.C.: National Trust for Historic Preservation, 1973), p. 86.



NORTH WING FIRST FLOOR PLAN

scale: 1/8" = 1' - 0"

0 1 2 4 8 16 FT

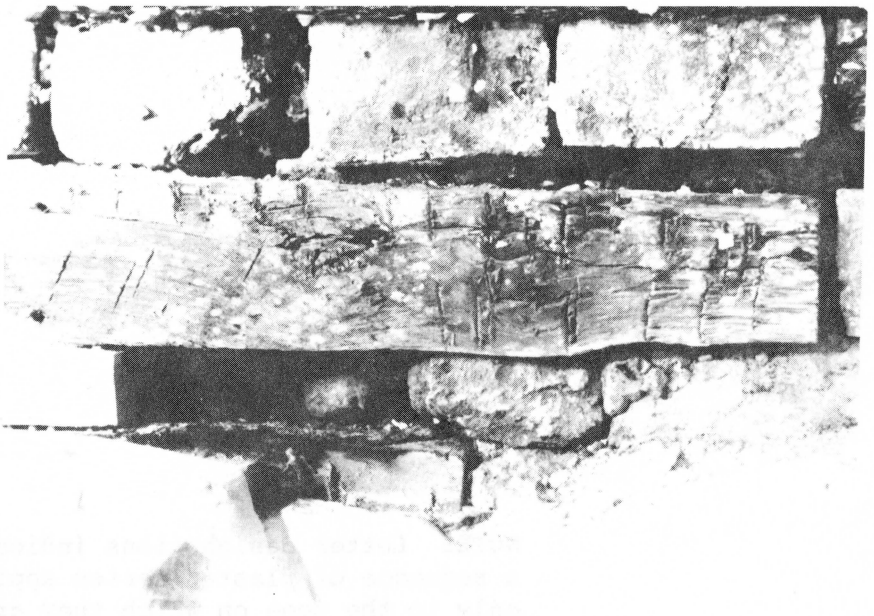
north

NOTE: Letter designations indicating a sequence of plaster series apply only to the page on which they are shown, and do not represent a general sequence throughout the north wing.

II. PHYSICAL EVIDENCE

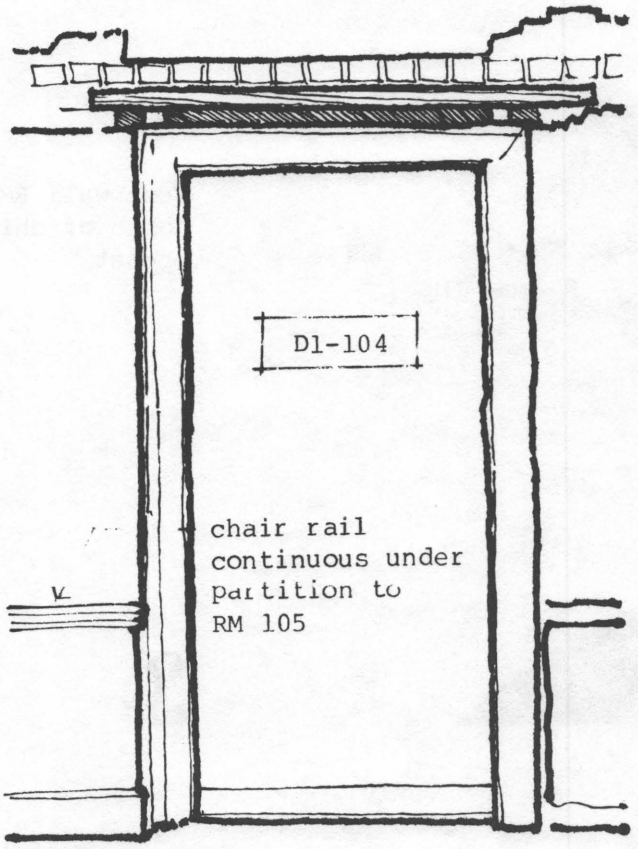


West wall RM 104
Door D1-104



West wall RM 104
Detail of lintel
at north jamb,
Door D1-104

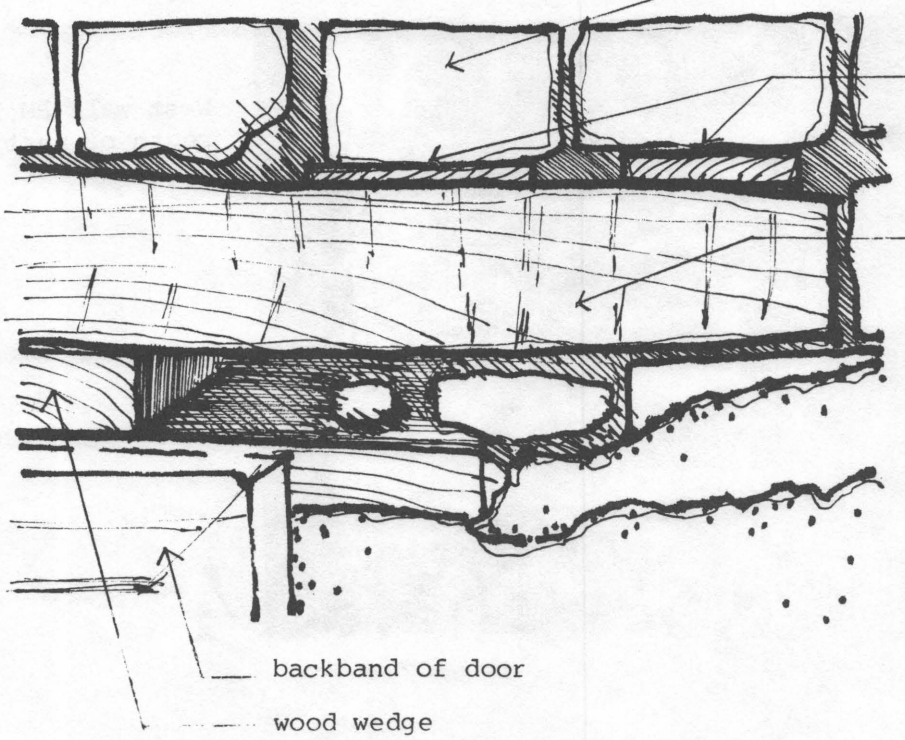
2



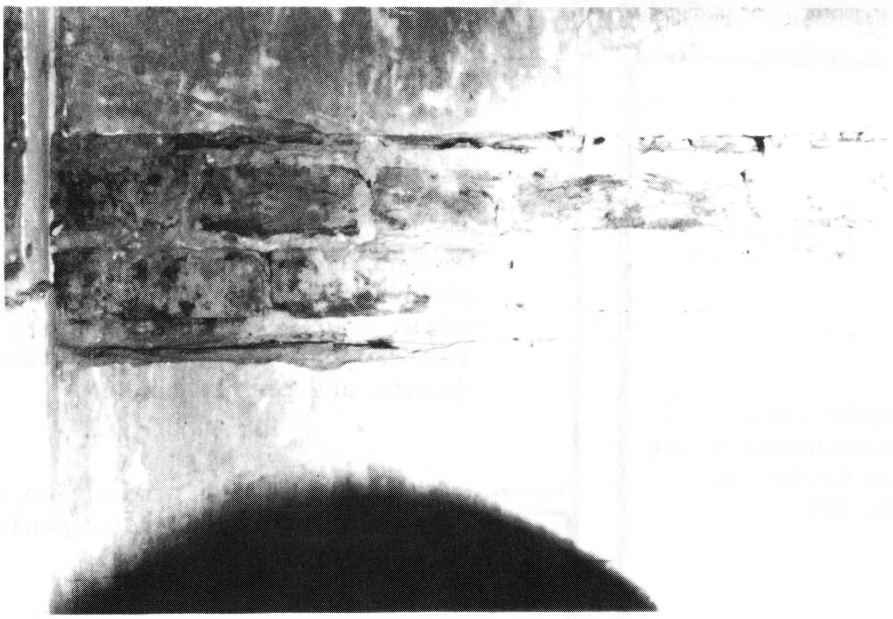
1A

Door not original to construction of wall. Brick at jambs sheared off to form opening. Hewn wood lintel is reused, as evidenced by noncontextual tenon at midspan, wood wedges and shims to level frame, and cut masonry lugs at lintel bearing points.* First course of brick headers above lintel has dropped from bed joint above. Head joints are poorly bonded.

*masonry lug--a projection of the lintel extending beyond the opening into the masonry.



2A



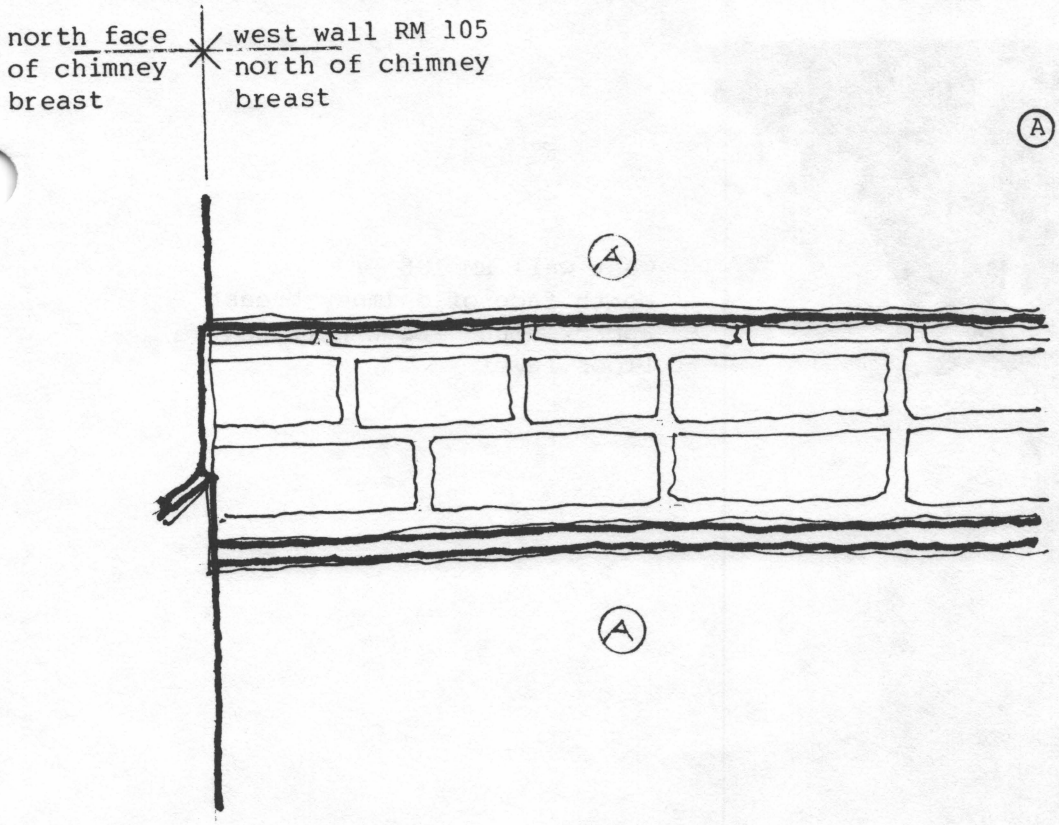
West wall RM 105
north of chimney
breast

3



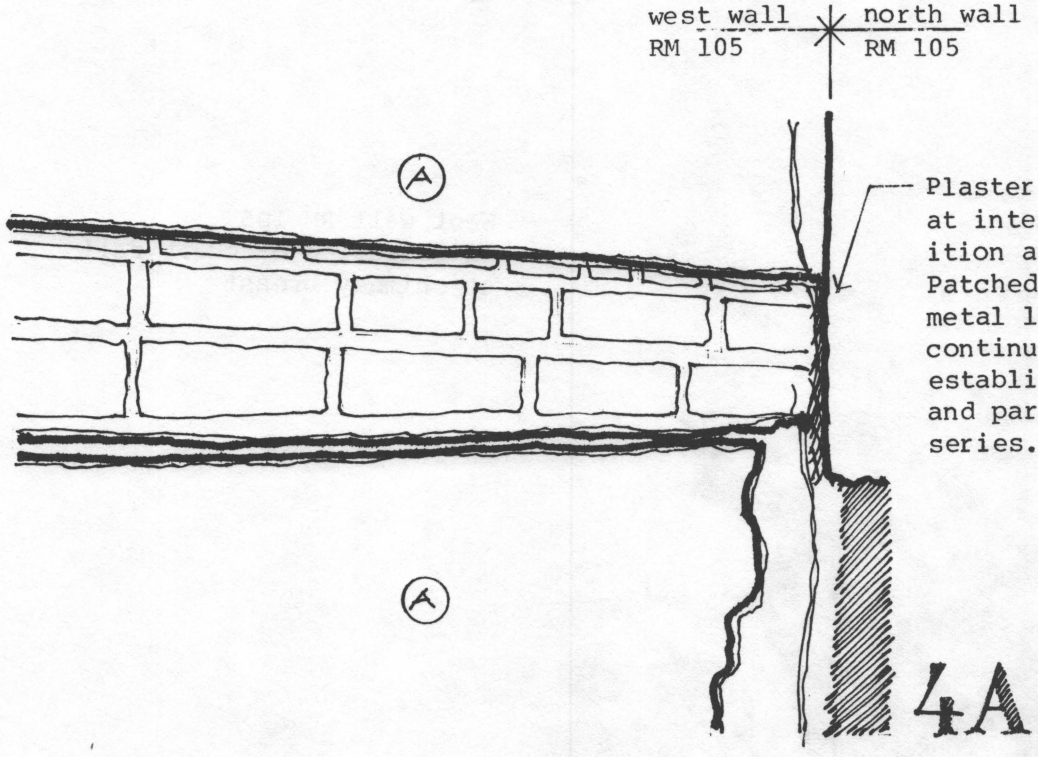
West wall RM 105
south of partition

4



Ⓐ First and only series of plaster on brick. Approx. 2" thick, composed of rough coat, brown coat and finish coat.

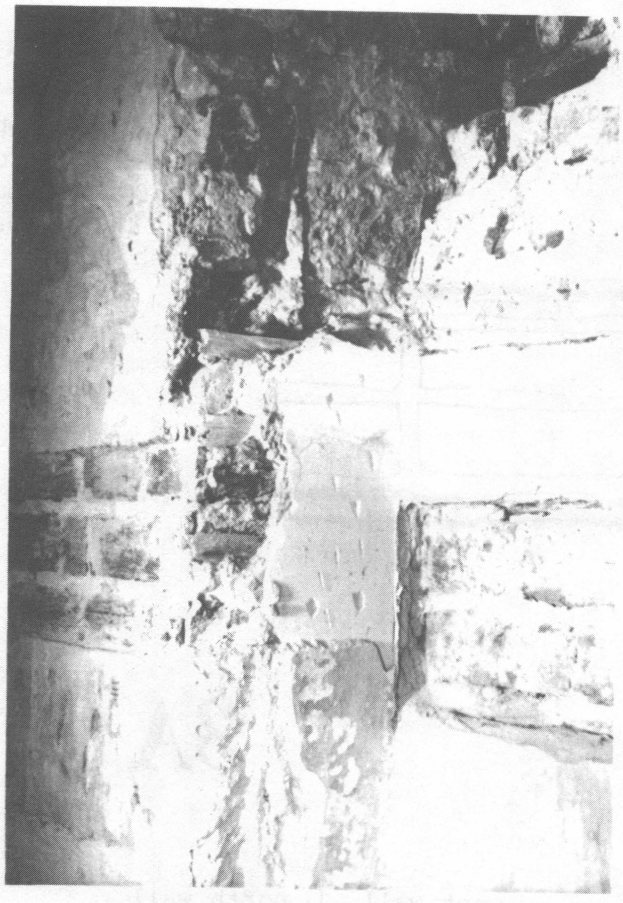
3A



Plaster cut full height at intersection of partition and bearing wall. Patched over expanded metal lath. Therefore, continuity cannot be established between wall and partition plaster series.

4A

Masonry features -- Note the lack of consistant bonding pattern, stacked head joints, and random use of headers. There is no evidence of construction joints or infilled masonry openings.



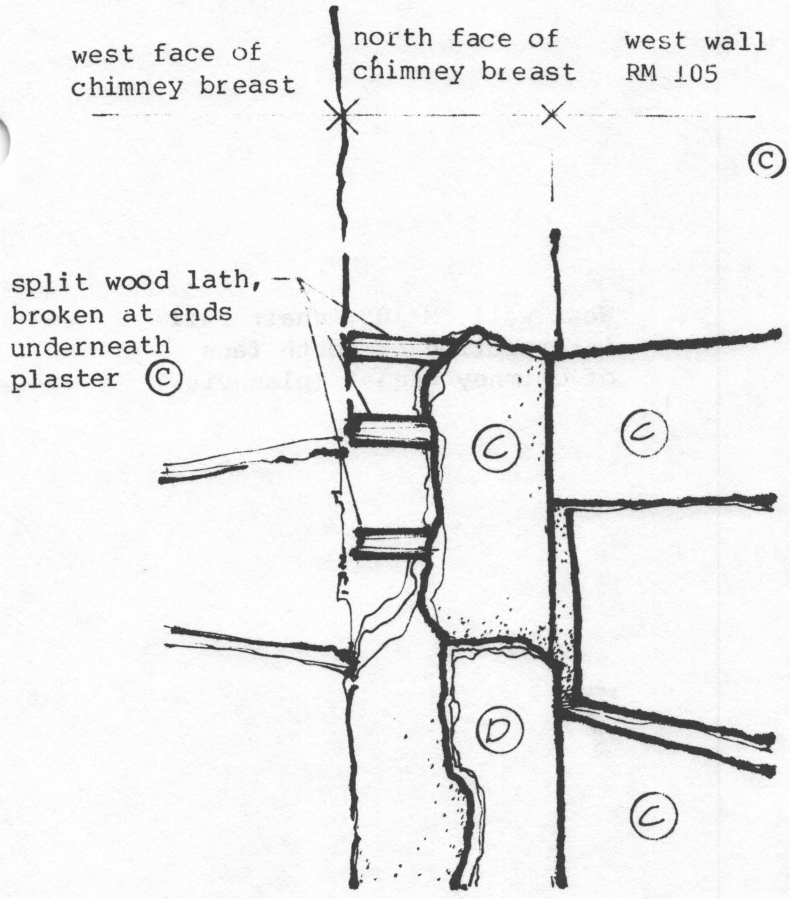
West wall RM 105
North face of chimney breast
approx. 100" above existing
floor level

5



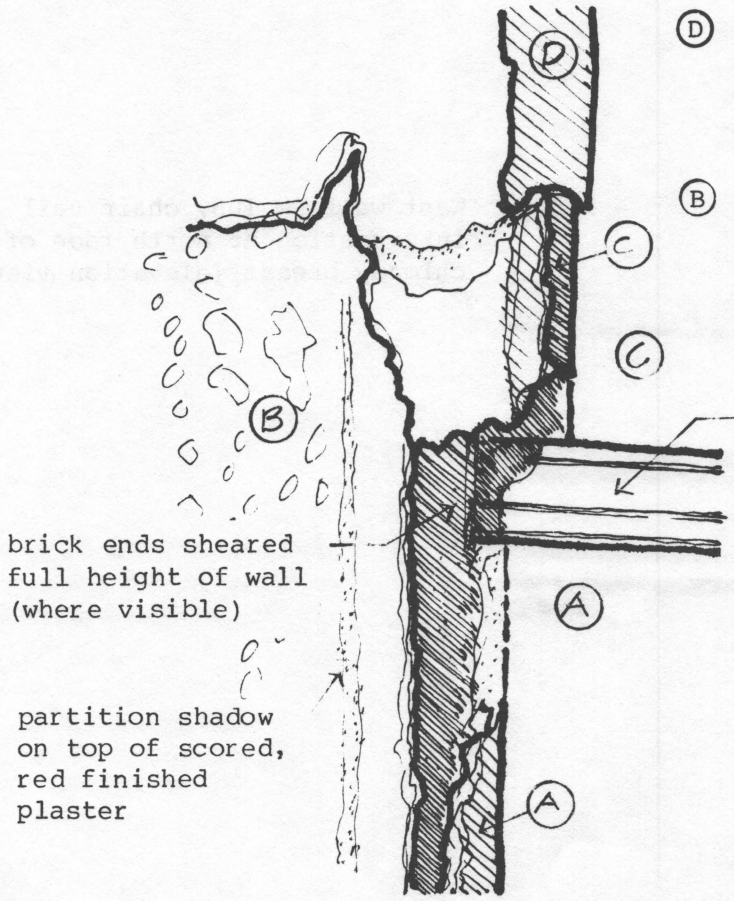
West wall RM 105
intersection of chair rail
at chimney breast

6



(C) First series of plaster on brick. Approx. 2" thick, consisting of rough coat, brown coat, and finish coat. At the north face of the chimney breast this plaster turns the corner in a continuous fashion. Reduced in thickness, it covers split wood lath on brick, and terminates abruptly in a broken edge. The split lath and first series of plaster are the remnants of the north face of a partition which formerly ran perpendicular to the west elevation of the chimney breast. This partition is the first extant trace of a post floor reduction interior arrangement. At chair rail height plaster (C) is placed over the horizontal surface of the chair rail.

5A



(D) Most recent full series of plaster. Approx. 3" thick, applied as a uniform surface over the north, west, and south elevations of the chimney breast.

(B) First series of plaster on brick in this location. The surfaces bears an applied red finish, believed to be calcimine paint. Scored to receive subsequent plaster series.

Chair rail on top of brick ledger formed by reduction in wall thickness to a height approx. 26" above the existing floor. The vertical element of the chair rail rests on top of plaster (A), which apparently predates the reduction of the wall. This is shown by the broken upper edge of the plaster, which is sheared uniformly at the reduced height of the ledge wall.

6A



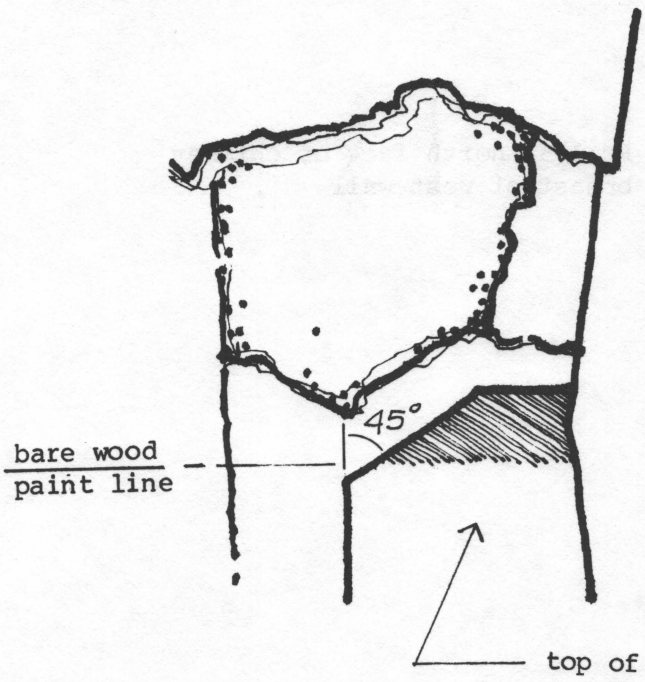
West wall RM 105, chair rail intersection at north face of chimney breast (plan view)

7



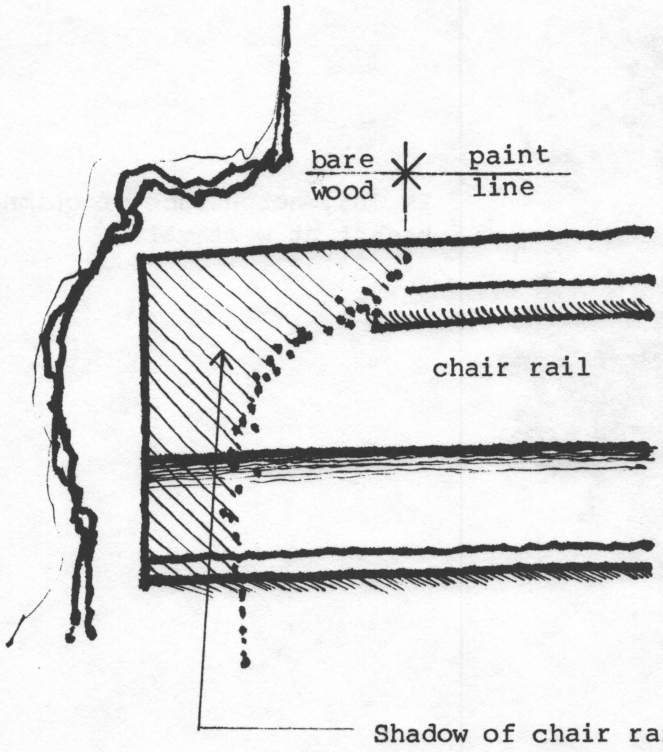
West wall RM 105, chair rail intersection at north face of chimney breast (elevation view)

8



mitered end at chair rail indicates a 90 degree turn at the former partition face (see illustration 5A), and the continuation of the chair rail across the north face of the former partition.

7A



8A



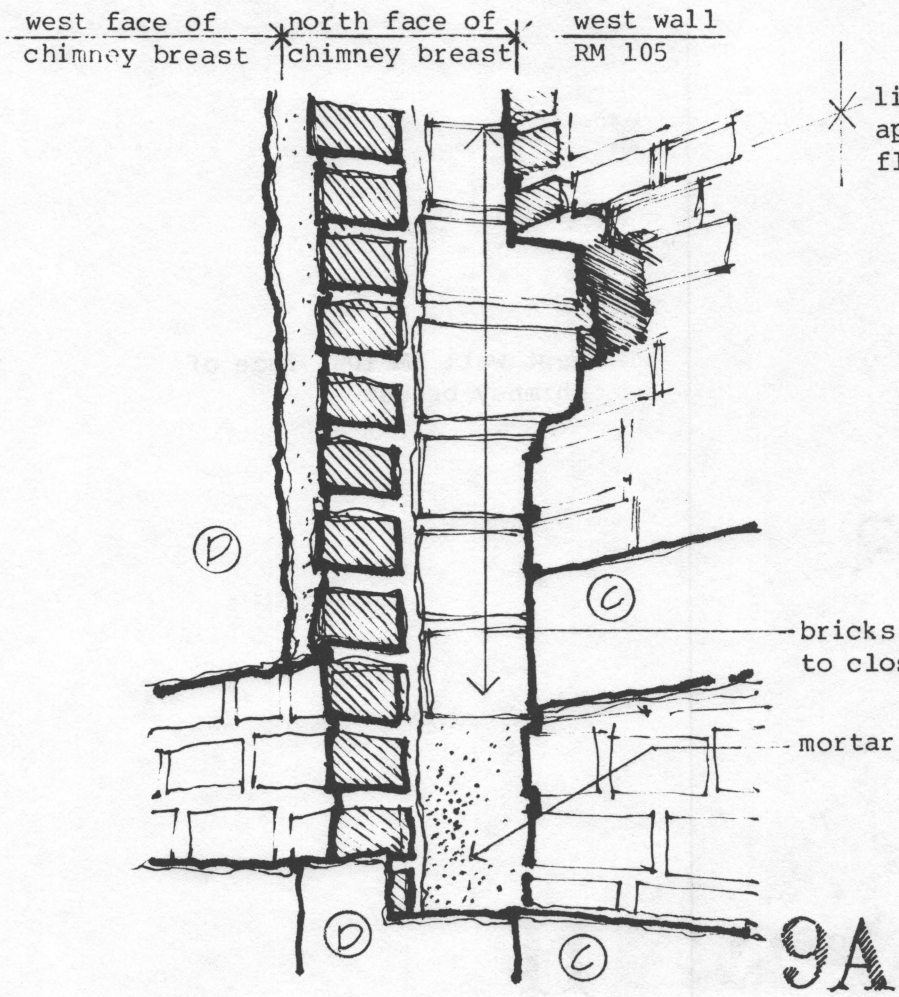
RM 105, north face of chimney breast at west wall

9

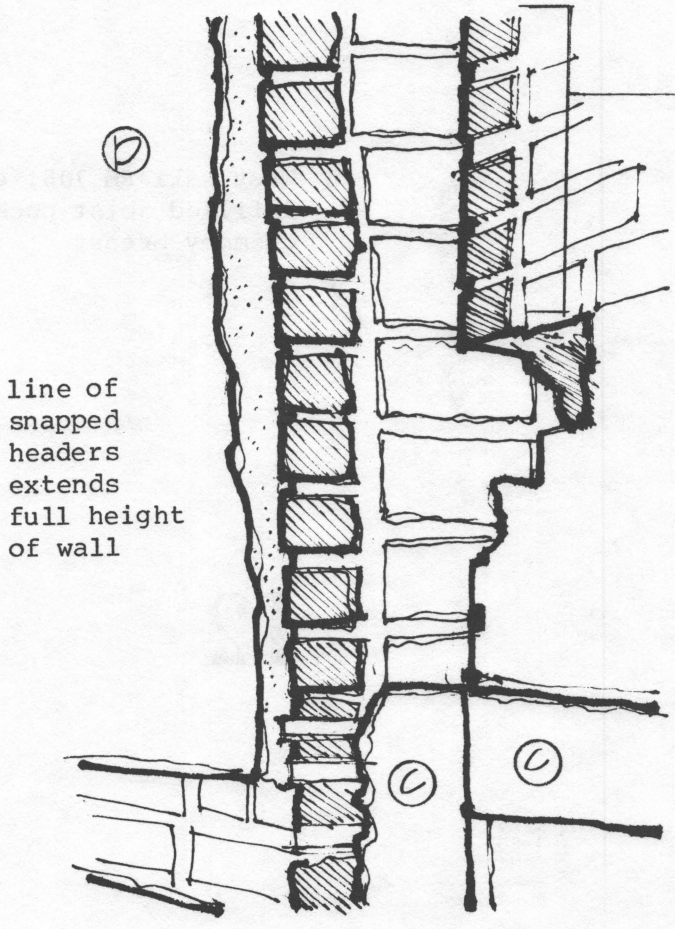


RM 105, north face of chimney breast at west wall

10



9A



This feature apparently represents a flue original to construction of the wall. The sheared bricks at the face of the chimney breast and the adjacent west wall show no evidence of changes other than those involve in closing the flue and reducing the wall to its present configuration. The floor to ceiling line of broken bricks at the north end of the chimney breast indicate that the face of this wall originally extended northward for an unknown distance. The snapped headers on the west wall show the original eastward projection of a single thickness of brick for at least part of the height of the wall.

10A



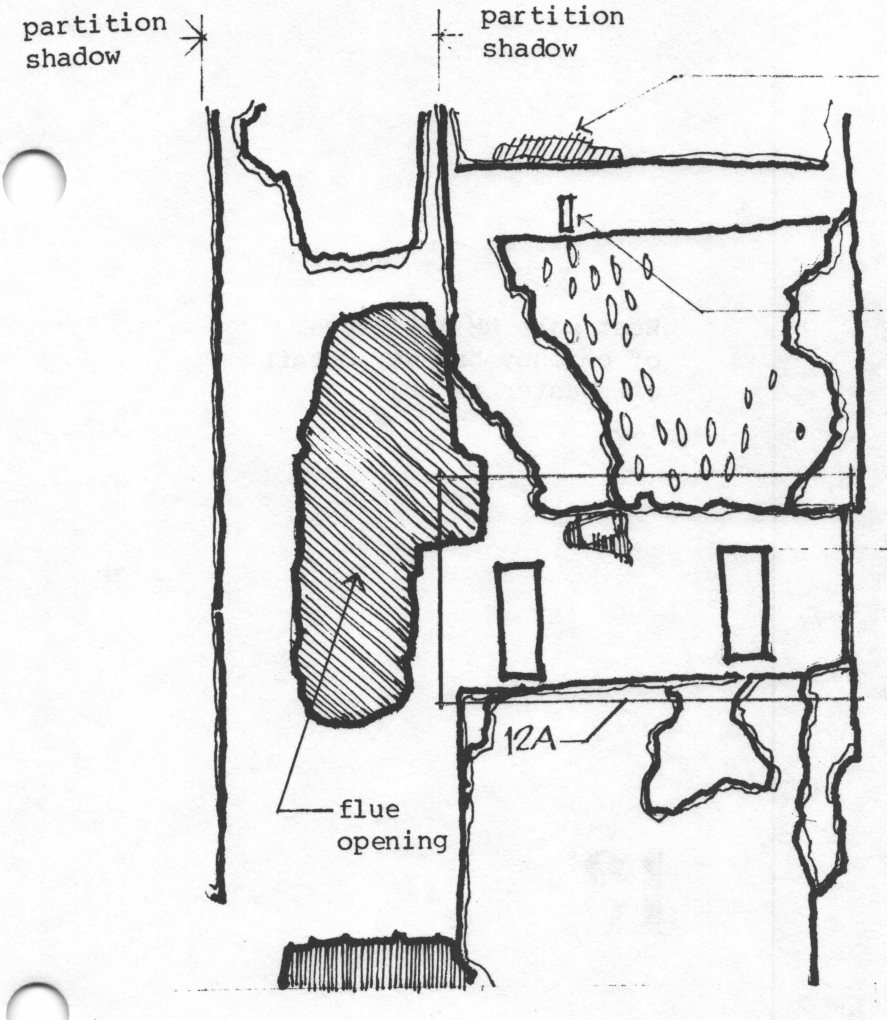
West wall RM 105, face of chimney breast

11

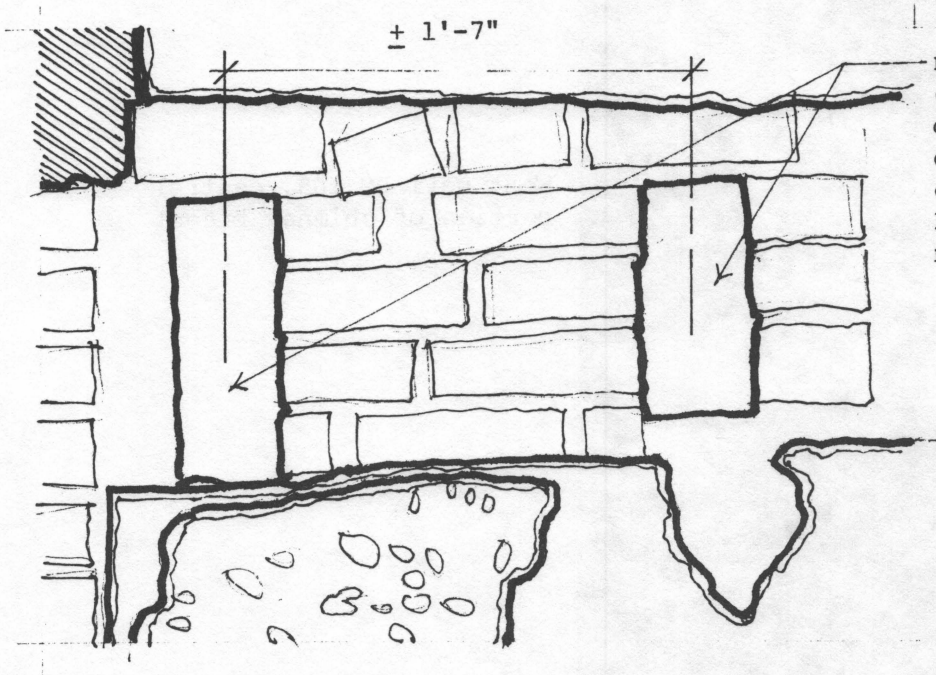


West wall RM 105, detail of infilled joist pockets at chimney breast

12


partition shadow
partition shadow
yellow and green wallpaper fragments immediately above pre- floor reduction chair rail shadow
wood nailer block, appears to be original to construction of the wall. The location of this block in a channel patched with plaster, is indicative of a pre- floor reduction chair rail.
previous floor height 5'-0" above existing floor
12A
flue opening

11A

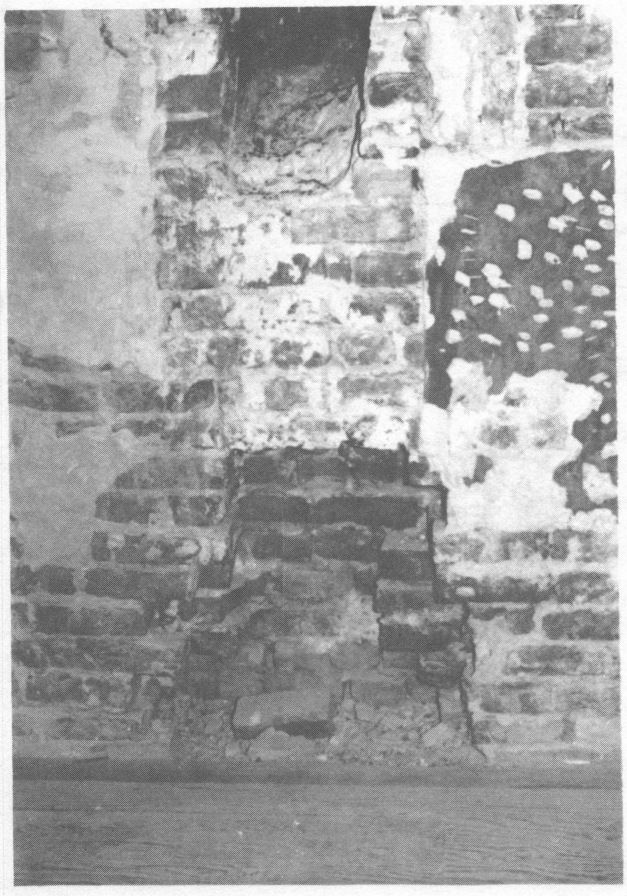

± 1'-7"
masonry joist pockets are original to construction of wall. Note formed brick edges. Original joist dimensions up to 3" x 12". Pockets infilled with brick rubble and mortar.
pre- floor reduction ceiling height

12A



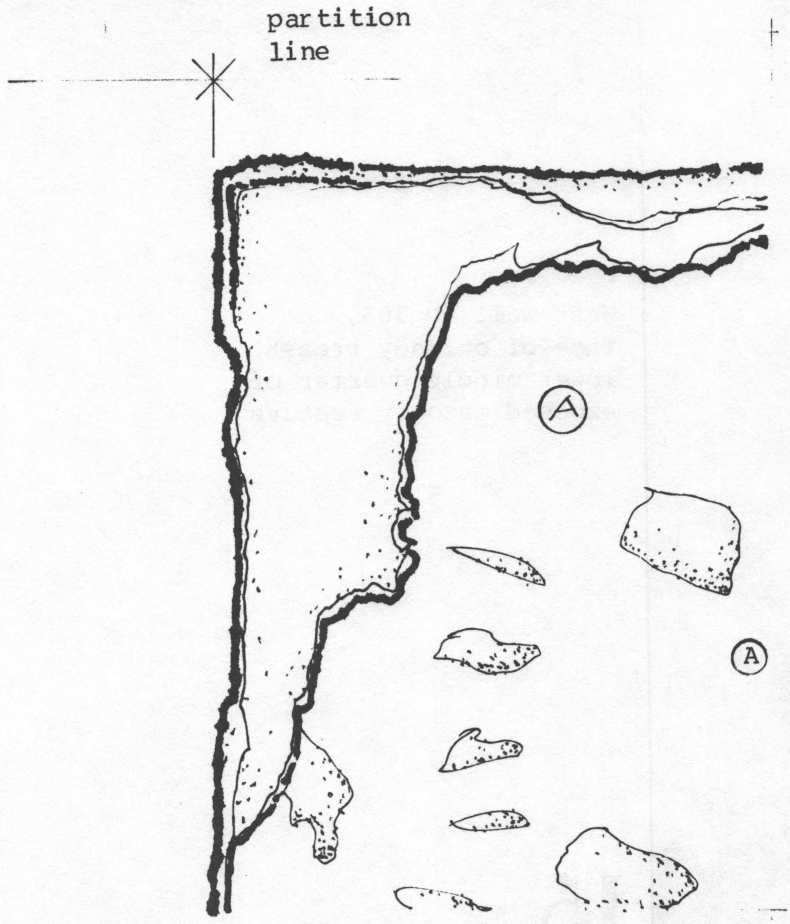
West wall RM 105, face of chimney breast, detail of plaster return

13



West wall RM 105, central portion of chimney breast

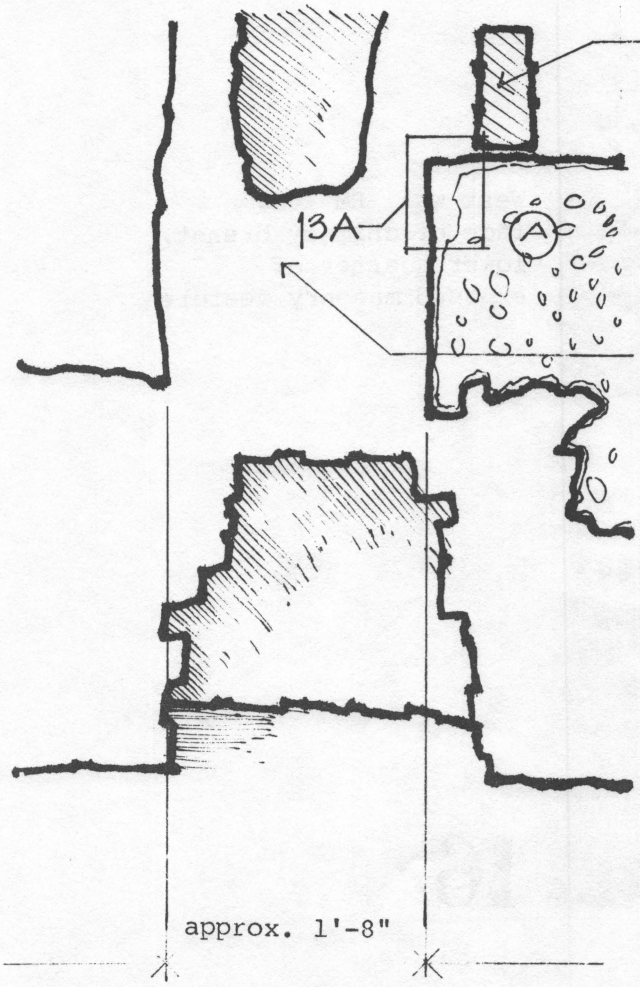
14



Note formed edge where plaster turned horizontal and vertical corners and continued along ceiling and north face of partition/wall.

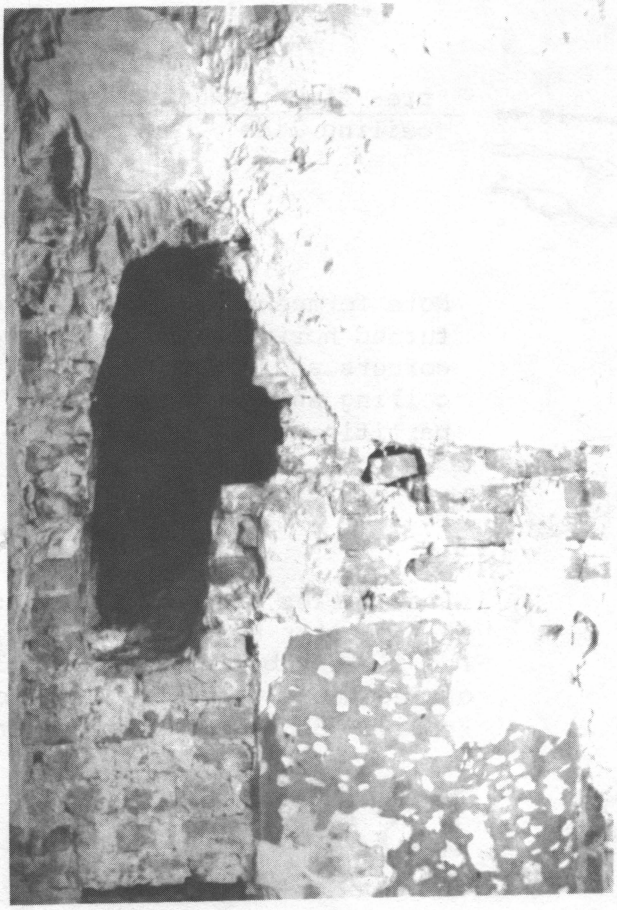
(A) First series of plaster on brick. This plaster bears an applied, red finish, believed to be calcimine paint. It is scored to receive subsequent plaster series.

13A



This exposed area of brick extends floor to ceiling in a vertical channel approx. 1'-8" wide, bounded on both sides by several plaster types, all having distinct formed edges representing a 90 degree corner at the face of a wall or partition. This feature shows only one series of finish plaster which is continuous with the most recent series over the entire chimney breast. See plaster (D) in illustrations 5A and 6A, and plaster (A) in illustration 15A.

14A



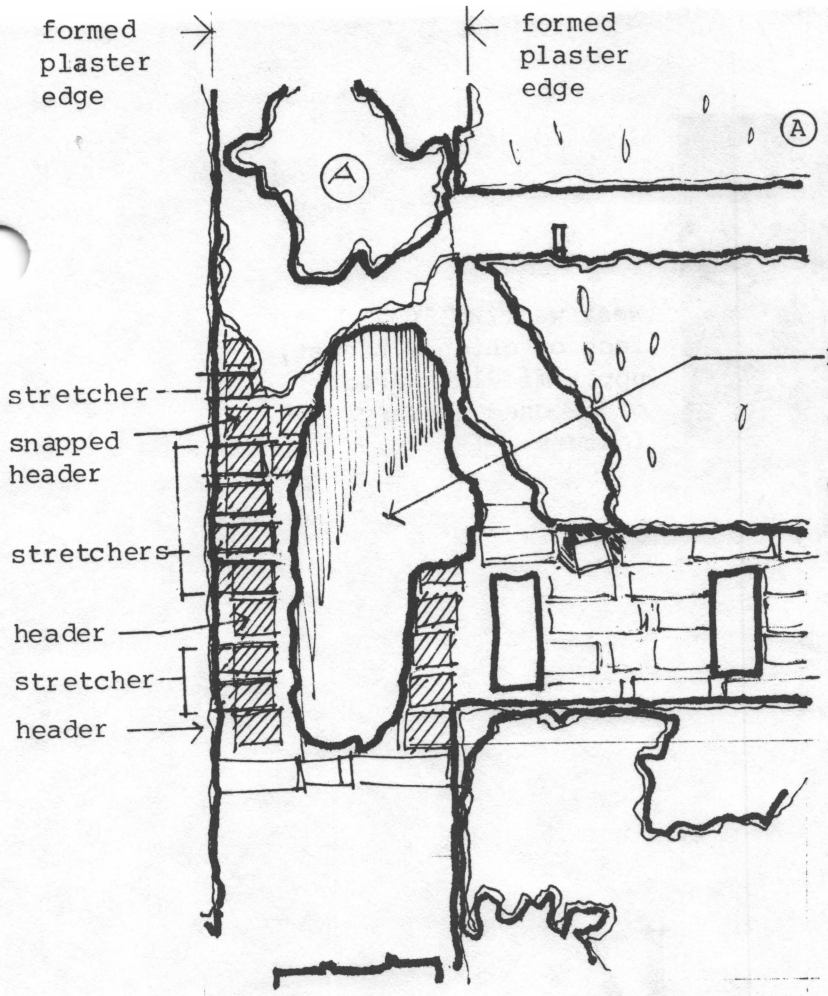
West wall RM 105,
face of chimney breast,
lower middle quarter of
exposed masonry feature

15



West wall RM 105,
face of chimney breast,
lower quarter of
exposed masonry feature

16

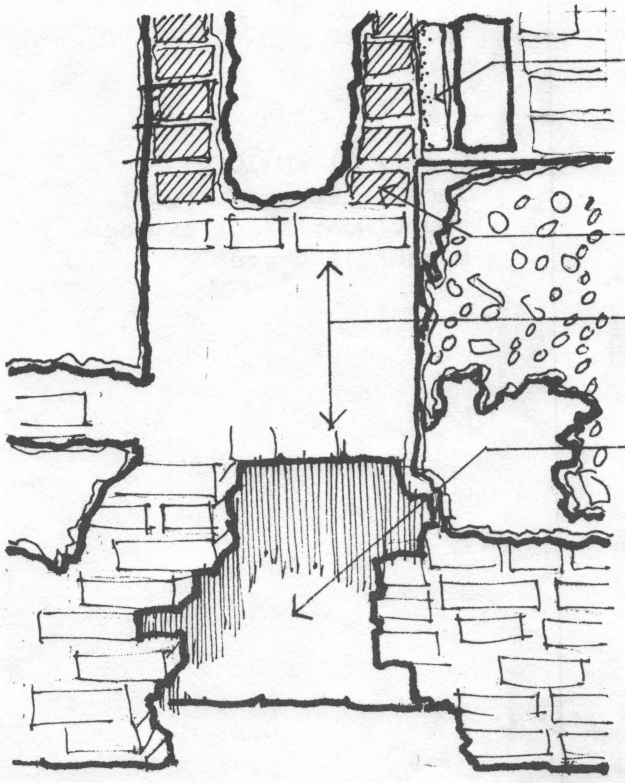


(A) First series of plaster on brick between partition lines. Continuous with most recent series over entire west, north, and south face of chimney breast.

Flue opening, measuring approx. 3'-0" x 1'-0". Broken bricks at the face of the opening indicate that the flue was either not an original feature, or that it was enlarged.

bottom of flue opening approx. 3'-9" above existing floor

15A



plaster patch infilled at joist height shows partition shadow at south edge.

unfired brick header

brick bonded in relatively continuous manner across face of chimney breast in this area.

Patched opening uncovered during 1980-81, physical investigation. The opening is a noncontextual area of removed bricks, possibly representing an early architectural investigation based on Gilbert Rodier's 1924, article in Architectural Forum. Rodier believed that the chimney breast was the original site of a large fireplace. (Snell: HSR, Historical Data Section. 1982. p.155).

16A



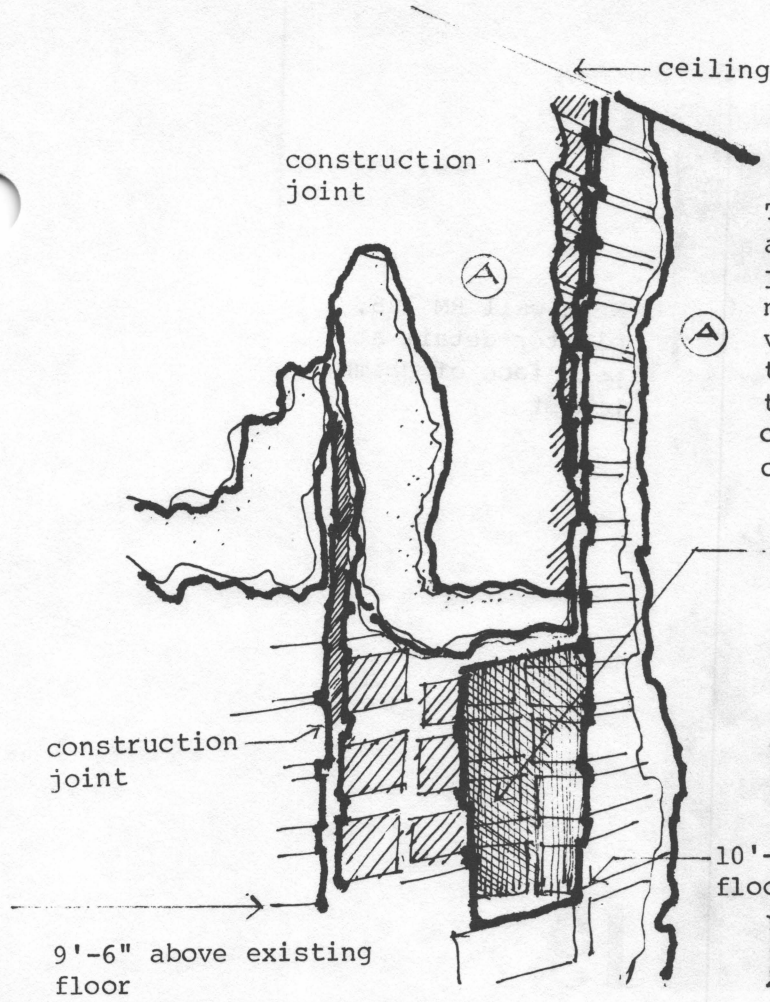
West wall RM 105,
face of chimney breast,
upper middle quarter
of exposed masonry
feature

17



West wall RM 105,
face of chimney breast,
upper quarter of exposed
masonry feature

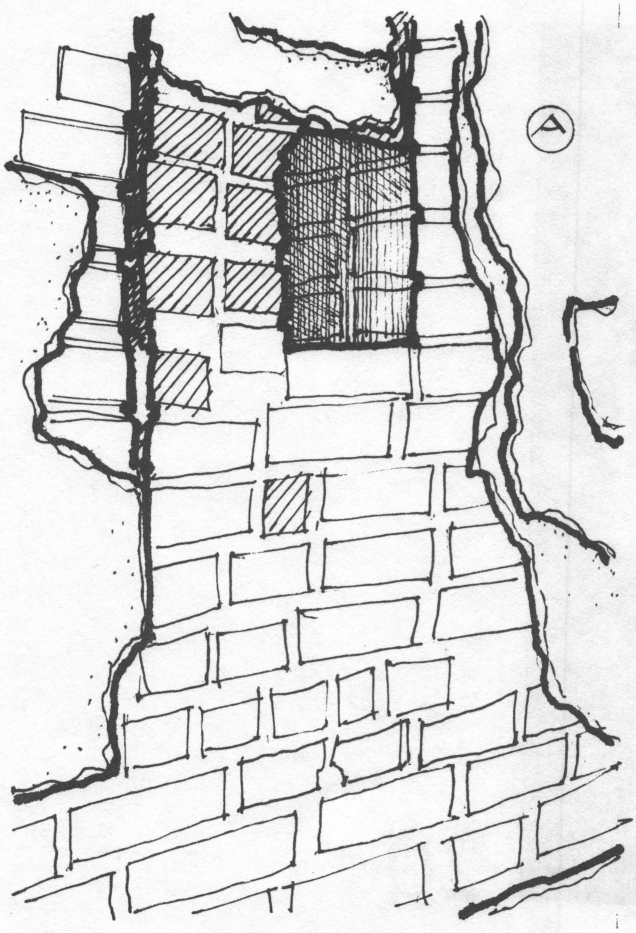
18



The top quarter of this masonry feature abruptly develops distinct construction joints at the elevations shown. The north edge shows an almost perfectly vertical construction joint to within three courses of the ceiling. There the northern head of each brick slightly overhangs the one below, forming a corbeled effect.

Opening believed to have been created during the 1980-81 architectural investigation. Bricks in this area do not bond to the adjacent wall surface, nor do they appear to bond to the outermost course of brick which forms the east wall surface of RM 101.

17A



snapped headers

In general the vertical alignment of snapped headers below the construction joints exactly parallels the formed plaster edge of the former partition/ wall. However, in several instances snapped headers actually lie partially below the formed plaster edge.

Masonry between partition lines is distinctly inferior in quality to other areas visible on the face of the chimney breast. It is characterized by use of unfired, low fired, and broken bricks laid without discernable bonding pattern.

18A



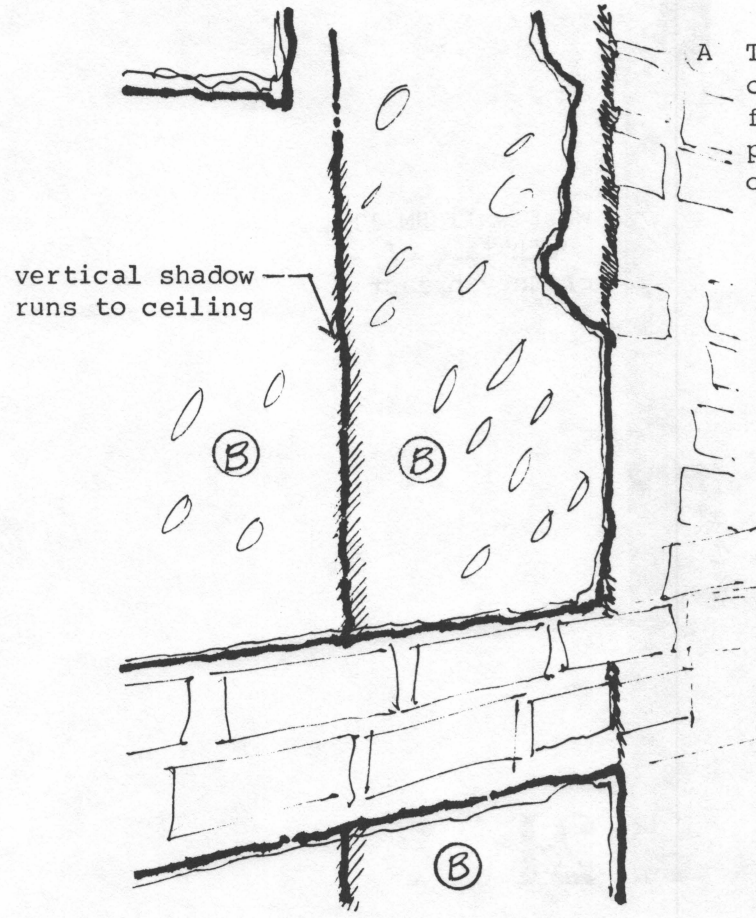
West wall RM 105, plaster detail at west face of chimney breast

19



West wall RM 105, plaster at west face of chimney breast

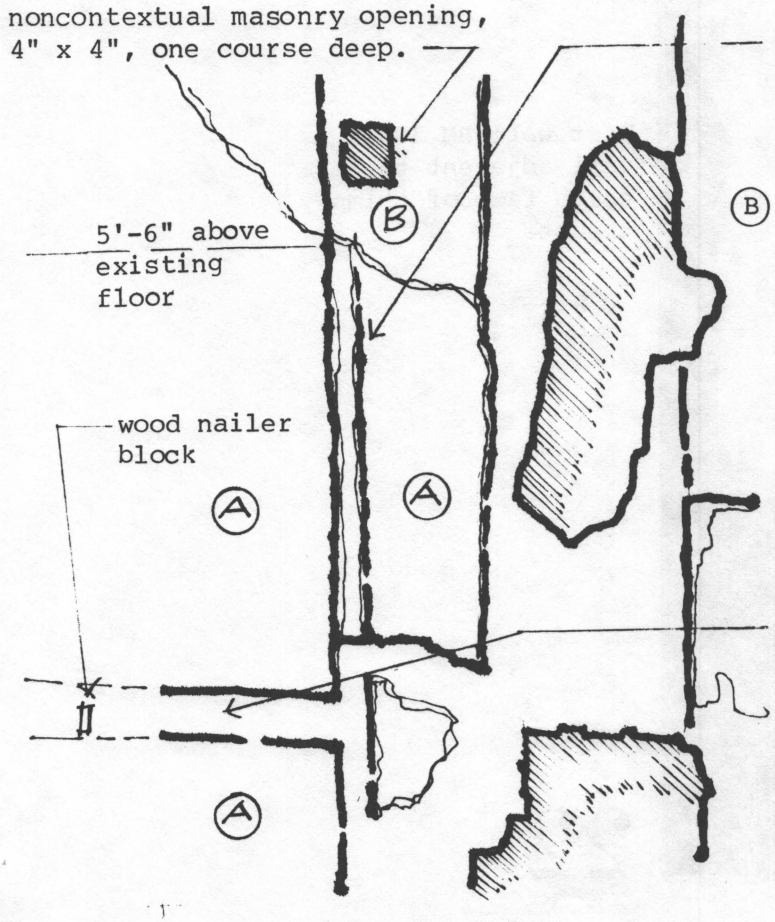
20



A This first plaster against brick consists of a thin single coat bearing wallpaper fragments having a stylized wood grain pattern and boarder, just above the shadow of a baseboard at the existing floor level.

Note: a single infilled masonry opening approx. 3"x6", occurs about 6" from the south edge of the chimney breast at the same height as the joist pockets shown in illustration 12A.

19A



3 1/2" wide partition shadow on top of first finish coat of plaster on brick. This shadow clearly bears the shadow of both partition faces.

(B) This plaster, also the first series on brick, is distinct from plaster (A), and begins in an irregular patch approx. 5'-6" above the existing floor and continues to ceiling height. It shows a continuous vertical shadow on its surface, following the same line as the south edge of the partition shadow below. This plaster bears fragments of the same wallpaper seen in illustration 31A. Some areas of this plaster are scored to receive a later finish coat.

Exposed brick and formed plaster edges defining a 3½" wide channel, indicate a former post floor reduction chair rail location, terminating at the partition scar. A single wood nailer block remains between two stretchers.

20A



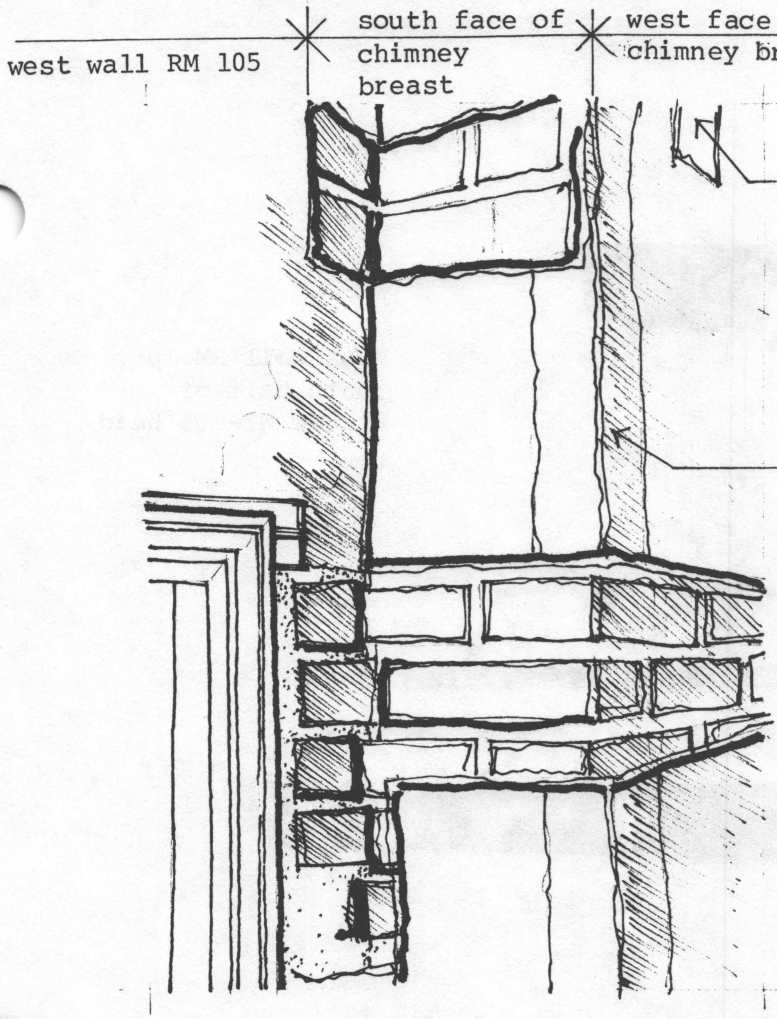
West wall RM 105,
south face of
chimney breast

21



West wall RM 105,
wall adjacent to
south face of chimney
breast

22



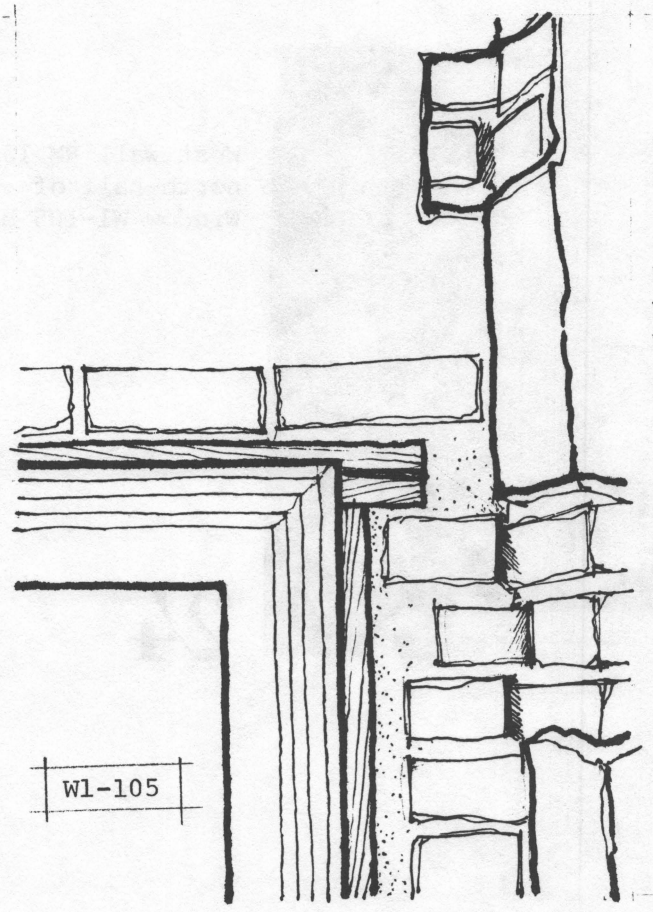
Steel plate, 1980, structural stabilization of loggia by NPS.

The brick at the south face of the chimney breast can conclusively be seen to bond with the brick on the west wall of RM 105. Note the half lapped brick at alternate courses.

Plaster at the intersection of the south and west faces of the chimney breast appears to be cut to an indeterminate depth and patched.

The south face of the chimney breast shows two series of plaster. The first layer on brick is interrupted by a chair rail scar, as at the west face of the chimney. The series above is the same finish layer found on the entire surface of the chimney breast. Both series are continuous onto the west wall south of the chimney breast.

21A



Window W1-105 is not original to construction of the wall. Sheared bricks at both masonry jambs show that the opening was broken through the wall. Note also, mortar infill to patch voids between the masonry opening and window frame. The head of the window frame serves as a lintel.

22A



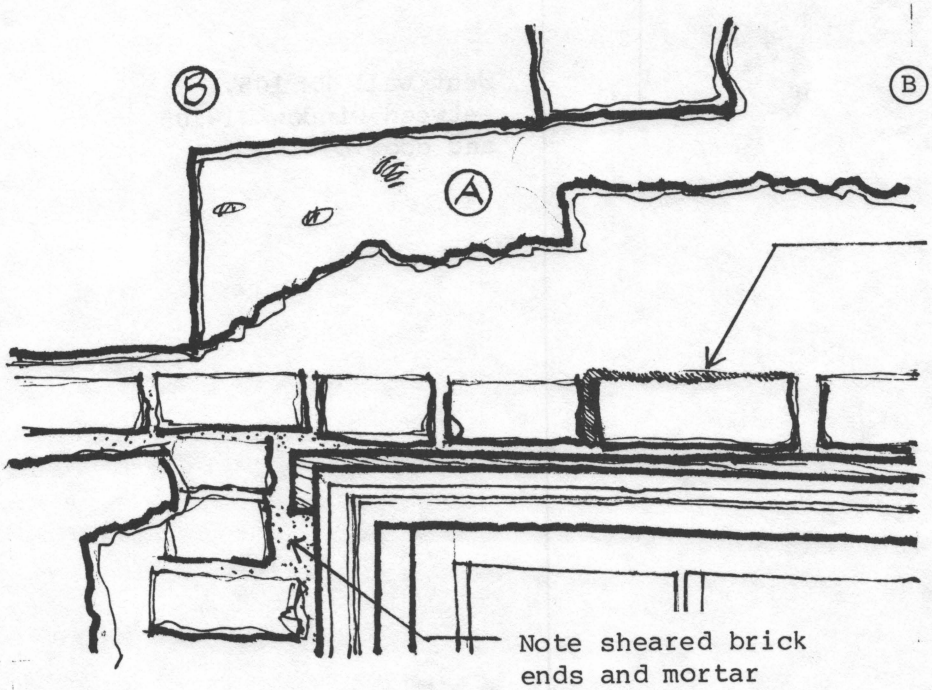
West wall RM 105,
south half of
Window W1-105 head

23



West wall RM 105,
north half of
Window W1-105 head

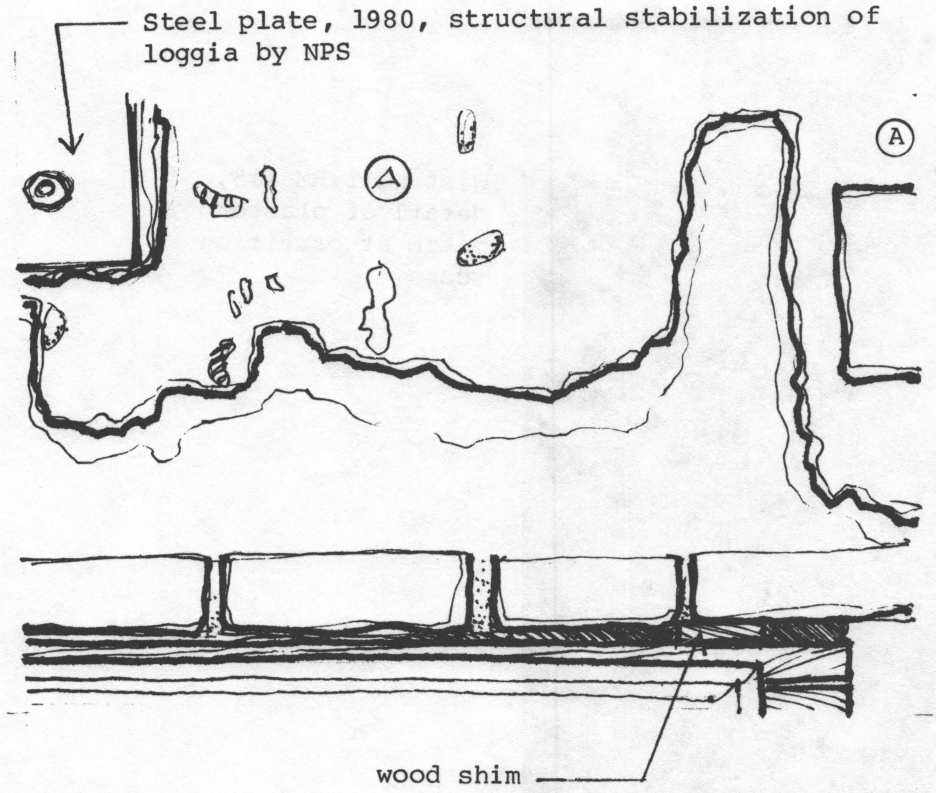
24



(B) Most recent plaster series, continuous with with top layer on chimney breast.

Note stretcher dropped from bed joint above.

23A



(A) First layer of plaster on brick bears fragments of same red and black wallpaper seen in illustration 31A. The irregularly broken lower edge of this plaster suggests that this finish predates window W1-105, as installation of the window would have required removal of adjacent plaster.

24A



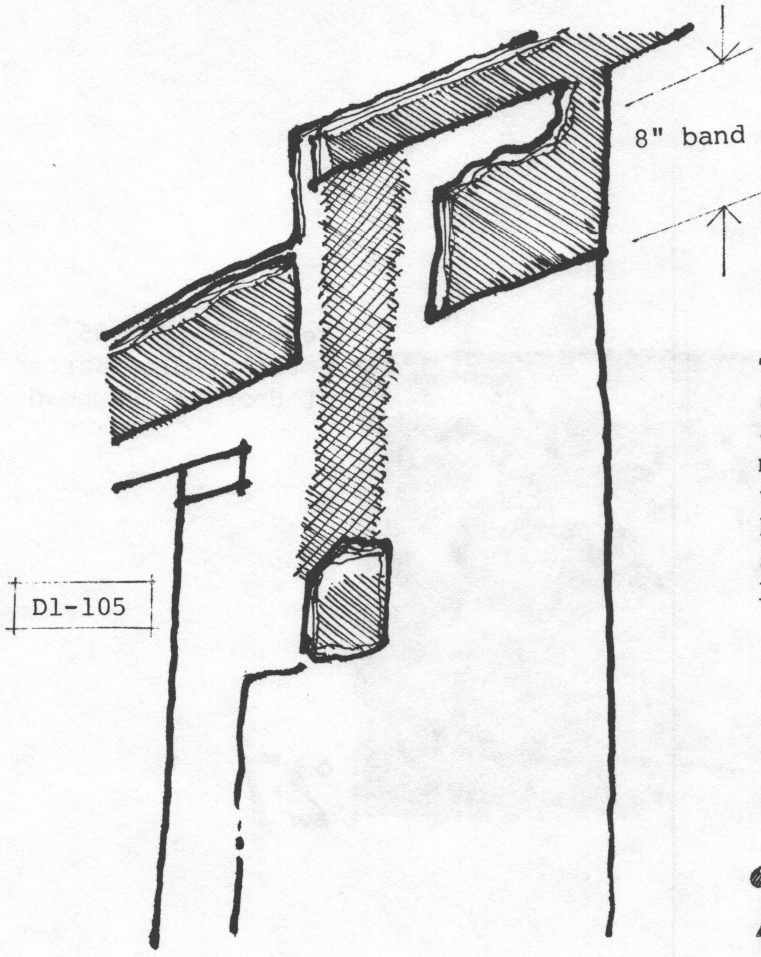
West wall RM 105,
between window W1-105
and door D1-105

25



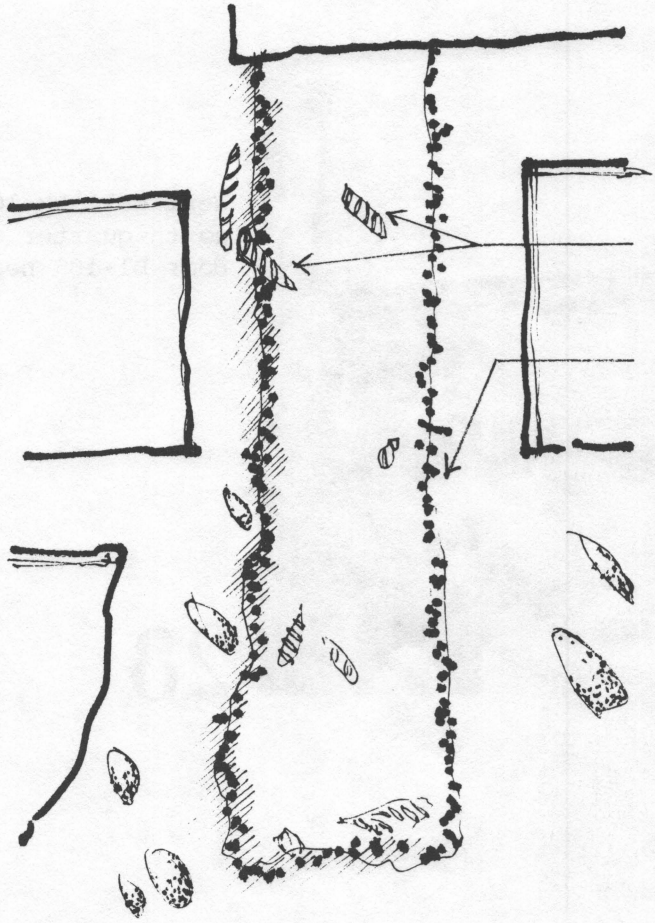
West wall RM 105,
detail of plaster
patch at partition
scar

26



The first layer of plaster on brick shows a vertical channel filled with a hard plaster patch. The patch does not extend below a height 5'-0" above the existing floor. Therefore it can be concluded that this feature represents a pre- floor reduction partition location.

25A



Fragments of red and black wallpaper, (see illustration 31A), applied after removal of partition.

Outline of plaster patch at partition scar.

Note: the area of plaster bearing the partition scar and wallpaper fragments was left <u>in situ</u> where it intersects the 8" plaster band.

26A



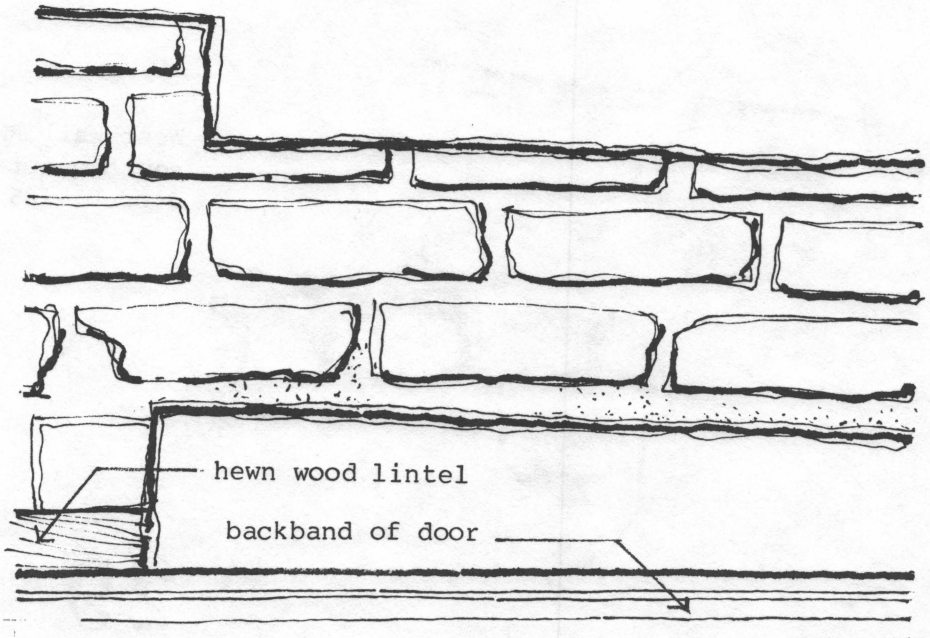
West wall RM 105,
north middle quarter
of door D1-105 head

27



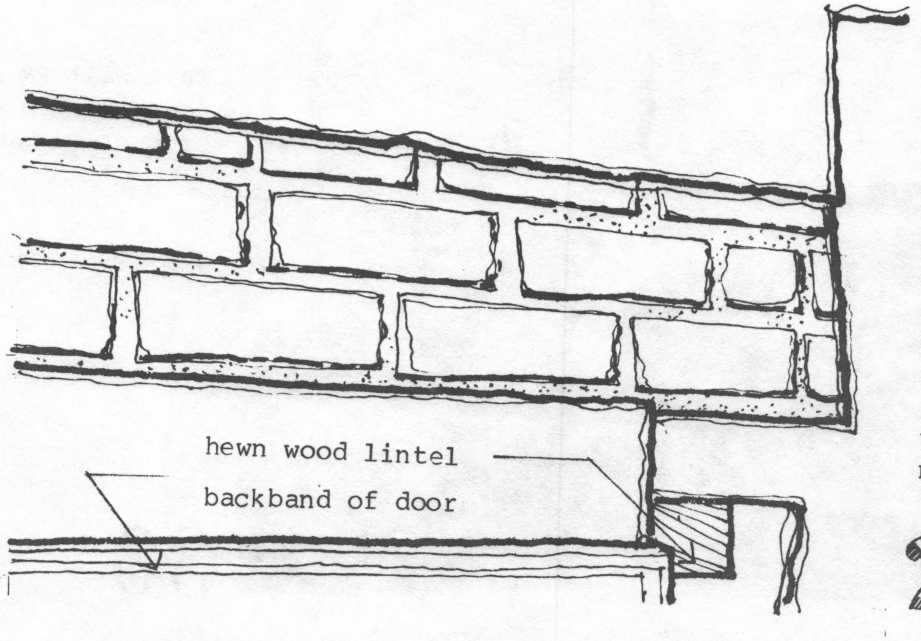
West wall RM 105,
north quarter of
door D1-105 head

28



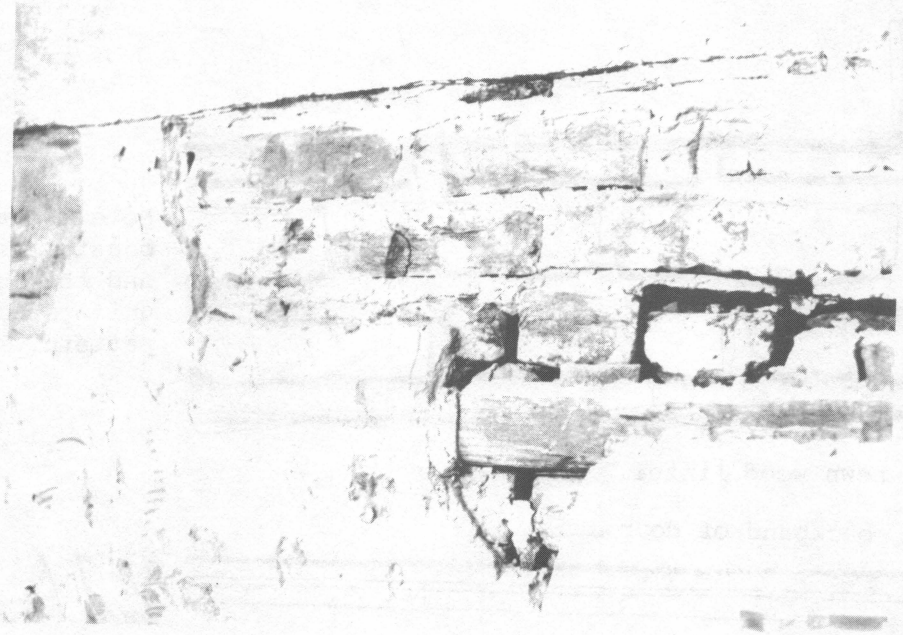
Note the absence of construction joints and the relatively uniform bonding pattern.

27A



Note the absence of a construction joint in the exposed brick above the door jamb. If, as has been suggested, an opening relating to the previous floor level had been located at this point, the required additional vertical opening would have required masonry infill.

28A



West wall RM 105, south quarter of door D1-105 head

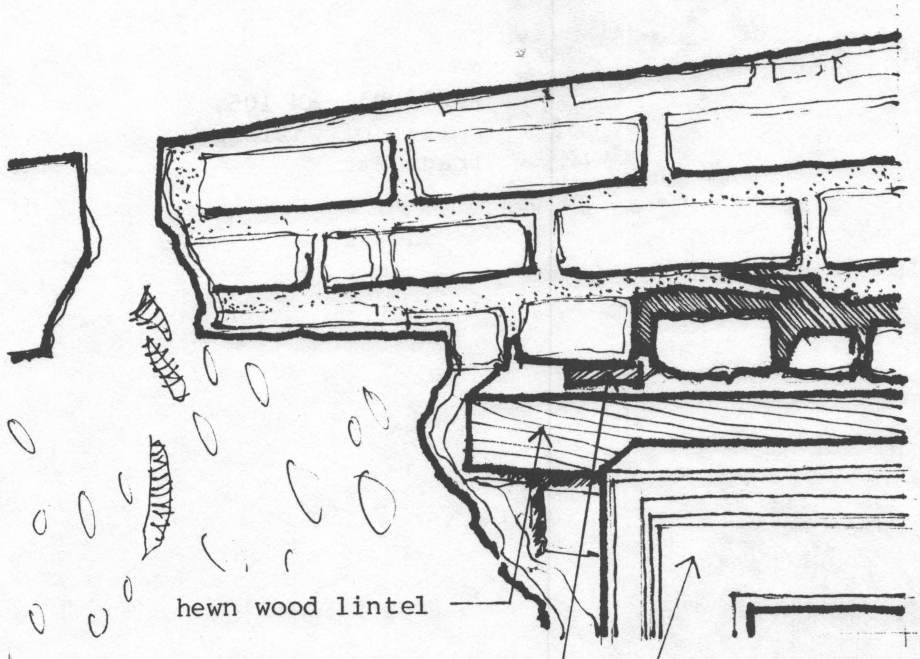
29



West wall RM 105, south middle quarter of door D1-105 head

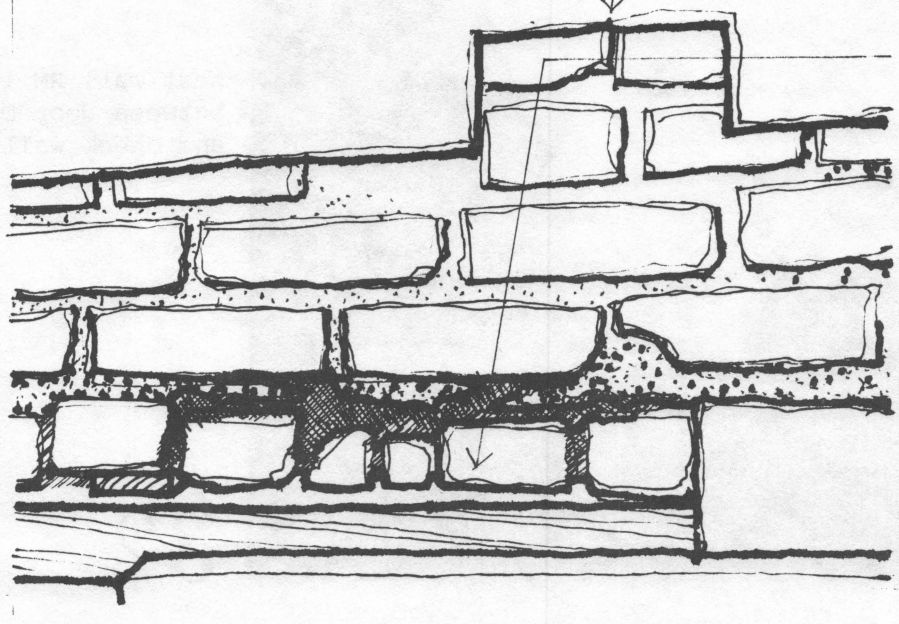
30

Note the absence of construction joints or changes in masonry rhythm apart from the line of dropped headers above door head.



29A

stacked head joint, but no evidence of masonry infill or patch.

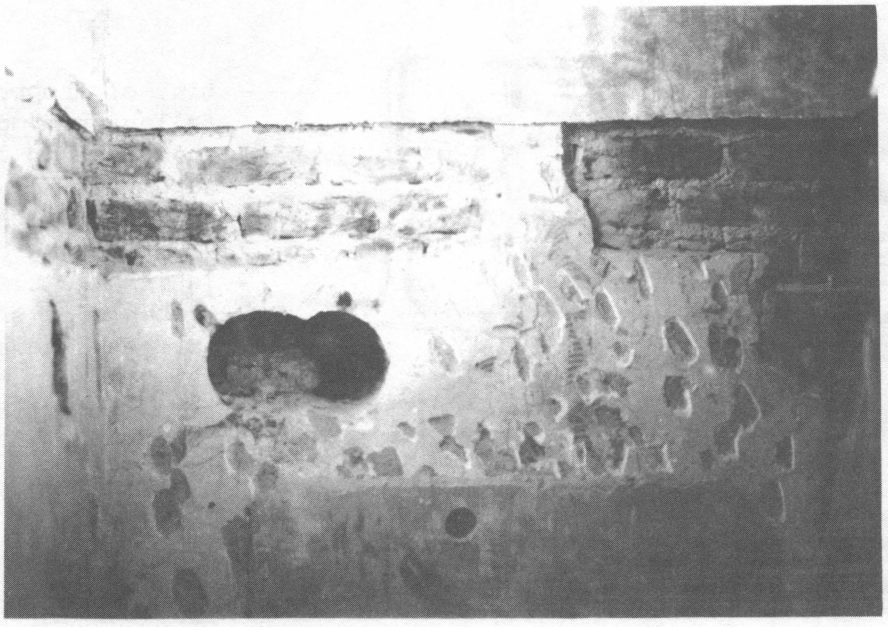


Line of dropped headers fallen from mortar joint above due to lack of support following creation of masonry opening. In addition, masonry at jambs (where visible), shows broken bricks and mortar patches, indicating that this door is not original to construction of the wall.

30A

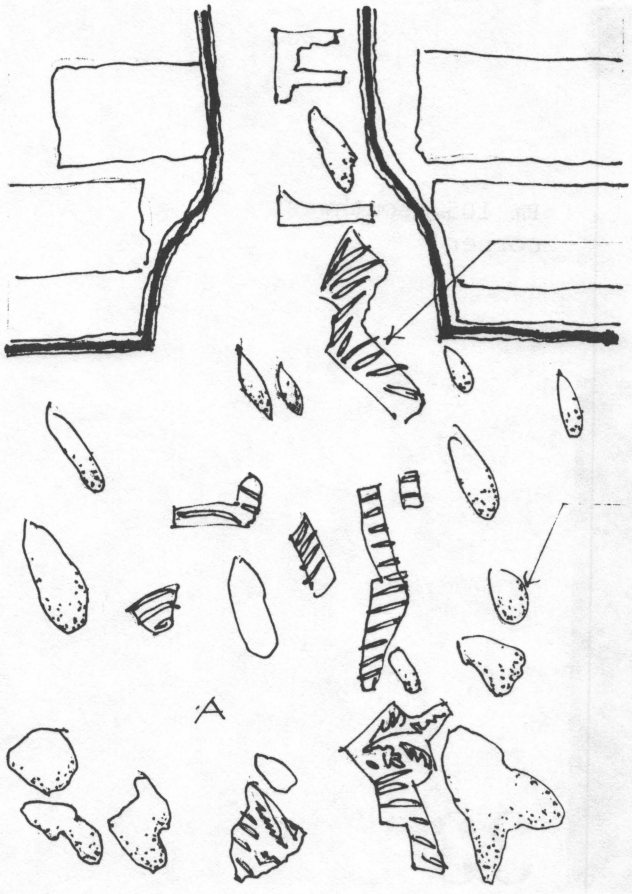


West wall RM 105,
detail of wallpaper
fragments



West wall RM 105,
between door D1-105
and cheek wall

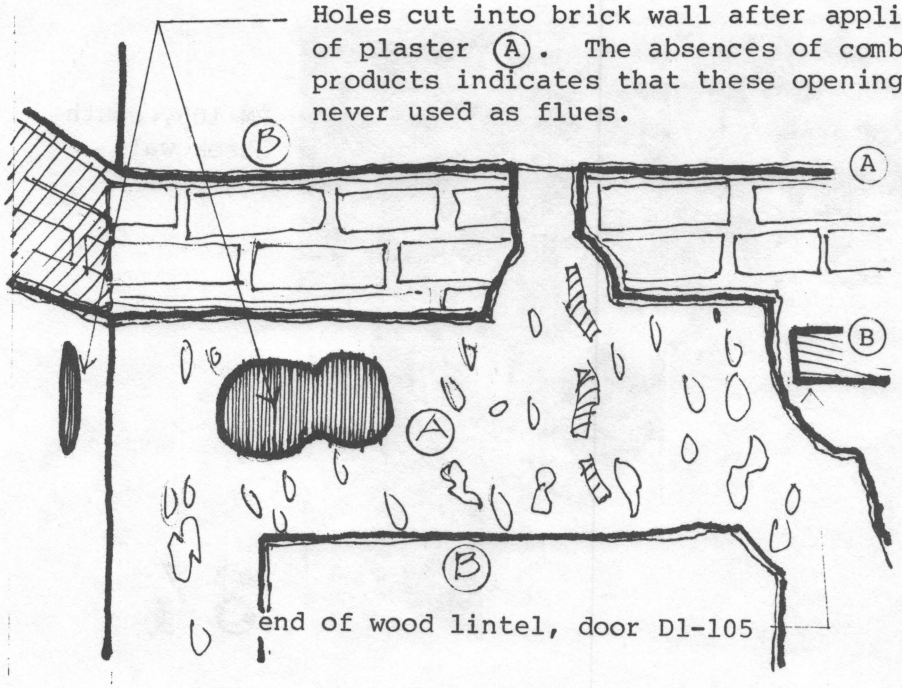
32



Red and black wallpaper fragments on first series of plaster on brick. Stylized floral pattern. This area of plaster was left in situ.

Hack marks where plaster was scored to receive subsequent coats.

31A



Holes cut into brick wall after application of plaster (A). The absences of combustion products indicates that these openings were never used as flues.

(A) First layer of plaster on brick. Was nowhere found to extend below a line 5'-0" above the existing floor.

(B) First finish coat of plaster on brick below a line 5'-0" above the existing floor. Above that line plaster (B) is on top of plaster (A).

32A

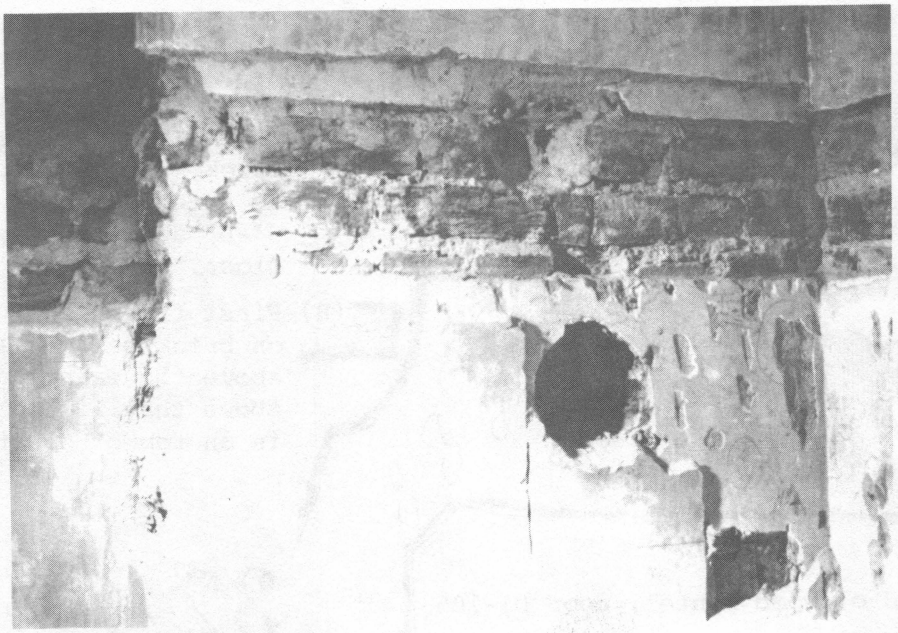
south cheek wall RM 105 × west wall RM 105

Masonry features -- note the absence of constructed joints or infilled openings.



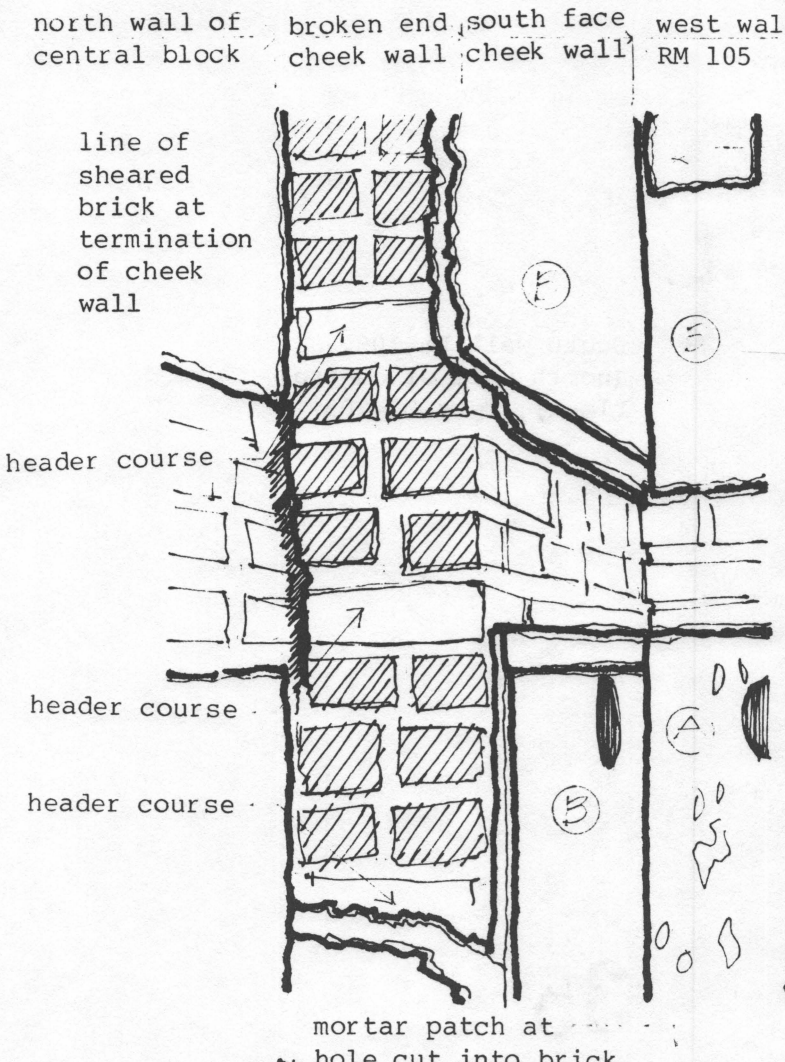
Rm 105, southwest corner

33



RM 105, south cheek wall

34

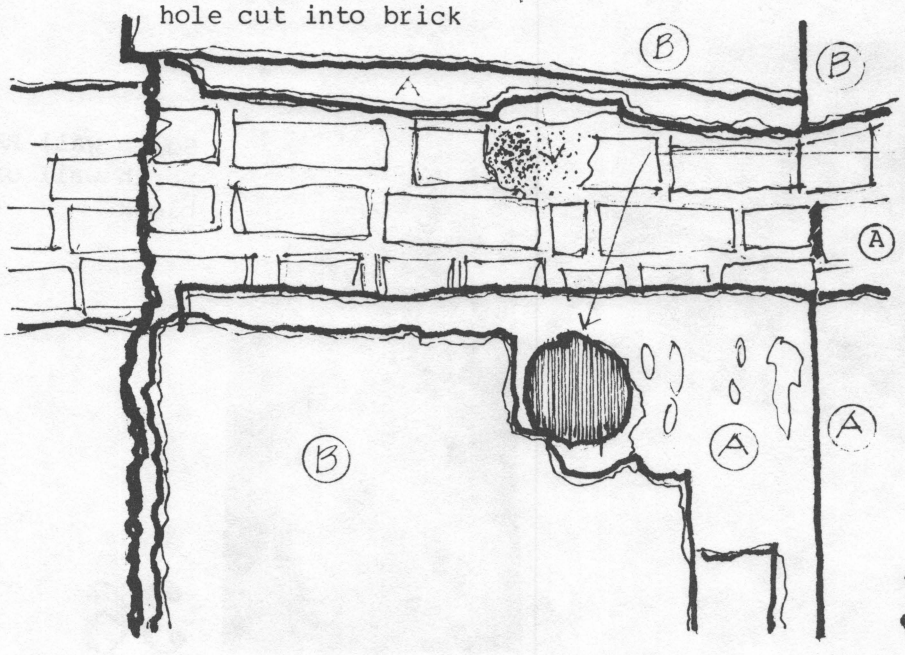


steel plate, 1980 structural stabilization of loggia by NPS

sheared brick ends

The cheek wall represents the remainder of the terminal wall of the north wing. Evidence of any openings original to construction of the wall disappeared when the wall was breached. It seems probable that the abutting wall of the central block was constructed before the wall was breached. The principle physical evidence supporting this conclusion is the fact that the mortar joints in the exposed masonry of the central block wall are not struck, as this would be impossible were the wall built flush against an existing surface.

33A



The brick at the intersection of the west and south walls is bonded, showing a half lap at alternate courses

hole cut into brick

First series of plaster on brick is continuous at the corner formed by the south and west walls. This plaster bears traces of the red and black wallpaper seen in illustration 31A.

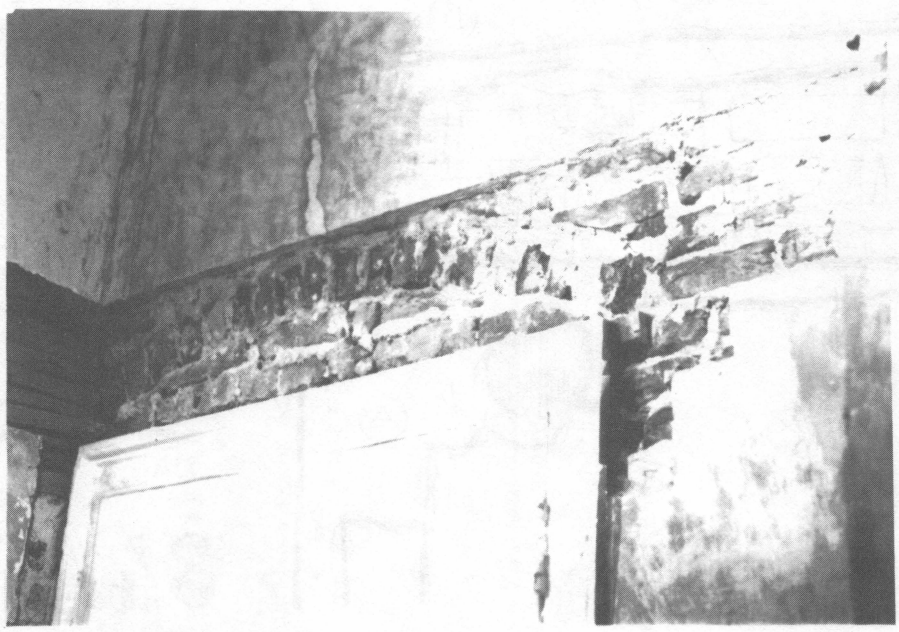
34A

B The most recent series of plaster on the west wall and south cheek wall continues onto the central block wall, where it is the only plaster series.



South wall Rm 105,
(north wall of central
block), door D2-105

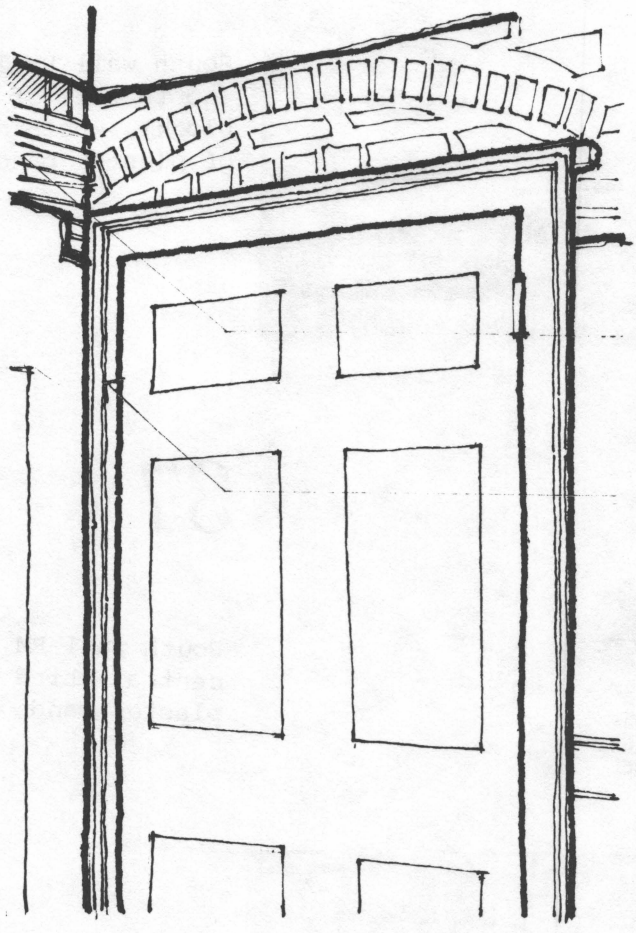
35



South wall RM 105,
north wall of central
block

36

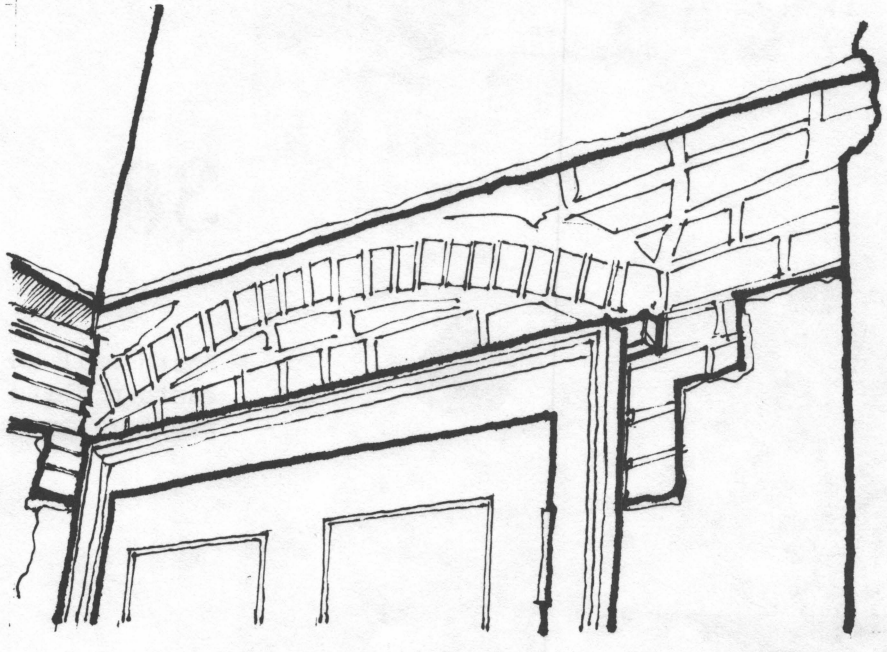
east partition wall RM 105 / south wall RM 105



single series of plaster on split wood lath at partition. Corner cut full height and patched over expanded metal lath.

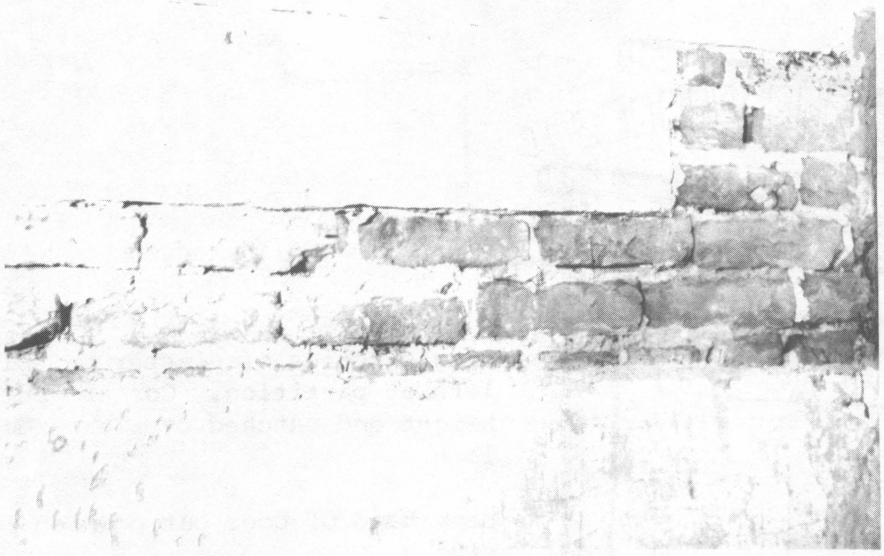
back band of door cut down on lock side

35A



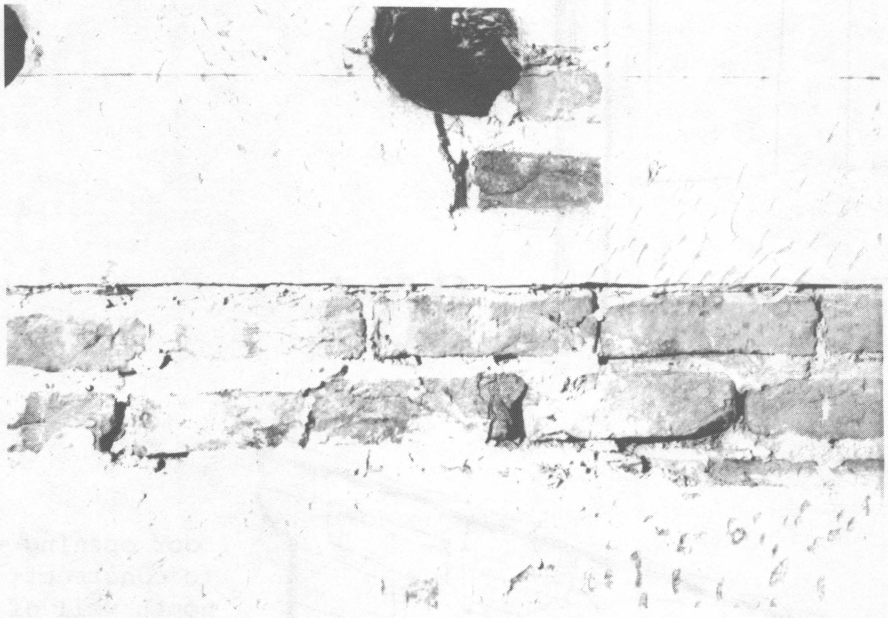
Door opening is original to construction of the north wall of the central block, as evidenced by constructed brick jambs, integral masonry relieving arch and wood lintel.

36A



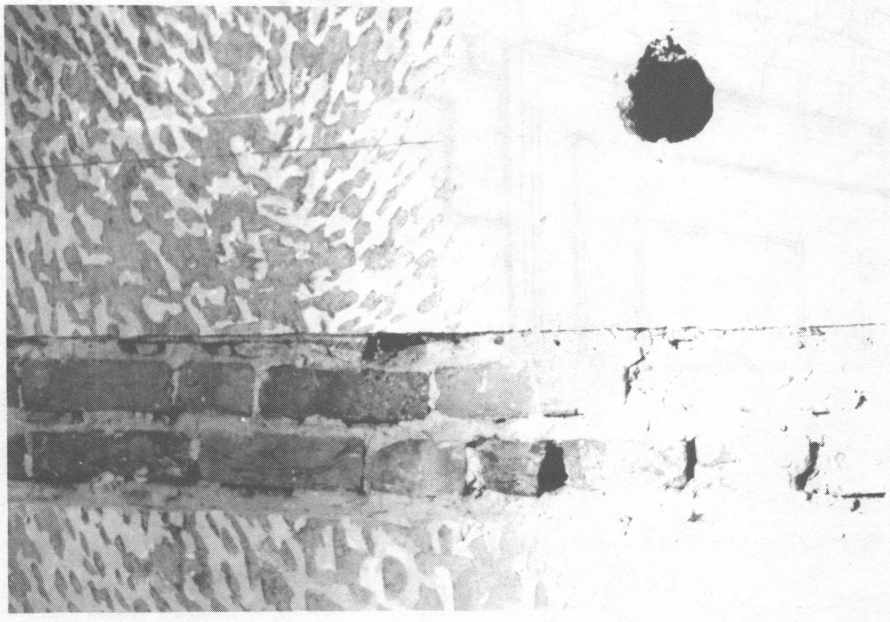
South wall RM 107, (north wall of central block), western third of plaster band

37



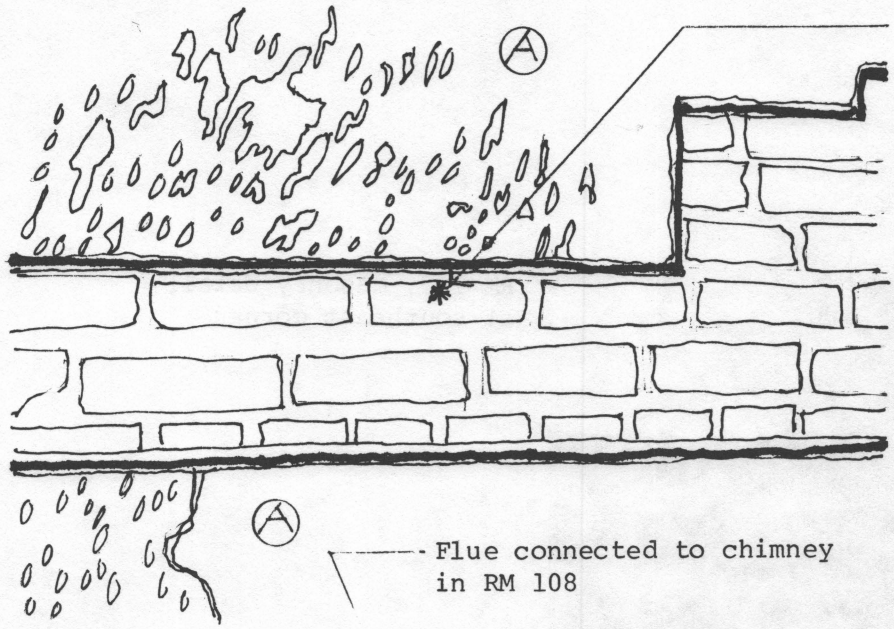
South wall RM 107, central third of plaster band

38



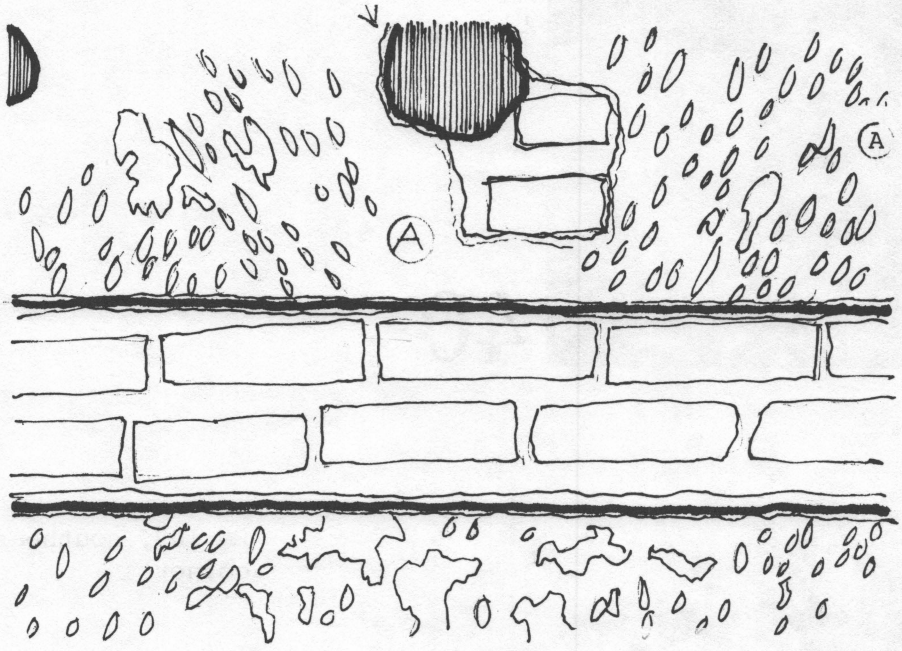
South wall RM 107, eastern third of plaster band

39



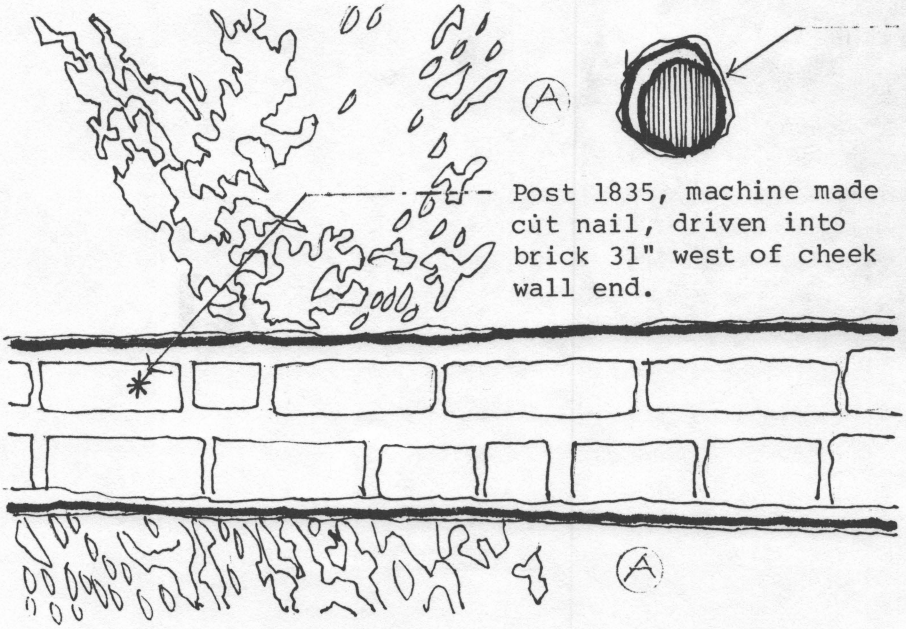
Post 1835, machine made cut nail, driven into brick 31" east of the west partition wall. Plaster A was applied after the nail was in place as evidenced by adhesion of plaster to the nail. See also 39A. The purpose of these nails is unknown, but the regularity of their placement suggest the possibility of a mechanically applied finish material such as paneling.

37A



Two series of plaster on brick. First finish coat heavily scored to receive subsequent single white coat, which is mo st recent finish.

38A



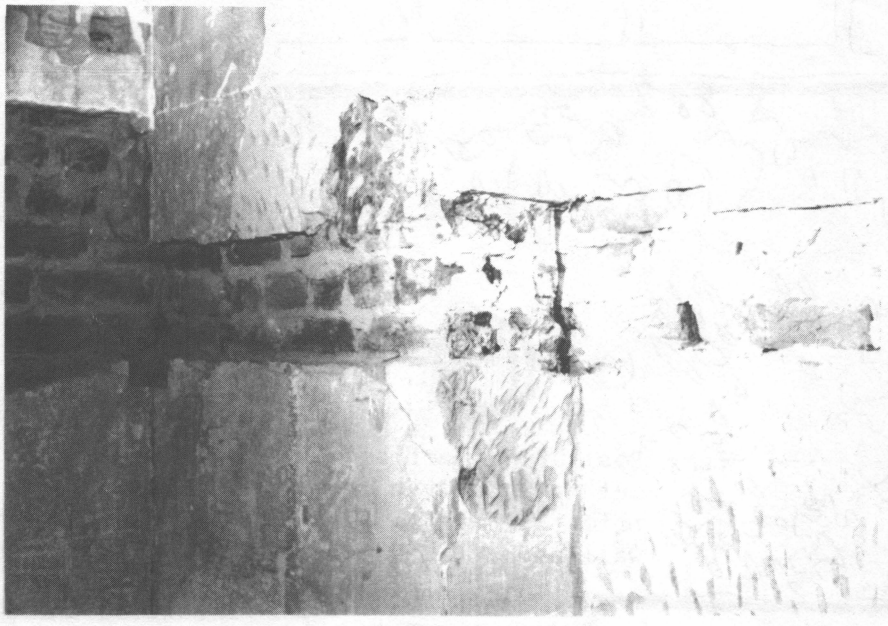
Masonry features -- Exposed wall is the bearing wall for the north end of the central block. Extensive use of broken bricks. Bed joints irregular and poorly leveled. Note the absence of construction joints or infilled masonry openings.

39A



RM 107, masonry detail
at southeast corner

40

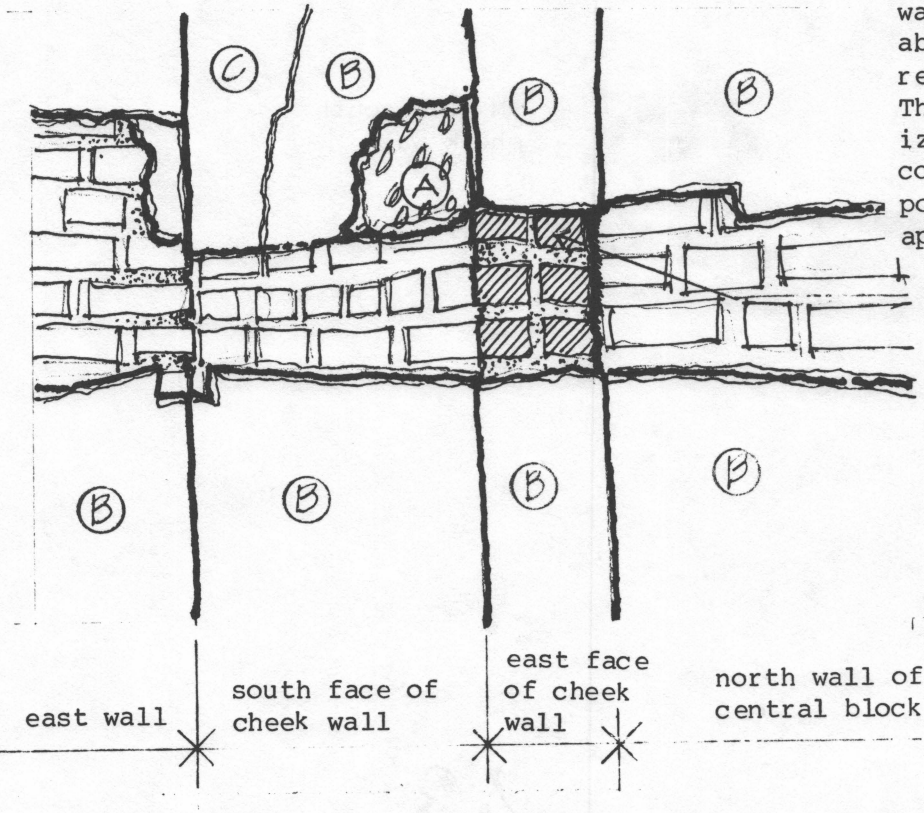


RM 107, southeast
corner

41



40A



east wall | south face of cheek wall | east face of cheek wall | north wall of central block

41A

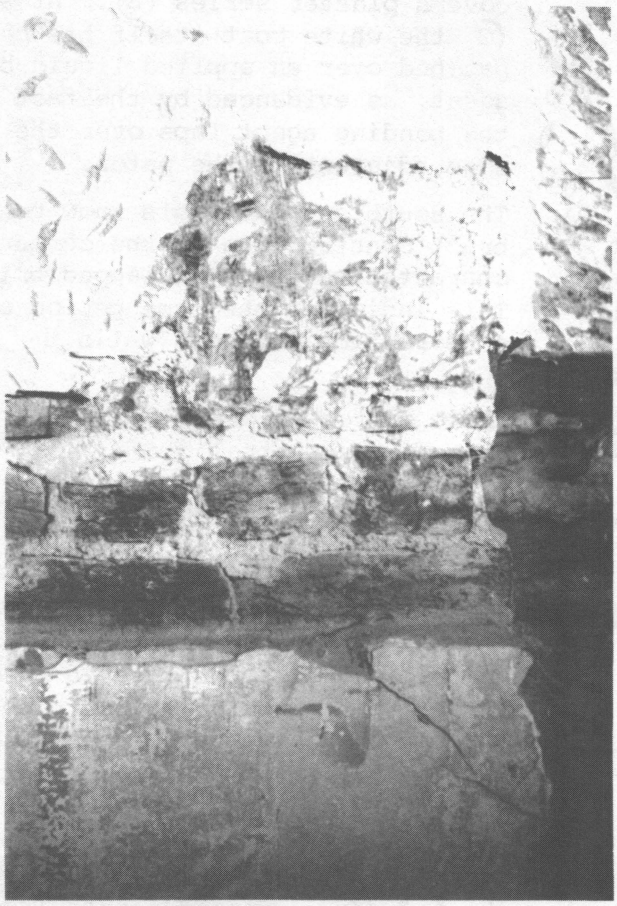
(C) A single layer of white coat generally covers plaster series (B). At area (C) the white coat itself has been patched over an applied liquid bonding agent, as evidenced by the fact that the bonding agent laps over the edge adjacent to the patch.

The south and east wals show bonded brick construction at the corner, characterized by half lapped bricks. This indicates the same period of construction for both walls.

(B) First series of plaster on brick on the face of the central block wall, where it is applied over the machine made, cut nails shown in illustrations 37A and 39A. This plaster appears to be continuous around the corner to the east face of the cheek wall, where it covers a thin layer of plaster which appears to be an earlier finish coat over the sheared brick ends. It then turns the corner onto the south face of the cheek wall where it covers plaster (A).

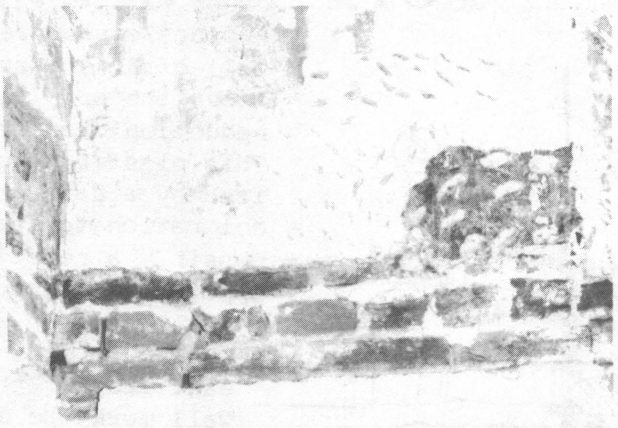
(A) First series of plaster on brick, continuous around corner from south cheek wall to east wall. Appears elsewhere on east wall of RM 107 and RM 106, above the pre- floor reduction chair rail height. This plaster is characterized by a dark grey discoloration to its surface, possibly a reaction of applied wallpaper sizing.

Sheared bricks at the east face of the cheek wall mark the line at which the original terminal wall of the north wing was breached to make the connection to the central block.



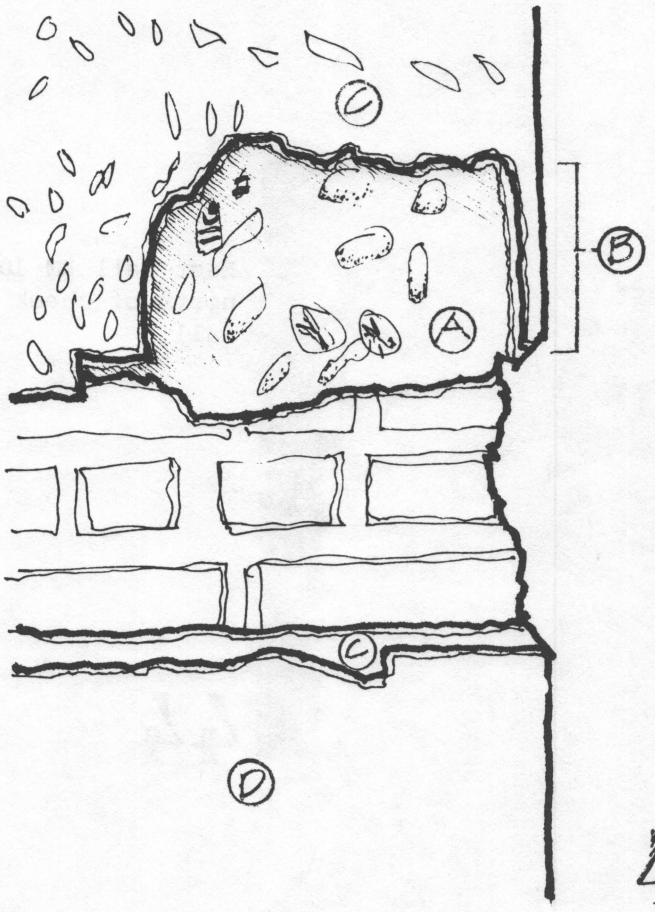
RM 107, western edge of south cheek wall

42



RM 107, south cheek wall

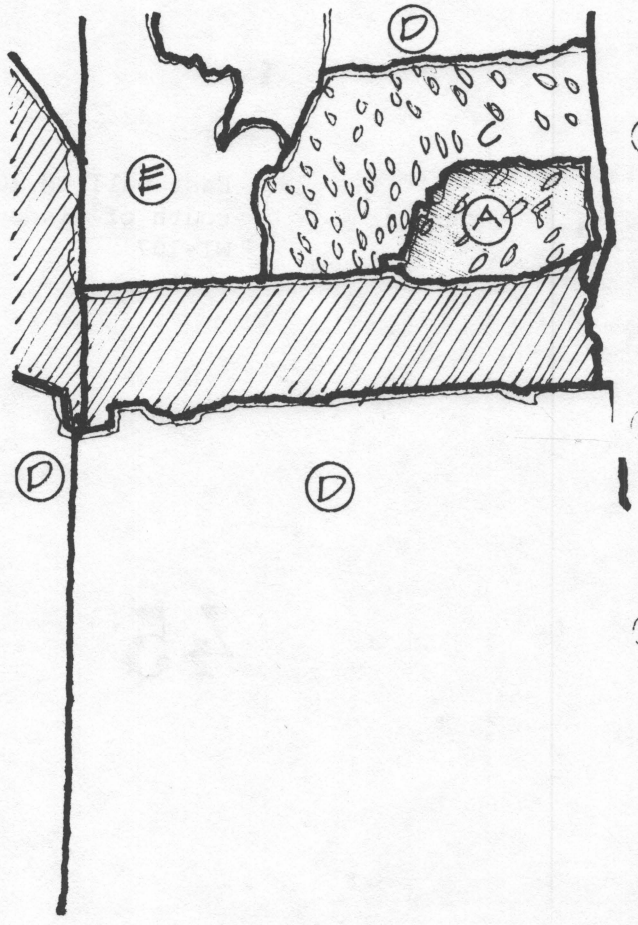
43



(A) First series of plaster on brick. See illustration 41A, plaster (A). This plaster shows fragments of the red and black wallpaper illustrated in 31A. This plaster appears also on the east wall of RM 107 and RM 106 just above the pre- floor reduction chair rail. On the cheek wall, the plaster is sheared off along the line of broken bricks. Therefore it was apparently the extant interior finish at the time the wall was breached. This series is scored to receive subsequent finish coats.

(B) A thin plaster edge is visible underneath plaster (C) on the east face of the cheek wall where it abuts the sheared edge of plaster (A). Where visible, this plaster appears to have a smooth hard finish. Therefore it may represent the first treatment after the north wall was breached.

42A

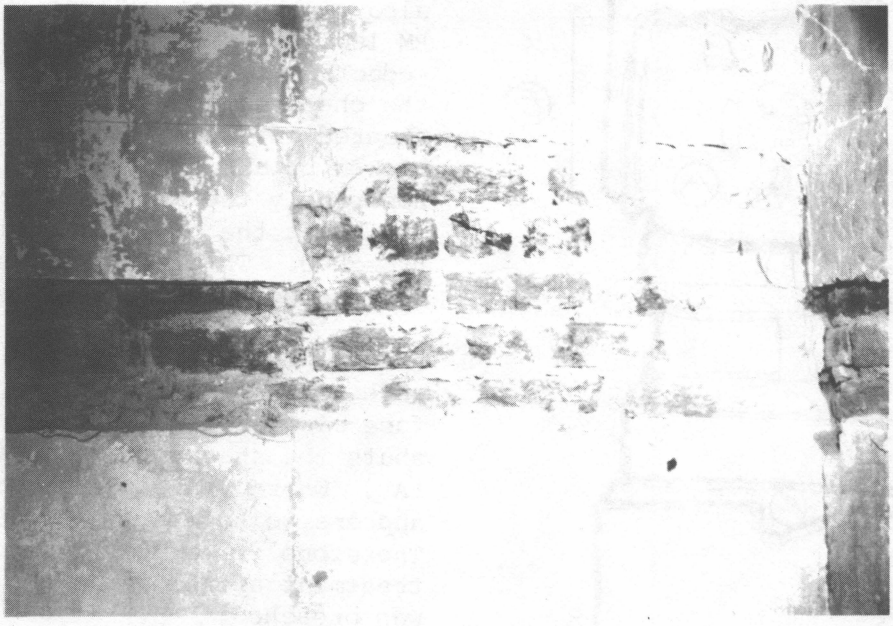


(C) This series of plaster represents a general finish coat on the east wall of RM 107 and the south and east faces of the cheek wall, as evidenced by continuity at corners. Also, it appears to make the transition to the face of the central block wall. See illustration 41A.

(D) A single layer white finish coat is the most recent plaster surface. It was applied over a metal corner bead at the corner of the cheek wall, suggesting a 20th century repair.

(E) Patch to white coat over applied liquid bonding agent.

43A



East wall RM 107, north of cheek wall

44

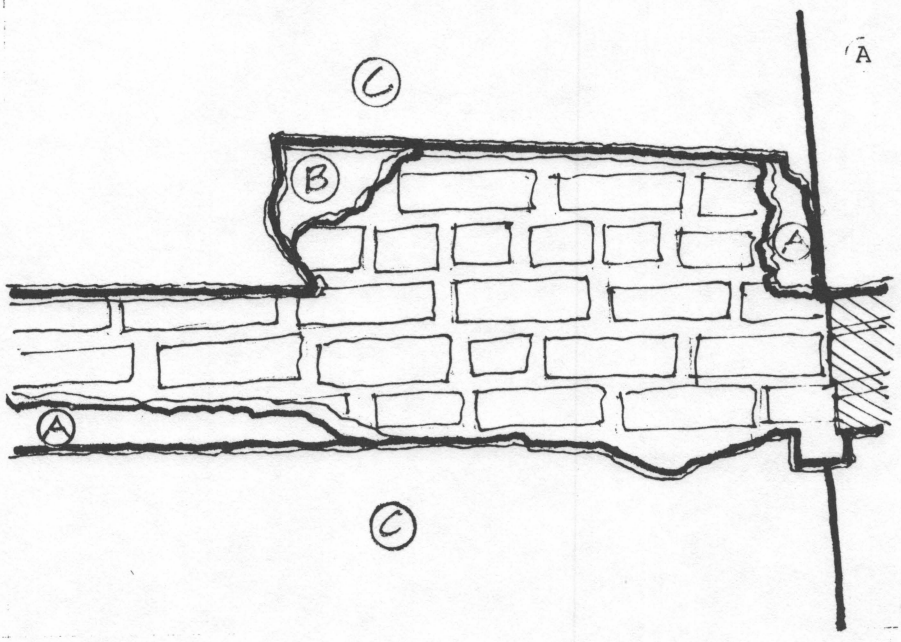


East wall RM 107, south of window W1-107

45

east wall
RM 107

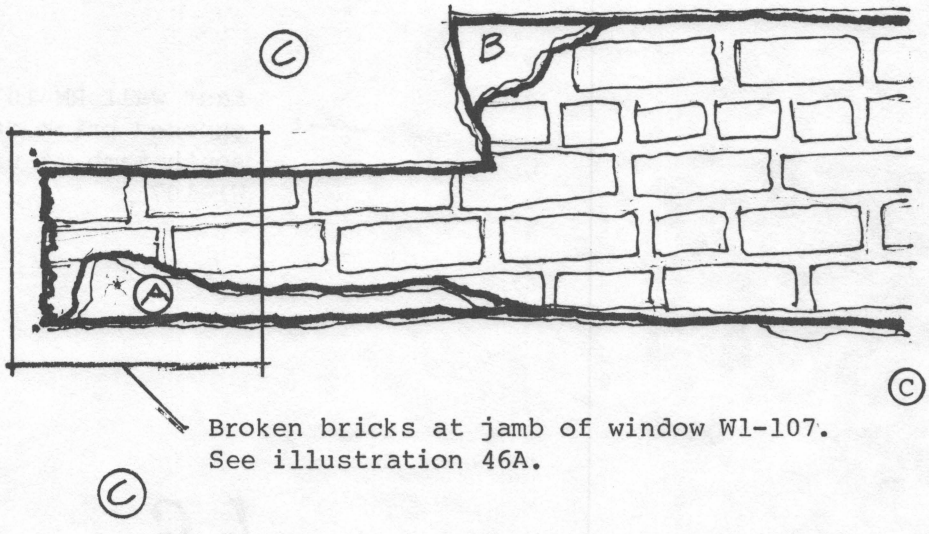
south wall
RM 107



(A) First series of plaster on brick. Dark grey surface discoloration. Continuous at southeast corner. Appears elsewhere above pre- floor reduction chair rail height on east wall of RM 106 and RM 107. One post floor reduction scored coat is the general finish above this series.

44A

(B) Hard grey plaster patch applied against brick. Extent unknown.



Broken bricks at jamb of window W1-107. See illustration 46A.

(C) White coat. Most recent finish throughout wing.

45A

Masonry features -- Note brick header course and absence of construction joints or infilled masonry openings.

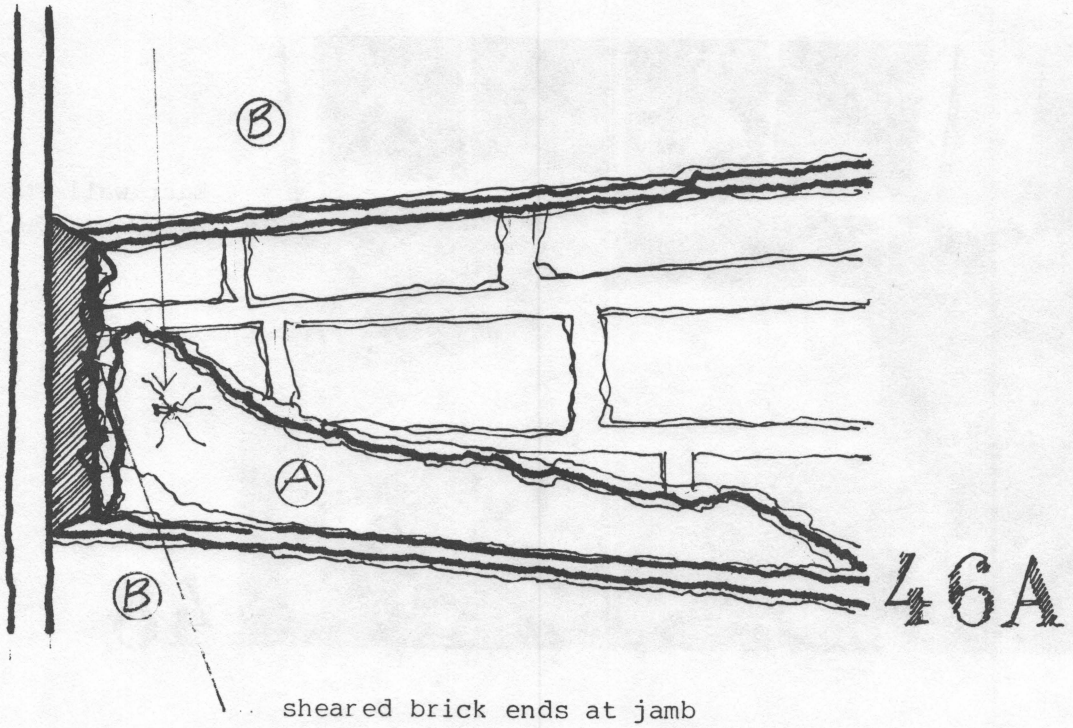


East wall RM 107,
exposed brick at
south jamb of window
W1-107

46

Note: the north jamb of the masonry opening at window W1-107, is integral to construction of the wall, as shown by flush vertical alignment of exposed bricks. Also, the mortar joints are formed flush at the heads of the brick, suggesting that the wall was laid against a wood frame.

Machine made cut nail. The pattern of radial cracks in the surrounding plaster (A) indicate that the nail was driven into the wall after this plaster was in place. Plaster (B), which was removed during the course of the investigation was found to adhere to the surface of the nail, and completely covered it. Therefore, the nail was already in place when plaster B was applied.

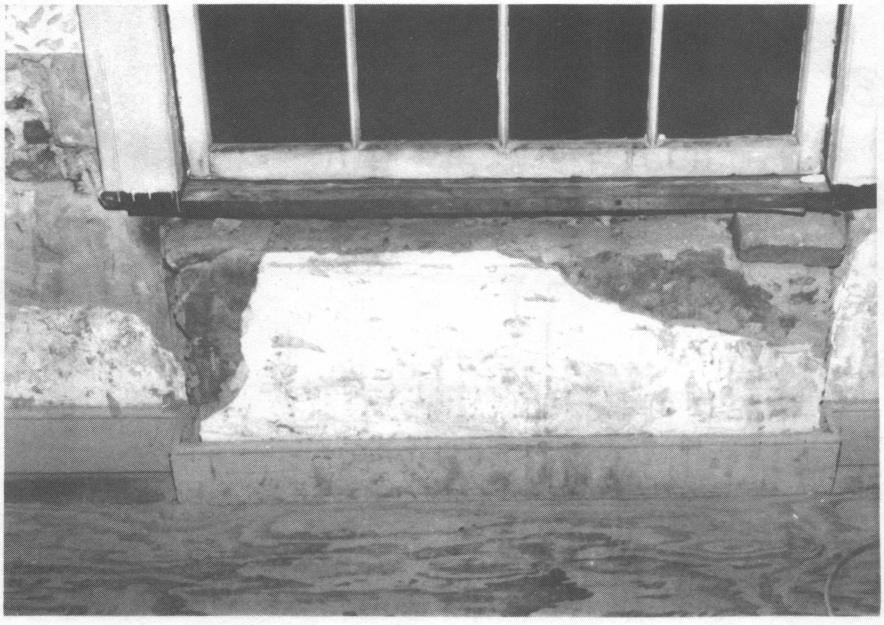


sheared brick ends at jamb



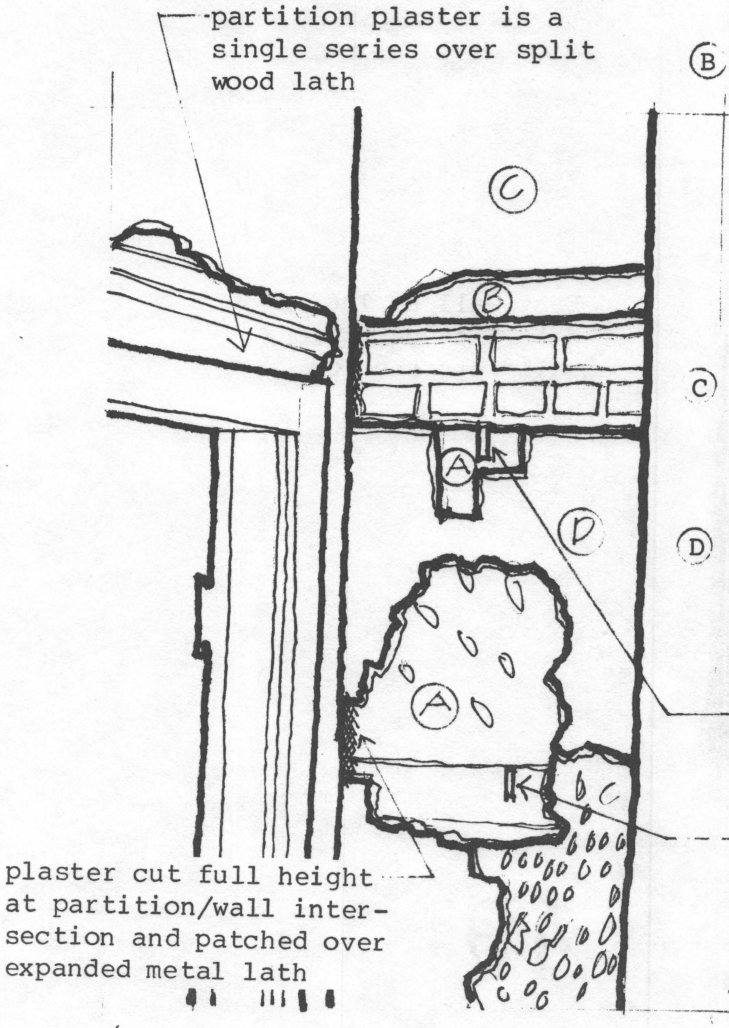
East wall RM 107,
between window W1-107
and north partition
wall

47



East wall RM 107,
below window W1-107

48

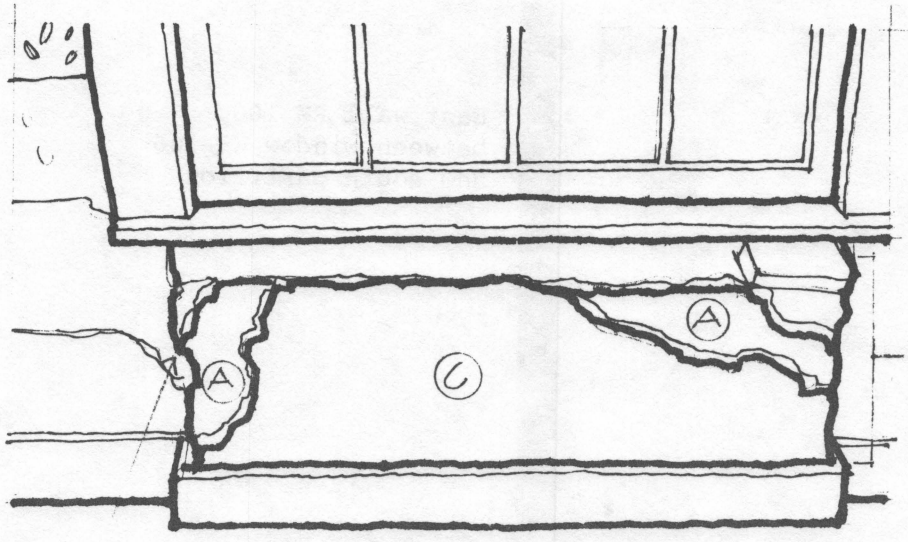


(B) First layer of plaster on brick. Dark grey surface discoloration. This plaster was formed against the upper edge of the pre- floor reduction chair rail. It corresponds to the red sur-faced plaster, found below chair rail height, formed against its lower edge.

(C) First extant post floor reduction plaster series appears generally over entire wall surface above plaster (A) and (B). Scored to receive subsequent finish.

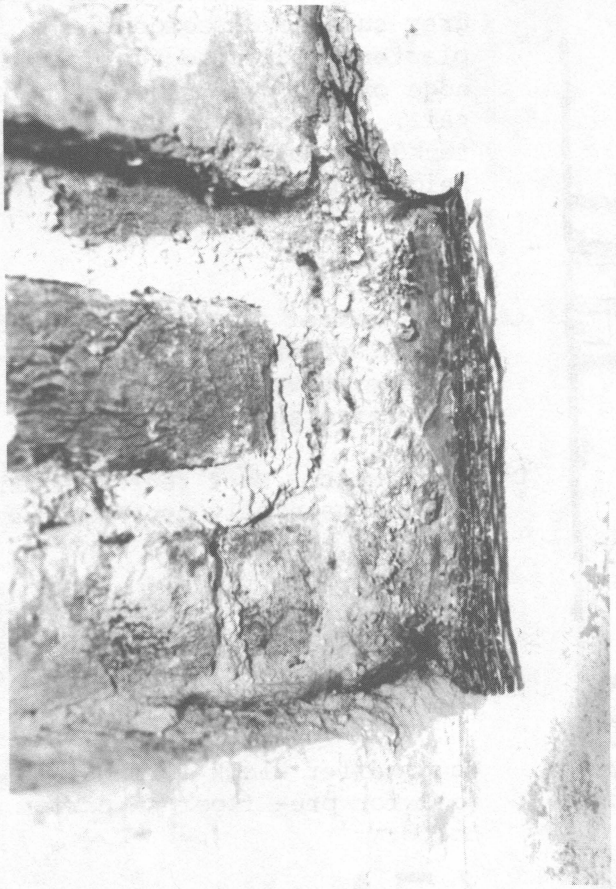
(D) White coat. Most recent extant finish. Appears generally over plaster (C) on all wall surface.

47A



48A

(A) First layer of plaster on brick below pre- floor reduction chair rail height. Hard red finish, scored to receive sub-sequent coats. Appears also on the unreduced face of the wall below window W1-107. Sheared plaster at the broken brick ends corresponds to the line at which the wall was reduced adjacent to the window.



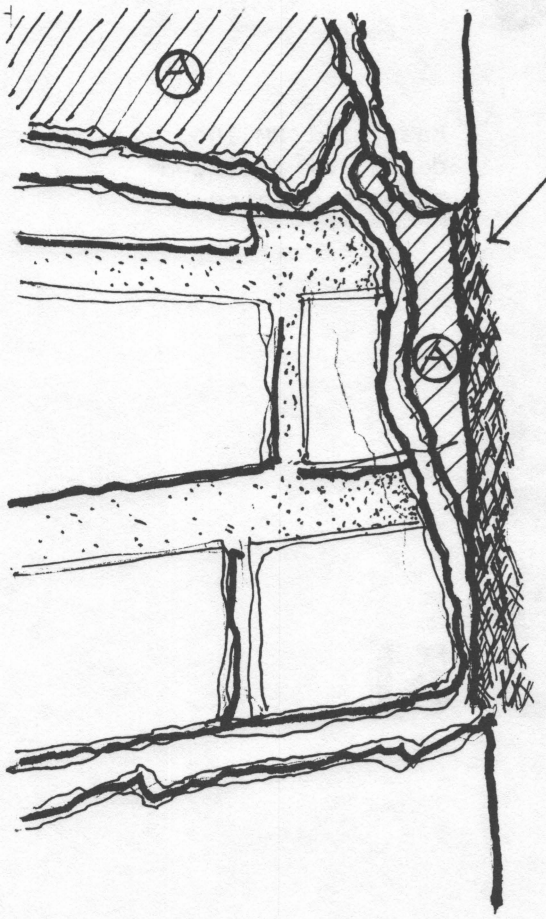
East wall RM 106,
detail at partition/
wall intersection

49



East wall RM 106,
between window W1-106
and south partition

50

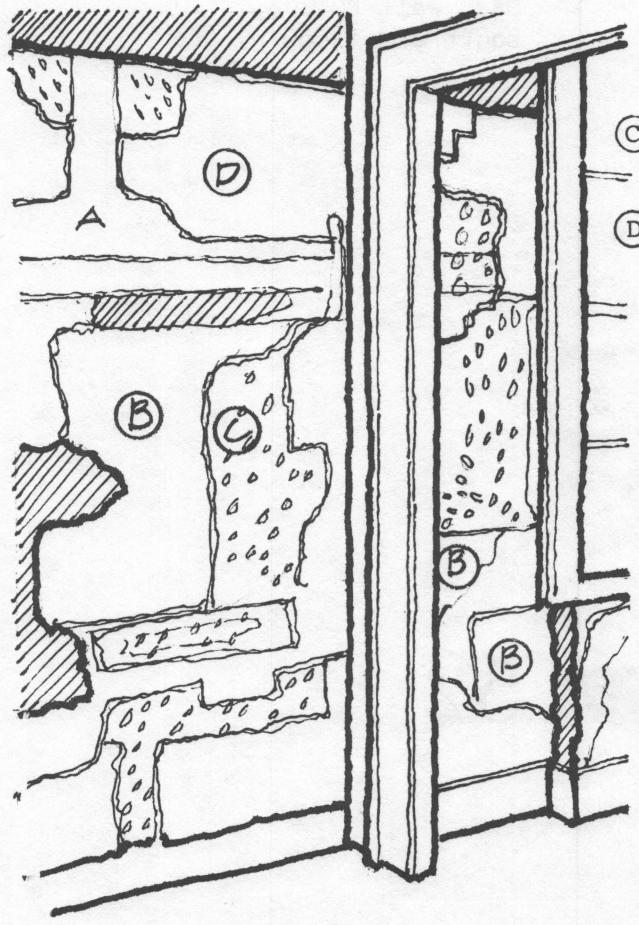


Plaster cut full height at partition/ wall intersection and patched over expaneded metal lath.

(A) First plaster on brick, hard grey finish plaster found in conjunction with pre-floor reduction chair rail is continuous underneath existing partition to RM 107 east wall. Again, the the grey plaster is found above chair rail height, with the corresponding hard red plaster below.

(B) Portland cement patch over lime plaster rough coat. The patch is continuous underneath the existing partition to the east wall of RM 107, where it carries a small fragment of an unidentified patterned wallpaper.

49A



(C) Post floor reduction, scored plaster coat general over (A) and (B).

(D) White coat. Most recent finish.

50A



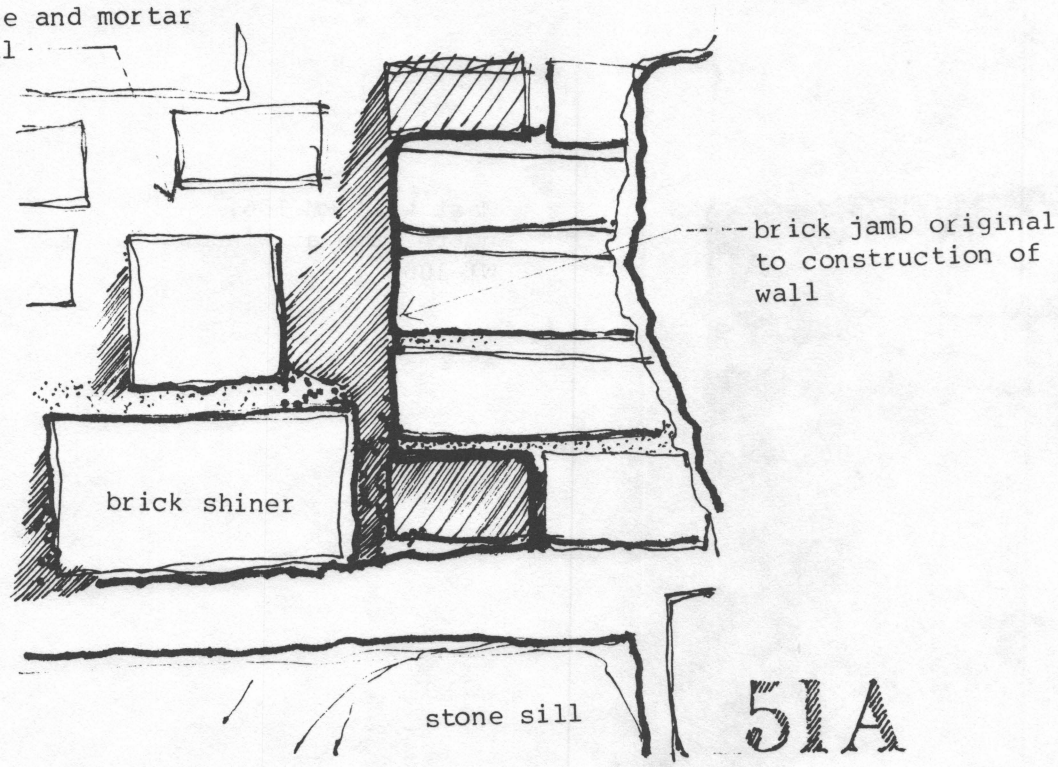
East wall RM 106,
detail of infilled
masonry opening

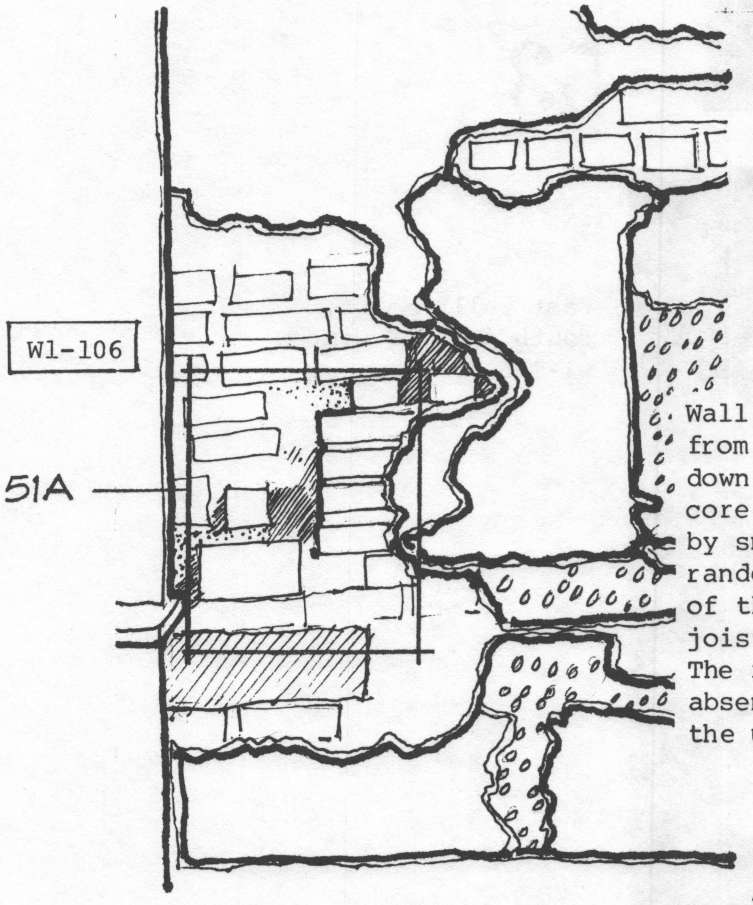
51



East wall RM 106,
south of window W1-106

52





Wall reduced one course of brick in thickness from a line 5'-0" above the existing floor down to the current floor level. The inner core of the wall thus exposed is characterized by snapped headers and broken bricks laid in random coursing. This feature shows the line of the brick ledge wall which carried the floo joists at their originally constructed height. The removal of this ledge also explains the absence of vestigial joist pockets except at the unreduced face of the chimney breast.



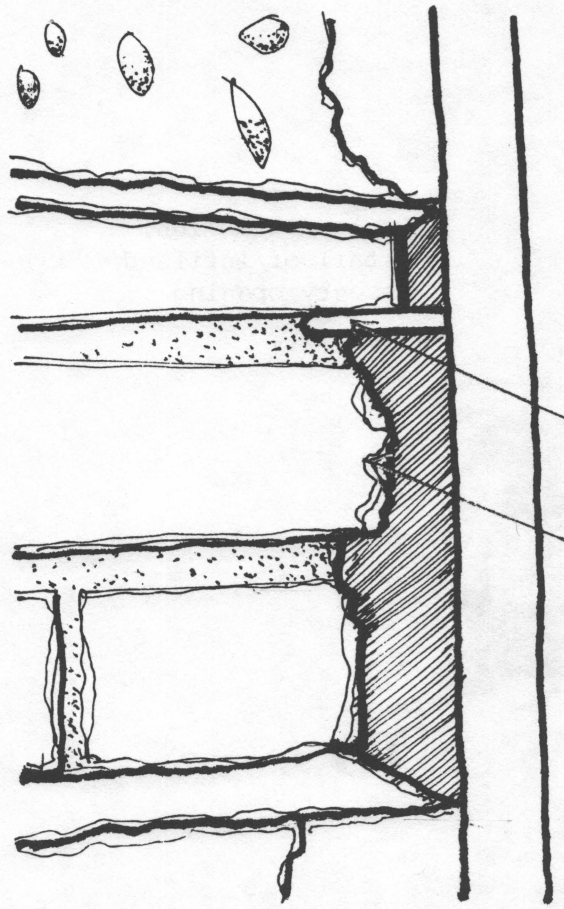
East wall RM 106,
north jamb at window
W1-106

53



East wall RM 106,
south jamb at window
W1-106

54



W1-106

Metal anchor through window frame into jamb

Sheared brick ends, full height of masonry opening, where visible

53A



W1-106

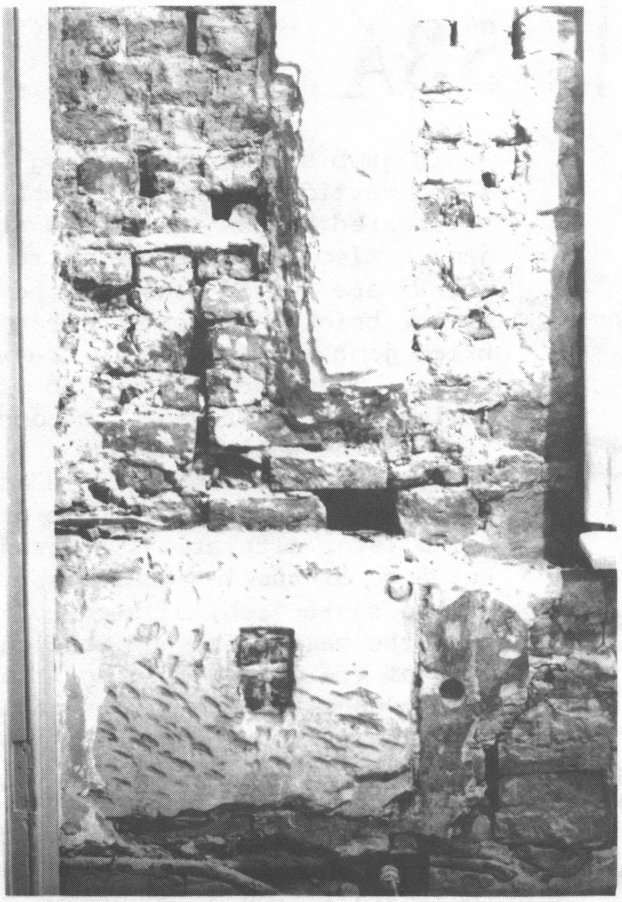
South jamb of masonry opening shows a flush vertical alignment of bricks. No sheared bricks were found at this jamb. Also, all visible mortar joints are formed flush at the head of the bricks, suggesting that the brick jamb was laid against a wood frame. Therefore, this jamb is believed to be original to construction of the wall. The masonry lugs and segmental relieving arch at the window head show no evidence of being later alterations. Given the evidence of the integral construction of the south jamb, it seems probable that the basic size and configuration of the window opening is original to construction of the wall. Documentary sources confirm a history of repair and replacement of windows. The sheared brick at the north jamb may be assumed to be the result of one of these alterations, probably the installation of counterweights, necessitating a wider masonry opening.

54A



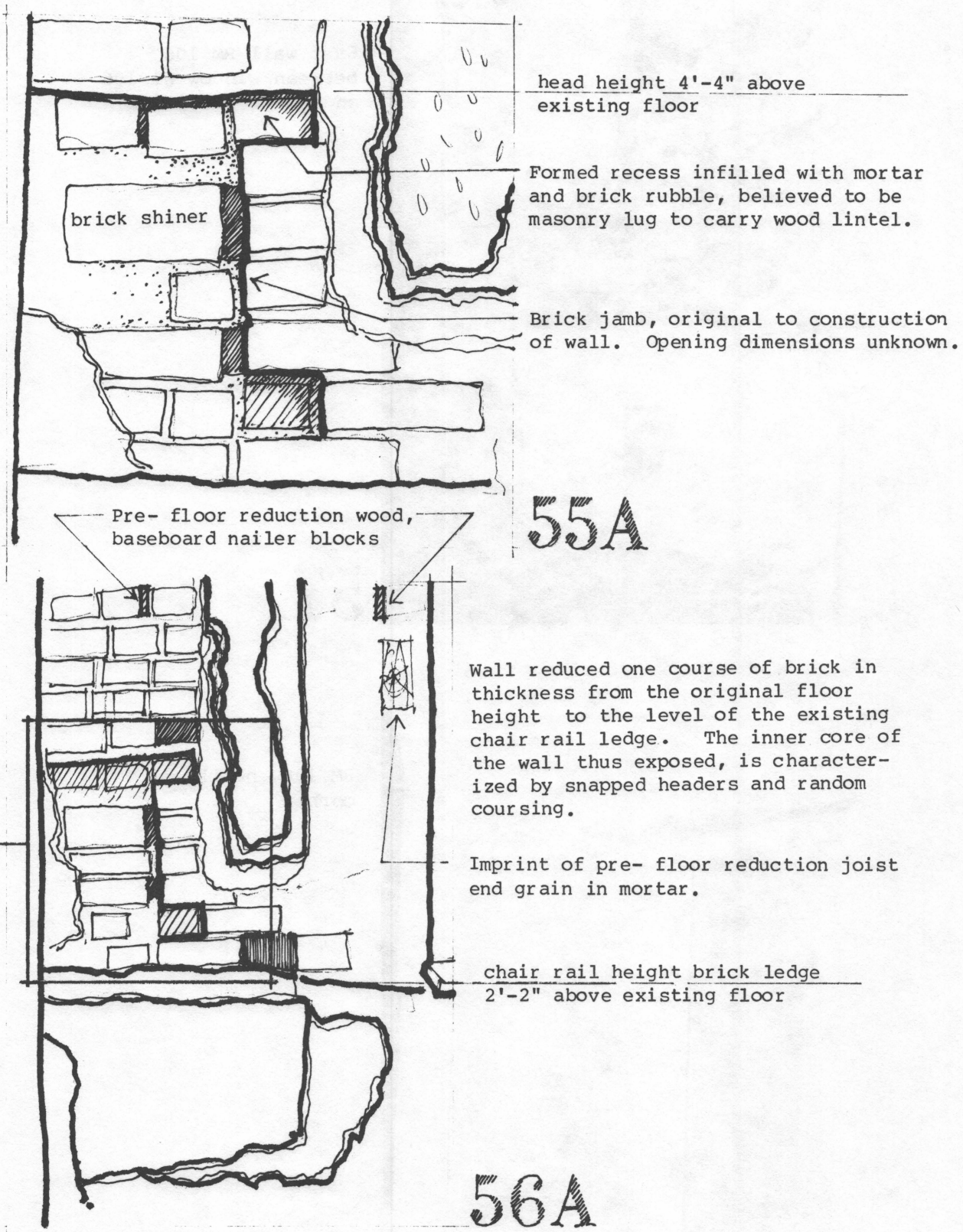
East wall RM 106,
detail of infilled
masonry opening

55



East wall RM 106,
between window W1-106
and north partition

56


head height 4'-4" above existing floor
Formed recess infilled with mortar and brick rubble, believed to be masonry lug to carry wood lintel.
brick shiner
Brick jamb, original to construction of wall. Opening dimensions unknown.
55A
Pre- floor reduction wood, baseboard nailer blocks
Wall reduced one course of brick in thickness from the original floor height to the level of the existing chair rail ledge. The inner core of the wall thus exposed, is characterized by snapped headers and random coursing.
55A
Imprint of pre- floor reduction joist end grain in mortar.
chair rail height brick ledge 2'-2" above existing floor
56A
north partition wall
east wall RM 106



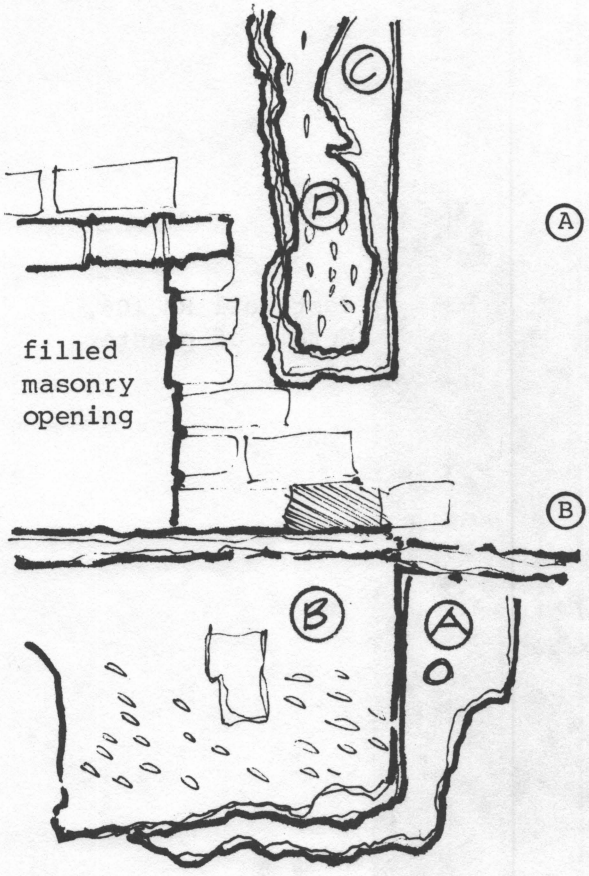
East wall RM 106
between window W1-106
and north partition

57



RM 106, northeast
corner

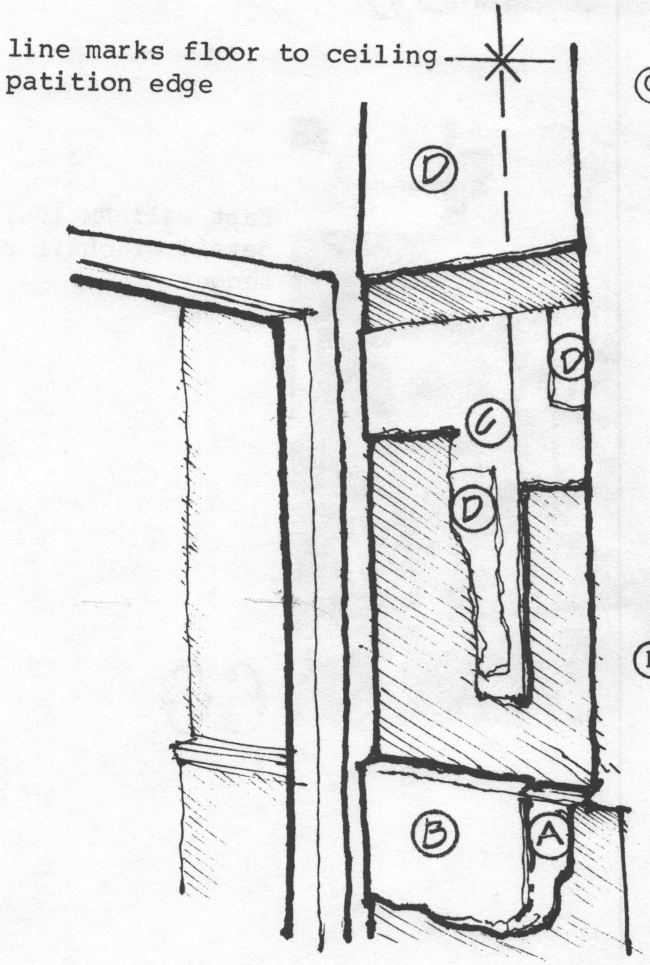
58



(A) First layer of plaster on brick. Applied red finish. Appears only on unreduced areas of wall below the height of the original floor level. The sheared upper edge of this plaster corresponds to the line of reduction in wall thickness to the height of the existing chair rail.

(B) First finish series on top of plaster (A). The south edge of this plaster is formed in the imprint of a partition edge. The upper edge of this plaster is also sheared at chair rail height, suggesting that it also predates the reduction in floor level.

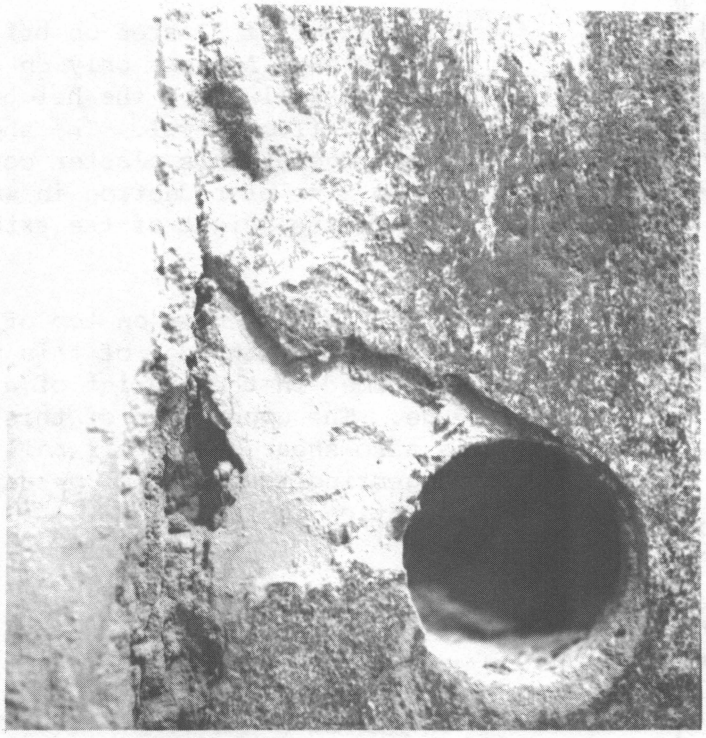
57A



(C) First seriesof plaster on brick above existing chair rail height. This plaster terminates abruptly in a formed vertical edge, continuous from chair rail height to the ceiling. This edge, if projected in a line perpendicular to the west wall of RM 105 intersects the former partition location at the north face of the chimney breast (see illustrations 5A and 6A). This plaster series carries the shadow of a cornice and neck moulding which is continuous on the east walls of RM 106A and RM 104. It turns the corner to the north and west walls of RM 104, and continues on the west wall of RM 105 to its termination at the north face of the chimney breast.

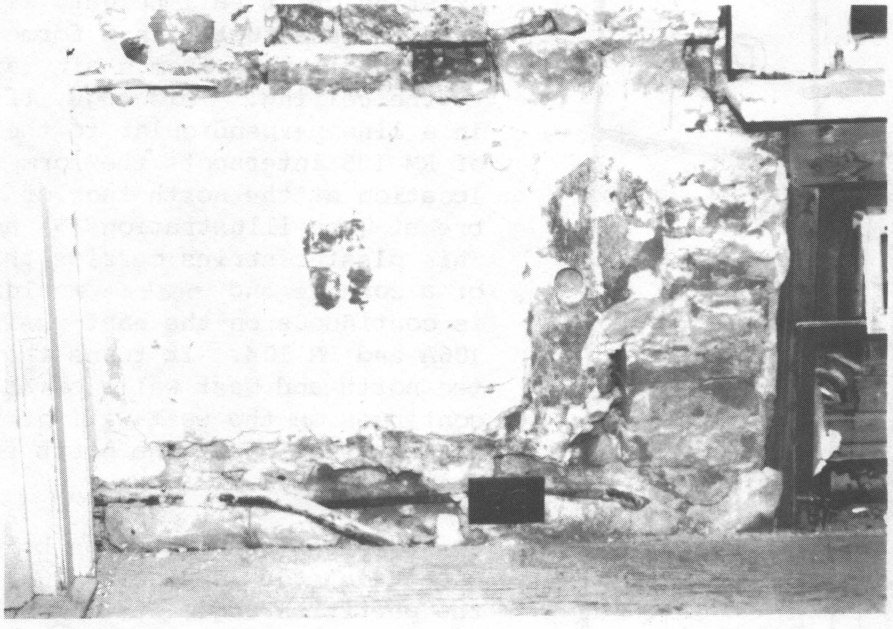
(D) First series of plaster on brick south of partition edge in plaster (C). North of the partition edge, it forms the first series on top of plaster (C), terminating at the north wall of RM 106. This series is covered with a white coat, which forms the most recent finish.

58A



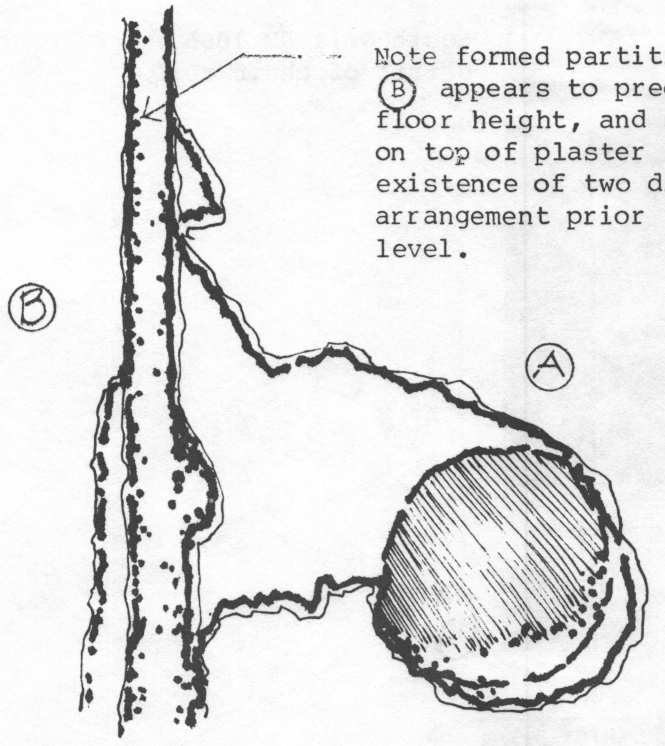
East wall RM 106,
detail of plaster
edge

59

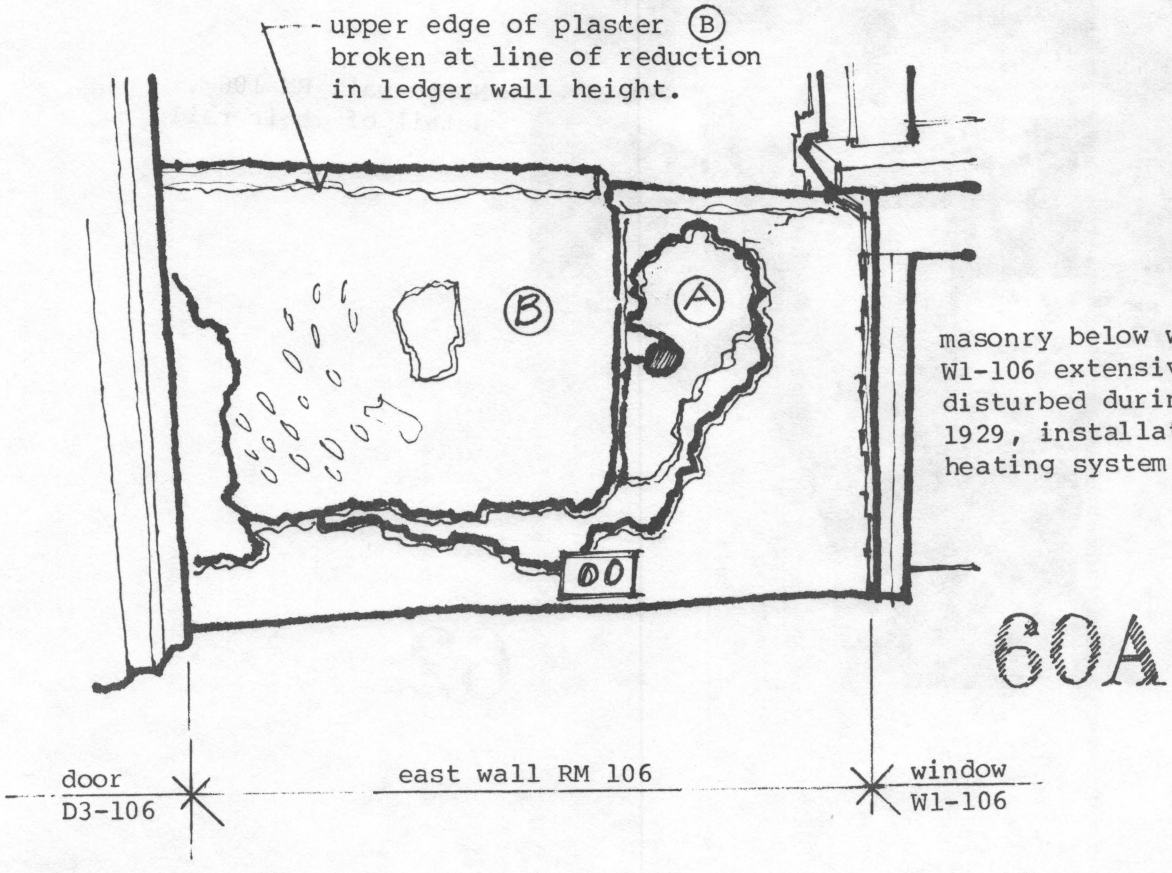


East wall RM 106,
detail of chair rail
ledger

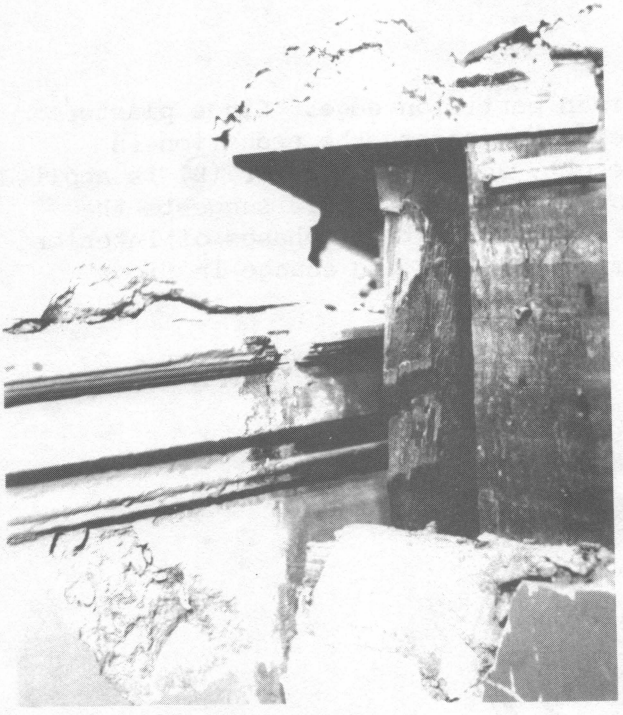
60


Note formed partition edge. Since plaster (B) appears to predate the reduction in floor height, and since plaster (B) is applied on top of plaster (A), this suggests the existence of two distinct phases of interior arrangement prior to the change in floor level.
(B)
(A)

59A

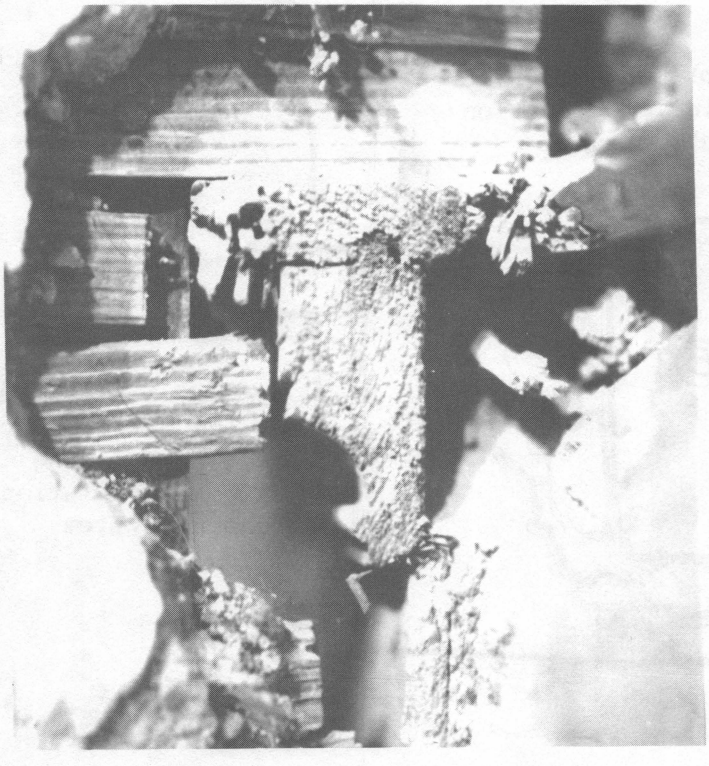

upper edge of plaster (B) broken at line of reduction in ledger wall height.
(B)
(A)
masonry below window W1-106 extensively disturbed during 1929, installation of heating system
door D3-106
east wall RM 106
window W1-106

60A



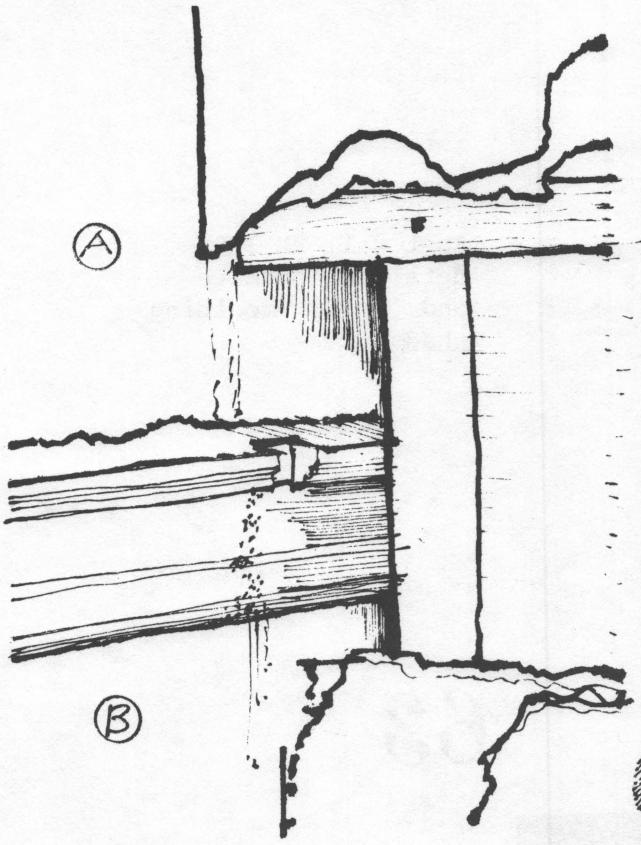
South wall RM 106A,
detail of chair rail

61



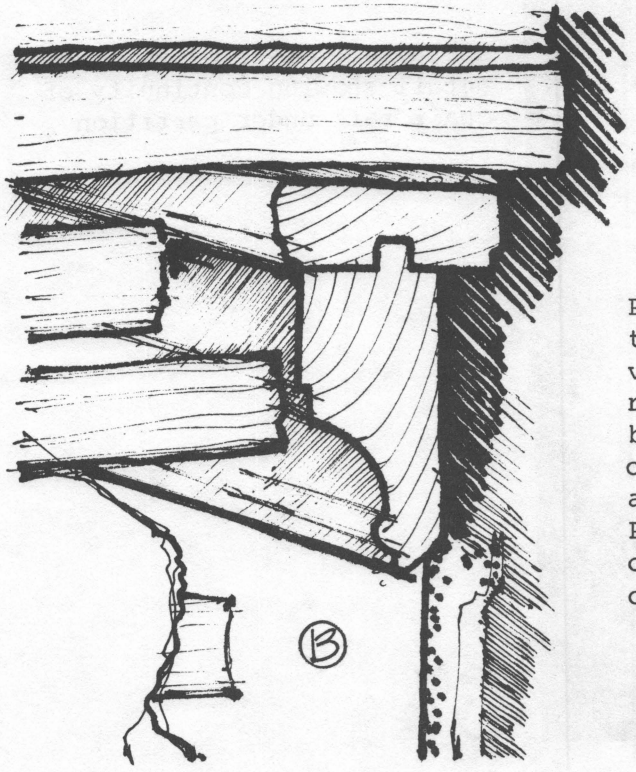
North wall RM 106 ,
detail of chair rail

62



Chair rail is continuous through the partition separating RM 106A and RM 106. The partition, typical of all partitions in the north wing, is composed of a single series of plaster on split lath over reused whip sawn studs. The area of chair rail protected by the partition shows a green painted finish.

61A



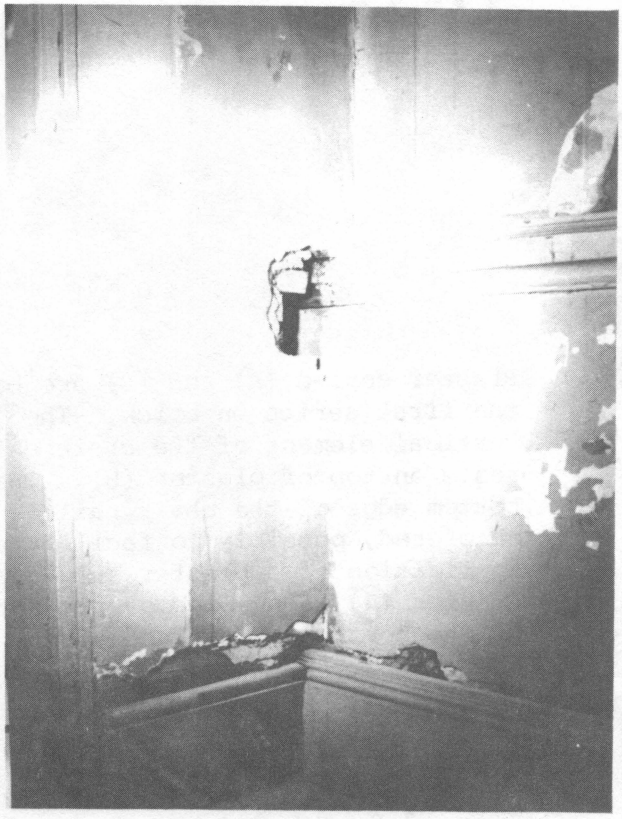
Plaster series (A) and (B) are both the first series on brick. The vertical element of the chair rail rests on top of plaster (B). The bottom edge of the chair rail is chamfered, possibly to facilitate application of a plaster skim coat. Plaster (A) is applied over the top of the horizontal surface of the chair rail.

62A



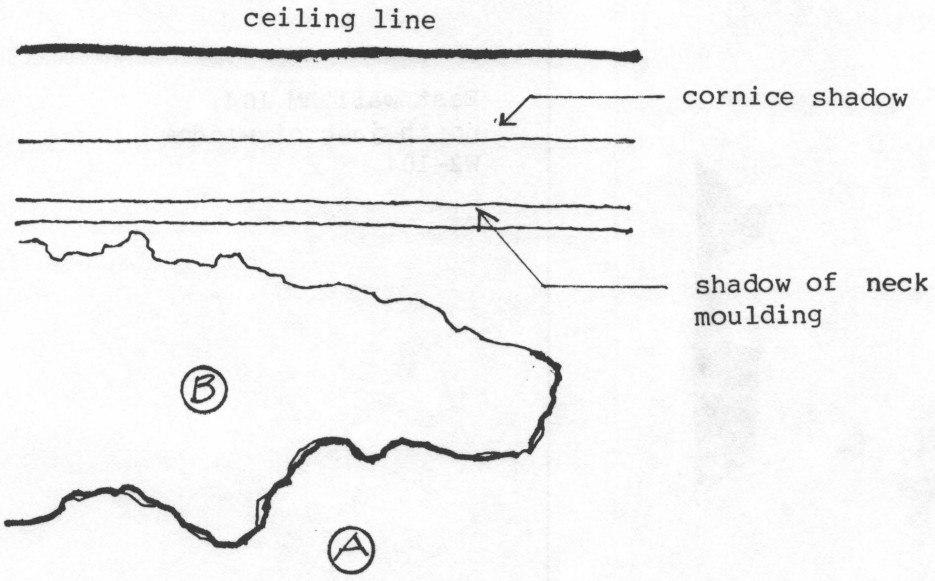
East wall RM 105,
detail of cornice
and neck moulding
shadow

63

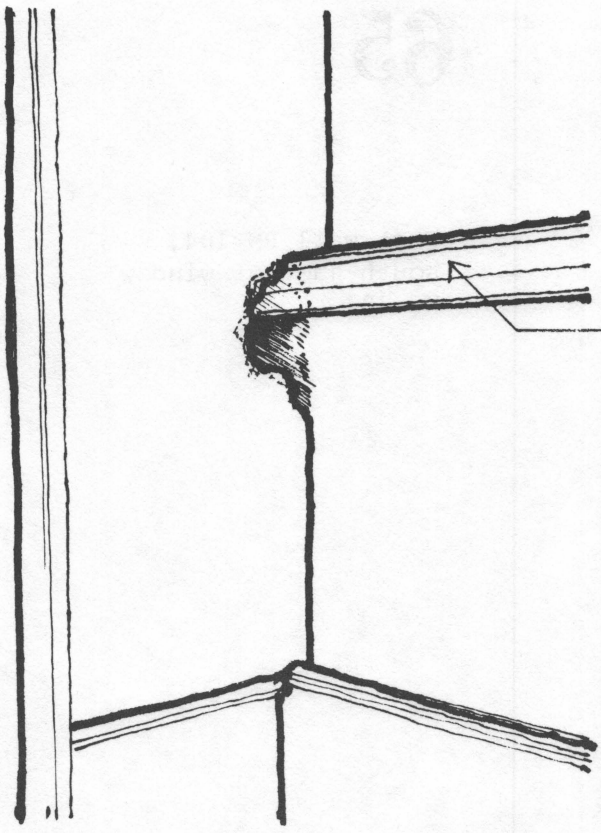


Northeast corner of RM 106A,
detail showing continuity of
chair rail under partition

64



63A



Ⓐ First finish series of plaster on brick.

Ⓑ Extant area of white coat, which is the most recent finish.

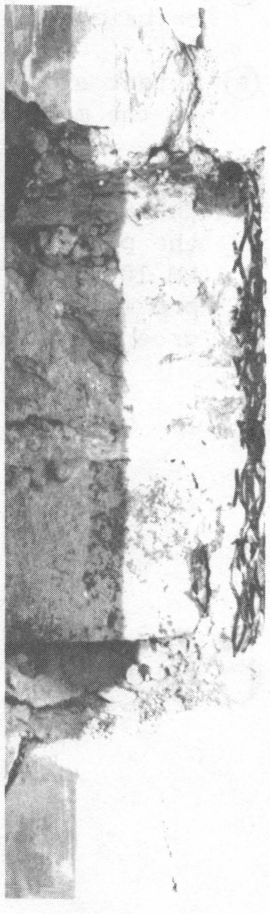
Chair rail is continuous underneath the partition separating RM 106A and RM 104. The area of the chair rail protected by the partition shows a green painted finish.

64A



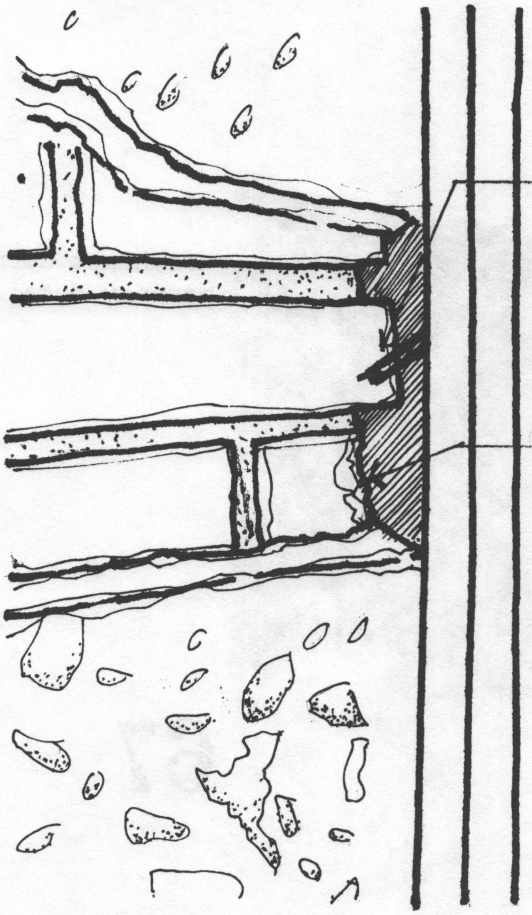
East wall RM 104,
north jamb of window
W2-104

65



East wall RM 104,
south jamb of window
W2-104

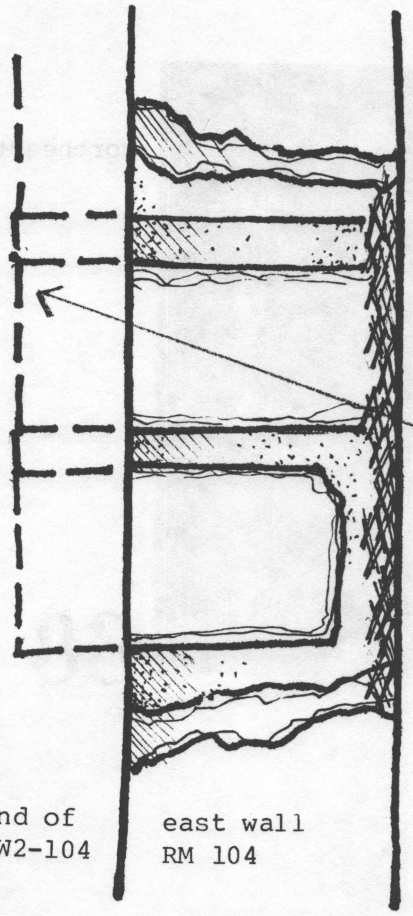
66



Metal anchor through window frame into brick jamb. A similar condition occurs at window W1-106, see illustration 53A.

sheared bricks at jamb

65A



This opening exhibits the same conditions shown at windows W1-106 and W1-107. Therefore, following the same reasoning, this opening in basically the same size and configuration, is assumed to be original to the construction of the wall.

Brick jamb integral to construction of wall. See illustration 54A.

back band of window W2-104

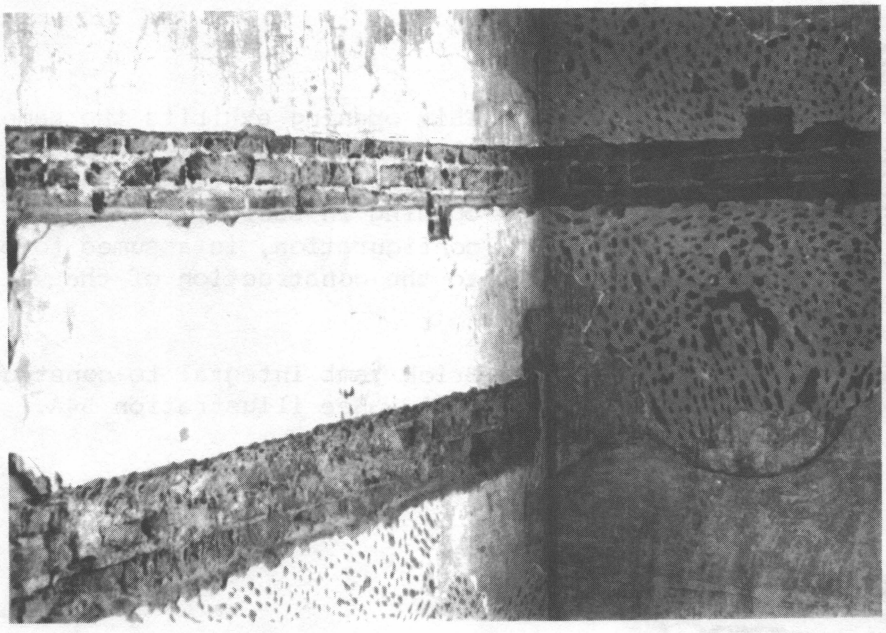
east wall RM 104

66A



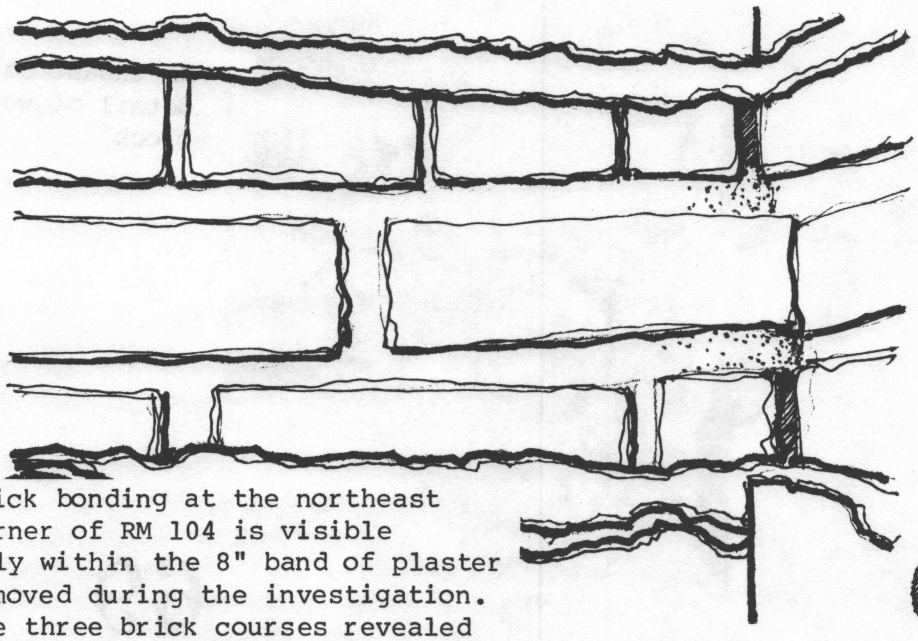
Northeast corner RM 104,
masonry detail

67



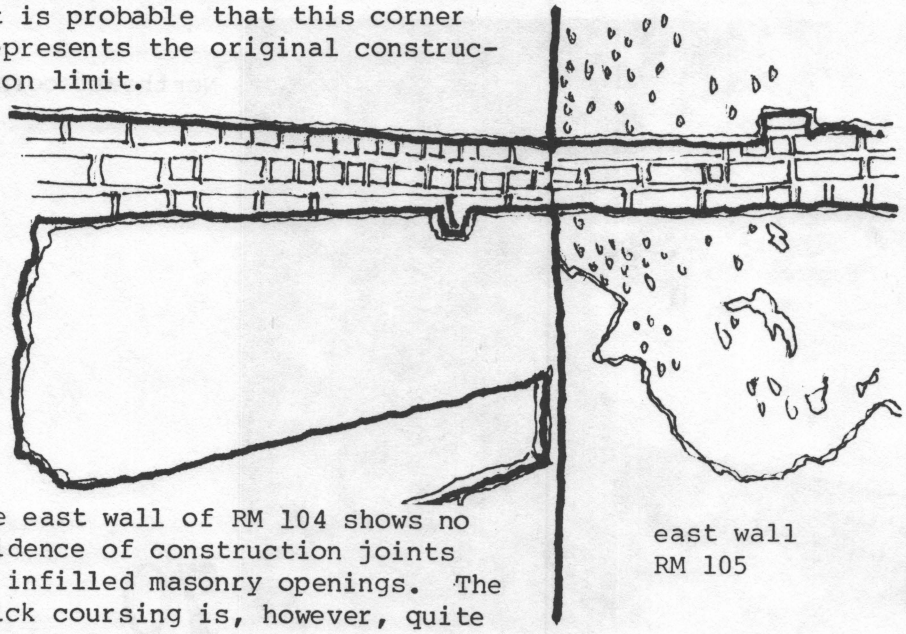
Northeast corner RM 104

68



67A

Brick bonding at the northeast corner of RM 104 is visible only within the 8" band of plaster removed during the investigation. The three brick courses revealed do not show positive evidence of bonded construction. However, since the other three corners show bonded construction, and since there is evidence of continuity in all four walls, it is probable that this corner represents the original construction limit.



east wall
RM 105

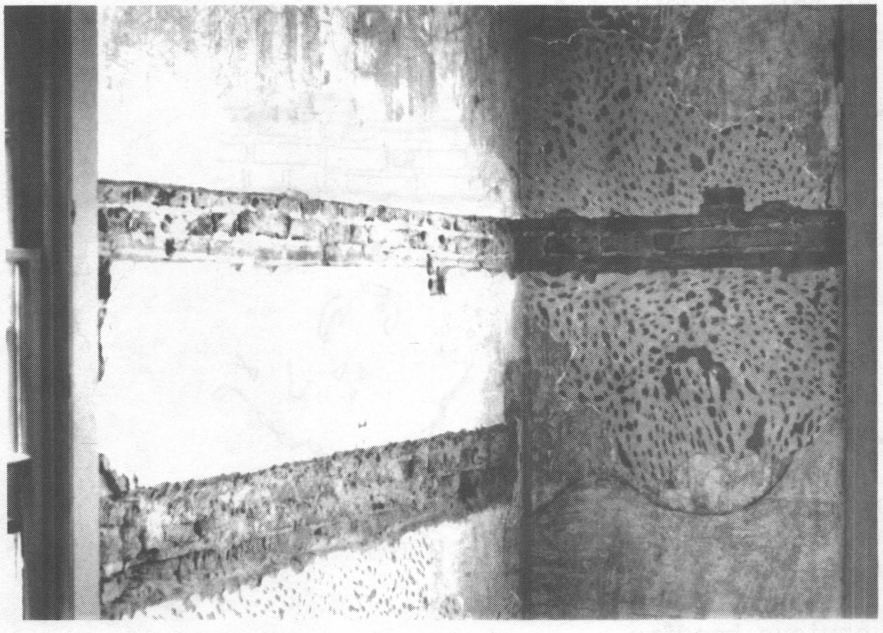
68A

The east wall of RM 104 shows no evidence of construction joints or infilled masonry openings. The brick coursing is, however, quite irregular with no obvious bonding pattern. The lowest visible course immediately north of window W2-104 shows a row of five brick headers without mortared head joints. This wall shows no evidence of nailer blocks relating to a pre- floor reduction chair rail.



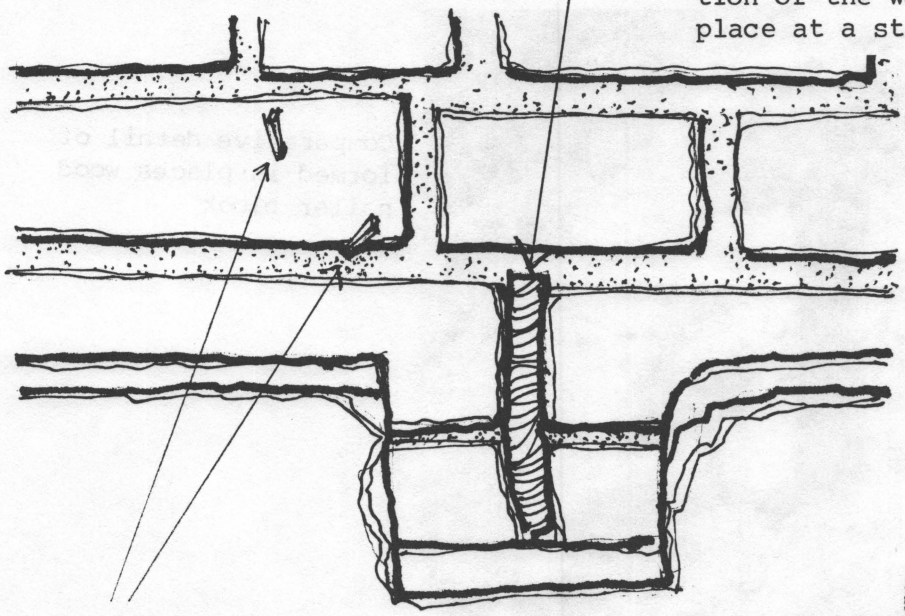
Northeast corner RM 104, detail of wood nailer block

69



Northeast corner RM 104

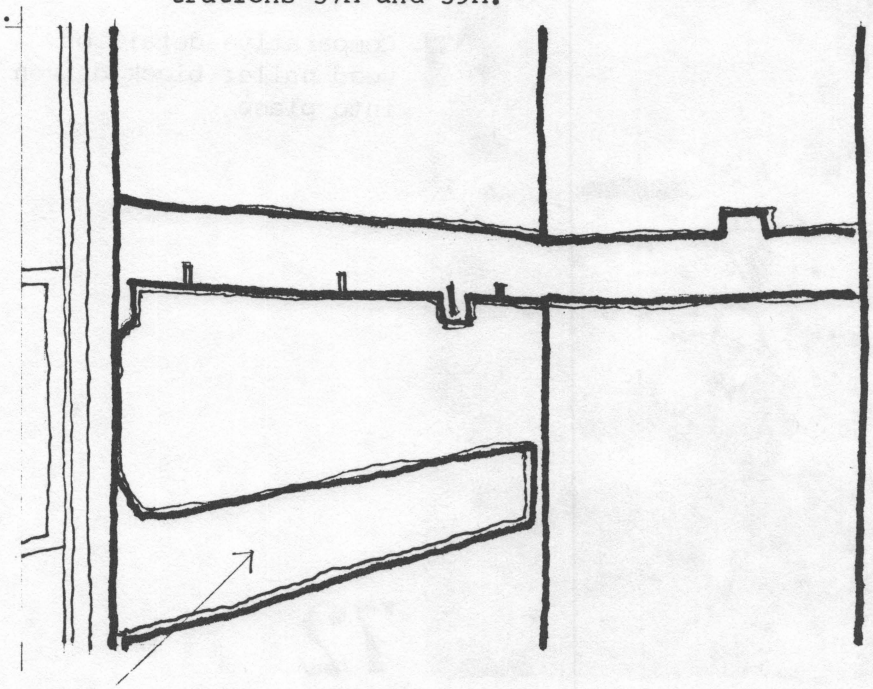
70



1/2"x4" wood nailer block at pre-floor reduction chair rail height. Note that the nailer block was not formed in place during construction of the wall but driven in place at a stacked head joint.

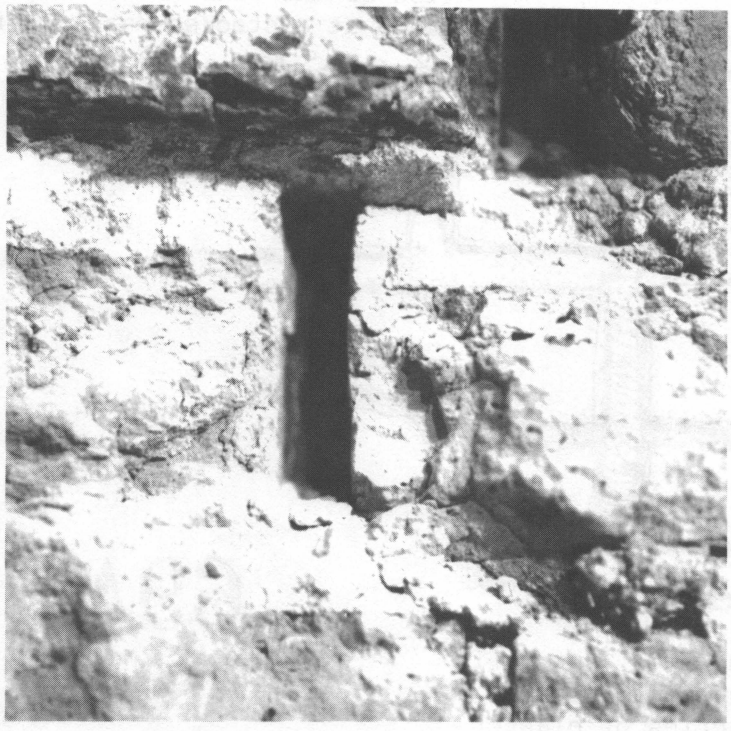
69A

Post 1835 machine made, cut nails driven into brick and mortar joint. Single series of plaster on this wall was applied over the top of these nails. See illustrations 37A and 39A.



70A

Random coursing, broken bricks, and snapped headers characterize exposed brick below a line 5'-0" above the existing floor level, indicating the level at which the original outer course of brick forming the ledge was reduced to its present chair rail height.



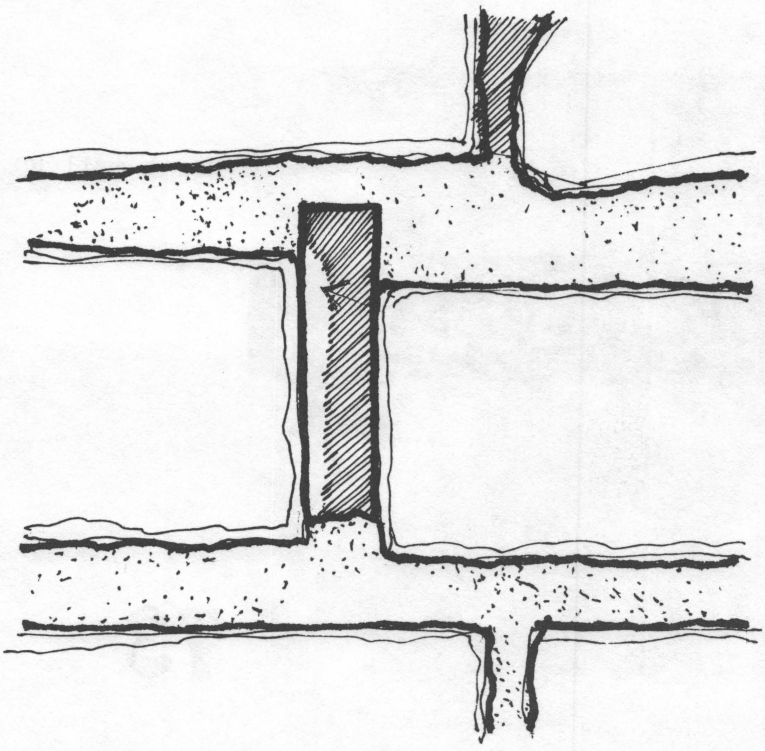
Comparative detail of formed in places wood nailer block

71



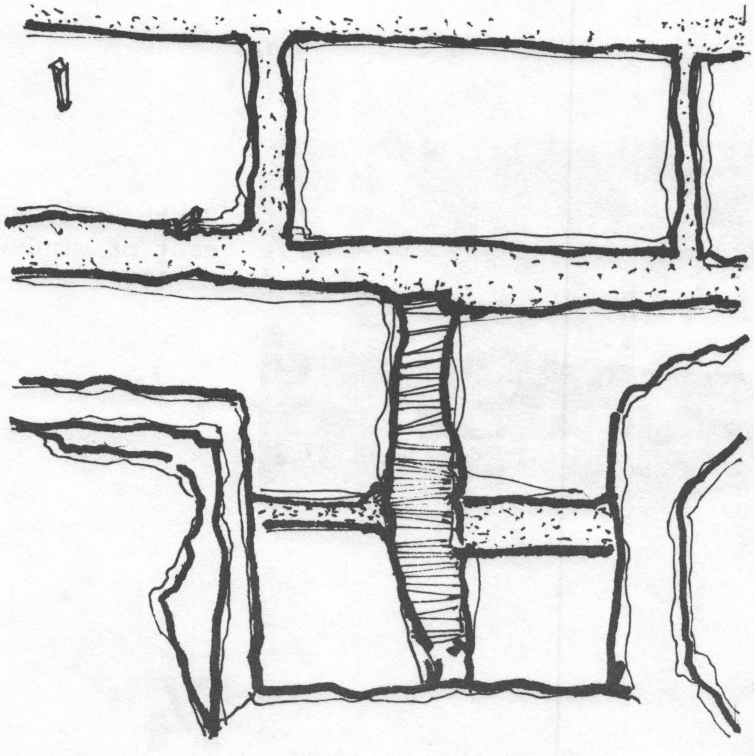
Comparative detail of wood nailer block driven into place

72



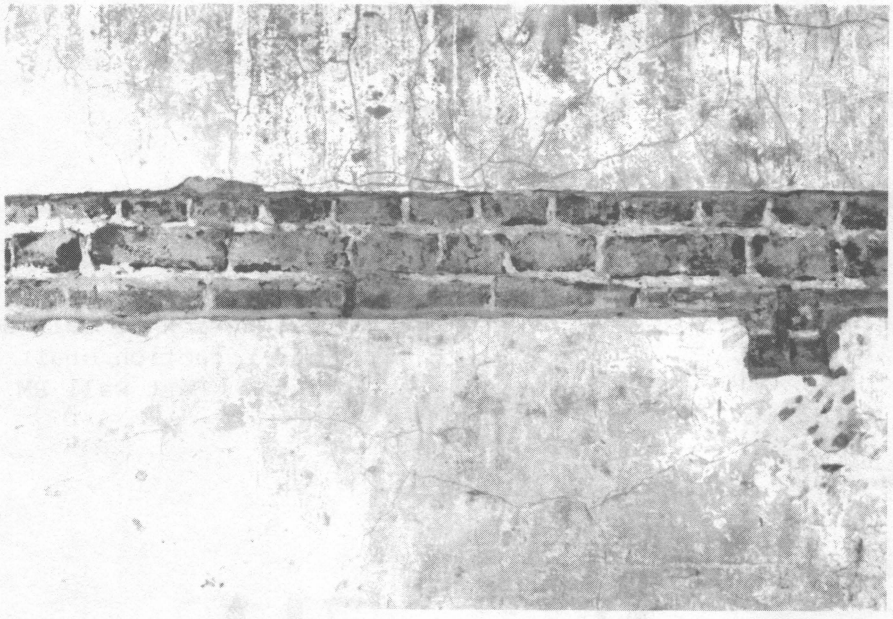
Formed opening, integral to construction of wall at pre-floor reduction chair rail height. East wall RM 106

71A



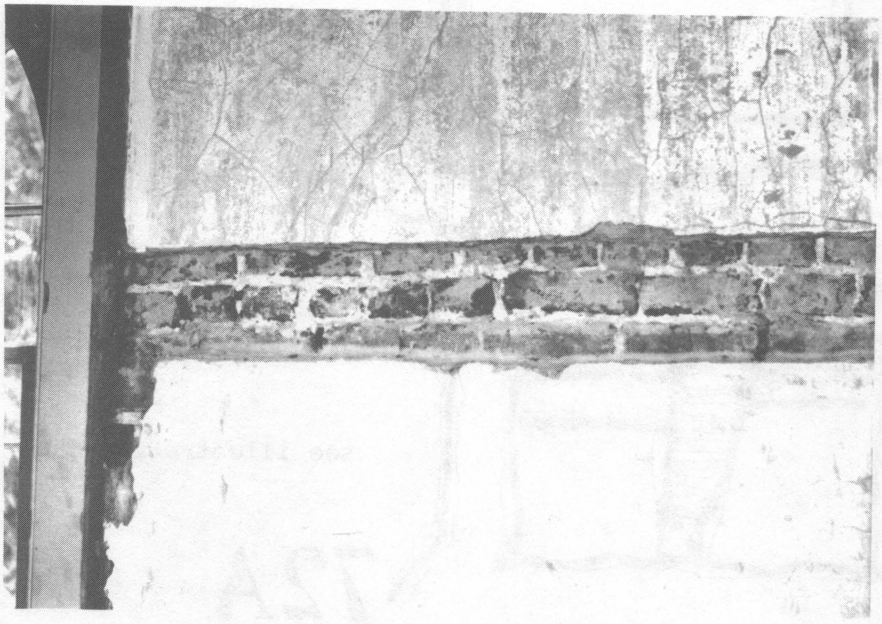
see illustration 69A

72A



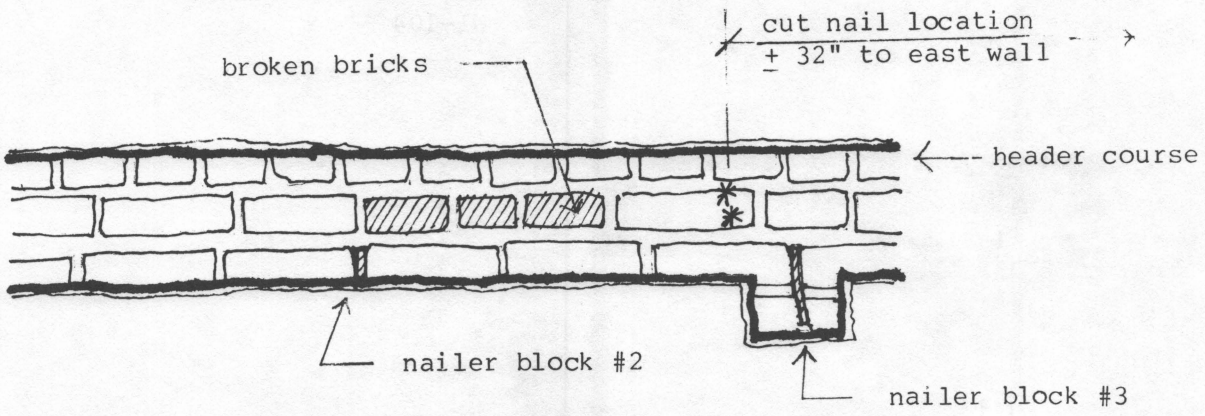
North wall RM 104

73

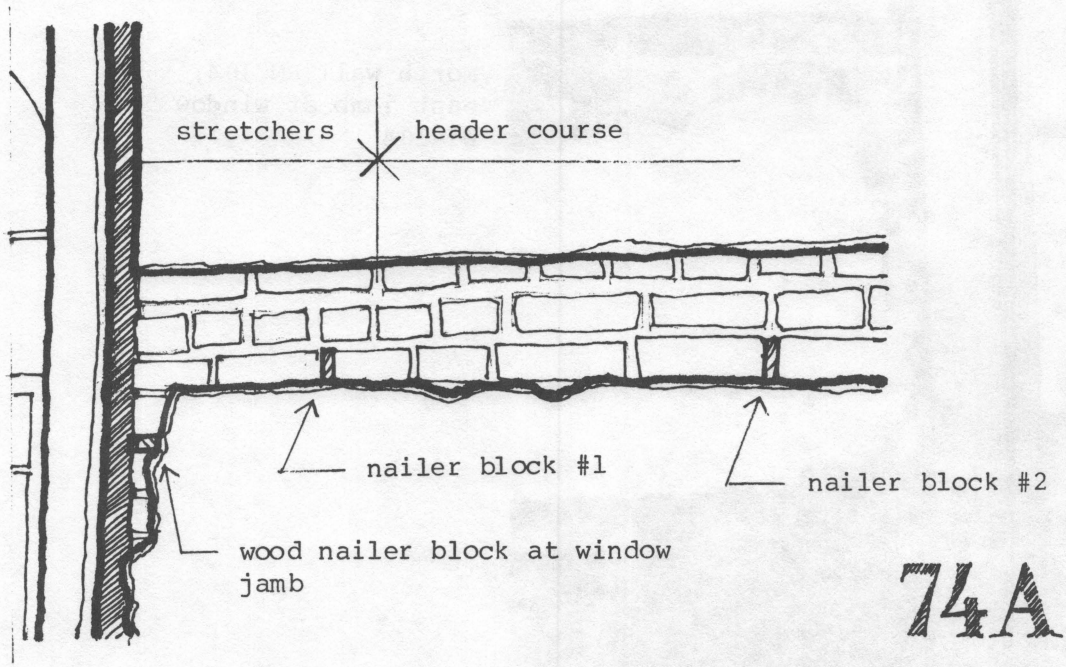


North wall RM 104,
east of window
W1-104

74

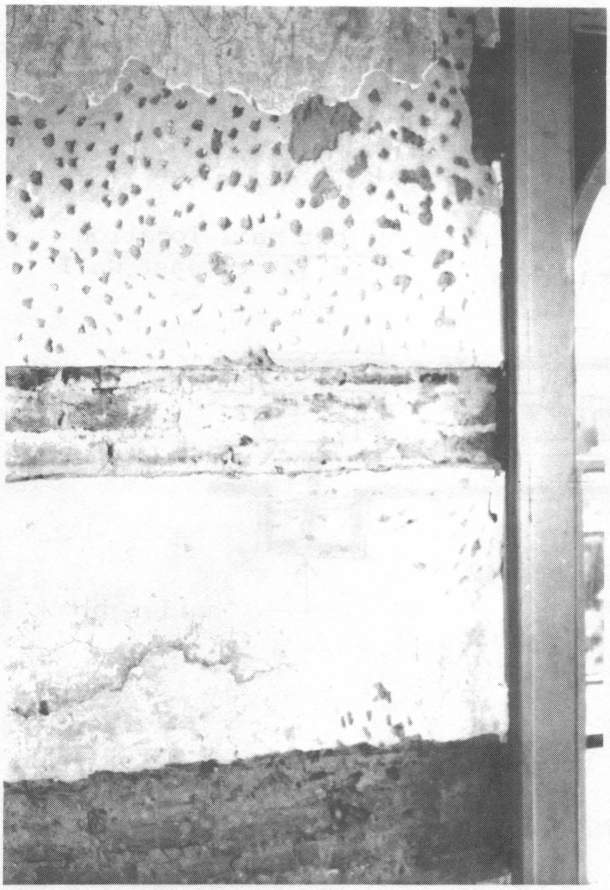


73A



74A

Masonry features -- Note the absence of consistant brick bonding pattern. Much of the brick appears to be reused, as evidenced by the inclusion of broken bricks. No evidence of constructed masonry openings was found.



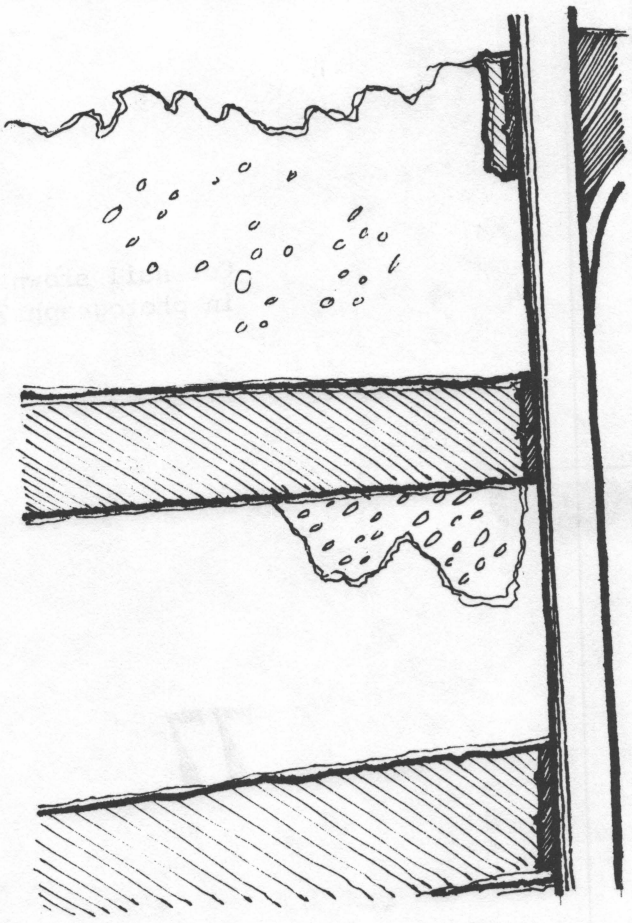
North wall RM 104,
west jamb at window
W1-104

75

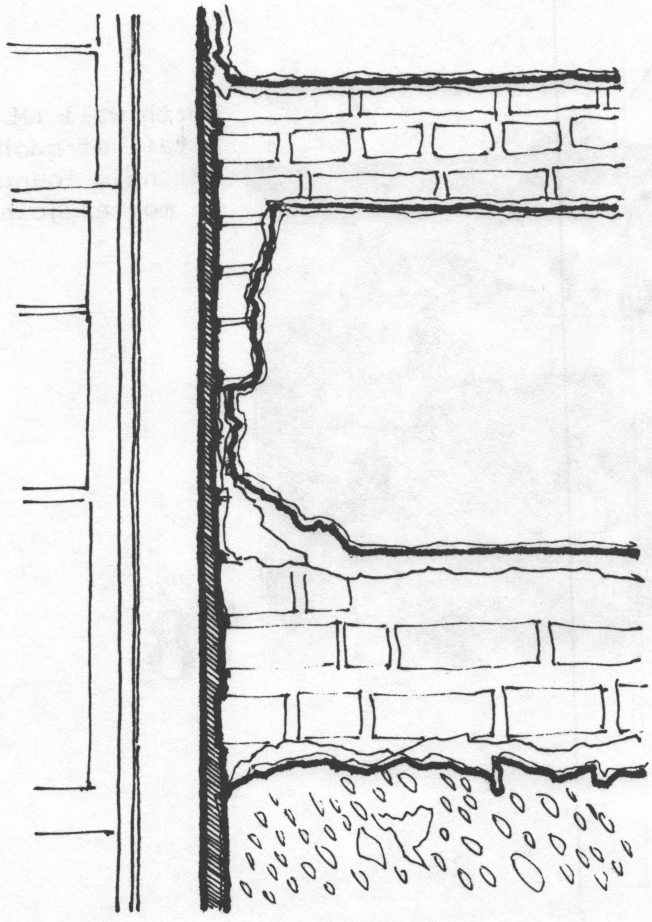


North wall RM 104,
east jamb at window
W1-104

76



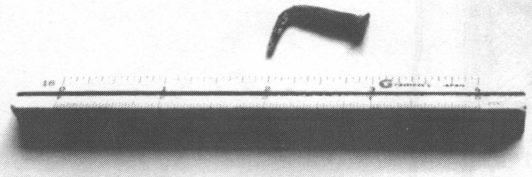
75A



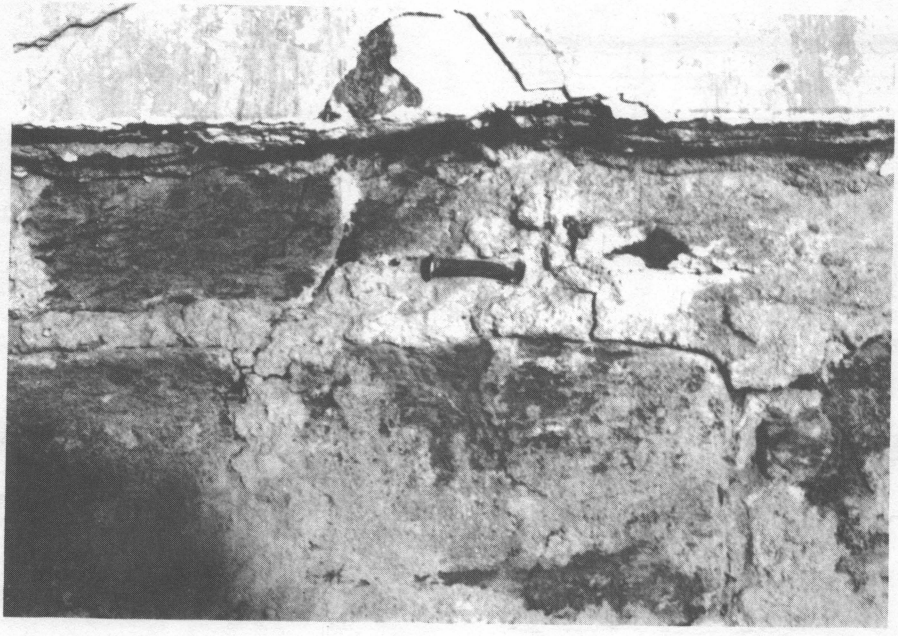
76A

The masonry opening at window W1-104 is exposed at both jambs for a considerable portion of its height. Both jambs show a flush vertical alignment of bricks. Mortar joints are formed flush at the heads of the bricks, as would be the case if the wall was constructed against a wood frame. Therefore, the masonry opening in its present dimensions is assumed to be original to construction of the wall.

Cut nail shown in situ in photograph 78

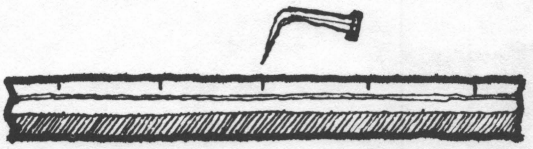


77



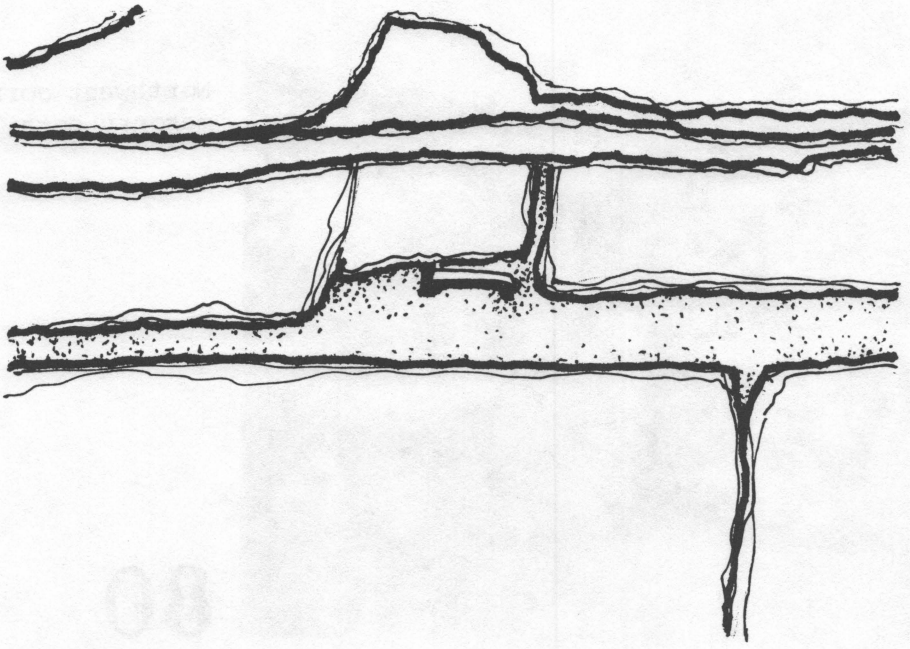
North wall RM 104, detail of machine made, cut nail found embedded in mortar joint

78



Post 1835, machine made, cut nail. This nail was found driven into a mortar joint 31" from the west wall. It was bent flush against the wall surface with no part of it projecting through the single unbroken plaster series above. Therefore, this plaster series, which represents the first extant post floor reduction finish on this wall, could not have been applied before the earliest probable date of manufacture of the nail.

77A



78A

The regularity of placement of identical nails on both end walls, and the presence of only one complete plaster series suggests the possibility of a previous, mechanically attached, finish material



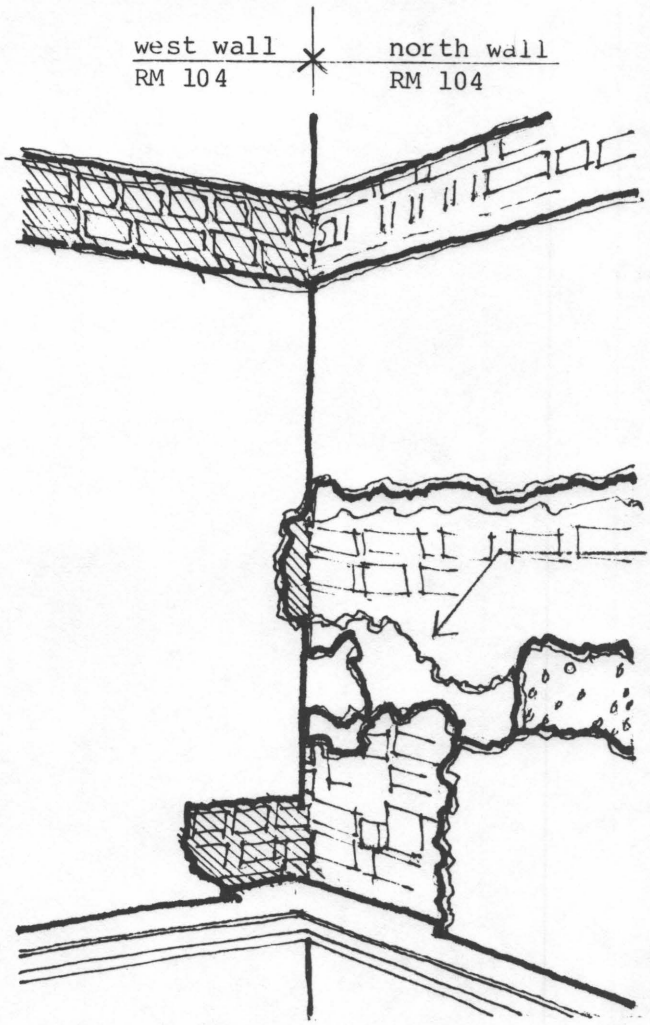
Northwest corner RM 104

79



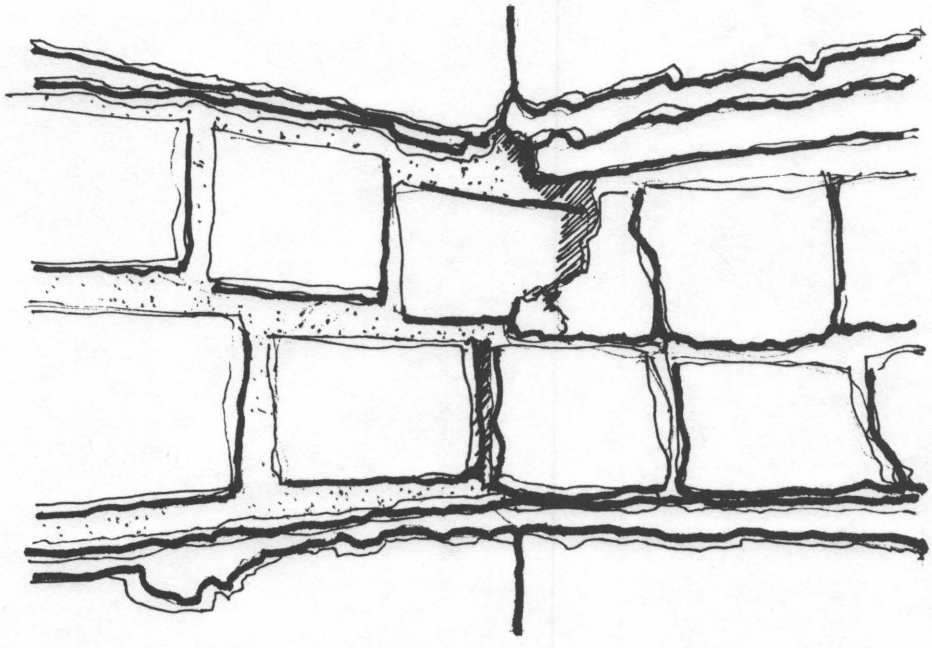
Northwest corner RM 104,
masonry detail

80



Random coursing, snapped headers, and brick rubble infill characterize the exposed masonry below a line 5"-0" above the existing floor, showing the level at which the original brick ledge was reduced to it present chair rail height.

79A



80A

North and west walls show an integral brick bond, as evidenced by half lapped brick at alternate courses.

III. SUMMARY OF FINDINGS

The evidence detailed in the preceeding section provides support for the theory that the north wing, while initially constructed as a freestanding unit, was designed as an element in a concept for the mansion as a whole. Bonded brick at three out of four perimeter wall corners and continuity in construction indicate that the shape and orientation of the existing structure is original. The window openings in the east and north walls appear to have been constructed to approximately their existing dimensions, although the first floor, at its original height, spanned the middle of the openings. Apart from the unexplained brick jambs on the east wall of Rm. 106, the absence of infilled masonry openings relating in a more conventional manner to the original floor level suggests that the north wing facade was designed to fit the formal and aesthetic requirements of the completed mansion. Of particular interest is the fact that no infilled openings were found on the west wall. The absence of any openings original to construction of this wall serves as circumstantial evidence of intent to add an additional architectural element to that elevation (i.e., The Loggia). The apparent conflict between exterior appearance and interior division of space is consistant with the assumption that G.W.P. Custis built the north wing (c. 1802) while still a bachelor, both as a residence and as a place to store his collection of Washington artifacts.[1] The extant physical evidence relating to the original interior finishes - chair rail, baseboard, and wallpaper - is diagnostic of residential use. However, based on the physical evidence suggesting that the north wing facade was intended to serve as an element in a larger design concept, it seems probable that this arrangement was regarded as an interim measure.

As finances permitted and the requirements of family life dictated, Custis continued development of the design scheme. The diary of artist William Birch recorded a visit to the Arlington House, probably in September of 1805. He noted that Custis "Had built the two wings of his Capital House."[2] Custis' daughter, Mary Ann Randolph Custis (b. 1808), related in a letter that the family lived in the two wings of the house for a number of years before the central block was completed.[3] Unfortunately, no documentary source has been located which refers to the interior arrangement of either of the wings during this period. Although the location of several pre-floor reduction partitions

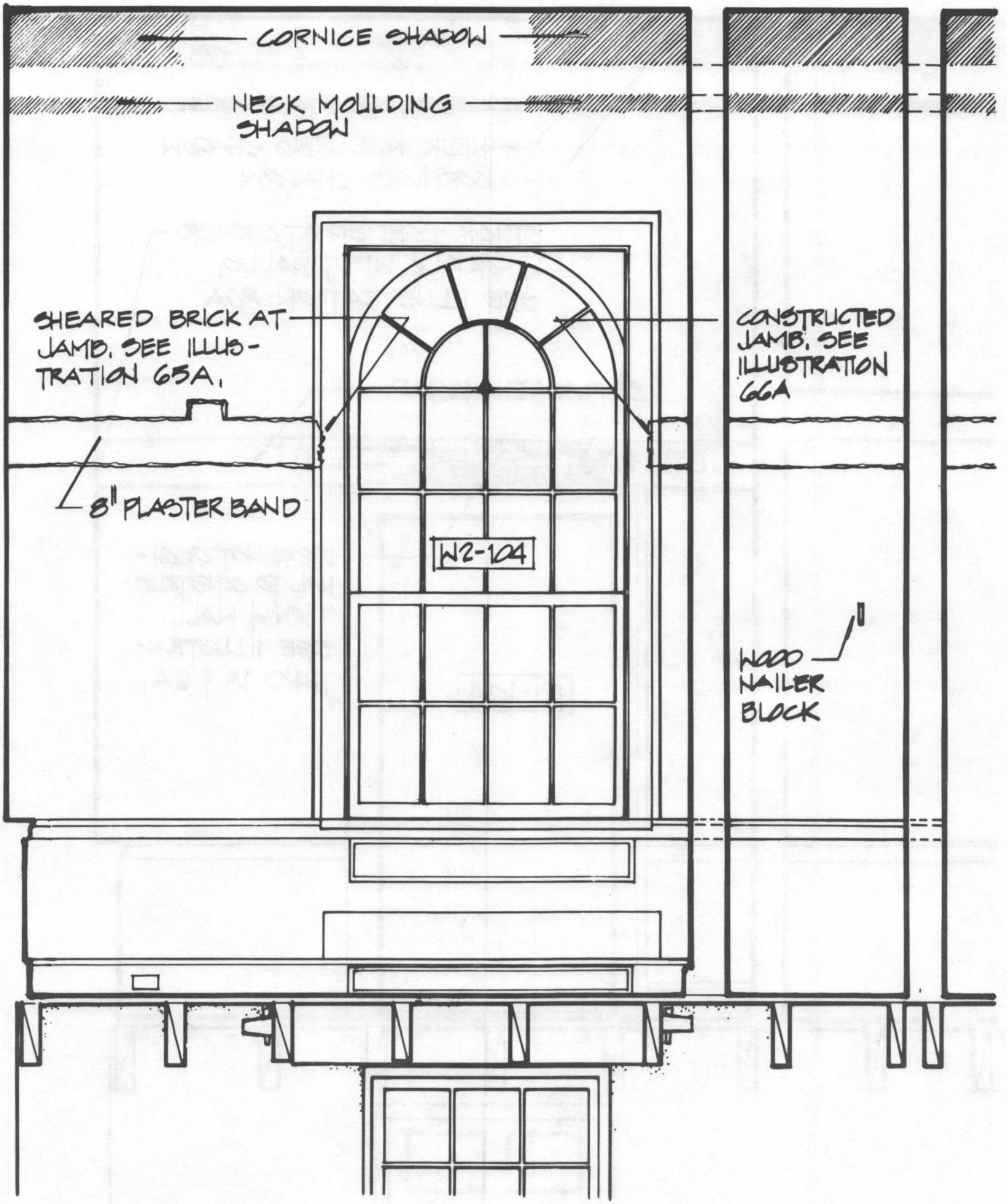
has been determined from the physical evidence, there is insufficient information on which to base a complete interior plan for the earliest construction period. Also, it is probable that at least one major change in interior arrangement occurred prior to the reduction in floor height.

Although no definitive date can be assigned to the change in floor level on the basis of the available evidence, the first major traces of a post floor reduction room arrangement cannot predate the post 1835 cut nails found driven into the brick of the north and south perimeter walls. The principal extant feature of this phase is a room at the north end of the wing, approximately 15'-6" x 22'-0", characterized by the cornice and neck molding shadows presently visible in Rms. 104, 105, and 106. Again, the physical evidence is insufficient to determine the dating of this arrangement or its layout in the remainder of the wing.

The partition arrangement following this phase represents the existing condition in the north wing. There is presently no definitive means of establishing a date of construction for the existing partitions. Because the partition/perimeter wall intersections have been cut full height and patched over expanded metal lath, the continuity of partition and perimeter wall plaster series cannot be established. While it is possible that the present partition locations represent the 1861 interpretive period condition, there is no compelling evidence in support of this conclusion. The presence of post 1870 machine made lumber in door openings and the continuity of lath and plaster adjacent to these openings provides circumstantial evidence that the partitions themselves may post date the interpretive period.

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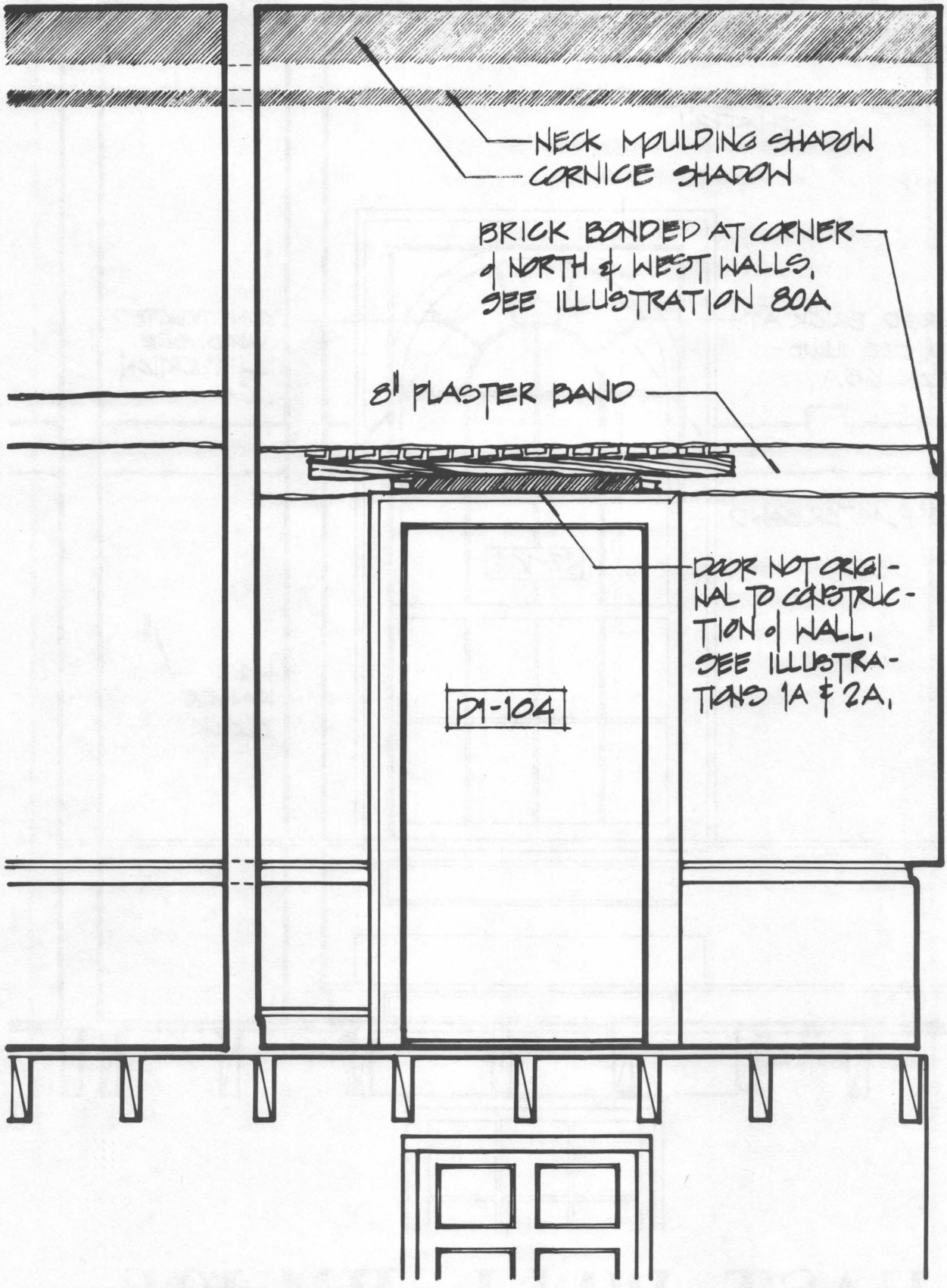
1. Charles W. Snell. Historic Structures Report, Historic Data Section, Vol. 1 (Unpublished Manuscript). March 1982. pp. 11-12.
2. IBID., p. 19
3. IBID., p. 23
4. IBID., p. 24



EAST WALL RM 104 ELEVATION

SCALE: 1/2" = 1'-0"

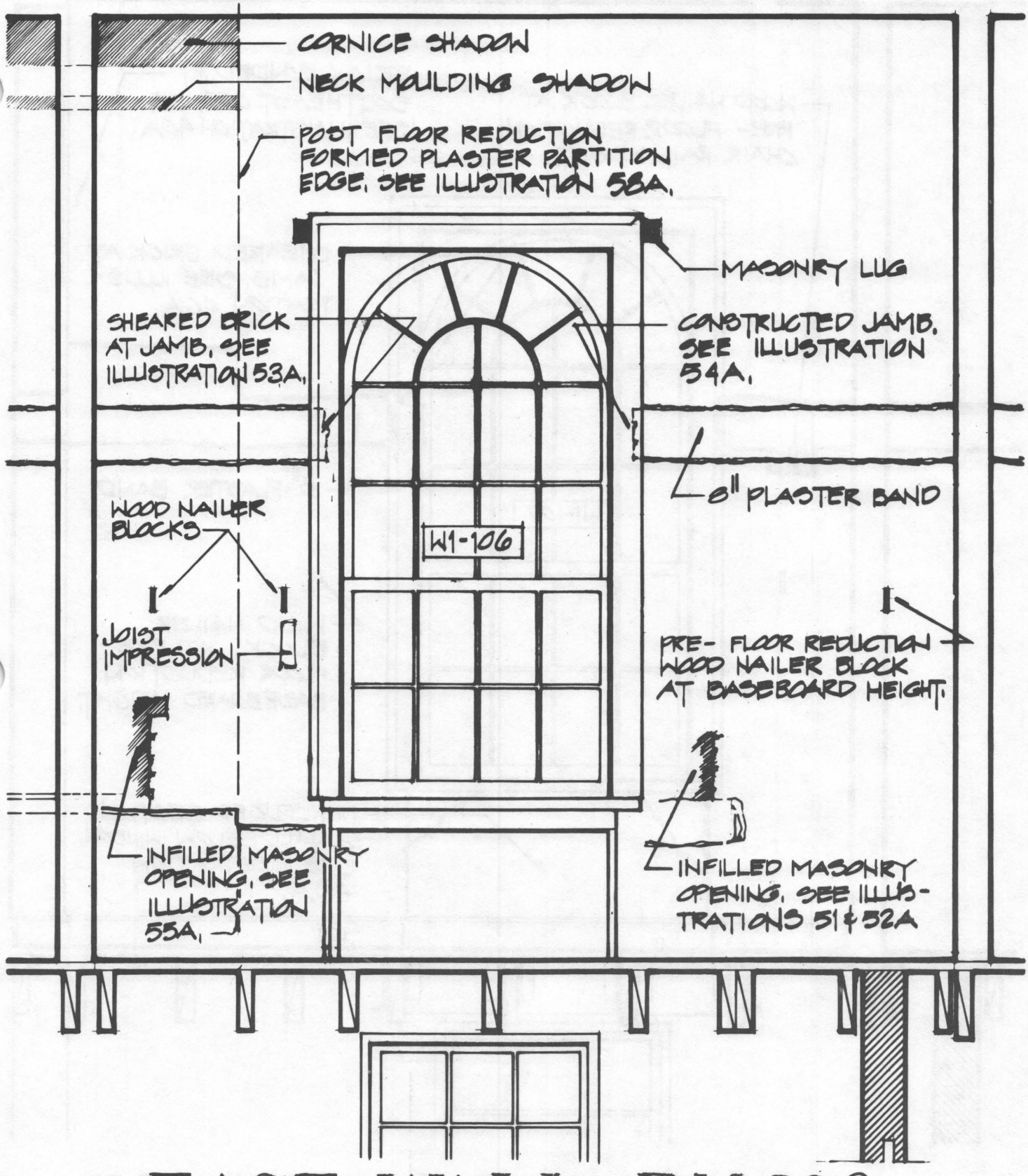
0 1 2 3 4 6 FEET



WEST WALL RM 104 ELEVATION

SCALE: 1/2" = 1'-0"

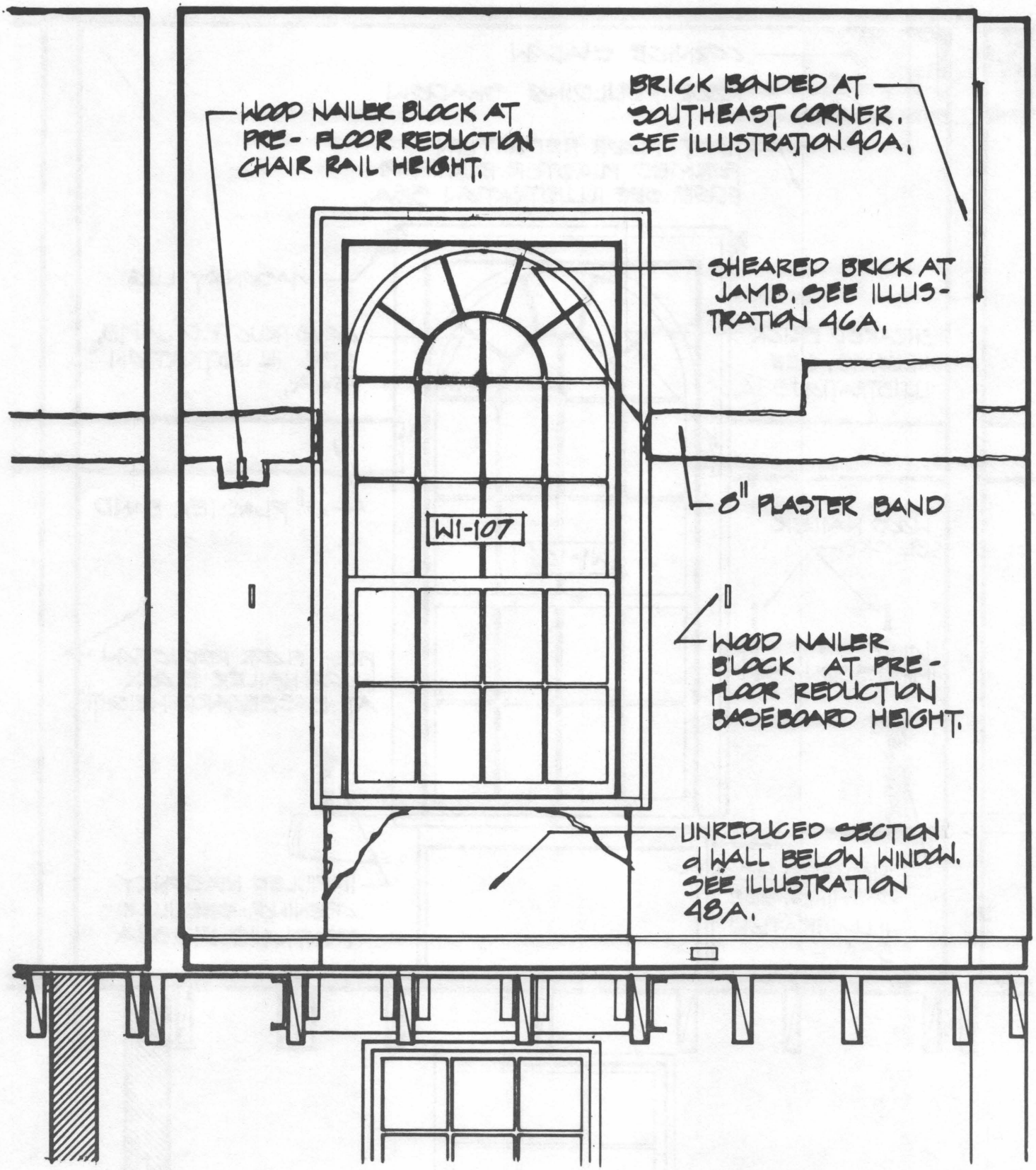
0 1 2 3 4 6 FEET



EAST WALL RM 106 ELEVATION

SCALE: 1/2" = 1'-0"

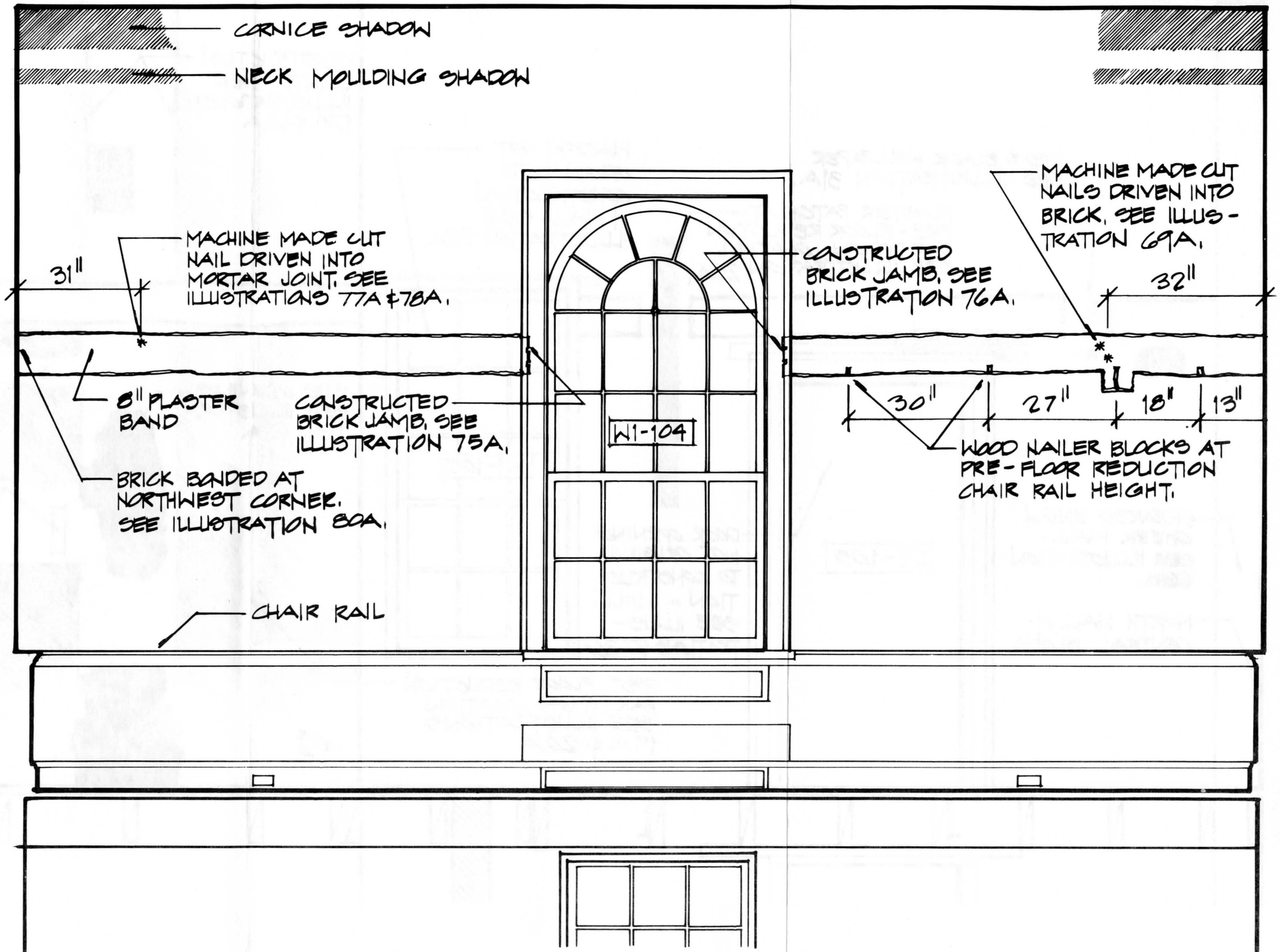
0 1 2 3 4 6FEET



EAST WALL RM 107 ELEVATION

SCALE: 1/2" = 1'-0"

0 1 2 3 4 6FEET



NORTH WALL ELEVATION RM 104

SCALE: 1/2" = 1'-0"

0 1 2 3 4 8 FEET

RED & BLACK WALLPAPER SEE ILLUSTRATION 31A.

PLASTER PATCH AT PRE-FLOOR REDUCTION PARTITION LOCATION. SEE ILLUSTRATION 25A.

WINDOW NOT ORIGINAL TO CONSTRUCTION OF WALL. SEE ILLUSTRATION 22A.

CONSTRUCTION JOINTS. SEE ILLUSTRATIONS 17A & 18A

CORNICE SHADOW

NECK MOULDING SHADOW

8" PLASTER BAND

SHEARED END OF CHEEK WALL. SEE ILLUSTRATION 23A.

NORTH WALL OF CENTRAL BLOCK

D1-105

DOOR OPENING NOT ORIGINAL TO CONSTRUCTION OF WALL. SEE ILLUSTRATIONS 27-30A

W1-105

FLUE OPENING SEE ILLUSTRATION 26A

PLASTER PATCH AT PRE-FLOOR REDUCTION CHAIR RAIL. SEE ILLUSTRATION 11A

PRE-FLOOR REDUCTION JOIST POCKETS. SEE ILLUSTRATION 12A.

POST FLOOR REDUCTION PARTITION LOCATION. SEE ILLUSTRATIONS 19A & 20A

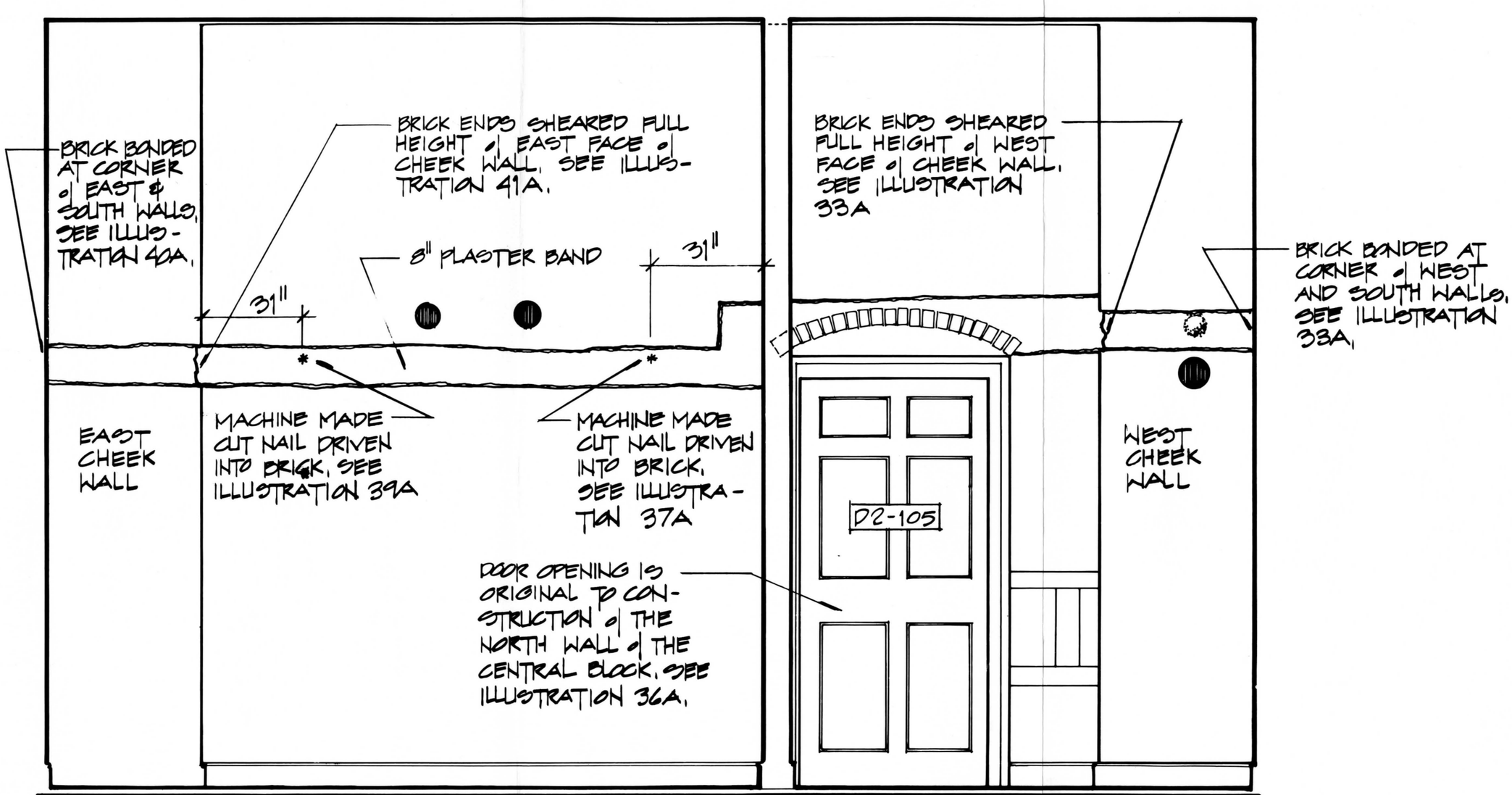
POST FLOOR REDUCTION PARTITION LOCATION. SEE ILLUSTRATIONS 5A & 6A.

MITERED END OF CHAIR RAIL. SEE ILLUSTRATIONS 7A & 8A.

WEST WALL ELEVATION RM 105

SCALE: 1/2" = 1'-0"

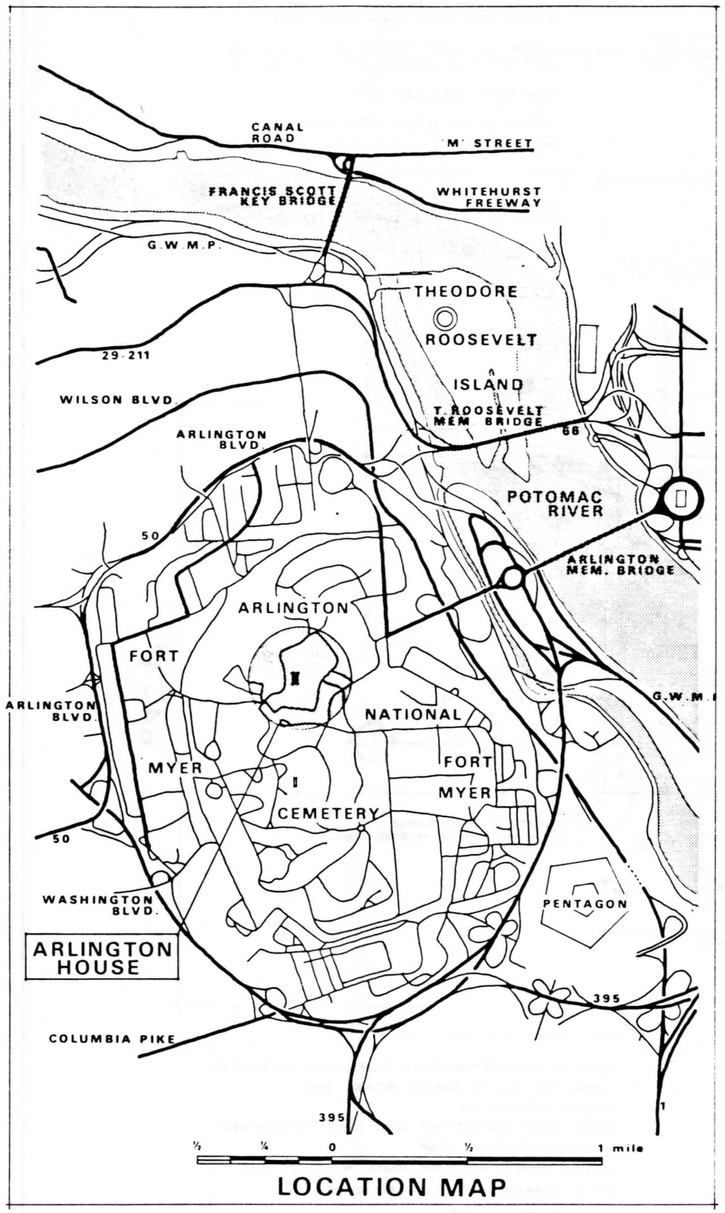
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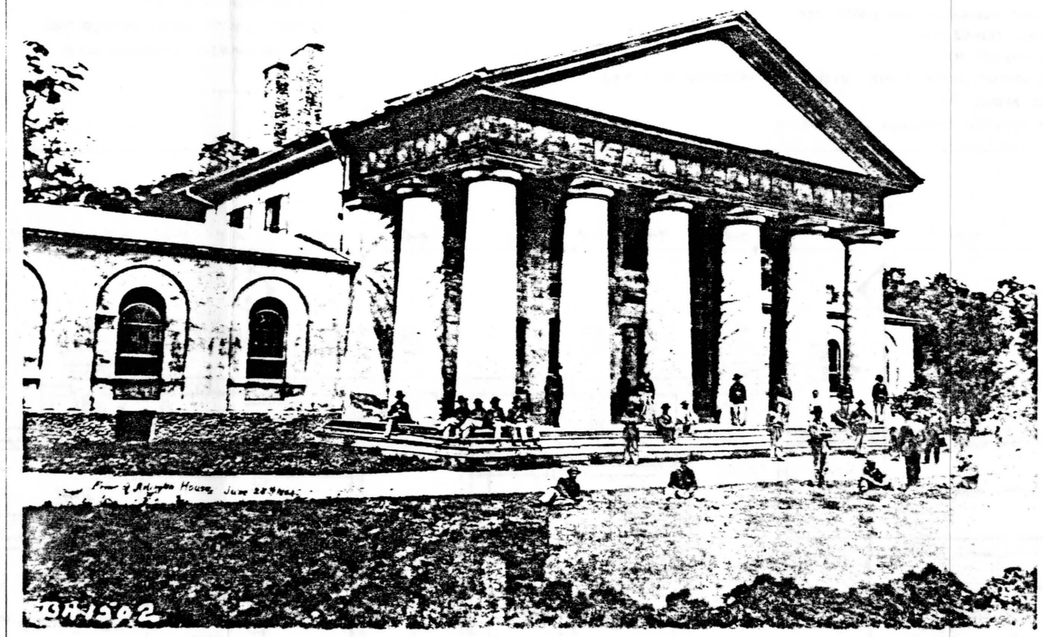
SOUTH WALL ELEVATION

SCALE: 1/2" = 1'-0"

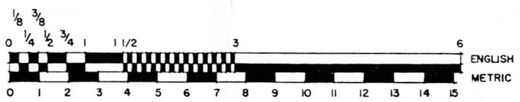
0 1 2 3 4 8 FEET



LOCATION MAP



ARLINGTON HOUSE
HISTORIC STRUCTURE REPORT

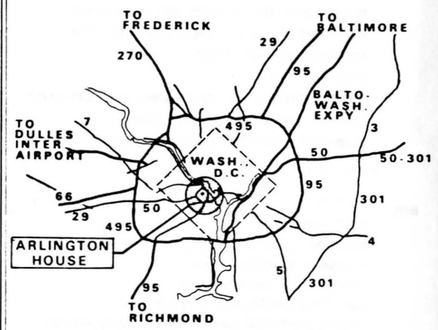


BASIC DATA: H.A.B.S NO. VA. 443, AUG. 25, 1941 · FIELD SURVEY, DSC/TNC 1979-81.

NATIONAL PARK SERVICE
Department of the Interior

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4. PLAN - SECOND FLOOR, ATTIC
5. ELEVATION · EAST, WEST
6. ELEVATION · NORTH, SOUTH
   SECTION · NORTH WING
7. SECTION · SOUTH WING, LONGITUDINAL
8. SECTION · MAIN BLOCK
9. PLAN · ATTIC FLOOR FRAMING
10. PLAN · ATTIC ROOF FRAMING
11. DETAILS · ATTIC STRUCTURAL
12. DETAILS · COLUMN DAMPPROOFING
13. PLAN · NORTH WING RADIANT FLOOR



VICINITY MAP
SCALE
5 0 5 10 miles

BRANCH OF CULTURAL RESOURCES UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE DENVER SERVICE CENTER	PREPARED: ELIGH DESIGNED: WELDS/ELIGH DRAWN: ZUNLD CHECKED: 6/28/82 DATE	TITLE OF DRAWING: ARLINGTON HOUSE HSR DRAWINGS LOCATION WITHIN PARK: ARLINGTON CEMETERY NAME OF PARK: GEORGE WASHINGTON MEMORIAL PKWY NAT'L. CAP. (REGION) ARLINGTON (COUNTY) VIRGINIA (STATE)	DRAWING NO. 350 25,000 PCTP PKG. 500 SHEET 1 OF 13

GPO-1974-678-709

B10

HERRING BONE BRICK 2" BELOW EXISTING DIRT FLOOR
FIREDOOR D10/D1 1980
LINTEL ABOVE D10/D8 STRENGTHENED 1980
FIREPLACE REBUILT 1929
BLOWER, HEAT EXCHANGER AND DUCTS 1929
SOUTH WALL REBUILT 1929
D10/D8 OPENED 1984
HISTORIC, EXPOSED JOISTS ABOVE WHITEWASHED - REPAIRED 1929 - 1980
EAST WALL REBUILT 1929
1 CEILING MOUNTED PORCELAIN LIGHT FIXTURE

B10A/B

PARTIALLY EXCAVATED 1929
HEAT EXCHANGER AND DUCTS 1929
RETAINING WALL 1980
ACCESS DOOR D10A/D1
EXPOSED JOISTS ABOVE REPAINED 1929
1 CEILING MOUNTED PORCELAIN LIGHT FIXTURE

B01

BUILDING BOUND BRICK FLOOR RELAID 1980
COPPER HOT WATER RADIANT HEAT SYSTEM ON VAPOR BARRIER, ON CONCRETE PAD, ON GRAVEL - 1980
WOOD STAIRS STABILIZED 1980
LINTELS AT B01/W2.W3 STRENGTHENED 1980
SPLIT LOG CEILING JOISTS ADDED TO 1980

HEATING SYSTEM SUPPLIED VIA UNDERGROUND CONDUIT BY BOILER IN COMFORT STATION - 1969

B09

DIRT FLOOR
PLASTER ON BRICK PIER ON NORTH WALL
STALACTITE ENTERED O.W. COOLER, HOME PACK MOUNTED
SPLIT LOG CEILING STRENGTHENED 1980
1 CEILING MOUNTED PORCELAIN LIGHT FIXTURE
1 DUPLEX RECEPTICLE

B08

DIRT FLOOR
FIREDOOR D08/D1 - 1980
EXPOSED JOISTS ABOVE NOT PAINTED
NEW CONCRETE PIER CAP - 1980
5/8" STEEL PLATE THROUGH-BOLTED TO EXISTING DOUBLE 3"x12" CENTER BEAM 1980
2 CEILING MOUNTED PORCELAIN LIGHT FIXTURES
2 DUPLEX RECEPTICLES

B07

DIRT FLOOR
HEAT EXCHANGER AND DUCTS 1929
EXPOSED JOISTS 1860 STRENGTHENED 1929, 1980
1 CEILING MOUNTED PORCELAIN LIGHT FIXTURE

B06

5"x8" BRICK PAVERS ON SAND - 1929
BLOWER, HEAT EXCHANGERS AND DUCTS - 1929
CEILINGS ON NORTH WALL CLOSED - 1929
FIREDOOR D06/D1 1980
D06/W1 - 1929
LARGE CEILING ON SOUTH WALL CLOSED - 1980
EXPOSED, UNPAINTED JOISTS ABOVE -
2 CEILING MOUNTED LIGHT FIXTURES

B05

DIRT FLOOR
ELECTRIC JUNCTION BOX ON WEST WALL
FIREDOOR D05/D2 - 1929
SOUTH WALL WHITEWASHED
HEAT EXCHANGERS, DUCTS - 1929
HISTORIC, EXPOSED JOISTS ABOVE WHITEWASHED
NEW CONCRETE PIER CAP 1980
5/8" STEEL PLATE THROUGH-BOLTED TO EXISTING DOUBLE 3"x12" CENTER BEAM - 1980
2 CEILING MOUNTED PORCELAIN LIGHT FIXTURES
2 DUPLEX RECEPTICLES

B04

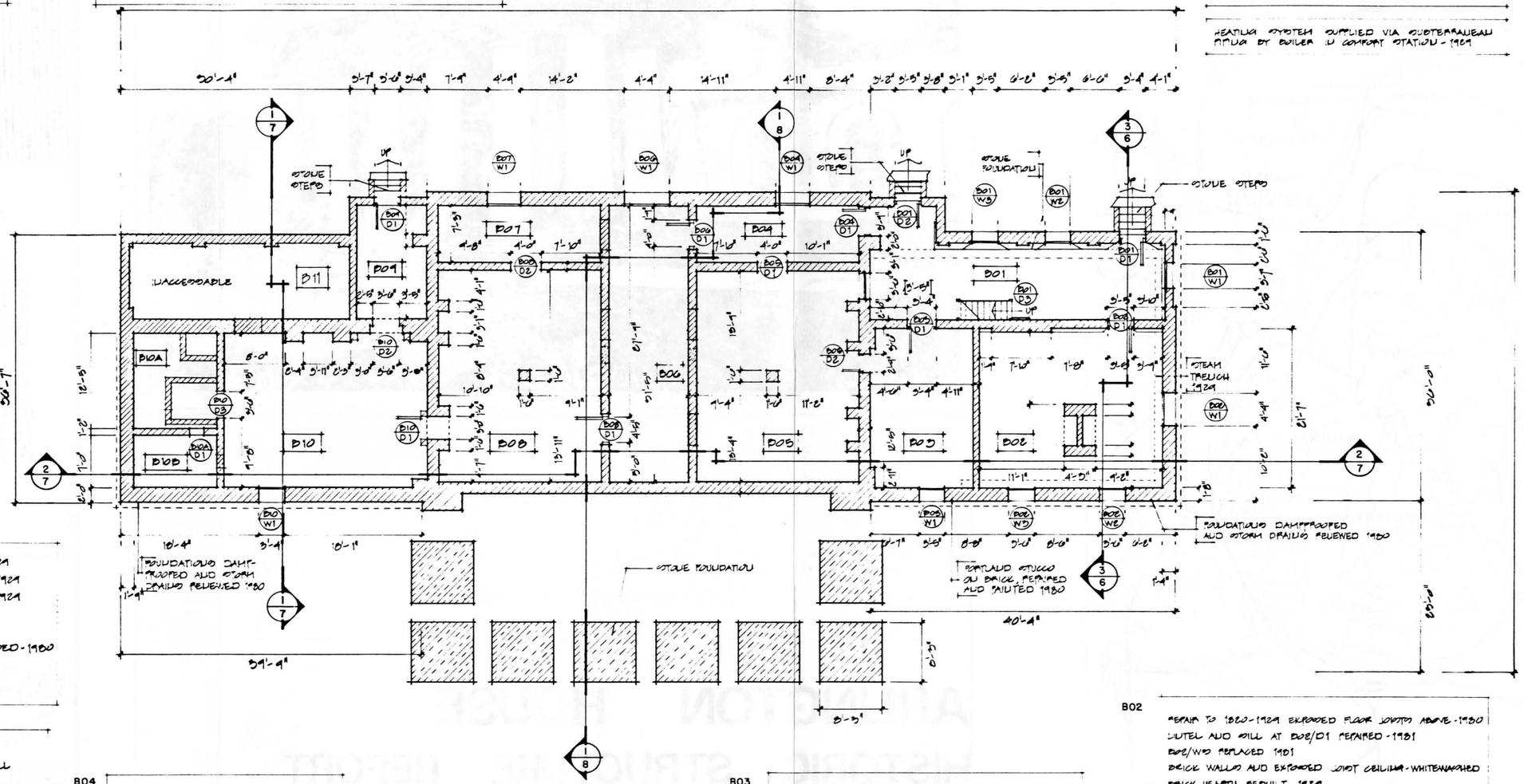
BUILDING BOUND BRICK FLOOR 1929
BRICK WALLS WHITEWASHED
DUCTS, HEAT EXCHANGER 1929
TELEPHONE JUNCTION BOX
FIRE DETECTION SYSTEM 1976
HISTORIC EXPOSED CEILING JOISTS WHITEWASHED
FLOOR ABOVE TEMPORARILY SUPPORTED 1976
1 CEILING-MOUNTED PORCELAIN LIGHT FIXTURE

B03

DIRT FLOOR - 1981
BRICK WALLS SHOW SOME PORTLAND, BROWN COAT PLASTER AND WHITEWASH
EXPOSED, UNPAINTED CEILING JOISTS 1930 - REPAIRED 1980
LINTEL AT B03/W1 STRENGTHENED 1980
CONDUIT REROUTED 1980
1 DUPLEX RECEPTICLE

B02

REPAIR TO 1860-1929 EXPOSED FLOOR JOISTS ABOVE - 1980
LINTEL AND SILL AT B02/D1 REPAIRED - 1981
B02/W3 REPLACED 1981
BRICK WALLS AND EXPOSED JOIST CEILING - WHITEWASHED
BRICK HEARTH REBUILT 1929
HEATING PIPES TO RADIATORS ABOVE REMOVED 1980
BRICK HERRING BONE FLOOR RELAID 1981
2 DUPLEX RECEPTICLES



1/2 PLAN · BASEMENT
SCALE · 1/8"=1'-0"

EXISTING CONDITIONS

ARLINGTON HOUSE · PLAN

1/8"=1'

PREPARED	DRAWING NO.
HOFELD	850
DESIGNED	28,000
OLIGH	PCIP PKG. 500 · SHEET 2 OF 13
DRAWN	
ZOUALD	
CHECKED	
5/9/82	
DATE	

2 GPO: 1977 777-389

EXISTING CONDITIONS

ARLINGTON HOUSE · PLAN

114
BALLROOM WIDTH FLOORING (E-W) - 1929
TELEPHONE IN CLOSET 114/A
FIREPLACE IN 114/A
TRANSOM ABOVE 114/D1
114/D1 REPAIRED 1981
1 DUPLEX RECEPTICLE IN 114/A

115
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILING PLASTER - 1820
PLASTER CORNICE AND CENTER MEDALLION - 1820
2 FLOOR DIFFUSERS AT NORTH WALL
3 DUPLEX RECEPTICLES

116
BRICK HERRING BONE FLOOR - 1929
HEAT DIFFUSER IN WEST WALL
WALLS, PLASTER
CEILING EXPOSED WOOD JOISTS, AND SHEATHING
WATER SPIGOT ON NORTH WALL

117
BALLROOM WIDTH FLOORING (N-S)
WALLS AND CEILING PLASTER 1820
CORNER FLUE AT E & N WALL
DUCT IN
PLASTER CORNICE 1820
SKYLIGHT ABOVE 117/D1
1 DUPLEX RECEPTICLE

101
BALLROOM WIDTH FLOORING (N-S) - 1980
E,W,S WALLS PLASTER ON BRICK - N WALL PLASTER ON WOOD LATH
101/D1, D2 REPAIRED 1981
ELECTRIC RADIANT HEAT CEILING 1980
1 DUPLEX RECEPTICLE
TRANSOM ABOVE 101/D1

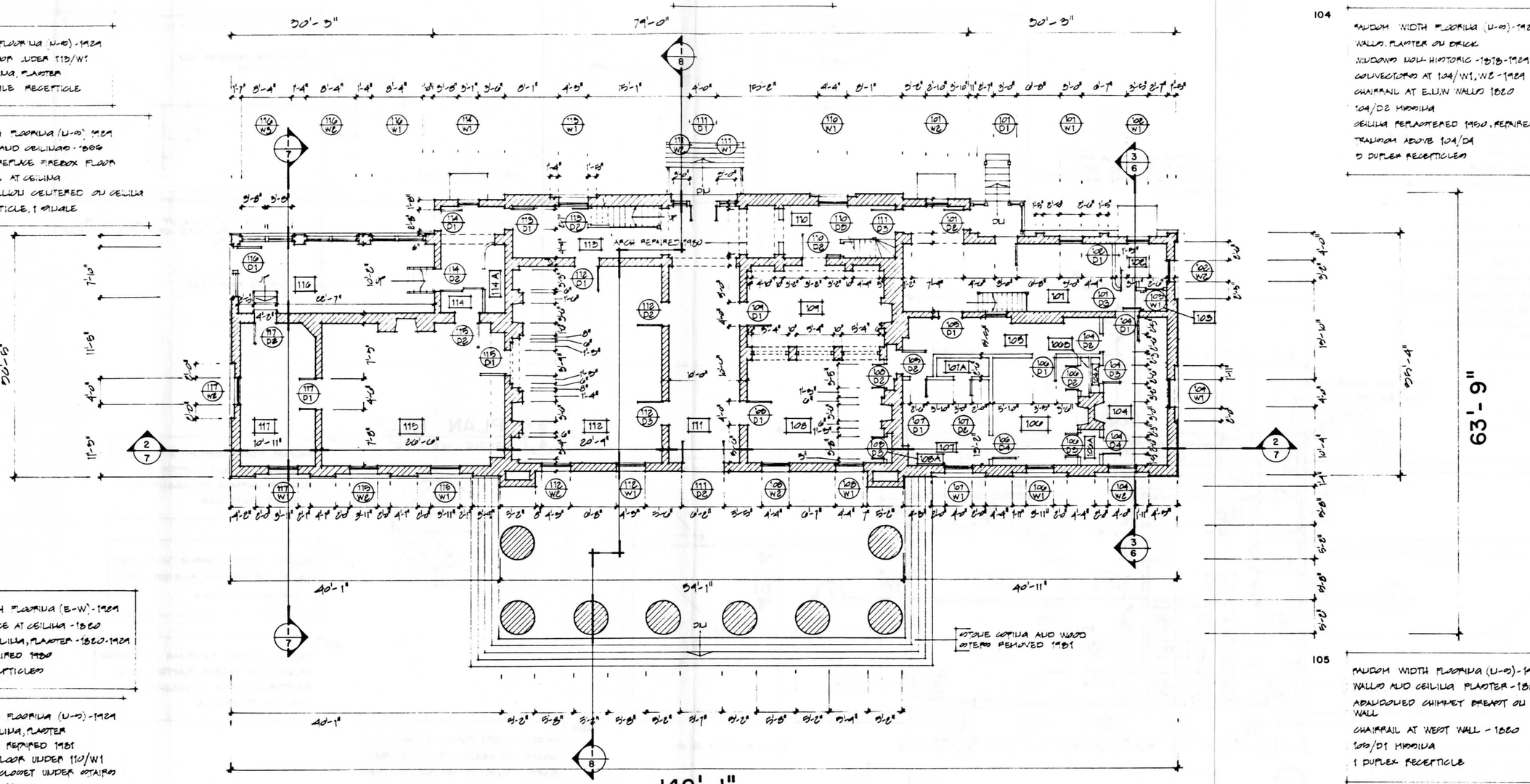
102
BALLROOM WIDTH FLOORING 1820-1929
WALLS, WAINSCOTING WITH PLASTER ABOVE 1820-1929
102/W2 REPAINED 1981
CEILING IN UNDERSIDE OF LEAD-LINED WATER TANK
TRANSOM ABOVE 102/D1
2 DUPLEX RECEPTICLES

103
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS, WAINSCOTING WITH PLASTER ABOVE 1929
CEILING IN UNDERSIDE OF LEAD-LINED WATER TANK
TRANSOM ABOVE 103/D2
THERMOSTAT FOR ELECTRIC CEILING ON SOUTH WALL

113
BALLROOM WIDTH FLOORING (N-S) - 1929
DIFFUSER IN FLOOR UNDER 113/W1
WALLS AND CEILING, PLASTER
ABANDONED DIVIDE RECEPTICLE

112
BALLROOM WIDTH FLOORING (N-S) 1929
PLASTER WALLS AND CEILINGS - 1886
DIFFUSERS IN FIREPLACE FIREBOX FLOOR
PLASTER CORNICE AT CEILING
PLASTER MEDALLION CENTERED ON CEILING
1 DUPLEX RECEPTICLE, 1 DIVIDE

104
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS, PLASTER ON BRICK
WINDOWS WALL-HISTORIC - 1878-1929
CONVECTORS AT 104/W1, W2 - 1929
CHAIRRAIL AT E.N.W WALLS 1820
104/D2 MISSING
CEILING REPLASTERED 1950, REPAINED 1981
TRANSOM ABOVE 104/D1
3 DUPLEX RECEPTICLES



111
BALLROOM WIDTH FLOORING (E-W) - 1929
PLASTER CORNICE AT CEILING - 1820
WALLS AND CEILING, PLASTER - 1820-1929
111/D1, D2 REPAIRED 1980
2 DUPLEX RECEPTICLES

110
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILING, PLASTER
SILL AT 110/W1 REPAIRED 1981
DIFFUSER IN FLOOR UNDER 110/W1
TELEPHONE IN CLOSET UNDER STAIRS
1 DUPLEX RECEPTICLE

109
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILING, PLASTER - 1820
SKYLIGHT ABOVE 109/D2
SHELVES ON WEST WALL
DIFFUSER IN FLOOR OF FIREBOX OF FIREBOX ON SOUTH WALL
PLASTER CORNICE AT CEILING
1 DUPLEX RECEPTICLE

108
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILINGS, PLASTER 1820
DIFFUSER IN FLOOR OF FIREBOX OF FIREPLACE ON SOUTH WALL
PLASTER CORNICE AT CEILING 1820
1 DUPLEX RECEPTICLE

107
BALLROOM WIDTH FLOORING (N-S)
WALLS AND CEILING PLASTER - 1929
TRANSOM ABOVE 107/D2
107/W1 - REPLACED 1929
1 DUPLEX RECEPTICLE

105
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILING PLASTER - 1820
ABANDONED CHIMNEY BREAST ON WEST WALL
CHAIRRAIL AT WEST WALL - 1820
105/D1 MISSING
1 DUPLEX RECEPTICLE

106
BALLROOM WIDTH FLOORING (N-S) - 1929
WALLS AND CEILING, PLASTER - 1820, 1929
CONVECTOR AT 106/W1 - 1929
106/W1 - 1929
2 DUPLEX RECEPTICLES

1/3 PLAN · FIRST FLOOR
SCALE · 1/8" = 1'-0"

PREPARED	HADFIELD
DESIGNED	SLAH
DRAWN	SQUALO
CHECKED	3/19/82
DATE	

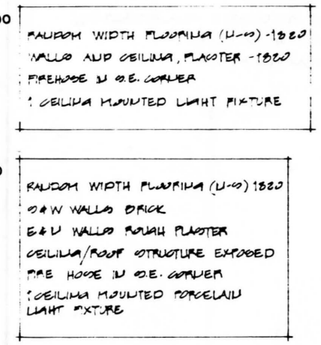
DRAWING NO. 350 25000
PCIP PKG. 300
SHEET 3 OF 13

1/8" = 1' 0 5 10 15 20 FEET

☆ GPO: 1977 777-369

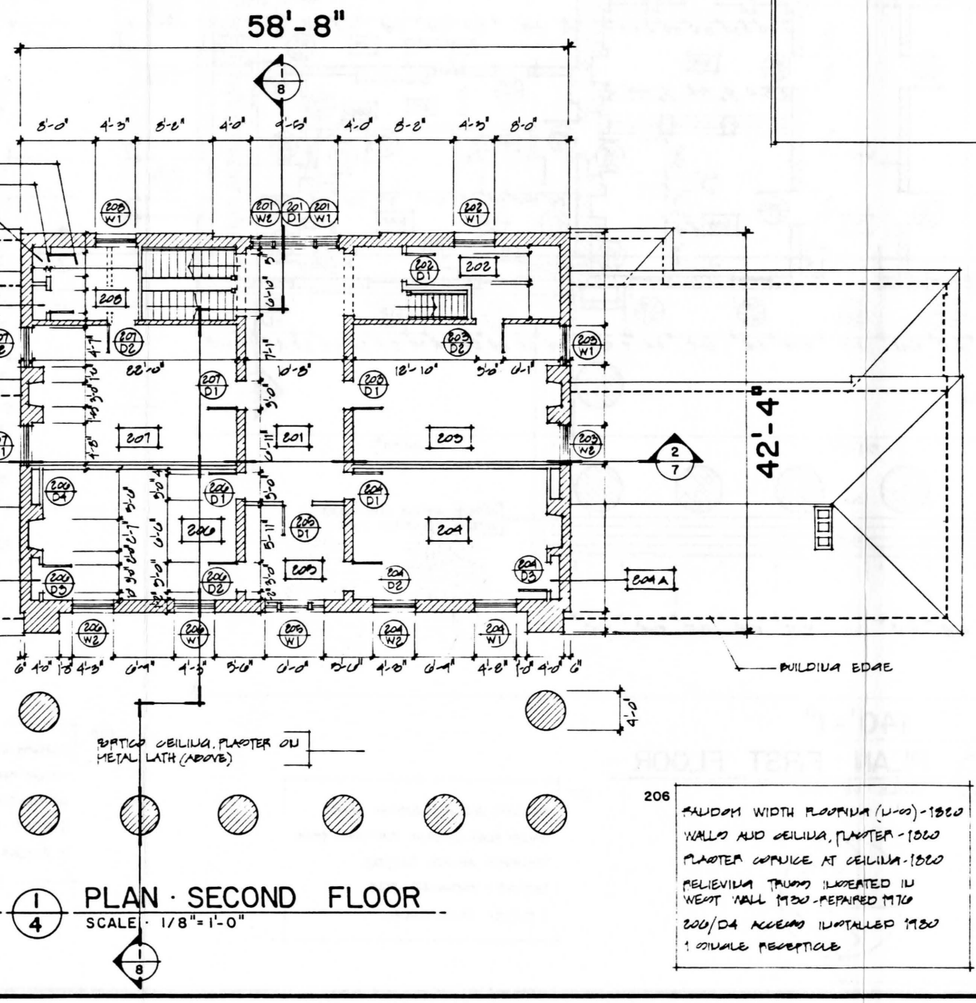
EXISTING CONDITIONS

ARLINGTON HOUSE · PLAN

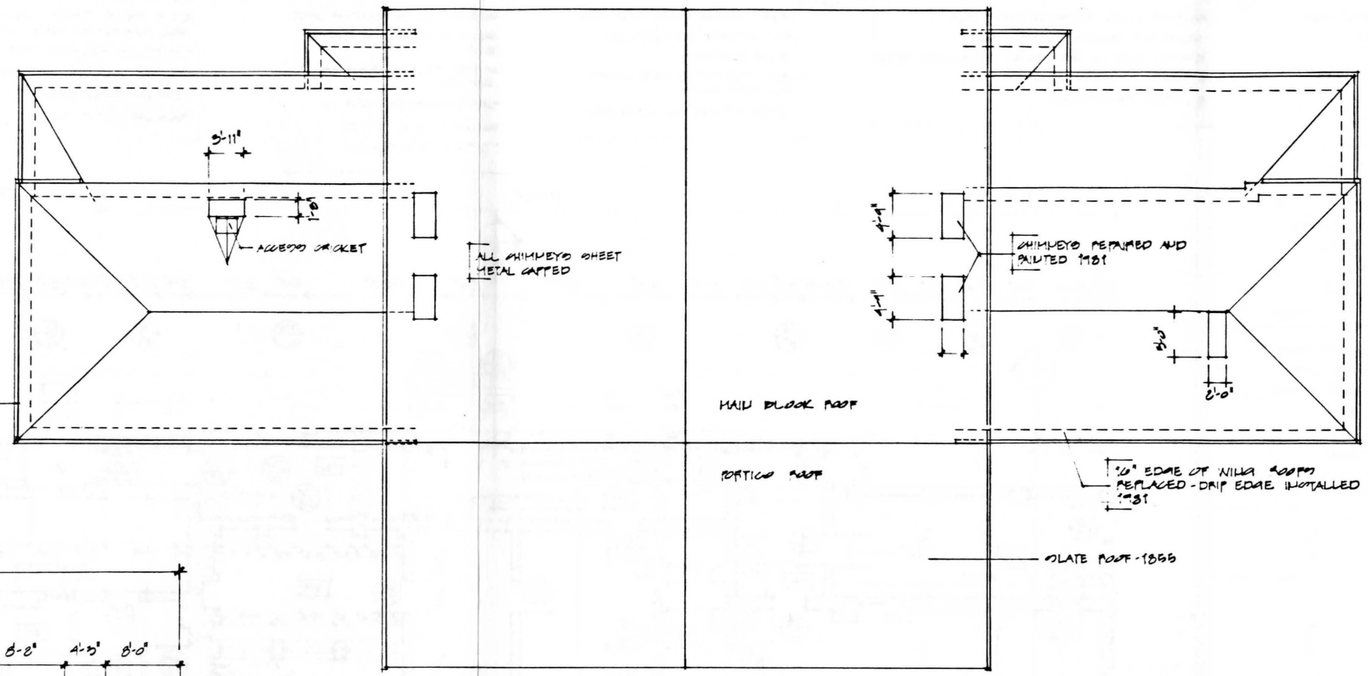


200
RANDOM WIDTH FLOORING (E-W) - 1860
WALLS AND CEILING, PLASTER - 1860
FIREHOSE N O.E. CORNER
1 CEILING MOUNTED LIGHT FIXTURE

300
RANDOM WIDTH FLOORING (E-W) 1860
S & W WALLS BRICK
E & N WALLS ROUGH PLASTER
CEILING/ROOF STRUCTURE EXPOSED
FIRE HOSE N O.E. CORNER
1 CEILING MOUNTED PORCELAIN LIGHT FIXTURE



1/4 PLAN · SECOND FLOOR
SCALE · 1/8"= 1'-0"



2/4 PLAN · ROOF
SCALE · 1/8"= 1'-0"

201
RANDOM WIDTH FLOORING (E-W) - 1900
WALLS AND CEILING, PLASTER
PLASTER CORNICE AT CEILING - 1860
1 DUPLEX RECEPTICLE

202
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860
1 DUPLEX RECEPTICLE

203
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860
PLASTER CORNICE AT CEILING - 1860
1 DUPLEX RECEPTICLE

204
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860
PLASTER CORNICE AT CEILING - 1860
1 SINGLE RECEPTICLE

205
RANDOM WIDTH FLOORING (E-W) - 1860
WALLS AND CEILING, PLASTER - 1860
1 SINGLE RECEPTICLE

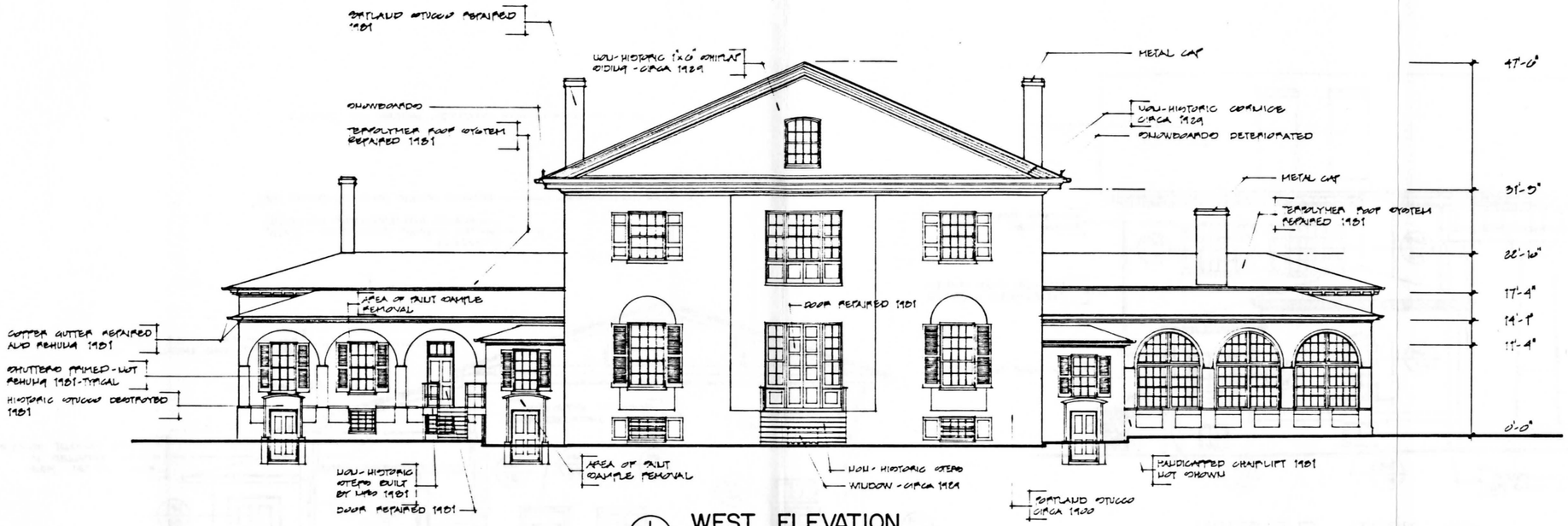
206
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860
PLASTER CORNICE AT CEILING - 1860
RELIEVING TRUSS LOCATED IN WEST WALL 1930 - REPAIRED 1976
200/D4 ACCESS INSTALLED 1980
1 SINGLE RECEPTICLE

207
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860
CORNICE AT CEILING, PLASTER - 1860
1 SINGLE RECEPTICLE

208
RANDOM WIDTH FLOORING (N-S) - 1860
WALLS AND CEILING, PLASTER - 1860

PREPARED	DRAWING NO.
HADFIELD	850
DESIGNED	23,000
CLARK	PCIP PKG.
DRAWN	5001
DONALD	SHEET
CHECKED	4
2/9/82	OF 13
DATE	

* GPO: 1977 777-999

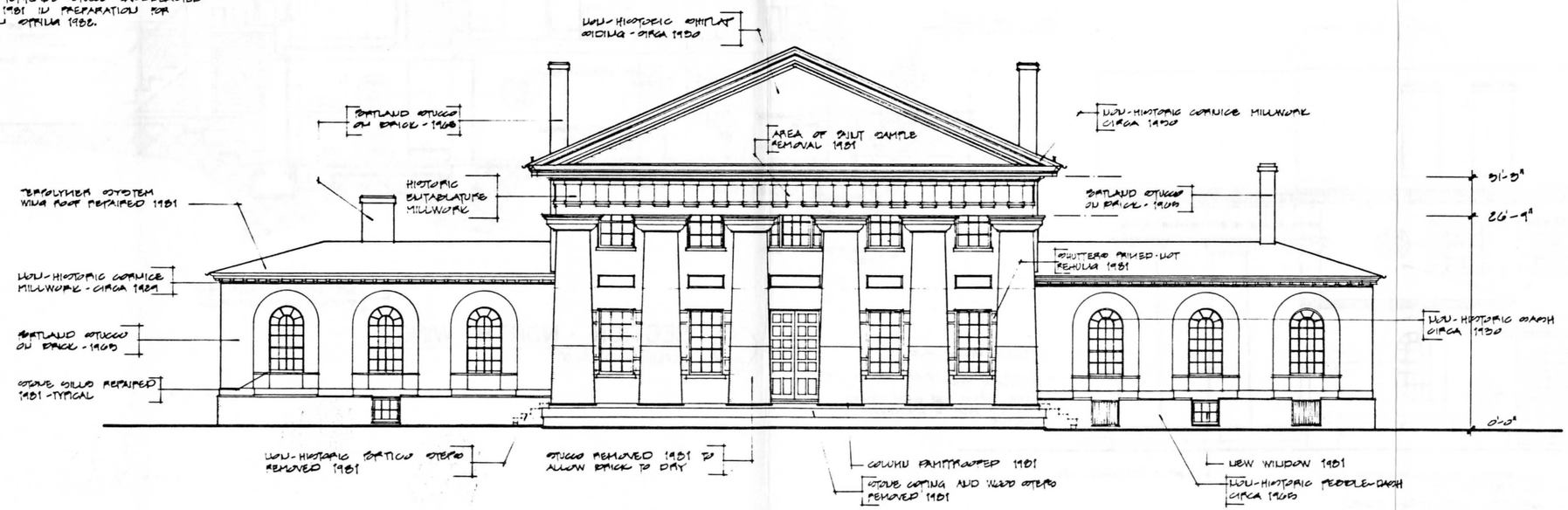


1/5 WEST ELEVATION

SCALE · 1/8"= 1'-0"

NOTE:

NON-HISTORIC PORTLAND STUCCO SANDBLASTED AND PAINTED 1981 IN PREPARATION FOR HARDLIZATION CYCLE 1982.



2/5 EAST ELEVATION

SCALE · 1/8"= 1'-0"

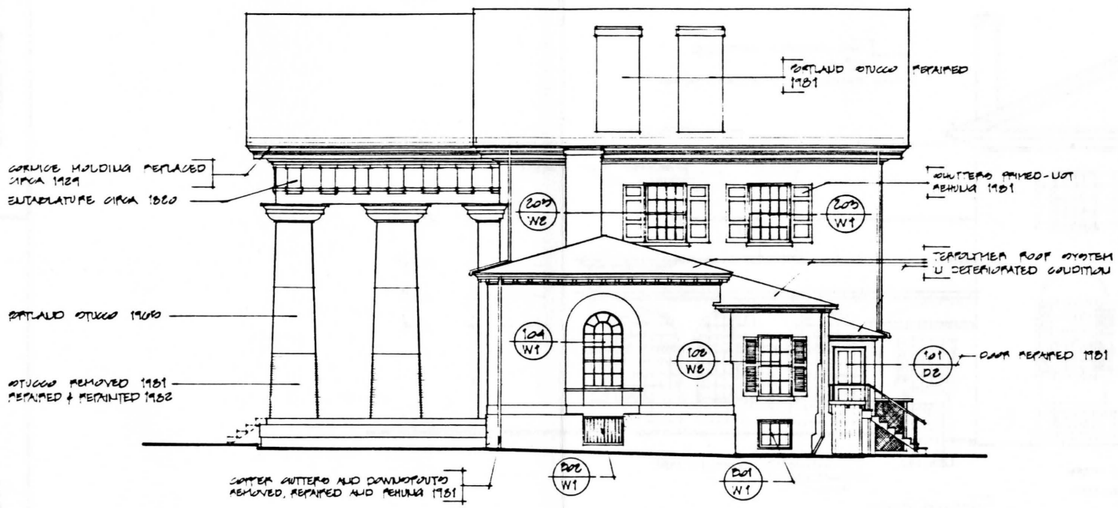
EXISTING CONDITIONS

ARLINGTON HOUSE · ELEVATION

1/8"=1' 0 5 10 15 20 FEET

PREPARED	DRAWING NO.
HADFIELD	850
DESIGNED	23,000
OLIAH	PCIP PKG. 300 / SHEET 5
DRAWN	
DOUALD	
CHECKED	OF 13
5/9/82	
DATE	

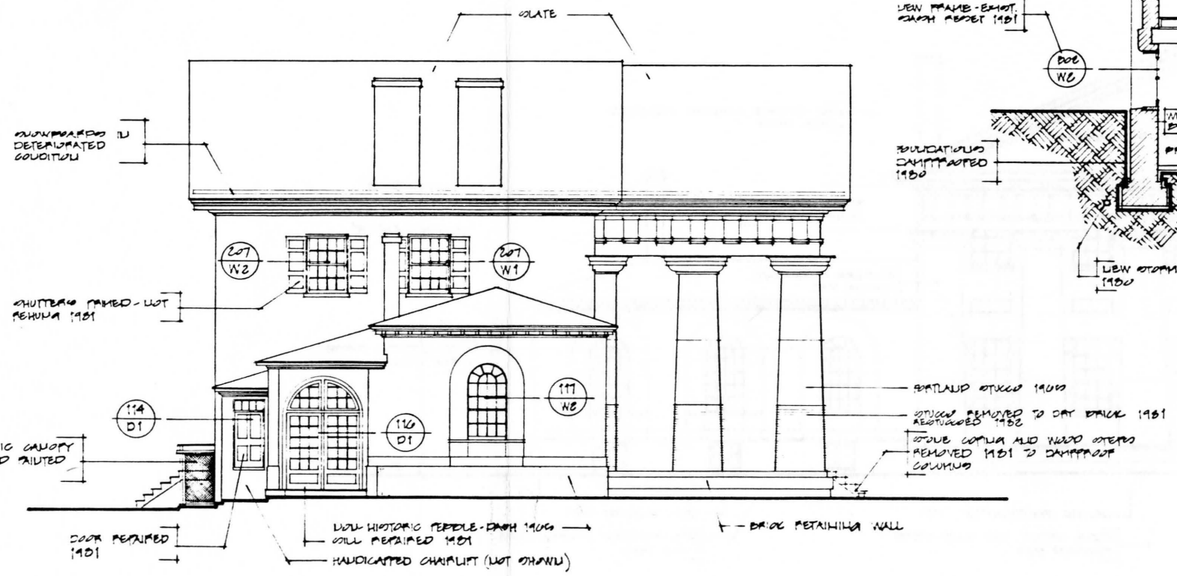
☆ GPO: 1977 777-999



1/6 NORTH ELEVATION

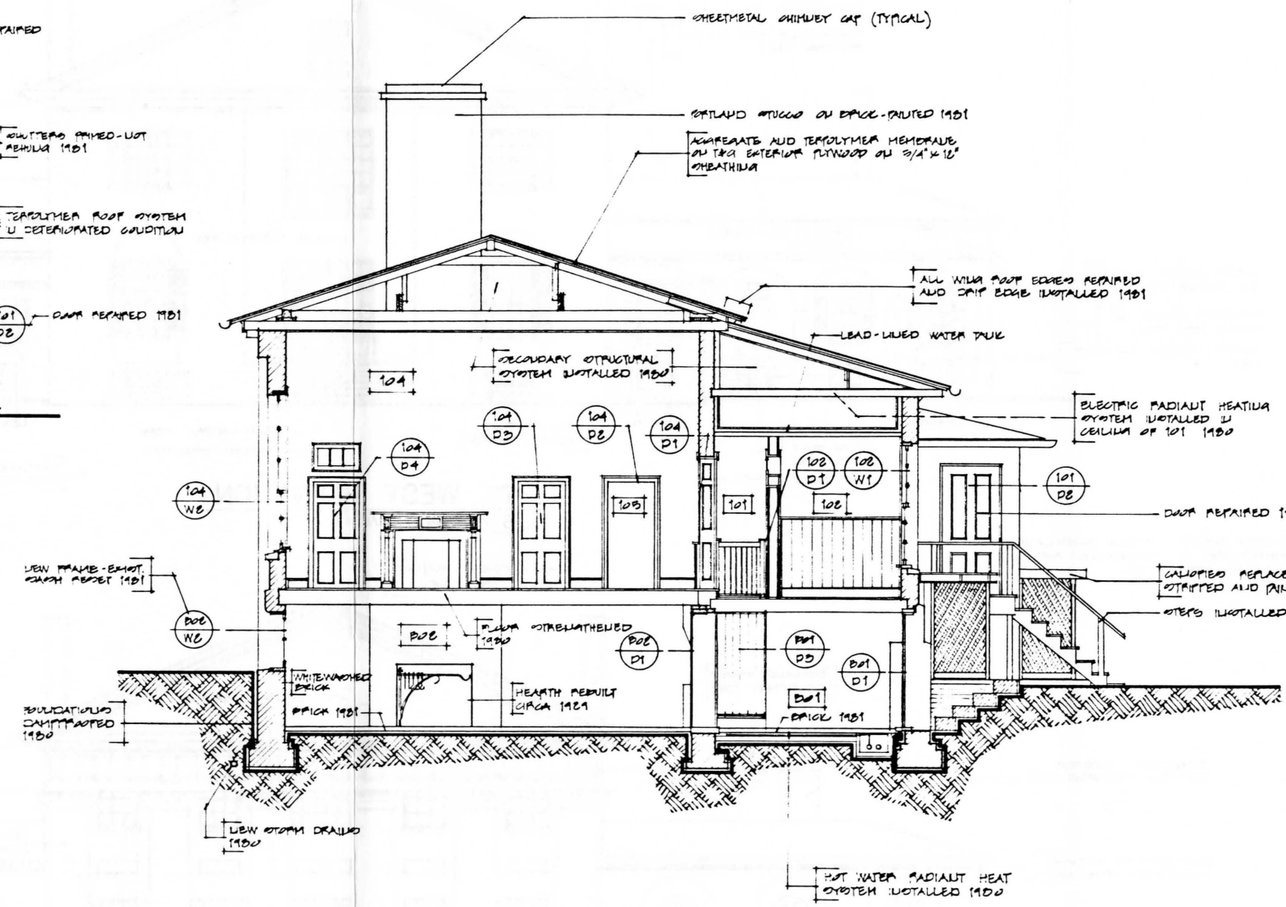
SCALE 1/8"=1'-0"

NOTE:
NON-HISTORIC PORTLAND STUCCO SANDBLASTED AND PAINTED 1981 IN PREPARATION FOR MARBLEIZATION 1982.



2/6 SOUTH ELEVATION

SCALE 1/8"=1'-0"



3/6 SECTION · NORTH WING

SCALE · 1/4"=1'-0"

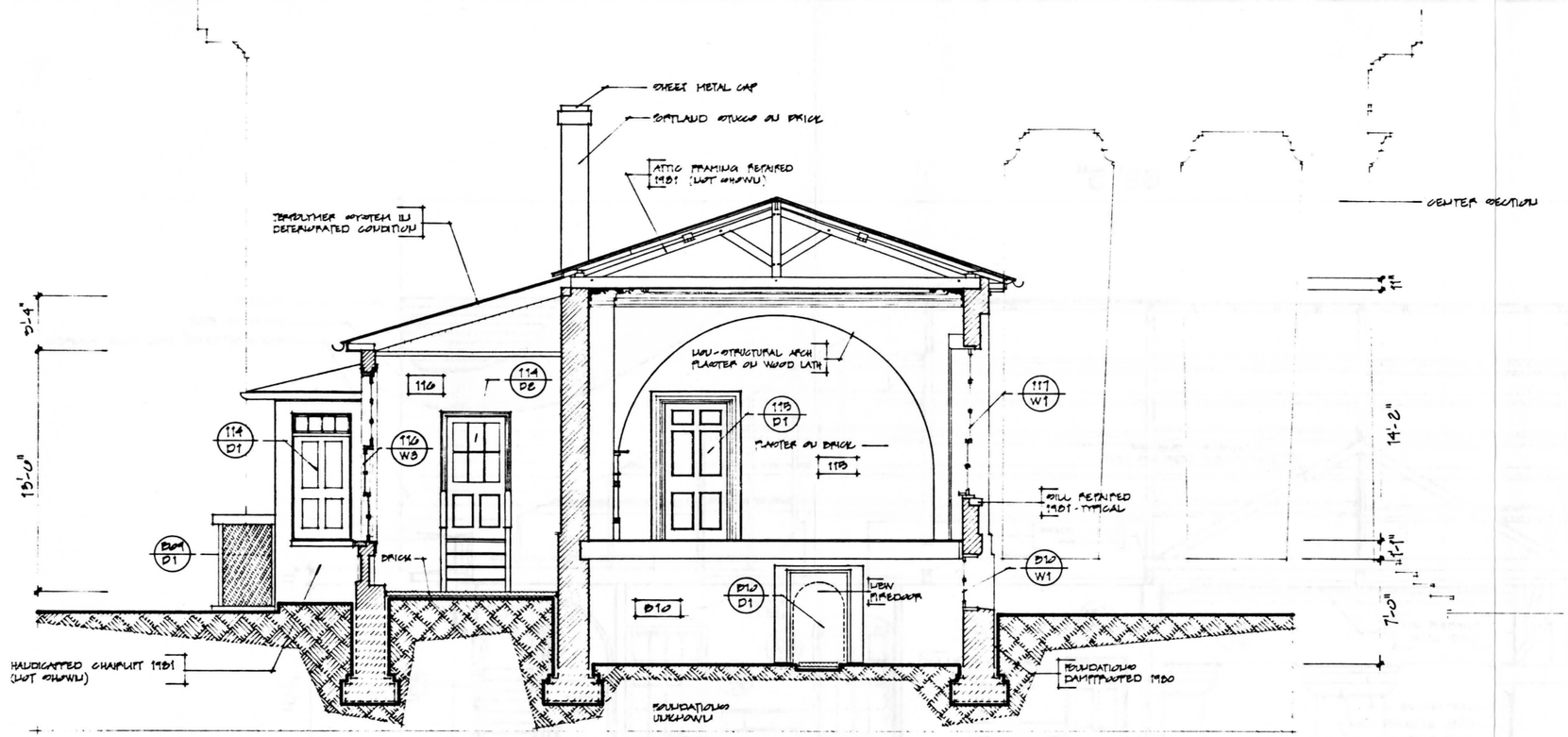
EXISTING CONDITIONS

ARLINGTON HOUSE · SECTION·ELEVATION

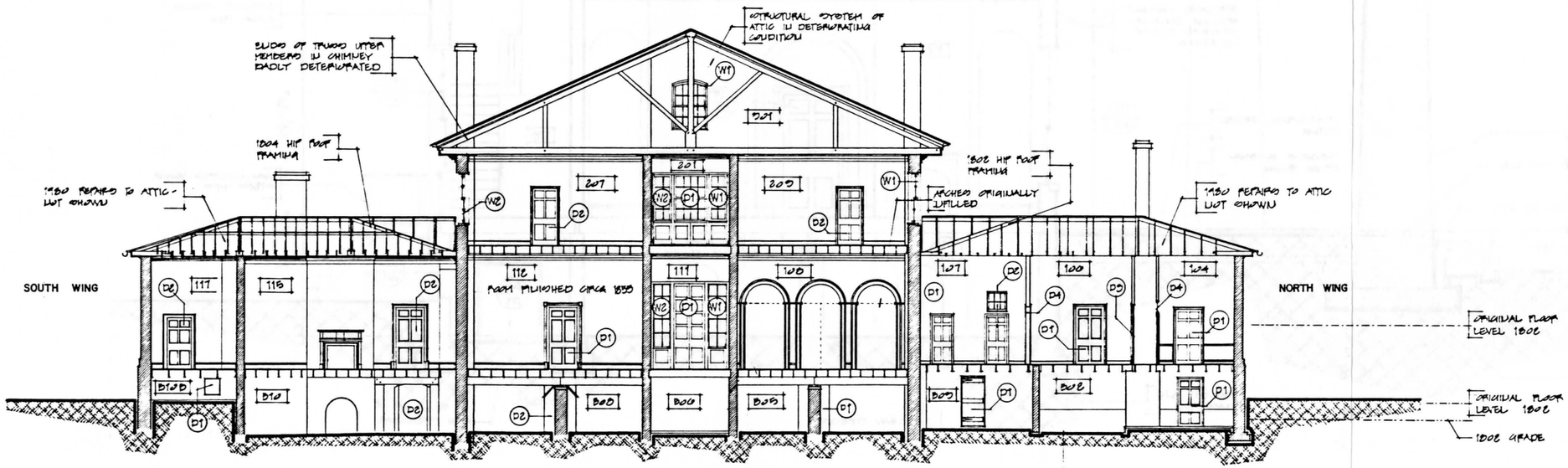
1/4"=1'-0" 1/8"=1'-0"

PREPARED	DRAWING
HADFIELD	550
DESIGNED	23000
OLIAN	PCIP PKG.
DRAWN	500
DOUALD	SHEET
CHECKED	6
3/7/80	OF 13
DATE	

© GPO: 1977 772-388



1/7 SECTION · SOUTH WING
SCALE · 1/4"=1'-0"



NOTE: REPAIRED TO FLOOR SYSTEMS COMPLETE IN ROOMS: 115, 118, 200/109, 107, 100, 103, 104, 101

2/7 LONGITUDINAL SECTION
SCALE 1/8"=1'-0"

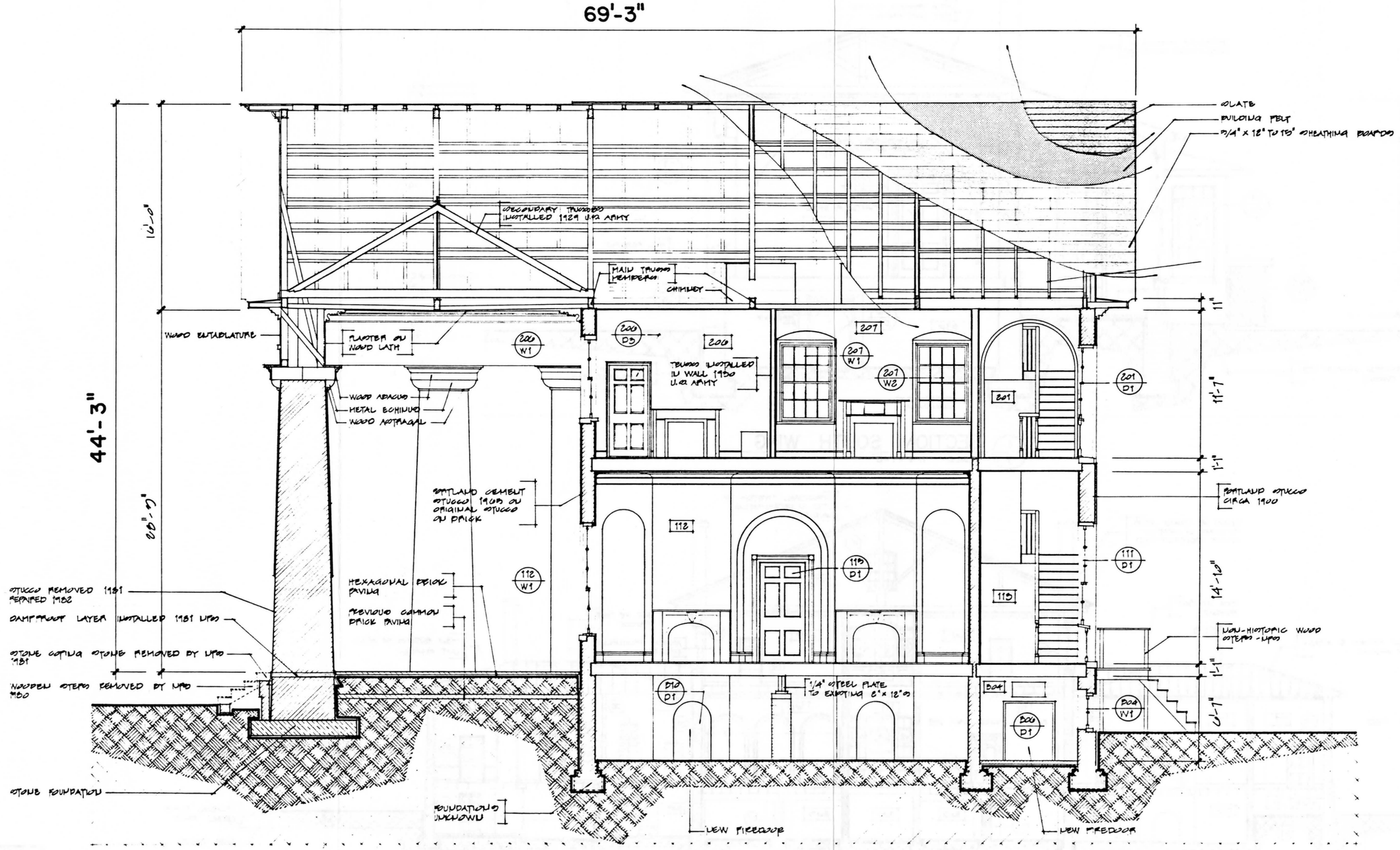
EXISTING CONDITIONS

ARLINGTON HOUSE · SECTION

1/8"=1'

PREPARED	DRAWING NO.
HADFIELD	5350
DESIGNED	23,333
GLIAH	PCIP PKG. 300
DRAWN	SHEET 7
DONALD	OF 13
CHECKED	
5/9/82	
DATE	

☆ GPO: 1977 777-999



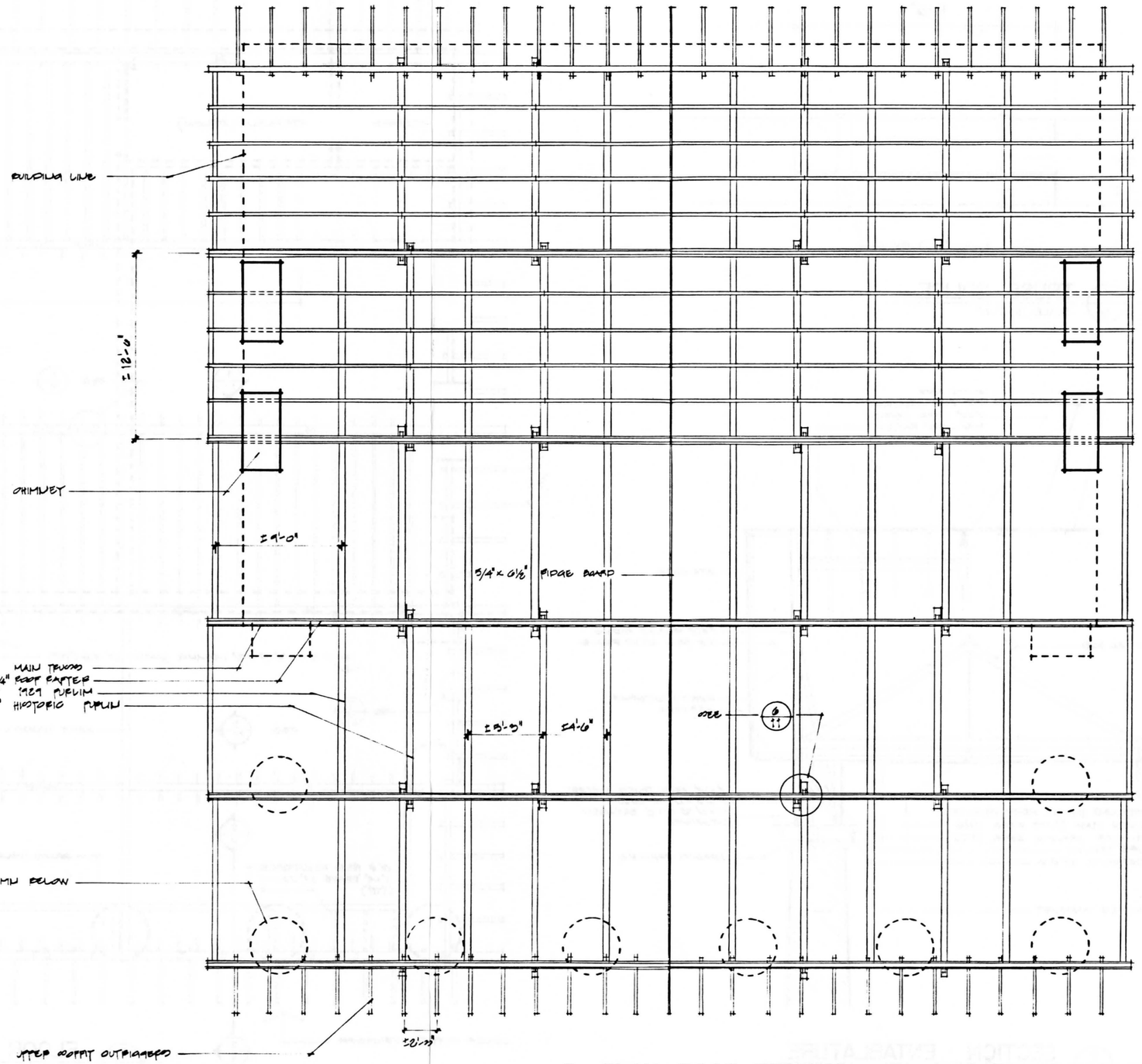
1/8 TRANSVERSE SECTION · MAIN BLOCK

SCALE · 1/4" = 1'-0"

ARLINGTON HOUSE · SECTION

PREPARED	DRAWING
HADFIELD	850
DESIGNED	25,200
DRAWN	PCIP PKG. 300
DONALD	SHEET 8 OF 13
CHECKED 5/9/82	
DATE	

* GPO: 1977 777-999



1/10 PLAN · ROOF FRAMING
SCALE: 1/4" = 1'-0"

EXISTING CONDITIONS

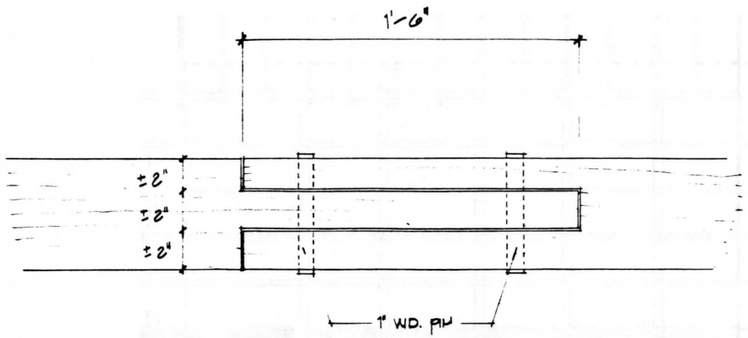
FRAMING SYSTEM

ARLINGTON HOUSE: CENTRAL ATTIC FRA

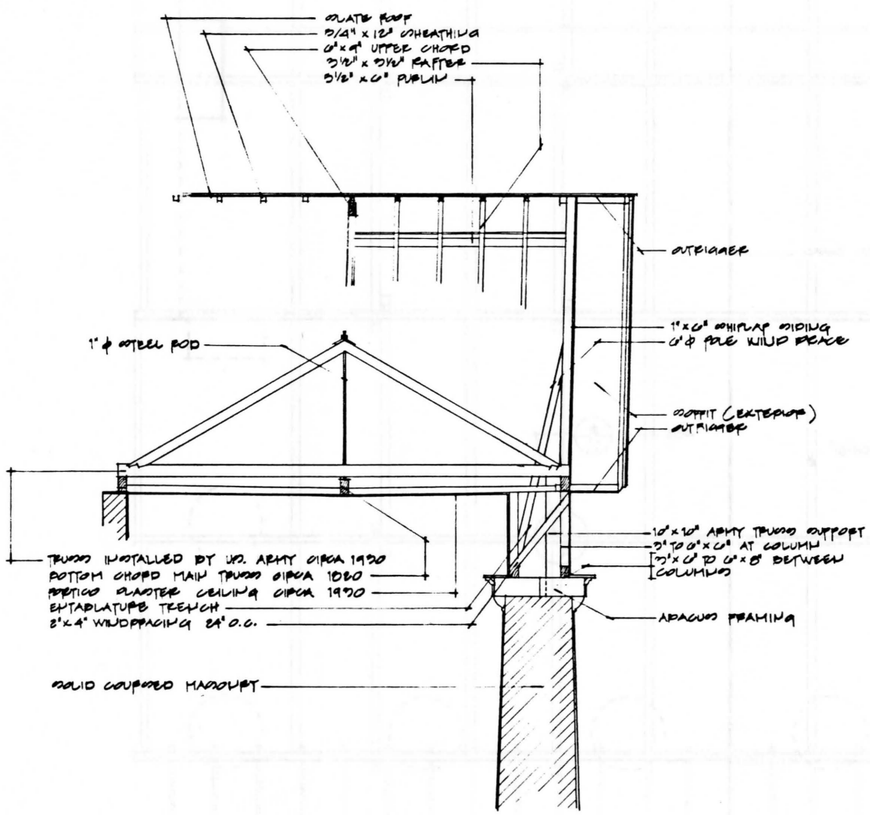
1/4" = 1' 0 2 4 6 8 10 FEET

PREPARED	DRAWING
HADFIELD	850
DESIGNED	25000
OLIGH	PCIP PKG. 500
DRAWN	SHEET 10
DONALD	OF 13
CHECKED	
10/22/81 DATE	

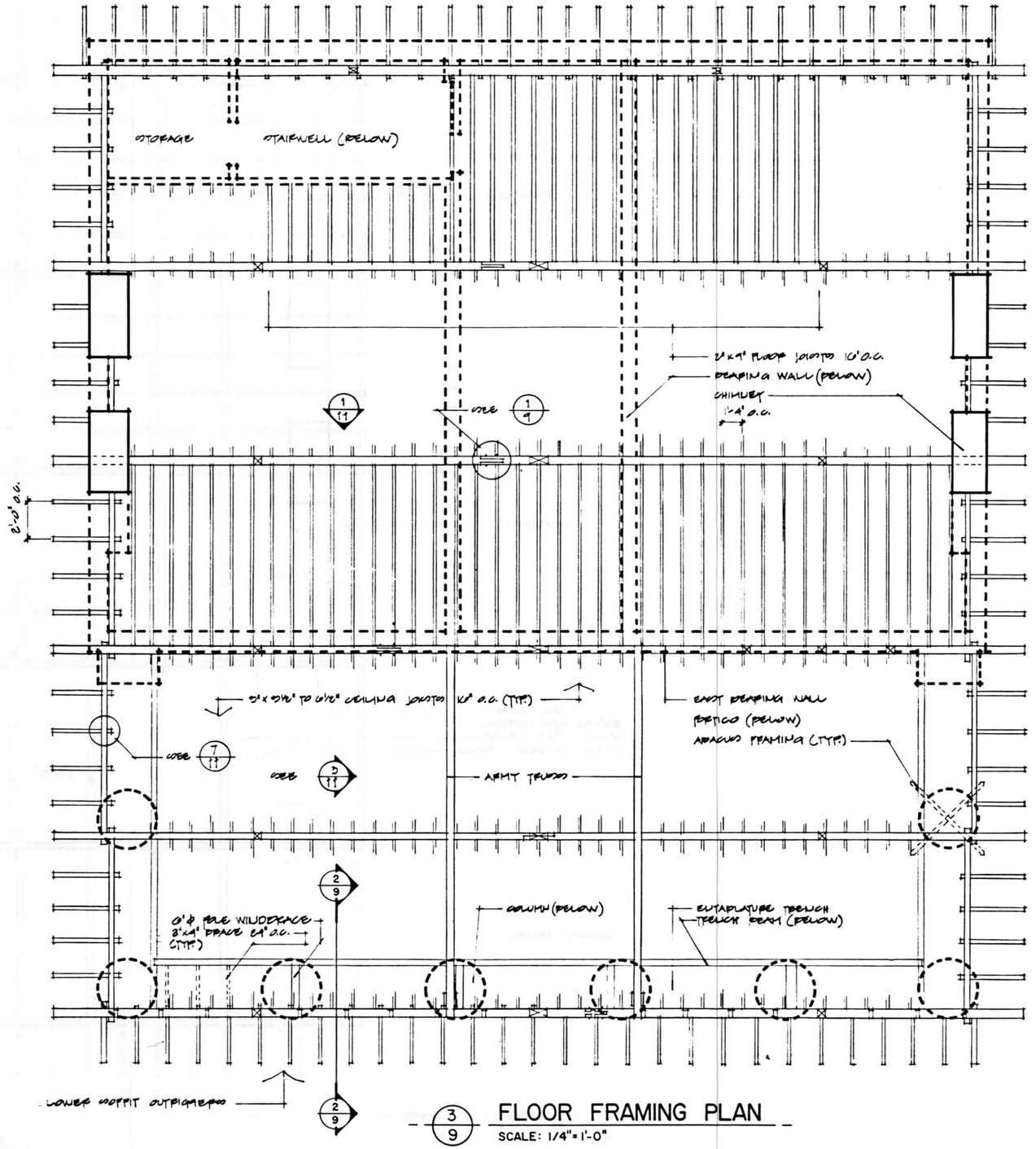
* GPO: 1977 777-999



1/9 TRUSS SPLICE
SCALE: 3"=1'-0"



2/9 SECTION · ENTABLATURE
SCALE: 1/4"=1'-0"



3/9 FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

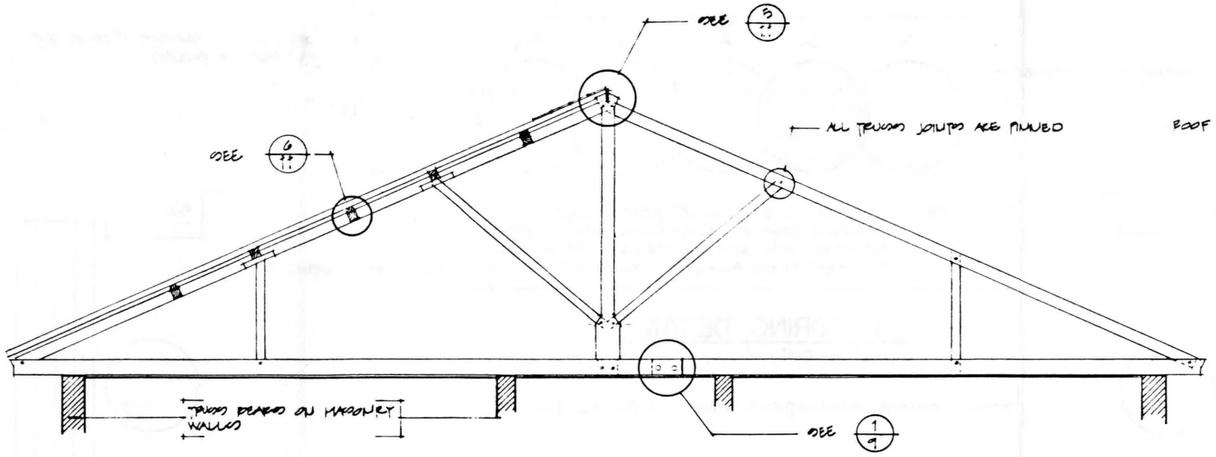
EXISTING CONDITIONS

ARLINGTON HOUSE: CENTRAL ATTIC FRAMING SYSTEM

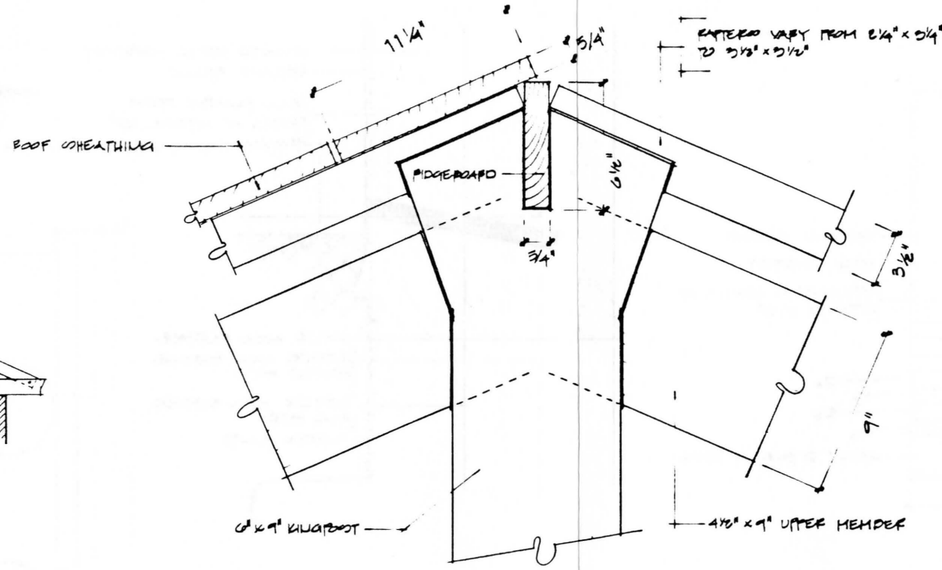
1/4"=1' 0 2 4 6 8 10 FEET
3"=1'

PREPARED	DRAWING NO.
HADFIELD DESIGNED	850
OUGH DRAWN	23,000
DONALD CHECKED	PCIP PKG. 500 / SHEET 9 OF 13
10/22/81 DATE	

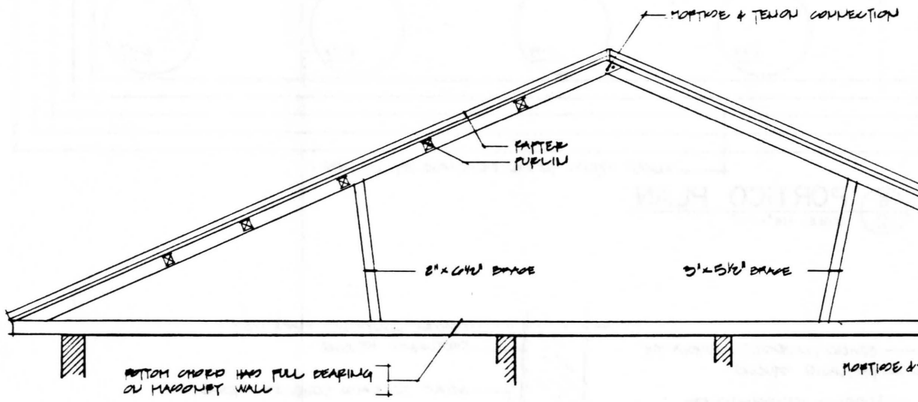
* GPO: 1977 777-888



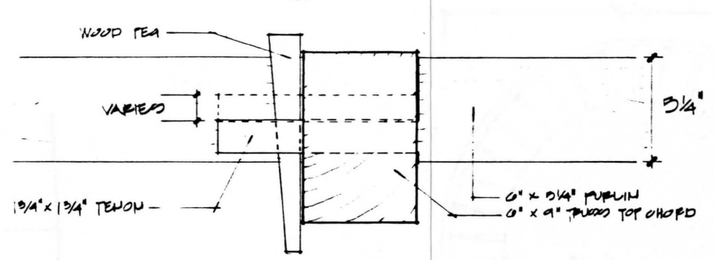
1/11 ELE. · TRUSS
SCALE · 1/4"=1'-0"



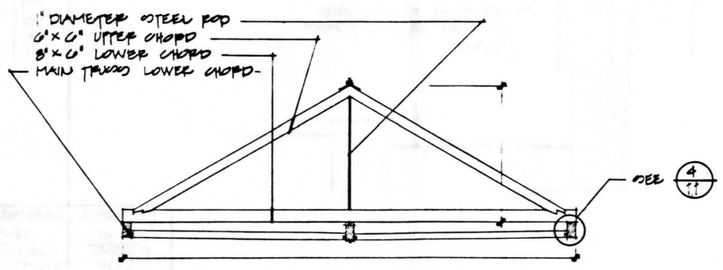
5/11 ELE. · TRUSS VERTEX
SCALE · 3"=1'-0"



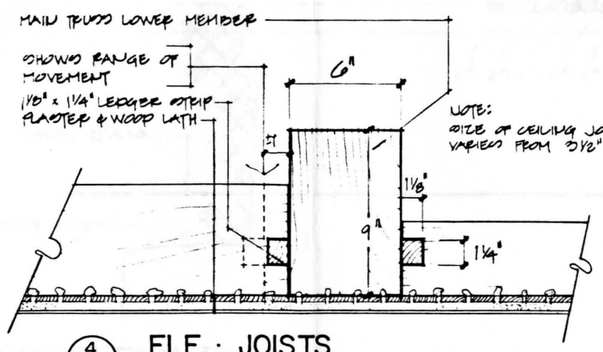
2/11 ELE. · WEST WALL TRUSS
SCALE · 1/4"=1'-0"



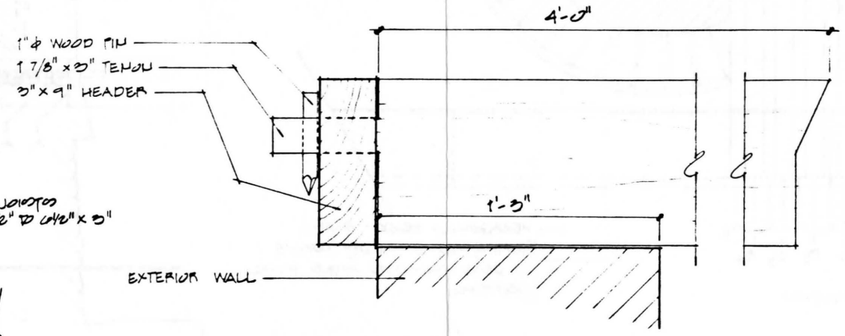
6/11 ELE. · PURLIN
SCALE · 3"=1'-0"



3/11 ELE. · 1930 TRUSS
SCALE · 1/4"=1'-0"



4/11 ELE. · JOISTS
3"=1'-0"



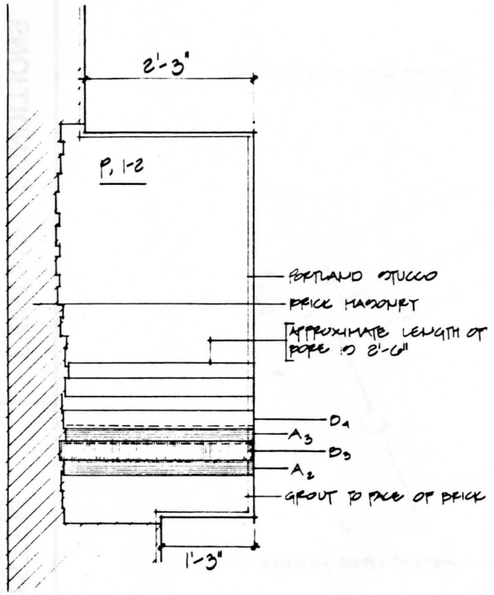
7/11 ELE. · OUTRIGGER
SCALE · 3"=1'-0"

EXISTING CONDITIONS

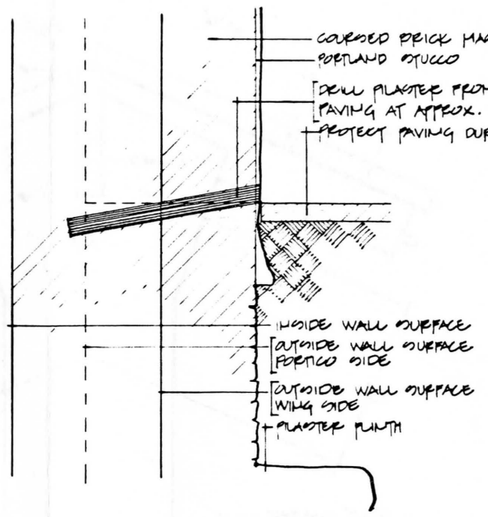
ARLINGTON HOUSE: CENTRAL ATTIC FRAMING SYSTEM

PREPARED	DRAWING NO.
HADFIELD DESIGNED	350 23,000
DUGH DRAWN	PCIP PKG. / SHEET
DONALD CHECKED	300 / 11
10/22/81 DATE	— / OF 13

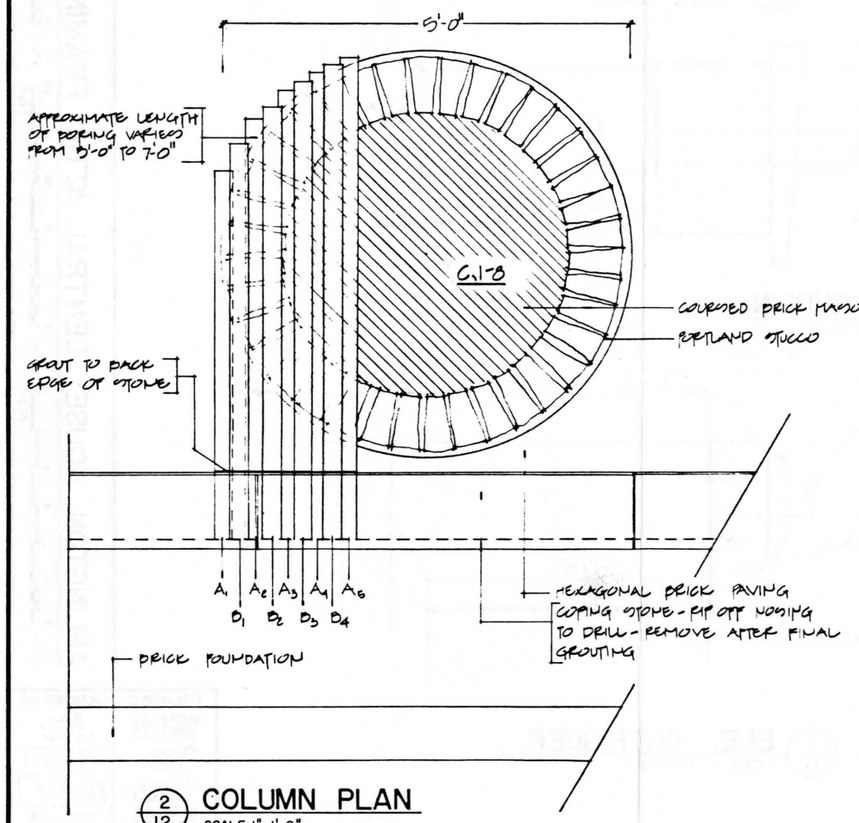
GPO: 1977 777-999



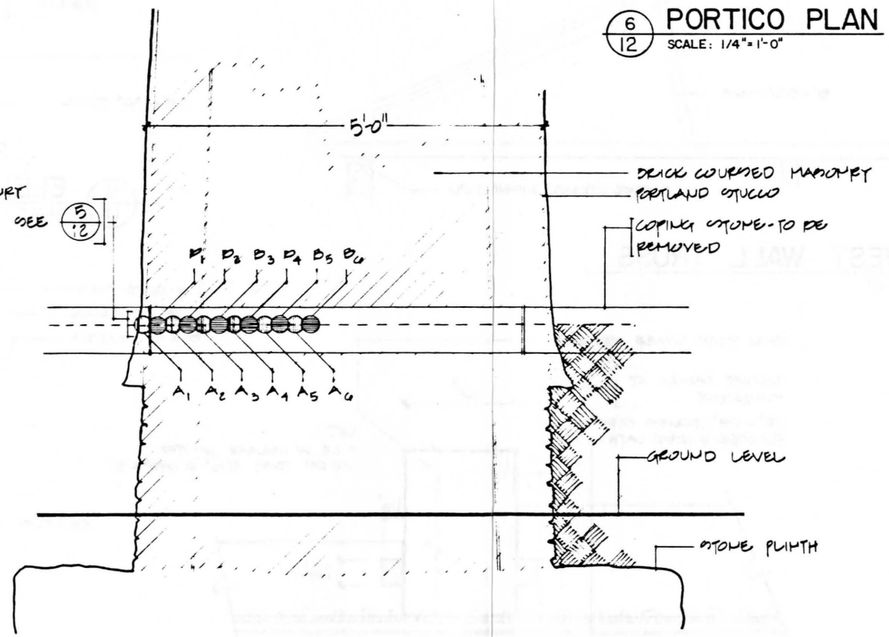
1/12 PILASTER PLAN
SCALE: 1"=1'-0"



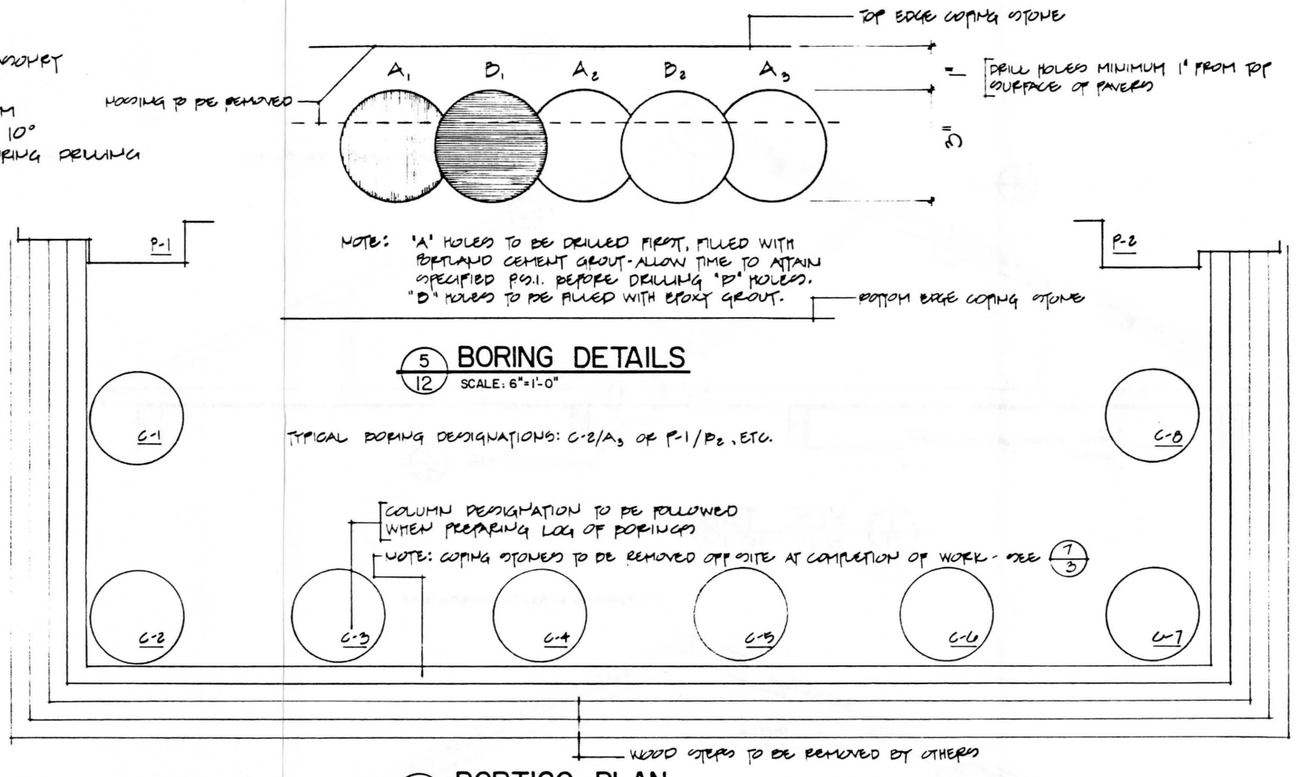
3/12 PILASTER SECTION
SCALE: 1"=1'-0"



2/12 COLUMN PLAN
SCALE: 1"=1'-0"



4/12 COLUMN SECTION
SCALE: 1"=1'-0"

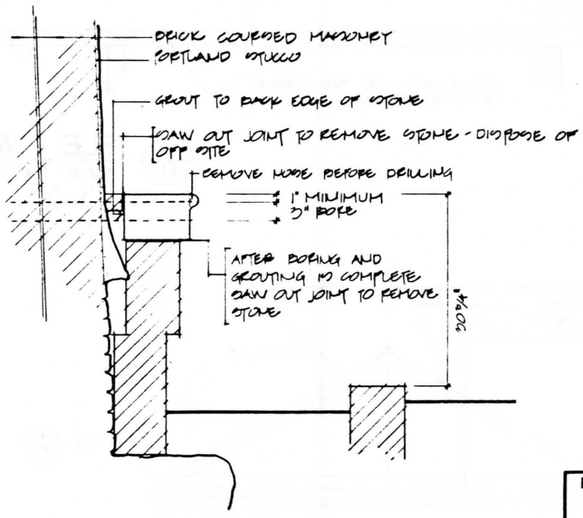


6/12 PORTICO PLAN
SCALE: 1/4"=1'-0"

NOTE: 'A' HOLES TO BE DRILLED FIRST, FILLED WITH PORTLAND CEMENT GROUT - ALLOW TIME TO ATTAIN SPECIFIED P.S.I. BEFORE DRILLING 'B' HOLES. 'B' HOLES TO BE FILLED WITH EPOXY GROUT.

5/12 BORING DETAILS
SCALE: 6"=1'-0"

TYPICAL BORING DESIGNATIONS: C-2/A3 OR P-1/B2, ETC.



7/12 COPING STONE SECTION
SCALE: 1"=1'-0"

NOTE: ALL WORK PERFORMED IN 1981

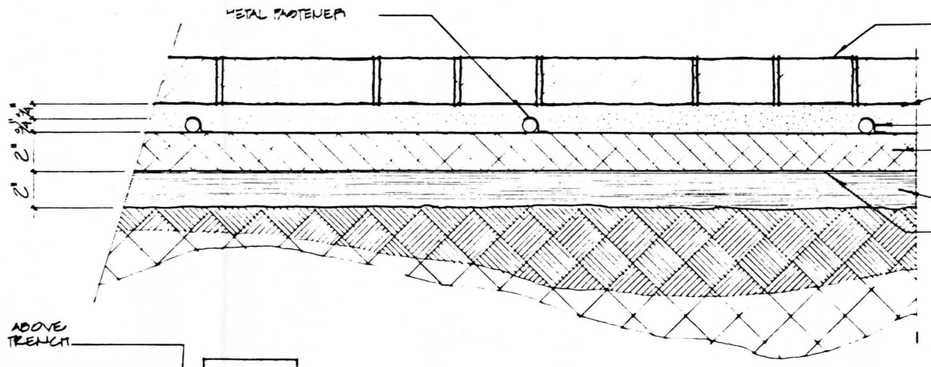
ARLINGTON HOUSE: COLUMN DAMPPROOFING

EXISTING CONDITIONS

1/4"=1'

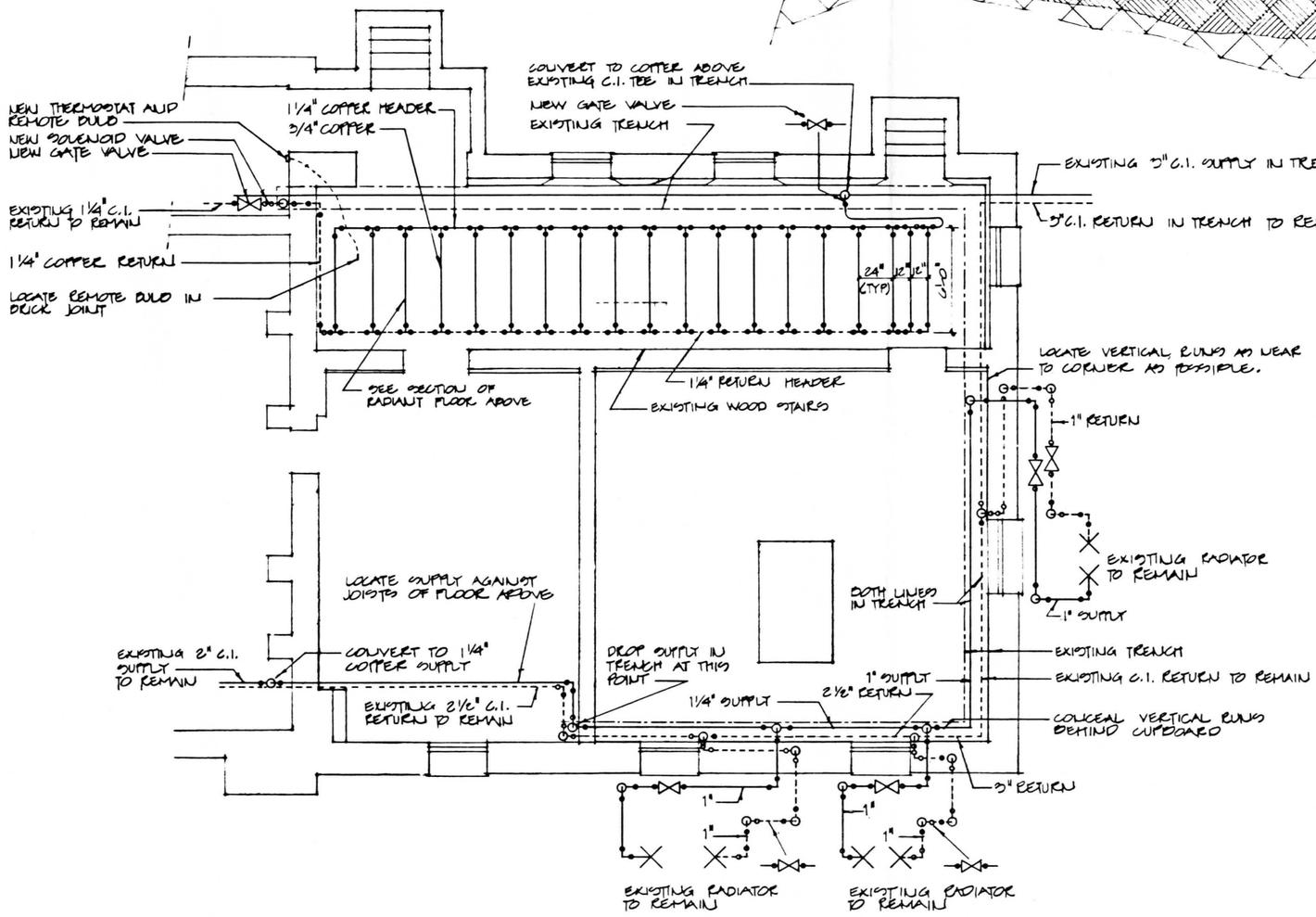
PREPARED	DRAWING NO.
DUGH	880
DESIGNED	80,000
DUGH	PCIP PKG. 800
DRAWN	SHEET 12
ADKINS	OF 13
CHECKED	
4/9/81	
DATE	

GPO: 1977 777-888



2/13 SECTION

3"=1'-0"



ALL WORK PERFORMED IN 1980

NOTE: PLUMBING FOR RADIATORS IS NOT SHOWN TO SCALE. RADIATORS ARE LOCATED IN RECESS BELOW WINDOWS ABOVE.

1/13 PLAN · N. WING HEATING LAYOUT

1/4"=1'-0"

EXISTING CONDITIONS

ARLINGTON HOUSE RADIANT HEAT SYSTEM

1/4"=1'-0" 0 2 4 6 8 10 FEET

3"=1' 0 FEET

PREPARED	DRAWING NO.
DLGH DESIGNED	850 85.000
DLGH DRAWN	PCIP PKG. 500
CHILTON CHECKED	SHEET 13 OF 13
9/19/80 DATE	

* GPO: 1977 777-888

As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The Department has also major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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